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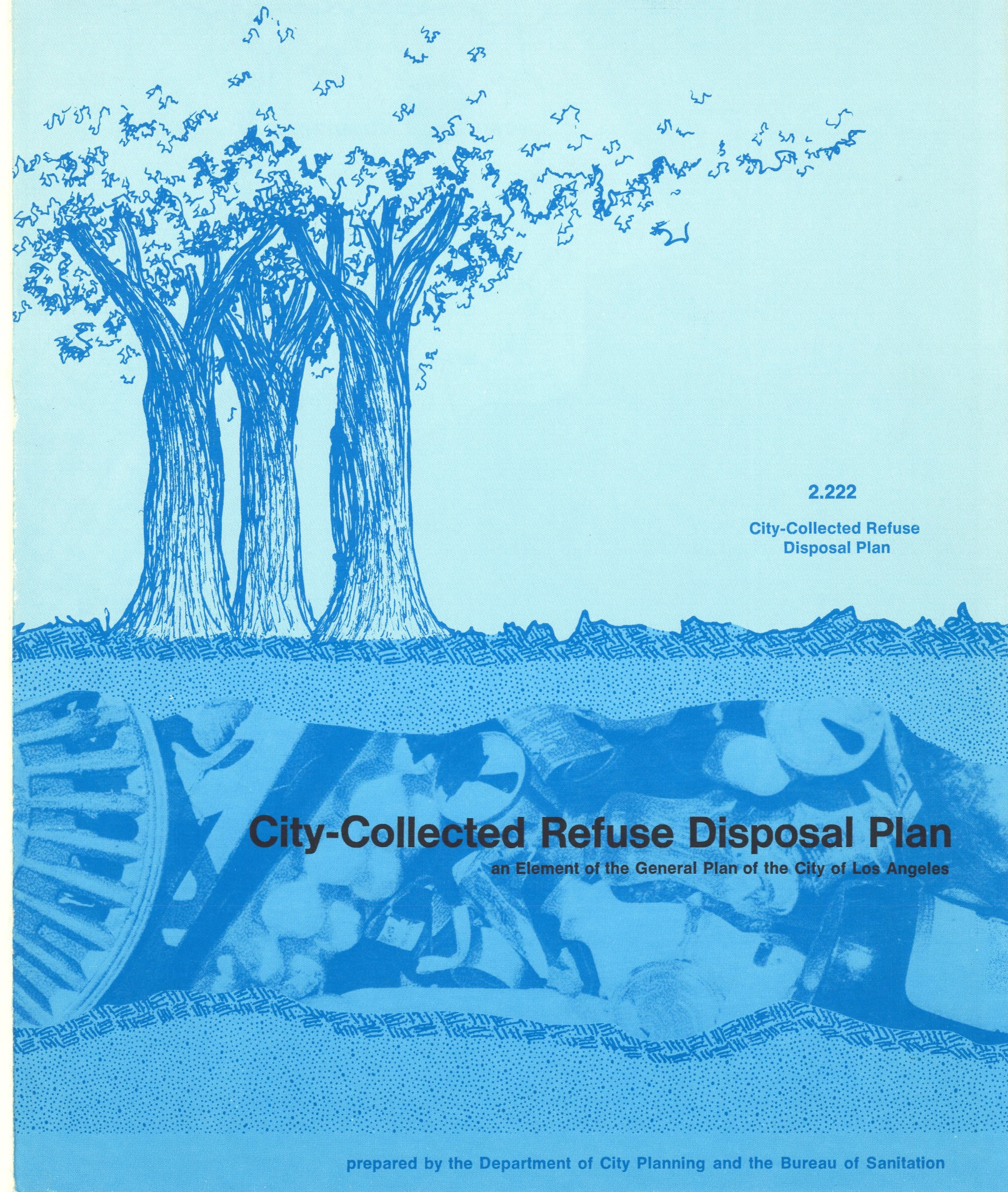
*Former employee

APPROVED: CITY PLANNING COMMISSION
APPROVED: BOARD OF PUBLIC WORKS
ADOPTED: CITY COUNCIL

10-28-71
8-22-69
1-5-72

for further information regarding this plan, please contact: Raymond I. Norman, Secretary, City Planning Commission, 485-5071 refer to CPC 20819

Robert D. Bargman, Director, Bureau of Sanitation, 485-5746



2.222

City-Collected Refuse
Disposal Plan

City-Collected Refuse Disposal Plan

an Element of the General Plan of the City of Los Angeles

prepared by the Department of City Planning and the Bureau of Sanitation

Statement of Policy

Purpose And Use Of The Plan

The City-Collected Refuse Disposal Plan is to be used as a general guide in the City's landfill site acquisition program and refuse disposal operations. Existing and potential City and County landfill sites are indicated, but private disposal sites, which receive only a relatively minor portion of the refuse in the total service area, are not shown on the map. This Plan, based on twenty year population projections, will be used as one basis in formulating the City Recreation Plan, since it indicates land that will become available for future recreational purposes.

The plan consists of the accompanying map, this Statement of Policy and the following Features of the Plan. It is an element of the General Plan of the City of Los Angeles.

Objectives Of The Plan

- To provide a basis for the use and acquisition of existing and future landfill sites necessary for the

disposal of refuse in order to maintain a clean and healthful environment.

- To serve as a guide to meet or exceed City, County and State refuse disposal requirements in the acquisition, maintenance and operation of existing and future landfill sites.
- To provide a basis for the review and adjustment of the plan made necessary by changing land use and new technologies.
- To provide a basis for the site acquisition program to meet future needs, considering proximity to collection areas and proposed uses for the reclaimed land.
- To consider waste material as a City resource in the reclamation of land to its optimum potential use.

Standards And Criteria

Refuse disposal standards were established, and are continually reviewed for improvement by the Los Angeles Regional Water Quality Control Board. Underground water purity is protected by these standards.

City and County ordinances regulate disposal of waste relative to site location, treatment, appearance, fire prevention, rodent control and other factors.

Basic criteria to be considered in the selection of a site are:

- Accessibility of the site by refuse collection vehicles—vehicular travel through residential areas shall be avoided even at the cost of additional travel distance or road construction.
- Feasibility of land acquisition at a reasonable cost.
- Suitability of the reclaimed land for subsequent use.

- Relationship of the site to the freeway system.
- Availability of suitable screening from adjacent property.

Transfer stations may be established when close-in sites are no longer available. Stations are justified when it is more expensive to drive several collection trucks to distant disposal sites than it is to combine the loads and transfer them to the site in one large vehicle. Stations should be located near major traffic arteries at distances from five to seven miles apart.

Refuse collection operations are divided into six districts. An operations office and a yard for storage and maintenance of vehicles are located near the center of each district. Central headquarters provides City-wide administration and facilities for major vehicle maintenance and repairs.

Features Of The Plan

The following table summarizes refuse disposal facilities shown on the plan map.

FACILITY	CITY		COUNTY	
	existing	potential	existing	potential
Landfill Sites				
0-100 acres	2	0	0	0
101-200 acres	1	0	1(a)	0
More than 200 acres	0	0	3	0
To be determined	0	5	0	1
Transfer Stations	0	1	0	6
District Headquarters and Service Yards	6	2	0(b)	0(b)
City Headquarters (c)	1	0	0(b)	0(b)
Central Shop Facility	1	0	0(b)	0(b)
(a) Not shown on map				
(b) Not applicable to this Plan				
(c) To be relocated as shown on the plan map				

Background

Disposing of solid waste by simply burning or burying it on the residential site was discouraged by the early development of refuse disposal systems. Growth of the City and pollution of the air necessitated more satisfactory collection and disposal systems.

In 1902 the City entered into a contract for the disposal of garbage and in 1912 noncombustible disposal service was instituted. Both of these services were conducted by the use of mule carts, with the motor truck making its appearance in 1915.

Prior to 1964 householders segregated their refuse. Garbage was collected separately by both City forces and private collectors and disposed of under contract to hog feeders. Noncombustibles, including ashes, were collected by the City and disposed of under contract. Combustible rubbish was burned on the homeowner's property (until prohibited in 1957) or hauled away by private collectors. At first, disposal of garbage by City forces was limited to the Central City; contracts were awarded for garbage disposal in such areas as Venice and portions of the San Fernando Valley which were then being annexed to the City. In 1943, however, the contractors were unable to perform under their contracts and the City instituted twice-a-week garbage pickup and disposal service on a City-wide basis.

A pilot project for the disposal of combustible rubbish was started in 1955 for the Harbor area as a third separate service. The demand for cleaner air brought about the elimination of the backyard incinerator and, at the same time, public support for this additional municipal service. Thus, with popular approval, during 1957 combustible rubbish disposal was provided throughout the City.

Advances in marketing procedures and changes in living habits have been reflected in the quantity and nature of domestic refuse. For example, the quantity of

food wastes has become a smaller proportion of the total household refuse. The decrease in the quantity of garbage is due both to the impact of modern food preparation and packaging and to the increase in the number and use of garbage disposal units.

These changes set the stage in 1961 for the first step toward combined collection and disposal service. First, wrapped garbage and all noncombustibles except metals were placed with household and yard rubbish for single pickup. Next, in 1964, metals were included. This ended separate domestic collections for the purpose of salvage.

The City started large-scale landfill operations in 1957 with the advent of City-wide collection and disposal service. The first was a park reclamation project in Griffith Park. Shortly thereafter two sites were added in the San Fernando Valley, one a completed gravel pit and one a canyon. By the spring of 1961 all of the available capacity of these latter sites had been used. Refuse from these service areas was then diverted to the County Sanitation District sites in Calabasas and Mission Canyon, and to the newly-opened site at Sheldon Street and Arleta Avenue.

Present Practice

Residential refuse collected by the City is currently disposed of in seven landfills, three of which are owned and operated by the City. The refuse is divided for disposal among these seven sites by operational re-

quirements based on economic studies. Approximately two-thirds of City refuse is disposed of in the three City sites. The remainder goes to four County sites.

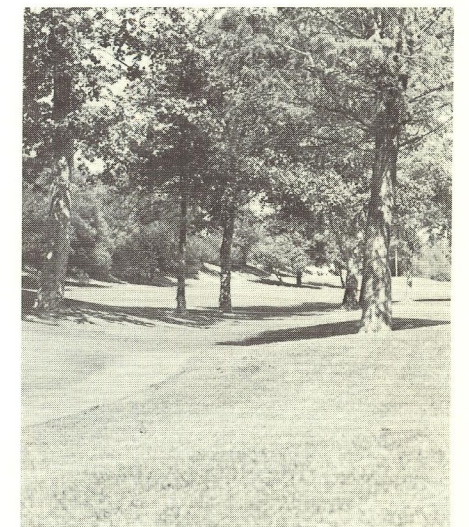
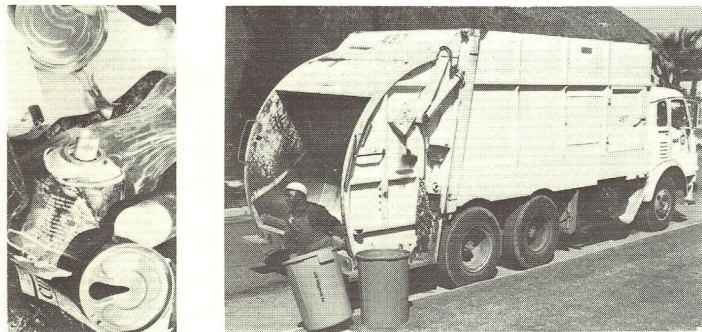
All of the refuse is weighed at the disposal sites prior to discharge from the refuse truck. At the discharge point, the material is compacted by dozer-crawler tractors in layers to a maximum depth of nine feet before covering with earth. The covering of earth is placed on the compacted refuse to maintain a minimum surface area of exposed refuse.

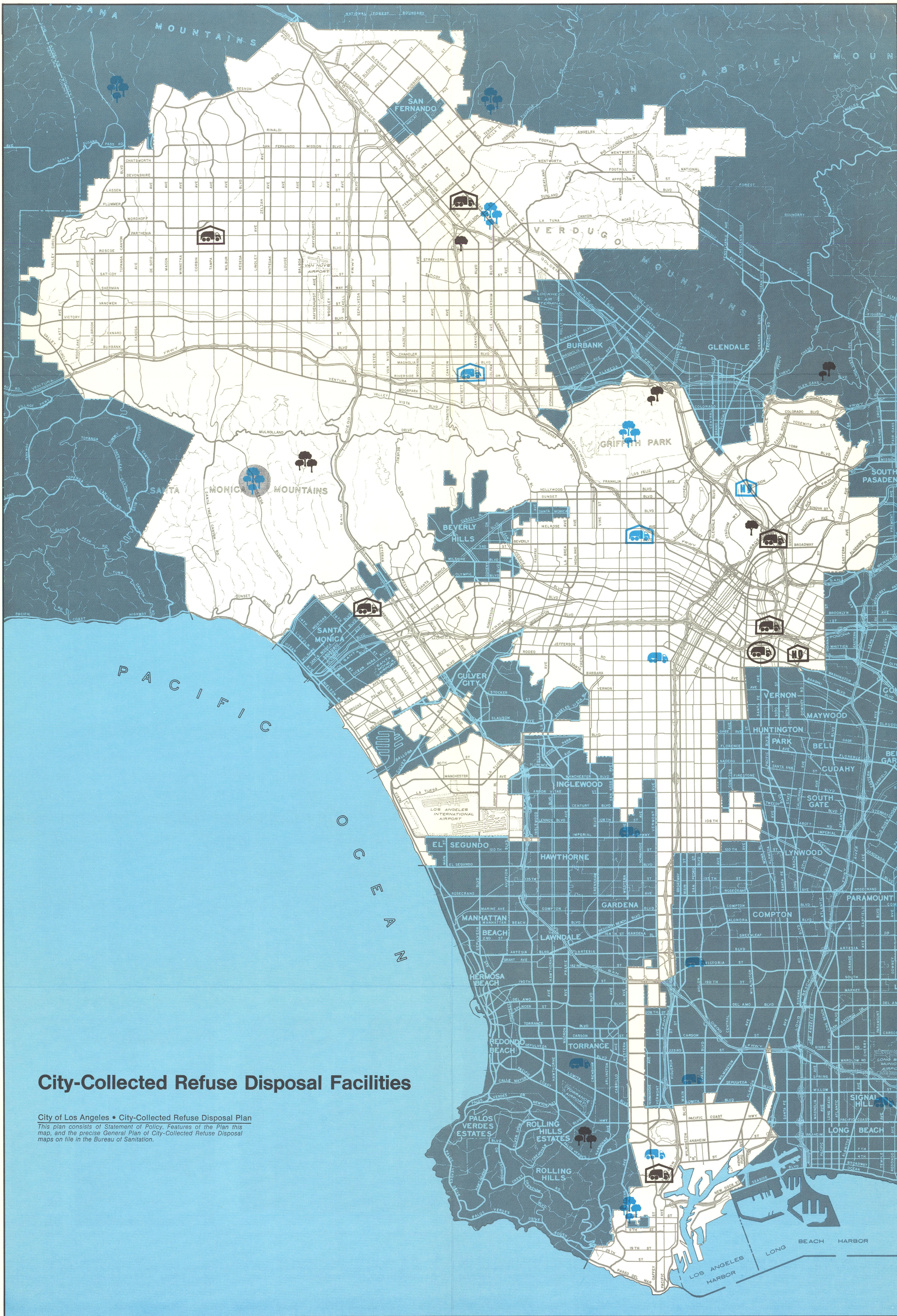
More than 1,200,000 tons of refuse are collected and disposed of each year from approximately 1,000,000 households within the City. This refuse consists of combustible rubbish, principally paper and yard trimmings, and non-combustible rubbish such as tin cans, bottles, ashes and wrapped garbage.

Other City Departments also make use of the municipal sites for disposal of street sweepings, construction debris, tree trimmings and general litter. About 550,000 tons of this material are received each year at the landfill sites.

Commercial and industrial solid waste generally is collected by private haulers and is disposed of at either private or County landfill sites. It is recognized that private disposal sites will continue to be needed in the City area. These will normally require conditional use approval by the Planning Commission subject to such restrictions as may be deemed necessary to protect the City, or they will be located on M-3 zoned land not nearer than 500 feet to property in any other zone.

The Refuse Collection and Disposal System begins with the removal of solid waste and ends with the creation of new recreation facilities and open space.





City-Collected Refuse Disposal Facilities

City of Los Angeles • City-Collected Refuse Disposal Plan
 This plan consists of Statement of Policy, Features of the Plan this map, and the precise General Plan of City-Collected Refuse Disposal maps on file in the Bureau of Sanitation.

FACILITIES (general locations)	CITY		COUNTY	
	existing	potential	existing	potential
landfill sites				
0-100 acres				
101-200 acres				
over 200 acres				
size to be determined				
transfer station				
district headquarters and service yards				
central shop facilities				
refuse collection and disposal administration headquarters				



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photography by the Department of Water and Power
layout and design by graphics section, Department of City Planning

CITY PLANNING COMMISSION	ADOPTED
WATER & POWER COMMISSION	10/31/68
CITY COUNCIL	10/3/68
	12/31/68

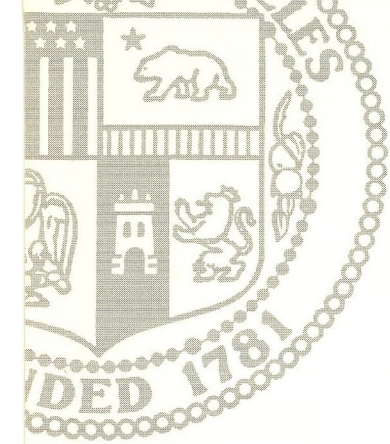
for further information regarding this plan, please contact:
Raymond I. Norman, Secretary, City Planning Commission,
MA 4-5211 ext. 2171, refer to CPC 19717
Mary J. Born, Secretary, Board of Water and Power Commissioners,
481-6390



2.24
Power System
Plan

Power System Plan

an Element of the Master Plan of the City of Los Angeles



City of Los Angeles • Power System Plan

this plan consists of Statement of Policy, Features of the Plan, and Power System Facilities map.

Statement of Policy

Purpose and Use of the Plan

The Power System Plan is an element of the Master Plan for the City of Los Angeles. The Plan is intended to serve as a general guide for the future construction of the power facilities of the City's Department of Water and Power. It designates general, rather than precise, locations for various power system facilities, to serve future power requirements as based on projected population and economic growth. The Power System Plan consists of the accompanying map, this Statement of Policy and the following Features of the Plan.

Objectives of the Plan

- To facilitate the utilization of advancements in technology, as they become practicable for application, to meet the ever increasing demand for the most reliable power supply possible at the most economical rates.

- To facilitate the periodic re-evaluation of the Los Angeles City Power System to reflect changing requirements for the generation and distribution of power as necessary to adjust it to changes in the land use and development patterns of the City.
- To provide a basis for the linking of the Power System with power systems of other utilities, so as to diversify sources of power and optimize reliability of service on a reciprocal basis.
- To encourage and facilitate the systematic replacement of overhead distribution power lines with underground circuits.
- To set forth general power system design standards relating to power supply and to the external appearance of facilities.

Standards and Criteria

The Power System should be expanded as necessary to increase the total power supply at peak load from the 1968 level of approximately 1.0 kilowatt per capita to an anticipated 1.7 kilowatts per capita in 1980 and to an anticipated 3.0 kilowatts per capita in 2000.

The total power supplied by the system, at peak load, should then be increased from the 1968 level of 2.7 million kilowatts to meet an anticipated demand of 6.0 or 6.5 million kilowatts in 1980 and 13.5 million kilowatts in 2000.

Power System facilities, including receiving and distributing stations, should be designed and constructed so that they will harmonize with their surroundings, insofar as practicable.

All new power distribution lines over six hundred feet in length in residential and commercial areas should be placed underground. Existing overhead lines will be replaced with underground cable wherever economically and technically feasible in the following situations:

- Major street widening projects where underground cable may be installed in lieu of relocating existing overhead facilities, and a complete electroliner street lighting system is also installed.
- Along major thoroughfares, streets adjacent to airports or other civic areas, or in commercial or residential areas where change in land use has created heavy load densities and congested overhead distribution line facilities.
- In connection with the installation of underground systems for other utilities such as telephone.

Large apartment and commercial structures being built should either be connected to the underground system initially or provide facilities for future connection in anticipation of the conversion of the overhead distribution system to underground.

Features of the Plan

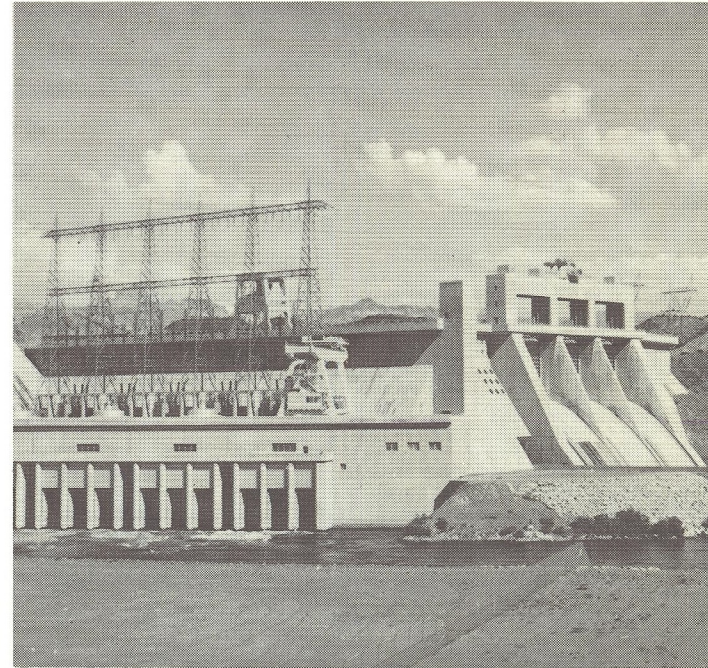
Power Sources

Existing

Owens River Aqueduct The first municipal power plant to supply the City is located along this aqueduct in San Francisquito Canyon some twenty-one miles north of the City boundary. Plants built in the Owens Valley, some two hundred miles to the north and others along the southern end of the aqueduct, supply 160,000 kilowatts—presently about five percent of the City's generating capability.

Hoover Dam In 1936, Hoover Dam electricity reached Los Angeles over 266 miles of high voltage transmission lines. Today its 400,000 kilowatts allocated to the City of Los Angeles are not a major source of energy, but it supplies a segment of the Power System's capability in meeting peak demands. Power from the dam presently provides about six percent of the City's energy requirements.

Steam Plants Eighty-six percent of Los Angeles' electric energy is supplied by nearby steam generating plants. There are four such plants in operation: the Haynes Steam Plant near Seal Beach, the Valley Steam Plant in the San Fernando Valley, the Harbor Steam Plant at Los Angeles Harbor, and the Scattergood Steam Plant near Playa del Rey. Together they have a generating capacity of 2,917,000 kilowatts.



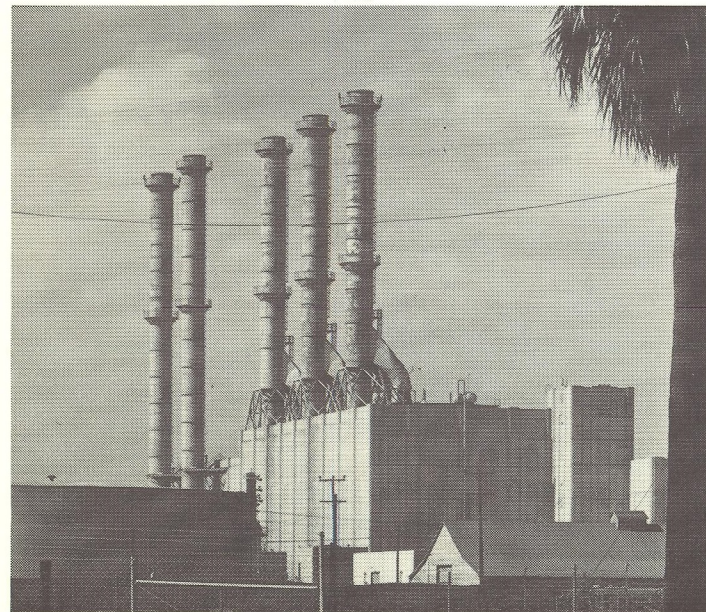
When completed Mohave Steam Plant will produce 318,000-kilowatts of power for Los Angeles.

Future

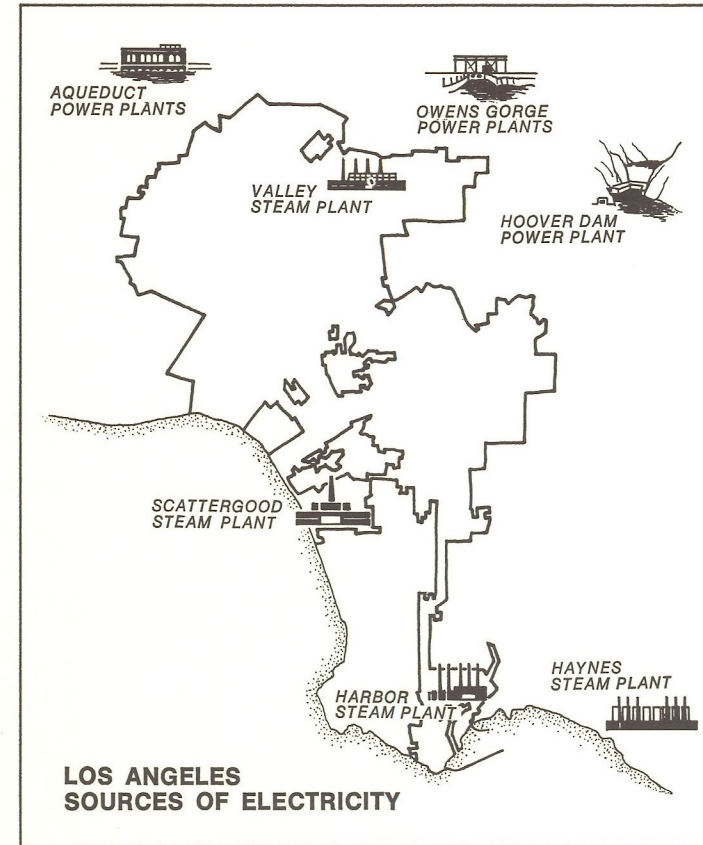
Dams The Department of Water and Power is building a 750,000 volt direct current transmission line to the Oregon-Nevada border to utilize hydroelectric generating resources of the Pacific Northwest. Hydroelectric power will also be supplied in the future from a plant on the California Aqueduct between Pyramid and Castaic Reservoirs and a small plant on the second Owens Valley Aqueduct.

Steam Plants A new steam plant, known as Mohave, is being built on the Colorado River and will use coal mined in Arizona. This is a cooperative project among several utilities in California and Arizona. The Los Angeles share of the plant is twenty percent, equal to 300,000 kilowatts.

Nuclear Power Plants Two nuclear-powered generating plants have been proposed; the first to be situated in Malibu, and the other in connection with a water desalination plant on a man-made island near Huntington Beach. The total capacity of these two plants will be about 1,300,000 kilowatts.



Steam plants provide 86% of power used in Los Angeles.



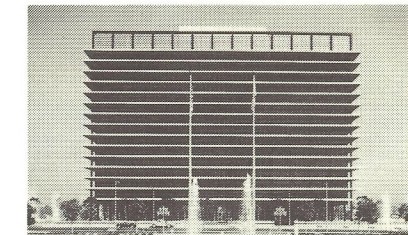
The magnitude of existing and proposed facilities in the Los Angeles Power System is indicated by the following summary:

	existing (1967)	additions proposed (to 1977)
Fossil Fired Steam Electric Generating Plants	4	1
Nuclear Steam Electric Generating Plants	0	2
Hydroelectric Generating Plants	13	2
D.C. Converter Stations	0	1
Receiving Stations	17	4
Distributing Stations	122	41
Power Distribution Circuits		
Overhead	9,512 mi.	not projected
Underground	1,586 mi.	not projected

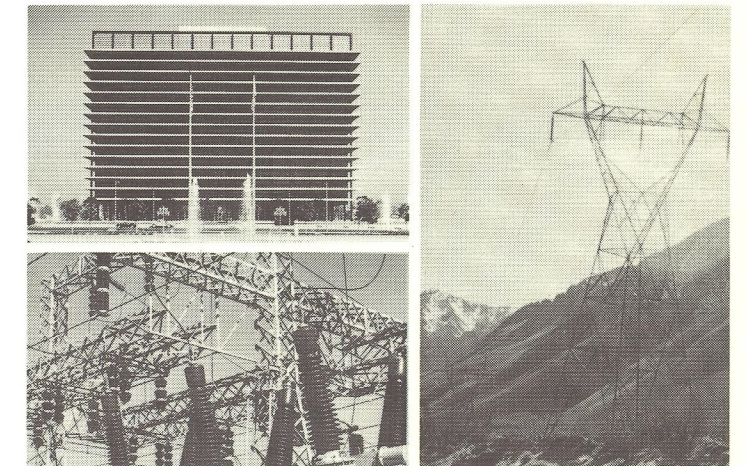
In-Town Facilities

Receiving and Distributing Stations Electricity from the local steam plants, the hydroelectric plants on the Owens River Aqueduct and in the Owens Gorge and from Hoover Dam is transmitted by high voltage lines to a "belt line" extending throughout the City. All receiving stations are connected to the belt line which supplies power to them as required. These receiving stations transform these high voltages to 34,500 volts for distribution to the distributing stations and to individual large customers.

Water and Power Building



High voltage power transmission lines

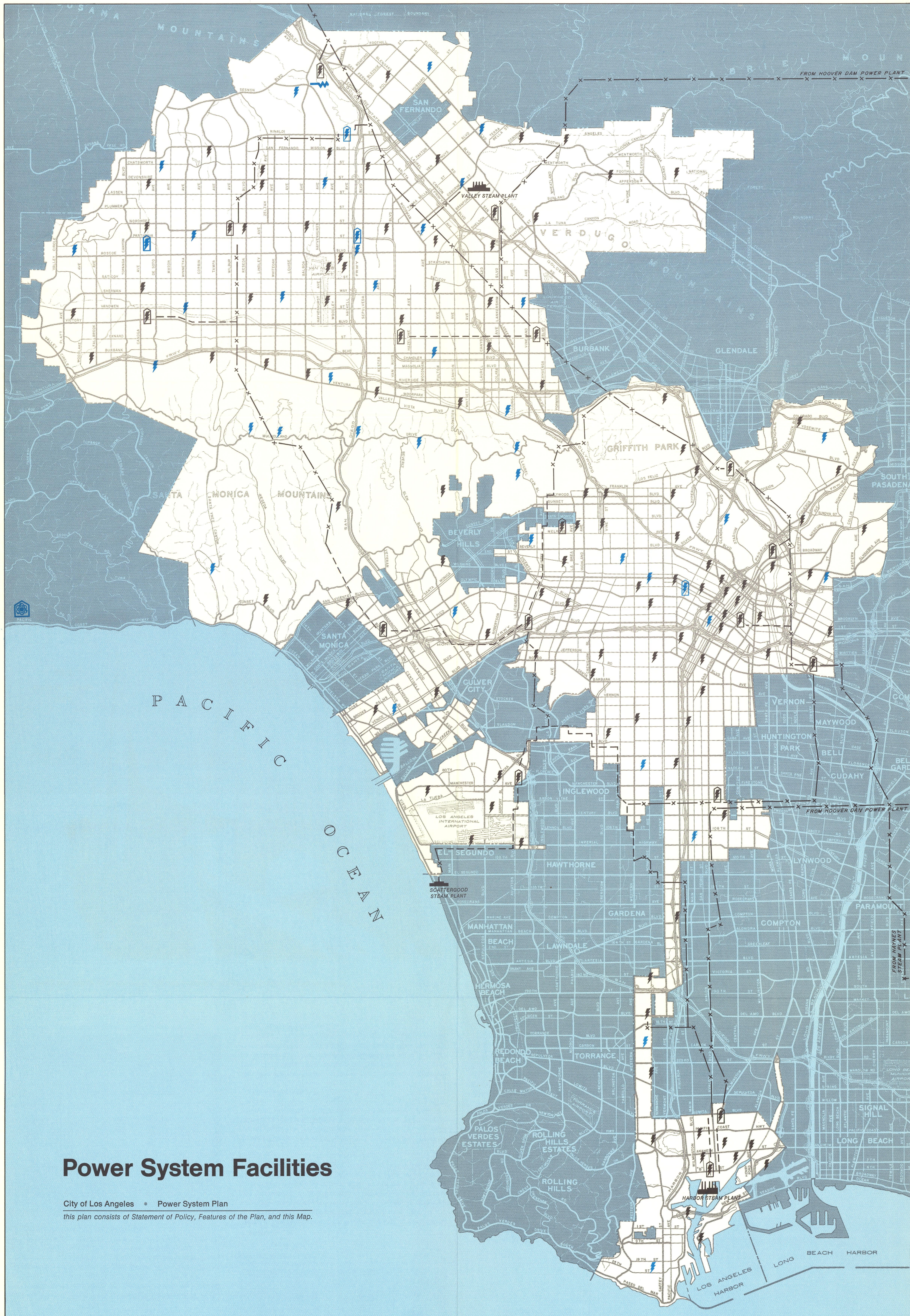


Distribution center

The zoning code permits receiving stations in the M1 Zone and distributing stations in the C2 Zone. They are also permitted in other zones, under conditions imposed to protect adjacent uses.

Power Distribution Lines Power lines are both overhead and underground. Currently, all new distribution voltage lines in commercial and residential subdivisions are required to be placed underground. There is also a long range program to replace overhead distribution lines with underground cables.

Power Line Rights-of-Way Overhead transmission lines are, and will be for some years to come, carried on large steel towers over wide rights-of-way which are otherwise undeveloped. Certain of these rights-of-way are being planned as strip parks and others as greenbelts for limited recreation use and beautification.



Power System Facilities

City of Los Angeles • Power System Plan
 this plan consists of Statement of Policy, Features of the Plan, and this Map.

- | FACILITIES | EXISTING* | PROPOSED† |
|------------------------|-----------|-----------|
| steam plant | | |
| nuclear power plant | | |
| d.c. converter station | | |
| receiving station | | |
| distributing station | | |
| transmission lines | | |
| overhead | | |
| underground | | |

* as of 6/30/67 † to 6/30/77



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photography by the Bureau of Engineering

layout and design by graphics section, Department of City Planning

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CITY PLANNING COMMISSION	8/29/68
BOARD OF PUBLIC WORKS	7/22/68
CITY COUNCIL	11/26/68

for further information, please contact:

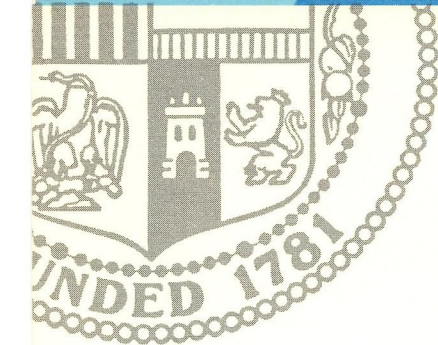
Raymond I. Norman, *Secretary*
City Planning Commission 624-5211, extension 2171 refer to CPC 19720
Louis Dodge Gill, *President*
Board of Public Works 624-5211, extension 3371

2.221
Sewerage
Plan

Sewerage Plan

an Element of the Master Plan of the City of Los Angeles

prepared by the Department of City Planning and the Department of Public Works



City of Los Angeles • Sewerage Plan

this plan consists of Statement of Policy, Features of the Plan and Sewerage Map

Statement of Policy

Purpose and Use of the Plan

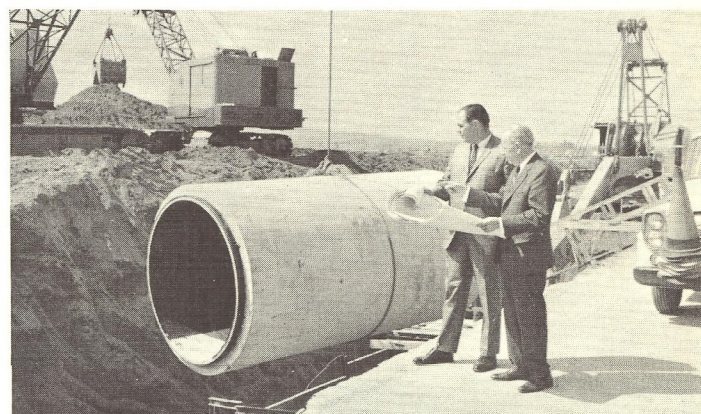
The Sewerage Plan is an element of the Master Plan of the City of Los Angeles. The Plan is intended to serve as a general guide to concerned governmental agencies and interested citizens for the construction, maintenance and operation of sewerage facilities in the City. It will also assist in the formulation and/or revision of other Master Plan elements which are affected by these facilities.

The Sewerage Plan is a 30-year long-range projection prepared by the Bureau of Engineering, based on population estimates by the Systems and Data Services Division of the Department of City Planning, on land use projections derived from community plans adopted by the City Planning Commission, and on the Department's best forecast of future land use in areas of the City not yet covered by such community plans.

The Plan designates approximate locations for proposed sewers, water reclamation plants, pumping plants and sewer maintenance yards, and identifies the sites of existing facilities. Sewers under eighteen inches in diameter do not appear on the Plan map because they are too numerous to be shown graphically.

Periodic reexamination and revision of this Sewerage Plan is desirable and necessary as new elements of the Master Plan are adopted and existing elements are revised or as unanticipated developments occur within or near the City of Los Angeles.

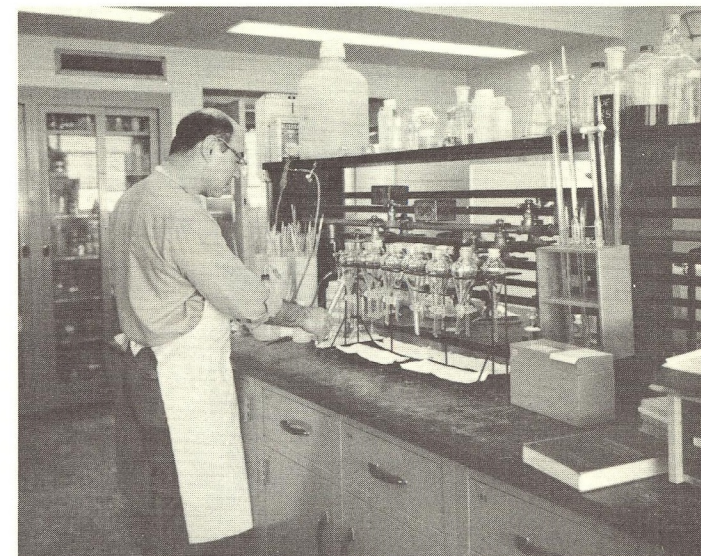
The first future revision of the Sewerage Plan will reflect actual population densities and land development trends and their effects upon sewer location and capacities.



Plastic lined concrete pipes carry sewage to disposal plants.

Objectives of the Plan

- To provide a basis for the development of a safe, efficient and economical sewerage system for the City of Los Angeles.
- To utilize the best current estimates of future land use in the areas to be served as a basis for determining quantitative requirements for sewerage facilities.
- To establish criteria for the location, design and installation of sewerage facilities which will minimize odor and unsightliness.
- To describe standards followed in formulating this modern sewerage plan.
- To provide a basis for the improvement of existing sewerage facilities, the development of proposed facilities, and the accommodation of future technical improvements and alternative concepts of City development.
- To recognize that the system should not be limited by political boundaries.



Through experimentation the city is continually striving to improve the processing of sewage.

- To recognize that water and other by-products of the sewerage system may have economic value for the City.

(Statement of Policy continued)

Standards

Sewers The Bureau of Engineering employs various standards in its design of sewerage systems for the City. These standards comprise standard plans for design and construction and standard numerical values for the determination of flow quantities. Continued effort is made to update the various standards consistent with new information on engineering and construction practices, flow quantity research, and studies conducted both locally and throughout the country.

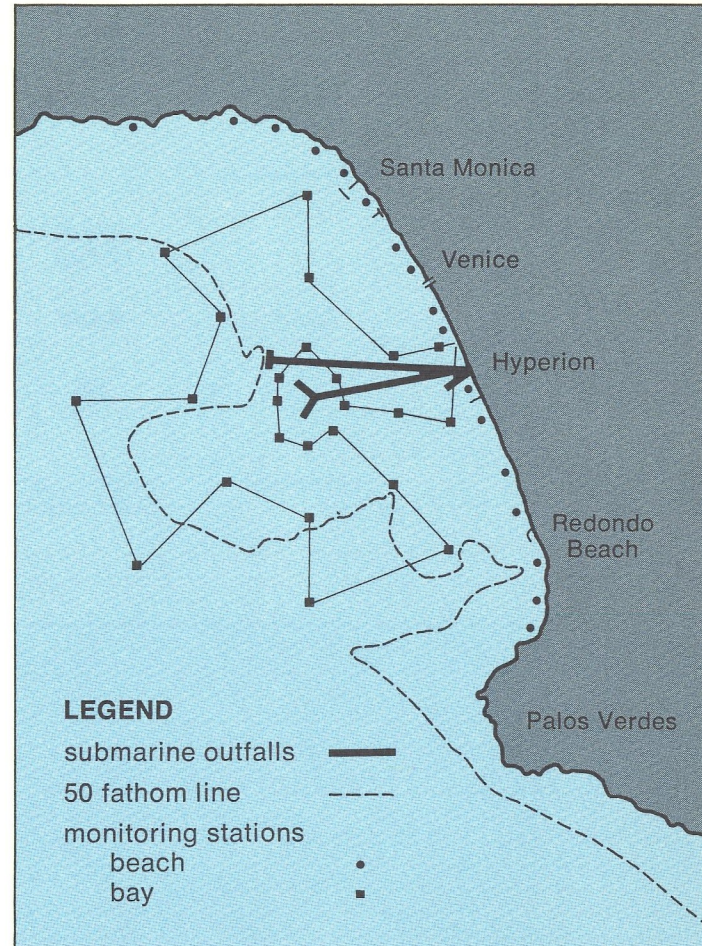


Constant monitoring of water samples are necessary to assure contamination free beaches.

Vitrified clay pipe receives wide use in sewer pipe construction because it is relatively inert to the corrosive chemical activity of sewerage. However, due to production problems, clay pipe is made no larger than forty-two inches in diameter. Pipe larger than forty-two inches is constructed of reinforced concrete. Because concrete is susceptible to the acids and gases generated by decaying sewerage, pipe constructed of this material is lined with plastic for protection.

Treatment Plants Treated effluent and digested sludge from the Hyperion Treatment Plant are discharged into Santa Monica Bay via submarine outfalls. Treated effluent from the Terminal Island Treatment Plant is discharged into Los Angeles Outer Harbor. In Santa Monica Bay the surf waters are tested daily at 17 beach stations and weekly tests are made at 24 stations in the bay. Sampling stations have also been established in Los Angeles Harbor.

Requirements for the receiving waters to which the



City's treated sewage is discharged are set by the State's Regional Water Quality Control Board No. 4. These requirements are determined so as to protect the beneficial uses established by the Board following public hearings. The standards specify conditions of dissolved oxygen, bacteria count, aesthetics, etc. Both of the above-described receiving waters consistently meet the standards imposed.

All sewage in the City of Los Angeles undergoes primary treatment. This process involves screening to remove coarse debris and settling to remove the finer inorganic solids and settleable organic solids. The solids removed undergo a fermentation process in separate heated digesters to produce a stable material for final disposal.

About one-third of the City's sewage is also given secondary treatment. In this process it is subjected to additional biochemical activity. Organic materials are removed by circulation of the primary waste water in the presence of bacterial cultures and air.

Features of the Plan

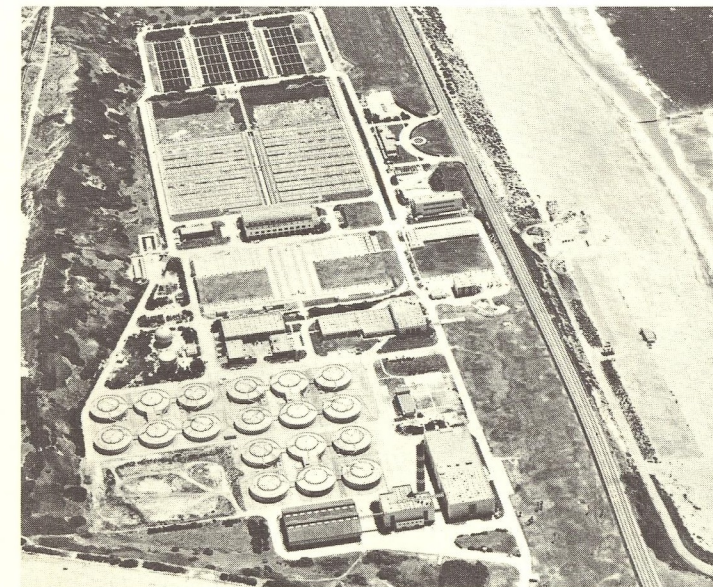
Facilities

Sewers The sewage in Los Angeles is all carried in a system of pipes which are separate from those carrying storm water. There are more than 5,600 miles of main-line sewers in the Los Angeles sewerage system and this figure is increasing by about 80 miles per year. The system includes approximately 100,000 manholes, thirty-seven pumping plants, seven ventilation stations and various siphons and diversion chambers. Eight sewer maintenance yards are located at different points throughout the City. Crews and equipment based at these yards provide maintenance service for the sewerage system.

Treatment Plants Los Angeles presently operates three plants for the treatment of sewage. Approximately 95 per cent of the City's liquid waste is processed at the Hyperion Treatment Plant. It is located on 144 acres of land overlooking Playa del Rey Beach. A few salient facts about this facility are listed as follows:

• Original cost 1950	\$45,000,000
• Enlargement 1960	34,000,000
• Total cost	79,000,000
• Average operating cost per year	2,300,000
• Total operating and maintenance personnel	228
• Total population served	3,000,000
• Average flow rate 1968	325 mgd*
• Design average flow rate	420 mgd

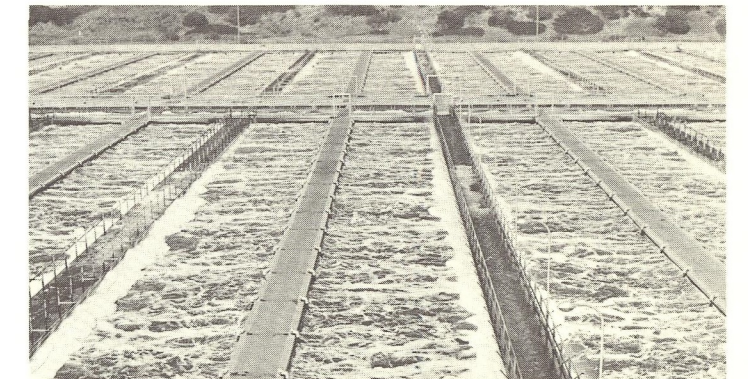
*Million gallons per day.



The Hyperion Treatment Plant handles 95% of the City's liquid waste.

About 3 per cent of the City's sewage flow, mostly from Wilmington and San Pedro, is treated at a plant located on Terminal Island in the Wilmington-San Pedro area. About 2 per cent, which cannot reach Los Angeles disposal facilities by gravity flow, is processed by the Los Angeles County Sanitation Districts. The City's Valley Settling Basin Plant treats only a small flow and is being operated on an experimental basis.

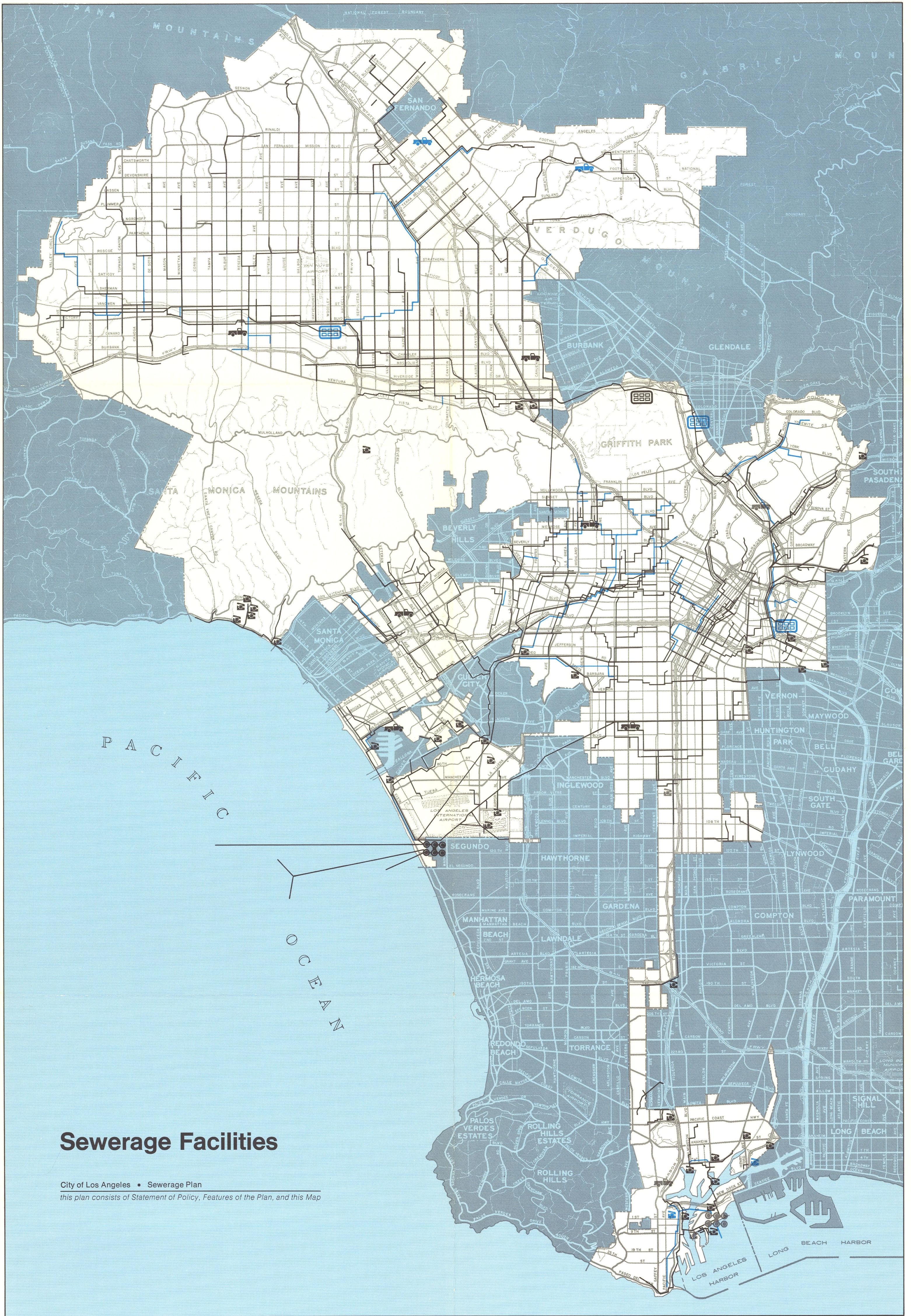
Approximately 60 mgd of the sewage transported and treated in the Los Angeles sewerage system is received in accordance with sewage disposal contracts with adjoining cities and sanitation districts. The largest quantities come from Glendale, Burbank, Santa Monica, Beverly Hills, Culver City, and Los Angeles County Sanitation District No. 4 (West Hollywood).



Secondary treatment circulates sewage with air for removal of organic material.

Water Reclamation Plants In 1968 the City was considering a recommendation of the Board of Public Works that a portion of the City's future sewage flow be processed at inland water reclamation plants located adjacent to the Los Angeles River. If this recommendation is followed, three plants will be constructed; one in the Sepulveda Basin in Van Nuys, another near Colorado Street in the Griffith Park area and a third just north of the Santa Monica Freeway in Boyle Heights. The ultimate size of these three facilities would be 200 mgd, 50 mgd, and 30 mgd respectively. Most of this flow could be reclaimed and used for industrial and irrigational purposes and perhaps, through the recharge of ground water storage, also for general use.

An experimental water reclamation plant, the Valley Settling Basin Plant, is presently being operated by the City. Irrigation water reclaimed from sewage is now being used in a portion of Griffith Park for demonstration purposes.



Sewerage Facilities

City of Los Angeles • Sewerage Plan
 this plan consists of Statement of Policy, Features of the Plan, and this Map

FACILITIES	EXISTING	MODIFICATION OF EXISTING	PROPOSED
pumping plant			
maintenance yard			
treatment plant			
major sewer			
water reclamation plant			





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- Ruth Haney, *planning associate*
- Brian W. Farris, *planning assistant*

photography by the Department of Water and Power

layout and design by graphics section, Department of City Planning

CITY PLANNING COMMISSION	ADOPTED	AMENDED
WATER AND POWER COMMISSION	8/22/68	
CITY COUNCIL	7/30/68	
	1/14/69	

for further information, please contact:

Raymond I. Norman, Secretary, City Planning Commission 624-5211, Ext. 2171
refer to CPC 19716

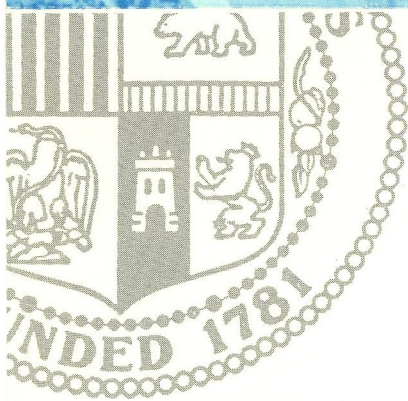
Mary J. Born, Secretary, Board of Water and Power Commissioners 481-6390



2.23
Water
System
Plan

Water System Plan

an Element of the Master Plan of the City of Los Angeles



City of Los Angeles • Water System Plan

this plan consists of Statement of Policy, Features of the Plan, and Water System Facilities map

Statement of Policy

Purpose and Use of the Plan

The Water System Plan is an element of the Master Plan of the City of Los Angeles. The Plan is intended to serve as a general guide for the future development of the water system facilities of the City's Department of Water and Power. The Plan sets forth basic objectives and standards and designates general (rather than precise) locations for the various facilities necessary to the provision of a water supply adequate to serve future demands, as based on projected population and economic growth.

Objectives of the Plan

- To identify the needs for land and facilities necessary to provide an adequate and reliable water supply throughout the City of Los Angeles and to designate general locations for such facilities.
- To introduce and utilize new technologies for the improvement of the water system in order to meet the ever increasing demand for water at the most economical rates possible.
- To periodically re-evaluate the capability of the water system facilities in order to reflect changes

in the demand for water resulting from technological developments and new patterns in the City's land use.

- To provide water pressure and supply necessary for normal domestic needs and for efficient fire protection.
- To set forth design standards for the water system relating to the total water demand and availability of supply, number and size of facilities, and to assure construction of facilities to be aesthetically compatible with adjacent lands and development.

Standards and Criteria

The Department of Water and Power projects a minimum yearly need for 292 billion gallons of water by the year 2000 as based on population and economic growth projections for the City. This amount would be equivalent to 200 gallons per day for each resident of the City in that year.

The water supply served in Los Angeles meets a high standard for safety and quality. The water is stored in protected reservoirs, and chlorinated prior to distribu-

tion to assure its safety. No water-borne disease has ever been traced to the municipal water supply.

To cope with distribution problems, the City is divided into 107 pressure zones, served primarily by gravity and the remaining area by pump and tank systems. In general, pressures are maintained at a normal standard of 60 pounds per square inch and do not fall below 40 pounds per square inch.

The Los Angeles City Planning Commission has adopted the following policy relating to its approval, under the Conditional Use procedure, of water tanks in residential areas of the City:

It shall be the policy of the City Planning Commission, in the control of the appearance of storage tanks within residential areas of the City of Los Angeles, to encourage concealment and compatibility of the tanks with the surrounding area to a degree consistent with service and safety responsibilities of the Department of Water and Power.

Except where prevented due to geological or other controlling conditions, as much as feasible of a tank shall be placed below the adjacent finished ground surface.

A portion of the screening plants used to soften the silhouette of the tank shall be of such height at planting and of such growth characteristics that within a period of three to five years they will reasonably be expected to effect partial concealment of the structure with heights as follows:

EXPOSED HEIGHT OF TANK	HEIGHT OF PLANT
Less than 20 feet	Not less than top of tank
20 feet to 40 feet	Two-thirds of exposed height of tank, but not less than 20 feet
Higher than 40 feet	One-half of exposed height, but not less than 27 feet

It is desirable that a portion of the trees shall be of such a species that they can reasonably be expected to ultimately exceed the height of the tank. It is understood that all plants shall be maintained in a healthy and vigorous condition and supplied with adequate moisture and plant nutrition to obtain optimum growth consistent with geological and environmental conditions. Where irrigation might affect the stability of the tank site due to geological conditions, plants which require a minimum amount of moisture should be used in respect of public safety.

Features of the Plan

Existing and Proposed Facilities

The following table summarizes the planned extent of water system facilities:

Type of Facility	Existing 1968	Proposed	Total
MAJOR WATER MAINS	*	*	—
ALL RESERVOIRS	94	34	128
PUMPING STATIONS	82	22	104
WELL FIELDS	15	2	17
SPREADING GROUNDS	3	0	3

*as shown on plan map

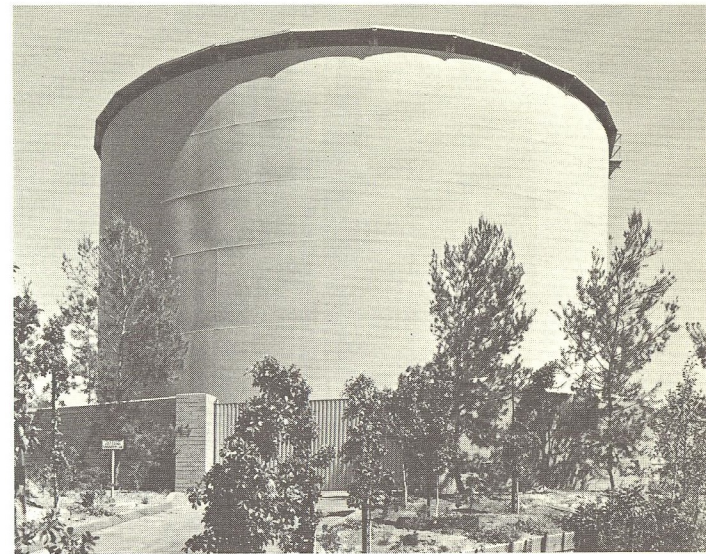
The plan map does not show all of the minor reservoirs and pumping stations but only a representative number to indicate the scope of water system facilities throughout the City.

Detailed facility location, water service availability and related items should be arranged directly with the water system of the Department of Water and Power.

Sources of Water

Traditional Sources The present sources of water for Los Angeles are local groundwater supply, Owens River — First and Second (under construction in 1968), Los Angeles Aqueduct, and the Metropolitan Water District. The Metropolitan Water District sources are the Colorado River and the California State Aqueduct (under construction in 1968). Well production from the underground basin of the Los Angeles River is declining as the area becomes more urbanized but still accounts for 94 million gallons daily, enough for 550,000 persons, or approximately 20 per cent of the City's water.

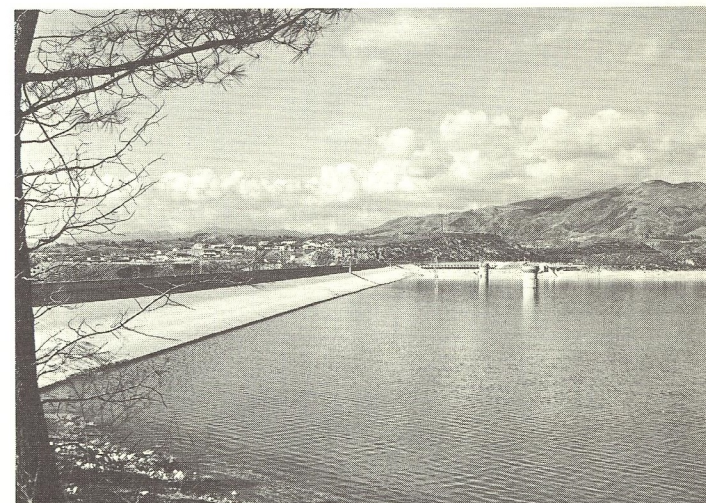
Surface water is derived from two main sources: the Owens and Colorado Rivers. The water is transported to the City by means of a 338 mile aqueduct from the Owens River and a 320 mile aqueduct to the Metropolitan Water District from Parker Dam on the Colorado River. The former source supplies 286 million gallons daily, about 61 per cent of the total supply and the latter 86 million gallons daily, about 19 per cent. The City has a preferential right to 288 million gallons daily from the Colorado River. Studies are in progress on ways to divert water from other river basins with surplus flows into the Colorado River. A second Los Angeles Aqueduct from the Owens River, under construction in 1968, would increase the aqueduct supply by approximately 50 per cent, enough for 750,000 people or a 15 year population growth when completed late in 1969. When the 444 mile long California State Aqueduct is extended to Southern California in 1971, Los Angeles will have still another source of surface water for an additional 190 million gallons daily.



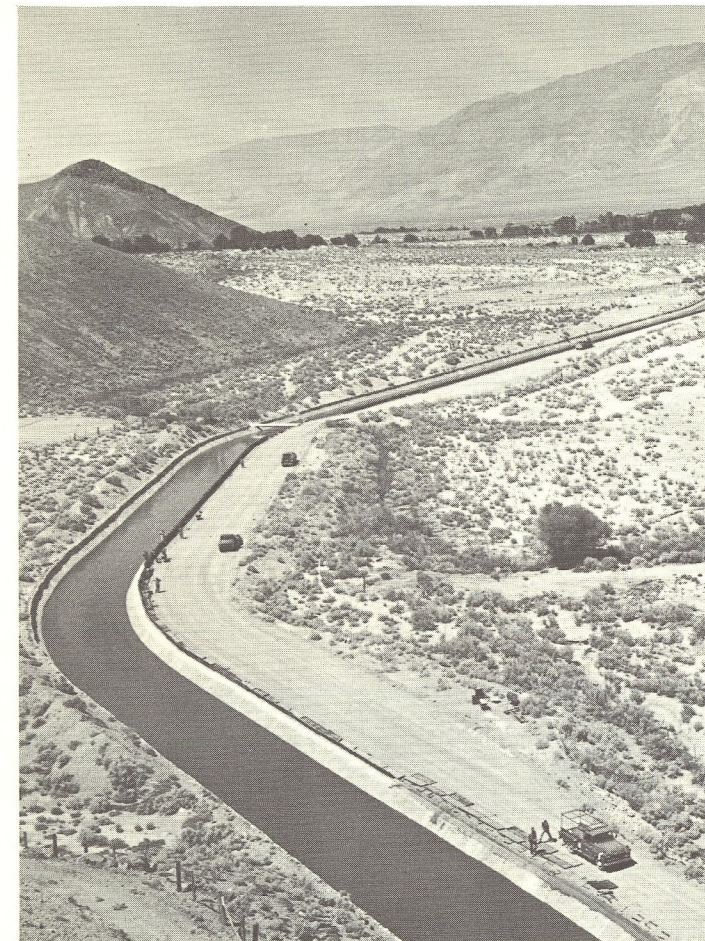
When mature, these fast growing trees will help to blend the water tank into its surroundings.

In-Town Facilities There are 101 major and minor (water tanks) reservoirs in the water system of which seven are located in Owens Valley and 94 are in-town. The total storage capacity of these reservoirs is 415,494 acre feet (135 billion gallons) and is equivalent to a nine-month supply of present-day City water demand. Water is delivered into the City's 464 square miles at altitudes ranging from sea level to 2,400 feet.

There are 104 wells in the system within the City. Rain water, return flows from irrigation and landscape uses and excess water from the Owens River replenish the underground supply. There are 75 chlorinating stations to assure good water quality and 50,000 regular inspections are made annually.



Lower Van Norman Lake is one of many reservoirs that in combination provide 492 million gallons of water daily for Los Angeles users.



Sixty percent of the Los Angeles water supply is channeled to the City from the High Sierra some 340 miles away.

Future Additional Sources The construction of a nuclear powered salt water desalination plant on Bolsa Island, an artificial island to be built off the coast of Orange County, has been approved by the Federal Government, Metropolitan Water District, Department of Water and Power, and the suppliers of water to other local jurisdictions. When completed, it will supply an additional 150 million gallons of fresh water per day to the Metropolitan Water District for its members.

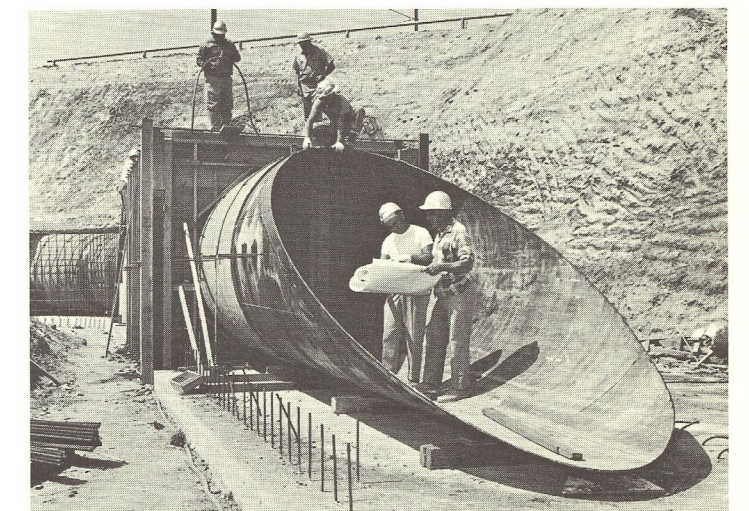
The reclamation of waste water offers the potential for a reusable source of water for irrigation and industrial uses. Reclaimed water may also be introduced into the water system by means of transfer, spreading and percolating in the groundwater basins and subsequently pumping it from the City's wells. This latter method was under study by the Bureau of Engineering in 1968. Better conservation of storm water runoff through the improvement and expansion of spreading grounds promises an additional increase in the quantity of the underground water supply.

Water Consumption Los Angeles City water use in 1966-67 totalled 169 billion gallons. This amount was lower than previous years because of unusually heavy winter rainfall. Daily use averaged 464 million gallons — a per capita use of 163 gallons. Most of this water was utilized for personal consumption and industrial uses. Intermittent irrigation, mostly in the rapidly urbanizing San Fernando Valley, decreased to six million gallons daily.

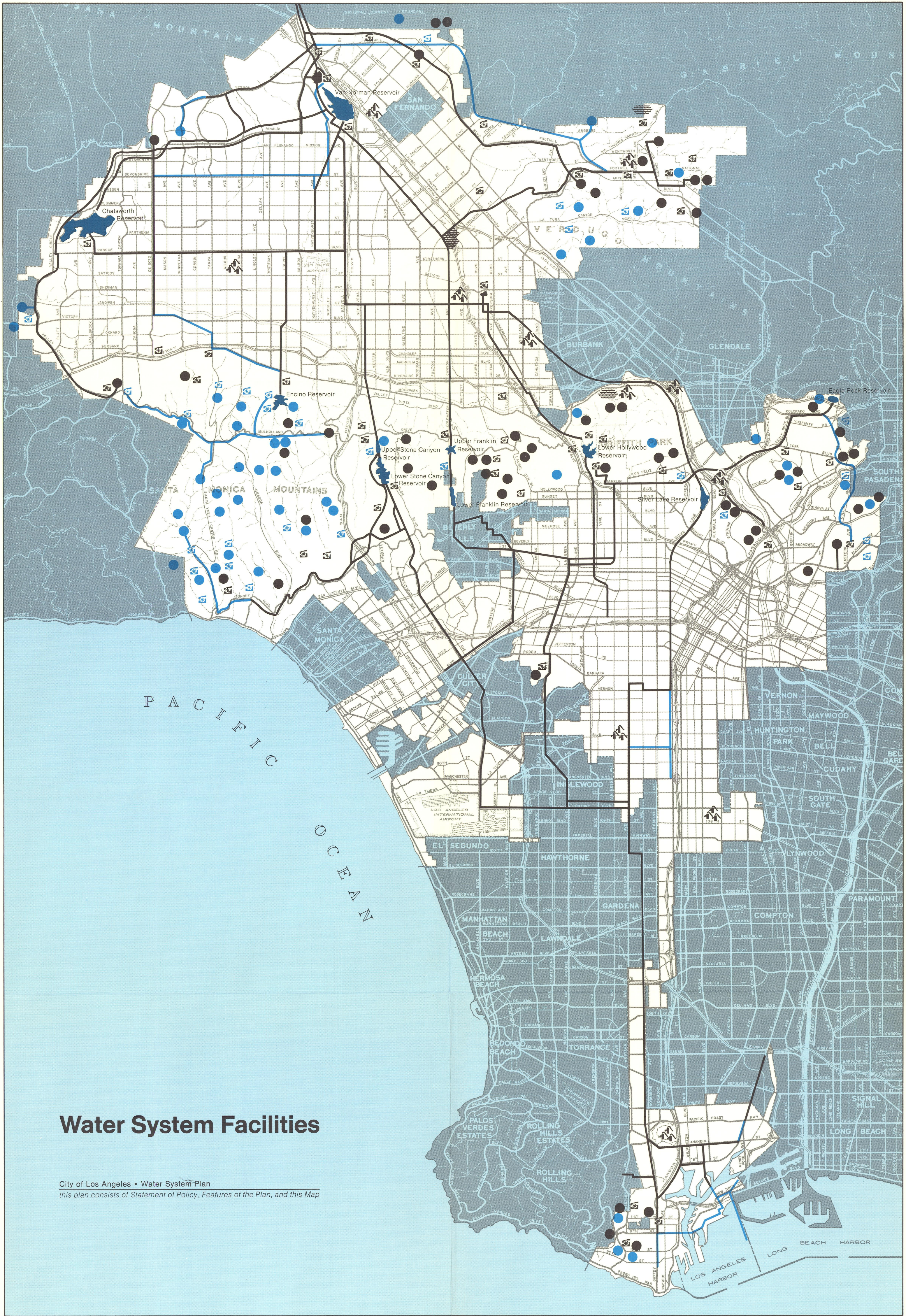
Construction In the 1966-67 fiscal year, \$38 million was spent on Los Angeles City water system capital projects. These projects included work on the Second Los Angeles Aqueduct, Reservoirs (one completed, one begun and 18 planned), and Pumping Stations (three completed, two under construction and 11 planned). Eighty-five miles of new pipe were installed. Additionally, three chlorinating stations and various other improvements were finished. One hundred ninety million dollars has been allocated for capital facilities construction during the five-year period starting in 1968.

Future Water Demand In 1968, per capita daily use of water was about 170 gallons; with increased industrial use this may rise to 200 gallons. The 1968 population of 2.86 million used about 171 billion gallons during the year. With a projected population increase of 500,000 persons every ten years, 292 billion gallons per year would be needed by the year 2000.

The Los Angeles River, Owens River and Colorado River systems are expected to supply adequate water for the City until 1990. New sources are being planned and constructed in order to guarantee the future supply requirements. Some are improvements on traditional sources while others will create new sources of water.



Careful attention is given to every detail during construction to assure a continued adequate water supply.



Water System Facilities

City of Los Angeles • Water System Plan
 this plan consists of Statement of Policy, Features of the Plan, and this Map

FACILITIES	EXISTING	PROPOSED
major water main		
major reservoir tank		
pumping station		
well field		
spreading ground		