

UTILITIES

UTILITES

THE DRAINAGE PLAN: The city of Deer Park is fortunate in being located on relatively high land situated on and across the divide between two major drainage channels, namely Buffalo Bayou and Middle Bayou. The northern portion of the City drains into Buffalo Bayou via two of its tributaries. These tributaries are Boggy Bayou and Patrick's Bayou. The southern portion of the City drains into Middle Bayou via a drainage ditch and two separate channels of Willow Springs Bayou.

Buffalo Bayou Watershed: As mentioned, the northern portion of Deer Park drains to Buffalo Bayou via Boggy Bayou and Patrick's Bayou. Boggy Bayou which drains the northwest portion of the City has recently been enclosed in a concrete storm sewer from Buffalo Bayou to the south right-of-way line of State Highway 225 by the Tenneco Chemical Company. A provision in the design of this storm sewer for a runoff rate from the area south of State Highway 225 of 1300 cubic feet per second was made. The drainage area contributing to this sewer south of the highway is about 1450 acre of which about 750 acres are in Deer Park. A channel capacity at bankfull stage of about 0.9 cfs/acre is provided by Boggy Bayou. This should be adequate for many years unless diversion from another watershed to this channel is made or a land use yielding a higher runoff than residential land use occurs in the Boggy Bayou watershed. The land use plan for the City of Deer Park provides for the area in this watershed to be primarily residential, however, some 700 acres of this watershed lie in Pasadena and the City of Deer Park has no control over its use.

Patrick's Bayou, which drains the remainder of the north portion of the City has been improved by the Harris County Flood Control District. The Channel has a capacity at bankfull stage at the point the channel crosses State Highway 225 of about 740 cubic feet per second. The drainage

area contributing to the runoff at this point in the channel is about 1240 acres. A channel capacity at bankfull stage of about 0.6 cfs/acre is provided by Patrick's Bayou. If the development of this water shed takes place at the rate anticipated, the runoff rate will exceed the channel capacity sometime before 1980 and additional improvements will have to be made to this channel. The proposed channel capacity can be increased to about 1300 cfs, or about 0.9 cfs/acre, by lining the proposed channel with concrete.

Middle Bayou watershed: Three tributaries of Middle Bayou Drain the southern portion of Deer Park; two channels of Willow Springs Bayou and a roadside drainage ditch along the north side of Spencer Highway and the east side of Red Bluff Road.

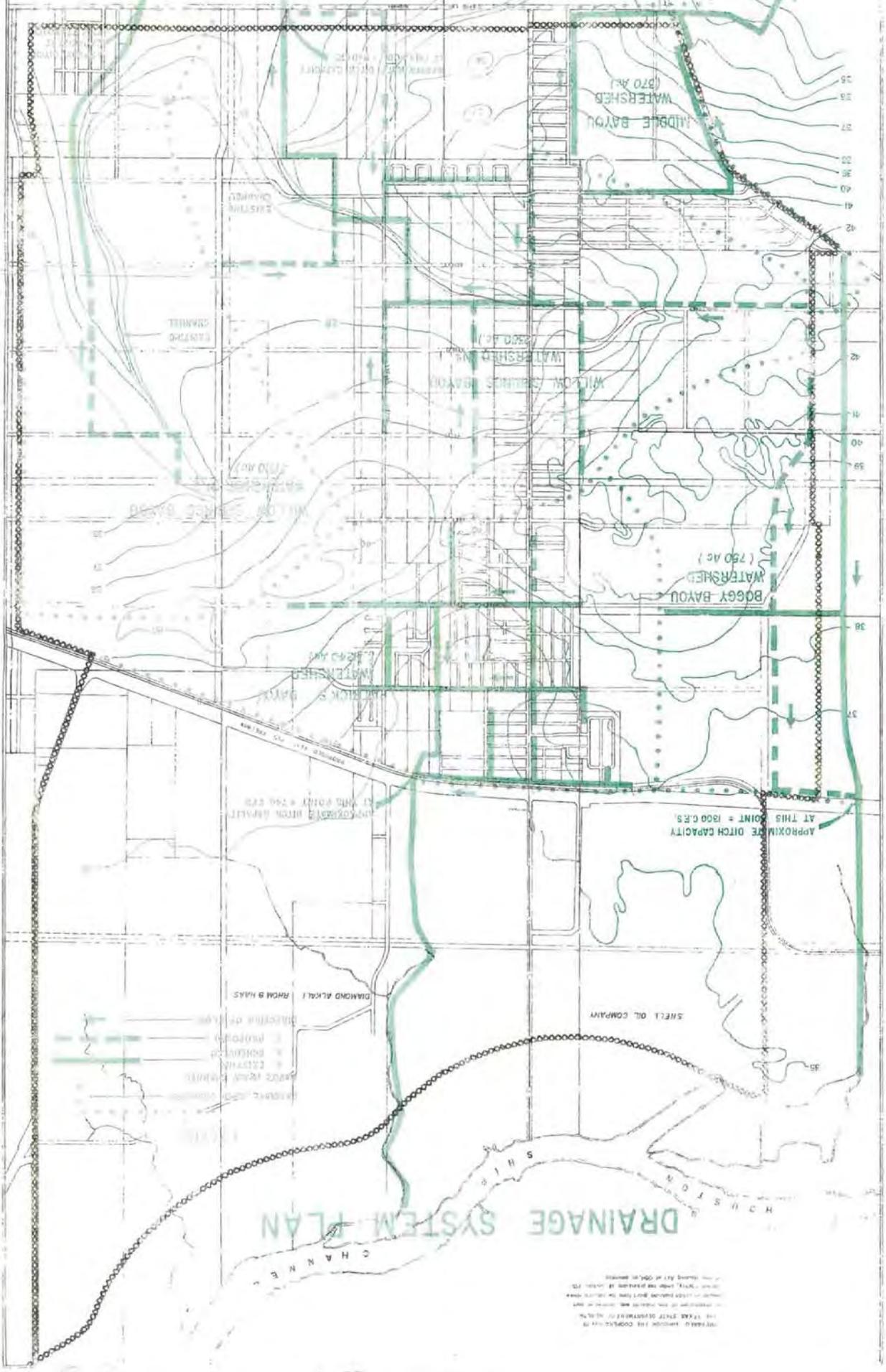
The Spencer Highway drainage ditch which drains about 370 acres in the southwestern portion of the City needs improvements. Apparently, a blockage of the drainage exists in this ditch at Red Bluff Road. The ditch from Red Bluff Road to the west appears to have adequate capacity. A detailed engineering investigation into the capacity of the main drainage channel is indicated at this time.

The main channel of Willow Springs Bayou is scheduled for improvements by the Harris County Flood Control District. The scheduled improvements provide for a channel capacity at bankfull stage at the Spencer Highway of about 1140 cfs, or about 0.5 cfs/acre. This capacity should prove adequate until additional land development in this watershed. The forecasted population distribution for 1980 indicates that about 80% of this watershed will be developed at that time. If this development occurs at the rate anticipated, additional improvements will have to be accomplished on this

channel before 1980. The capacity of the proposed channel could be increased to about 2020 cfs, or 0.9 cfs/acre, by lining the proposed channel with concrete.

The second channel of Willow Springs Bayou drains the eastern extremity of the City. The present channel capacity at the Spencer Highway at bankfull stage is estimated at about 300 cfs, or about 0.25 cfs/acre. This watershed at this time is almost completely undeveloped and flooding of the pasture land adjacent to the channel does little harm. The 1980 population distribution forecast indicates that this watershed will still be largely undeveloped at that time except in its lower reaches adjacent to the Spencer Highway. Additional work of a minor nature will undoubtedly have to be accomplished before 1980; however, it appears that major improvements will not be required before that time.

The proposed routes of the main channels in all watersheds are shown on Plate 11. Also shown on this plate are the proposed routes for the lateral drainage channels that are anticipated to be required before 1980.



DRAINAGE SYSTEM PLAN

PREPARED UNDER THE CONTRACT OF
 THE STATE ENGINEERING DEPARTMENT OF TEXAS
 AND THE CITY OF DEER PARK, TEXAS
 BY MILLER & ASSOCIATES, INC.
 DALLAS, TEXAS

INDICATES THE LOCATION OF
 DRAINAGE CHANNELS
 DITCHES
 AND
 CONCRETE WITH ASPHALT

DIAMOND ALKALI FROM B. HAYS

SHELL OIL COMPANY

APPROXIMATE DITCH CAPACITY
 AT THIS POINT = 1300 C.F.S.

CONCRETE WITH ASPHALT
 AT THIS POINT = 750 C.F.S.

BOGGY BAYOU
 WATERSHED
 (750 AC.)

MIDDLE BAYOU
 WATERSHED
 (870 AC.)

MIDDLE BAYOU
 WATERSHED
 (750 AC.)

SANITARY SEWAGE PLAN

Collection System: The recommended sanitary sewer layout and the drainage area contributing to each individual sewer is shown on Plate 12. The proposed routing takes advantage of the natural slope of the land and provides the most feasible routing for the various sewers.

The existing sewage collection facilities connecting to the Patrick's Bayou treatment plant are located in drainage areas 3 and 4. The existing collection facilities connecting to the Willow Springs treatment plant are located in drainage areas 7 and 8. These collection facilities should prove to be adequate to serve these areas for some time. However, extensions of these collection systems beyond the drainage areas indicated will result in "overloading" and will require the installation of relief sewers.

Recent experiences in drainage area 8 indicate that some of the laterals in this area have inadequate hydraulic capacity and/or are experiencing excessive infiltration. An engineering investigation of this matter is recommended.

Sewage Treatment Facilities: The study of the sanitary sewage treatment facilities indicates that both plants will have to be expanded prior to 1980 and that the City has available sufficient land area in the present sites to accommodate the required expansions. The study also indicates that the per capita sewage contribution is likely to increase over the planning period and that this increase will have to be considered in the next expansions of the sewage treatment facilities. The projected 1980 average sewage flows are presented in Table XIII, page 45. Also, in the future, as the land around Willow Springs Bayou becomes developed, it is anticipated that an "up-grading" of the effluent from the south sewage treatment plant will be required.

In view of the anticipated "up-grading" of the Willow Springs Bayou treatment plant effluent, it is recommended that accurate records of the daily flow received and the quality of effluent be kept in order to determine when an expansion of the facilities will be required.

TABLE XIII
ESTIMATE AVERAGE SEWAGE FLOWS
BY DRAINAGE AREAS

Area	City Acreage	Outside City Acreage	Total Acreage	1980 Population		Average Sewage Flow	
				Inside City	Outside City	1980	M. G. D. Holding Capacity
1	424	0	424	0	0	0	0.50
2	467	0	467	760	0	0.09	0.55
3	355	0	355	2,820	0	0.37	0.42
4	433	0	433	3,530	0	0.46	0.51
5	767	0	767	1,910	0	0.28	0.90
6	133	0	131	1,100	0	0.14	0.15
	<u>2,577</u>	<u>0</u>	<u>2,577</u>	<u>10,120</u>	<u>0</u>	<u>1.34</u>	<u>3.03</u>
Patrick's Bayou Plant							
7	364	17	381	3,020	160	0.42	0.45
8	457	0	457	4,330	0	0.54	0.54
9	662	0	662	4,030	0	0.53	0.78
10	353	0	353	1,750	0	0.25	0.41
11	941	0	941	250	0	0.00	0.99
12	577	54	631	750	500	0.09	0.74
13	137	161 ⁽¹⁾	298 ⁽¹⁾	750	185 ⁽²⁾	0.46 ⁽¹⁾	0.65 ⁽¹⁾
Willow Spring Bayou Plant							
	3,391	91	3,623 ⁽¹⁾	14,880	845	2.29 ⁽¹⁾	4.56
TOTAL FOR CITY	5,968		6,200 ⁽¹⁾	25,000	845	3.63 ⁽³⁾	7.59

(1) Includes San Jacinto Junior College

(2) Does not include population equivalent of San Jacinto Junior College

(3) Without San Jacinto Junior College

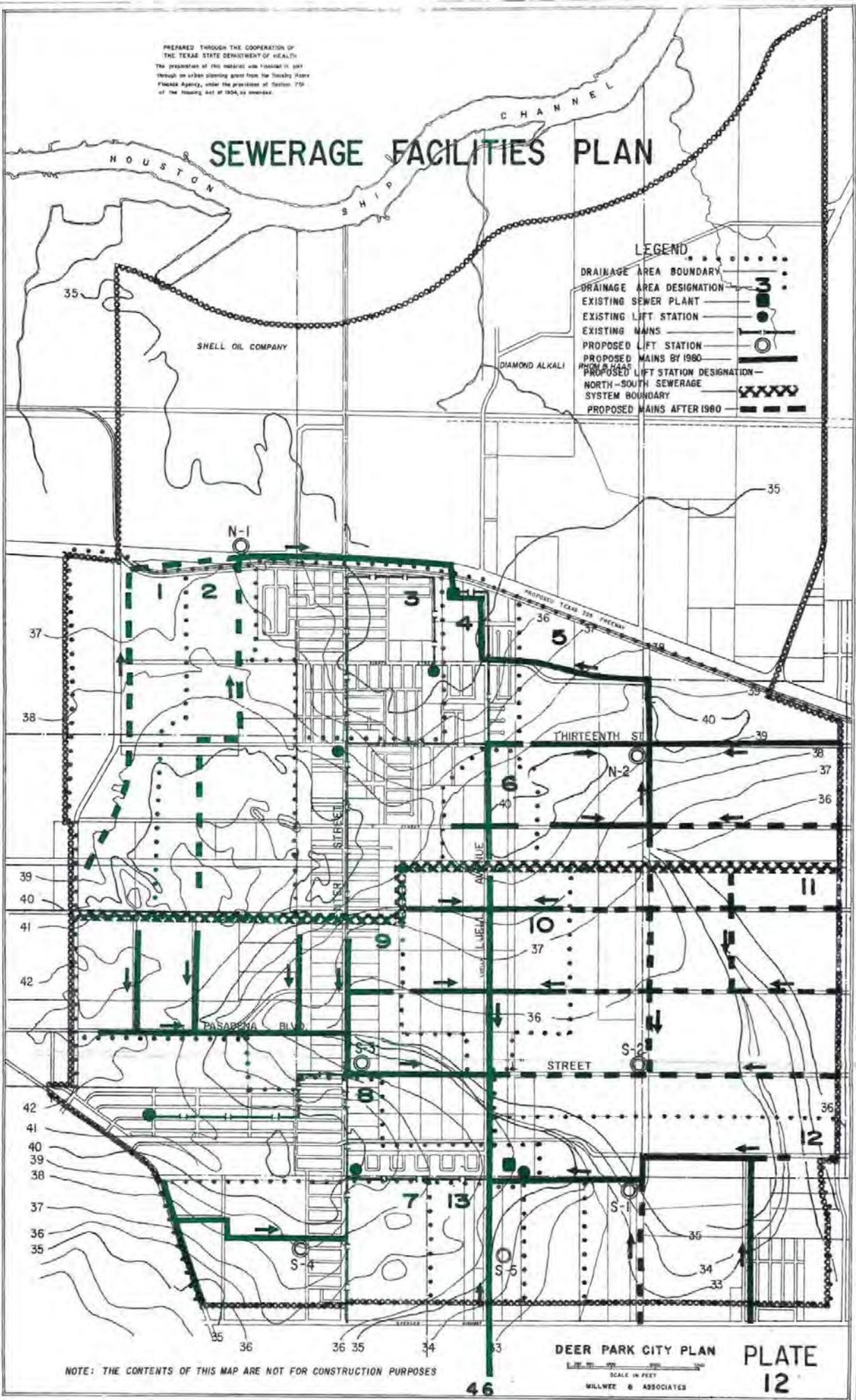
Note: Flow based on 100 gpcpd plus 250 gpad infiltration during ordinary weather.

PREPARED THROUGH THE COOPERATION OF
THE TEXAS STATE DEPARTMENT OF HEALTH
The preparation of this material was financed in part
through an urban planning grant from the Housing Plans
Finance Agency, under the provisions of Section 701
of the Housing Act of 1954, as amended.

SEWERAGE FACILITIES PLAN

LEGEND

- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA DESIGNATION
- EXISTING SEWER PLANT
- EXISTING LIFT STATION
- EXISTING MAINS
- PROPOSED LIFT STATION
- PROPOSED MAINS BY 1980
- PROPOSED LIFT STATION DESIGNATION
- NORTH-SOUTH SEWERAGE SYSTEM BOUNDARY
- PROPOSED MAINS AFTER 1980



NOTE: THE CONTENTS OF THIS MAP ARE NOT FOR CONSTRUCTION PURPOSES

DEER PARK CITY PLAN

PLATE 12

SCALE IN FEET
WILLWEE & ASSOCIATES

WATER SUPPLY AND DISTRIBUTION PLAN

The public water supply must serve two primary purposes, that of the provision of domestic water and of providing fire protection to the homes and structures in Deer Park.

The study indicates that the City may depend upon the ground water aquifers in the area for its source of water for many years, but that it should investigate the possibility of salt water intrusion or depletion of the aquifers.

The water demand per capita is expected to increase during the planning period to approximately 175 gallons per capita per day in 1980. The maximum hourly demand is expected to be approximately 250% of the average hourly demand, and the peak day is expected to be about 175% of the average day.

An investigation into the water quality and the economics of well construction indicates that the water obtained from the available aquifers will require no treatment other than chlorination and that the most economical sources of water are the Alta Loma and Upper Lissie aquifers. Cost data relating to the well construction in these aquifers are shown on Plates WW-1, page 50, and WW-2, page 51. Wells with a capacity of approximately 1500 gallons per minute or a larger capacity appear to be the most economical. It is recommended that wells be so spaced that no more than 1,000 gallons per minute is produced from any one aquifer at points less than 2,000 feet apart. The Texas State Department of Health regulations require that a well be so located that the following sanitary hazards will not be located closer than the distance shown adjacent thereto:

Concrete or tile sanitary sewer	50 feet
Stock pens	50 feet
Septic tank drainfields	150 feet
Drainage ditch	300 feet
Sewage Treatment plant	500 feet

It is recommended that the City secure a sufficient well site size to insure that these sanitary hazards will not be located closer than the minimum distances shown.

The water supply study indicates that approximately four additional wells, depending upon the capacity, will have to be constructed prior to 1980 and that ultimately approximately eight wells will have to be provided.

A study of the storage requirements indicates that the City will have to provide, if it is to meet acceptable recognized standards, ground storage facilities having an aggregate capacity of 3.25 million gallons by 1980. It is recommended that ground storage reservoirs in the order of 1 million to 1.5 million gallons be constructed to correspond to the capacity of the well or wells it serves. At the present time (1962) the city is in need of additional ground storage capacity. Cost data relating to the construction of ground storage reservoirs is shown on Plate W-4, having an aggregate capacity of 1.36 million gallons by 1980. It is estimated that the elevated storage capacity the City now provides will be sufficient through 1967. Cost data relating to the construction of elevated tanks is presented on Plate W-5, page 53.

At the present time (1962), the City does not have sufficient booster pumping capacity to adequately provide for the required fire flow demand and the ordinary water consumption.

As a result of the above conclusions, it is recommended that the City consider the possibility of constructing a water plant in 1962 or 1963 consisting of a new well in the 1,000 to 1,500 gallons per minute capacity range, a one million gallon ground storage reservoir, and a booster pumping station. This plant should be constructed in planning Unit 4 or 5 between the two existing population concentrations.

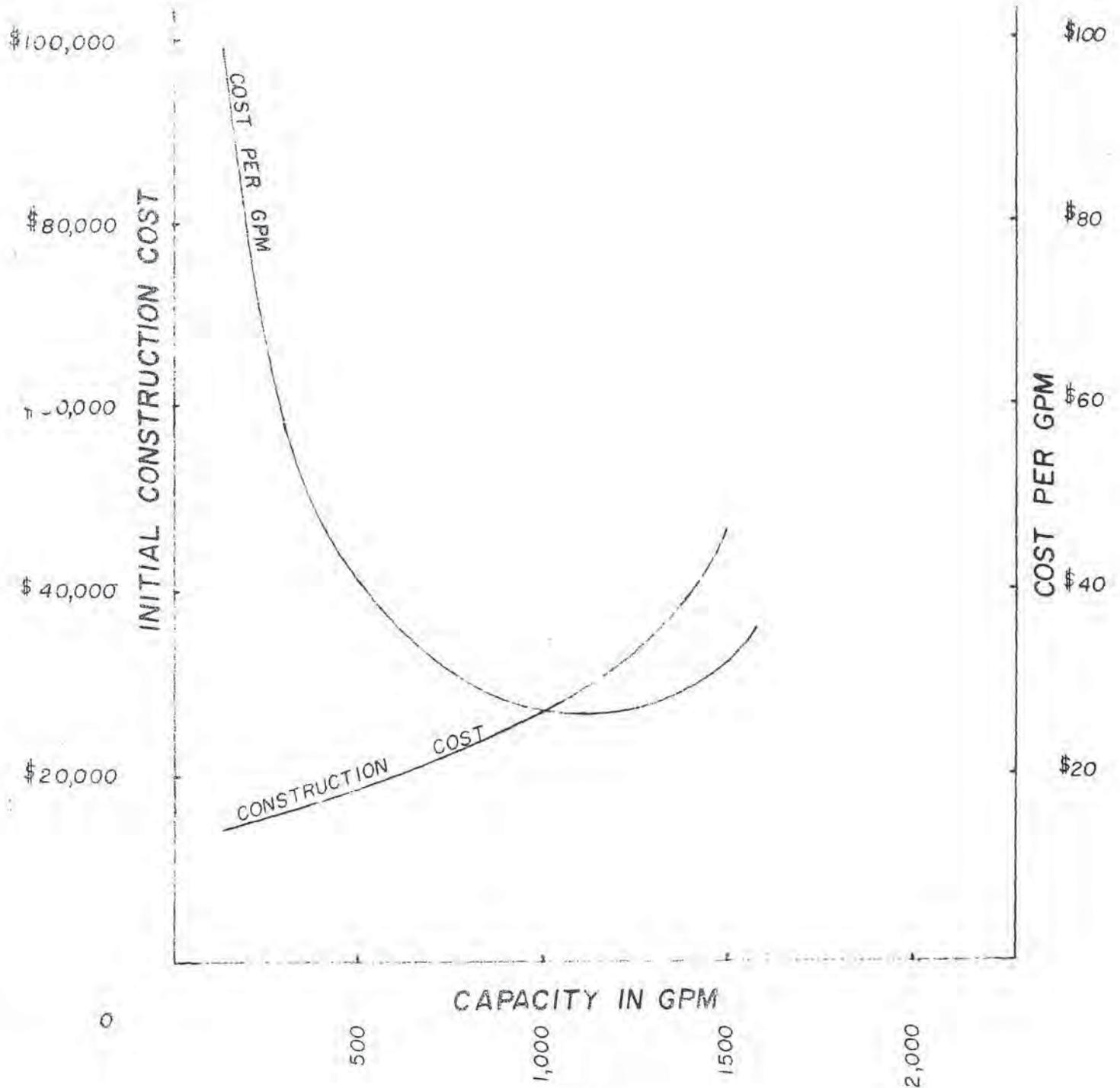
The water mains forming the skeleton of the distribution system are shown on Plate 13. It will be noted that a grid layout is proposed and that the various production, storage and pumping facilities are located at various points around the City. This type distribution system provides many advantages over a radial type distribution.

As the City of Deer Park is subjected to hurricane winds from time to time, it is recommended that the water supply system be equipped with auxiliary power equipment in order that this important public facility can be kept in service during periods of power failure.

WATER WELL COST COMPARISON

ALTA LOMA FORMATION 550' TD

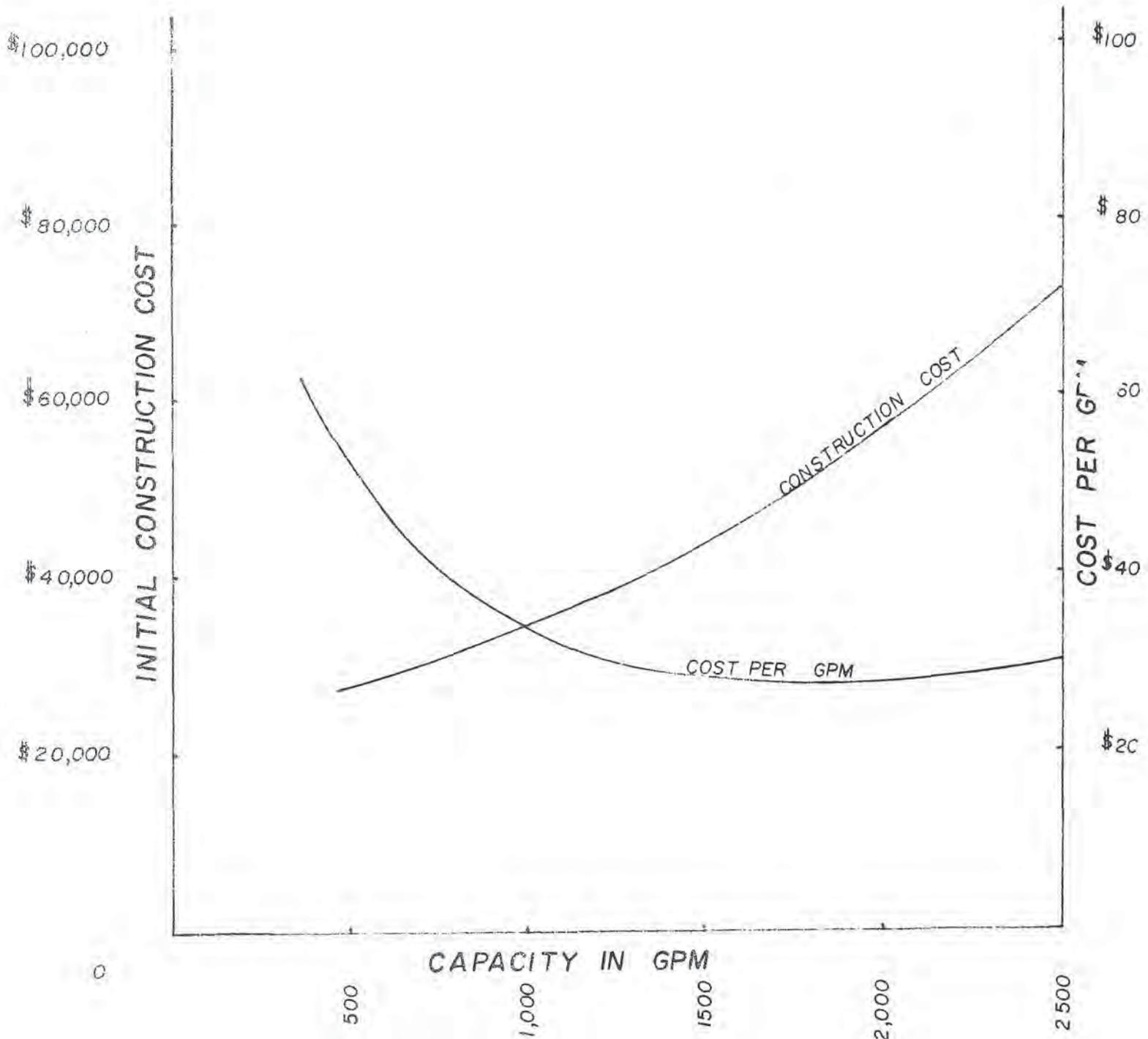
DEER PARK, TEXAS AREA



WATER WELL COST COMPARISON

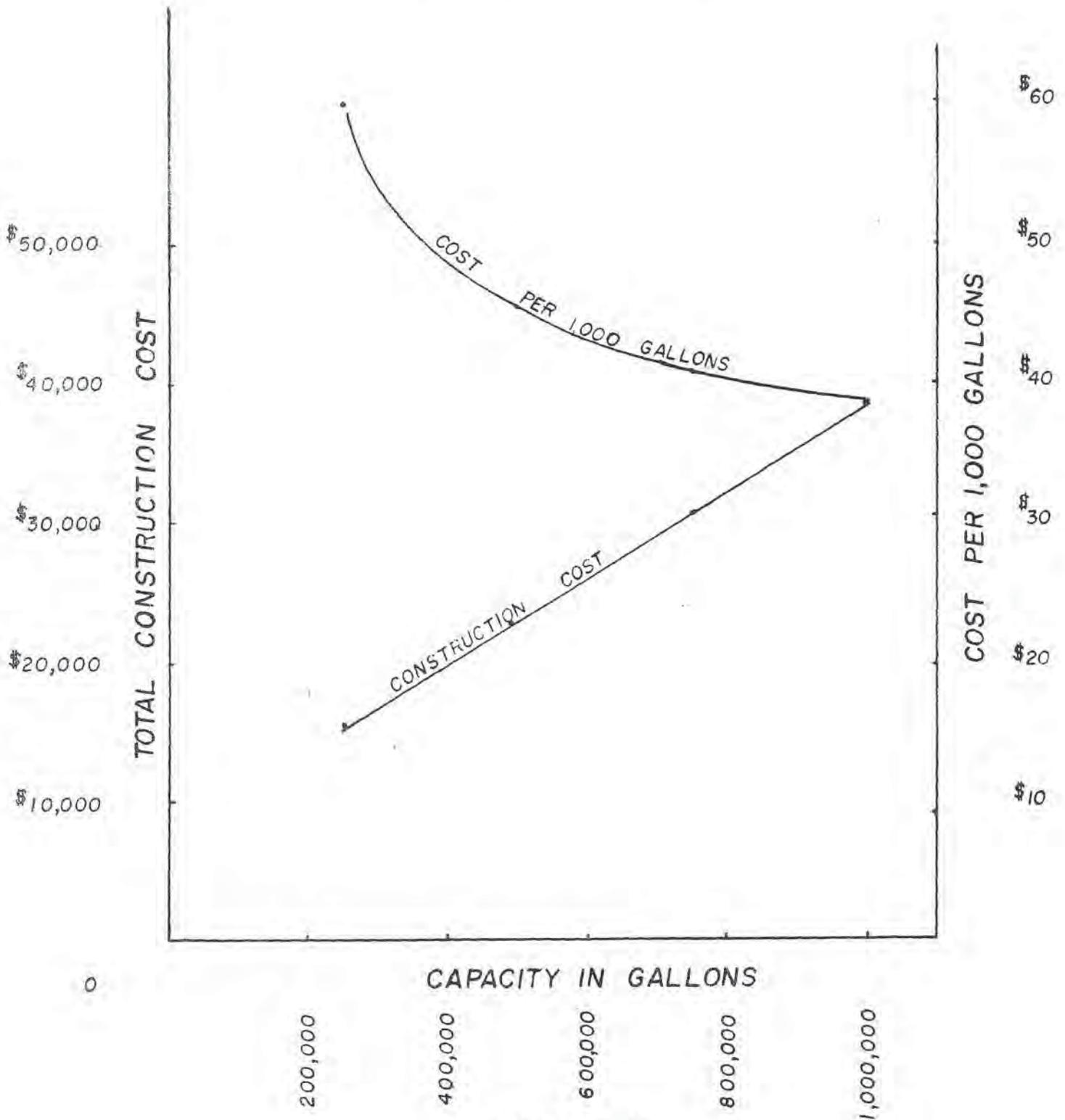
UPPER LISSIE FORMATION - 1200'
(600' - 1400')

DEER PARK, TEXAS AREA



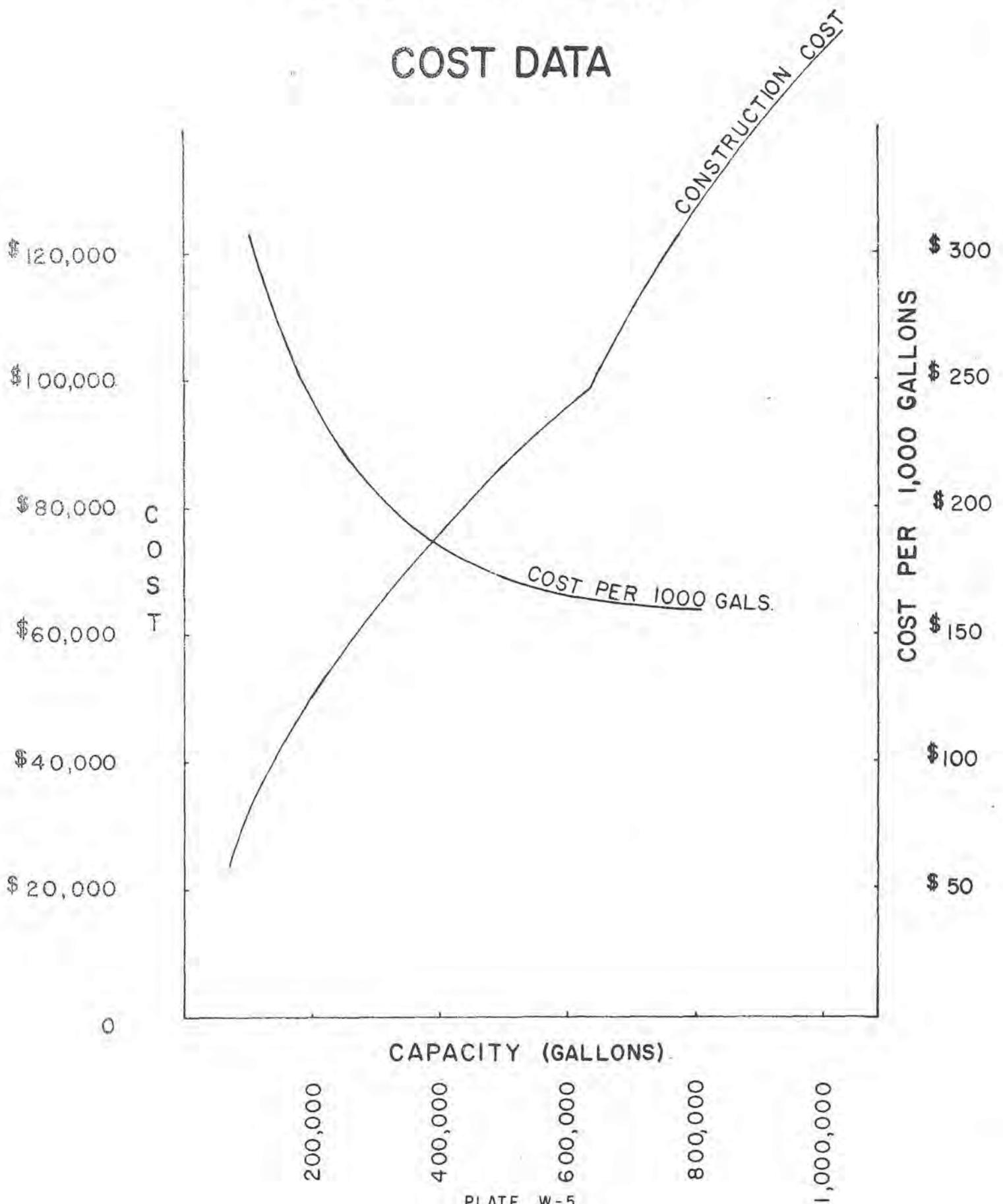
GROUND STORAGE TANK COST DATA

DEER PARK TEXAS AREA



ELEVATED TANK

COST DATA



PREPARED THROUGH THE COOPERATION OF
THE TEXAS STATE DEPARTMENT OF HEALTH
The preparation of this schedule was facilitated in part
through an urban planning grant from the Housing Home
Finance Agency, under the provisions of Section 701
of the Housing Act of 1949, as amended.

WATER FACILITIES PLAN



- | | | | |
|---|--------------------------------|-------|----------------------------|
| ■ | EXISTING WELL & GROUND STORAGE | — | EXISTING MAINS (8" & OVER) |
| □ | PROPOSED WELL & GROUND STORAGE | — | PROPOSED 10" MAINS |
| ● | EXISTING ELEVATED STORAGE | - - - | PROPOSED MAINS (6" - 8") |
| ○ | PROPOSED ELEVATED STORAGE | | |

DEER PARK CITY PLAN
SCALE IN FEET
MILLWEE & ASSOCIATES

PLATE
113

PARKS AND RECREATION

PARKS AND RECREATION

The population of the City of Deer Park is amply supplied with regional recreational facilities. However, the City is lacking in neighborhood and community recreational facilities. This lack has not been serious in the past nor will it become serious for some time to come because of the vacant land within the City and the abundance of regional recreation facilities which are freely used by the population, but as Deer Park and the region around it grows, a greater and greater demand will be made on the regional recreational facilities and the roads that serve them. This fact will tend to place an increasing emphasis on recreational facilities provided locally.

The location and type of recreational facilities recommended are shown on Plate 14. It is not intended that the locations shown be interpreted as exact locations but merely as general locations which would be suitable. The following general recommendations are offered to supplement this Plate.

- (1) The City should continue its efforts toward the development of a complete community playfield on the twenty acre site on "P" Street.
- (2) Efforts should be made to acquire a site approximately twenty acres in size, located at a central point for the development of a community park. The site should be easily accessible but not necessarily on a major or secondary thoroughfare.
- (3) Every effort should be made to purchase and develop combination neighborhood parks and playgrounds on 5 to 6 acre sites within a one-half mile radius of all homes. These sites should be properly equipped to facilitate their usefulness.
- (4) Encouragement should be given to civic clubs, private citizens and businesses to carry out beautification projects within the neighborhood parks and playgrounds.

- (5) When the existing community building located on the corner of 13th and Center Streets becomes too small, a larger community building should be constructed at a more centrally located site and the old building converted to another use. This building might be constructed in the community park or the community playfield grounds.
- (6) In the event the policy of the Deer Park Independent School District changes to allow the development of combination recreation facilities, the City should be ready to participate in this program as this will avoid a duplication of facilities.

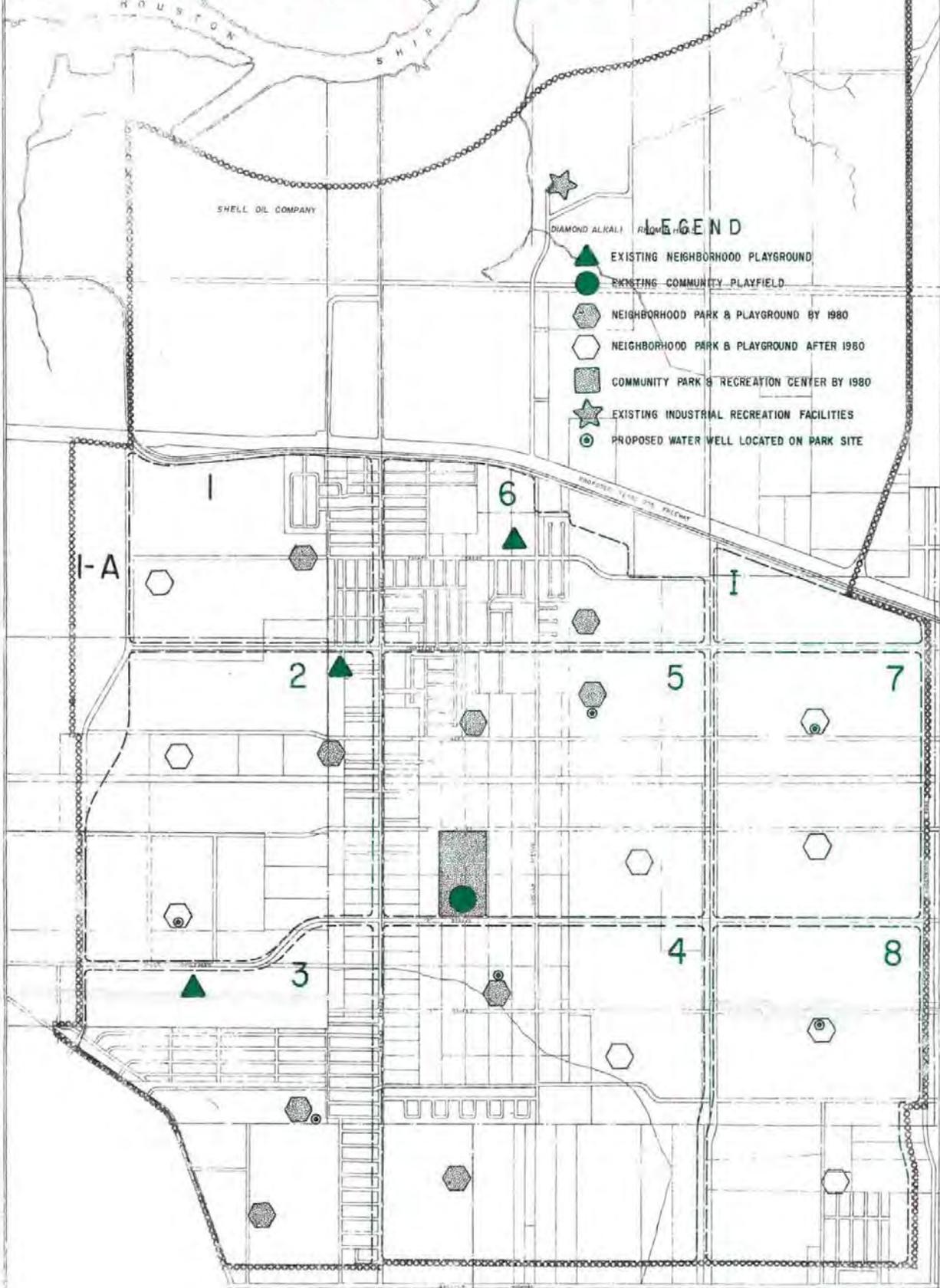
It is recommended that the City give consideration to the possibility of providing the following facilities in the near future.

- (1) More facilities at the existing Community playfield including possibly a swimming pool, tennis courts, and elementary age play equipment.
- (2) The Neighborhood Park and Playground located in Planning Unit #3.
- (3) The Neighborhood Park and Playground located in Planning Unit #1.
- (4) The Neighborhood Park and Playground located in Planning Unit #6.

The achievement of the overall Parks and Recreation Plan will depend primarily upon two factors: 1) the interest and enthusiasm of the citizens, and 2) the financial ability of the City to meet these needs as well as the needs for other facilities that will have to be provided.

PREPARED THROUGH THE COOPERATION OF
THE TEXAS STATE GOVERNMENT THROUGH THE
CONTRIBUTION OF THE FEDERAL AID HIGHWAY ACT
FOR THE PURPOSE OF PLANNING AND DEVELOPING
LOCAL COMMUNITY RECREATION FACILITIES
AS AUTHORIZED BY THE PROVISIONS OF SECTION 10
OF THE HOUSING ACT OF 1954, AS AMENDED

PARK AND RECREATION PLAN



- LEGEND**
- EXISTING NEIGHBORHOOD PLAYGROUND
 - EXISTING COMMUNITY PLAYFIELD
 - NEIGHBORHOOD PARK & PLAYGROUND BY 1980
 - NEIGHBORHOOD PARK & PLAYGROUND AFTER 1980
 - COMMUNITY PARK & RECREATION CENTER BY 1980
 - EXISTING INDUSTRIAL RECREATION FACILITIES
 - PROPOSED WATER WELL LOCATED ON PARK SITE