ENVIRONMENTAL RESOURCES ELEMENT
of the
SIGNAL HILL GENERAL PLAN

City of Signal Hill
Draft - For Discussion Only

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I. INTRODUCTION

A. Purpose and Scope

The purpose of the Environmental Resources Element is to improve the overall quality of life for Signal Hill residents through proper guidance in the management of natural resources and open space lands. The goals, policies and implementation programs for the Signal Hill Environmental Resource Element are guidelines that will direct the timing, location, amount and uses of resources, such as air, groundwater, soils, wildlife and minerals, as well as those properties that are generally unimproved.

Data in the Signal Hill Environmental Resources Element reveals current conditions for the atmospheric environment, water and hydrology, land resources, biological resources, historical, paleontological and archaeological resources and open space and energy resources.

B. Legislative Authorization

The State of California recognizes open space lands as a valuable resource not only for their aesthetic, recreational and public health qualities, but as a limited natural resource. The state also recognizes that all natural resources are limited and, along with open space lands, are part of an overall ecosystem. The state has mandated, therefore, that each city prepare Open Space and Conservation Elements in its General Plan to provide overall, comprehensive guidelines for the protection and proper management of open space lands and natural resources. The Signal Hill Environmental Resources Element is a combination of the required Open Space and Conservation Elements and includes all state-mandated requirements for each element.

California state law defines open space land as "...any parcel or area of land or water which is essentially unimproved and devoted to an open-space use...."[1] Section 65560 of the California Government Code describes the requirements for the open space element as follows:

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1 State of California. Government Code Section 65560 (b).

"...(1) for the preservation of natural resources including, but not limited to, areas required for the preservation of plant and animal life...; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and coastal beaches, lakeshores, banks of rivers and streams and watershed lands; (2) open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply; (3) open space for outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails and scenic highway corridors; (4) open space for public health and safety, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs and areas required for the protection and enhancement of air quality."

California Government Code Section 65302(d) specifies that the purpose of a Conservation Element is "...for the conservation, development and utilization of natural resources, including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals and other natural resources." In addition, "...the conservation element may also cover: (1) the reclamation of land and waters; (2) prevention and control of the pollution of streams and other waters; (3) regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan; (4) prevention, control and correction of the erosion of soils, beaches and shores; (5) protection of watersheds; (6) the location, quantity and quality of the rock, sand and gravel resources; and (7) flood control."

C. Justification for Combination of the Conservation and Open Space Elements

Conservation and open space elements are complementary and can be legally combined into one, as in the City of Signal Hill Environmental Resources Element. Since requirements for the Conservation Element closely parallel those categories for an Open Space Element that deal with "...open space for preservation of natural resources and open space for the managed production of resources," they are closely linked and should be combined.

D. Relationship of the Environmental Resources Element to Other General Plan Elements

The Environmental Resources Element is perhaps most closely related to the Land Use Element in the Signal Hill General Plan. Both elements examine and provide policy guidelines related to natural resources (e.g., water, agriculture, soil, mineral and wildlife resources) and aesthetic, cultural and recreational resources (e.g., parks, scenic areas, views and public access). The Environmental Resources Element is also related to the land use, safety and noise elements in terms of hazards (e.g., oil production and flooding). For example, the Land Use Element provides guidelines for regulating the development of residential land uses in sloped areas, whereas the Environmental Resources Element locates and defines those areas and specifies means of reducing the hazards where possible.

II. BACKGROUND AND EXISTING CONDITIONS

A. Atmospheric Environment

1. Climate

Signal Hill is located within the South Coast Air Basin. The annual average temperature in the city ranges from the mid 50 degrees Fahrenheit (°F) in winter to the mid 70°F in the summer. Average temperatures in January range from 46°F to 65°F and in July from 62°F to 82°F. Freezing conditions and temperatures over 100° occur infrequently. Annual precipitation varies, with a long-term average of about 15.4 inches per year. Annual average relative humidity in January ranges from 50 to 75 percent daily, whereas in July it varies from 60 to 85 percent.

The prevailing wind pattern is a daytime sea breeze, flowing toward the east and northeast with little seasonal variability. Nighttime winds are light, and although variable, often have an offshore character that flows toward the south/southwest. During the fall and early winter, Santa Ana wind conditions sometimes occur. These relatively strong winds flow from the mountains in the east toward the southwest in the vicinity of Signal Hill and generally increase local temperatures.

2. Air Quality

The South Coast Air Basin experiences light average wind speeds, which results in the slow dilution of air contaminants. The vertical dispersion of air contaminants within the South Coast Air Basin is frequently limited by the presence of a persistent thermal inversion, or inversions, between ground level and about 1,500 feet (a thermal inversion is an atmospheric layer exhibiting a sudden rise in temperature with increasing height above the ground). A thermal inversion generally traps vertical air movement, preventing it from mixing upward and dispersing. The distance from the ground surface to the bottom of the lowest inversion layer is called the "mixing height." This height frequently increases vertically during the day. Winter inversions frequently break up completely by midmorning. Summer inversions often break up in the afternoon. This phenomenon, along with the arrival of the sea breeze front, sometimes results in a sudden clearing up of visible smog during summer afternoons in the coastal areas.

Most air pollutants are released near the ground surface and mix upward as far as the mixing height will allow. A combination of a low inversion and low windspeed results in the least dilution and greatest concentrations of air contaminants. Air pollution levels are lowest when there is no inversion and moderate to strong windspeeds (10 mph or more) are prevalent.

These atmospheric conditions usually follow a daily and seasonal pattern. Pollutant concentrations of carbon monoxide and nitrogen oxides can be highest during the night and early morning hours. Photochemical smog (ozone, etc.) is the principal concern during summer and early fall due to greater solar intensity and a low mixing height level. Ozone levels are at their lowest during winter months due to an increased mixing height during the hours of strong sunlight.

Air quality in an area is a function of the primary and secondary pollutants, the existing regional ambient air quality, and the topographical and meteorological factors influencing the transport and dispersion of pollutants. Air quality is determined by both primary and secondary air pollutants. Primary pollutants are emitted from a source into the atmosphere and include carbon monoxide (CO), oxides of nitrogen (NOx), reactive organic compounds (ROC), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and total suspended particulates (TSP). Secondary pollutants are created with the passage of time in the air mass by chemical and photochemical reactions. Examples of secondary pollutants include oxidants, primarily ozone (O_3) and sulfate particulates.

3. Ambient Air Quality

Ambient air quality is given in terms of state and federal standards adopted to protect public health with a margin of safety. Air quality trends are shown in Table 1. In addition to ambient standards, California has adopted episode criteria for oxidants, carbon monoxide, sulfur dioxide, nitrogen dioxide and particulate matter. The episode levels represent short-term exposures at which public health is actually threatened. Air quality data are collected by the South Coast Air Quality Management District (SCAQMD). The SCAQMD air monitoring station located at Long Beach Airport is most representative of Signal Hill's ambient air quality. Table 1 is based on data from this station, and the following air quality trends have developed in Signal Hill.

TABLE 1

AIR QUALITY TRENDS, 1981-1984
LONG BEACH AIR QUALITY MONITORING STATION[1]

	1981	1982	1983	1984
Ozone (O_3)				
Highest concentration (parts per million)	0.23	0.22	0.30	0.27
Number of days state/federal standards exceeded	30/13	18/6	35/16	32/13
Carbon Monoxide (CO)				
Highest concentration (parts per million)	13.0	14.0	14.0	14.0
Number of days state/federal standards exceeded	0/0	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)				
Highest concentration (parts per million)	0.37	0.30	0.37	0.35
Number of days state/federal standards exceeded	13/ND	4/ND	3/ND	7/1
Sulfur Dioxide (SO_2)				
Highest concentration (parts per million)	0.14	0.09	0.12	0.32
Number of days state/federal standards exceeded	0/0	0/0	0/0	1/0
Total Suspended Particulates (TSP)				
Highest concentration (micrograms per cubic meter)	292	192	212	195
Number of days state/federal standards exceeded	22/2	13/0	16/0	15/0

Ozone: Ozone is the air pollutant of primary concern in Signal Hill and adjacent areas. Ozone is formed by the reaction of hydrocarbons and oxides of nitrogen in the presence of bright sunlight. Pollutants emitted upwind react while being carried downwind to produce the oxidant concentrations experienced in this area. The state 1-hour ozone standard was exceeded an average of 29 days each year at the Long Beach air monitoring station and federal standards were exceeded an average of 12 days each year from 1981-1984.

Carbon Monoxide: Carbon monoxide is a primary pollutant that is concentrated near major roadways and freeways. Carbon monoxide levels did not exceed state or federal standards between 1981 and 1984.

Nitrogen Dioxide: Nitrogen dioxide levels exceeded the state NO_2 standard an average of 7 days each year between 1981 and 1984, and an average of 0.25 days per year during this period.

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1 South Coast Air Quality Management District, Air Quality Data 1981-1984. California Air Resources Board, Air Quality Data, 1985.

Sulfur Dioxide: State sulfur dioxide standards were exceeded an average of 0.25 days per year during the period 1981 to 1984. Federal standards were not exceeded.

Total Suspended Particulates: The state particulate standard was exceeded an average of 17 days each year, monitored at the Long Beach Station. These episodes are primarily due to natural sources, but are also linked to grading operations and motor vehicle emissions. The federal particulates standard was exceeded and average of 0.50 days each year from 1981 to 1984.

4. Air Quality Management

The State Lewis Air Quality Act (1976) and the Federal Clean Air Act Amendments (1977) require the development of a program to meet state and federal air quality standards in the South Coast Air Basin (SoCAB). The state has indicated a time frame of "...at the earliest achievable date" and the federal government required attainment of all primary national ambient air quality standards by 1982, with a possible extension of attainment deadlines to 1987 for carbon monoxide and photochemical oxidants. The SoCAB has been designated a nonattainment area for oxidants, carbon monoxide, nitrogen dioxide and total suspended particulates.

In February 1979, the Southern California Association of Governments (SCAG) and the South Coast Air Quality Management District (SCAQMD) adopted the Air Quality Management Plan (AQMP) for the South Coast Air Basin. After several revisions, the AQMP was adopted by SCAG and the SCAQMD on October 15, 1982. AQMP projections and mitigation measures are based on the SCAG-82A Growth Forecasts. The AQMP recommends control measures that, when implemented, will succeed in reducing primary air emissions to the level of the state and federal air quality standards by 1987. The control measures rely heavily on continued technical improvements to both stationary and mobile pollution control equipment and the implementation of transit, rideshare and congestion relief.

Rules and Regulations: The SCAQMD has published a set of "Rules and Regulations" to reduce both stationary and mobile source pollutant emissions. This document outlines permits, fees prohibitions, procedures for hearings, emergency measures,

order to abatement, standards of performance for new stationary sources, and standards for additional specific air contaminants (Federal Register, Vol. 46, No. 13, January 13, 1981).

Of particular concern to cities within the South Coast Air Basin is Regulation IV, Prohibitions, of the "Rules and Regulations," which relates to the emission of fugitive dust (Rule 403). Regulation IV is one of the few rules and regulations applicable to site-specific projects that has feasible means of reducing fugitive dust. Rule 403 mandates that "...a person shall not cause or allow fugitive dust emissions from any transport, handling, construction, or storage activity, so that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source." Also, "...a person shall take every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, cleaning of land and solid waste disposal operations" (Rule 403(b)) and "...to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations" (Rule 403(d)).

Los Angeles County Subregional Element: Los Angeles County has developed a "Subregional Element for the 1982 Regional Air Quality Management Plan." Several measures are listed in the Los Angeles element that may have applicability to future projects in Signal Hill. These include encouraging new development to incorporate commercial and industrial uses near residential communities to reduce trips and trip lengths. The element also encourages several parking strategies, carpool and bus alternatives, the promotion of bicycle rack installation, and tree and shrub planting to improve air quality.

B. Hydrology

1. Surface Water

Surface water in Signal Hill occurs in the form of runoff that follows the topographic features of the Hill.[1] Figure 1, Drainage, shows the overall surface water flow pattern in Signal Hill. In the past, the City has been subject to flooding in the low-

1 Note: The Hill is the highest point and the most notable topographic feature of Signal Hill. It is located in the southeast portion of the City and is a major feature of community identity.

The California Bowl Detention Basin is located between Spring Street, Orange Avenue, Willow Street, and California Avenue in the City of Long Beach. This basin provides flood protection for the west drainage area of the city. Presently, storm runoff in the area east of the basin is conveyed as street flow in a northerly direction to a City of Long Beach storm drain located along the south side of the San Diego Freeway. This drain conveys these street flows and runoff from the San Diego Freeway to the basin. The basin outlets into a storm drain located along 27th Street and is ultimately discharged into the Los Angeles River.

In addition to these major drainage facilities, three minor storm drains exist within the City. These storm drains are the uppermost reaches of major drainage facilities existing within the City of Long Beach (see Figure 1, Drainage).

The first storm drain is located along Wardlow Road, with a lateral drain along California Avenue and Cherry Avenue. This drain provides flood protection for the portion of the City located north of the San Diego Freeway.

The second minor drain is located in the west drainage area of the city. This drain serves as an outlet storm drain for a sump condition that exists at the intersection of Atlantic Avenue and Columbia Street.

The third minor drain is located in the south drainage area of the city along 21st Street. This storm drain receives runoff from the area between Junipero Avenue, 21st Street, Temple Avenue and Pacific Coast Highway.[1]

2. Groundwater

Signal Hill is located within the Long Beach Plain groundwater basin. The basin includes the Gage, Lynwood, Silverado and Sunnyside aquifers, which developed in the buried stream channels and flood plain deposits of the ancient Los Angeles and San Gabriel River drainage courses.[2]

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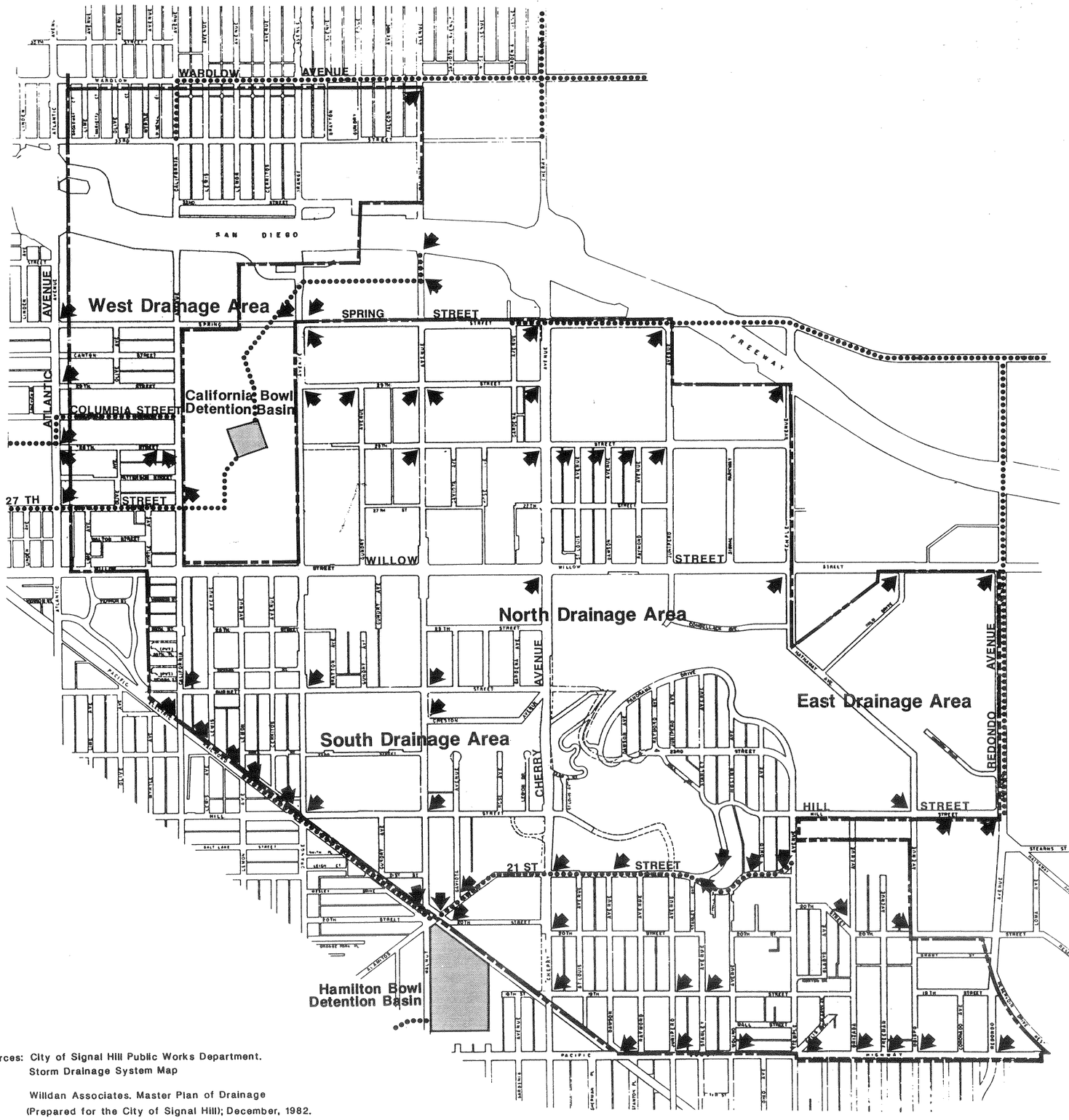
1 City of Signal Hill, The Master Plan of Drainage (p.5).

2 Jim Hinzdel and Associates. Draft Environmental Impact Report (Tentative Tract 43263) for Belmont Vista Development. February 1985. p IV-2.

DRAINAGE

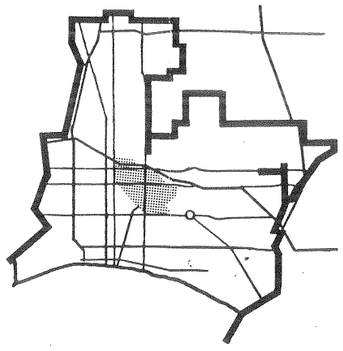


Sources: City of Signal Hill Public Works Department.
Storm Drainage System Map

Willdan Associates. Master Plan of Drainage
(Prepared for the City of Signal Hill); December, 1982.

LEGEND

- Storm Drain
- Direction of water flow
- Detention Basin



0 600 1200 1800

City of Signal Hill

FIGURE 1

ENV. RES.

Water from the basin and delivered to Signal Hill residents is of good quality. All county, state and federal water quality standards have been met or exceeded in the past and in the current water supply. There are occasional consumer complaints about rust in the system that are remedied immediately by flushing the lines involved. Water supply is discussed in some detail in the Circulation and Infrastructure Element.

C. Land Resources

1. Geology

Knowledge and awareness of the community's underlying geologic structure and proximity to major fault lines is critical for the many land use and developmental possibilities in the seismically active area of Southern California. The land in Los Angeles County is in a youthful state of geological evolution, and is considered unstable.[1] Many active and potentially active earthquake faults are found in the county. Liquefaction, landsliding, shattered ridges, land settlement, tsunamis and seiches are other seismic-related hazards found in the region. Many areas are subject to local earth movement, such as landslides, rockslides and subsidence. Rocks and soils prone to instability include alluvium, terrace deposits, shale, metamorphic schist and siltstone.

Identification of geologic hazards and seismic risk in Signal Hill is essential because of the City's close proximity to the most important geologic feature in the Southern California region: the Newport-Inglewood Fault. Movement within this fault region was responsible for the 1933 Long Beach earthquake, which registered 8.3 on the Richter scale (refer to the Safety Element for additional discussion on seismic hazards).

The Newport-Inglewood Fault is a normal fault with a strike slip fault component. Several other well-known, potentially active faults are located within the same geographical area as the Newport-Inglewood Fault: the Cherry Hill Fault, the Dickler Fault, the Northeast Flank Fault and the Reservoir Hill Fault (refer to the Safety Element, Figure 2, and Section II.B., Geologic Hazards of the Safety Element).

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1 Los Angeles County General Plan. November 1980.

2. Soils

Signal Hill is located in an area known as the Los Angeles Coastal Plain. The plain sits on an extraordinarily deep marine and nonmarine sedimentary base that has an important bearing on earthquakes, petroleum deposits and subsidence problems. Table 2 shows geologic zones in Signal Hill.

TABLE 2

GEOLOGIC ZONES

Zone	Thickness (feet)		Composition
—	500		Sand, reddish-brown, silty, poorly consolidated; siltstone; and gravel
—	—		
Upper Gas zone	1,750	2,500	Sand, gray, medium to coarse grained, poorly consolidated, pebbly. Shale, olive to dark brown, massive, silty.
Upper Wilbur zone	2,500		
Lower Wilbur zone	2,650	2,500	Sand, fine to coarse grained, occasionally pebbly, with thin calcareous sandstone interbeds. Shale, dark grey to dark brown, sandy, micaceous.
Alamitos zone	3,000		
Brown zone	4,800	9,000	Sand, light grey, fine to medium grained, massive, firm to friable, with thin interbeds of silt and silty shale. Shale dark brown to gray-black, hard, fissile, biotitic.
Deep zone	5,500		
—			
DeSoto zone	9,500		
—	—	—	Talcshist, green to bluish green, containing some glaucophane and quartz.

Source: City of Signal Hill. Derived from summary of California Oil Fields, State Division of Oil and Gas, 1968.

For the most part, soils within the City are composed of weathered alluvium and are thus classified as silts and sands. The following is a description of the soil composition and conditions in the City.

Southeast Section: Upper natural soils consist of fine to medium fine sand and silty sand generally nonexpansive with isolated areas of slightly expansive, sandy clays and clayey fine sands. Fill materials are scattered in this area and vary in depth up to 25 feet.

Southwest Section: Upper natural soils consist of sand, very fine to fine to medium, silty sand and clayey fine to medium sand essentially nonexpansive. Fill materials may also be encountered throughout the area up to 18 feet deep, generally in the petroleum production areas.

East Central Section: Upper natural soils consist of clean sands, silty sands, silts and sandy silts, and silty and sandy clays. There is a slight change in soil composition from nonexpansive in the eastern portions of this area to slightly expansive in the western portions of the area. High contamination of natural soils occurs with petroleum production operations in this section. Fill materials of varying depth may be found throughout this section and are mixed with a considerable amount of inorganic debris.

West Central Section: Natural soils consist of fine sands, silty sands, clayey sands and sandy clay. Soils are slightly to moderately expansive. Traces of oil in the upper native soil can be found due to petroleum production operations in this section. Fill materials to 25 feet in depth are located in oil production areas.

Northern Section: Upper natural soils consist of silty clays and clayey silts. These soils are, in general, moderately expansive except in the eastern area, which is highly expansive.

3. Topography and Slope

The City of Signal Hill's topographic features are the surface expression of underlying geologic conditions and are one of many major factors in determining the suitability of land for development. Properties of very steep slope for example, may be unsuitable for intensive development unless extensive engineering is used to ensure structural stability.

The overall topography is the most predominant characteristic that gives Signal Hill its unique physical form (Figure 2, Geologic Hazards of the Safety Element). In this City of approximately 2.25 square miles, slopes vary from 10 to 80 percent. Slopes are steepest surrounding the Hill. This feature is one of a series of anticlinal or upfaulted hills that formed along the Newport-Inglewood Fault Zone (refer to

Figure 2, Safety Element). In the southwest portion of the City, the boundary elevation is 25 feet above sea level and terminates at the hilltop plateau at an elevation of 370 feet above sea level. The greatest percentage of slope change occurs on the southerly slopes of the Hill with an average of 40 percent slope and increasing in some areas to as much as 80 percent slope. In the adjacent areas of the City, the slope change is more gradual, in most cases only 5 to 10 percent.

Major portions of the Hill do not consist of uniform slopes. In most cases, roads and pads have been cut to facilitate road access to service the oil equipment and development. The cuts create steep slopes that terminate in a flat terrace shape. This condition occurs on many of the Hill's major slopes; for example, those extending from the southwest, at the intersection of 21st Street and Cherry Avenue, along the western and northern faces, and terminating in the northeast, near Hathaway Street. Therefore, the Hill's slopes, as illustrated on the slope map, are somewhat misleading; in reality, portions of the land that have been cut for roadways and other development create steeper slopes than the overall topography depicts.

4. Petroleum Resources

The City of Signal Hill's history has been tied to oil production. The Long Beach Oil Field was discovered with the completion of "Alamitos No. 1" by Shell Oil Company in March 1921. This first well was located at the corner of Temple Avenue and Hill Street in what is now Signal Hill. The discovery spawned the speculative oil development of the area, setting the stage for what resulted in one of the largest historical oil fields in the state. Trapped mainly against the Cherry Hill Fault are some of the world's thickest oil-saturated sand beds, collectively known as the Long Beach Oil Field. The oil field, over 4 miles long and 1 mile wide, is located primarily within the City of Signal Hill; it also extends into the City of Long Beach. Six oil-producing zones are recognized in the field: (1) Upper Wilbur Zone; (2) Lower Wilbur Zone; (3) Alamitos Zone; (4) Brown Zone; (5) Deep Zone; (6) DeSoto Zone (also see the preceding soils section).

As of January 1984, the cumulative production from the Long Beach Oil Field, largely centered in Signal Hill, has been over one billion barrels of crude petroleum, making it one of the largest fields in the state. The field covers approximately 1,205 productive acres, and recovery-per-acre was at one time the highest in the world.

Over 2,400 oil wells have been drilled in the field, of which approximately 600 active producing wells currently remain within the City of Signal Hill. These Signal Hill wells produced approximately 2,575,000 barrels of oil in 1982, an average daily production per well of approximately 12 barrels. Signal Hill's production represented approximately 76 percent of the total 1982 production in the Long Beach Oil Field (3,400,000 barrels), with a dollar value approaching 65 million dollars.

Due to title ownership problems, diverse and splintered ownerships, and the size of the oil field, three major oil companies with the largest operating interests in the Long Beach Field, (Shell Oil, Texaco, and Atlantic-Richfield) decided each would take a portion of the field for unitization purposes. Unitization occurs when each oil company and royalty owner having mineral and/or surface interests in an area sign a unit agreement with the interests of other owners in the area to further oil production through development of secondary recovery facilities.

Secondary recovery is a general term used to describe the method of production adopted to replenish the original energy when this natural method of production is no longer sufficient to produce the oil. "Waterflooding," a secondary recovery method, is used in Signal Hill. The waterflooding technique enables heavy oils, otherwise difficult to extract from the earth, to be pumped more quickly and economically from the field. The secondary recovery program is thought to be the most economical and ecologically sound method of continuing oil production in Signal Hill. The program represents the first attempt to control production logically in a field that has otherwise been characterized by a multiplicity of operators, an irregular development pattern, and wasteful land utilization.

Through this unitization effort, it is estimated that an additional 70 million barrels of oil will be produced in Signal Hill. This is in excess of the 30 million barrels that would have been produced under primary production. In addition to significantly increasing the ultimate recovery of oil in Signal Hill, the waterflood project has resulted in more efficient production; many abandonments have occurred and a significant release of surface rights has resulted in favor of orderly development.

As the secondary recovery program proceeds, land will gradually be released for urban development. The presence of extensive oil resources in Signal Hill is an important local land use planning consideration. As shown in Figure 2, approximately

one-third of the city is still vacant, in oil production or being held for oil production. As a result, the City will continue to be faced with problems of planning for competitive land uses. As pressures for development in Signal Hill continue, the City will need to preserve surface access to oil resources while still encouraging development. At the same time, careful planning will be necessary to mitigate impacts resulting from a close interface between urban development and oil production.

5. Development Suitability

Development suitability describes the degree of safety with which land can support urban structures. Principal determinants of development suitability include: (1) ultimate use, (2) slope, (3) soil composition, (4) significant landforms, (5) view potential and (6) mineral resources. Slope, soil composition and landforms are the most critical of all of the suitability criteria, since they can severely restrict or completely eliminate the possibility of urban development, depending upon their severity. The last two criteria are, in fact, matters of policy and are not physically restrictive to development.

Slopes over 20 percent are not generally considered suitable for urban development. In addition, highly expansive or compressible soils and land with significant rock outcroppings or other landforms are not suitable for development. Moreover, Signal Hill has significant view potential that can only be protected through the careful placement of structures. Lastly, the City has unique oil resources that may constitute a precedent for properties to be developed with oil-related facilities, rather than other urban development types. Development suitability in Signal Hill, then, considers both physical development restrictions and policy direction.

D. Biological Resources

The City of Signal Hill is located approximately 2.5 miles from Long Beach Harbor. The topography of the area provides the City with a direct coastal influence, producing an environment of mild temperatures and moderate humidity. The favorable climate historically support a diverse flora and fauna.

1. Plant Life

Prior to development of the area, the dominant plant community was coastal sage scrub. This is a low, open shrub and subshrub plant community typically found on slopes subject to coastal influences. Remnants of coastal sage scrub can be found in the brushy, open areas adjacent to existing oil wells within the city limits. Typical coastal sage species, all of which are relatively uncommon in the area, include California sage brush (Artemisia californica), Spanish bayonet (Yucca whipplei), laurel sumac (Malosma laurina), slender tarweed (Hemizonia ramosissima) and prickly pear (Opuntia sp.).

The coastal sage scrub community of Signal Hill has been largely converted through brush-clearing to a ruderal community. Ruderals are plant species that have the ability to rapidly colonize disturbed areas where such environmental extremes as very loose substrates or compacted soils, high temperatures, intense light and low moisture predominate. They are usually rapidly growing species that flower and set seed within a short time, when conditions are favorable. Ruderals may be native plants (many wildflowers are ruderals) or, more commonly, introduced weedy species. Ruderal species in the Signal Hill area include common, nonnative weedy species, such as Russian Thistle (Salsola iberica), broad-lobed filaree (Erodium botrys), common wild oat (Avena fatua), short-podded mustard (Brassica geniculata) and bur-clover (Medicago polymorpha).

In addition, a number of ornamental species have been planted throughout the City. Common species utilized include juniper (Juniperus sp.), eucalyptus (Eucalyptus sp.), Peruvian pepper trees (Schinus molle) and various species of palms.

No species of plant currently designated rare, threatened or endangered by the U.S. Fish and Wildlife Service, California Department of Fish and Game or California Native Plant Society has been located or is expected to occur within the City.

2. Wildlife

Due to the degraded nature of the available habitat within the City of Signal Hill, most animals are expected to be common, widespread and highly adaptable species. The Pacific slender salamander (Batrachoseps pacificus) is an amphibian expected in

the vicinity of irrigated landscaping. Expected reptiles include the western fence lizard (Sceloporus occidentalis), side-blotched lizard (Uta stansburiana) and southern alligator lizard (Gerrhonotus multicarinatus).

Birds, being highly mobile, are the most numerous vertebrates in the area. Species tolerant of human presence, such as the mourning dove (Zenaida macroura), northern mockingbird (Mimus polyglottus) and house finch (Carpodacus mexicanus) are expected to be common.

Mammals tolerant of human presence and able to utilize a disturbed habitat include the Virginia opossum (Didelphis virginiana), black-tailed jack rabbit (Lepus californicus), desert cottontail (Sylvilagus audubonii), California ground squirrel (Spermophilus beecheyi) and species of rodents commonly considered pests, such as black rat (Rattus rattus), Norway rat (Rattus norvegicus) and house mouse (Mus musculus).

No species of wildlife currently designated rare, threatened or endangered by the U.S. Fish and Wildlife Service or the California Department of Fish and Game has been located or is expected to occur within the City of Signal Hill.

E. Historic Resources

The historical resources in Signal Hill include oil development and historical structures. The remaining oil development in Signal Hill is a present-day reminder of the City's past. It was the discovery of oil in June 1921 that gave the City its financial resources to incorporate and develop to the extent that it has today. Remaining derricks and towers are a living reminder of these past events. The Alamitos #1 Discovery Well, located at the northeast corner of Hill Street and Temple Avenue is designated as a state historical monument. Figure 3, Cultural, Aesthetic and Recreational Resources shows its location.

In addition to the remaining oil activity, Signal Hill has a number of structures with potential historical value that exhibit a variety of architectural styles. In January 1985, Signal Hill commissioned a survey of historic structures in the city.[1] The study

notes that approximately 10 architectural styles can be identified in the city, including Greek Revival, Colonial Revival, Transitional, Craftsman, Cottages/ Bungalows, Spanish Colonial Revival, Period Revival, Neoclassical, Vernacular and Moderne. Sixteen of the most important are shown on Figure 3. An additional 47 buildings were identified as being of secondary importance. Buildings in both categories could, if restored, be potential candidates for the National Register of Historic Places. A total of 309 historically distinctive structures was identified.

The first seven architectural styles identified above are characteristic of residential structures with Neoclassical, Vernacular and Moderne typified in commercial/industrial structures. These structures date back from 1870 for those of Greek Revival style, to 1940 for those of Cottages/Bungalows, Spanish Revival and Period Revival. Most structures have undergone alteration, rehabilitation, and to some extent, modernization. A number of buildings remain primarily in their original state. Preservation of historical resources in Signal Hill can enhance community identity and contribute to the character already established in the city.

F. Cultural, Aesthetic and Recreational Resources

In order to plan logically for the preservation, conservation, and rational utilization of open space, knowledge of the existing open space resources of the community is necessary. The areas of open space uses recognized in the City of Signal Hill are landscaped medians, parks, school playgrounds and special function areas, as described below.

1. Landscaped Street Medians and Parkways

Landscaped medians and parkways, although they cannot provide usable open space for community residents, can significantly enhance the aesthetic appearance of highways and major roadways and, at the same time, improve the flow of traffic. Landscaping also helps to increase community identity and can distinguish Signal Hill from the surrounding area. Identification monuments, entrance fountains, distictive street trees and unique landscape treatment can all be included in medians and parkways to achieve distinctive community character and aesthetic quality improvements.

Willow Street is currently the only roadway in Signal Hill that is developed with a landscaped center median. The median extends from the western to eastern City boundary and is landscaped with river rock, liquid amber and palm trees.

Parkway plantings and street trees are provided as part of the City's continuing street improvement program. In addition, landscaping is required as part of the City's development review and permit process.

Criteria that may be utilized in determining potential future landscaped roadways (or portions thereof) include:

- Roadway significance in relation to general circulation pattern, as determined by roadway width, traffic volume, general plan designation or combination thereof.

- Proximity to major features; e.g., major commercial concentrations, unique landforms, view potential.

Under these criteria, other potential roadways for landscape consideration might include Cherry Avenue (south of I-405), Orange Avenue and Spring Street. Where right-of-way is not sufficient for full median and parkway landscaping, more compact design solutions might be possible.

2. City Parks and Recreational Facilities

The City of Signal Hill enjoys a somewhat unique position among Southern California communities in that it remains relatively undeveloped as compared with adjacent areas, and it is completely surrounded by the fully developed City of Long Beach. In view of Signal Hill's relative location, recreational opportunities in nearby Long Beach cannot be ignored when determining needs for the City.

Many parks and other facilities in the City of Long Beach are closer and more convenient to Signal Hill residents than to other areas of Long Beach. It is anticipated that Long Beach parks and school playgrounds within one-half mile of the Signal Hill City limits may be used frequently by this community's residents. These facilities should, therefore, be included in planning for the recreation needs of the

City. In a similar manner, residents of Long Beach may be expected to utilize park facilities in Signal Hill, and these should also be considered as part of the recreational opportunities available to that City's residents.

The residents of Signal Hill will, of course, go beyond the immediate area in search of recreation. Excellent regional park facilities exist in the City of Long Beach, and Pacific Coast beaches are less than 20 blocks to the south of Signal Hill's southern boundary. At somewhat farther distances, a much wider range of recreational opportunities is also available.

As noted elsewhere in this plan, some of the land in the Hill area is very steeply sloping and subject to erosion; it may require extensive alteration in order to be utilized for urban development. Such areas are frequently better suited to open space and recreational uses. The City should, therefore, seek to protect actual or potential erosion areas on the Hill through the direct designation of permanent open spaces or through the utilization of strict development controls in these areas.

The City of Signal Hill has approximately 15 acres of developed and undeveloped park lands, as shown in Table 3 and Figure 3. Hinshaw Park, located at Cherry Avenue and 21st Street, is 10.07 acres, including City Hall and other public buildings. The active recreation facilities at Hinshaw Park include a softball diamond, a tot lot and a half basketball court. A fitness trail will also soon be installed. North End Park is located between Wardlow and 33rd Street and Brayton and Gundry. The park is approximately 2.78 acres and is at the same location as a water reservoir and related facilities, which total about 1.4 acres. North End Park provides for passive recreation (e.g., picnicking, relaxation) and has no facilities for active recreation. Wall Street Park, currently undeveloped, is located at Wall Street and Temple Avenue and encompasses approximately 0.54 acres. Legion Park, located at Hill Street and Legion Drive is 1.16 acres and is not fully developed. Approximately 0.35 acres of the site is used for a city parking lot and Chamber of Commerce headquarters.

TABLE 3

PARKS INVENTORY

Name	Location	Acreage	Existing Facilities	Planned Facilities
Hinshaw Park	Cherry Avenue at 21st Street	10.07	Softball diamond, tot lot, half basketball court, City Hall, public buildings	Fitness trail
North End Park	Between Wardlow and 33rd, Brayton and Gundry	2.78	Water reservoir and related facilities, picnicking and passive recreation	
Wall Street Park	Wall Street and Temple Avenue	0.54		
Legion Park	Hill Street at Legion Drive	1.16	Parking lot, Chamber of Commerce HQ (partly developed)	
TOTAL		**14.55**		

In addition to the existing parks described above, Signal Hill is in the process of considering possible additional recreational facilities. A 1.4-acre site located at Dawson Avenue and Panorama Drive is being reviewed as a possible passive recreational site (e.g., picnicking, enjoying the view). Linear view areas within the public right-of-way will also be created along Panorama Drive.

The existing Signal Hill General Plan requires the provision of 4 acres designated as park or recreation space per 1,000 city population. Such acreage is to include both passive recreational areas/open spaces and active recreational park facilities. With a 1983 population of 6,973 persons, the City standard reveals a need for 27.8 acres of parkland, an increase of 13.3 acres. By the year 2000, this requirement will increase to approximately 40 acres, based on the City's projected population of 10,070.

Within one-half mile of the Signal Hill City limits are six sites designated and developed for recreational uses in the City of Long Beach. The largest of these

recreation areas is Chittick Field, an 18-acre facility owned by the Los Angeles County Flood Control District and leased by the City of Long Beach. The other facilities are five Long Beach City parks. The City of Signal Hill does not control the development or utilization of any of these park facilities; however, because of their close proximity to the City and their availability to Signal Hill residents, they have been, and will continue to be, important recreational resources for the community. This should be considered when recognizing the city's parkland deficiencies. School playgrounds discussed below, can also be utilized by residents through mutual agreements with the school district.

3. School Playgrounds

Two public schools are located in Signal Hill and are under the jurisdiction of the Long Beach Unified School District. Signal Hill Elementary School has 7.39 acres available for recreational use during school hours. Burroughs Elementary School has 8.55 acres for recreational activity. The recreational facilities at both schools are also available for limited supervised public use only after school hours.

In addition to these schools, five other Long Beach public schools are within a short walking distance of Signal Hill. Altogether, they provide a total of approximately 18.82 acres of recreational open space land and playground facilities. They are located south and west of the City. Each has over 2.5 acres of available open space after school hours and each can be expected to continue to provide essential recreational facilities to area residents for the foreseeable future.

Long Beach City College, southwest of Signal Hill, also provides open space. It is adjacent to Chittick Field and together, these two facilities provide nearly 30 acres of open space that can be utilized by Long Beach and Signal Hill residents alike.
A summary of recreational facilities available at the schools is given in Table 4.

TABLE 4

SCHOOLGROUND RECREATIONAL ACREAGE

Schools in Signal Hill	Recreational Acreage	Recreational Facilities
Signal Hill Elementary	7.39	Playground and Grass
Burroughs Elementary	8.55	Playground and Grass
Schools 1/2 mile from City of Long Beach/Signal Hill Boundary		
Lee Elementary	2.87	Playground
Whittier Elementary	5.28	Playground
Burnett Elementary	2.69	Playground
College Intermediate	3.24	Playground and Grass
Nightingale	4.74	Playground and Grass
Other		
Long Beach City College	11.70	Gymnasium, Soccer Field, Tennis Courts
Chittick Field	18.28	Baseball Diamonds
Total	**64.74**	

4. Special Function Open Space and Recreational Areas

Landscaped buffers provided between incompatible land uses, and along City or property boundaries, can also provide visual relief and aesthetic character to the Signal Hill community. For example, a portion of the San Diego Freeway passes through Signal Hill. The freeway is depressed as it passes through the city and is landscaped on either side. Although the open space is not usable for recreational purposes, the landscaping along the freeway helps buffer adjacent uses from the dust generated by freeway traffic. At the same time, it provides aesthetically attractive views for freeway motorists.

In addition, unique surface geology offers the potential for permanent open space uses. The Signal Hill uplift is a portion of the Inglewood-Newport fault system. This system is seismically active and numerous earthquakes have been recorded along its trend. The on-shore fault surfaces show topographic expression above ground in the City and elsewhere along the system.

Although preservation of open space is often used to minimize development in geologically hazardous areas, movements along the basement surfaces will not necessarily generate an equivalent movement on the ground. Therefore, open space planning that is used as a device for limiting development in areas subject to geologic hazard must be tempered by the realization that there is no assurance that seismic damage will be more severe along the surface expression of the fault system than anywhere else in the City. In the event of a strong earthquake not located in the immediate vicinity, the Signal Hill uplift might, in fact, represent a fairly stable location, as the uplift represents a relatively steady building area with respect to surface soils.

Nonetheless, structures located along the fault system might be in danger if movement occurs in the immediate vicinity. Open space designations on such hazard areas can minimize risk associated with earthquake activity in the immediate area, while providing such lands for recreational use and aesthetic value. Future development proposals should, therefore, be reviewed carefully with respect to seismic hazard toward the end that rational use be made of areas in the immediate vicinity of the fault zone. The Safety Element provides further information, maps and development recommendations with respect to seismic hazards in the community.

G. Other Open Space Resources

Signal Hill has other open space resources, including undeveloped land, privately owned open space, open spaces adjacent to the City and recreational travel resources, as described below.

1. Privately Owned Land and Vacant Lands

Undeveloped Land: Over 30% of the land in Signal Hill, or 416 acres, is presently vacant or being used for surface oil production. The location and extent of such lands is shown graphically in Figure 2. Approximately 45 percent of this undeveloped land has been zoned for residential uses, whereas 31 percent has been zoned for commercial use and 26 percent has been designated for industrial uses. As the City continues to develop, open space areas are required to provide visual relief from urban development and recreational facilities for future residents of the City. These

portions of land currently undeveloped offer perhaps the greatest potential for future open space and recreational opportunities in the City.

Military Academy: The Southern California Military Academy is located at the southwest corner of Cherry Street and 21st Street and contains 6.26 acres. The Academy, which provides 2.06 acres of open space, is expected to continue at its present location. While the school is privately owned, the Academy has made its recreational facilities available during summer months to the City recreation program. The conservation of this open space is necessary so that visual relief from urbanization within the City can be maintained.

Signal Petroleum Company: The Signal Petroleum Company has recently purchased land along Cherry Avenue, south of Burnett Street, from the Shell Oil Company. The Shell Oil Company, in cooperation with the City, maintained a landscaped open space area along a portion of Cherry Avenue to provide visual relief and an attractive open appearance for motorists. The greenbelt, which consists of 4.40 acres, provides a buffer for adjacent residential development from traffic noise generated on Cherry Avenue. Because of slope conditions, some portion can be expected to continue to provide visual relief along Cherry Avenue.

Sunnyside Cemetery: The Sunnyside Cemetery is located at the northeast corner of California Avenue and Willow Street and constitutes approximately 13.92 acres. It is a privately owned facility located adjacent to Signal Hill, within the City of Long Beach. The City of Long Beach has designated the site as a permanent open use area.

Long Beach Cemetery: The Long Beach Cemetery encompasses approximately 4.41 acres, and it is located adjacent to the Sunnyside Cemetery. The cemetery is located in, and owned and operated by, the City of Long Beach. Similar to Sunnyside Cemetery, it is designated as a permanent open use area.

Long Beach Airport: The Long Beach Airport is located directly northeast of the City of Signal Hill in the City of Long Beach. The airport encompasses approximately 1,133 acres and provides a major open space area. The facility provides visual and spatial relief from the urbanization that surrounds it. In addition, the airport supplies recreational flying opportunities to the public. The airport

operations produce noise and air pollution that negatively affect the environment. The facility is expected to continue in existence and is designated as an open space area in the Long Beach Open Space Element.

2. Public Rights-of-Way and Other Open Space

Bicycle Pathways: The principal discussion of bicycle pathways appears in the Circulation Element. There are significant issues regarding locations, grades, traffic conflicts and origins and destinations of bike riders that need to be resolved through detailed analysis and planning.

Existing City policy includes bicycle pathways as part of the Town Center and Hilltop Specific Plans and a route traversing the city from the intersection of Walnut and the Pacific Electric right-of-way northeasterly to the Temple Avenue interchange with the San Diego Freeway. In addition, the City of Long Beach has proposed several bicycle pathways that would cross Signal Hill: one at Willow Street, and the other along California Avenue. A coordinated and focused effort will be required to reexamine future City policy on this matter.

Scenic Routes: Signal Hill has designated a roadway, which surrounds the Hill area, as a scenic route. The roadway includes Panorama Drive, 23rd Street, 21st Street and portions of Temple Avenue (See Figure 3). This route uses the existing street system and provides a link between the Civic Center/Hinshaw Park and the State Historical Monument, which is located on the east side of the Hill at Temple and Hill streets. The entire route provides attractive views of urban Southern California from the Hill.

H. Alternative Energy Resources

The use of solar energy for heating and cooling has increased rapidly throughout California due to rising energy costs. Some residents of Signal Hill have taken advantage of this alternative form of energy; however, they represent only a small percentage of the city's total population. The City has good solar access and has the potential to increase solar energy utilization in the future. In addition, the City's undeveloped land (approximately 350 acres) has very good potential for applying solar designs and technologies, including "passive solar" techniques, where collected heat

moves by the natural forces of convection, conduction and radiation, or "active solar," which involves the use of pumps and fans to transport heat. The solar energy potential of residential neighborhoods in Signal Hill is given in Figure 4. Industrial and commercial areas, though not addressed in Figure 4, have potential to use solar energy for space and water heating. Criteria used in determining solar potential include topography, development density and vegetation as described below.

Type 1 Solar Potential: These areas are designated as low-density residential on the General Plan, and large portions are undeveloped. Due to the undeveloped nature of these districts, there is good potential to incorporate solar access into future development designs, or through retrofit of existing development.

Type 2 Solar Potential: This area, designated medium-density residential, is currently being developed and has excellent year-round solar access. When this area is developed further, consideration of solar access in structural designs need to be implemented for continued solar access.

Type 3 Solar Potential: Much of the land in this area is indicated low-density residential and portions are currently being developed. Solar access is good for individual retrofit collectors on rooftops. In addition, this area has excellent potential for passive space heating designs and solar collectors due to the existing long lots.

Type 4 Solar Potential: Land use in these neighborhoods consist of low/medium-density and high-density residential designations. Most of the land is developed and these areas are generally poor sites for passive solar systems due to the narrow lots and limited space between structures. However, these sites can take advantage of solar access with roof-mounted retrofit collectors.

Type 5 Solar Potential: Currently, this area is undeveloped. This area contains slopes of more than 15 percent, causing solar access to be poor. A major potential problem for solar systems in this area is long shadows that would shade the sun's incoming rays.[1]

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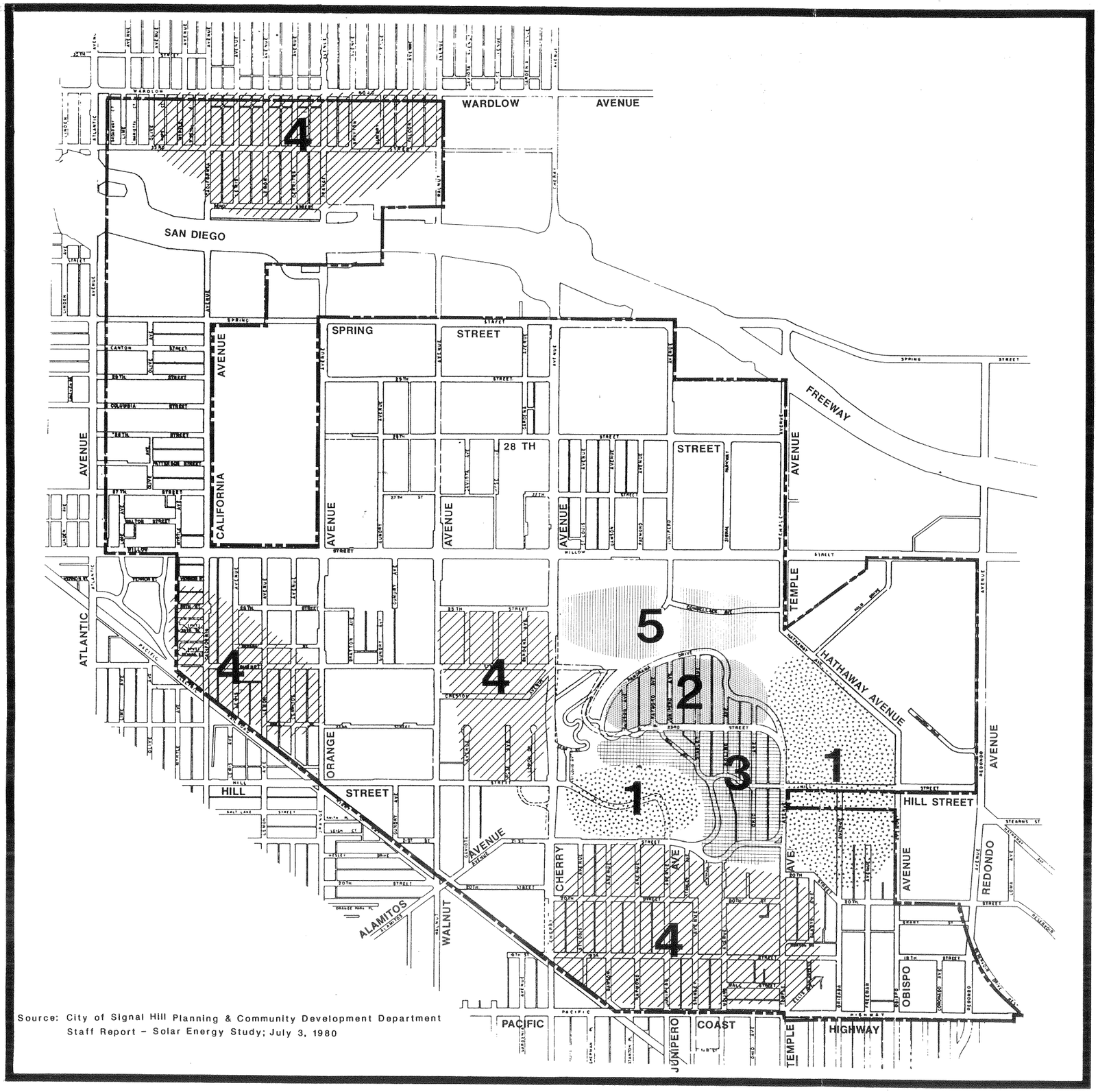
1 The description of solar energy and potential use in Signal Hill was derived from the City of Signal Hill Staff Report, dated July 3, 1980.

SOLAR POTENTIAL



Source: City of Signal Hill Planning & Community Development Department
Staff Report – Solar Energy Study; July 3, 1980

LEGEND

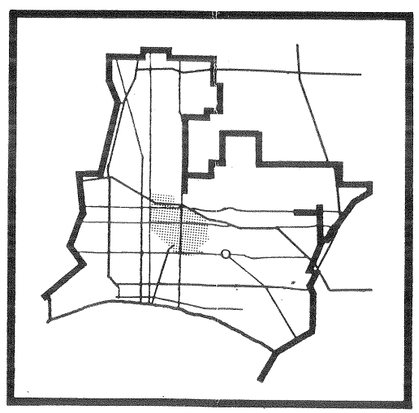
1 **Type 1 Solar Potential:** designated low-density residential; largely undeveloped area; future and retrofit solar potential is high.

2 **Type 2 Solar Potential:** designated medium-density residential; currently being developed; excellent year round solar access.

3 **Type 3 Solar Potential:** area is low-density residential; portions currently under development; solar retrofit potential is good.

4 **Type 4 Solar Potential:** mixed density residential designations; most land developed; generally limited to poor solar potential.

5 **Type 5 Solar Potential:** designated as town center; undeveloped; poor solar access.



0 600 1200 1800

City of Signal Hill

FIGURE 4
ENV. RES.

III. NEEDS, ISSUES AND CONSTRAINTS

A. Introduction

Section II of this element describes existing conditions related to air quality, water and land resources, biologic environment, open space and recreation and the historical resources of Signal Hill. To provide a policy guide for the future, these existing conditions must be compared with community needs. In this section, needs are identified through a combined effort of the City and the public.

Once needs and issues are identified, the City must examine constraints to meeting those needs. Sometimes constraints are physical, such as slope or existing structures, and sometimes they are policy-oriented, such as means of financing, or priority relative to other development. The needs, issues and constraints for Signal Hill related to environmental resources are discussed below.

B. Needs and Issues

The following needs and issues have been identified through an analysis of existing conditions, and by the public at workshops held in December 1984 and August 1985.

- **Improve Air Quality**

  State and federal air quality standards are exceeded infrequently in Signal Hill. The city's unique topography makes views important. Therefore, visual clarity is an important consideration in planning. Additionally, dust and particulate matter resulting from industrial and construction activity is a subject of continued monitoring. Moreover, regional air quality that is not static and that is subject to changes with the regional economy and development patterns is the responsibility of other agencies.

- **Protect Water Quality and Conserve Water Supply**

  Water quality in Signal Hill is high, both for imported water and for that pumped directly from the underground basin. A major responsibility of the City is to reduce and/or eliminate contamination of the groundwater

supply. Responsibility for quality and supply is with others, as well; advocacy and collaboration will be required.

- **Preserve and Enhance Unique Natural Features and Protect Public Health and Safety**

  The Hill provides Signal Hill with its most important identifying feature. Significant potential exists to enhance the City's living environment and overall image through creative and sensitive treatment of this major topographic feature. There are also additional opportunities for views noted on the Cultural, Aesthetics and Recreational Resources Map (Figure 3). Notably, views <u>of</u> the Hill are as important as views <u>from</u> the Hill. These same natural features can be used to protect the public health and safety in areas of severe slope, poor soil conditions or geologic hazard.

- **Manage the Development and Production of Petroleum Resources**

  There are two issues related to the development and production of petroleum resources. One issue involves balancing the need to extract these valuable mineral resources in a way that minimizes hazards, softens the impact of production activities on surrounding properties, and does not inhibit economic development of other sectors of the City. A second issue involves the transition from resource production to urban uses, which is treated as well in the Land Use Element.

- **Protect and Enhance Historic and Architectural Resources**

  Signal Hill has a wide range of architecturally significant buildings. As many as 63 of these potentially could qualify for inclusion on the National Register of Historic Places, if properly registered and/or restored. A significant historic resource is the first oil well in the city, Alamitos Discovery Well, a State Historic Landmark. These could be the foundation for a renewed interest in the City's history.

- **Provide Open Space and Landscaped Improvements for Visual Relief**

  As a component in the aesthetic appearance of Signal Hill, the visual presentation along the City's highways is basic. The City's first median landscaping project on Willow Street sets the tone for developing an overall system that is integrated with other public facilities, parks, parkways and other possible highway improvements.

  Unbuildable slopes and land that is left open because of geological/seismic considerations should also be integrated, whenever possible, into the overall system. This private element of the greenbelt system would be designed to relate visually to public facilities while taking care to respect the private nature of that space.

- **Provide for Adequate Outdoor Recreation Areas**

  To meet current and future city standards for recreation additional land should be made available. In addition, currently undeveloped parkland should be improved. Significant recreational resources exist in and adjacent to Signal Hill; coordination of these facilities will create an overall system available to all residents.

- **Promote Conservation of Energy and Use of Alternative Energy Resources**

  Signal Hill residents have opportunities to benefit from the Southern California climate by exploiting solar energy. Although the utility and potential of this resource is not typically available to the average homeowner, there is a clear need to encourage the use of this energy source.

C. Constraints

As part of the planning process, the identification of barriers or constraints to city action is necessary. This is not so much a listing of what is impossible, but a challenge to think creatively about how to surmount the barrier. There are always constraints that relate to resource availability. Most often, these have to do with

funding; less frequently, they relate to the availability of resources such as expertise and leadership. The following constraints have been identified for the Environmental Resources Element:

- **Regional Problems and Jurisdictional Responsibilities**

  Signal Hill is a relatively small city of just over 7,000 people in a county that has over 7 million people and many regional regulatory agencies. Signal Hill cannot always take direct action to solve certain problems; the city's ability to mitigate the impacts on its residents is limited. For some issues, such as air quality, the SCAQMD is the lead agency. Los Angeles County, because of its size, and geographic importance, has prepared its own policy statement. To some extent, water quality is a similar regional problem.

- **Limitations and Costs of Known Technology**

  This constraint is a scientific and engineering one, and like the jurisdictional question, is not unique to Signal Hill. Given, for instance, the Southern Californian's dependence on the automobile, and current technology available to curtail automotive emissions, elimination of air pollution resulting from this source is unlikely in the forseeable future. Similarly, methodologies for recovering, storing, and transporting petroleum resources have a cost/technology relationship that can act as a constraint. Although this type of constraint is one that Signal Hill can do little about, some actions are available to the City. These include keeping current with technologies and costs in key areas of concern, such as petroleum resource recovery and designing development standards to recognize technological advances and limitations, among other actions.

- **Rights Attendant on Private Ownership of Property**

  This constraint on government is a fundamental one. It most often comes into focus in areas of property maintenance, use and reuse of historic and architecturally significant buildings, and in development standards applied to new construction. With respect to environmental resources in Signal

Hill, it comes into play in the rights to develop property that might be needed to achieve open space goals, in recovering petroleum resources that might cause environmental degradation, or in proposed use or remodeling of architecturally significant structures. The solution lies in the City's ability to set guidelines that can optimize competing goals.

- **Fiscal Limitations**

  Although not unique to environmental and open space resource conservation, fiscal constraints exist at every level of government. Signal Hill is no exception. Land acquisition for parks and open space purposes, development of recreation facilities, landscaping of medians and parkways and similar expenditures must compete for limited City dollars. To the extent possible, reliable alternate funding sources should be developed.

- **Level of Public Knowledge and Information**

  On many issues, the public is poorly informed. This lack of information often translates into lack of support for worthwhile proposals and programs. This may be the case, for instance, with energy and water conservation: a short-term experience with "plenty" sets the tone for response to conservation programs. All government programs should include public education components that clearly state the known facts and presumptions upon which action to the public is recommended.

IV. GOALS AND POLICIES

Signal Hill's environmental resources, goals and policies have been developed to respond to community needs and recognize constraints as discussed in the preceding section of this element. Goals are defined as desirable long-range conditions that the city will strive to reach. Policies are statements of direction for the City to achieve those goals. Together, they provide the city with a guiding framework to define implementation strategies.

GOAL 1

Maintain and enhance the identity and aesthetic quality of Signal Hill as a City with striking view potential, and a City that is carefully managing its transition from resource extraction to balanced land uses.

POLICY 1.1

Protect views both to and from the Hill and other scenic features. This will extend to all new development, and to major rebuilding and additions.

POLICY 1.2

Design a greenbelt system that includes landscaped entranceways to the city, and landscaped medians and parkways on City streets. The greenbelt system should be linked to the civic center as a community focal point, the City's park system, bicycle and pedestrian trail system, active and passive open space, with consideration given to developing guidelines to integrate the system with private open space.

POLICY 1.3

Develop design guidelines and themes that can be utilized throughout the City, and that are integrated with the greenbelt system, public signage, street furniture, public buildings, and similar facilities.

POLICY 1.4

Protect and enhance the natural topography that exists in the City.

GOAL 2

Maintain and enhance the City's unique cultural, aesthetic and historic areas.

POLICY 2.1

Protect and enhance the State Historical Landmark at the Alamitos Well Site #1.

POLICY 2.2

Protect and enhance architectural resources in the City consistent with their significance and importance. Develop ways of encouraging these resources to remain intact as the City grows and develops.

GOAL 3

Provide and maintain a variety of parks and recreational facilities, both passive and active, that will be conveniently located througout the community.

POLICY 3.1

Provide parkland and recreational facilities in neighborhoods of the City currently not served with such facilities.

POLICY 3.2

Ensure accessibility of local and regional parklands of all types to all users, including the young, the elderly and the handicapped.

POLICY 3.3

Provide (within economic capabilities) as full a range of activities as possible, including active and passive recreation, biking, walking, jogging, picnicing and "viewing."

POLICY 3.4

Coordinate with the Long Beach Unified School District to ensure the availability of school recreational facilities for public recreation after school hours.

POLICY 3.5

Coordinate with the Long Beach Parks and Recreation Department on park and recreation planning to ensure that all users of these facilities in both cities are well served.

GOAL 4

Manage the production of economically valuable resources in the city to achieve a balance between current market forces and long-term community values.

POLICY 4.1

Improve the interface between oil production activities and urban development, both for existing and new projects.

POLICY 4.2

Encourage the development and production of natural resources that are demanded by the market, and that release land for urban uses at a reasonable and controlled rate.

POLICY 4.3

Require the restoration and reuse of land no longer necessary or economical for oil-production activities.

POLICY 4.4

Minimize and eliminate where feasible the adverse environmental impact of resource-production activities. Also provide adequate setback and open space where oil-production activities continue adjacent to urban development.

GOAL 5

Ensure minimal degradation to the physical environment from development or operational activities, and require restoration of the environment where degradation has occurred.

POLICY 5.1

Cooperate and participate in regional air quality management plans, programs and enforcement measures.

POLICY 5.2

Protect water quality and conserve water supplies through reducing and eliminating contamination from industrial operations or resource development activities. Cooperate and participate in regional water quality and water supply plans, programs and implementation measures.

POLICY 5.3

Eliminate the unsafe storage, use and transport of hazardous industrial and commercial chemicals and substances through regulation, planning and development review processes.

POLICY 5.4

Reduce and eventually eliminate current environmental degradation in all areas of the city. Require restoration of the environment in these areas where it is subsequently degraded.

GOAL 6

Ensure and protect the public safety in natural hazard areas.

POLICY 6.1

Regulate development to protect the public health, safety and general welfare where studies indicate hazards due to earthquake faults, unstable soils or steep slopes. Where needed, maintain such lands in public or private open space uses. Restrict the proximity of buildings to existing oil production uses or petroleum storage facilities that present a high risk of explosion or fire.

GOAL 7

Maintain and provide information to the community on environmental problems, opportunities, progress and issues.

POLICY 7.1

Disseminate information about the values of alternative energy technology, including use of solar energy in Signal Hill.

POLICY 7.2

Develop a public information program in conjunction with the oil production industry to explain programs and progress toward improving the resource production/urban development interface.

POLICY 7.3

Provide information to the general public on environmental conditions and issues in Signal Hill.

V. IMPLEMENTATION - STRATEGY AND PROGRAM

The following programs are action statements to implement the framework established in the goals and policies. Programs, generally, are the most definitive means for accomplishing community needs since they are, where possible, quantitative guides for the management of environmental resources in the City.

	Implementation Program	Corresponding Policy
1.	Review and revise the current zoning ordinance to provide protection to areas of greatest view sensitivity, and to encourage preservation of the natural terrain through mechanisms such as reducing residential densities as recommended in the Land Use Element.	1.1, 1.4
2.	Through the City's site plan and development review procedures, continue to evaluate individual projects to ensure protection of views and preservation of the natural topography wherever possible.	1.1, 1.4
3.	In preparing capital improvement plans, the City will explicitly consider view protection and protection of natural resources.	1.1, 1.4
4.	Prepare a comprehensive greenbelt plan. The plan will include landscape architectural designs for entranceways to the City, plant lists and landscape designs for medians and parkways, standards for landscaping requirements on private properties that front arterial highways or other significant public properties, and precise implementation measures. The plan will link public open space, private open space, historical and cultural resources.	1.2
5.	Prepare overall design guidelines for the City specifying design, size, materials, colors, and similar elements that can be integrated with a greenbelt system, public signage, street furniture, public buildings and private improvements.	1.3
6.	Explore mechanisms and available programs to protect and enhance the State Historical Landmark at the Alamitos Well Site #1. Cooperation of the State Historic Landmarks Commission and the oil industry will be sought. An effort will be made to develop a passive park to complement the site.	2.1

	Implementation Program	Corresponding Policy
7.	As funding is available, continue to expand upon the Historic Resources Study. Additional information about structures which might be collected includes oral histories of use and ownership, pictorial history of significant design and construction details, condition of structure and details of additions, craftsmen involved, important owners and/or residents and similar items.	2.2
8.	Examine all "A" rated structures in the city's Historic Resources Study and review possible zoning mechanisms and funding sources to encourage the preservation and enhancement of these structures.	2.2
9.	Continue to require dedication of park lands or in-lieu fees or a combination of both, from developers of new residential subdivisions and planned developments. Revenue received from these fees should be used for park acquisition and/or development within the area of the particular development they were collected from.	3.1
10.	In acquiring and developing park lands, top priority should be given to Planning Areas 7 and 4.	3.1
11.	Develop a program to remove architectural and other physical barriers to the use of City parks that reduce accessibility by the young, the elderly and the handicapped.	3.2
12.	Prepare an open space zoning ordinance that designates public park lands and facilities as open space.	3.2
13.	The City will seek to minimize City costs of acquiring and managing recreational and open space through techniques which may include easement acquisition, donations, etc.	3.1, 3.2, 3.3
14.	As part of the annual budget process, including the review of public works as required by section 65401 of the State Planning Law, ensure that recreation opportunities are included as financial resources are available. Recommendations should consider the need for both active and passive recreation opportunities.	3.1, 3.2, 3.3
15.	Develop a comprehensive plan for bicycle trails and pedestrian pathways in the City. This plan will connect major focal points in the City, including but not limited to the Hilltop, the Town Center and the Civic Center. The plan will explore the possibility of linking facilities outside of the city with those in the City, the usefulness of the Pacific Electric right-of-way, and linking City trails with those shown on the Long Beach General Plan.	3.3

	Implementation Program	Corresponding Policy
16.	Where feasible, and where consistent with adopted specific plans, the general plan and the zoning ordinance, the City will encourage facilities that capitalize on view potentials. Public facilities will include view parks, view points along bike trails and pedestrian pathways and roadside view points along scenic highways. Private view opportunities could include restaurants (as exemplified by the Hilltop specific plan) and other uses where numbers of people might congregate.	1.1, 3.3
17.	The City will work toward establishing with the Long Beach Unified School District a written agreement for the recreational use of school facilities after hours.	3.4
18.	The City will discuss with the City of Long Beach a possible mutual agreement for the purpose of ensuring the use and availability of recreational resources in Long Beach for Signal Hill residents.	3.5
19.	The City will review all regulatory ordinances to define areas where the interface between oil production and urban uses is involved. Amendments will be proposed to improve the quality of this interface and minimize undesirable impacts.	4.1
20.	Where hazardous or recurrent nuisance conditions exist, the city will work with property owners and occupants to resolve issues and mitigate impacts. This will include: (a) a survey and definition of such conditions, based on a field survey and a review of complaint and incident records, and (b) a review of relevant municipal code procedures and enforcement practices to determine desirable changes.	4.1
21.	Maintain communication with oil extraction interests in the City regarding market trends and projections for continued pumping from Signal Hill oil fields. As trends and projections are refined, review City plans and policies for continued appropriateness, and amend plans, policies and implementation tools as necessary.	4.2
22.	Periodically review and update operational and drilling standards for oil production. In collaboration with the oil industry, define criteria and standards for the restoration and reuse of land no longer necessary or economical for oil production activities.	4.1, 4.2, 4.3, 4.4, 5.3
23.	Review carefully all zoning, building and discretionary permit applications which interface with oil production activities. As part of the approval and permit process, the City will require or encourage changes in project design, fencing, landscaping, etc., to minimize or eliminate undesirable impacts.	4.4

	Implementation Program	Corresponding Policy
24.	Coordinate with the South Coast Air Quality Management District (SCAQMD), the California Air Resources Board and applicable federal agencies to improve air quality throughout the South Coast Air Basin. Specifically, the City will coordinate with the SCAQMD to implement regional air quality attainment measures applicable to the City of Signal Hill.	5.1
25.	Coordinate with appropriate regional and state agencies to promote the conservation of water and groundwater resources to ensure that continued adequate supplies of water will be available into the future, with the highest water quality available.	5.2
26.	In collaboration with representatives of the oil industry, explore means of expediting cleanup from oil spills, chemical spills and other industrial accidents which may affect the environment. Review current response procedures and explore ways of allocating costs to the responsible parties.	5.2
27.	Cooperate and participate in regional studies and investigations dealing with hazardous waste disposal. Implement programs that are clearly within the City's sphere of responsibility and fiscal ability, as appropriate.	5.2
28.	Review current zoning, building, safety and other codes regulating storage, use and transport of hazardous chemicals on a regular basis, to ensure that they are responsive to technology in use, and available means of risk management. Amendments will be recommended as appropriate.	5.3
29.	Through implementation of the Sanitary and Industrial Waste Ordinance, identify and abate hazards and nuisances resulting in unacceptable risk of contamination or personal safety.	5.3
30.	During the permit and development review process, the presence or likelihood of hazardous chemicals and substances will be identified. If such do exist in any situation, permits will not be issued until adopted City ordinances standards and regulations have been complied with.	4.4, 5.3
31.	As a condition of permit issuance, the City will require that property be cleaned of rubble, remnants of abandoned structures, and environmentally degraded portions of the site as required by existing City ordinances standards and regulations.	5.4

	Implementation Program	Corresponding Policy
32.	Implement applicable code enforcement procedures requiring remedial measures where the environment is substantially degraded, and there is a public health or safety threat. Where the degradation is not hazardous, but visual or of a nuisance character, utilize nuisance provisions in the municipal code to obtain corrections.	5.4
33.	Existing codes and ordinances will be reviewed and revised as necessary to restrict building in areas of unstable or steep slopes.	6.1
34.	The City will require that new developments respect natural landforms and minimize grading. Amendments will be made to appropriate codes and ordinances to encourage contouring, to require stabilization of cut and fill slopes and to require landscaping of slopes, where substantial grading is proposed.	1.4, 6.1
35.	The City, through appropriate codes and ordinances, will provide adequate building setbacks from oil production and petroleum storage facilities with a high risk of explosion and fire.	6.2
36.	The City will prepare a brochure and information program, in conjunction with local energy utility companies, which describes the costs and benefits of solar technology to Signal Hill residents.	7.1
37.	In collaboration with the oil industry and the Chamber of Commerce, develop an educational program describing the interface between oil production and urban uses, and how it is expected to change over time. Material developed as part of this program will be distributed to existing and prospective businesses and residents in Signal Hill.	7.2
38.	Periodically provide City newsletter information covering environmental issues and progress, for delivery to residents and businesses.	7.3