ESTIMATED COST OF CONEJO DAM AND RESERVOIR
WITH STORAGE CAPACITY OF 20,000 ACRE-FEET

(Based on prices prevailing in spring of 1953)

Elevation of crest of dam: 375 feet
Elevation of crest of spillway: 360 feet
Height of dam to spillway crest, above stream bed: 130 feet
Capacity of reservoir to crest of spillway: 20,000 acre-feet
Capacity of spillway with 5-foot freeboard: 6,000 second-feet

Item	Quantity	Unit price	Cost	
CAPITAL COSTS				
Dam				
Exploration		lump sum	$ 20,000	
Diversion of stream and dewatering of foundation		lump sum	10,000	
Stripping topsoil	45,000 cu.yd.	$ 0.60	27,000	
Foundation excavation				
Abutment	97,000 cu.yd.	1.50	145,500	
Channel	400,400 cu.yd.	0.60	240,200	
Embankment				
Impervious	826,190 cu.yd.	0.70	578,300	
Random	828,820 cu.yd.	0.60	497,300	
Rock riprap	28,800 cu.yd.	4.00	115,200	
Drilling grout holes	11,900 lin.ft.	3.00	35,700	
Pressure grouting	7,900 cu.ft.	4.00	31,600	$1,700,800
Spillway				
Excavation	120,000 cu.yd.	2.00	240,000	
Concrete				
Weir and cutoff	230 cu.yd.	35.00	8,100	
Floor	700 cu.yd.	30.00	21,000	
Walls	1,000 cu.yd.	40.00	40,000	
Reinforcing steel	153,000 lbs.	0.15	23,000	332,100
Outlet Works				
Tower concrete	500 cu.yd.	80.00	40,000	
Concrete encasement	600 cu.yd.	40.00	24,000	
Steel pipe 72-inch dia.	800 lin.ft.	45.00	36,000	
Tower inlet valve 36-inch dia.	4 each	5,000.00	20,000	
Needle valve 60-inch dia.	1 each	27,500.00	27,500	
Miscellaneous metal work	35,000 lbs.	0.40	14,000	161,500
Reservoir				
Land acquisition		lump sum	70,000	
Clearing	350 acres	50.00	17,500	87,500
Subtotal				$2,281,900
Administration and engineering, 10%				$ 228,200
Contingencies, 15%				342,300
Interest during construction				114,000
TOTAL				$2,966,400

ESTIMATED COSTS OF DISTRIBUTION SYSTEM FOR COLORADO RIVER WATER IN CALLEGUAS-CONEJO HYDROLOGIC UNIT

(Based on prices prevailing in spring of 1953)

Item	Quantity	Unit price	Cost	
CAPITAL COSTS				
Simi-Las Posas Feeder - - Capacity: 65 second-feet				
Excavation	26,300 cu.yd.	$ 0.90	$ 23,700	
Backfill	20,000 cu.yd.	0.45	9,000	
Pipe, furnish and install reinforced concrete	12,500 lin.ft.	24.50	306,300	
Fittings		lump sum	14,500	
Valves		lump sum	11,200	
Line meters		lump sum	6,000	
Road resurfacing	800 tons	7.50	6,000	
Right of way		lump sum	4,000	$ 380,700
Simi Lateral - - Capacity: 15 second-feet				
Excavation	33,800 cu.yd.	0.90	30,400	
Backfill	29,200 cu.yd.	0.45	13,100	
Pipe, furnish and install reinforced concrete	27,000 lin.ft.	9.69	261,600	
Fittings		lump sum	11,900	
Valves		lump sum	2,200	
Line meters		lump sum	2,000	
Road crossings		lump sum	2,000	
Road resurfacing	430 tons	7.50	3,200	
Regulating reservoir		lump sum	38,300	364,700
Las Posas Lateral - - Capacity: 50 second-feet				
Excavation	134,100 cu.yd.	0.90	120,700	
Backfill	110,500 cu.yd.	0.45	49,700	
Pipe, furnish and install reinforced concrete	97,200 lin.ft.	16.29	1,583,300	
Fittings		lump sum	147,200	
Valves		lump sum	47,900	
Line meters		lump sum	5,000	
Road crossing		lump sum	22,000	
Road resurfacing	2,100 tons	7.50	15,700	
Regulating reservoir		lump sum	80,000	
Right of way		lump sum	24,000	2,095,500
Conejo Feeder - - Capacity: 30 second-feet				
Excavation	25,100 cu.yd.	0.90	22,600	
Backfill	20,900 cu.yd.	0.45	9,400	
Pipe, furnish and install reinforced concrete	17,200 lin.ft.	12.48	214,600	
Fittings		lump sum	13,000	
Valves		lump sum	13,400	
Line meters		lump sum	4,000	
Road crossings		lump sum	1,000	
Road resurfacing	370 tons	7.50	2,800	
Regulating reservoir		lump sum	70,000	
Right of way		lump sum	10,300	361,100

ESTIMATED COSTS OF DISTRIBUTION SYSTEM FOR COLORADO RIVER WATER
IN CALLEGUAS-CONEJO HYDROLOGIC UNIT
(Continued)

Item	Quantity	Unit price	Cost	
APITAL COSTS				
housand Oaks Lateral - - Capacity: 10 second-feet				
Excavation	18,100 cu.yd.	$ 0.90	$ 16,300	
Backfill	16,200 cu.yd.	0.45	7,300	
Pipe, furnish and install reinforced concrete	19,400 lin.ft.	7.84	152,100	
Fittings		lump sum	9,600	
Valves		lump sum	2,500	
Line meters		lump sum	2,000	
Road crossings		lump sum	1,500	
Road resurfacing	80 tons	7.50	600	
Regulating reservoir		lump sum	38,300	
Right of way		lump sum	14,900	$ 245,100
ewbury Park Lateral - - Capacity: 15 second-feet				
Excavation	24,700 cu.yd.	0.90	22,200	
Backfill	21,900 cu.yd.	0.45	9,900	
Pipe, furnish and install reinforced concrete	31,900 lin.ft.	6.32	201,600	
Fittings		lump sum	12,800	
Valves		lump sum	4,400	
Line meters		lump sum	2,000	
Road crossings		lump sum	700	
Road resurfacing	540 tons	7.50	4,100	
Regulating reservoir		lump sum	44,000	
Right of way		lump sum	15,700	317,400
Subtotal				$3,764,500
dministration and engineering, 10%				$ 376,400
ontingencies, 15%				564,700
nterest during construction				94,100
TOTAL				$4,799,700
NNUAL COSTS				
nterest, 4%				$192,000
mortization, 40-year sinking fund at 4%				50,500
peration and maintenance				14,400
TOTAL				$256,900

ESTIMATED COST OF CONDUIT TO DELIVER
COLORADO RIVER WATER FROM CONEJO RESERVOIR
TO OXNARD REGULATING RESERVOIR AND THE CITY OF VENTURA

(Based on prices prevailing in spring of 1953)

Item	Quantity	Unit price	Cost	
CAPITAL COSTS				
Conejo Reservoir to Oxnard Regulating Reservoir - capacity 150 second-feet				
Excavation	227,200 cu.yd.	$ 0.90	$ 204,500	
Backfill	164,900 cu.yd.	0.45	74,200	
Pipe, furnish and install 66-inch dia. lock joint concrete cylinder	73,200 lin.ft.	44.70	3,272,000	
Fittings		lump sum	163,600	
Valves		lump sum	13,000	
Line meter	1 each	5,000.00	5,000	
River crossing		lump sum	10,000	
Road resurfacing	12,000 tons	6.00	72,000	
Right of way		lump sum	5,000	$3,819,300
Oxnard Reservoir to City of Ventura - capacity 25 second-feet				
Excavation	55,500 cu.yd.	1.05	58,300	
Backfill	46,300 cu.yd.	0.55	25,500	
Pipe, furnish and install 36-inch dia. lock joint concrete cylinder	37,000 lin.ft.	13.00	481,000	
Fittings		lump sum	24,100	
Valves		lump sum	8,100	
Line meter	1 each	2,000.00	2,000	
River crossing	2,200 lin.ft.	35.00	77,000	
Road resurfacing	8,000 tons	6.00	48,000	
Terminal reservoir		lump sum	44,000	
Right of way		lump sum	15,000	783,000
Subtotal				$4,602,300
Administration and engineering, 10%				$ 460,200
Contingencies, 15%				690,300
Interest during construction				115,100
TOTAL				$5,867,900
ANNUAL COSTS				
Interest, 4%				$ 234,700
Amortization, 40-year sinking fund at 4%				61,700
Operation and maintenance				14,500
TOTAL				$ 310,900

APPENDIX D

SOME ORGANIZATIONAL AND FINANCIAL ASPECTS INVOLVED IN IMPLEMENTING WATER PLANS IN VENTURA COUNTY

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SOME ORGANIZATIONAL AND FINANCIAL ASPECTS INVOLVED
IN IMPLEMENTING WATER PLANS IN VENTURA COUNTY

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SOME ORGANIZATIONAL AND FINANCIAL ASPECTS INVOLVED IN IMPLEMENTING WATER PLANS IN VENTURA COUNTY

INTRODUCTION

Future economic expansion in Ventura County is believed to be inextricably involved with the development of its water resources, together with the furnishing of supplemental supplies and the importation of water from outside the County. In a number of areas throughout the County, utilization of the local water supply is nearly complete, and in some areas the water supply as presently developed is used beyond its safe limits. In these latter instances, the security of investments made many years ago, as well as of those recently made, is becoming increasingly jeopardized. Possibilities for sound future economic growth within the County appear to be remote under present water supply conditions.

The physiography of Ventura County, and the location and type of mineral, agricultural, and other resources therein, present challenges to the people of the County with respect to planning for future economic growth, including planning to provide utility services for such growth. How the people respond to these challenges will determine the economic course of the future.

Because of the unique physiography, the climatic characteristics, and the concentrations of population which bear little relation with concentrations of assessed valuation of taxable property, the matter of initiating water resources development plans for Ventura County appears to require somewhat unusual approaches with respect to organizational and financial aspects. The objectives of this appendix report are: (1) a general review of the purposes and powers of existing organized public water districts in Ventura County; (2) discussion of the adequacy of existing water districts with regard to solution of the County's water problems; and (3) suggestion of a county-wide

type of water district which would plan, finance, construct, and operate water resources projects.

EXISTING ORGANIZED PUBLIC WATER DISTRICTS

In California there are so many kinds of water districts that may be organized by local interests, each kind of which is designed to meet a special circumstance or need, that it behooves local interests to be certain that they either have, or organize, a type of district that best fits their overall needs. The Legislature has enacted more than 30 general and more than 30 special water district acts for the primary purpose of assisting local interests to resolve their local water problems.

Investigation of Ventura County and its water problems indicates that there are several factors that should be considered in ascertaining what type of public water district is desirable, and whether the existing district are satisfactory to cope with the problems at hand. These factors include th following: the purposes and powers of the district, the basis of voting, the type of governing board, restrictions on and kinds of indebtedness that may be incurred, and the legally available sources of revenue that may be obtaine and used to retire such indebtedness. These matters will be considered in describing the existing districts, and in suggesting what types of districts may be desirable for Ventura County.

Ventura County Flood Control District

This district was organized in 1944, under the provisions of a special enabling act passed by the Legislature, known as the "Ventura County Flood Control Act". It is the only district that embraces the entire County. Its purposes and powers were appreciably broadened by passage of Assembly Bil No. 494 by the Legislature in 1953. Among other things, the District may

control flood and storm waters, store, spread and sink water, reclaim water, import water, sell water, and levy charges for the use of ground water in areas where the District spreads water. The District is divided into four zones to accomplish these objectives, and for bonding and assessment purposes.

The basis of voting is the qualified registered voter. Thus, tenant and landlord have equal voting power. The Ventura County Board of Supervisors constitutes the governing board of the District. General obligation bonds only may be issued and shall be a lien upon all, but only on the taxable property of the zone of issuance, not the entire District. Said bonds are declared by law to be legal investments and shall be paid from assessments levied within the zone, or out of any other fund of the zone. A two-thirds favorable vote by the electorate in the zone affected is necessary to approve a bond issue. No zone, nor the property therein, shall be liable for the bonded indebtedness of any other zone. Ad valorem taxes may be levied upon all taxable property in the District to pay district costs that are of common benefit to the whole District.

The Ventura County Flood Control District does not have specific powers to develop and sell hydroelectric power, issue general obligation bonds which would be a lien upon the entire District, and issue revenue bonds.

Water Conservation Districts

There are four water conservation districts in Ventura County, namely: San Antonio, Santa Clara, Simi Valley, and United. These districts have been formed under two general enabling acts.

The earliest known district of this type formed in the County is the Santa Clara Water Conservation District, which was organized in 1927 under the "Water Conservation Act of 1927". Its powers and purposes are somewhat limited in that there are no provisions with respect to the issuance and sale

of bonds, and its assessment powers are limited. However, within the foregoing severe financial restrictions, the District may acquire, store, and distribute surface water supplies for irrigation, seasonal storage or underground replenishment; construct, operate, and maintain works; sell water supplies for surface irrigation; and provide flood protection facilities. The basis of voting is one vote per acre or fraction thereof. There are only a few districts in the State organized under this particular act. The Santa Clara Water Conservation District held an election in 1953 to dissolve the district. However, the proposition failed to carry.

In 1929, an alternative law was enacted by the Legislature. In 1931 it was modified and is now known as the "Water Conservation Act of 1931". It is under these latter two acts that the remaining Ventura County water conservation districts were organized. The purposes and powers of districts organized under the 1931 act are somewhat broader in scope and generally more adequate than those organized under the 1927 act. Such districts may not generate and sell hydro-power but may, among other things, conserve and store water by almost any manner of means for any useful purpose, including the sinking in wells and spreading of water; install and operate wells, pumps, etc.; and sell, deliver, and otherwise dispose of water.

Members of the boards of directors are elected by the resident registered voters of the districts. General obligation bonds, approved by a two-thirds vote, may be issued. No revenue bonds are authorized. Ad valorem assessments may be levied on lands or real property, whichever is preferred. Improvement districts may be organized.

In addition to the foregoing powers, the Legislature of 1953 granted the United Water Conservation District special powers to own and operate hydroelectric power facilities in conjunction with its water conservation projects and to sell electrical energy at wholesale at the point of generation.

County Water Districts

This type of district is one of the most popular in California, although there is only one in Ventura County - the Meiners Oaks County Water District.

The county water district has broad powers. It can, among other things, furnish water for any beneficial use, store and conserve water, generate and sell hydroelectric power, salvage water, sell or lease oil or mineral rights, and cooperate with other entities. The resident registered voter is eligible to vote, and the five-man board of directors is elected from the eligible electorate. Improvement districts may be created to finance projects that are not of benefit to the district as a whole. The district may issue general obligation and revenue bonds. A two-thirds favorable vote of the electorate is required for approval of all bond issues. Revenue may be obtained from sales or leases of facilities and services, including water. Assessments are based upon an ad valorem levy on all taxable property in the district. However, bond assessments may be levied only on those properties so benefited by the bond issue.

This type of district is often desirable when water facilities for both urban and rural uses are involved.

County Waterworks Districts

There are seven districts of this type in Ventura County, as follows: County Waterworks Districts No. 1(Moorpark), No. 2 (Heuneme), No. 3 (Simi), No. 4 (Casitas Springs), No. 5 (Camarillo), No. 6 (Thousand Oaks), and No. 7 (Live Oaks Acres).

County waterworks districts organized under the enabling act have defined purposes and powers that are more circumscribed than those of a county water district or a water conservation district. Overlapping of boundaries of

certain other types of districts is prohibited. Resident registered voters may vote, and the county board of supervisors is the governing board of the district. The board may appoint directors from among the registered voters who are also owners of real property within the district.

General obligation and revenue bonds may be issued, subject to a majority approved vote by the electorate. Special zones or improvement districts may be formed to construct and finance facilities, or to fix special rates and charges. The district can obtain revenue from the sale of water, and from leases or sales of property. Ad valorem assessments may be levied upon all taxable property.

Municipal Water Districts

The Ventura River Municipal Water District, formed in 1952, is the only one of this type in Ventura County. Residents of the Calleguas Creek watershed area will soon vote on forming the Calleguas Municipal Water Distri

This type of district has broad purposes and powers and may, among other things, acquire water works, water rights, store and distribute water, sell water to all public and private entities and to individuals, salvage water, and spread and purify water. However, it may not develop hydroelectri power potentialities, nor carry on flood control activities.

The area of the district may include both incorporated and unincorporated territory. Resident registered voters may vote. Members of the boar of directors are elected by qualified voters in the district. Improvement districts may be formed for certain special purposes which do not equally affect the district as a whole. General obligation bonds only may be issued, subject to approval by a two-thirds vote, and are declared by law to be legal investments. Revenue may accrue from a number of sources. Ad valorem assess ments may be levied upon all taxable property.

Other Public and Private Water Agencies

In addition to the foregoing public water districts in Ventura County, there are four soil conservation districts, two of which lie wholly within the County, nine privately owned public water service utilities, and more than ninety mutual water companies.

Soil conservation districts exist for the principal purposes of control of runoff, prevention and control of soil erosion, improvement of farm irrigation, development of farm storage and distribution of water, and land drainage. Although the purposes of such districts are commendable, their limited financing capacity, together with the nature and characteristics of their projects, precludes further consideration of soil conservation districts for purposes of implementing the water development program outlined in this bulletin.

The privately owned public utility is operated for profit, and sells a service subject to the regulations of the State Public Utilities Commission. Because it must operate for profit purposes, and because venture capital flows to those areas and activities in which either the risks are less or the net returns are more than those accruing from financing water supply facilities, this type of public utility in recent years has not been able to resolve complex water problems. The number of privately owned water utilities is dwindling as public water districts are formed for the purpose of acquiring private properties and operating them. It is not a so-called community type of organization.

The mutual water company is a community organization which may be incorporated or unincorporated. It is a voluntary nonprofit enterprise, primarily engaged in supplying water to its stockholding members. Like the foregoing commercial utility, it has no power of taxation. The mutual water company is controlled by its members rather than by the qualified electors.

It is not required to serve water to nonmembers, and no one is compelled to join it. Only where water problems are not complex, water users are relatively few in number, and simplicity and ease of formation and operation are desired and possible, does this type of organization appear to be suitable.

ADEQUACY OF EXISTING WATER DISTRICTS AS REGARDS SOLUTION OF COUNTY WATER PROBLEMS

Existing institutional factors in Ventura County are deemed to be inadequate for the purpose of implementing a plan of comprehensive county-wid water development. The existing districts, with their present limited power, jurisdictional areas, and tax bases, are not equipped to finance, construct, or operate water resource development works of the magnitude required to solv the water problems of Ventura County. Neither are they adequate to facilitat the equitable distribution of necessary supplemental water to areas of need.

In spite of the number of public water districts that now exist in Ventura County, relatively little has been accomplished in the aggregate toward resolving the County's water problems. Annual sums disbursed by the County and special districts for water amount to only about one per cent of the aggregate sum disbursed for all activities. The Santa Clara Water Conser vation District has been spreading runoff waters for a number of years, an activity recently taken over by the United Water Conservation District. Zone1 of the Ventura County Flood Control District has constructed and operates the Matilija Dam and Reservoir. The United Water Conservation District is undertaking a $10,900,000 program on Piru Creek with the objective of resolving it water problems. However, these steps, though pointed in the right direction, are only a small beginning of what could and should be accomplished.

The Ventura River Municipal Water District appears to be the only district with sufficient present financial capacity to develop supplemental water supplies to fully satisfy present water supply deficiencies within the

district boundaries. In the case of this District, under the most feasible plan for development of the Ventura River watershed, a relatively large surplus of water over and above present requirements within the district boundaries would be developed. An immediate market for this surplus is available in the coastal plain of the Santa Clara River Valley outside the limits of the District. However, desirable interim use of this surplus supplemental water supply in the Oxnard Plain and Pleasant Valley Subunits would be facilitated if the export were under the jurisdiction of a district with broader powers and areal jurisdiction than the Ventura River Municipal Water District. Such interim export and sale of the surplus water could ease the financial burden of taxpayers and water users in said District.

Existing water districts do not appear to be either financially capable or equipped with sufficient legal powers to effect the indicated desirable diversion of surplus waters in Piru Creek for use in the water-deficient Calleguas-Conejo Hydrologic Unit. Under the plan recommended in this bulletin, sufficient water could be diverted and regulated for use in ground water storage in the Calleguas-Conejo Hydrologic Unit to alleviate present water shortages therein, and to provide for some future expansion. Such diversion appears to be the only immediate feasible source of supplemental water for this area.

Based upon the following observations: The generally increasing seriousness of the ground water overdraft in Ventura County; the difficulty that existing districts have experienced in implementing development plans; and the tendency of local interests to be divisive with respect to water resources development, a factor which is aggravated by the zonal type of organization of the Ventura County Flood Control District; and in realization of the fact that imported water will be needed to supplement local supplies; and that full development of the water resources of the several watersheds,

within the limits of engineering and economic feasibility, will enable transfer of surplus water from one watershed to another; it is believed that the day of independent, uncoordinated, piecemeal planning and implementation of water supply facilities is past, and that an adequate agency is needed now to accomplish what has not been accomplished to date.

SUGGESTED COUNTY-WIDE TYPE OF WATER DISTRICT TO CARRY OUT WATER DEVELOPMENT PLANS, AND POSSIBLE METHODS OF FINANCING SUCH PLANS

It is believed that implementation of comprehensive water plans for Ventura County, as set forth in this bulletin, requires the coexistence of a county-wide water district and a number of smaller supporting water districts hereinafter referred to as member units. There are presently about 20 county wide water districts in California, of which about one-third are flood control districts such as the one in Ventura County. Most of the remaining two-thirds are so-called flood control and water conservation districts. As water supply problems become increasingly complex and involved due to fluctuating precipitation and fast growing demands for water, it is believed that county-wide districts may well assume increasing importance in resolving future water problems of California. The county-wide water district concept is being adopted on a rapidly increasing scale as a natural extension of the local district type in coping with problems of increasing magnitude and number. In one county, the thinking has advanced on water matters to the point that the county government contributes $100,000 annually to the county-wide water district, to be used to help defray water costs of several member districts which purchase water under long-term contracts from the larger district. In another county, the county-wide water district is proposing to sell irrigation water at below cost to one of its member units, with the loss in revenue estimated at $150,000 to $200,000 per year, to be recouped by means of levying a tax on all of the taxable property of the county.

Principal functions of the county-wide water district proposed for Ventura County, in addition to those already granted by the Ventura County Flood Control District Act as amended, would be facilitating the financing of projects, the construction and probable operation and maintenance of such projects, and the execution of water service contracts with member units. In order to carry out these purposes, it is recommended that additional authority would have to be granted to the district by the Legislature, such as permitting the county-wide district to issue bonds, the proceeds from the sale of which would be used for constructing water development projects, which would constitute a lien upon all of the taxable property in the entire County, even though the proceeds thereof might be used to benefit a smaller area. However, it is further recommended that the direct beneficiaries of the project, acting through some subordinate organization, would, concurrent with the issuance of the bonds, execute water service contracts with the county-wide district, with the rates for water being set at a price that over a period of years would pay for operation and maintenance costs, replacement costs, and bond service charges.

The foregoing discussion assumes that general obligation bonds would be issued. An alternative to this means of raising funds for construction would be the issuance of revenue bonds. The holder of such bonds would probably have first claim to all project revenues. In calling for bids for such bonds the district would probably require a minimum bid of par, with the interest rate or rates to be fixed by the bidder. In determining whether to bid at all or what interest rate to specify, groups or syndicates of investment bankers would take into consideration primarily the extent to which estimated net revenues were in excess of bond service requirements. Depending on the extent to which net revenues could be predicted with certainty, based on firm contracts or commitments for water service, they would be expected to equal at least 1.2 times bond service, with the requirements being probably

1.4 times bond service charges if such revenue estimates were less certain. However at the present time, the Ventura County Flood Control District cannot issue revenue bonds.

From the foregoing, it is believed that the particular local area using project water would not be required to raise large funds in advance, and would not necessarily need to hire a staff of qualified personnel to operate and maintain the project. Instead, the county-wide agency could perform such services. The county-wide agency would probably have less difficul in raising funds through sale of bonds because the entire County's taxing pow would support the bonds, and because of the contracts it would have with subordinate districts for the sale of water, a portion of the revenues from whic would be used to pay off bond service charges. Thus, the county-wide distric might be able to obtain more favorable interest rates and other more favorabl bond issuance features than could the member units. Furthermore, the county-wide district could and should act as arbiter in disputes over water matters between member units. It should also determine that any surplus waters creat by a project would be utilized in adjacent water-deficient areas within the scope of economic limitations.

Ventura County is in the upper quarter of counties in California wi respect to assessed valuations. Such values have increased at an impressive rate over a period of several decades. For instance, in the fiscal year 1909-10 the total assessed valuation was $22,189,000; in 1919-20, $38,264,000 in 1929-30, $106,620,000; in 1939-40, $96,513,000; and in 1949-50, $228,724,0 In the fiscal year 1953-54, the total amounted to $300,966,000.

Inflation during the past dozen years accounts for a portion of the foregoing almost phenomenal recent increases in assessed valuations. Howeve the principal increase may be attributed to growth in population and increas in output of goods and services in Ventura County. For instance, the populat

of Ventura County increased from 18,347 in 1910 to 69,685 in 1940, and to 114,647 in 1950. The State Department of Finance estimates that as of July 1, 1953, the population was 133,100, almost double that of 1940. Petroleum production increased from 17,038,470 barrels in 1940, valued at $18,525,000, to almost 34,000,000 barrels in 1950, valued at $92,550,000. Gross farm income (F.O.B. value) increased from $22,600,000 in 1940 to $75,300,000 in 1952.

Total public bonded indebtedness in Ventura County as of June 30, 1953, was $15,660,000, including school bonds of $11,221,200, and flood control (Zone 1), county water district, and county waterworks districts bonds in the amount of $3,083,000. In addition to this total, there were more than $3,000,000 in bonds, including self-supporting bonds, issued by the municipalities of Ventura, Santa Paula, Oxnard Ojai, and Port Heuneme. Excluding the municipal issues, the ratio of about five per cent of outstanding bonded indebtedness to total assessed valuation is below the reported average for all counties of the State. However, unlike that for Ventura County, such ratios calculated for many other counties in the State are misleading inasmuch as they do not include, for example, irrigation district bonds.

It is recommended in this bulletin that a plan of water resources development in Ventura County be adopted, including construction of Casitas Dam and Reservoir with a storage capacity of 130,000 acre-feet, Devil Canyon Dam and Reservoir with a storage capacity of 150,000 acre-feet, a well field in Fillmore Basin, and certain distribution and conveyance facilities, at an estimated capital cost of about $52,000,000. The over-all average annual cost of about 73,000 acre-feet of new water developed by the plan would be $40 per acre-foot, with average annual unit costs varying from $62 in the Ventura Hydrologic Unit to $33 in the Santa Clara River Hydrologic Unit. The bulletin further recommends that, if financial capacity does not permit immediate

construction of all features of the plan, a staged development be undertaken whereby construction of those features relating to the proposed diversion to the Calleguas-Conejo Hydrologic Unit be postponed. The estimated capital cos of the initial works under such staged development would be about $43,000,00C

Pursuant to the act creating the Ventura County Flood Control District, bonds (general obligation) issued by the District, which are issued fc any zone thereof, shall be legal investments for all trust funds and for the funds of banks, insurance companies, and for other related types of funds. However, this arbitrary declaration of what constitutes a legal investment ma not, on occasions, mean much to the prospective bidder for such bonds unless certain other criteria have been met.

One of the foregoing criteria may be whether the proposed issue meets the requirements of the State Financial Code regarding legal investment Section 1356(g) of that Code states that:

> ". . . the net direct debt of such public corporation or of such special district together with its net overlapping debt does not exceed 20 per cent of the assessed valuation of the taxable property within its boundaries . . .".

In some instances, public district bonds have been sold in which th foregoing 20 per cent limitation has been exceeded. However, under such conditions bond salability oftentimes is made more difficult inasmuch as the numbe of eligible buyers is reduced, and the interest rate must then be increased, or some other concession made, to enhance the salability.

A second possible criterion that may be requested by the prospectiv bond purchaser is that such bonds be certified by the California Districts Securities Commission as legal securities, pursuant to Section 20045 of the State Water Code, quoted hereafter:

> "20045. Except as herein provided, no bond issue of any district shall be approved for certification which together with any other outstanding bonds and bonds authorized but not issued of the district exceeds 60 percent of the aggregate value of the property

owned by the district or to be acquired or constructed with the proceeds of the bonds proposed to be issued by the district and the reasonable value of the land within the district.

"The foregoing limitation shall not apply to bond issues payable solely from revenues to be received from the proceeds of a contract with a corporation authorized to do business in this State if in the judgment of the commission the proposed revenues will be adequate to service the proposed bond issue, including any reserve fund requirements."

Perusal of available data regarding annual costs of irrigation water in Ventura County indicates a wide range of from about $5.00 to $40.00 per acre, with a few exceptions outside of this range. The Federal census report for 1949 shows an average annual cost of water of about $15.50 per acre for the entire County. Reports issued by the Ventura County Agricultural Extension Service, which include records obtained from all portions of the County, show the following: For 1951, records from 12 lemon groves showed costs of water varying from about $3 to $68 per acre, with an average of about $21 per acre; those from 24 valencia orange groves varying from $6 to $101 per acre, with an average of $37 per acre; and those from 6 walnut groves varying from $6 to $17 per acre, with an average of $9 per acre. For 1949, records from 18 lemon groves showed costs of water varying from $1 to $80 per acre, with an average of $19 per acre; those for 28 valencia orange groves varying from $6 to $80 per acre, with and average of $36 per acre; and those for 16 bean acreages varying from about $3 to $56 per acre. Applications of water to the bean crops varied from 9 to 46 acre-inches. However, most of the water costs for the beans averaged from $5 to $8 per acre, with an application of from 10 to 14 inches per acre.

It should be understood, however, that higher cost water from new projects for Ventura County would be used only as a supplemental supply and not as an exclusive supply. Therefore, the over-all average cost per acre per year of water applied, local and supplemental, might be low enough to induce the widespread use of a supplemental supply by agriculture.

Adoption of the recommended initial plan under the suggested form of action to be taken would appear to involve the county-wide water district in two approximately simultaneous operations--sale of bonds to the extent of some $43,000,000--and execution of contracts for water service with subordina entities that would benefit from construction of the bond-financed works.

Depending upon negotiations with the prospective purchasers of the construction bonds, retirement of them could commence soon after their issua by levying assessments upon all of the taxable properties in the County and reducing such assessment rates as income from water service contracts commen to be received, or only bond interest costs could be paid during the initial period of development by levying lower assessments upon all of the taxable property of the County, with no retirement of principal scheduled until inco from water service contracts becomes receivable. In the first foregoing instance, the over-all cost of bond service charges probably would be less than in the second instance, but the assessment costs against the taxable properties not directly benefited by the project would be greater.

There is an urgent need for supplemental water to supply the coast plain of the Santa Clara River Valley. Lands in this area are used so inten sively for irrigated agriculture and domestic and industrial purposes that their water needs exceed the ability of the pumped aquifers to transmit supp in sufficient quantity without creation of conditions conducive to the intru sion of sea water to the aquifers. This intensive land use had been made possible only through over-exploitation of the ground water supply and devel ment of a dangerous overdraft. All of the irrigation, domestic, and industr water users share in the same ground water supply, and all would be adversel affected if sea water were to destroy the utility of the underground basin through continuance of the present overdraft. They are mutually responsible for the present overdraft condition.

Inasmuch as the cost of supplemental water for the coastal plain of the Santa Clara River Valley would be much more than the cost of pumping ground water, and all water users would benefit from such a supply whether or not the supply was used directly, question arises as to determining some equitable criterion under which all water users would share in the added cost of the supplemental supply. An answer to this question might lie in the adoption of a method similar to that now being undertaken by the Orange County Water District. It has become evident to the people of Orange County, after some 25 years of effort and failure, that the encroachment of sea water and the eventual ruin of their ground water resources cannot be prevented by uncoordinated, piecemeal efforts. They have apparently decided that some effective agency must be given the power to manage and operate the ground water recharge program, to collect sufficient taxes on some reasonably equitable basis to pay for the necessary imported supplemental water, and to administer the program. Senate Bill No. 91, passed by the Legislature in May, 1953, broadens the powers of the existing Orange County Water District to accomplish this program. The bill provides, among other things, for the assessment of land and improvements, for a pumpage tax on water extracted from the basin, called a "replenishment assessment", and for registration and control of all water-producing facilities.

If the principle of the foregoing Orange County method were adopted in Ventura County, a pumpage tax could be levied against all ground water users in a given basin on the basis of annual water production. For illustrative purposes, alternative methods for fixing these charges in the coastal plain of the Santa Clara River Valley are described. It is believed that these methods could be generally applicable throughout the County.

It is estimated in this bulletin that the mean seasonal pumpage in the Oxnard Forebay, Oxnard Plain, and Pleasant Valley Subunits approximates 35,000 acre-feet. Of this amount, under the recommended plan of water

development, about 44,000 acre-feet of supplemental water would be supplied by surface conduit to a portion of the area presently served from ground water. However, the present cost of ground water supplies is appreciably cheaper than would be the cost of the supplemental supply.

Assuming that all water users in the area are mutually responsible for the overdraft condition, and therefore should bear all costs of alleviatin this condition proportionately, then that portion of the water users continuin to utilize the ground water supplies would, in addition to paying for the cost of pumping ground water, also pay a pumpage tax. This tax, based on a per acre-foot of pumped water, would be sufficiently high to raise funds with whic to purchase the necessary supplemental supply and would be used by the local water district to subsidize the users of the supplemental surface supply to th extent that all users in the area of overdraft would pay about the same unit cost for water.

An alternative to the foregoing method would be to levy an ad valore tax on the real property, the revenue from which would be used to reduce the amount of the required pumpage tax. If an ad valorem tax were levied at the rate of, say, $1 per $100 of assessed valuation, and if a total assessed valua tion of $40,000,000 for the area be assumed, the annual income from this sourc to be applied on the annual cost of the supplemental supply would amount to about $400,000. Thus, the required pumpage tax on ground water users would be reduced and, similarly, the 44,000 acre-feet of supplemental water could be sold at a lower price.

There is considerable justification for employing a combination wate toll and assessment method as a means of raising the required revenue for supplemental water. In many cases, high-value properties in urban and industrial areas have a relatively small water requirement. Nevertheless, they benefit substantially from the intensive agriculture that is prevailing in the

surrounding area, by furnishing goods and services to the farmer in his crop production and marketing. An increase in over-all water costs to the operators of such high-value properties would not increase their costs of doing business nearly as much as it would to the farmer.

In lieu of levying an assessment upon the real property described above, increased unit cost rates for water could be charged to the nonagricultural users. For instance, of the total seasonal delivery requirement of 85,000 acre-feet of water for the coastal plain of the Santa Clara River Valley, it is estimated that about 10,000 acre-feet per season of supplemental water could be sold to urban entities. Therefore, if one arbitrarily assumes an average cost of $20 per acre-foot to pump 41,000 acre-feet and to make available a supplemental supply of 44,000 acre-feet, then 10,000 acre-feet of the supplemental supply might be sold for possibly $50 per acre-foot for urban use. Thus, the average annual cost of the remaining 75,000 acre-feet of water utilized could be reduced from $20 to about $16 per acre-foot.

The foregoing suggested methods of financing supplemental water supplies for the Santa Clara River Hydrologic Unit could be undertaken by the United Water Conservation District if granted certain additional powers. It is not believed that this District now has the power to implement any kind of a program that would be based upon a pumpage tax. Therefore, authority would have to be requested of the Legislature for it to do so, as has been done by the Orange County Water District. Also, the financing programs could probably be carried out by an adequately empowered improvement district created within the United Water Conservation District.

A factor that should enhance the security of any general obligation bonds that would be presently issued in Ventura County is the probable future rate of increase in assessed values. During the past 10 years, from 1944-45

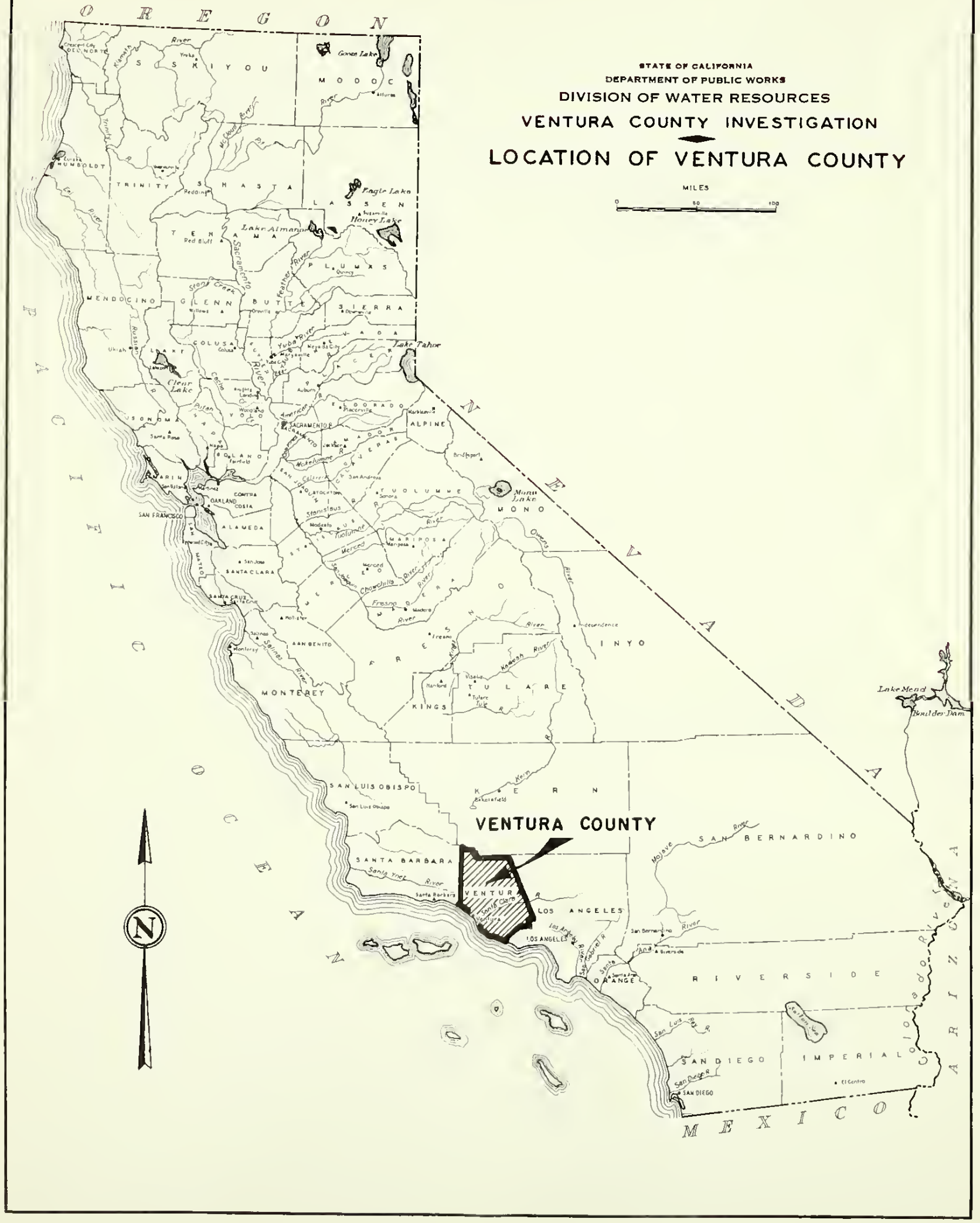
to 1953-54, inclusive, total assessed values have increased an average of $17,700,000 yearly. If only a $10,000,000 increase annually occurred in the future, there would be an aggregate increase of $100,000,000 a decade hence. With partial rectification of present adverse water supply conditions, such future growth in valuation does not appear unlikely.

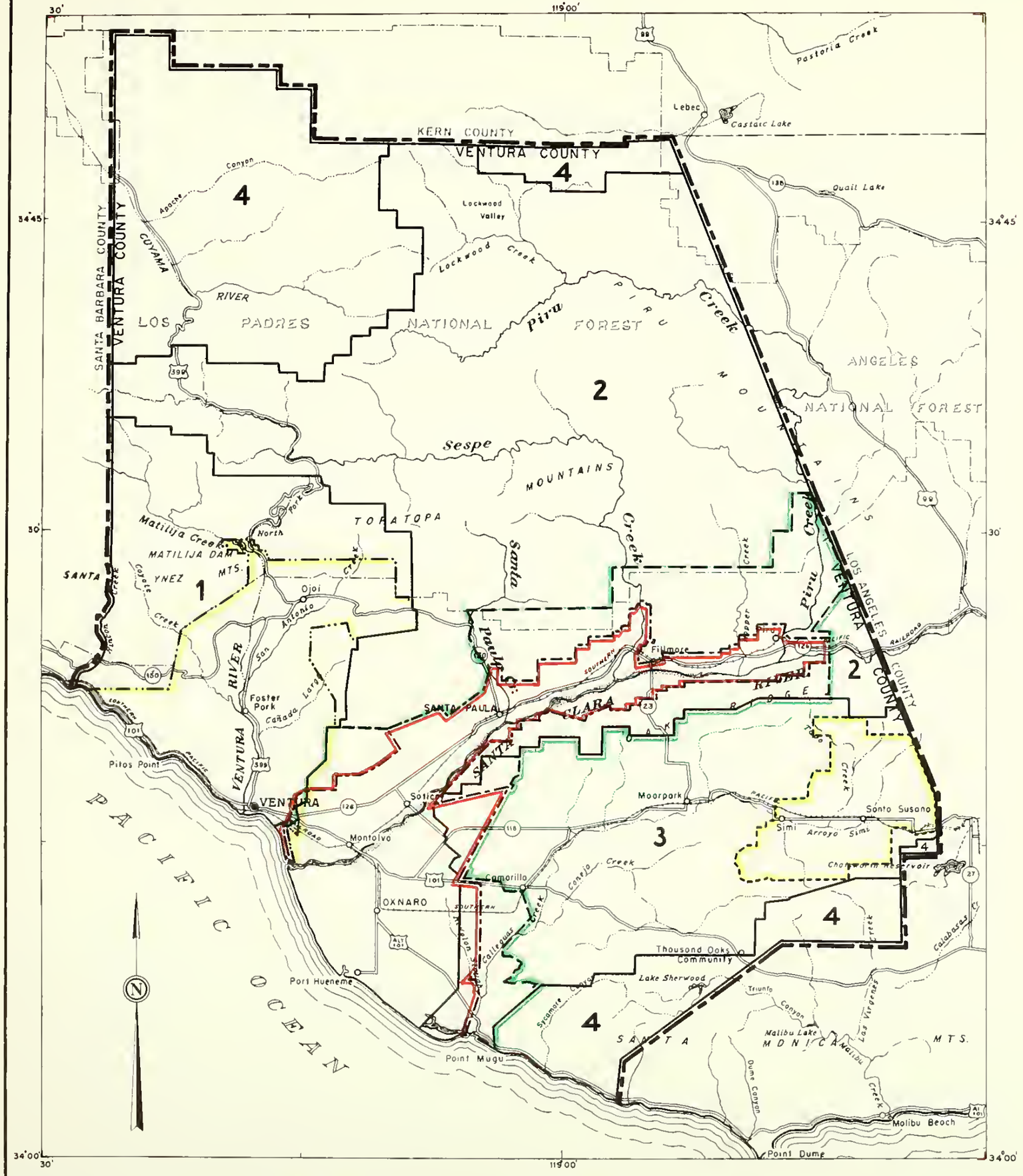
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

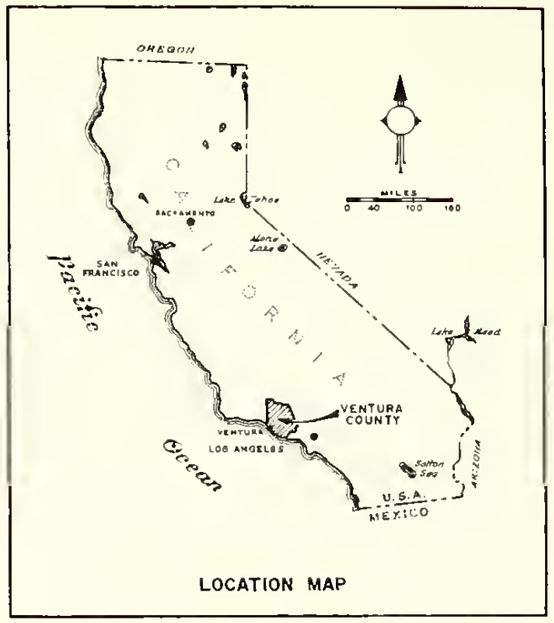
VENTURA COUNTY INVESTIGATION

LOCATION OF VENTURA COUNTY

MILES
0 50 100







LOCATION MAP

LEGEND

- BOUNDARY OF VENTURA COUNTY FLOOD CONTROL DISTRICTS BY ZONES
- 4 — FLOOD CONTROL DISTRICT ZONE NUMBER
- BOUNDARY OF SANTA CLARA WATER CONSERVATION DISTRICT
- BOUNDARY OF UNITED WATER CONSERVATION DISTRICT
- BOUNDARY OF VENTURA RIVER MUNICIPAL WATER DISTRICT
- BOUNDARY OF SIMI VALLEY WATER CONSERVATION DISTRICT

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

MAJOR WATER DISTRICTS

1953

MILES
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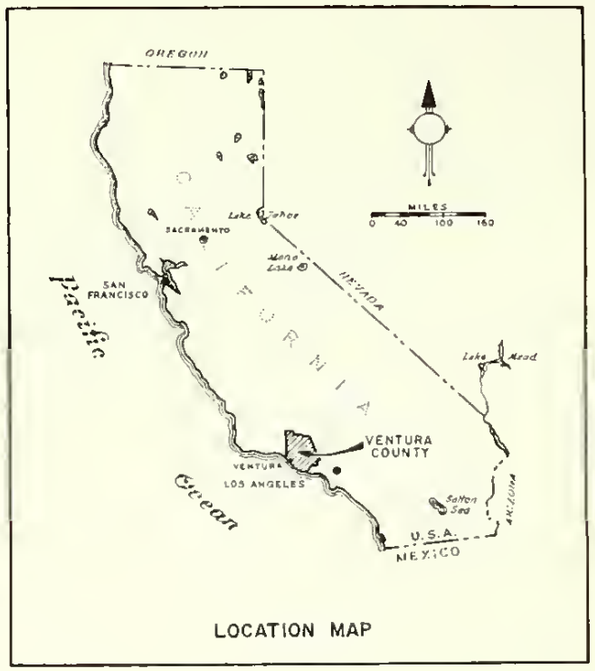
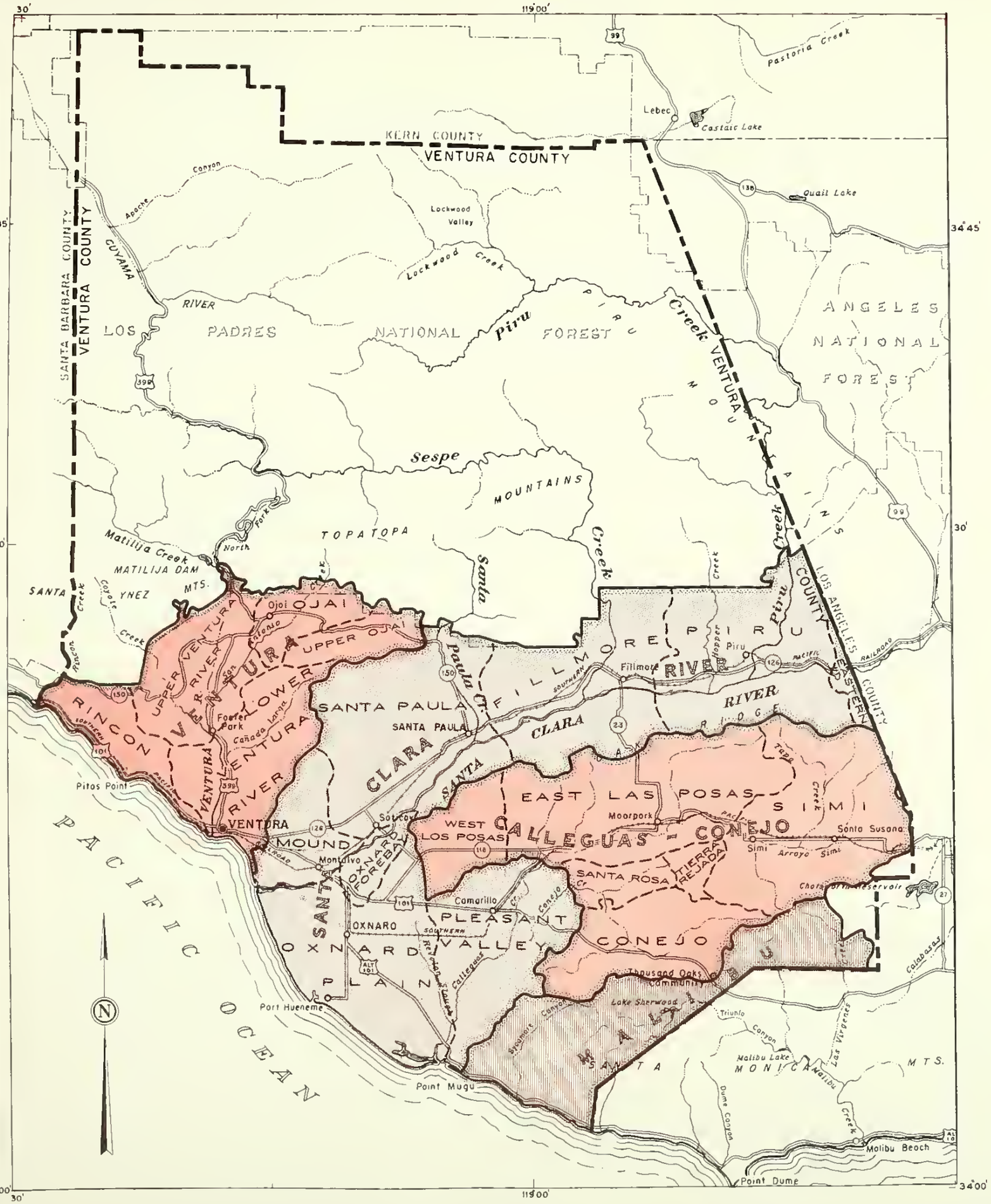


LOCATION MAP



LEGEND

HYOROLOGIC UNIT BOUNDARY

SUBUNIT BOUNDARY

PIRU NAME OF SUBUNIT

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

HYDROLOGIC UNITS
1953

MILES
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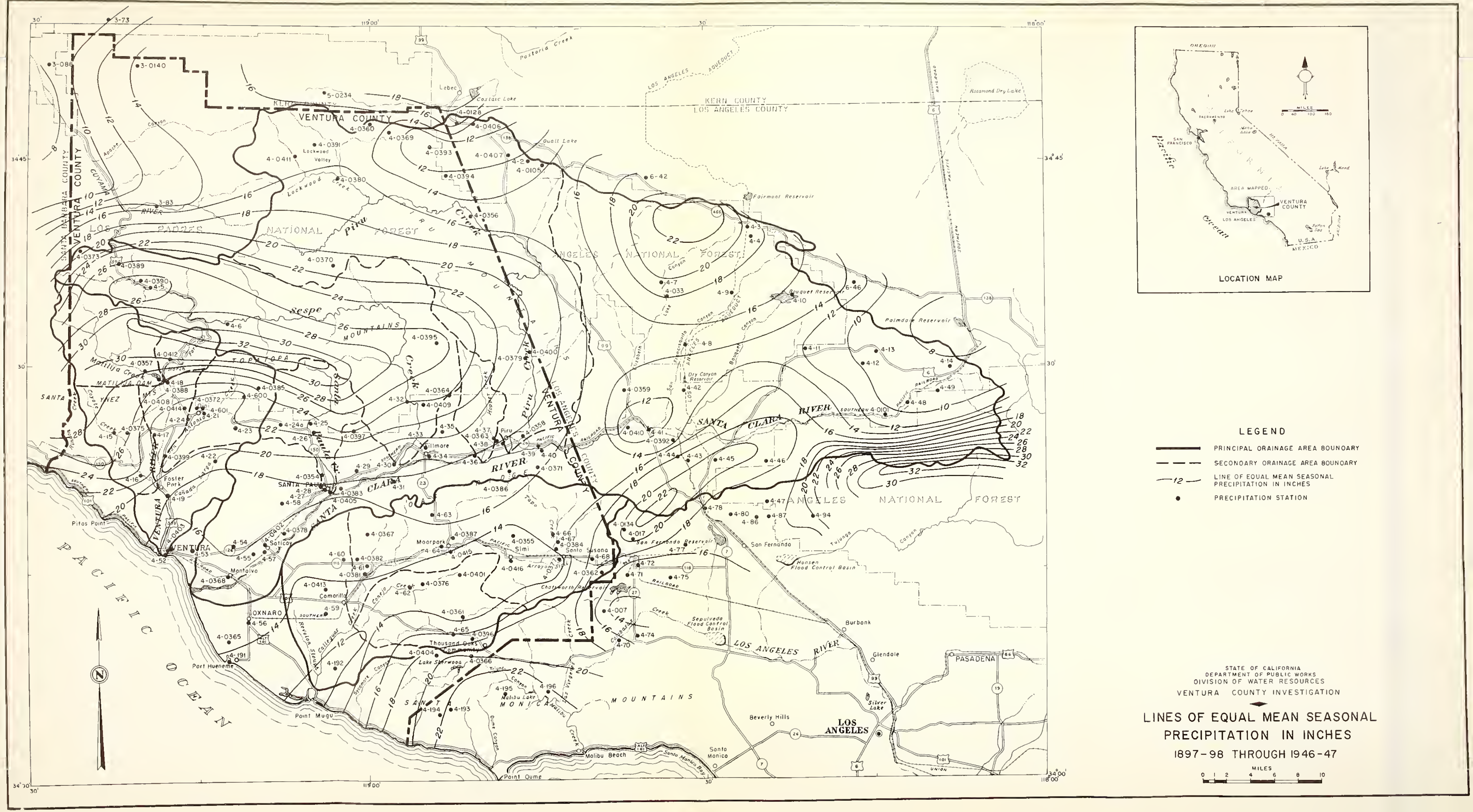
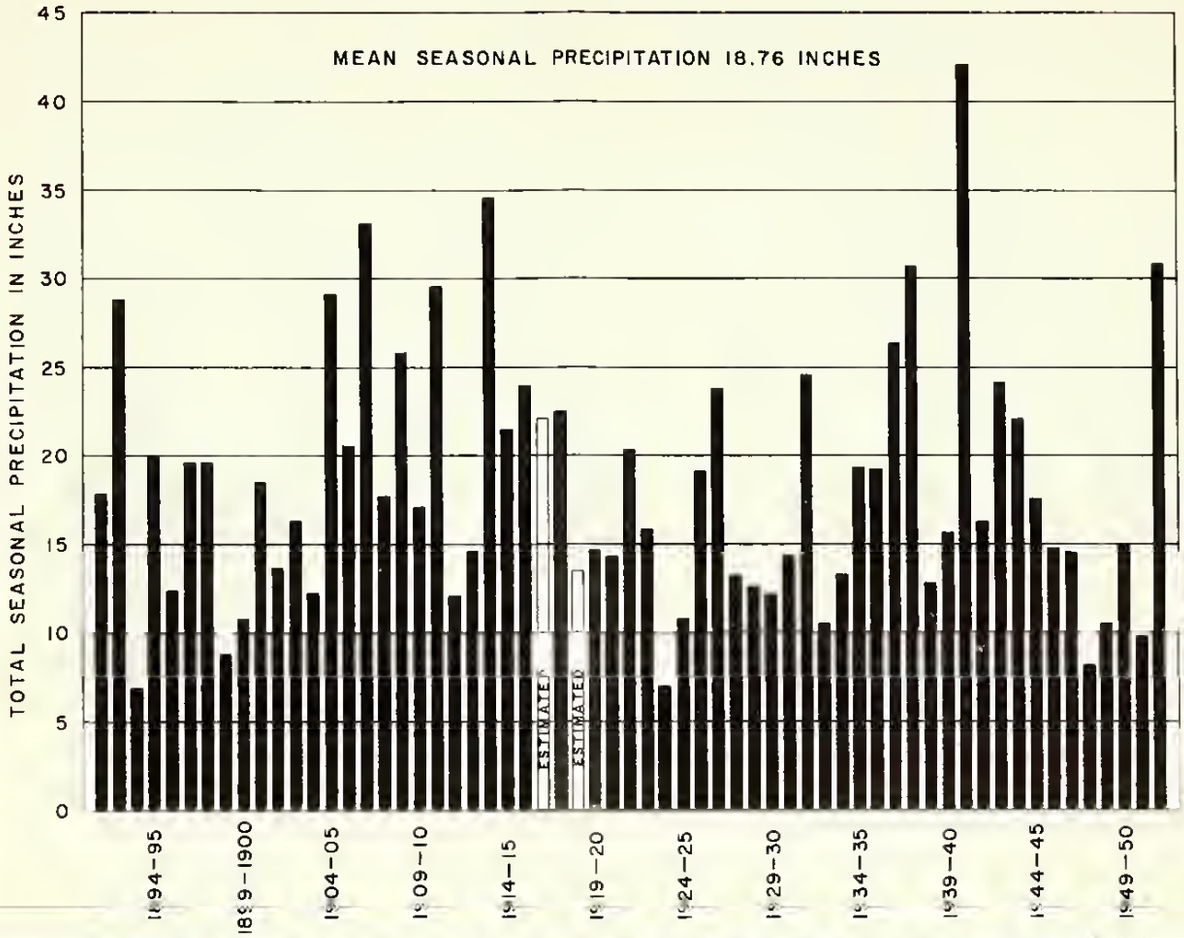
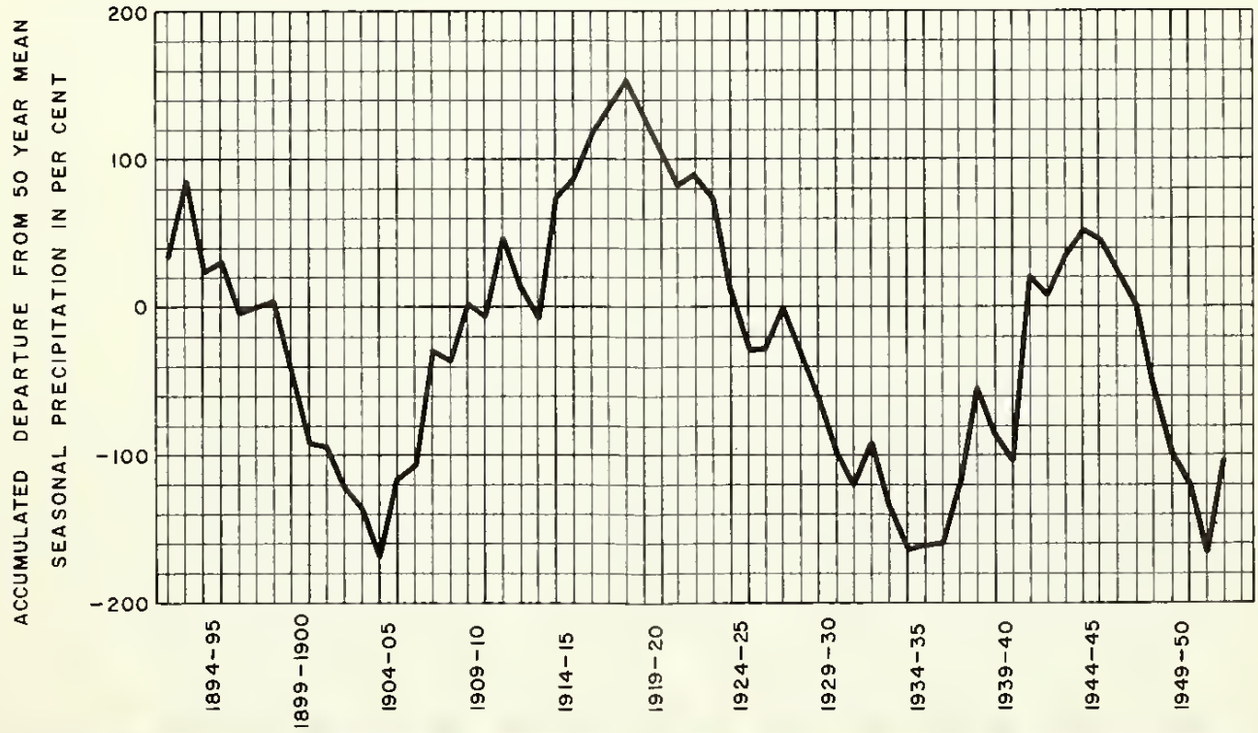

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION
LINES OF EQUAL MEAN SEASONAL PRECIPITATION IN INCHES
1897-98 THROUGH 1946-47
MILES
0 1 2 4 6 8 10
LEGEND
PRINCIPAL DRAINAGE AREA BOUNDARY
SECONDARY DRAINAGE AREA BOUNDARY
LINE OF EQUAL MEAN SEASONAL PRECIPITATION IN INCHES
PRECIPITATION STATION
LOCATION MAP
VENTURA COUNTY
AREA MAPPED
LOS ANGELES
PACIFIC OCEAN
KERN COUNTY
LOS ANGELES COUNTY
VENTURA COUNTY
SANTA BARBARA COUNTY
LOS PADRES NATIONAL FOREST
ANGELES NATIONAL FOREST
SESPE MOUNTAINS
TOPATOPA
SANTA CLARA RIVER
LOS ANGELES RIVER
SANTA MONICA MOUNTAINS
VENTURA
SANTA PAULA
OXNARD
Port Hueneme
Point Mugu
Fillmore
Piru
Moorpark
Simi
Camarillo
Thousand Oaks
San Fernando
Burbank
Glendale
PASADENA
LOS ANGELES
Beverly Hills
Santa Monica
Malibu Beach
Point Dume
Pitas Point
Lebec

PLATE 5



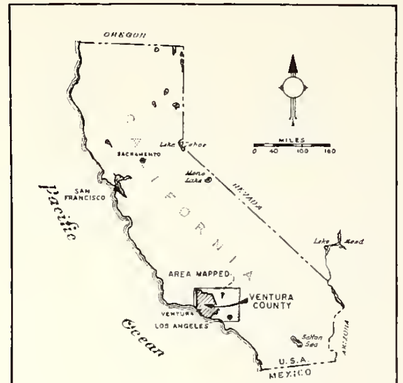
RECORDED SEASONAL PRECIPITATION AT OJAI

PLATE 6



ACCUMULATED DEPARTURE FROM MEAN SEASONAL PRECIPITATION AT OJAI

DIVISION OF WATER RESOURCES



LOCATION MAP

LEGEND

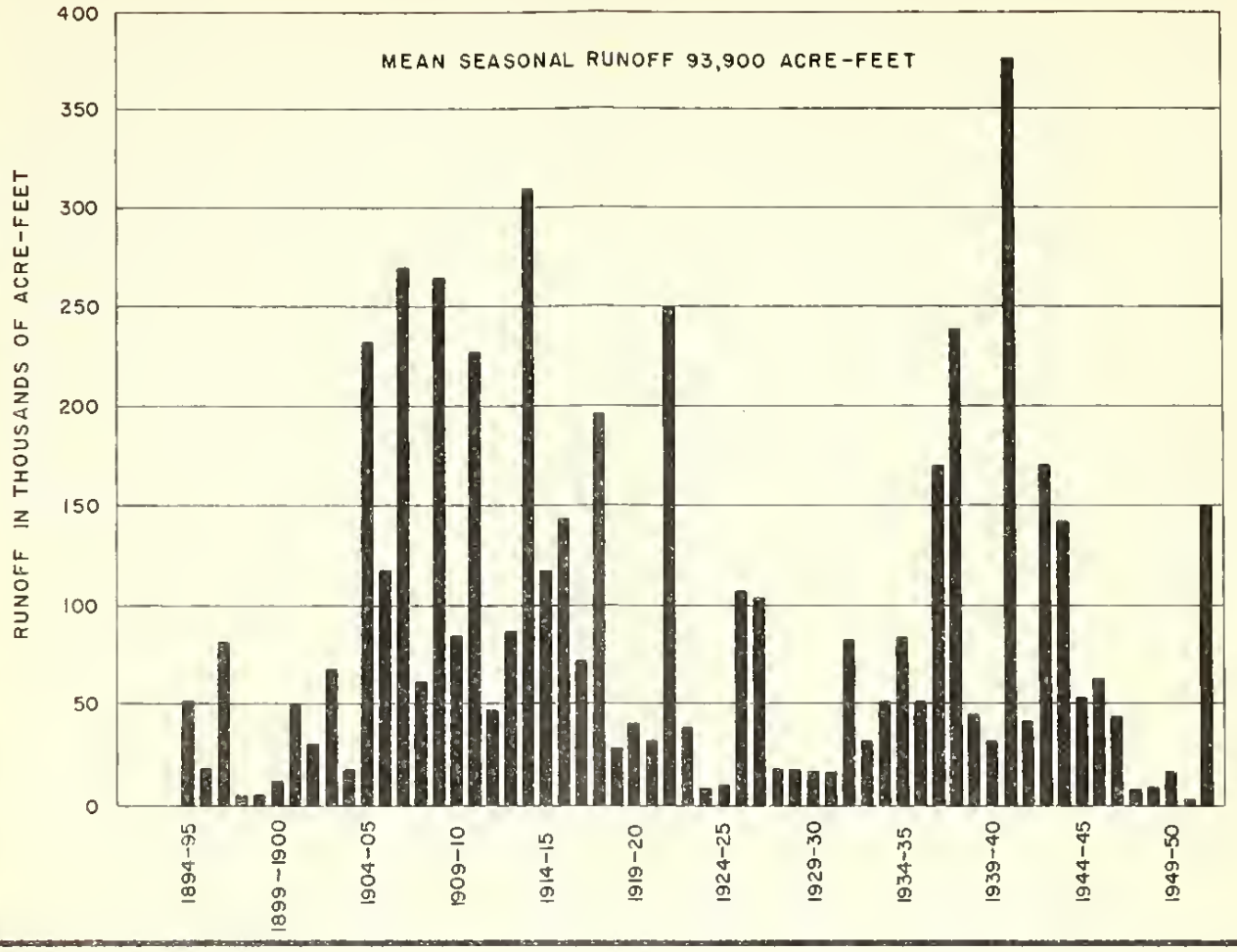
- PRINCIPAL DRAINAGE AREA BOUNDARY
- SECONDARY DRAINAGE AREA BOUNDARY
- ▼ RECORDING STREAM GAGING STATION, ACTIVE
- ▽ RECORDING STREAM GAGING STATION, INACTIVE
- ⊕ SURFACE WATER SAMPLING STATION
- ⊕ DRAINAGE WATER SAMPLING STATION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

STREAM GAGING AND WATER SAMPLING STATIONS 1952

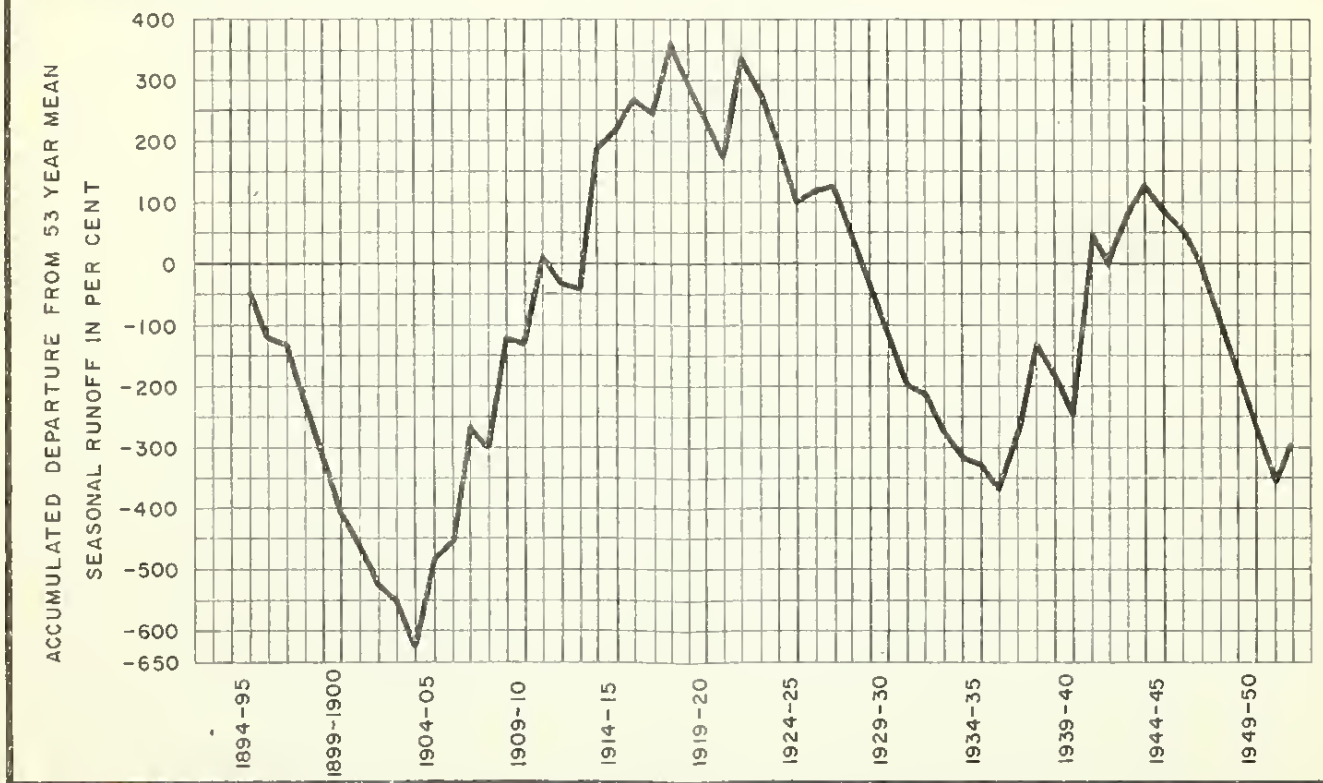
MILES
0 1 2 4 6 8 10

PLATE 8



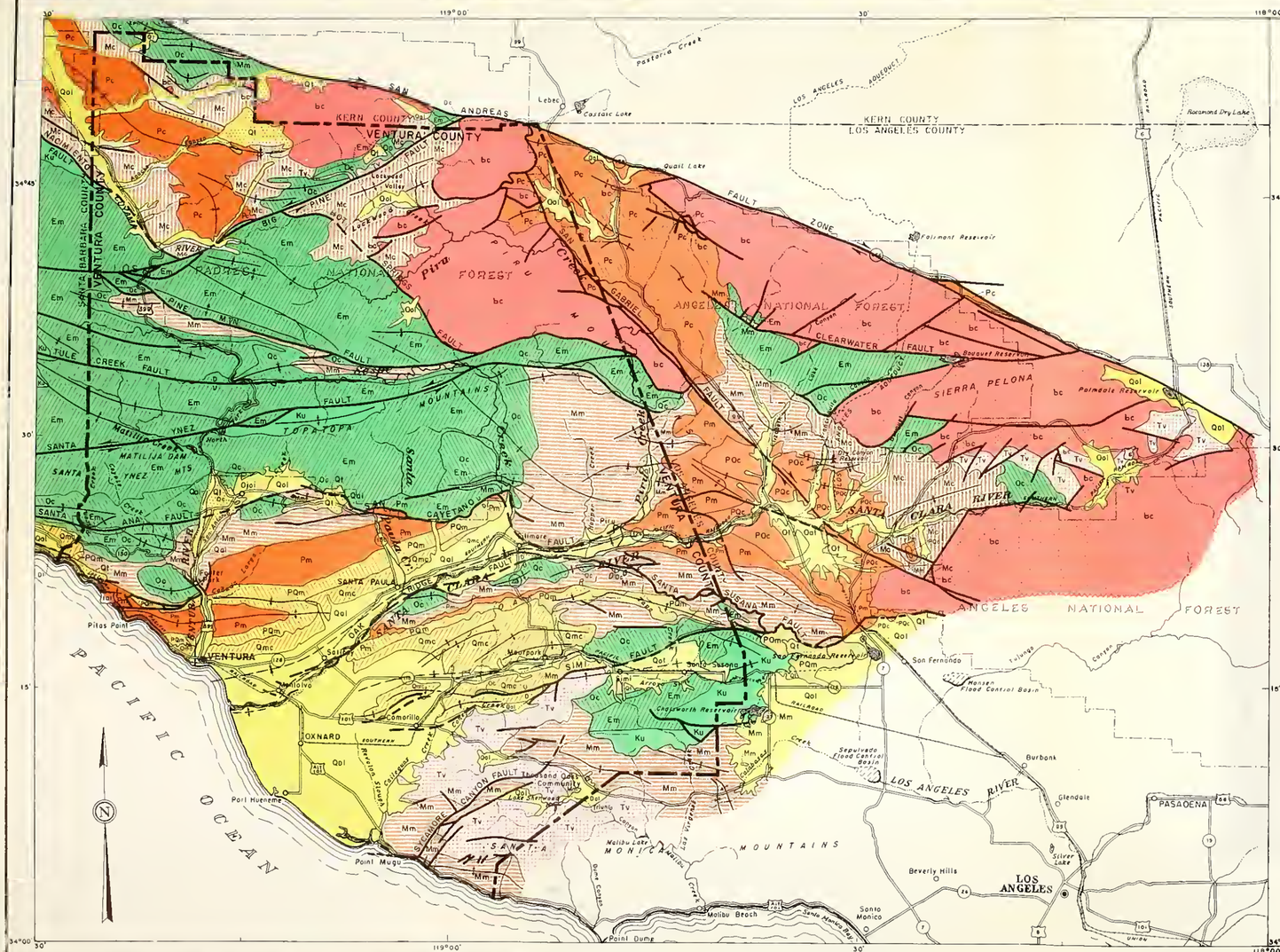
ESTIMATED SEASONAL NATURAL RUNOFF OF SESPE CREEK NEAR FILLMORE

PLATE 9



ACCUMULATED DEPARTURE FROM MEAN SEASONAL NATURAL RUNOFF OF SESPE CREEK NEAR FILLMORE

DIVISION OF WATER RESOURCES



GEOLOGIC LEGEND

SEDIMENTARY FORMATIONS

RECENT	Qal	ALLUVIUM SAND, GRAVEL AND CLAY IN STREAM CHANNELS AND FLOOD PLAINS. SUPPLIES MANY WELLS.	QUATERNARY
	Qt	TERRACE DEPOSITS AND OLDER ALLUVIUM GRAVEL, SAND AND CLAY. GENERALLY HIGHLY PERMEABLE; SUPPLIES MANY WELLS.	
PLEISTOCENE	Qmc	SAN PEDRO FORMATION SAND, GRAVEL AND CLAY, MARINE AND CONTINENTAL. PERMEABLE ZONES SUPPLY MANY WELLS; INCLUDES FOX CANYON MEMBER WHICH YIELDS CONSIDERABLE WATER OF GOOD QUALITY IN THE LAS POSAS AND PLEASANT VALLEY AREAS.	
PLIOCENE	PQm	SANTA BARBARA FORMATION MARINE MUDSTONE, SHALE, SANDSTONE, SAND, GRAVEL AND CLAY; NONWATER-BEARING EXCEPT FOR GRIMES CANYON MEMBER WHICH SUPPLIES SOME WELLS IN THE LAS POSAS—PLEASANT VALLEY AREA.	TERTIARY
	PQc	SAUGUS FORMATION SAND, SLIGHTLY CEMENTED GRAVEL AND CLAY; CONTAINS MODERATELY PERMEABLE STRATA; YIELDS WATER TO FEW WELLS.	
	Pm	PICO FORMATION MARINE SANDSTONE, SHALE; LENSES OF CONGLOMERATE. GENERALLY NONWATER-BEARING OR CONTAINS SALTY WATER.	
	Pc	RIDGE BASIN GROUP AND MORALES FORMATION CONTINENTAL SHALE, SANDSTONE, CONGLOMERATE, GRAVEL AND SAND CONTAINS UNDEVELOPED PERMEABLE ZONES.	
MIOCENE	Mm	SANTA MARGARITA, MODELO, RINCON AND VAQUEROS FORMATIONS MARINE SANDSTONE AND SHALE, SOME CONGLOMERATE AND CLAY; GENERALLY NONWATER-BEARING OR CONTAINS BRACKISH WATER. LOCALLY PROVIDES LIMITED QUANTITIES OF FRESH WATER TO WELLS.	
	Mc	MINT CANYON AND CUATAL FORMATIONS NON-MARINE SANDSTONE, CONGLOMERATE, GYPSIFEROUS CLAY AND SOME MARL. GENERALLY NONWATER-BEARING.	
OLIGOCENE	Oc	SESPE, SIMMLER AND VASQUEZ FORMATIONS NON-MARINE SANDSTONE, CONGLOMERATE AND SHALE. GENERALLY NONWATER-BEARING OR CONTAINS BRACKISH WATER; SUPPLIES FEW WELLS LOCALLY.	
EOCENE AND PALEOCENE	Em	UNDIFFERENTIATED EOCENE AND PALEOCENE FORMATIONS MARINE SANDSTONE, SHALE AND CONGLOMERATE. PERMEABLE ZONES YIELD LIMITED QUANTITIES OF VARIABLE QUALITY WATER.	
	Ku	UNDIFFERENTIATED MARINE FORMATIONS SANDSTONE, SHALE AND LITTLE CONGLOMERATE. PERMEABLE ZONES IN SOME AREAS YIELD WATER OF VARIABLE QUALITY IN LIMITED AMOUNT.	CRETACEOUS

IGNEOUS AND METAMORPHIC ROCKS

Tv	VOLCANIC FLOWS, PYROCLASTICS, AND SHALLOW INTRUSIVES YIELDS VARIABLE QUANTITIES OF WATER TO WELLS; IMPORTANT WATER SOURCE IN SANTA ROSA, TIERRA REJADA AND CONEJO AREAS.	TERTIARY
bc	BASEMENT COMPLEX GRANITIC AND METAMORPHIC ROCKS, NONWATER-BEARING EXCEPT FOR LIMITED QUANTITIES OF WATER DERIVED FROM FISSURES OR WEATHERED ZONES.	PRE-CRETACEOUS

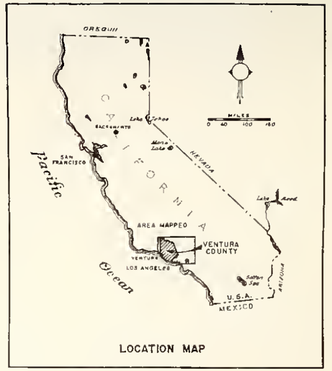
FAULT, SURFACE TRACE

FAULT, BURIED OR INFERRED

AXIS OF ANTICLINE } DASHED WHERE BURIED

AXIS OF SYNCLINE

FORMATION CONTACT



LOCATION MAP

COMPILED IN 1953 FROM FIELD MAPPING BY THE STATE DIVISION OF WATER RESOURCES AND FROM PUBLISHED AND UNPUBLISHED MAPS ACKNOWLEDGED IN THE ACCOMPANYING TEXT

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

AREAL GEOLOGY

1953

MILES
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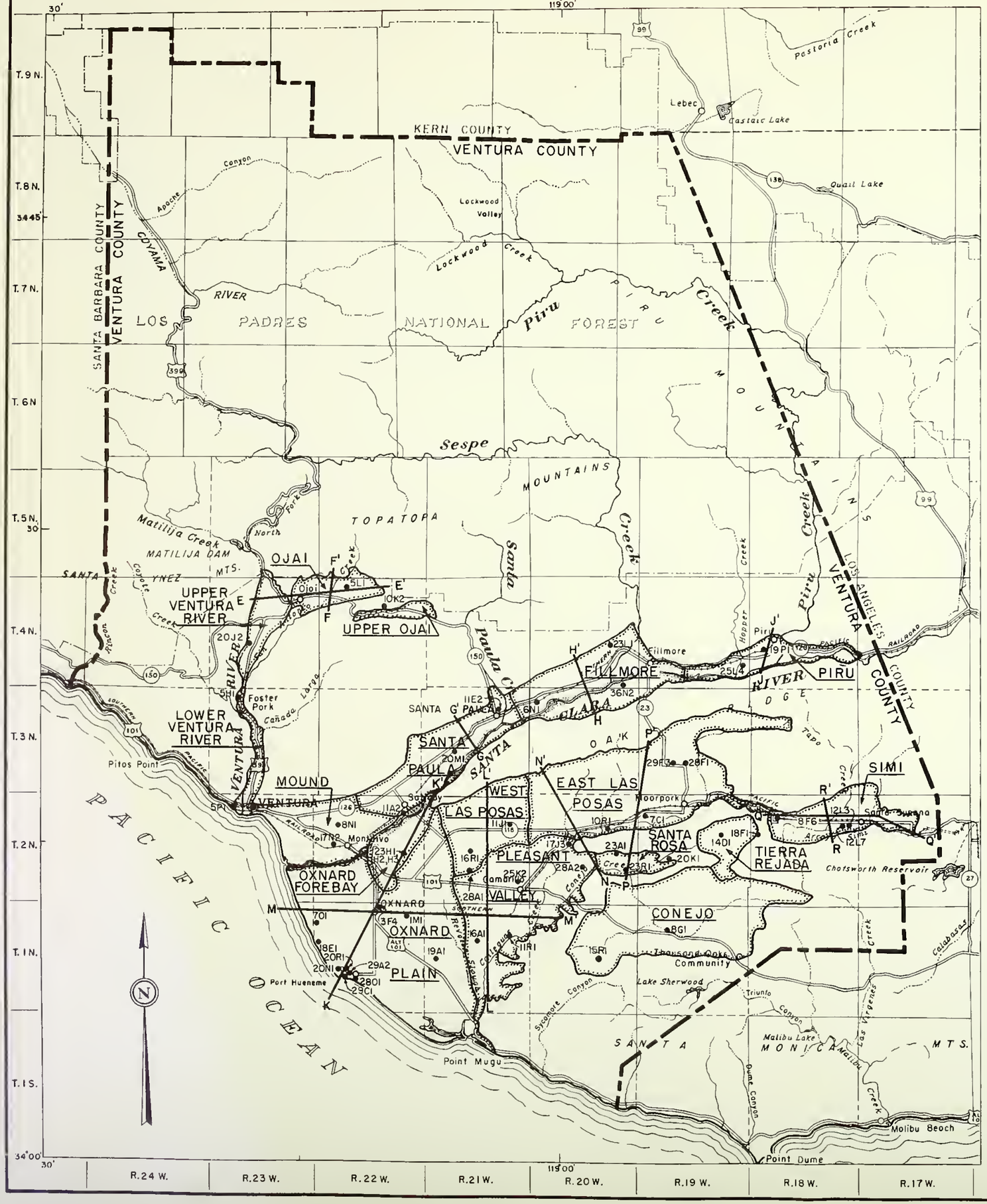
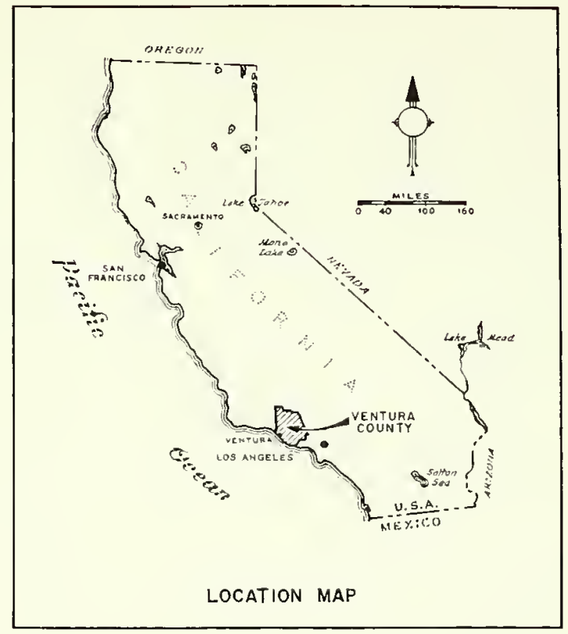




LOCATION MAP

LEGEND

GROUND WATER BASIN BOUNDARY

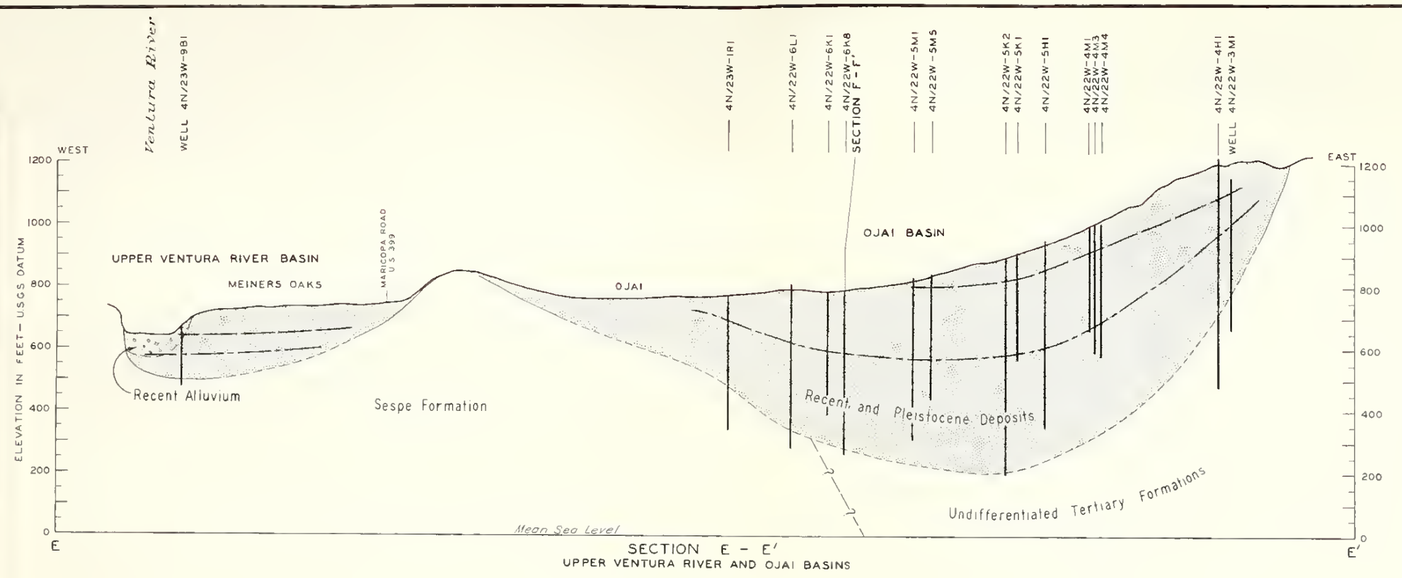
●35N1 KEY WELL

E ——— E' LINE OF GEOLOGIC SECTION

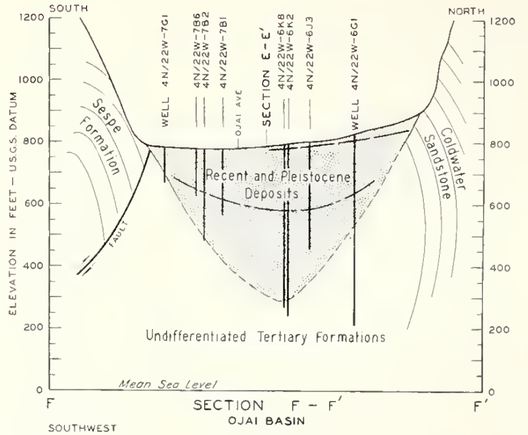
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

GROUND WATER BASINS
1953

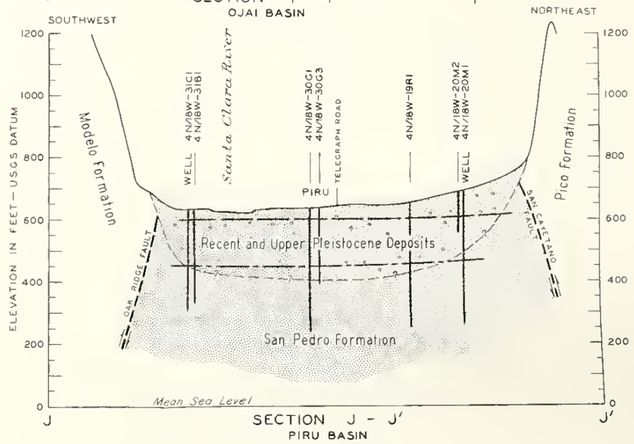
Scale of miles
5 0 5



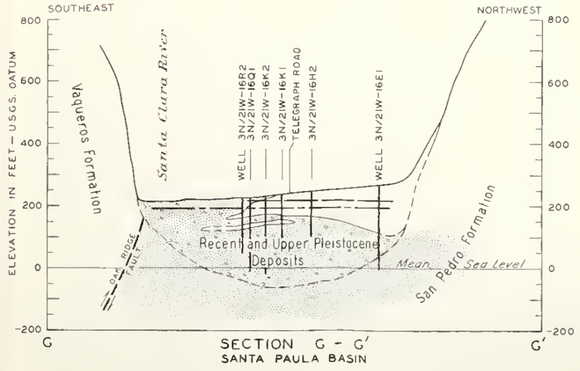
SECTION E - E'
UPPER VENTURA RIVER AND OJAI BASINS



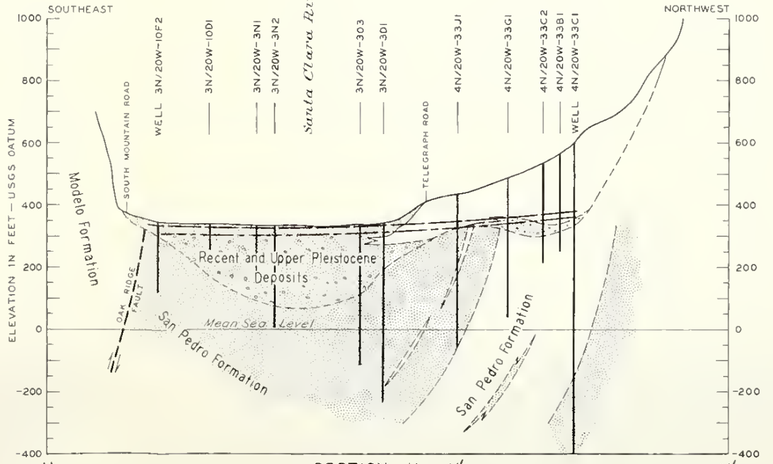
SECTION F - F'
OJAI BASIN



SECTION J - J'
PIRU BASIN



SECTION G - G'
SANTA PAULA BASIN



SECTION H - H'
FILLMORE BASIN

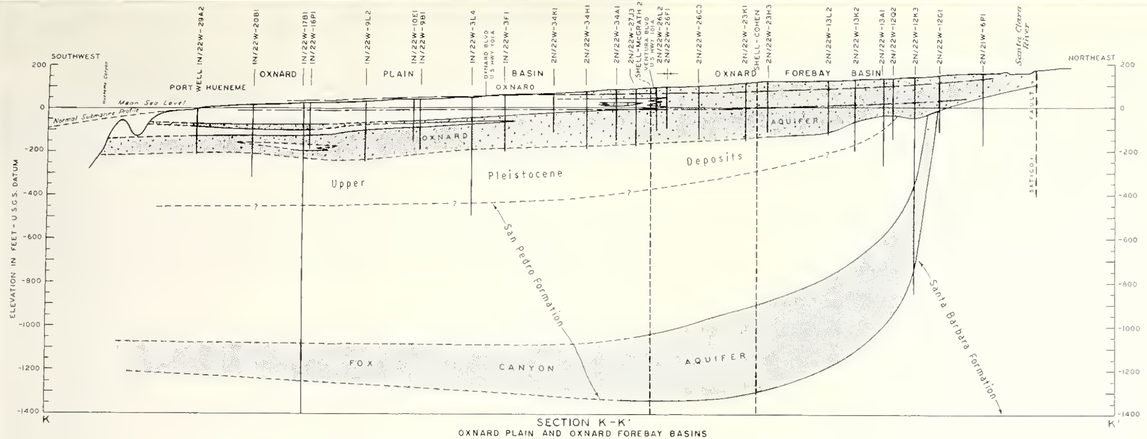
LEGEND

- DEPOSITS OF LOW PERMEABILITY
- RECENT AND UPPER PLEISTOCENE DEPOSITS
- FOX CANYON AQUIFER AND UNDIFFERENTIATED PLEISTOCENE DEPOSITS
- GRIMES CANYON AQUIFER
- WATER WELL
- Spring 1948 / Fall 1951 — APPROXIMATE LEVEL OF WATER IN WELLS

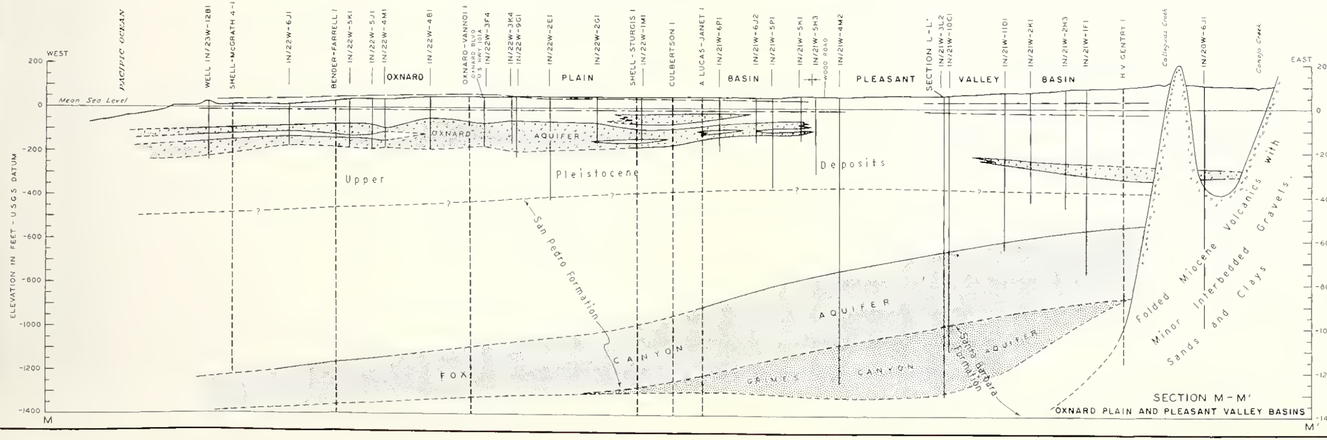
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

GEOLOGIC SECTIONS E-E', F-F', G-G', H-H' AND J-J'
1953

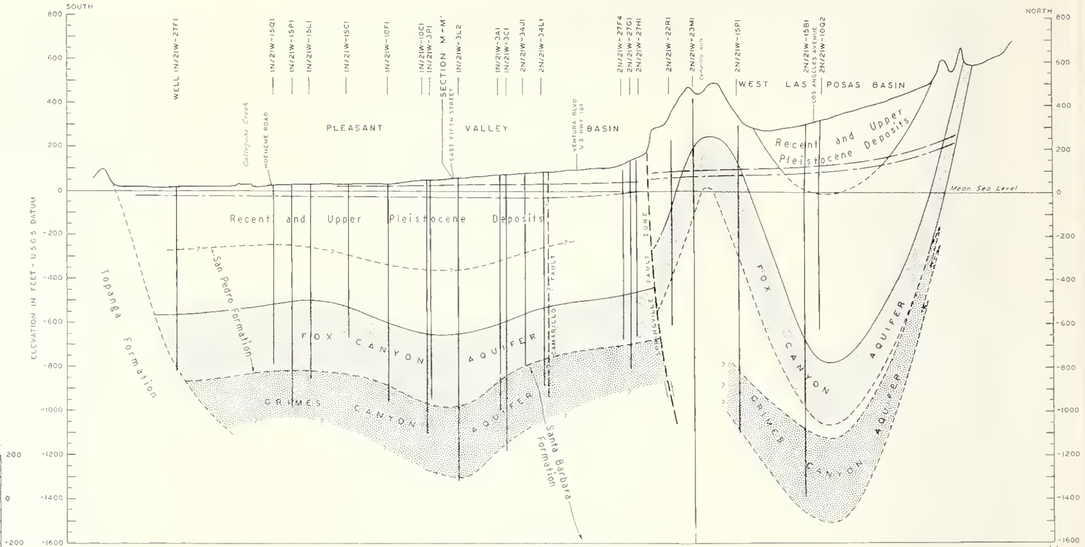
HORIZONTAL SCALE
2000 0 2000 4000 6000 FEET



SECTION K-K'
OXNARD PLAIN AND OXNARD FOREBAY BASINS



SECTION M-M'
OXNARD PLAIN AND PLEASANT VALLEY BASINS



SECTION L-L'
PLEASANT VALLEY AND WEST LAS POSAS BASINS

LEGEND

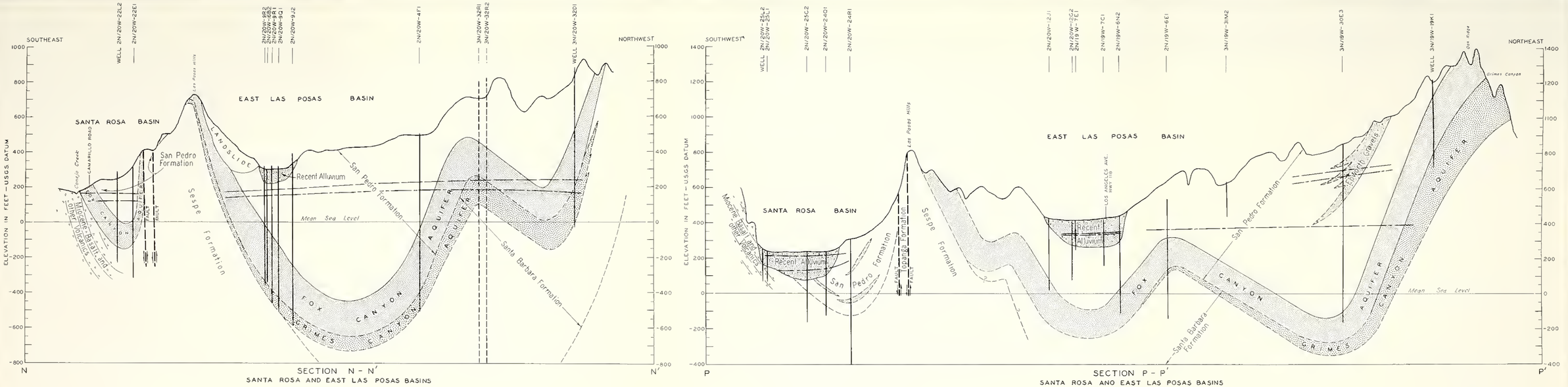
- DEPOSITS OF LOW PERMEABILITY
- RECENT AND UPPER PLEISTOCENE DEPOSITS
- FOX CANYON AQUIFER AND UNDIFFERENTIATED PLEISTOCENE DEPOSITS
- GRIMES CANYON AQUIFER
- WATER WELL
- OIL WELL
- APPROXIMATE LEVEL OF WATER IN WELLS

NOTE: PLAN OF SECTIONS SHOWN ON PLATE 11

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

GEOLOGIC SECTIONS K-K', L-L' AND M-M'
1953

HORIZONTAL SCALE 3000 0 3000 6000 9000 FEET



LEGEND

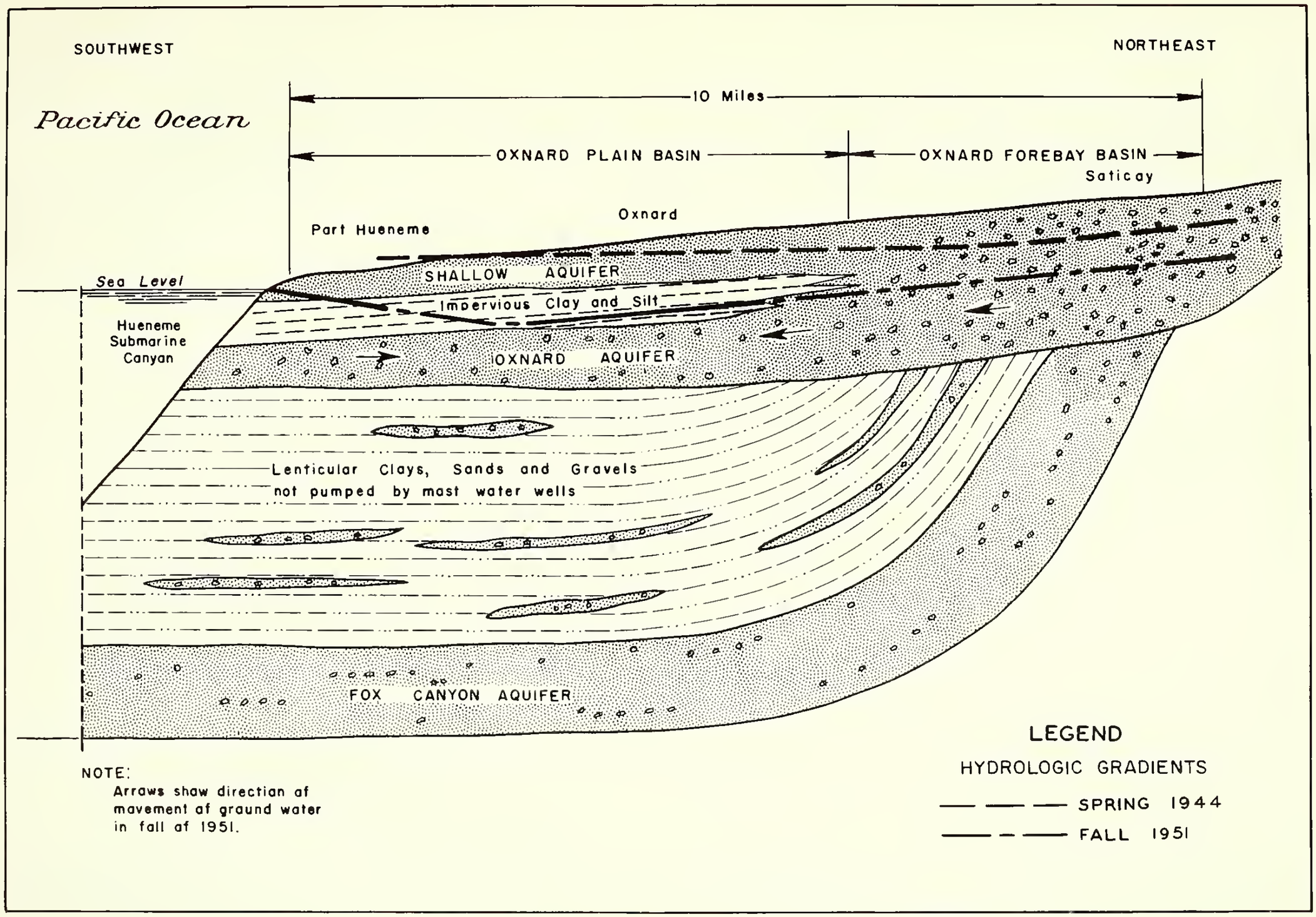
- DEPOSITS OF LOW PERMEABILITY
- RECENT AND UPPER PLEISTOCENE DEPOSITS
- FOX CANYON AQUIFER AND UNDIFFERENTIATED PLEISTOCENE DEPOSITS
- GRIMES CANYON AQUIFER
- WATER WELL
- OIL WELL
- Spring 1946 / Fall 1951 — APPROXIMATE LEVEL OF WATER IN WELLS

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

GEOLOGIC SECTIONS N-N', P-P', Q-Q' AND R-R'

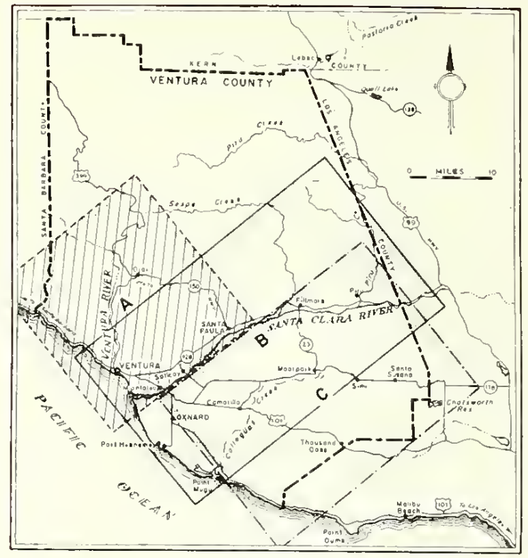
1953

HORIZONTAL SCALE — 2000 0 2000 4000 6000 FEET



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

DIAGRAMMATIC SKETCH OF OXNARD FOREBAY AND OXNARD PLAIN BASINS



KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- —20— LINES OF EQUAL ELEVATION OF GROUND WATER

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

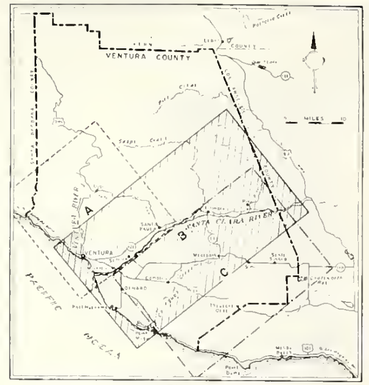
VENTURA HYDROLOGIC UNIT

LINES OF EQUAL ELEVATION OF GROUND WATER

FALL OF 1936

Scale of miles

0 1 2



KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- PIRU — NAME OF SUBUNIT
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER IN FOX CANYON AQUIFER
- AREA WITH GROUND WATER ELEVATION BELOW SEA LEVEL

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

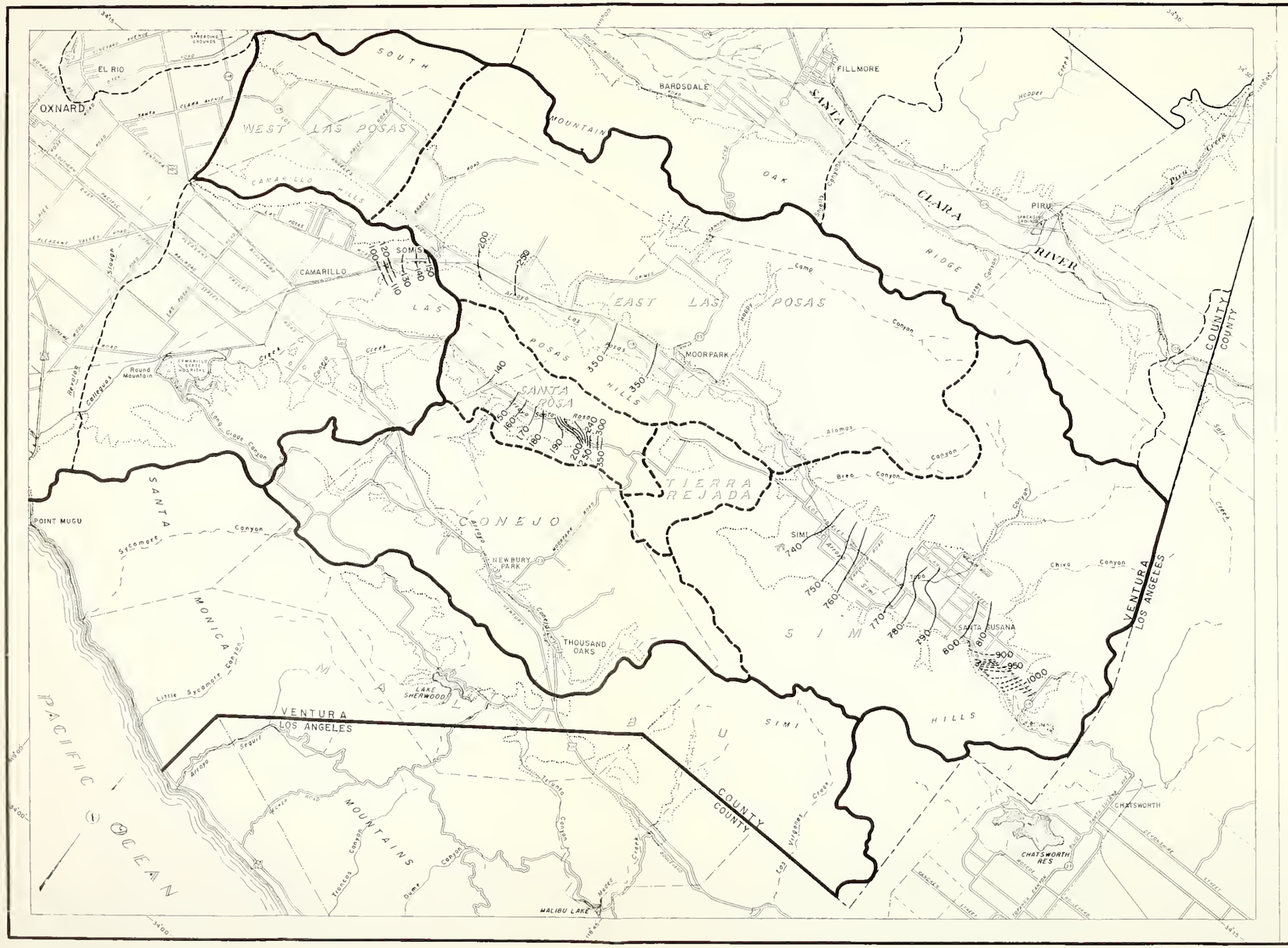
VENTURA COUNTY INVESTIGATION

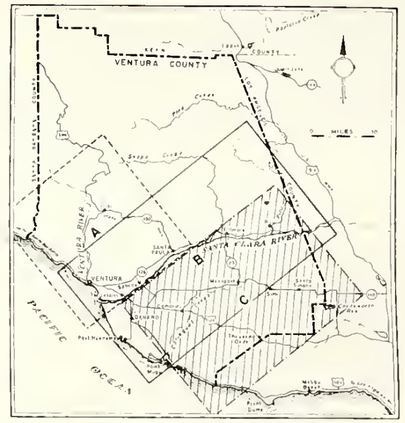
SANTA CLARA RIVER HYDROLOGIC UNIT

LINES OF EQUAL ELEVATION OF GROUND WATER

FALL OF 1936

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF HYDROLOGIC UNIT OR SUBUNIT
- —20— LINES OF EQUAL ELEVATION OF GROUND WATER
- —20— LINES OF EQUAL ELEVATION OF GROUND WATER IN FOX CANYON AQUIFER
- ---900--- LINES OF EQUAL ELEVATION OF GROUND WATER IN OLDER ROCKS

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

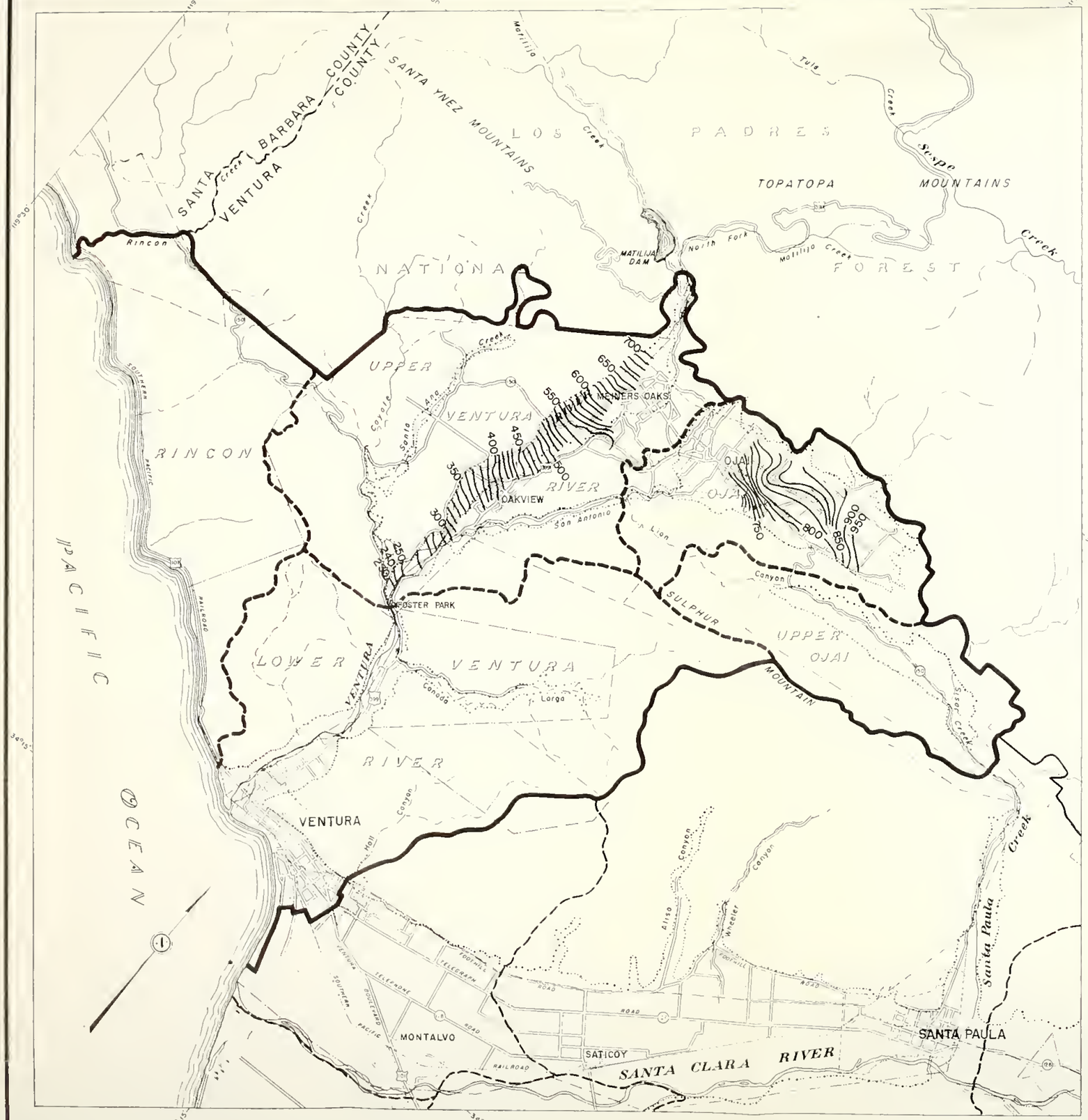
VENTURA COUNTY INVESTIGATION

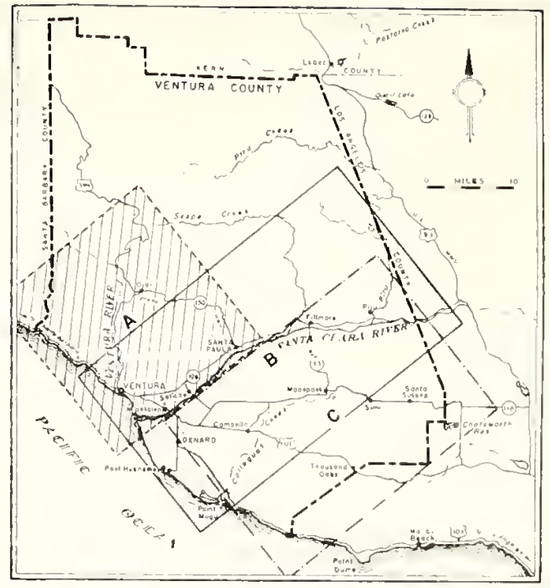
CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

LINES OF EQUAL ELEVATION OF GROUND WATER

FALL OF 1936

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

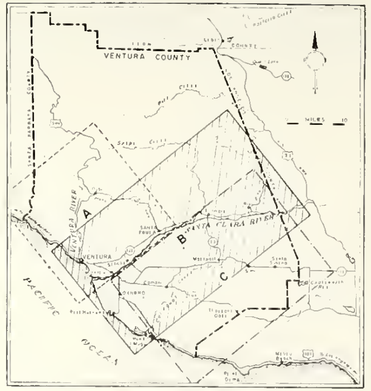
VENTURA HYDROLOGIC UNIT

LINES OF EQUAL ELEVATION OF GROUND WATER

SPRING OF 1944

Scale of miles

0 1 2 3



KEY MAP

LEGEND

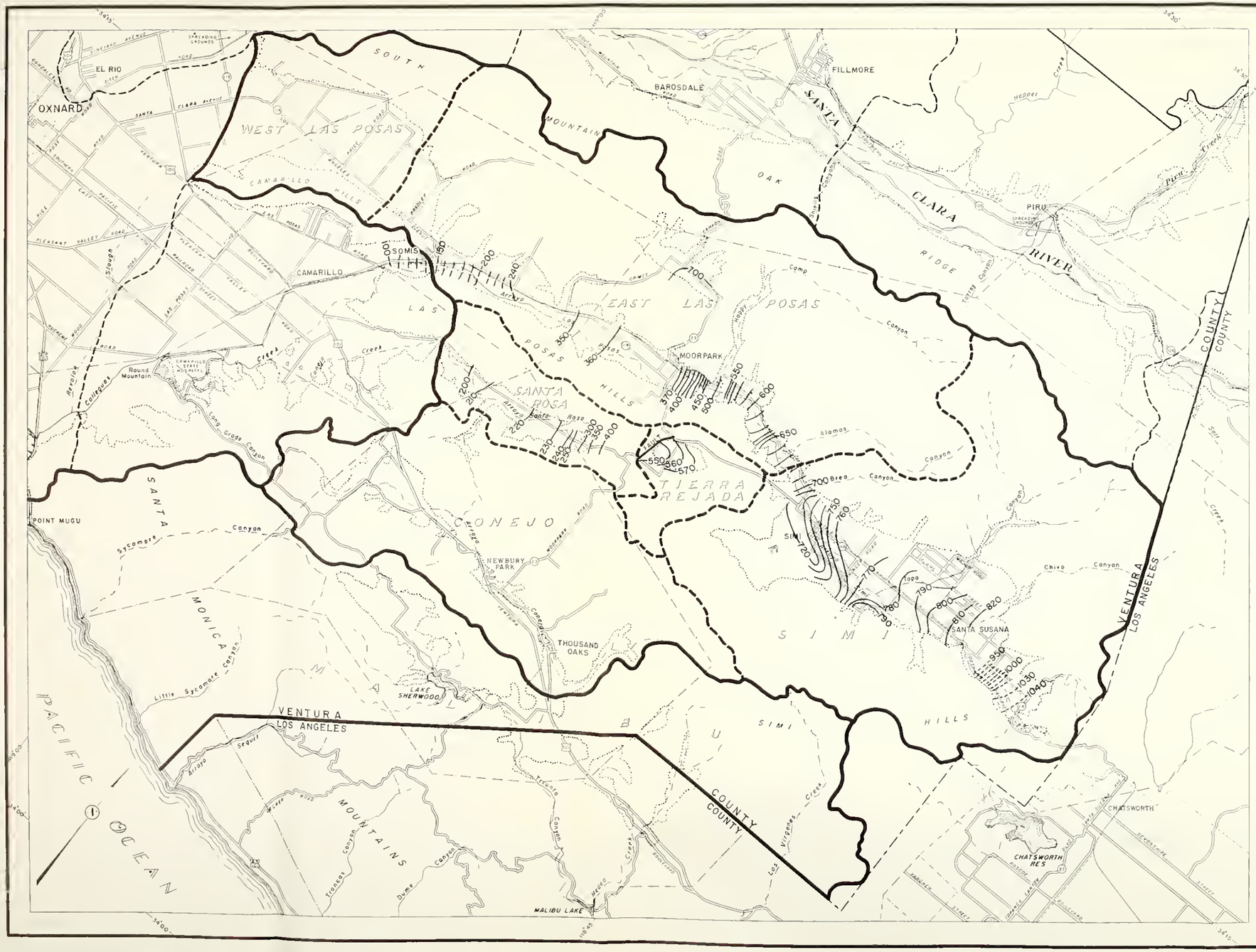
- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- PIRU — NAME OF SUBUNIT
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER IN FOX CANYON AQUIFER
- AREA WITH PIEZOMETRIC SURFACE ABOVE GROUND SURFACE

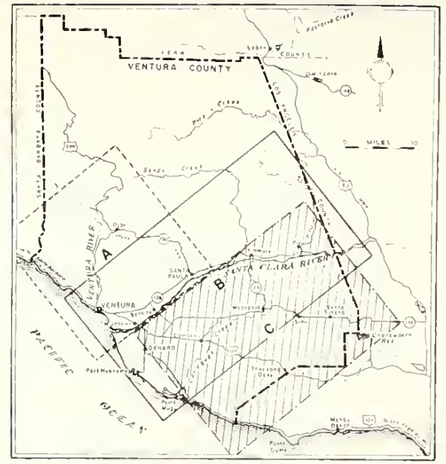
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

SANTA CLARA RIVER HYDROLOGIC UNIT

LINES OF EQUAL ELEVATION OF GROUND WATER SPRING OF 1944





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF SUBUNIT
- —20— LINES OF EQUAL ELEVATION OF GROUND WATER
- —20— LINES OF EQUAL ELEVATION OF GROUND WATER IN FOX CANYON AQUIFER
- —950— LINES OF EQUAL ELEVATION OF GROUND WATER IN OLDER ROCKS

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

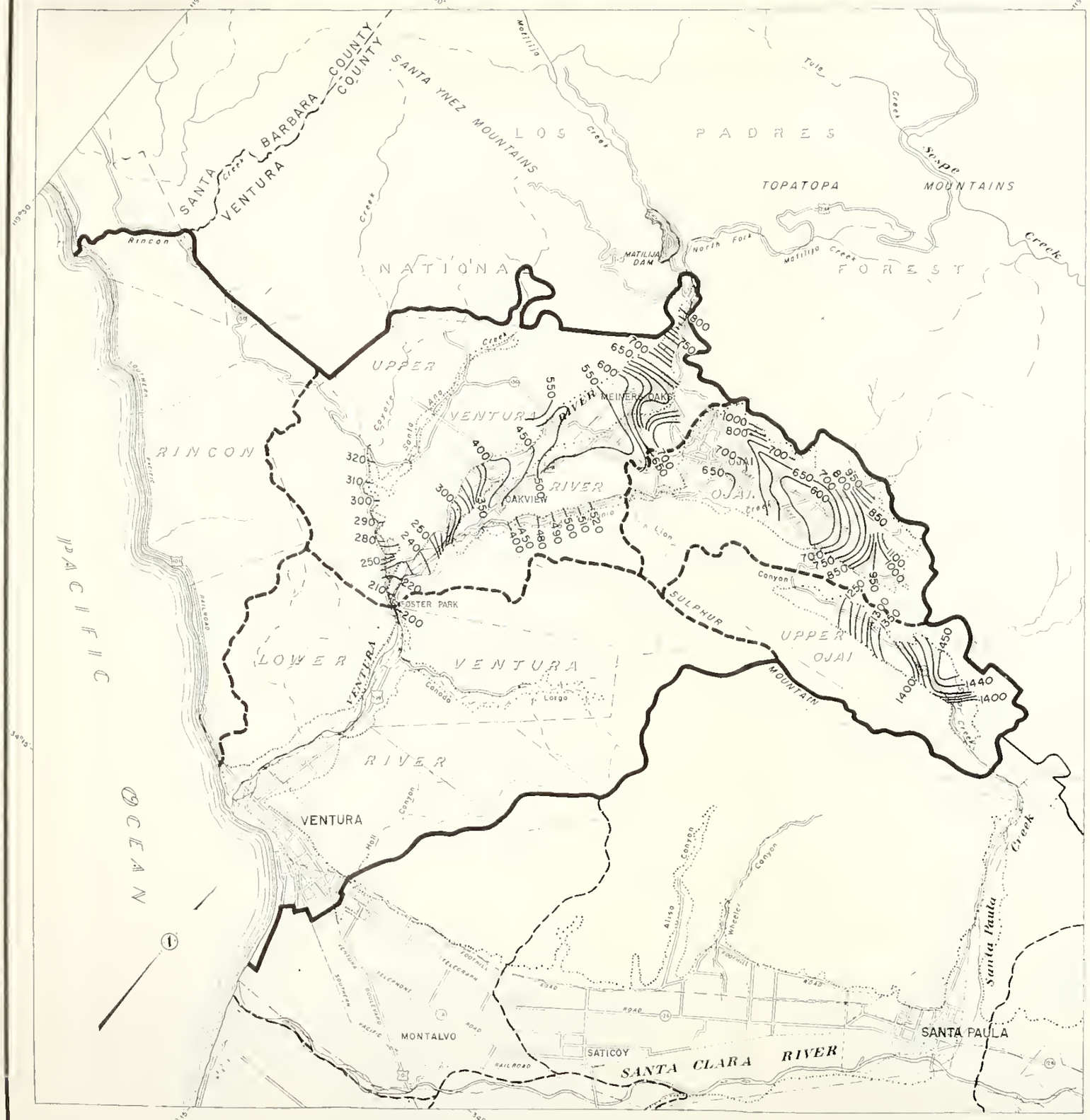
VENTURA COUNTY INVESTIGATION

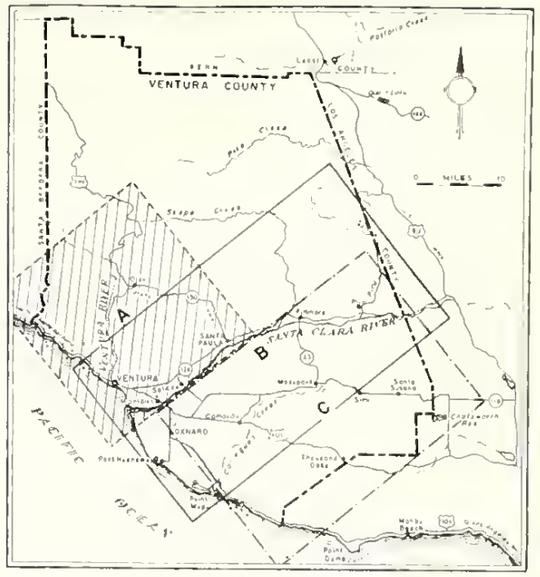
CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

LINES OF EQUAL ELEVATION OF GROUND WATER

SPRING OF 1944

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- —20— LINES OF EQUAL ELEVATION OF GROUND WATER

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

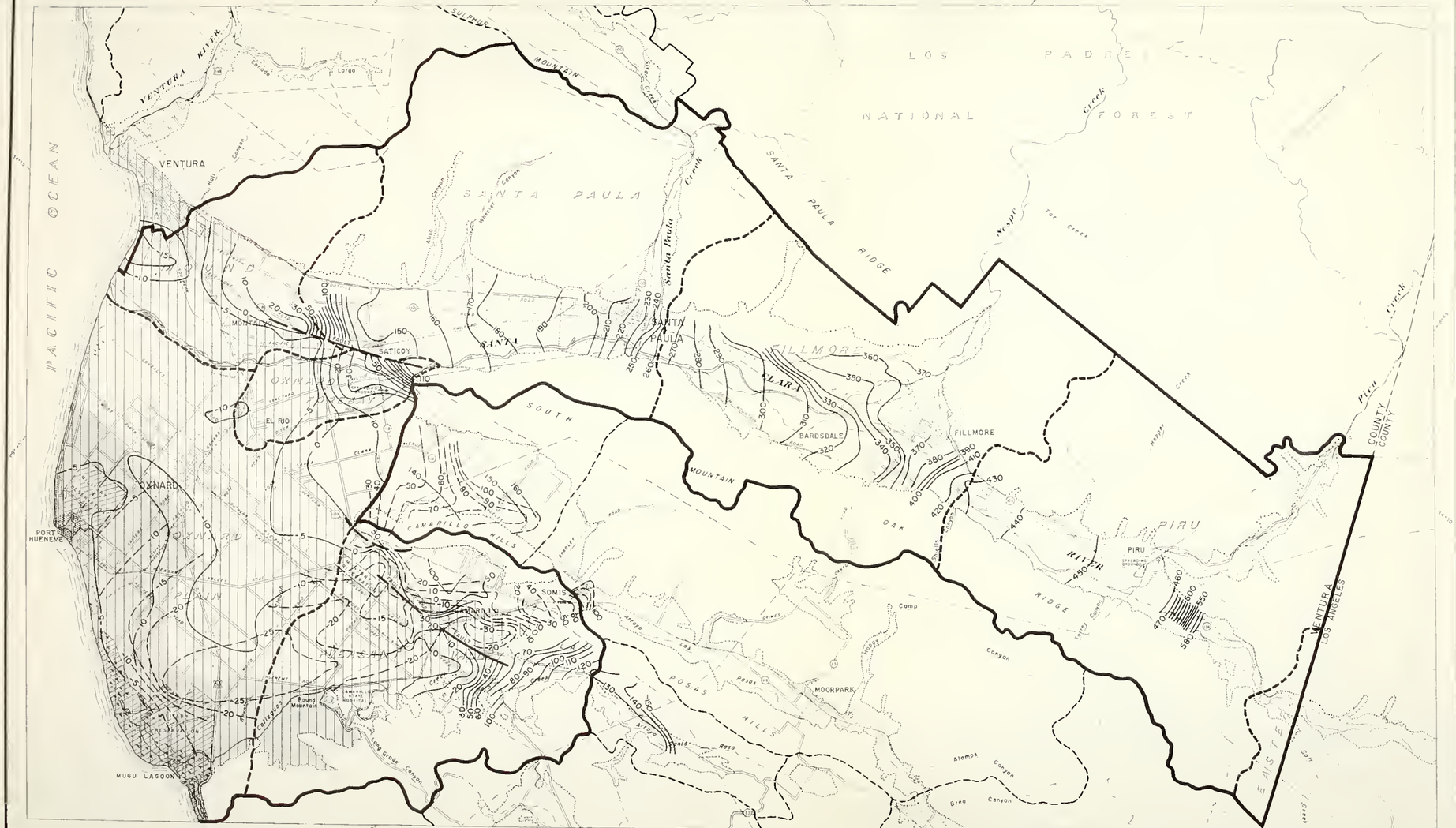
VENTURA HYDROLOGIC UNIT

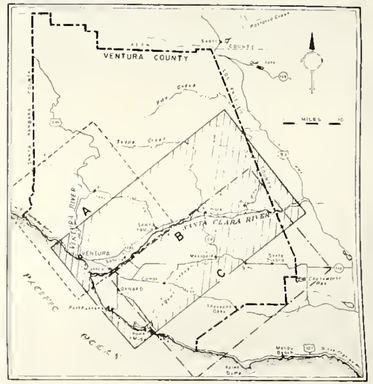
LINES OF EQUAL ELEVATION OF GROUND WATER

FALL OF 1951

Scale of miles

0 1 2 3





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- PIRU — NAME OF SUBUNIT
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER
- -20- — LINES OF EQUAL ELEVATION OF GROUND WATER IN FOX CANYON AQUIFER
- AREA WITH GROUND WATER ELEVATION BELOW SEA LEVEL
- AREAL EXTENT OF LANDWARD GRADIENT IN PIEZOMETRIC SURFACE OF PUMPING AQUIFERS
- PROBABLE EXTENT OF SEA WATER INTRUSION IN OXNARD AQUIFER

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

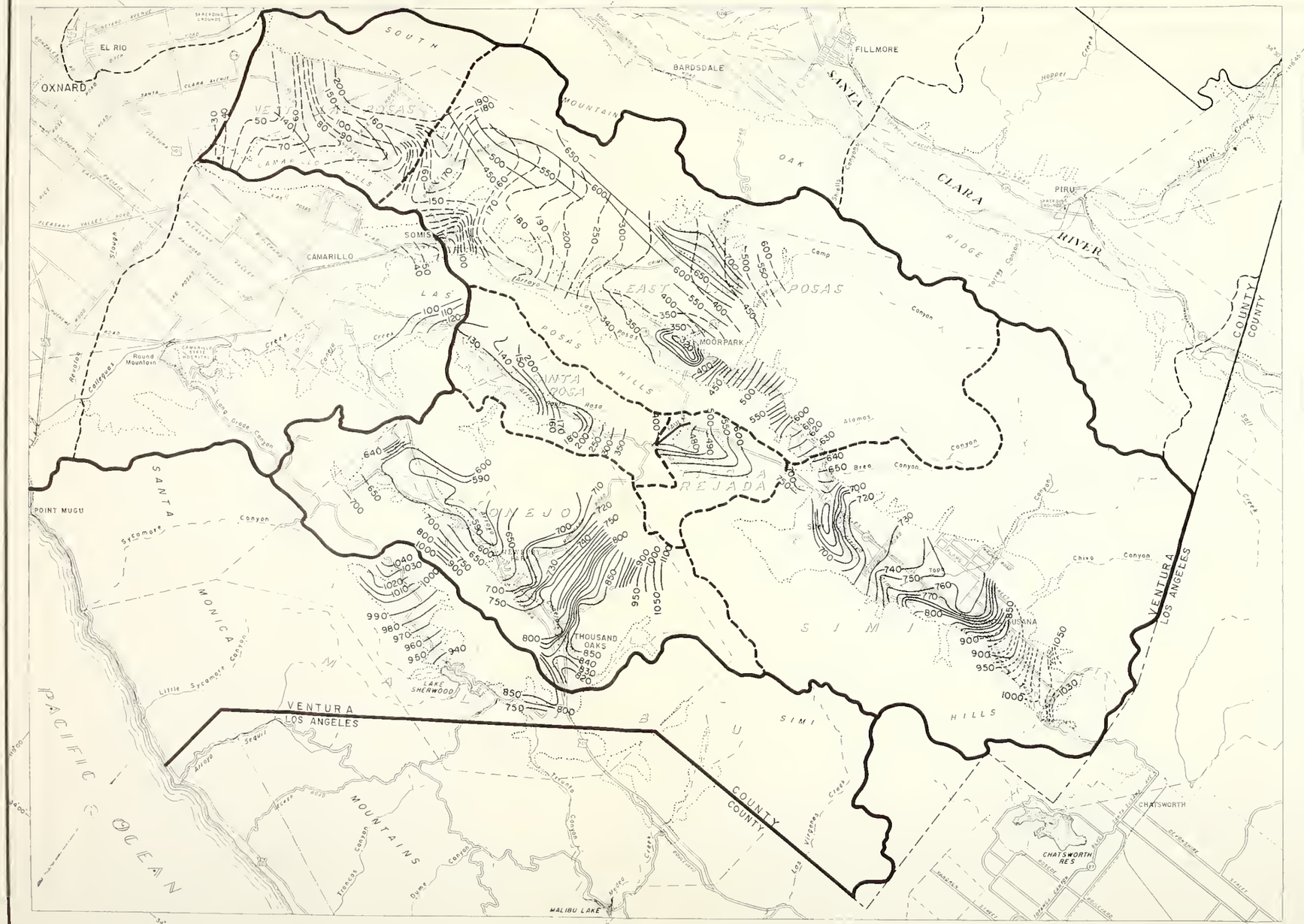
VENTURA COUNTY INVESTIGATION

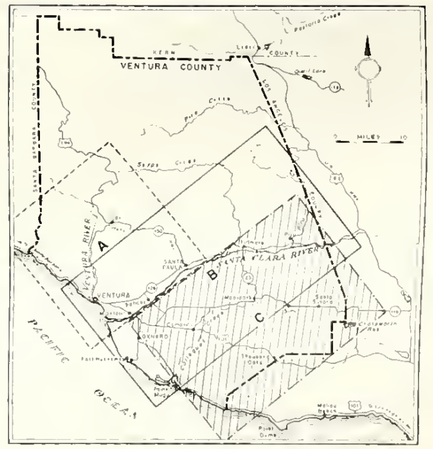
SANTA CLARA RIVER HYDROLOGIC UNIT

LINES OF EQUAL ELEVATION OF GROUND WATER

FALL OF 1951

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF HYDROLOGIC UNIT OR SUBUNIT
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER
- 20 — LINES OF EQUAL ELEVATION OF GROUND WATER IN FOX CANYON AQUIFER
- 900 — LINES OF EQUAL ELEVATION OF GROUND WATER IN OLDER ROCKS

STATE OF CALIFORNIA
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VENTURA COUNTY INVESTIGATION

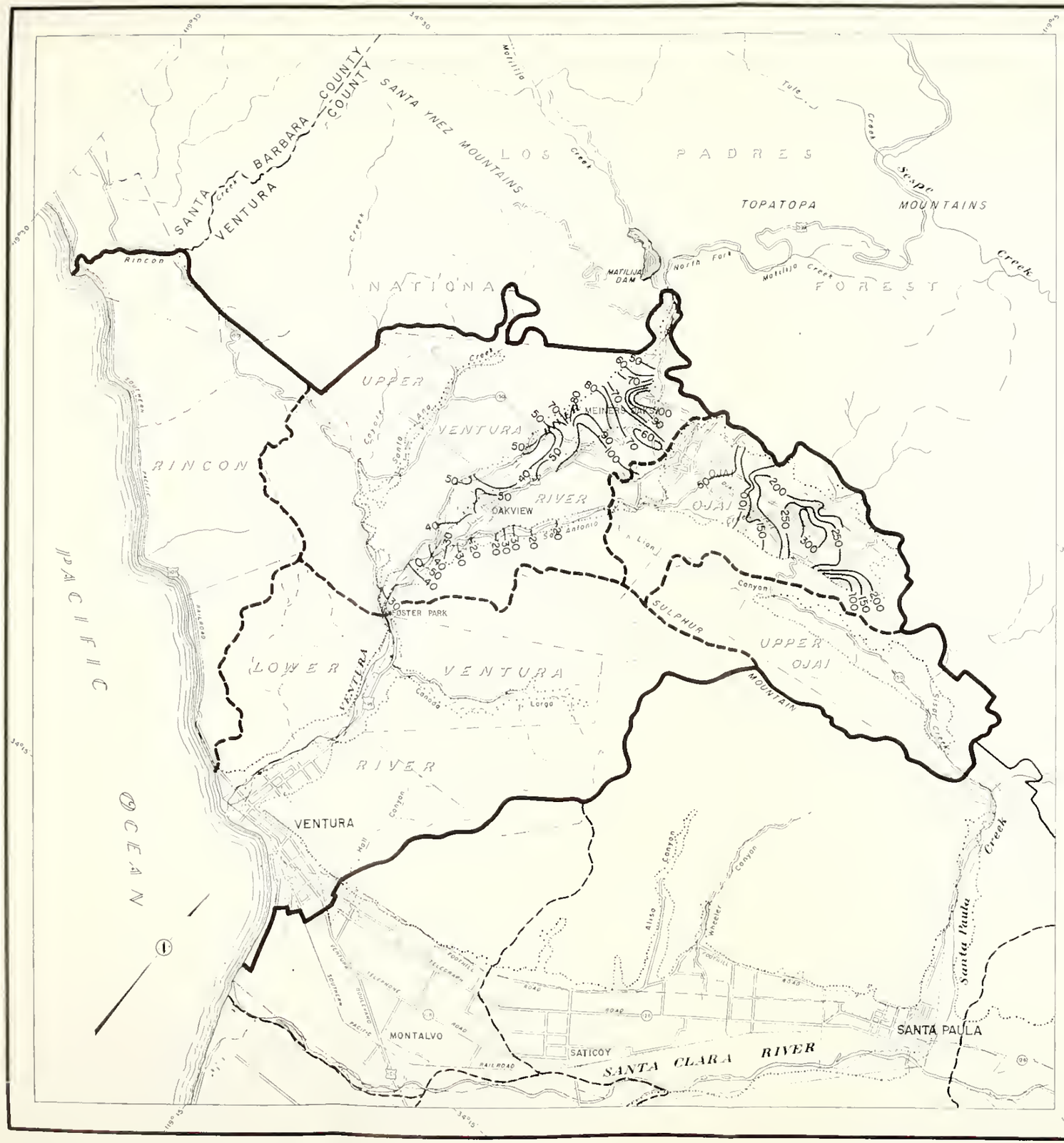
CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

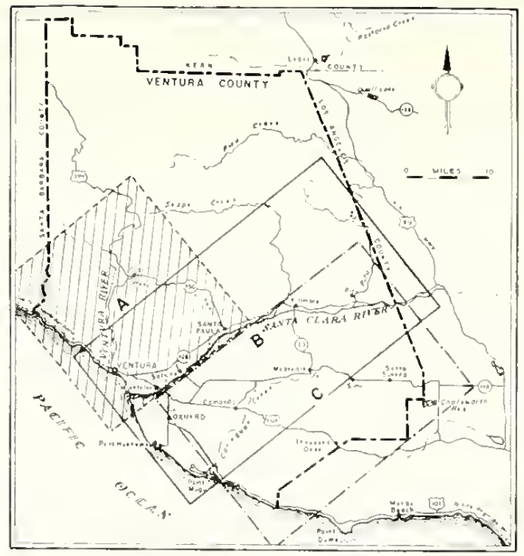
LINES OF EQUAL ELEVATION OF GROUND WATER

FALL OF 1951

Scale of miles

1 0 1 2 3





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- 20 — LINES OF EQUAL DEPTH TO GROUND WATER

STATE OF CALIFORNIA
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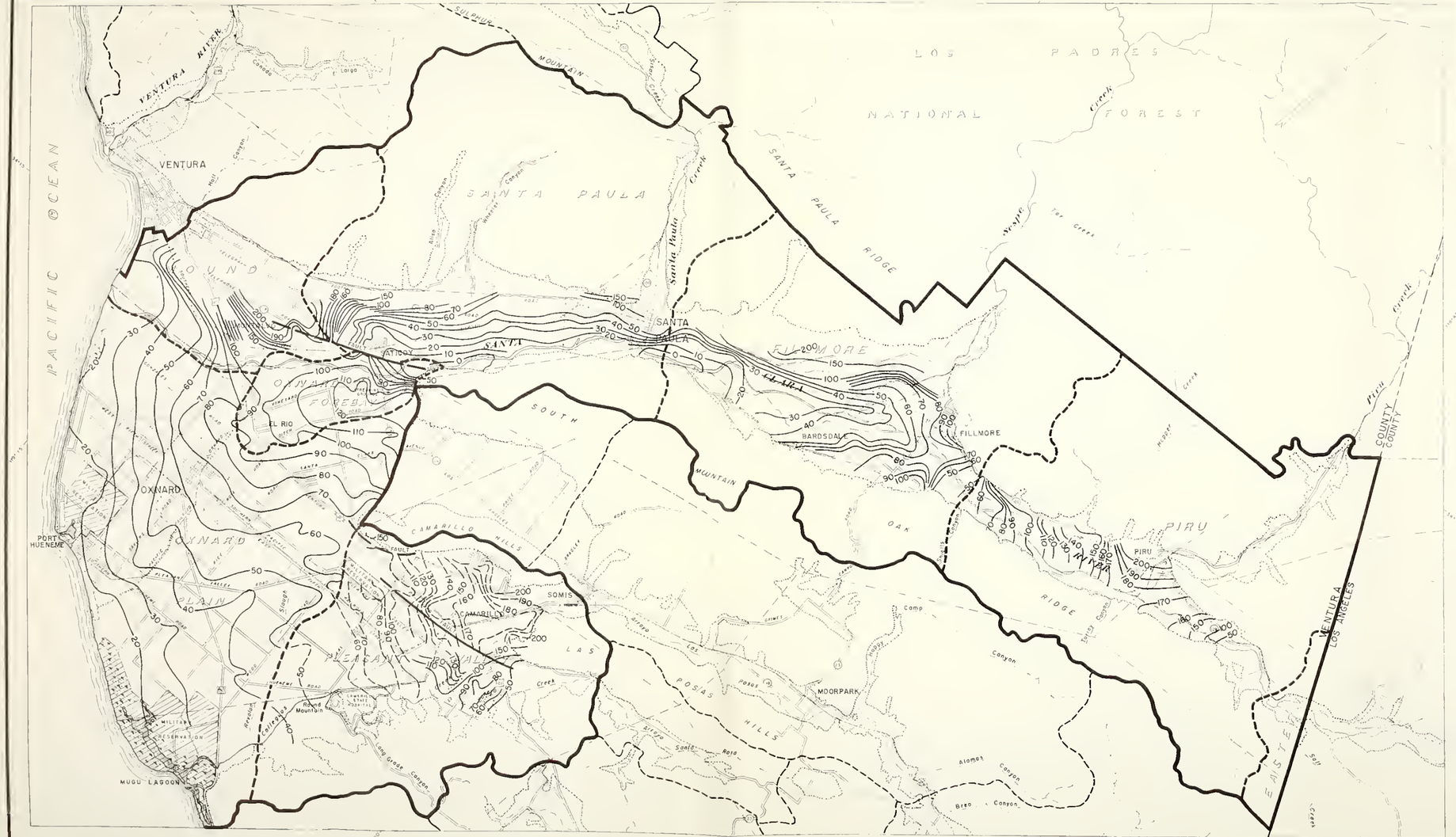
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

VENTURA HYDROLOGIC UNIT

LINES OF EQUAL DEPTH TO GROUND WATER FALL OF 1951

Scale of miles



KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- NAME OF SUBUNIT
- 20 — LINES OF EQUAL DEPTH TO GROUND WATER
- 100 — LINES OF EQUAL DEPTH TO GROUND WATER IN FOX CANYON AQUIFER

STATE OF CALIFORNIA
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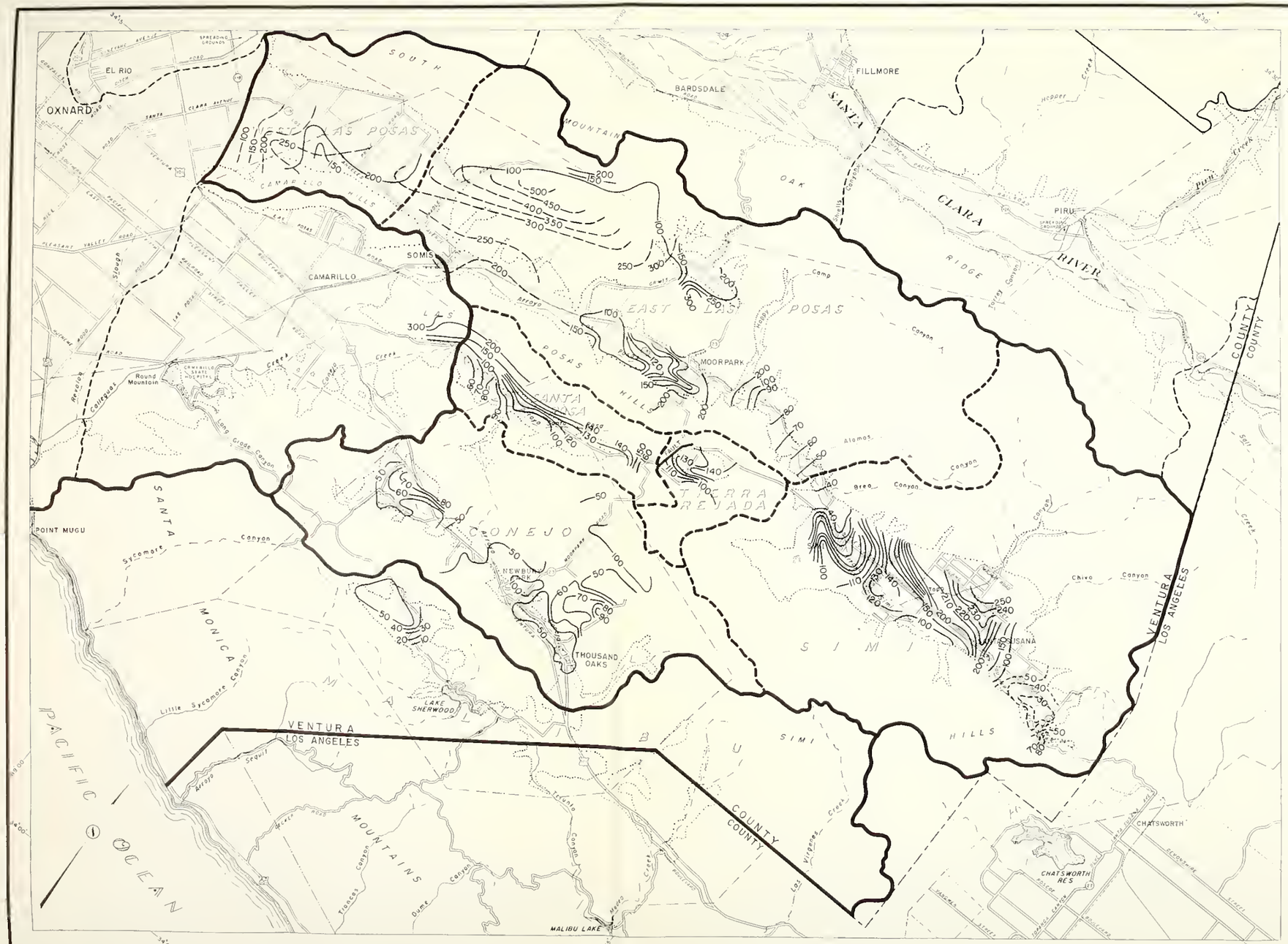
VENTURA COUNTY INVESTIGATION

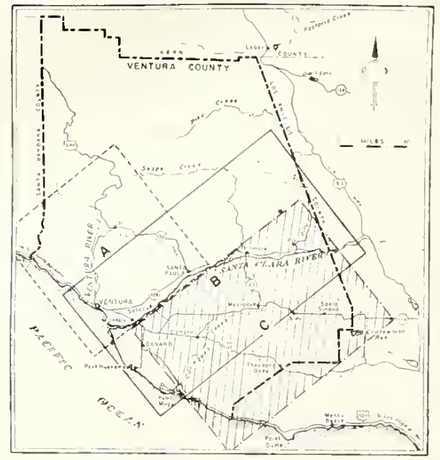
SANTA CLARA RIVER HYDROLOGIC UNIT

LINES OF EQUAL DEPTH TO GROUND WATER

FALL OF 1951

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF HYDROLOGIC UNIT OR SUBUNIT
- 20 — LINES OF EQUAL DEPTH TO GROUND WATER
- 20 — LINES OF EQUAL DEPTH TO GROUND WATER IN FOX CANYON AQUIFER
- 50 — LINES OF EQUAL DEPTH TO GROUND WATER IN OLDER ROCKS

STATE OF CALIFORNIA
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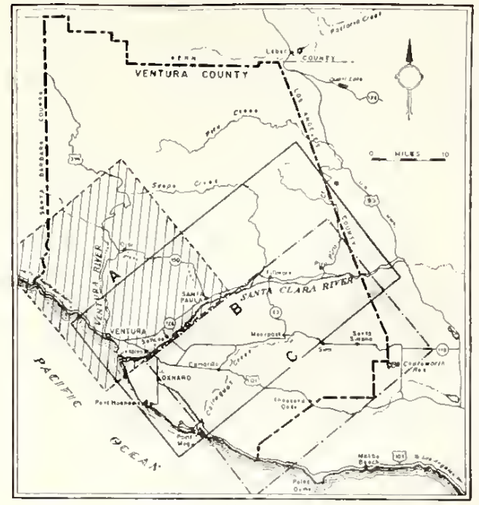
VENTURA COUNTY INVESTIGATION

CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

LINES OF EQUAL DEPTH TO GROUND WATER FALL OF 1951

Scale of miles



KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

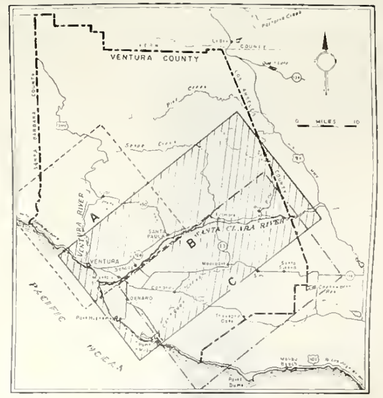
VENTURA HYDROLOGIC UNIT

LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

FALL OF 1936 TO FALL OF 1951

Scale of miles

0 1 2 3



KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- PIRU — NAME OF SUBUNIT
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION IN FOX CANYON AQUIFER

STATE OF CALIFORNIA
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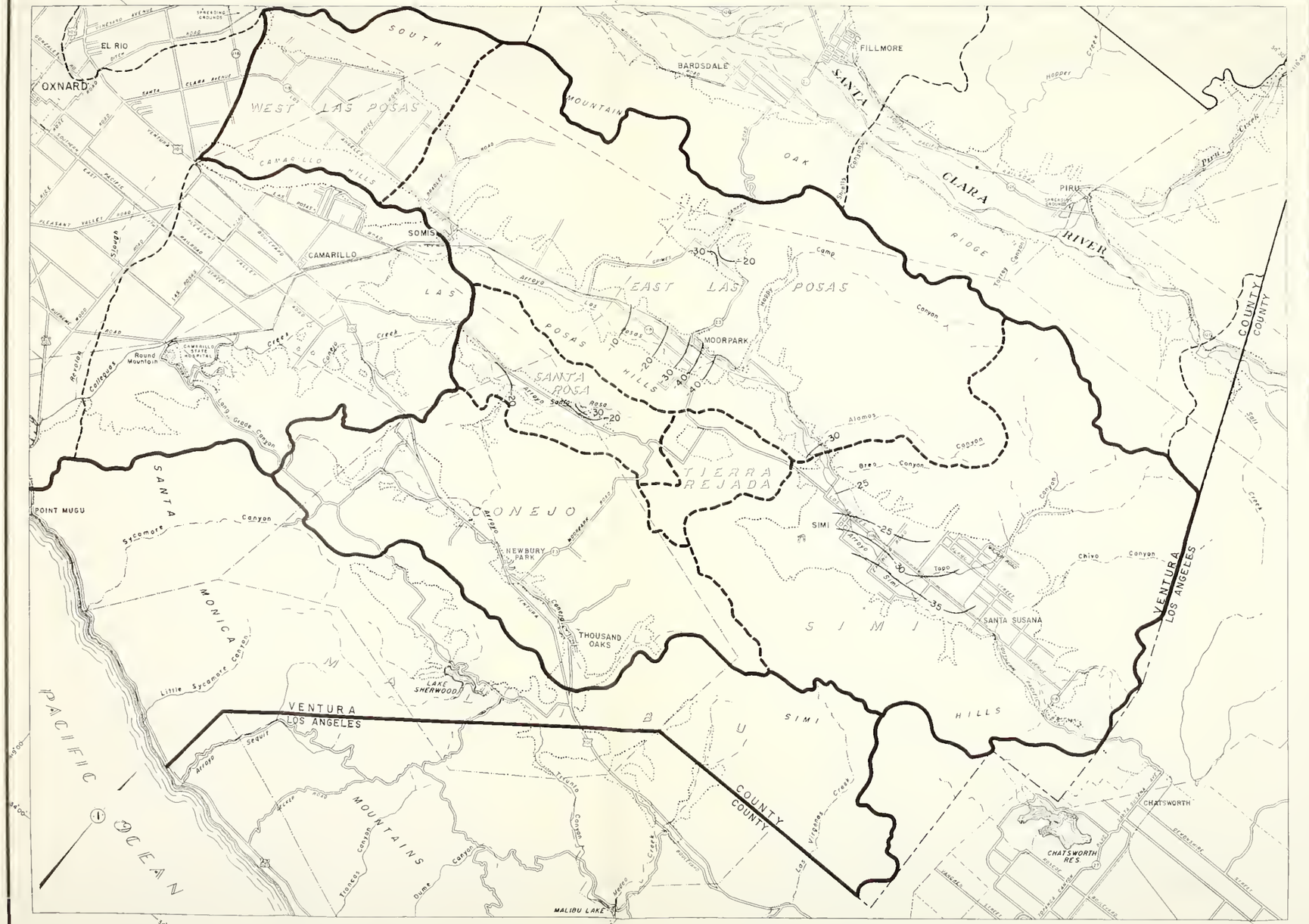
VENTURA COUNTY INVESTIGATION

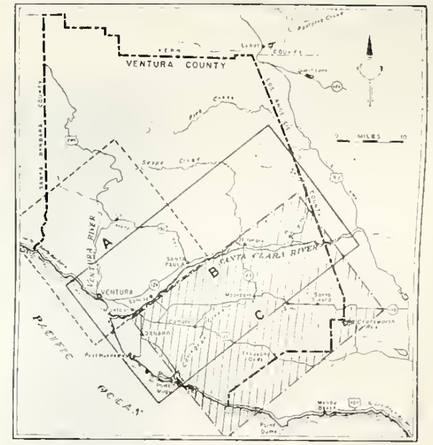
SANTA CLARA RIVER HYDROLOGIC UNIT

LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

FALL OF 1936 TO FALL OF 1951

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF HYDROLOGIC UNIT OR SUBUNIT
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
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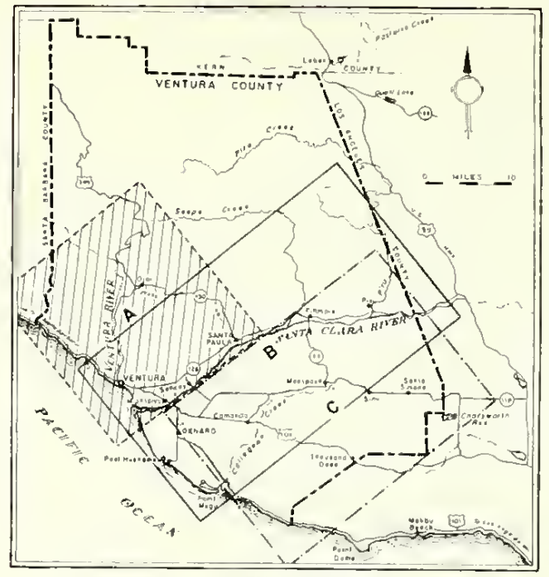
VENTURA COUNTY INVESTIGATION

CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

FALL OF 1936 TO FALL OF 1951

Scale of miles



KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
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VENTURA COUNTY INVESTIGATION

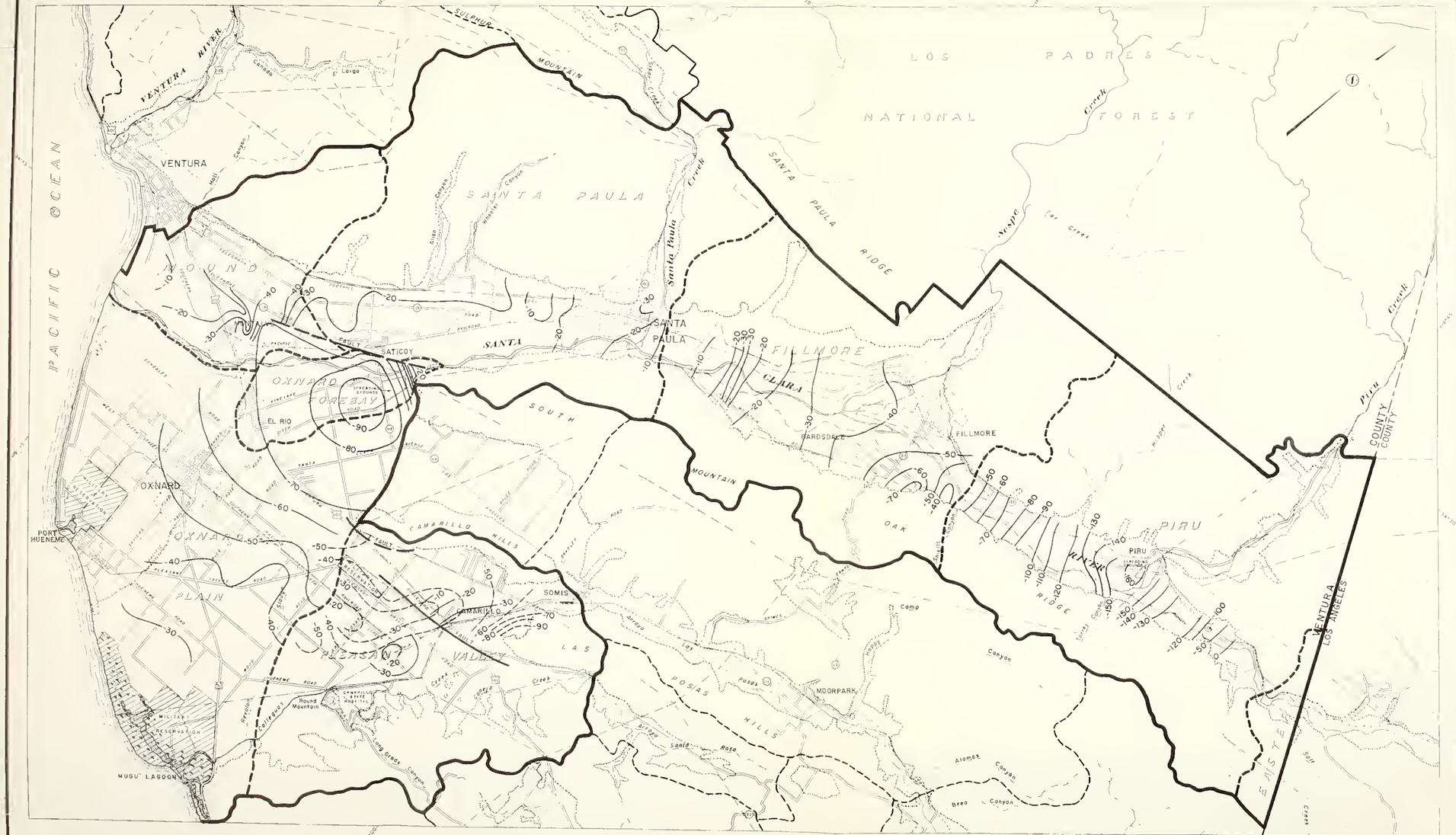
VENTURA HYDROLOGIC UNIT

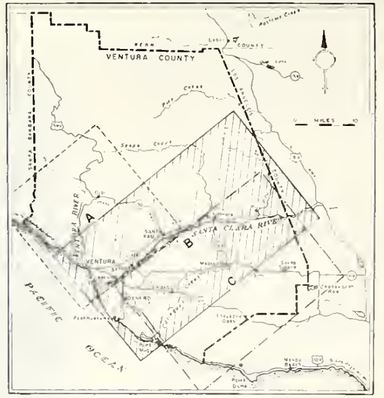
LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

SPRING OF 1944 TO FALL OF 1951

Scale of miles

1 0 1 2 3





KEY MAP

HYDROLOGIC UNIT BOUNDARY
SUBUNIT BOUNDARY
APPROXIMATE BOUNDARY OF VALLEY FLOOR
PIRU — NAME OF SUBUNIT
-20 — LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION
-20 — LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION IN FOX CANYON AQUIFER

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
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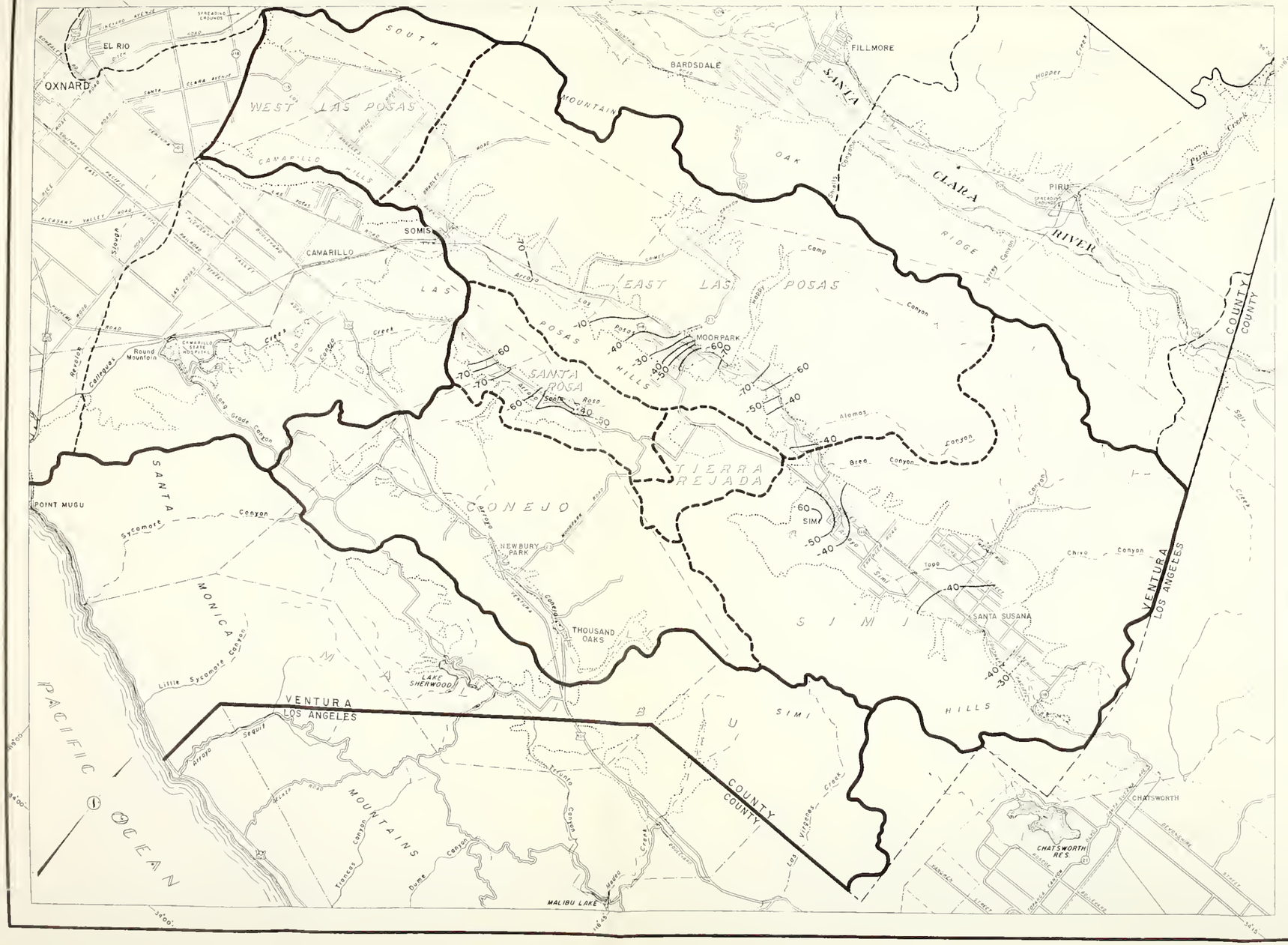
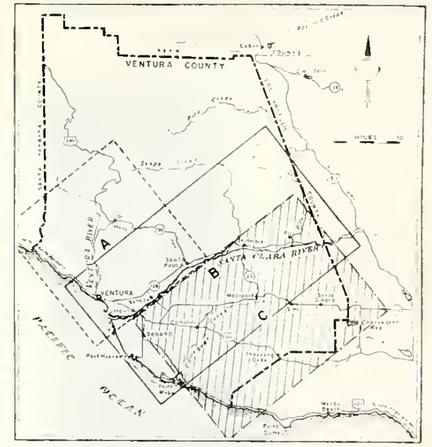
VENTURA COUNTY INVESTIGATION
SANTA CLARA RIVER HYDROLOGIC UNIT

LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

SPRING OF 1944 TO FALL OF 1951

Scale of miles
0 1 2 3





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF SUBAREA
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION
- —20— LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION IN FOX CANYON AQUIFER
- ---40--- LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION IN OLDER ROCKS

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
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VENTURA COUNTY INVESTIGATION

CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

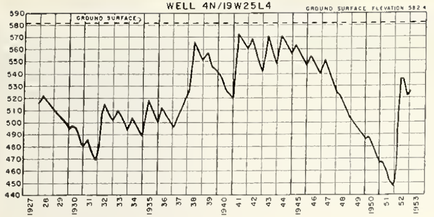
SPRING OF 1944 TO FALL OF 1951

Scale of miles

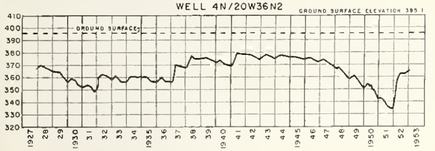
0 1 2 3

ELEVATION OF WATER LEVEL AT KEY WELLS IN FEET — U.S.G.S. DATUM

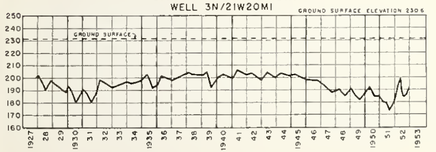
PIRU BASIN
WELL 4N/19W25L4



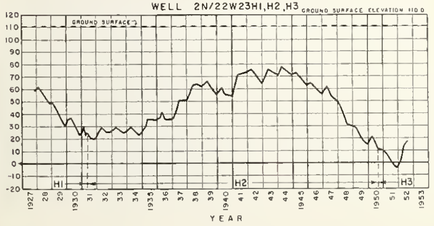
FILLMORE BASIN
WELL 4N/20W36N2



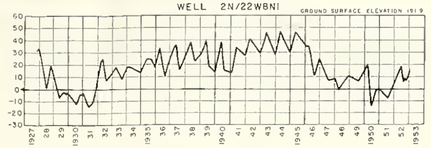
SANTA PAULA BASIN
WELL 3N/21W20M1



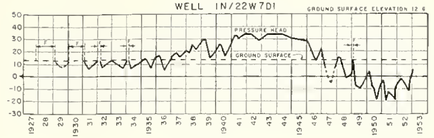
OXNARO FOREBAY
WELL 2N/22W23H1,H2,H3



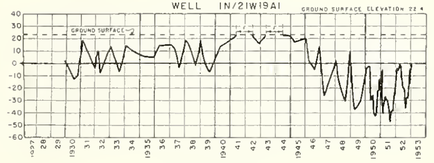
MOUNO BASIN
WELL 2N/22W8N1



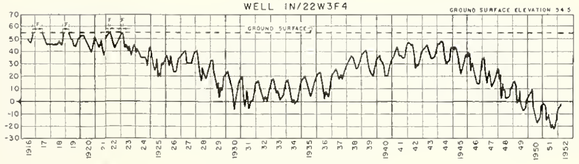
OXNARO PLAIN
WELL 1N/22W7D1



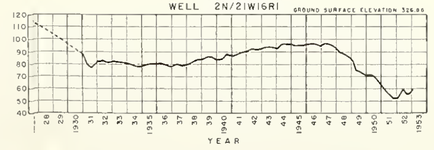
OXNARO PLAIN
WELL 1N/21W19A1



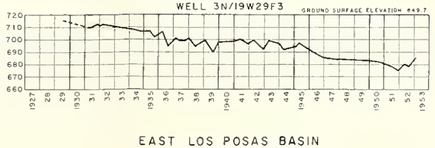
OXNARO PLAIN
WELL 1N/22W3F4



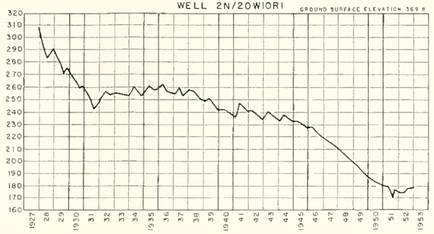
WEST LAS POSAS BASIN
FOX CANYON AQUIFER
WELL 2N/21W16R1



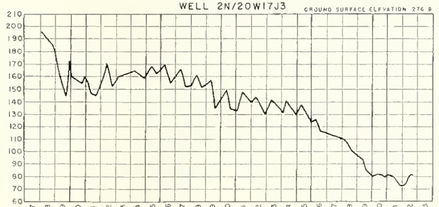
EAST LOS POSAS BASIN
EPWORTH GRAVELS
WELL 3N/19W29F3



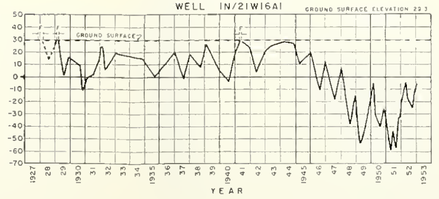
EAST LOS POSAS BASIN
FOX CANYON AQUIFER
WELL 2N/20W10R1



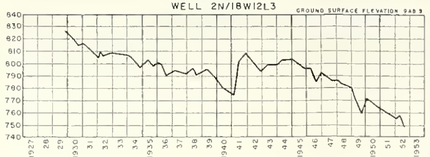
PLEASANT VALLEY
FOX CANYON AQUIFER
WELL 2N/20W17J3



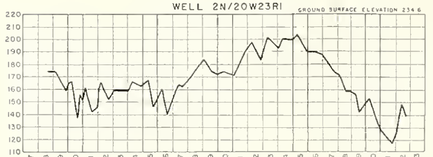
PLEASANT VALLEY
FOX CANYON AQUIFER
WELL 1N/21W16A1



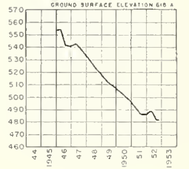
SIMI BASIN
WELL 2N/18W12L3



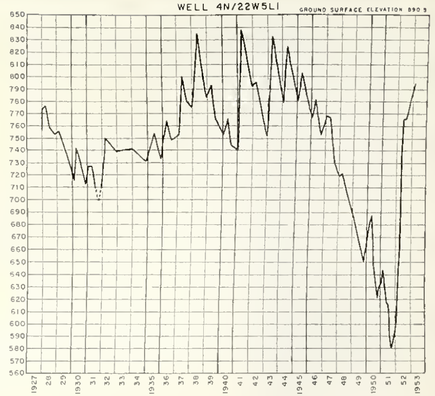
SANTA ROSA BASIN
WELL 2N/20W23R1



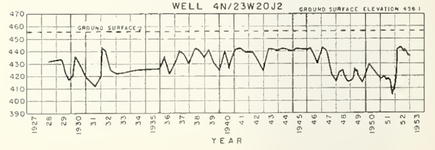
TIERRA REJAOA
WELL 2N/19W14Q1



OJAI BASIN
WELL 4N/22W5L1

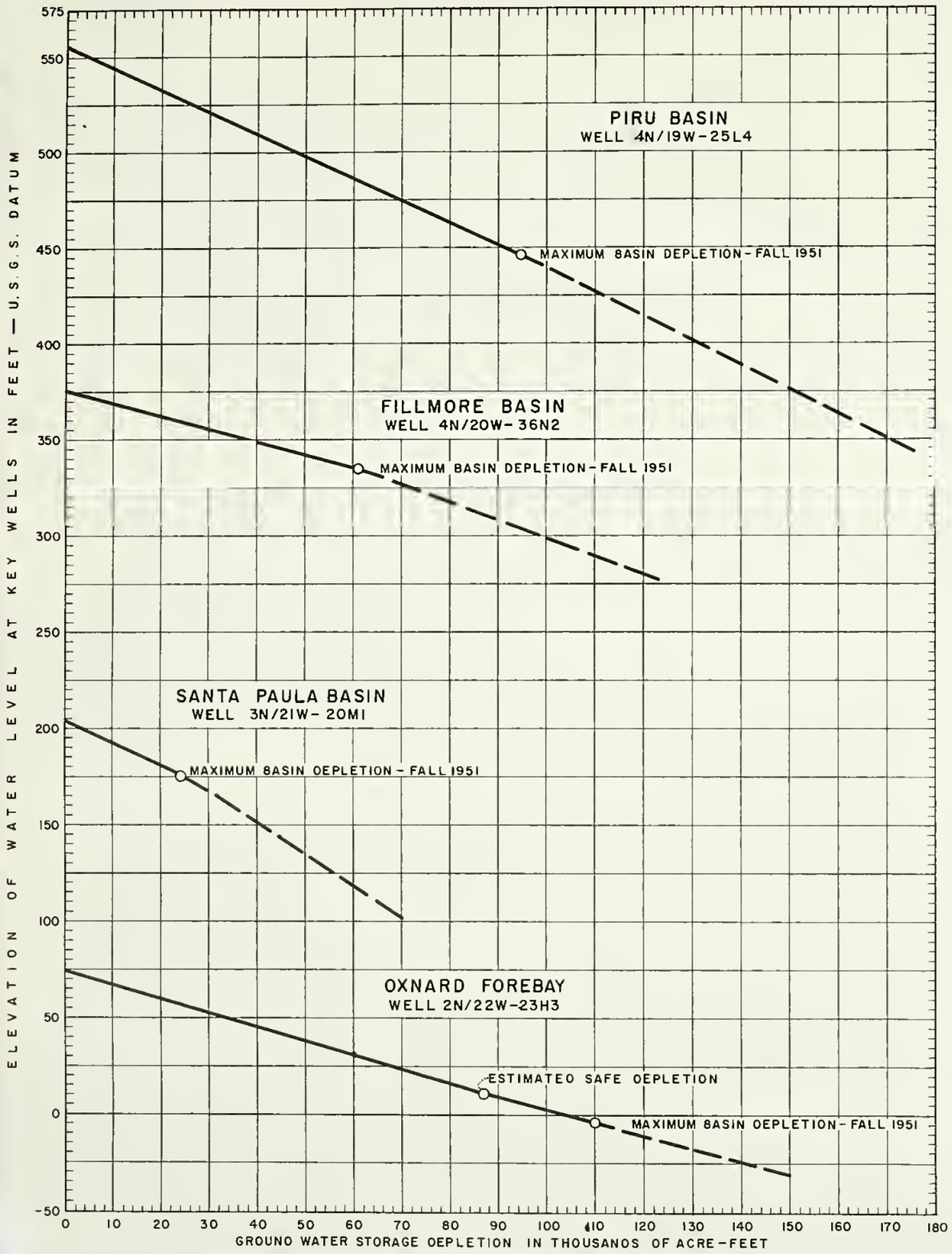


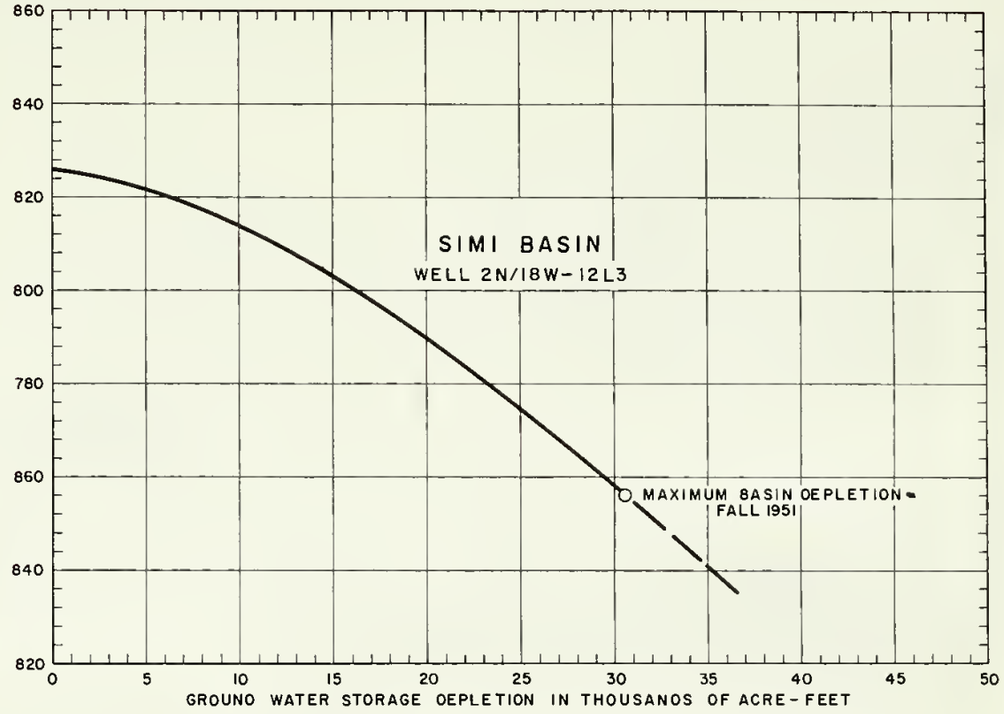
UPPER VENTURA RIVER BASIN
WELL 4N/23W20J2

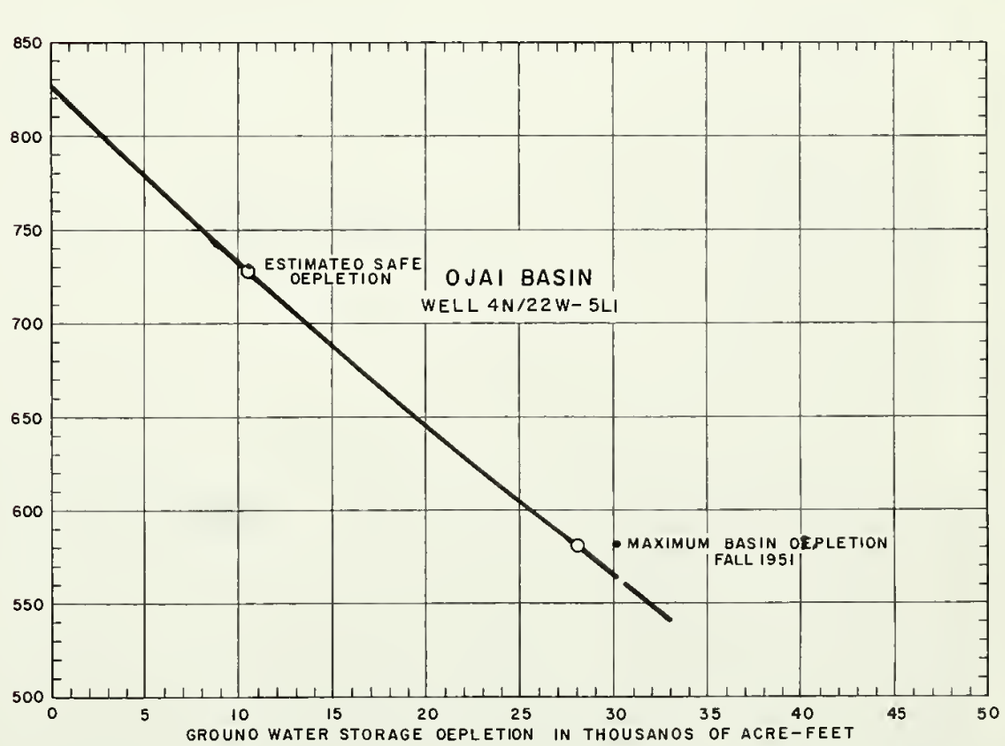


FLUCTUATION OF WATER LEVELS AT KEY WELLS

"F" INDICATES PERIOD DURING WHICH WELL FLOWED







RELATIONSHIP BETWEEN WATER LEVELS AT KEY WELLS AND GROUND WATER STORAGE DEPLETION

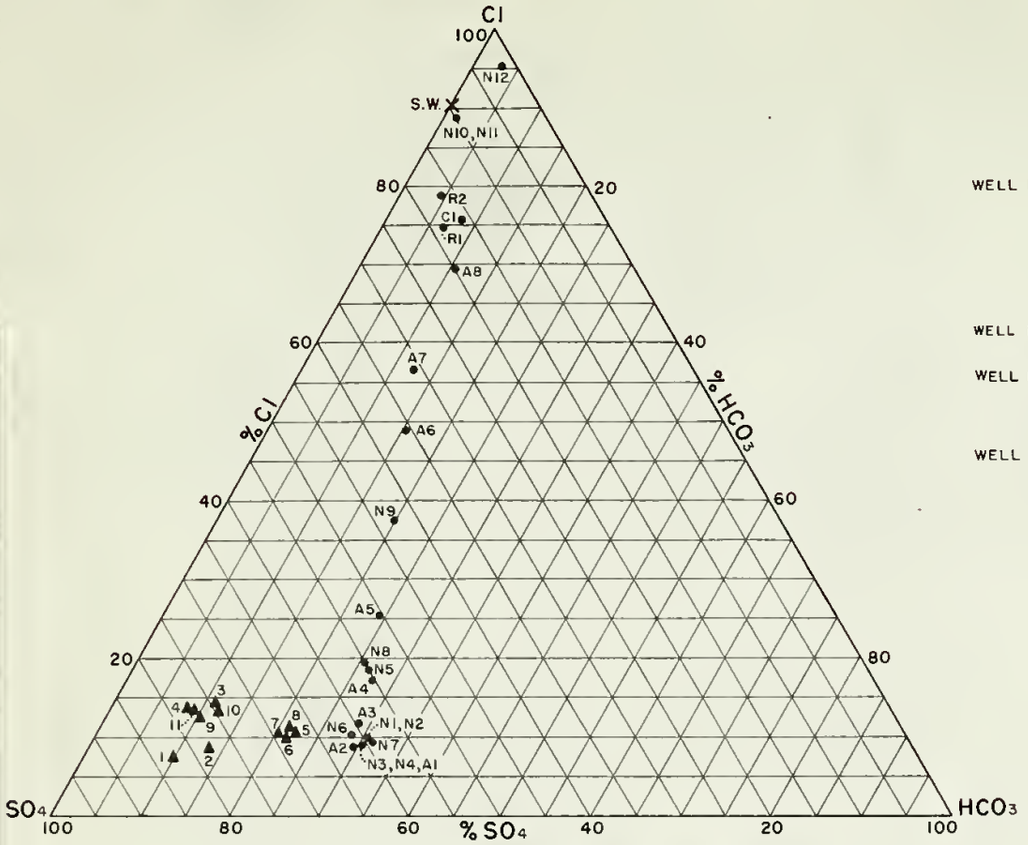


CHART A-CLASSIFICATION OF ANION CONSTITUENTS

	POINT NUMBER	DATE SAMPLED
CHART A		
WELL 1N/22W-29A2	A1	3-31-47
	A2	5-5-49
	A3	5-25-51
	A4	7-25-51
	A5	9-4-51
	A6	11-27-51
	A7	3-28-52
	A8	6-6-52
WELL 1N/22W-29C1	C1	9-2-52
WELL 1N/22W-20R1	R1	9-2-52
	R2	12-2-52
WELL 1N/22W-20N1	N1	4-3-31
	N2	9-4-31
	N3	6-3-32
	N4	3-3-33
	N5	7-21-36
	N6	12-20-39
	N7	9-27-45
	N8	4-30-48
	N9	7-16-48
	N10	10-7-49
	N11	10-8-49
	N12	3-23-50

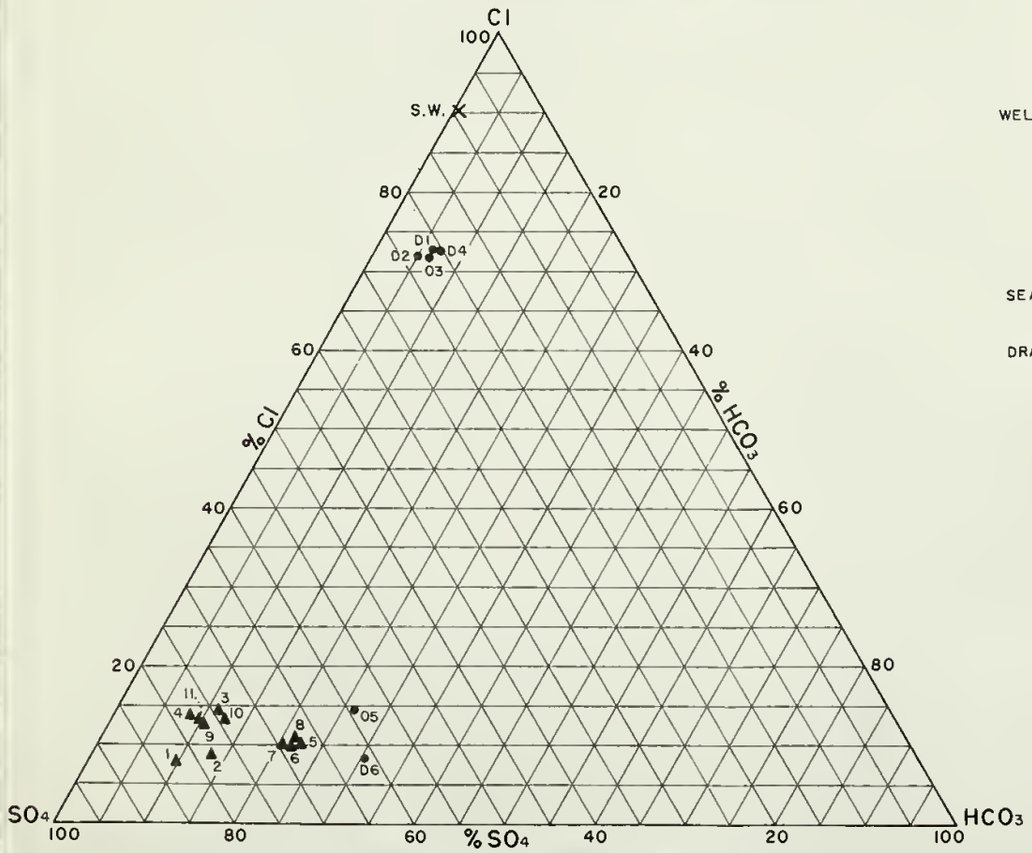


CHART B-CLASSIFICATION OF ANION CONSTITUENTS

	POINT NUMBER	DATE SAMPLED	
CHART B			
WELL 1N/22W-28D1	D1	6-5-31	
	D2	6-9-31	
	D3	6-26-31	(Low Tide)
	D4	6-26-31	(High Tide)
	D5	6-3-32	
	D6	3-3-33	
CHARTS A AND B			
SEA WATER	S.W.	5-1-52	

DRAINAGE DITCHES		LOCATION
	1	6-4-52 1N/22W-7J
	2	1-14-53 1N/22W-7J
	3	1-14-53 1N/22W-18A
	4	8-4-52 1N/22W-18B
	5	8-4-52 1N/22W-21B
	6	6-6-52 1N/22W-21F
	7	1-14-53 1N/22W-21F
	8	8-4-52 1N/22W-21D
	9	6-6-52 1N/22W-27C
	10	8-4-52 1N/22W-27C
	11	1-14-53 1N/22W-27C

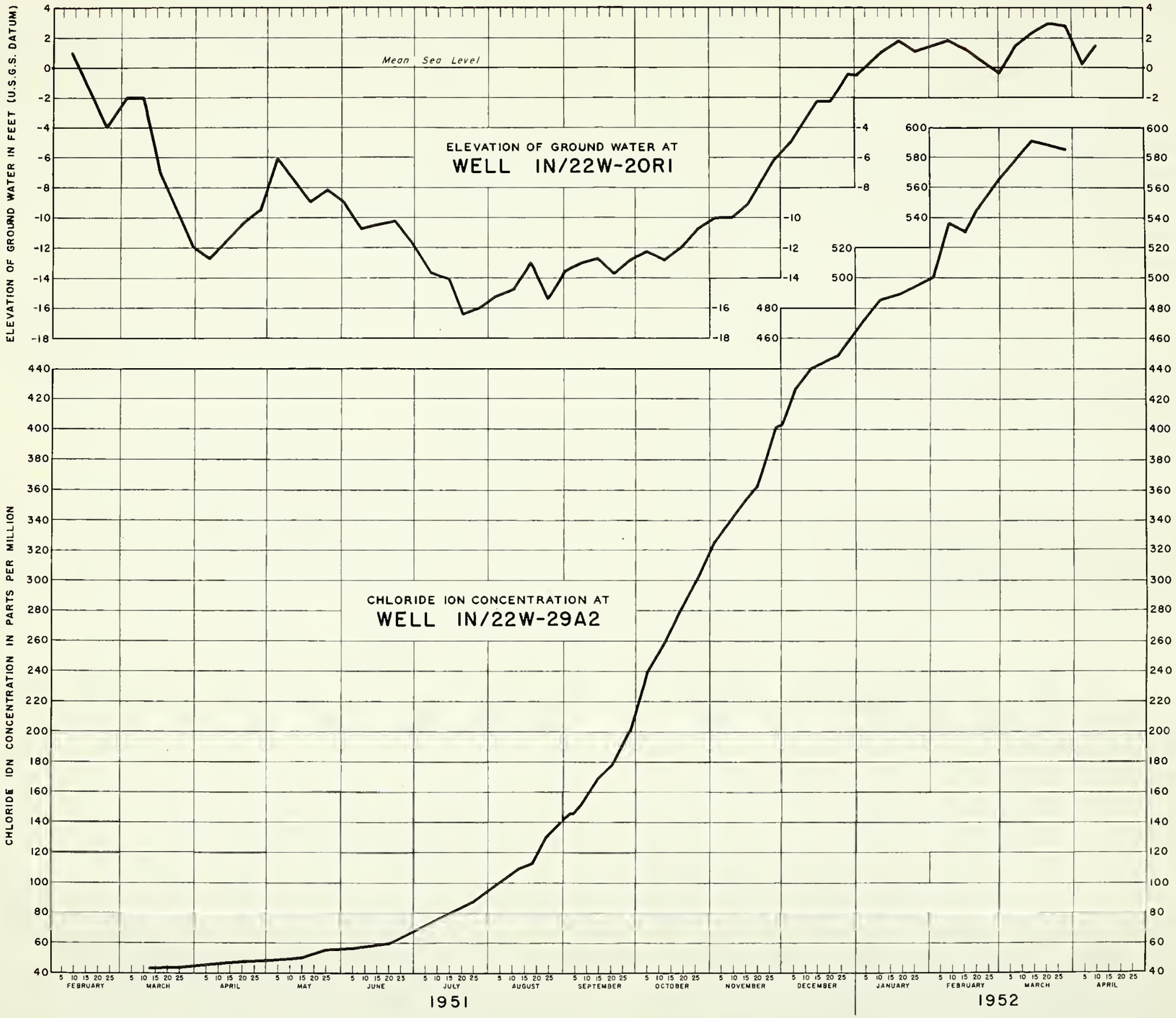
LEGEND

- ● WELLS
- ▲ GROUND WATER DRAINAGE
- ✕ SEA WATER

NOTE—SEE PLATE 11 FOR WELL LOCATIONS.
SEE PLATE 7 FOR GROUND WATER DRAINAGE SAMPLING POINTS

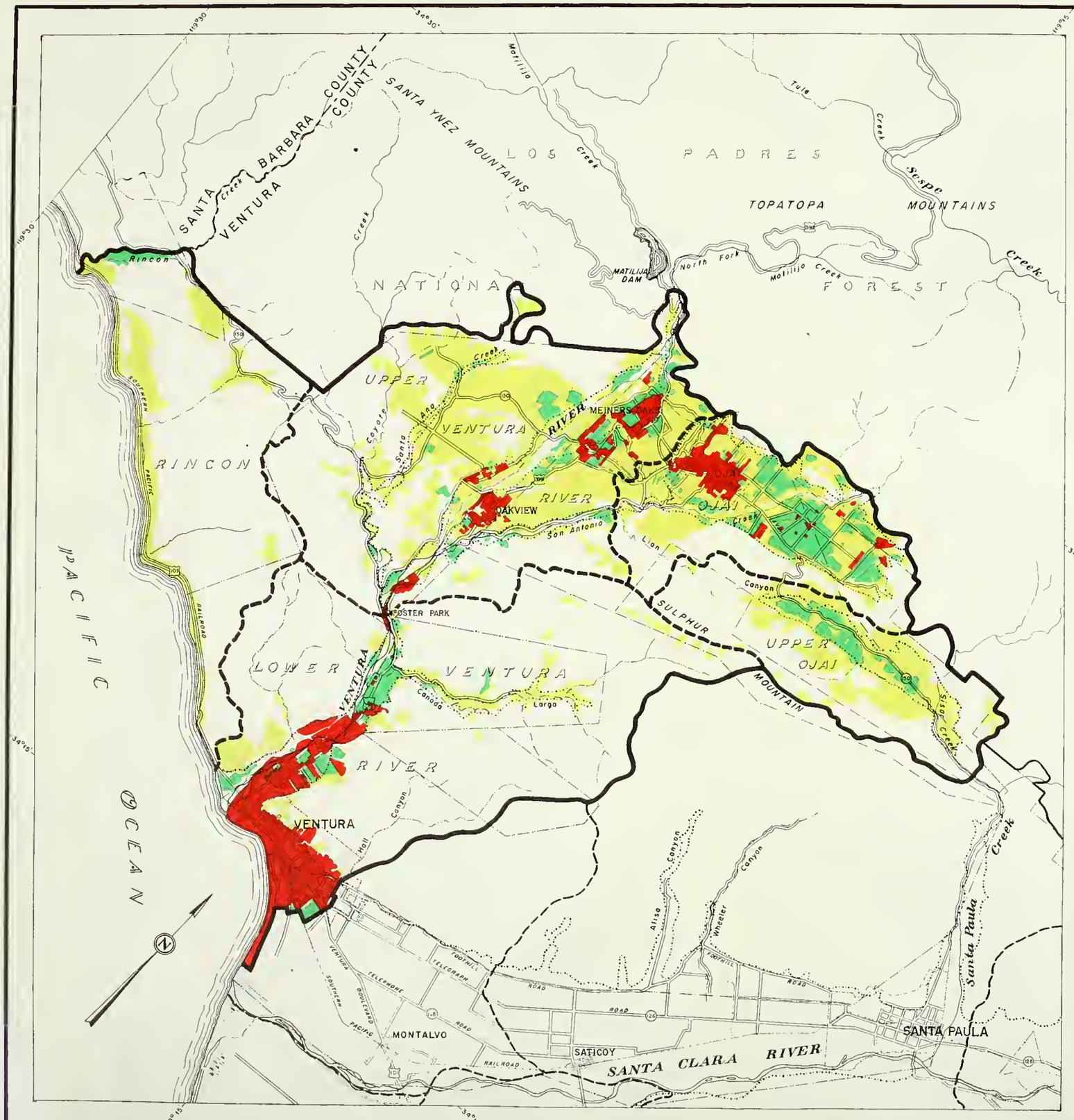
MINERAL CHARACTER OF GROUND WATERS

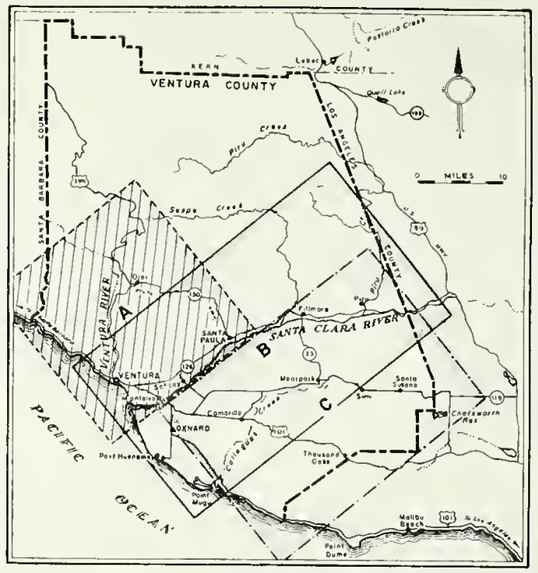
IN VICINITY OF PORT HUENEME AND POINT MUGU



ELEVATION OF GROUND WATER AND CHLORIDE ION CONCENTRATION

DIVISION OF WATER RESOURCES





KEY MAP

LEGEND

- HYOROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- OJAI — NAME OF SUBUNIT
- IRRIGATED LANDS
- IRRIGABLE AND HABITABLE LANDS
- URBAN AREAS

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

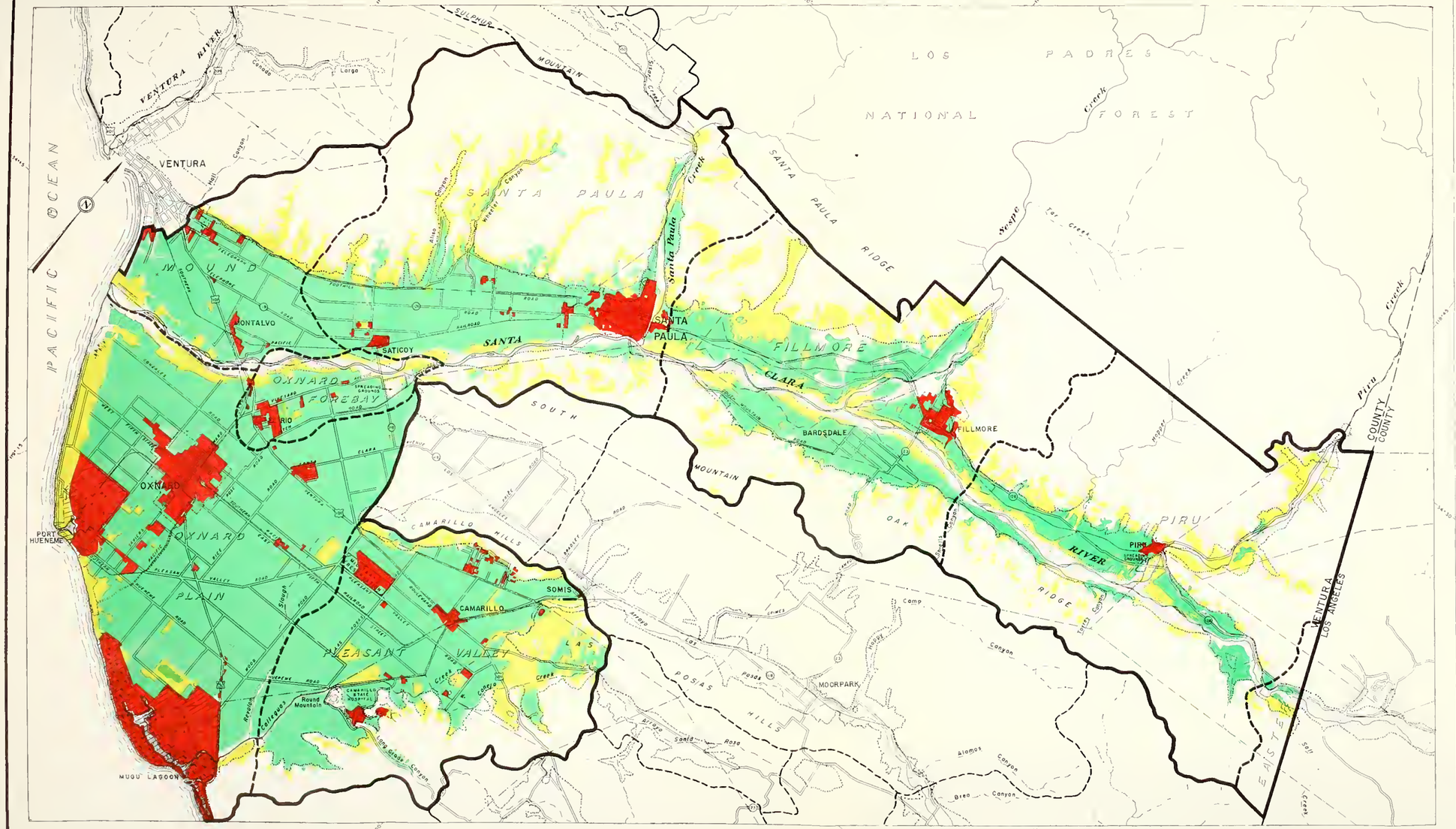
VENTURA HYDROLOGIC UNIT

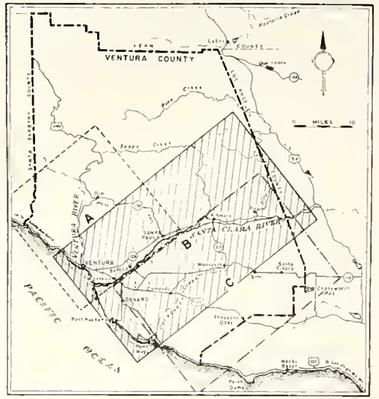
PRESENT AND PROBABLE ULTIMATE LAND USE

1950

Scale of miles

0 1 2 3





KEY MAP

LEGEND

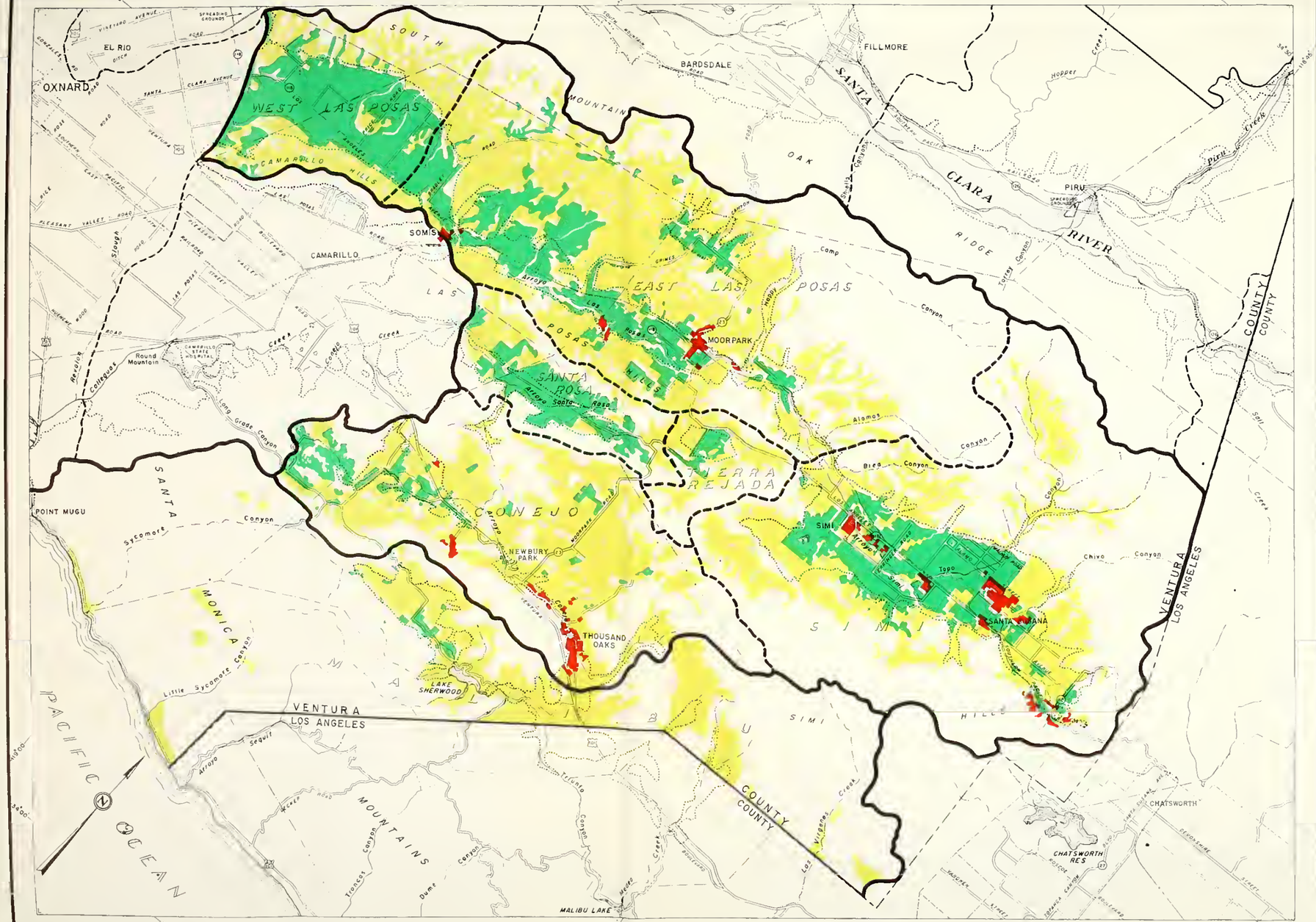
- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- PIRU — NAME OF SUBUNIT
- IRRIGATED LANDS
- IRRIGABLE AND HABITABLE LANDS
- URBAN AREAS

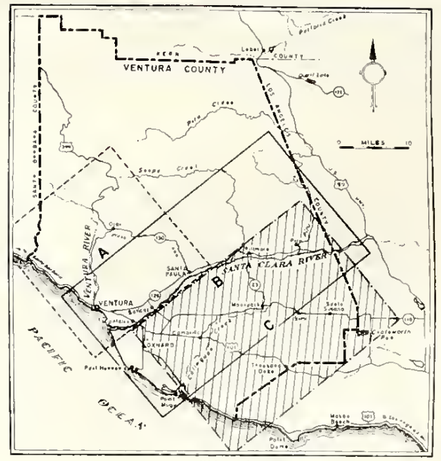
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION
SANTA CLARA RIVER HYDROLOGIC UNIT

PRESENT AND PROBABLE ULTIMATE LAND US

1950

Scale of miles





KEY MAP

LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- SIMI — NAME OF SUBUNIT
- IRRIGATED LANDS
- IRRIGABLE AND HABITABLE LANDS
- URBAN AREAS

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

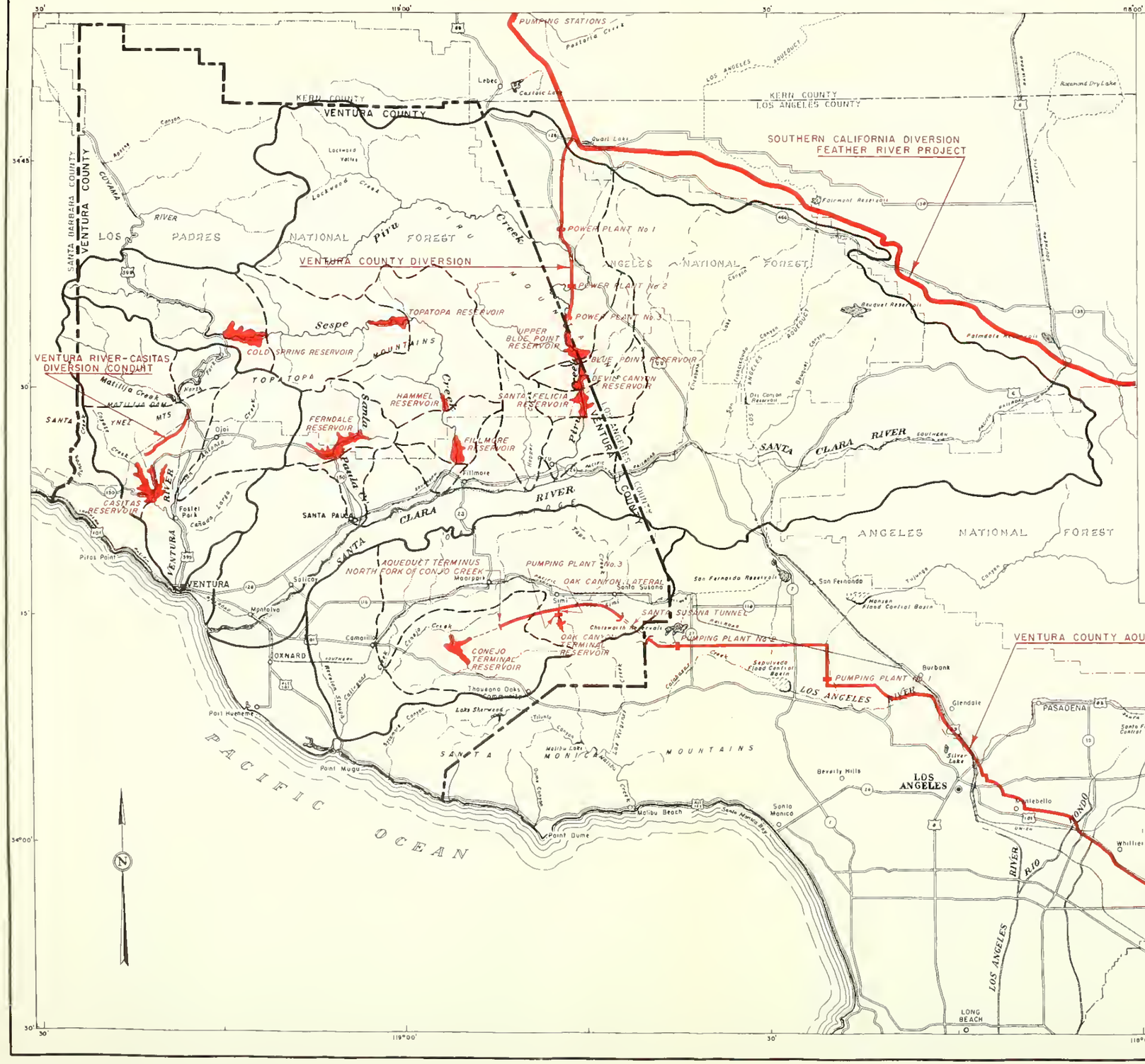
VENTURA COUNTY INVESTIGATION

CALLEGUAS-CONEJO AND MALIBU HYDROLOGIC UNITS

PRESENT AND PROBABLE ULTIMATE LAND USE

1950

Scale of miles



LEGEND

- PRINCIPAL DRAINAGE AREA BOUNDARY
- SECONDARY DRAINAGE AREA BOUNDARY
- POTENTIAL LOCAL WATER STORAGE DEVELOPMENTS AND CONVEYANCE UNITS FOR IMPORTATION OF WATER TO VENTURA COUNTY

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

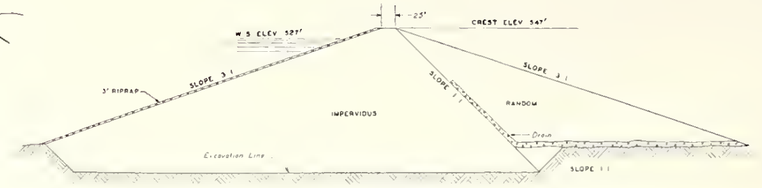
VENTURA COUNTY INVESTIGATION

POTENTIAL LOCAL WATER STORAGE DEVELOPMENTS AND CONVEYANCE UNITS FOR IMPORTATION OF WATER TO VENTURA COUNTY

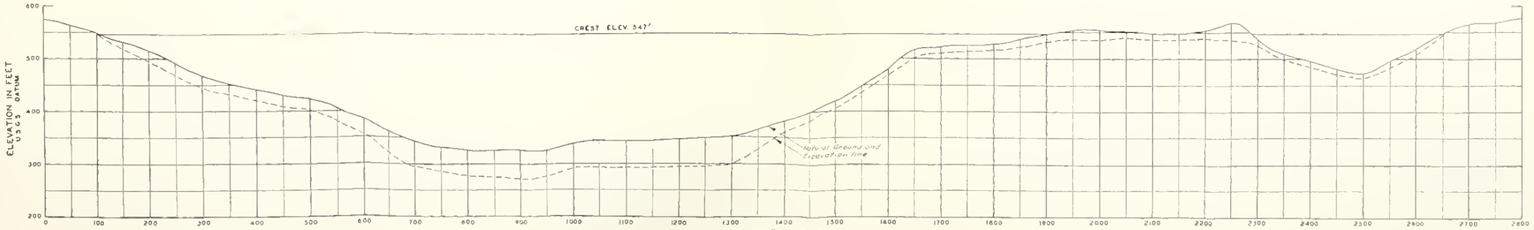
1953

MILES
0 1 2 4 6 8 10

GENERAL PLAN
SCALE OF FEET
0 100 200



SECTION OF DAM
SCALE OF FEET
0 100 200

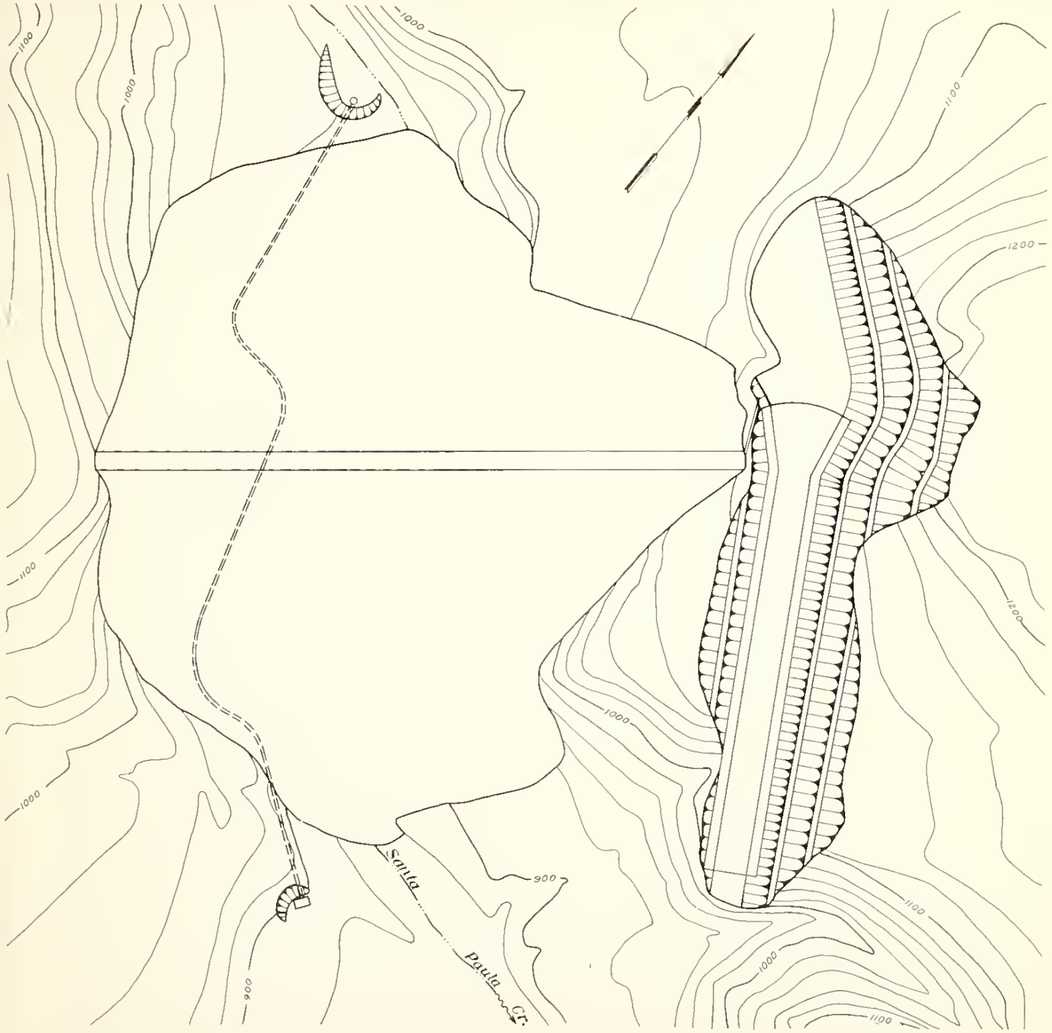


PROFILE OF DAM
LOOKING UPSTREAM

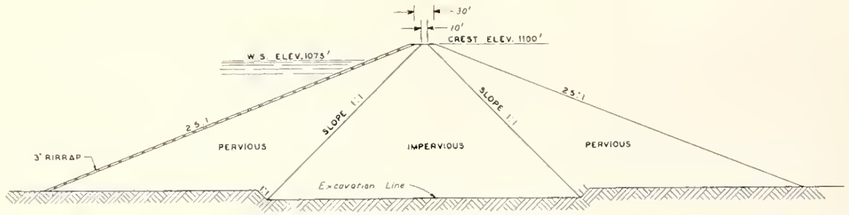
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

CASITAS DAM
ON
COYOTE CREEK

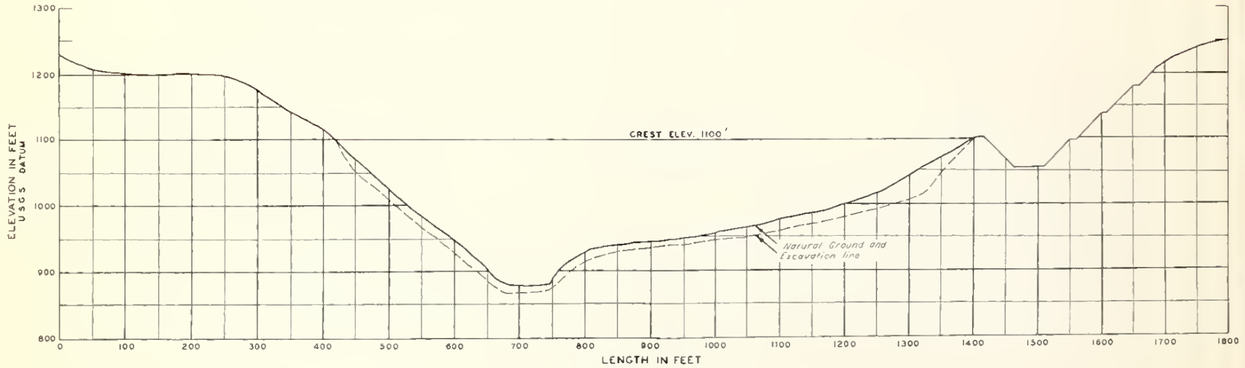
RESERVOIR STORAGE CAPACITY OF 130,000 ACRE-FEET



GENERAL PLAN
SCALE OF FEET
0 100 200



SECTION OF DAM
SCALE OF FEET
0 100 200

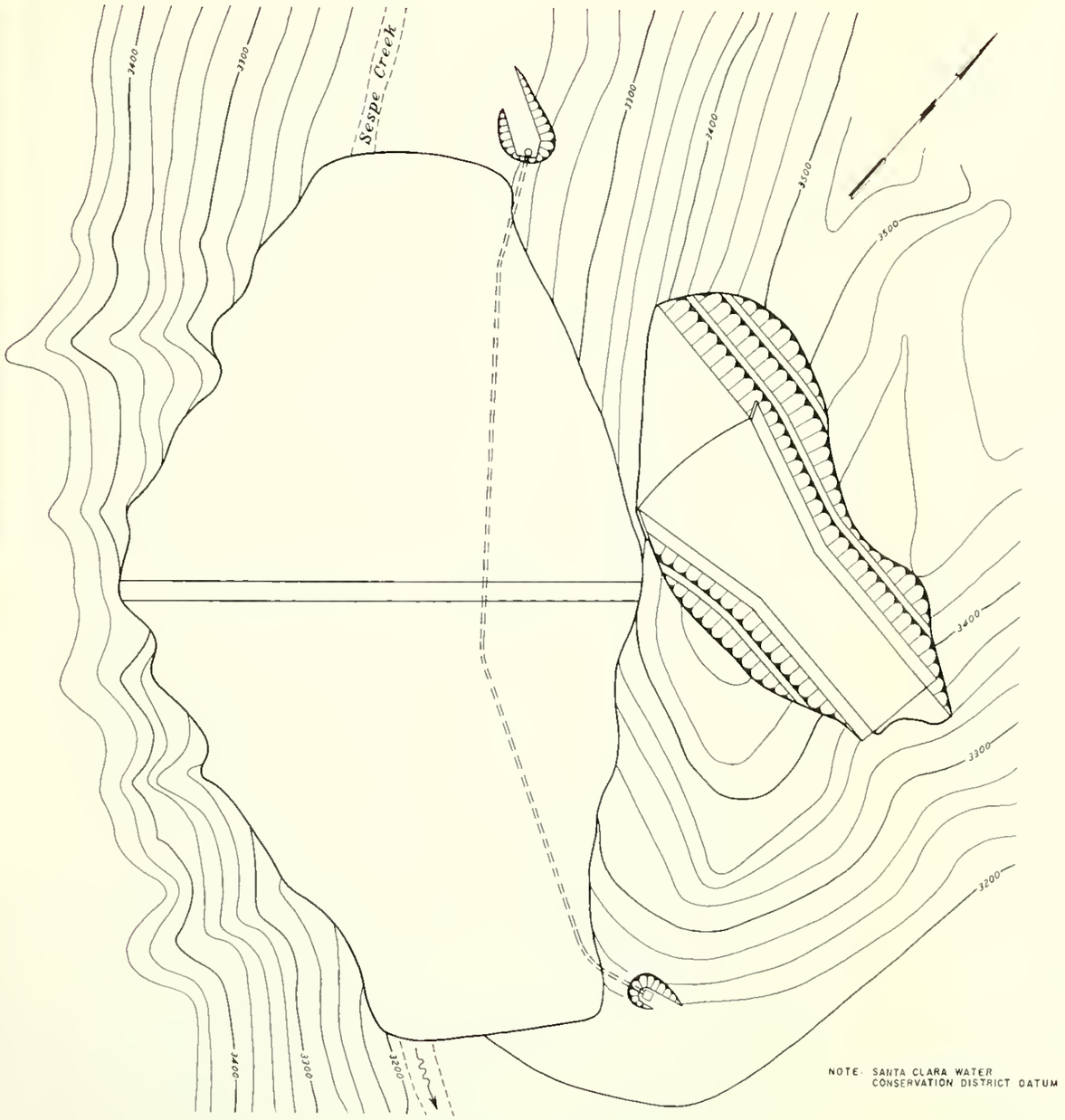


PROFILE OF DAM
LOOKING UPSTREAM

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

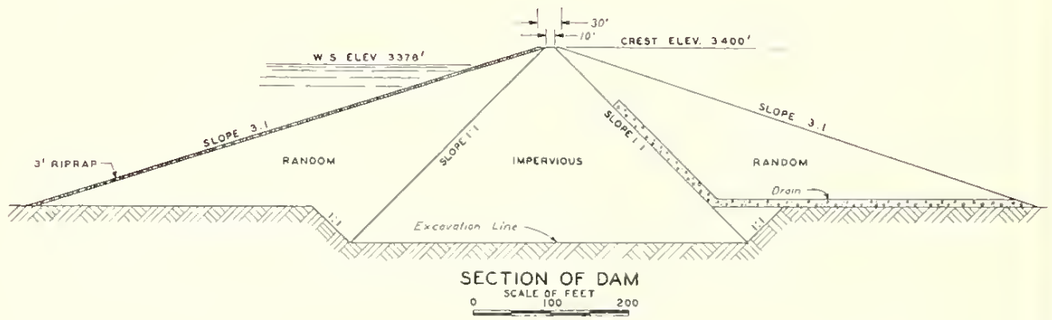
FERNDALE DAM
ON
SANTA PAULA CREEK

RESERVOIR STORAGE CAPACITY OF 12,000 ACRE-FEET

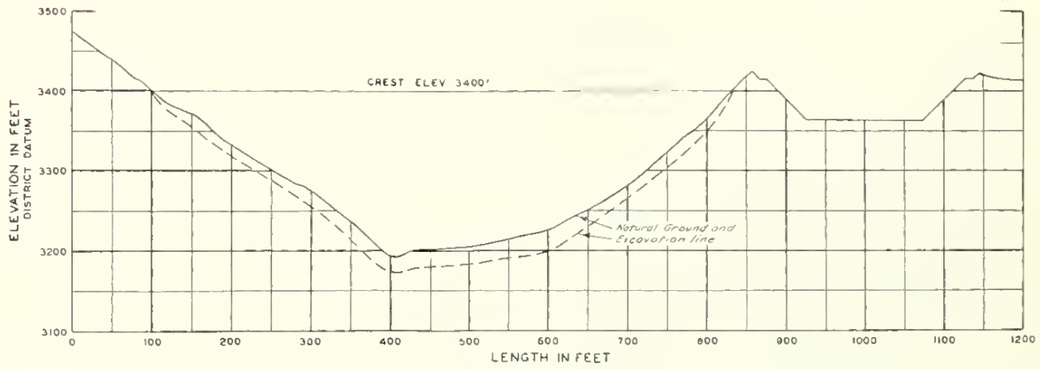


NOTE: SANTA CLARA WATER CONSERVATION DISTRICT DATUM

GENERAL PLAN
SCALE OF FEET
0 100 200



SECTION OF DAM
SCALE OF FEET
0 100 200

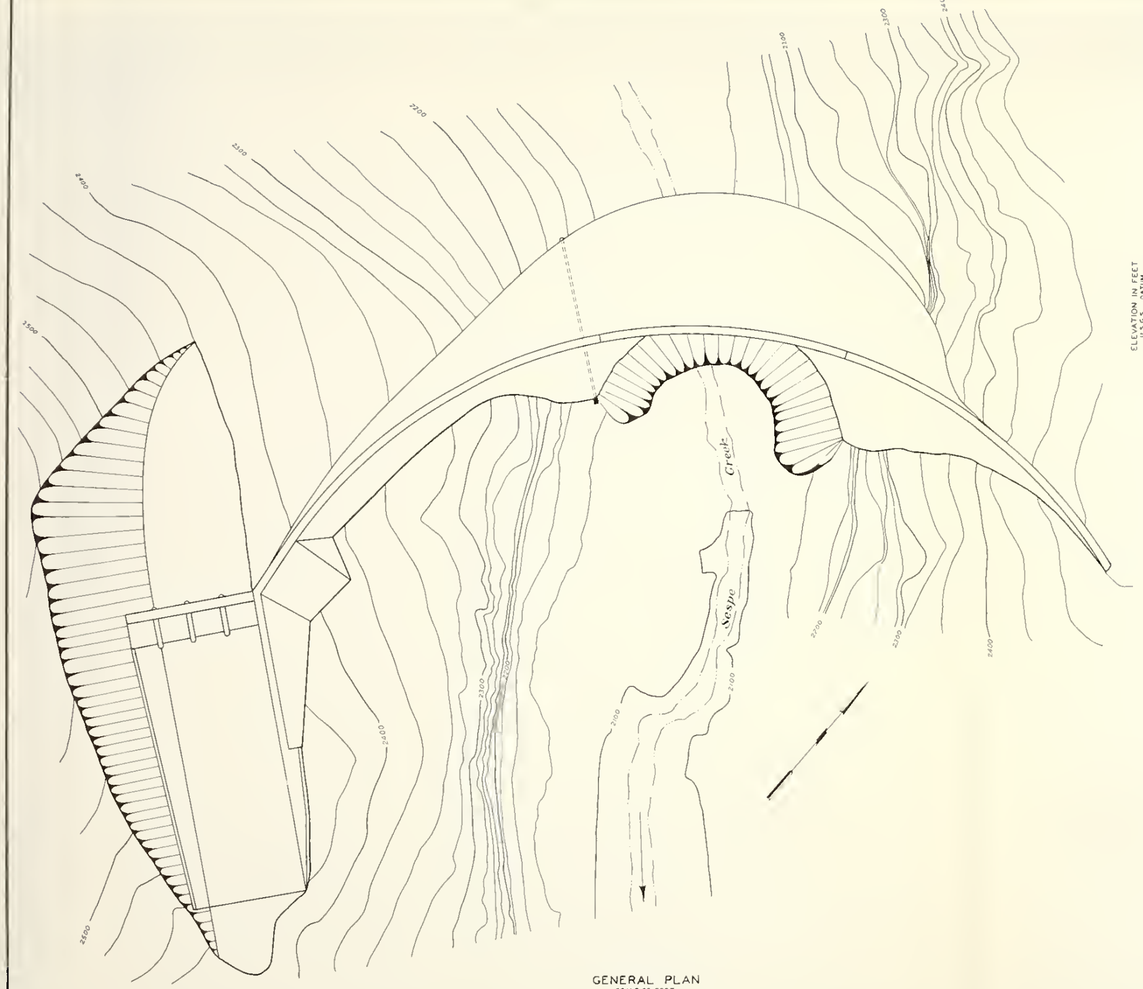


PROFILE OF DAM
LOOKING UPSTREAM

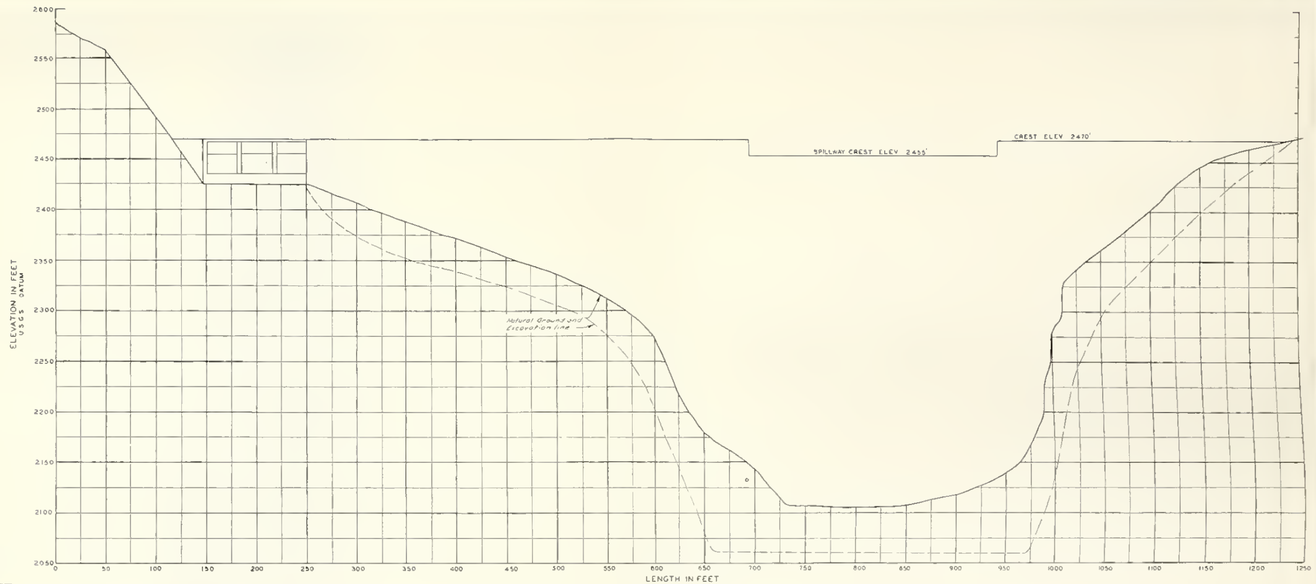
[redacted]
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

COLD SPRING DAM
ON
SESPE CREEK

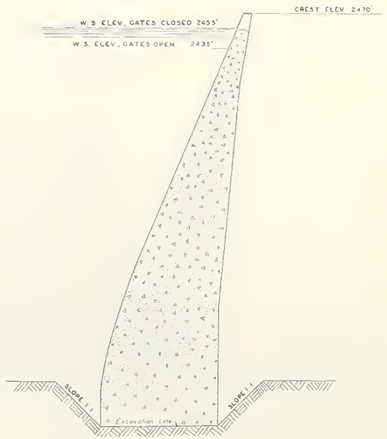
RESERVOIR STORAGE CAPACITY OF 35,000 ACRE-FEET



GENERAL PLAN
SCALE OF FEET
0 50 100



PROFILE OF DAM
LOOKING UPSTREAM

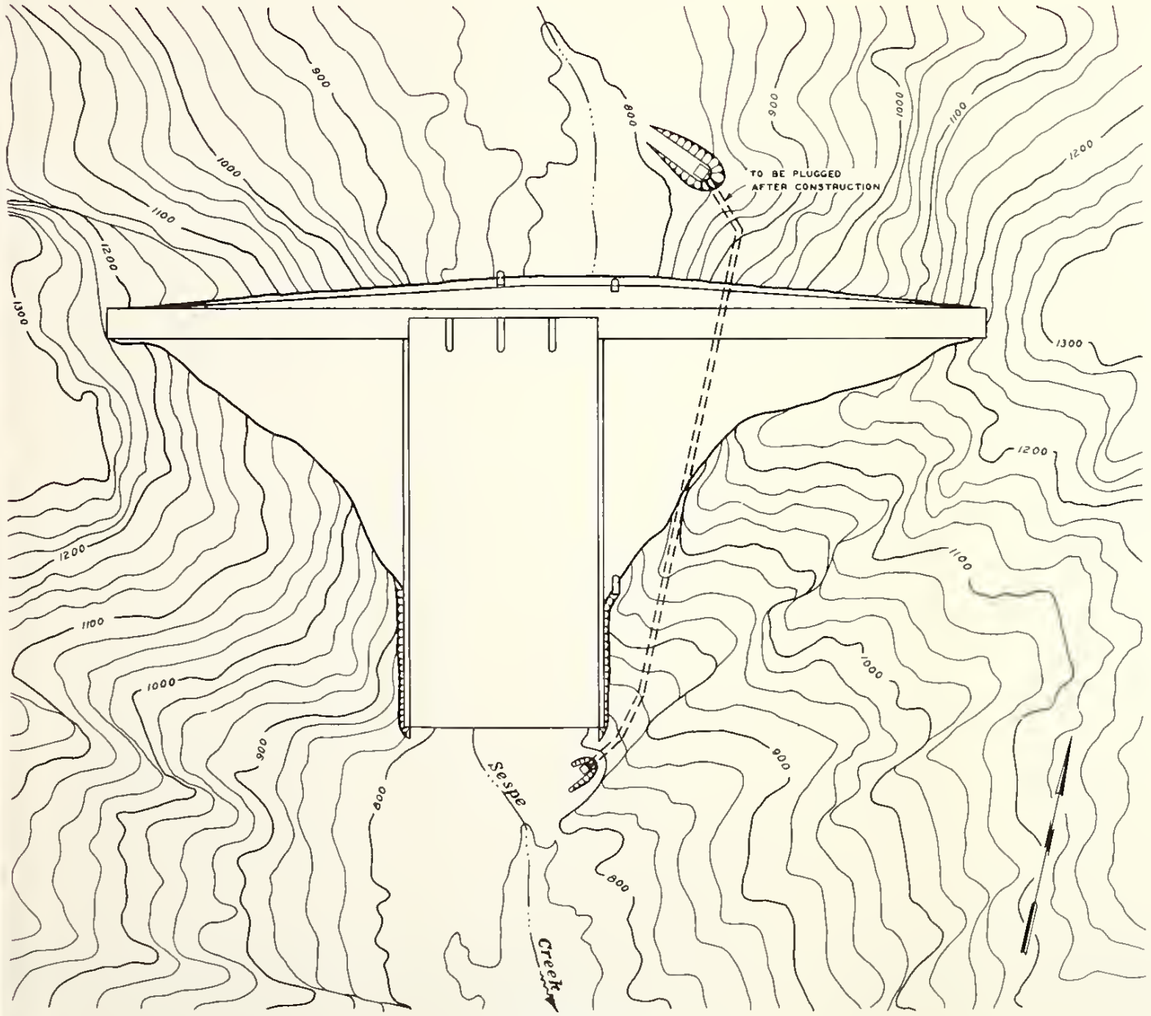


SECTION OF DAM
SCALE OF FEET
0 50 100

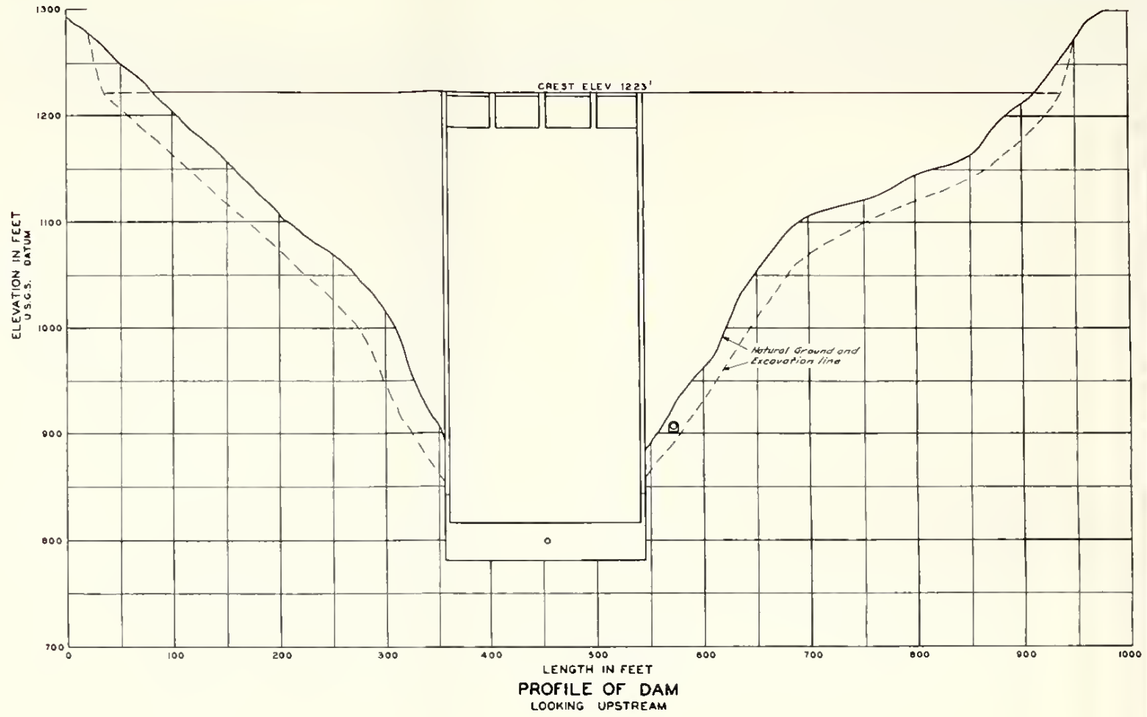
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

TOPATOPA DAM
ON
SESPE CREEK

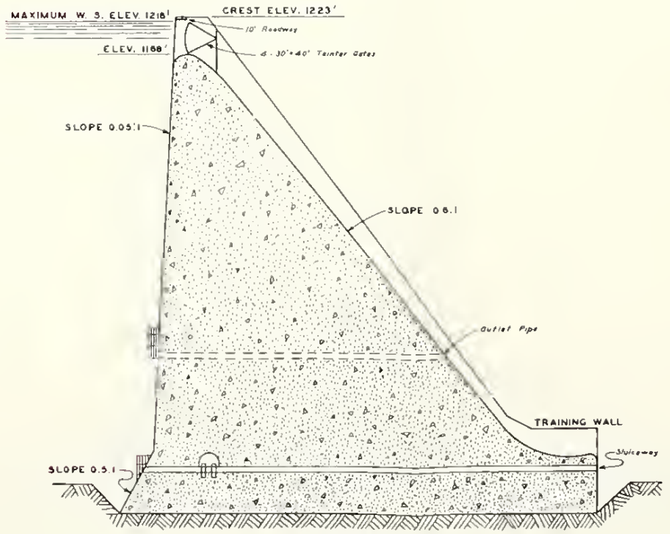
RESERVOIR STORAGE CAPACITY OF 100,000 ACRE-FEET



GENERAL PLAN
SCALE OF FEET
0 100 200



PROFILE OF DAM
LOOKING UPSTREAM



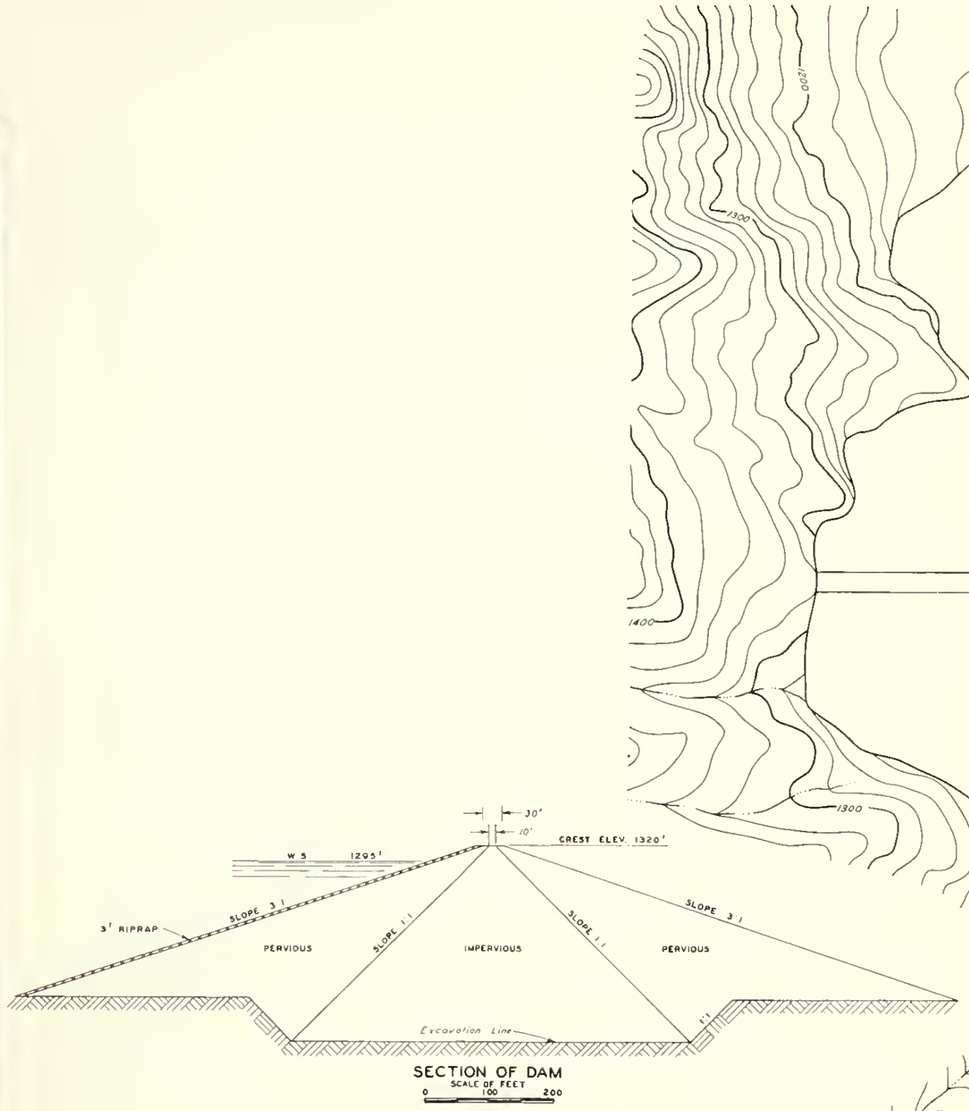
SECTION OF DAM
SCALE OF FEET
0 100 200

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

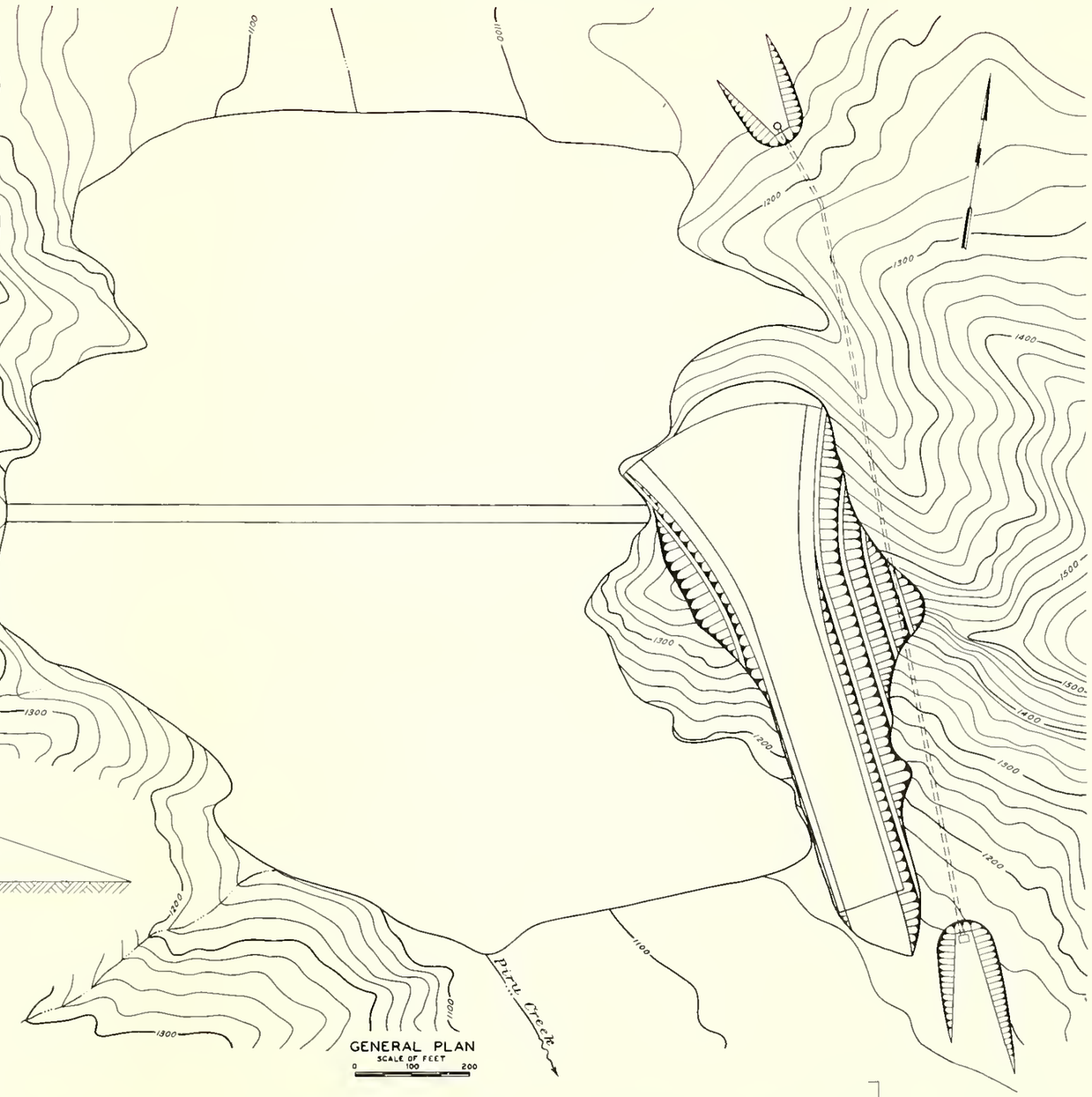
VENTURA COUNTY INVESTIGATION

HAMMEL DAM
ON
SESPE CREEK

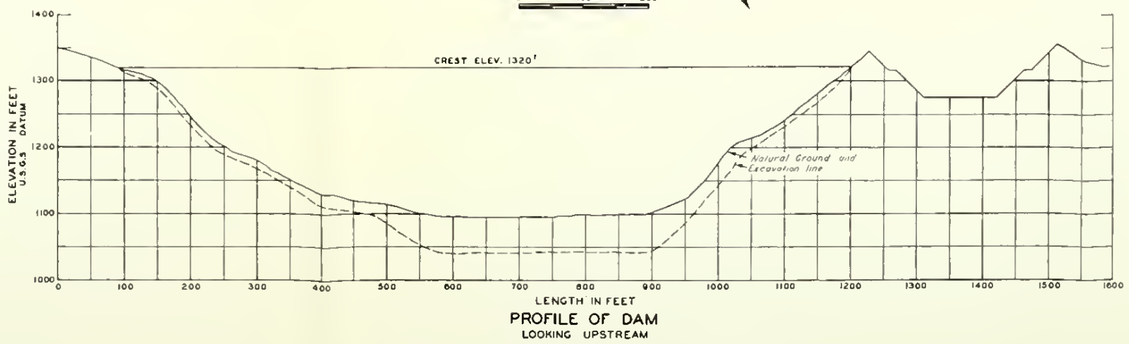
RESERVOIR STORAGE CAPACITY OF 50,000 ACRE-FEET



SECTION OF DAM
SCALE OF FEET
0 100 200



GENERAL PLAN
SCALE OF FEET
0 100 200

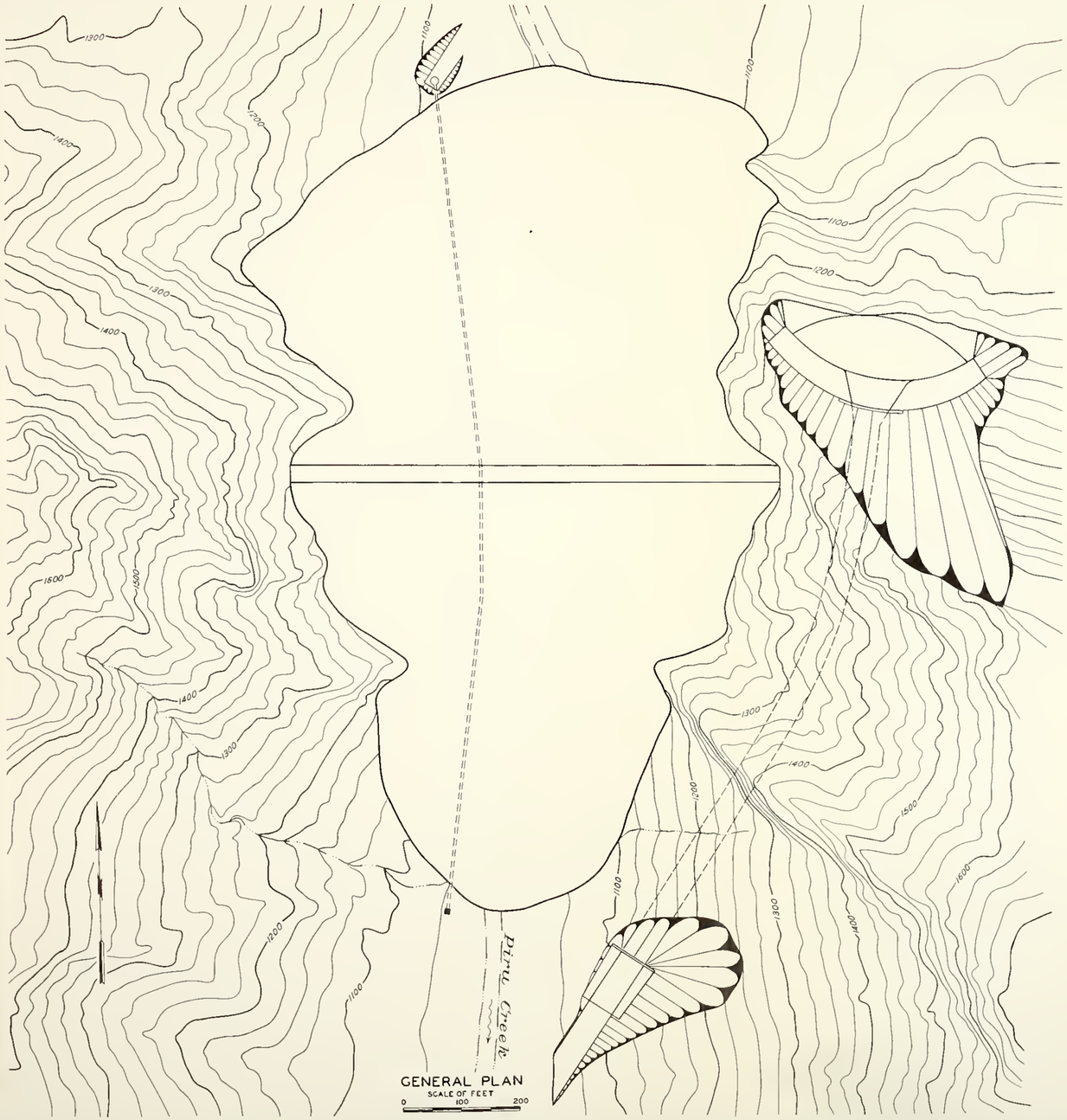


PROFILE OF DAM
LOOKING UPSTREAM

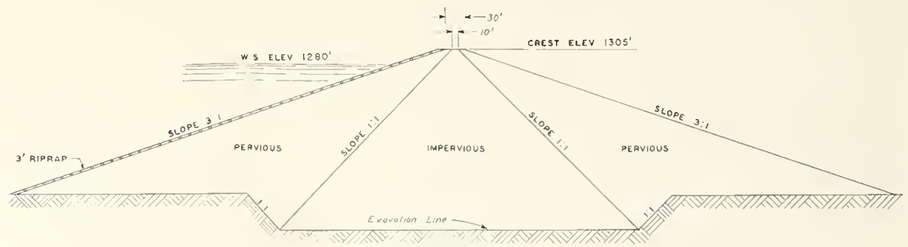
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

UPPER BLUE POINT DAM
ON
PIRU CREEK

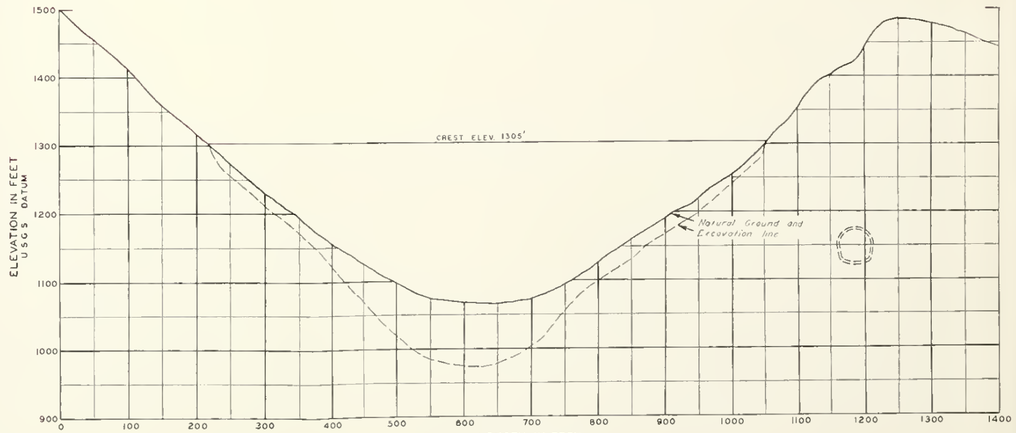
RESERVOIR STORAGE CAPACITY OF 50,000 ACRE-FEET



GENERAL PLAN
SCALE OF FEET
0 100 200

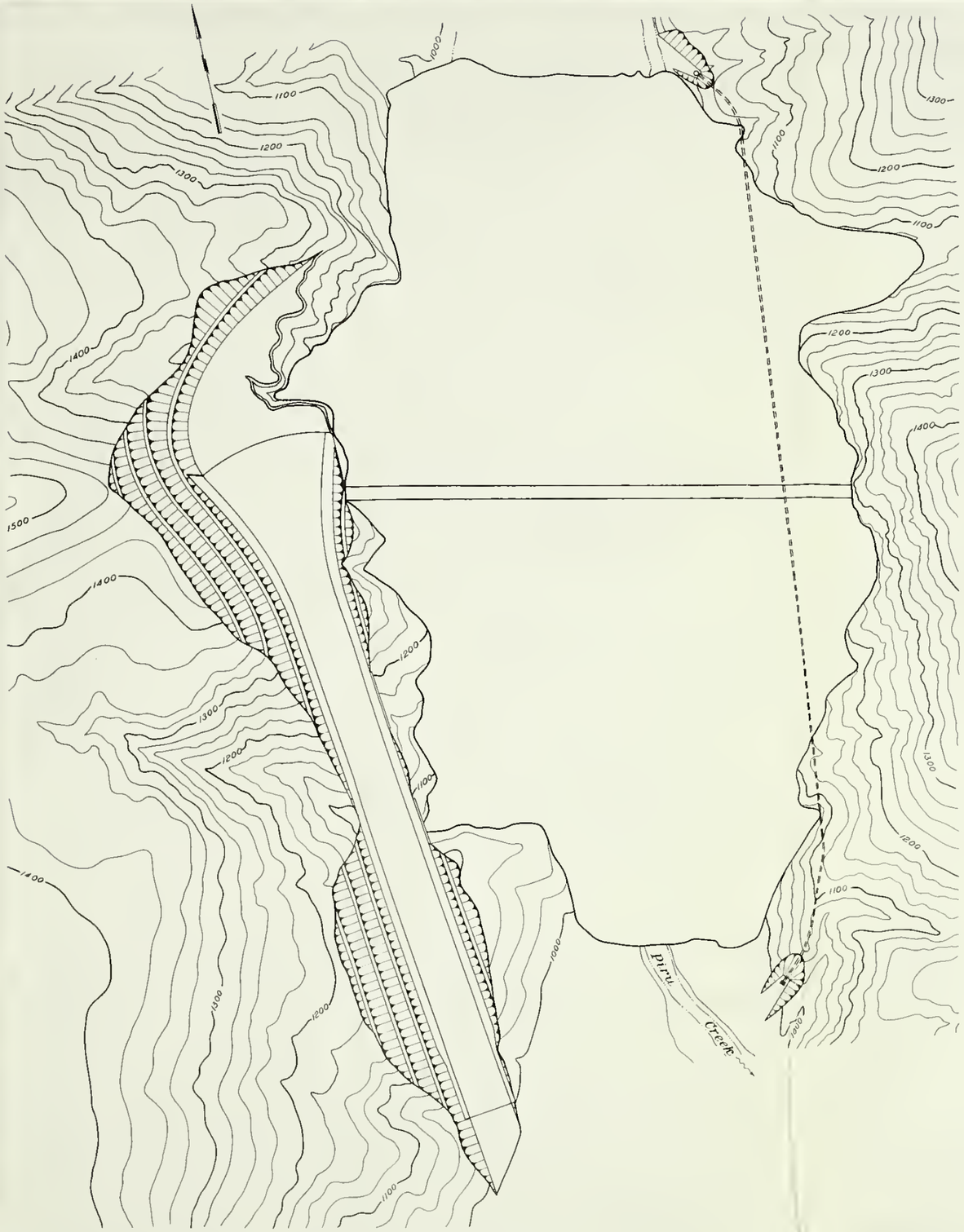


SECTION OF DAM
SCALE OF FEET
0 100 200

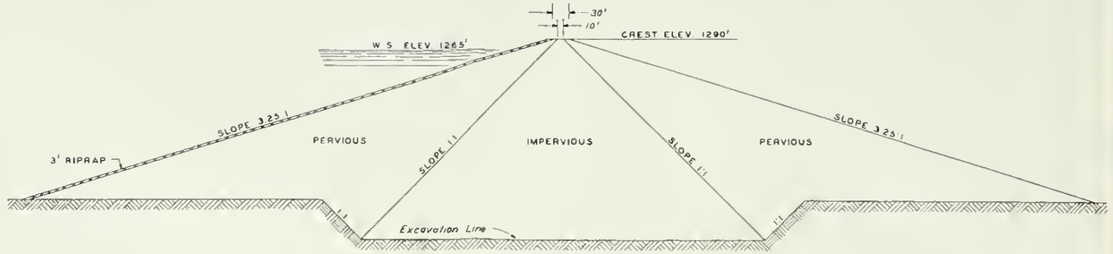


PROFILE OF DAM
LOOKING UPSTREAM

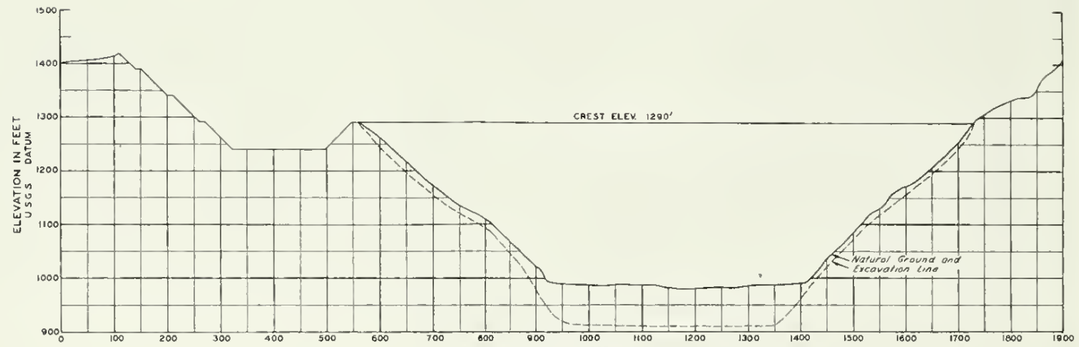
BLUE POINT DAM
ON
PIRU CREEK
RESERVOIR STORAGE CAPACITY OF 50,000 ACRE-FEET



GENERAL PLAN
SCALE OF FEET
0 100 200



SECTION OF DAM
SCALE OF FEET
0 100 200



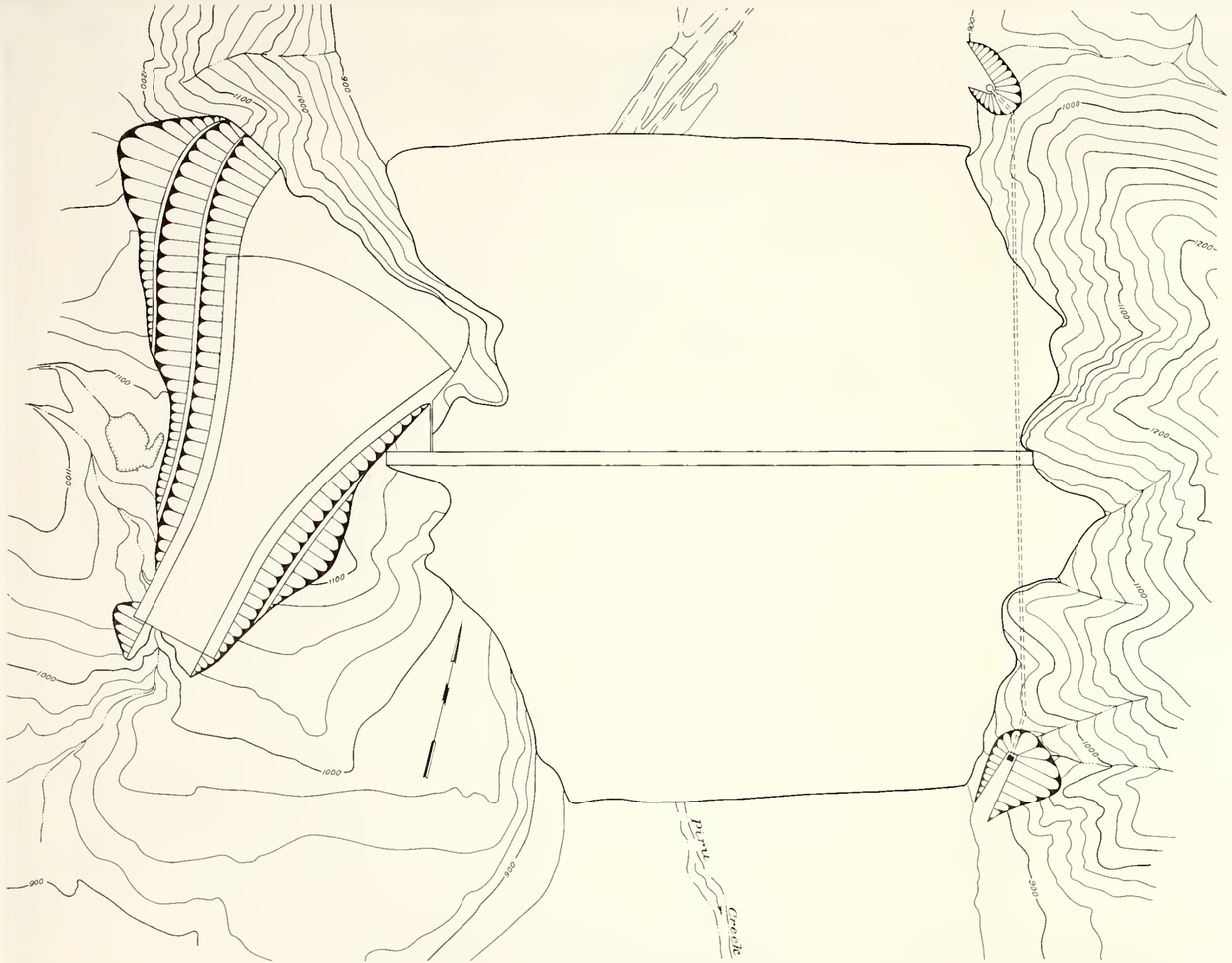
PROFILE OF DAM
LOOKING UPSTREAM

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

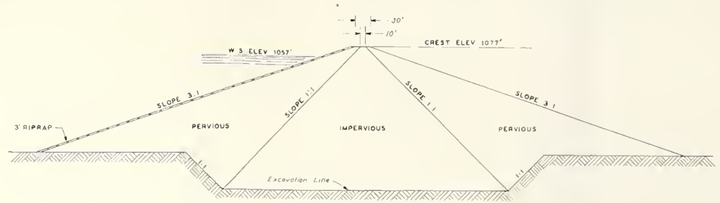
VENTURA COUNTY INVESTIGATION

DEVIL CANYON DAM
ON
PIRU CREEK

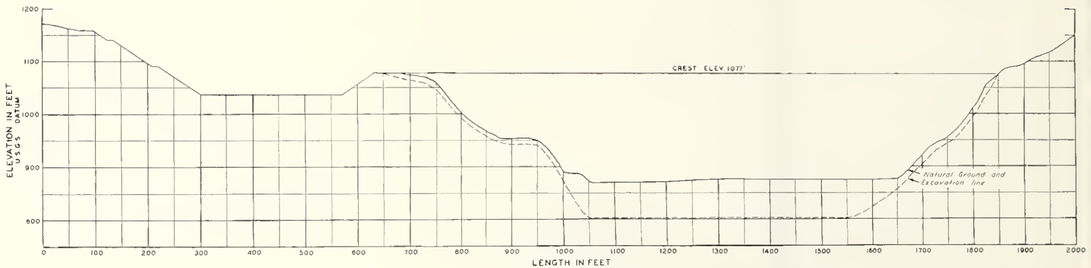
RESERVOIR STORAGE CAPACITY OF 150,000 ACRE-FEET



GENERAL PLAN
SCALE OF FEET
0 100 200



SECTION OF DAM
SCALE OF FEET
0 100 200



PROFILE OF DAM
LOOKING UPSTREAM

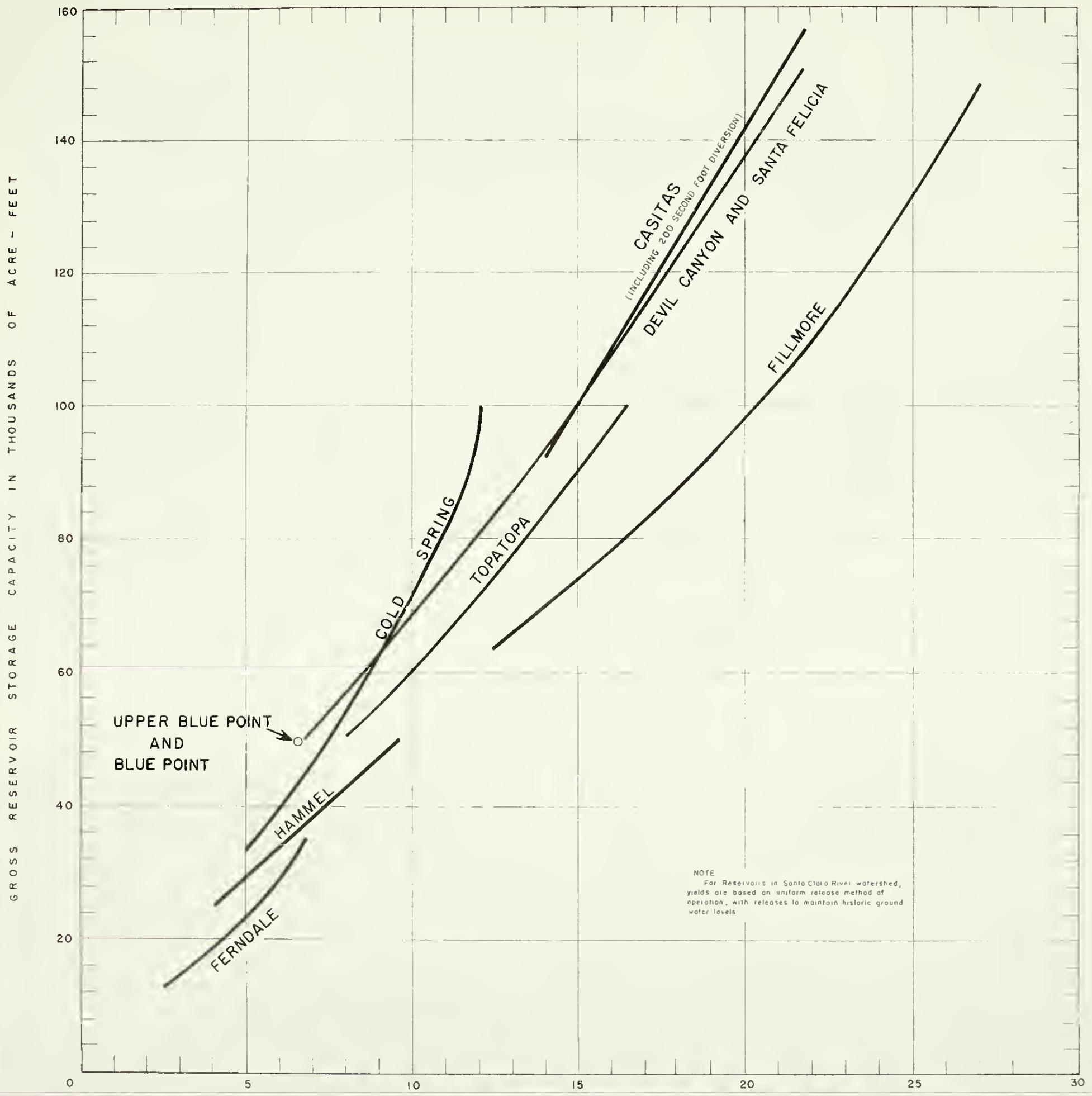
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

SANTA FELICIA DAM
ON
PIRU CREEK

RESERVOIR STORAGE CAPACITY OF 100,000 ACRE-FEET

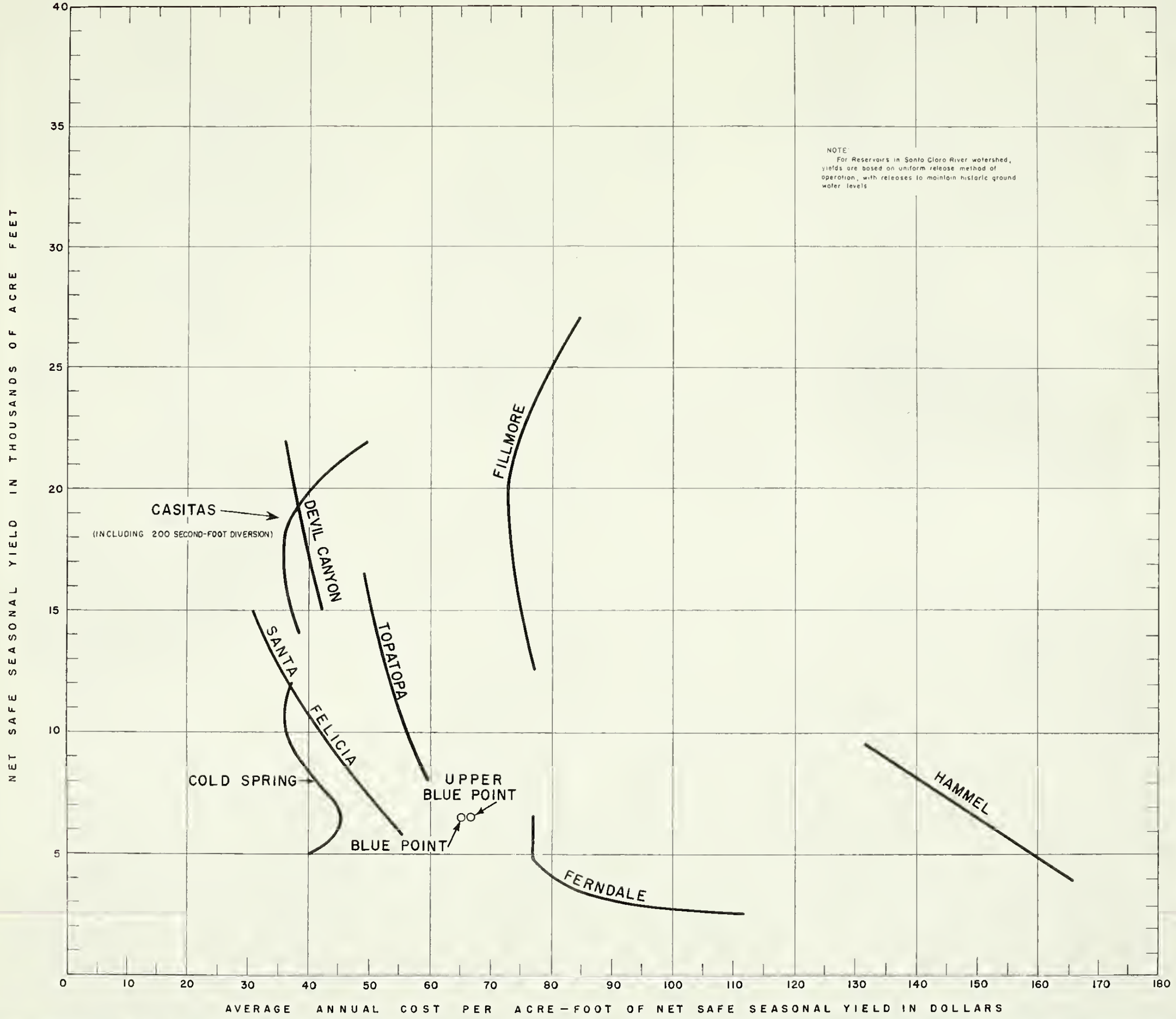
RELATIONSHIP BETWEEN STORAGE CAPACITY OF RESERVOIRS AND CAPITAL COST

DIVISION OF WATER RESOURCES



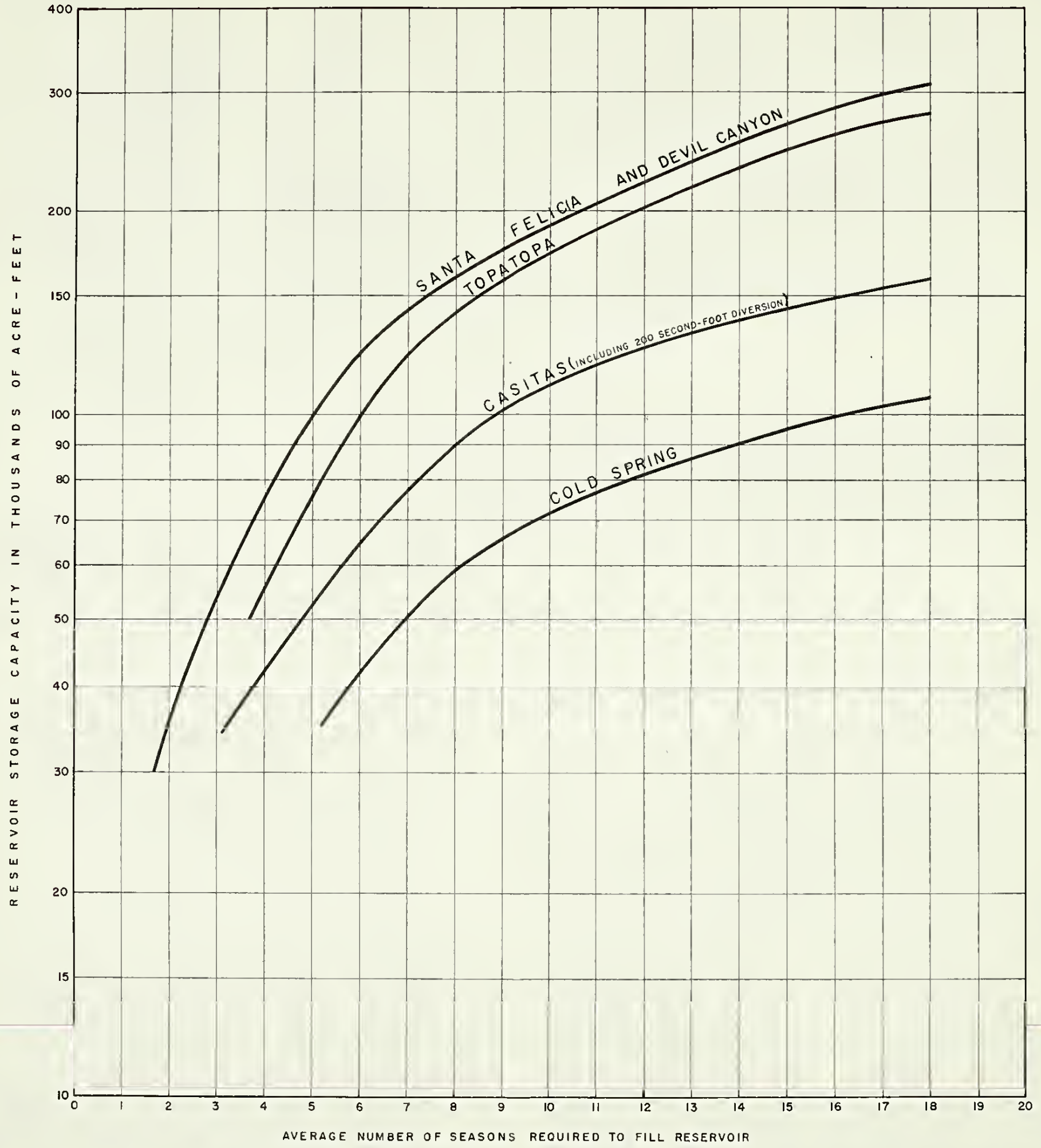
RELATIONSHIP BETWEEN STORAGE CAPACITY OF RESERVOIRS AND NET SAFE SEASONAL YIELD

DIVISION OF WATER RESOURCES

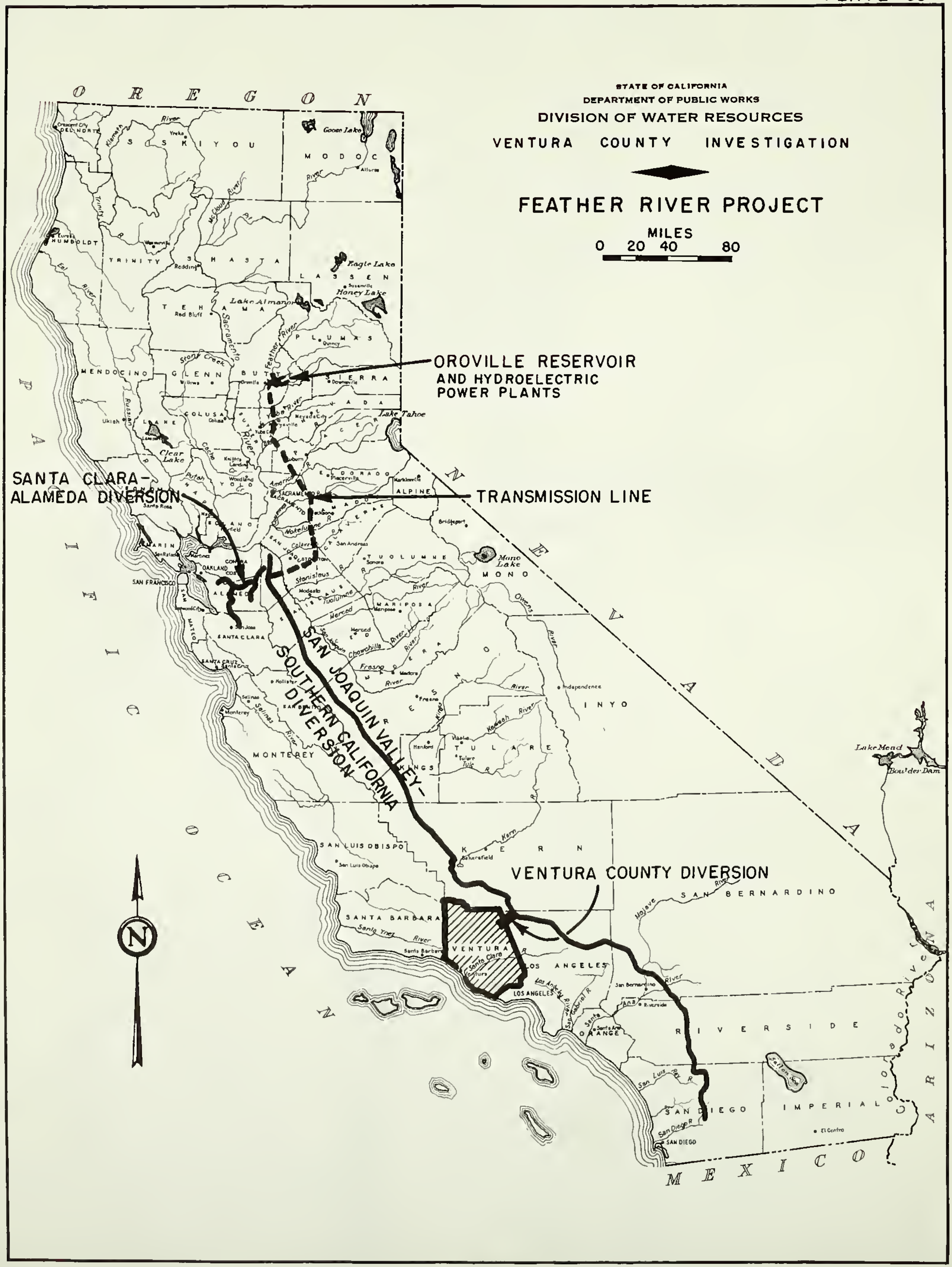


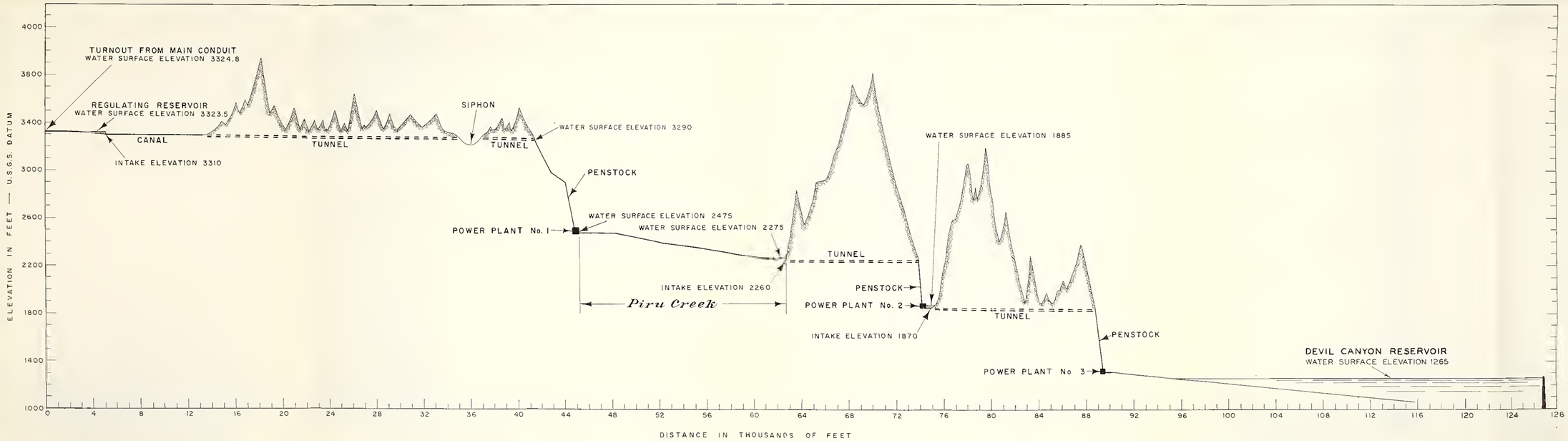
RELATIONSHIP BETWEEN NET SAFE SEASONAL YIELD OF RESERVOIRS AND ANNUAL UNIT COST

DIVISION OF WATER RESOURCES



PROBABLE TIME REQUIRED TO FILL RESERVOIRS AFTER CONSTRUCTION

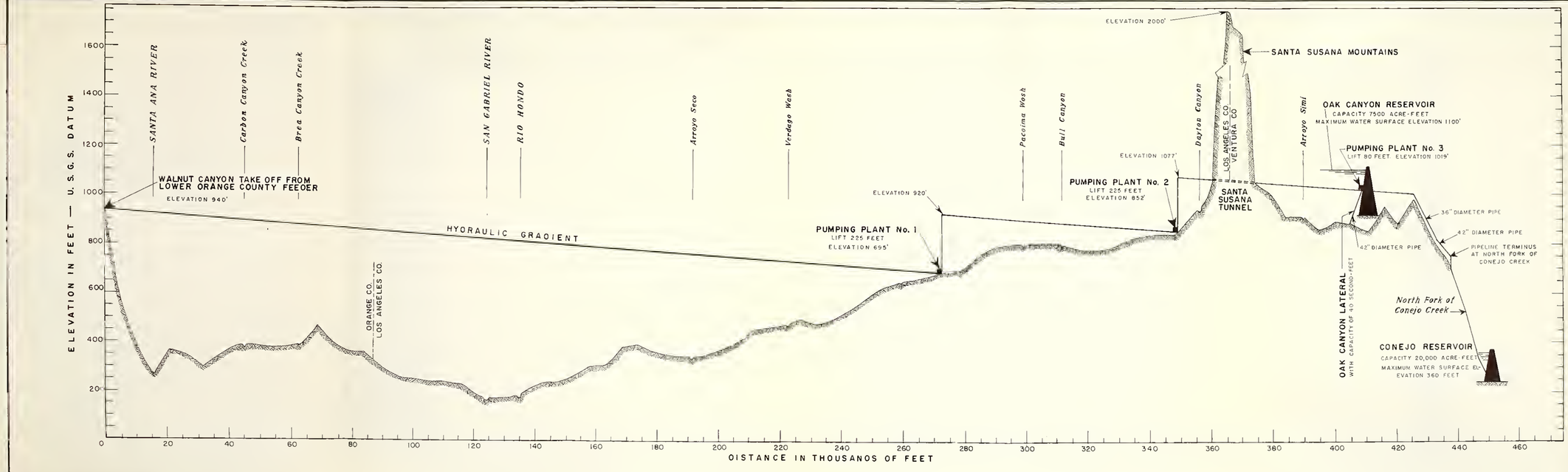

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION
FEATHER RIVER PROJECT
MILES
0 20 40 80
OREGON
PACIFIC OCEAN
NEVADA
ARIZONA
MEXICO
OROVILLE RESERVOIR
AND HYDROELECTRIC
POWER PLANTS
TRANSMISSION LINE
SANTA CLARA-
ALAMEDA DIVERSION
SAN JOAQUIN VALLEY-
SOUTHERN CALIFORNIA
DIVERSION
VENTURA COUNTY DIVERSION
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
GLENN
BUTTE
SIERRA
MENDOCINO
COLUSA
LAKE
YOLO
ALPINE
MONO
TUOLUMNE
MARIPOSA
SANTA CLARA
MONTEREY
INYO
TULARE
KERN
SAN LUIS OBISPO
SANTA BARBARA
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE
SAN DIEGO
IMPERIAL
Goose Lake
Eagle Lake
Honey Lake
Lake Almanor
Clear Lake
Lake Tahoe
Mono Lake
Lake Mead
Boulder Dam
SAN FRANCISCO
OAKLAND
SACRAMENTO
LOS ANGELES
SAN DIEGO
N



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

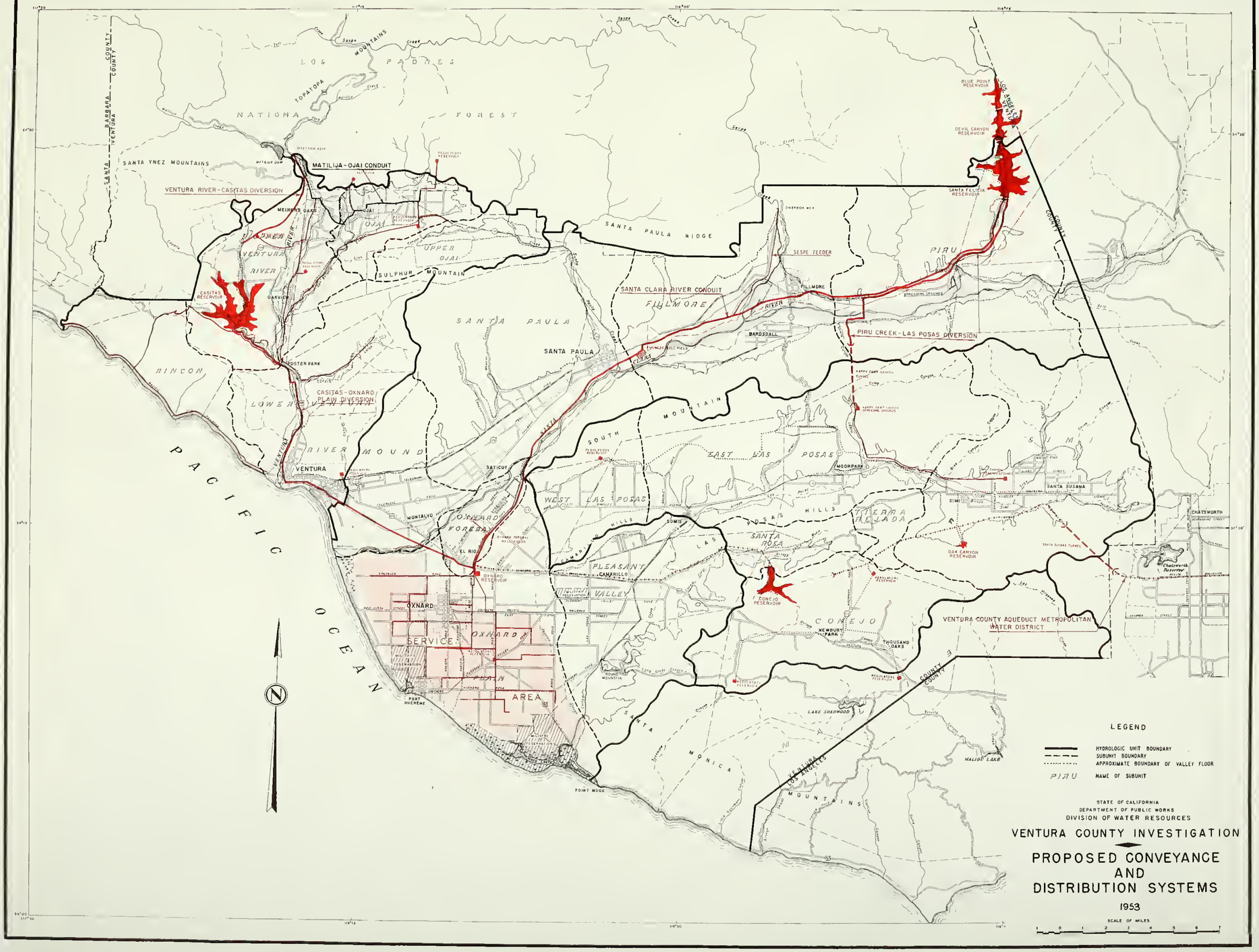
PROFILE OF POSSIBLE VENTURA COUNTY DIVERSION FEATHER RIVER PROJECT



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
VENTURA COUNTY INVESTIGATION

PROFILE OF PROPOSED VENTURA COUNTY AQUEDUCT TO CONNECT WITH SYSTEM OF METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

CAPACITY 150 SECOND-FEET



LEGEND

- HYDROLOGIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- APPROXIMATE BOUNDARY OF VALLEY FLOOR
- PIRU — NAME OF SUBUNIT

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

VENTURA COUNTY INVESTIGATION

PROPOSED CONVEYANCE AND DISTRIBUTION SYSTEMS

1953

SCALE OF MILES