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FINAL

ENVIRONMENTAL IMPACT REPORT

GENERAL PLAN AMENDMENT

FOR THE

LAGUNA SECA OFFICE PARK

DEVELOPMENT

BASE MAP #17

MARCH 1983

Prepared for:

County of Monterey Planning Department

EIR # 80-109
PC-3734 (REZONING)
PC-3834 (GENERAL PLAN AMMENDMENT)
SUBD 755

Prepared by:

Scott Lefaver, A.I.C.P
565 Chapman Court
Santa Clara, California 95050

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Suggested Mitigation: A preliminary geological report has been completed in order to precisely locate the areas of slope instability; further investigation is recommended to evaluate appropriate setbacks from these areas. Site specific investigations required for areas of possible liquefaction. Furthermore, project should conform with structural earthquake regulations and the County Seismic Safety Elements.

3. EROSION AND RUNOFF

Potential Impact: Removal of vegetation, grading activity, and the addition of impervious materials to the site will result in increased runoff and erosion. Project would increase stormwater runoff from the site and would increase concentrations of urban contaminants and sediments in the runoff.

Parts of the Proposed Office park development are located in a flood prone area.

Significance: Moderate

Suggested Mitigation: Contribute to the improvement of drainage structures immediately downstream from the project site. In addition, a complete drainage plan should be required, with engineer's design and analysis of on site drainage structures to collect runoff. The proposed retention basins which would be developed on site could mitigate impacts of increased runoff and sediments on downstream drainage facilities, depending upon specific detention basin design (not yet available).

4. BIOLOGY

Potential Impact: Impact due to damage to the natural vegetative communities through road construction, home and office site designation.

Significant damage could occur to a valuable area of oak woodland community due to the construction of the office park development.

Significance: Moderate

Suggested Mitigation: Dedicate to the County those areas of the property over 30% slope to scenic easement. Vegetation should be cleared only as required. Cleared areas should be replanted as soon as possible with fire retardant vegetation to assist in erosion control. Once construction on a lot is complete, a landscape concept including planting of young oaks of the same species as those existing should be instituted.

5. VIEWSHED

Potential Impact: The project may alter some of the natural, rural character of the State Route 68 scenic corridor.

The Office Park development would be partially visible from the State Route 68 corridor.

Significance: Moderate

Suggested Mitigation: Specific site design recommendations are suggested, including preservation of open space, protection and preservation of existing trees and a visual barrier along Route 68.

6. TRAFFIC

Potential Impact: The project would generate between 2,500 and 3,900 vehicle trips per day.

Significance: Minor

Suggested Mitigation: A phasing of improvements to Highway 68 as development of the project progresses. Specific improvements are detailed in the mitigation measures, to include recommendations for channelization, coordination of Office Park entrance intersection with Ryan Ranch entrance, traffic signals, fair share funding for State Route 68 improvements, and public transit service.

7. NOISE

Potential Impacts: The Office Park development will be subject to noise levels above the "normally acceptable" range.

Significance: Minor

Suggested Mitigation: Preparation of a detailed acoustical analysis should be required for any residential or professional use to be located within 400 feet of Highway 68, with the assistance of an acoustical technician when design plans are developed. Noise insulation measures also are required.

8. AIR QUALITY

Potential Impact: A cumulative impact upon the decreasing air quality in North Central Air Basin. An increase in air pollutants due to vehicle use.

Significance: Moderate

Suggested Mitigation: Request the regional transit systems serve the site. Design of project should encourage fuel conservation, walking and use of transit systems.

9. WATER AND SEWAGE SERVICE

Potential Impact: The Office Park development would require a new sewage system. The project proposes a wastewater reclamation system whose suitability has yet to be approved by the County Health Department.

Significance: Major

Suggested Mitigation: The proposed sewage reclamation system is subject to the specifications of design and approval of the California Regional Water Quality Control Board and County of Monterey Health Department. Certification from the Bishop Water Company stating that they will serve the development must be obtained. The water system must meet County standards. Suggested water conservation measures also are included.

10. POLICE, FIRE, SCHOOLS

Potential Impact: The Office Park development will have a minimal impact on police and fire services and no impact on school services provided through the County of Monterey.

Significance: Negligible

Suggested Mitigation: None.

11. ENERGY

Potential Impact: The proposed development of the project would result in construction, operational and transportation energy consumption. Of these three categories, operational and transportation related energy consumption would be the most significant, since they would extend over the life of the project.

Significance: Moderate

Suggested Mitigation: The developer should review solar design options and incorporate them into building designs. Other energy conservation measures should be considered. Public transit use and encouragement of car pooling would aid in minimizing energy use.

12. PUBLIC SERVICES

Potential Impacts: The Office Park development would add to the cumulative impact of providing services to the area.

Significance: Moderate

Suggested Mitigation: A plan for providing services to include details of funding, timing and implementation is needed. The plan should be coordinated with other agencies currently providing services to the area as well as with the County of Monterey.

13. FISCAL

Potential Impacts: The proposed project will generate more revenues to the County of Monterey than the costs incurred to the County of Monterey. This is primarily as a result of the creation of property tax revenues without the commensurate cost in public services. The reduction in public service expenses to the County of Monterey is primarily because the developer assumes, or passes on, many of the public service costs through entities other than the County of Monterey. The development will also add jobs to the local economy.

Significance: Positive

Suggested Mitigation: None

1.0 INTRODUCTION

1.1 Forward

This Environmental Impact Report has been prepared in compliance with the California Environmental Quality Act of 1970 (CEQA), as amended, to inform public decision makers and their constituency of the environmental effects of projects they propose to carry out or approve. The purpose of an Environmental Impact Report is to identify only a project's significant effects on the environment, "significant effects" being defined as "substantial adverse impact(s) on the environment." Therefore, this report identifies and discusses in detail those subjects considered to be significant. The initial study, included as Appendix A, indicates those subjects not considered to be significant and therefore not covered in detail in the body of this Report.

This EIR is being prepared on the proposed General Plan amendment to allow a 54 acre office park development in the Laguna Seca Ranch. The County of Monterey is the lead agency in processing this Environmental Impact Report.

An environmental impact report may not be used as an instrument to rationalize approval of a project, nor do indications of adverse impacts necessarily require that a project be disapproved.

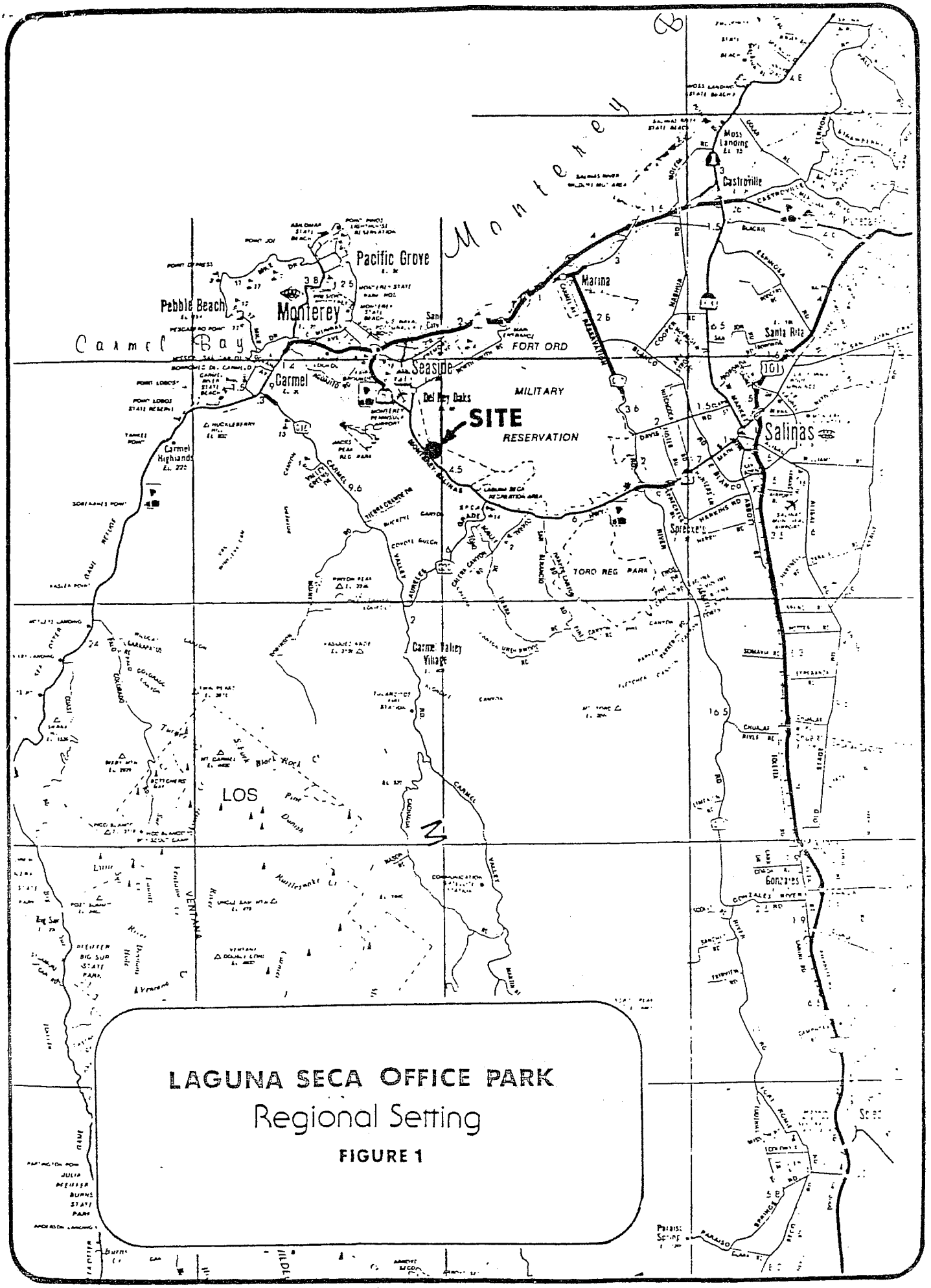
1.2 Project Description

1.2.1 Site Location and Description

The project site, Laguna Seca Office Park, is a 54± acre parcel located along Highway 68 adjacent to the City of Monterey and within the jurisdiction of the County of Monterey.

The proposed Office Park is adjacent to the Laguna Seca Ranch. The regional location is illustrated in Figure 1.

The Office Park site extends from York Road (the present Monterey City Limits) eastward for a distance of .5 miles. The site is bound by the existing Laguna Seca Ranch Estates No. 1 and the Laguna Seca Ranch Estates No. 2 on the east, by York School on the north, by York Road and the Ryan Ranch Industrial Park Development (located in the City of Monterey) on the west, and by Highway 68 on the south. The area to the south, along Highway 68, has been dedicated as an easement for future road construction to the proposed take line. The site is recognizable by the 8 foot high red picket fence with a white top which extends along the entire Highway 68 frontage.



LAGUNA SECA OFFICE PARK

Regional Setting

FIGURE 1

1.2.2 Background

The proposed Office Park is owned by the Bishop, McIntosh and McIntosh partnership. A golf course adjacent to the Park is also owned by the partnership, but is under lease to Nick Lombardo. The school, 20 acres in the northwest corner, is owned by York School. Laguna Seca Ranch Estates No. 1, 46 lots on 39 acres near the southwest corner, is owned by 46 individuals or families, with appurtenant open space owned by a Home Owners Association. Laguna Seca Ranch Estates No. 2 (49 lots on 135 acres) was developed in 1980. Some lots in Unit 2 have been sold and several homes are under construction, however none have been occupied or completed as of August 1, 1982. The Laguna Seca Ranch was acquired by Frank Bishop in 1953; the subdivision was created in 1962, the York School in 1964, and the golf course in 1969. York Road, a 1500 foot long, 70 foot wide strip, is owned by the U.S. Government and is a part of Fort Ord.

1.2.3 Proposed Project Development

The proposed development consists of 260,000 square feet of office space located on 54 acres at the south westerly section of the Laguna Seca Ranch. The professional offices will include financial institutions and business offices to be developed on 19 lots ranging from .6 to 2.6 acres. The lots will be sold or leased for the construction of custom designed buildings. The Tentative Subdivision Map for this office park development is included as Figure 2.

The development also proposes two single family lots (20 and 21) to be located adjacent to the existing Ranch Estates No. 1. The probable gross office space (260,000 square feet) was calculated at an average of 20% ground coverage, with 10% designated as two story. Table 1 details the uses at the site.

Lots 1 through 19 are proposed for office and professional uses and two lots (20 and 21) for single family uses adjacent to the existing Laguna Seca Ranch Estates No. 1. The average size of the office park lots is 1.46 acres, the smallest of these lots being .66 acres. Lot 20 is proposed for .82 acres and Lot 21 for 1.08 acres for single family homes.

The site is accessed along the existing York Road to the proposed Blue Larkspur Lane. The area south of this roadway will remain as open space until such time as area for expansion of Highway 68 is needed. The highway entrance to Laguna Seca Ranch Estates will be closed upon construction of Blue Larkspur Lane from York Road. (Refer to Figure 2.)

LAGUNA SECA OFFICE PARK

Office-Park Development Tentative Map

FIGURE 2

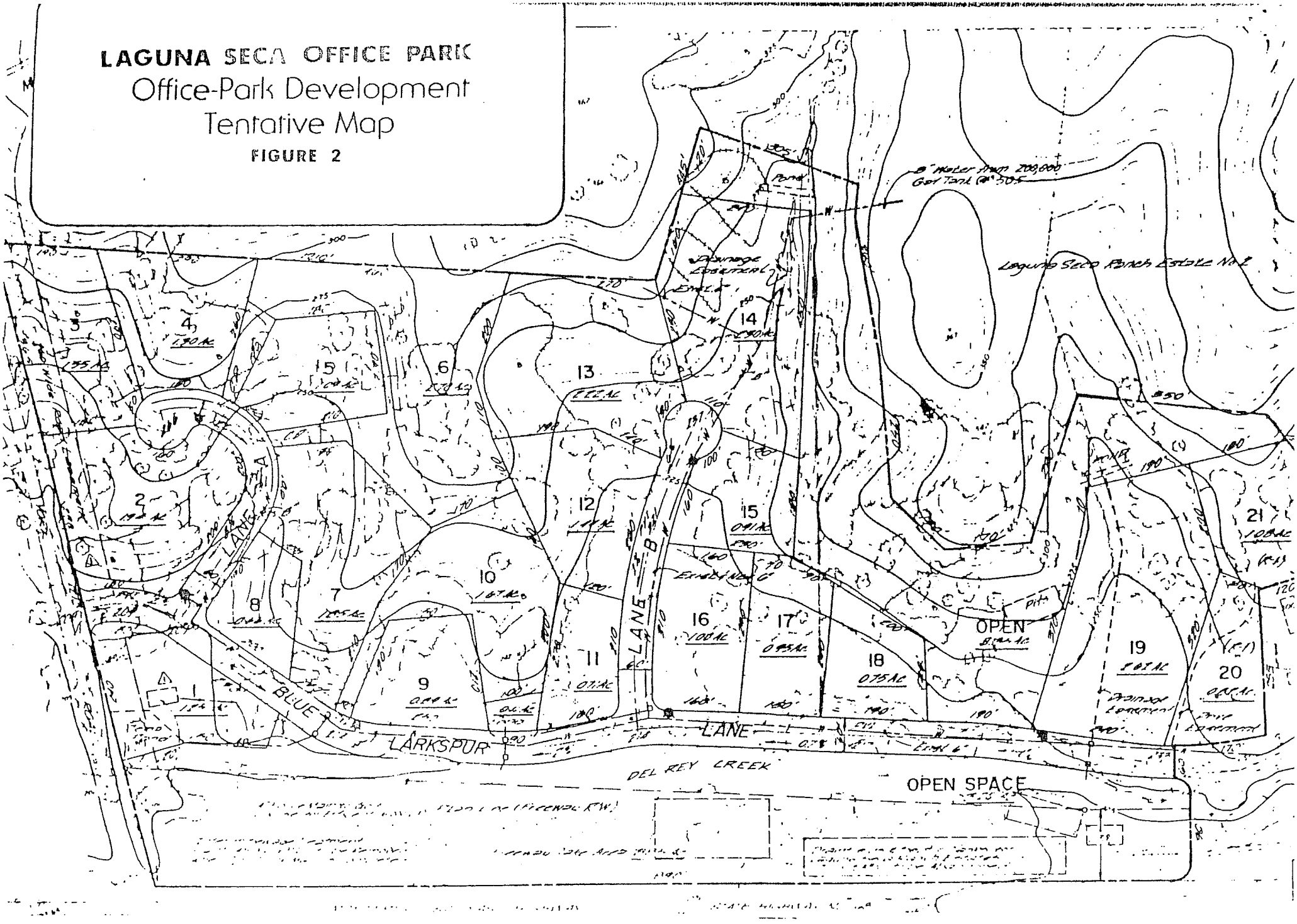


Table 1
Use Proposed for Office Park Development

Use	Net Acres	Percent
Roads	4.45	8.2
Common Drives	0.25	0.5
Freeway Take	8.85	16.1
Open Space	11.66	21.2
R-3 Lots (Office)	27.80	50.6
R-1 Lots (Single Family Homes)	1.40	3.5
TOTAL	54.91	100.0

1.2.4 Neighboring and Vicinity Land Use

The land in the vicinity of the project site, with its pastoral, semi-rural setting and attendant qualities (grassy meadows, oak groves, steep chaparral-covered slopes and pine forest), is a contrast to the urban city of Monterey. The area always has been a source of visual enjoyment for those passing by it on Highway 68, which was declared a Scenic Highway by the State of California in 1969.

The properties surrounding Laguna Seca Office Park are varied in their type and intensity of use. Generally, much of the land currently is undeveloped and/or in limited residential and agricultural use. However, there has been much planning activity on the part of landowners of the area, and there is evidence that substantial development could occur in the future.

The project site is within the former Monterey II Planning Area, located along the Highway 68 corridor. In March of 1976, the City of Monterey adopted its Monterey II Plan for this area. Based upon this plan a number of development proposals were prepared for almost 85% of the 8,300 acre Monterey II area over the last two decades. These proposals covered all of the 5 major land holdings in this area (Work Ranch, Lit Ng, Hidden Hills, Laguna Seca Ranch and Pebble Beach Corporation Properties). However, in November 1981 the people of the City of Monterey repealed the Monterey II Plan. Therefore, the future development of the surrounding area is unknown. Development can occur within the County as designated by the County's General Plan. No high intensity urban development can take

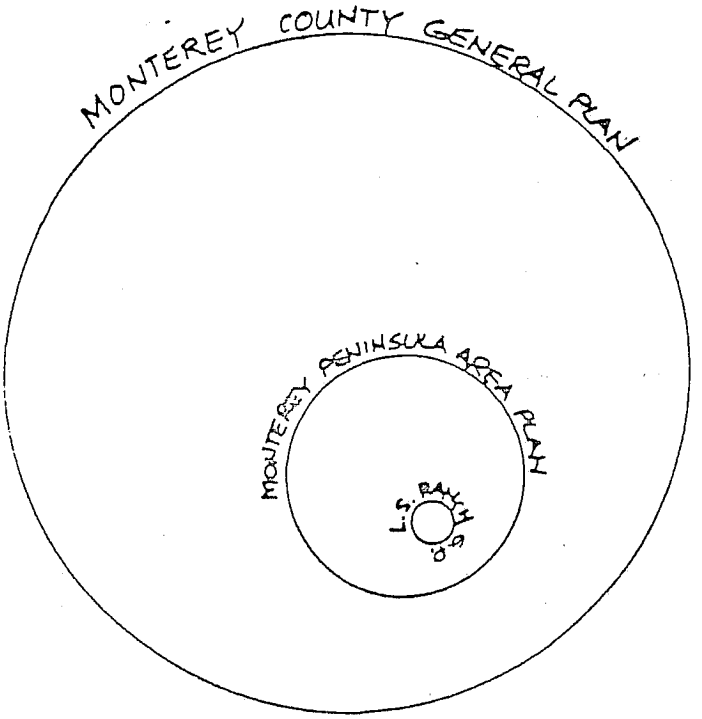
place within the County at the present. The land holdings and neighborhood vicinity are illustrated in Figure 3 and are discussed below in Section 3, Cumulative Impacts of this Report.

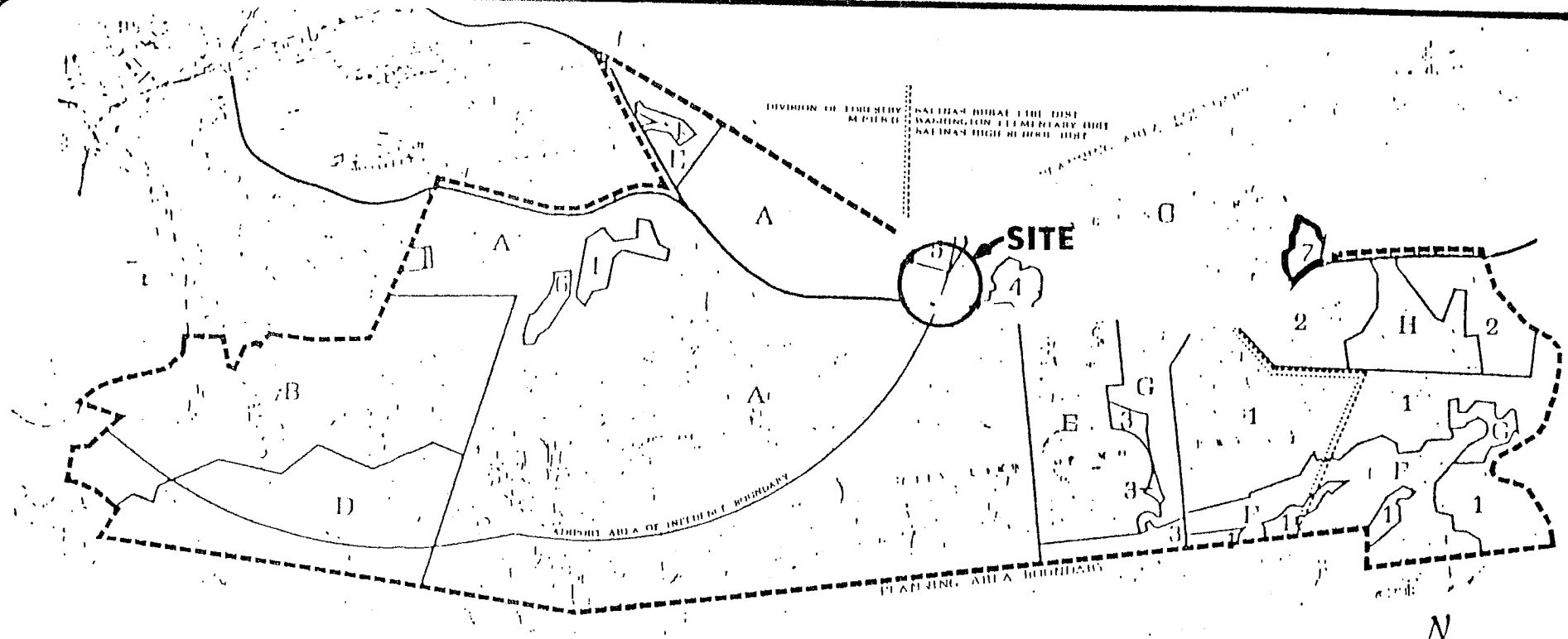
Also within the project site vicinity is the Monterey Peninsula Airport, located approximately 2 miles west of Laguna Seca Ranch.

1.3 Land Use and Planning

1.3.1 Planning Process, County of Monterey

Planning documents in Monterey County become more specific as the size of the area covered decreases. Within the overall Monterey County General Plan (November, 1968) encompassing 2,127,360 acres, there is the Monterey Peninsula Area Plan (July, 1966) which encompasses about 160,000 acres including, as urban areas, the cities of Carmel, Monterey, Marina, Seaside, Del Rey Oaks, Pacific Grove, and Sand City. Within both of these plans is the Rancho Laguna Seca Plan, the 1005-acre Ranch Plan for Laguna Seca adopted in May, 1967 as the detailed land use plan for the Ranch within the Monterey Peninsula Area Plan within the overall County General Plan.





Legend
Ownerships and Jurisdictions

- A TA Work Estate
  - Monterra
  - Ryan Ranch
  - Tarpey Flats
- B Del Monte Properties Co (Aguajito)
- C H.P. & Leonard McIntosh (Laguna Seca Ranch)
- D County of Monterey (Jacks Peak Park)
- E Standlex International
  - West Hidden Hills
  - North and North Ext.)
- G Don Hoegen
  - Hidden Hills West
  - Del Sol Hills
- H Society for the Prevention of Cruelty to Animals
- I Monterey Peninsula Unified School District
- J Other Private Owners
  - 1 Hidden Hills North
  - 2 Laguna Seca Estates No. 1
  - 3 Hidden Hills West
  - 4 Laguna Seca Rancho
  - 5 Jacks School
  - 6 California American Water Company
  - 7 Tarpey

0 5000
Scale in Feet

N

LAGUNA SECA OFFICE PARK
Project Site Vicinity
FIGURE 3

The planning process that would allow development of the proposed Office Park would require a General Plan amendment to the Rancho Laguna Seca General Plan to change the "suburban Residential 2-4 units/acre" designation to a "Professional Office" designation. Redesignating the Rancho Laguna Seca General Plan will require amendment of the sectional plan and overall Monterey County General Plan which encompass it. The sectional plan is the Monterey Peninsula Area Plan (The Peninsula Tomorrow) and the designation would change from "Rural Residential--one unit per acre" to "Administrative--Employment Center", a map change with no text revision required (see the Plan text, page 46). The Monterey County General Plan would change from "Rural Residential" to "Urban" with no text change necessary.

Following these plan amendments the required zoning change, to permit the Office Park uses, would be legal under California Planning Law, subject to approval of the Board of Supervisors. Individual lot owners would be required, under proposed zoning to apply for a Use Permit for the specific office use. A proposal by the developer includes an Office Park Owners' Association for control and maintenance of common lands, easements, and design standards.

1.3.2 County of Monterey, Applicable Plans and Policies

The Monterey County General Plan was adopted by the Board of Supervisors in October 1968, and is currently undergoing a major revision. Having been written more than a decade ago, the General Plan is outdated. Many of the policies and objectives established in years past are still being used. However, most of the State-mandated General Plan Elements have been completed since the time the original plan was written and, thus, policies contained in the elements are more current than the original land plan.

To assure a well-balanced County, the primary objective of the General plan is: "To assure orderly and beneficial development of the County and to protect the character and the physical, economic and social stability of land use in Monterey County." The on-going General Plan update will make current the County's land use policies. The County also will be faced with the task of coordinating existing technical reports and elements into a single comprehensive document.

The County has completed various State-mandated General Plan Elements since the time their original plan was adopted. These County Elements are as follows:

a) Conservation/Open Space Element, March 1974
b) Scenic Highway Element, June 1974

c) Safety Element, October 1975
d) Noise Element, November 1975
e) Seismic Safety Element, December 1975
f) Housing Element (not adopted)

The current County General Plan Revisions will review and update these documents where needed.

Other relevant County of Monterey General Plan elements are discussed below.

Historical Element. The Monterey County General Plan Historical Element was adopted in August of 1974. The objective of this element is to retain the romance, culture and heritage of Monterey County by encouraging the restoration and preservation of historical building sites and other historical components. Although a primary historical site is noted on Page 8 in the Corral de Tierra area, no historic sites are located on this property. In addition, no archaeological sites were noted during a field review of the property.

Circulation Element. The Circulation Element of the Monterey County General Plan was adopted in 1968. The objective of the element is to plan a circulation system which will provide safe, efficient and economic movement of people and goods, while at the same time recognizing, incorporating and retaining the natural beauty of the County. For more detail, refer to "Principles and Standards of the Circulation Element," number 5-10 on Page 7 of the Monterey County General Plan, and Section 2.7, Traffic and Circulation, of this Report.

Scenic Highway Element. This plan is the result of the concern of residents within Monterey County for the preservation of scenic values. Objectives of the Scenic Highway Element are given on Page 13 of that Element. Condensed objectives that relate to this project are:

1. To maintain and enhance the scenic route as an integral part of the setting through which it passes, without imposing undue restriction on private property.

2. To recognize scenic routes in Monterey County as part of a chain for scenic routes in California.

The nearest designated scenic roadways are: Laureles Grade Road, a Scenic County Road; and Highway 68, a designated State Scenic Highway. The proposed project site is located within the scenic corridor of that roadway. The Scenic Highway Element provides that, within a scenic corridor, all utilities should be placed underground and architectural and landscape control should be

exercised; and use of natural vegetation and sensitive site selection are encouraged. A detailed discussion of viewshed is presented in Section 2.6 of this Report.

Noise Element The five basic noise-related goals of Monterey County are discussed on pages 24 and 25 of the Noise Element.

The proposed project is in an area of special concern, according to the Monterey County Noise Element. An area of special concern is an area having noise sensitive characteristics, which also is impacted by noise sources to varying degrees. Therefore, these areas are recommended to be given special concern in evaluating their land use activity.

The noise environment at the project site consists of traffic noise from Highway 68 and both general aviation and commercial jet aircraft flyovers. The site lies outside the adopted Zone of Influence of the Airport Land Use Commission, which ends at York Road west of the project area. Aircraft-related noise levels may be an occasional nuisance in vicinity of the project site. For a more detailed discussion of Noise Impacts, refer to Section 2.9, Noise and Airport Safety, of this report.

Conservation/Open Space Element. This element is designed to assure that adequate open space is provided for all urban and rural areas in Monterey County. The general open space policies of Monterey County that apply to the project are as follows:

4. To encourage the incorporation of open space in all types of development.

5. To help retain the rural atmosphere of the County through the use of open space.

8. To encourage open space through the clustering of development, with passive and active recreational areas.

10. To establish open space patterns which will complement the locations of future developments.

These policies were established as a means of preserving and protecting open space. Further details of each environmental concern will be covered in the "Environmental Setting" section of this Report.

Recreational Trails Plan. The Recreational Trails Plan for Monterey County was adopted in 1971. It should be noted that the Conservation/Open Space Element incorporates, in a more general way, the specific items mentioned below. Plans recommended by the Recreational Trails Coordinating Committee which are pertinent to the proposed development are as follows:

1. Riding Trails Along Shoulders of Public Rights-of-Way.

2. Bicycling Strips Along Shoulders of Public Road Rights-of Way.

3. Riding and Hiking Trail Reservations Within Scenic Easement Conveyances to the County.

Safety Element. The Safety Element of the Monterey County General Plan dictates guidelines for the protection of the community in the event of fires, earthquakes, flooding and other civil emergencies. The following principle is central to the development and implementation of the Safety Element:

> Monterey County should actively develop, implement, and support measures which are desirable or necessary to minimize risk from natural hazards to persons, property, public services, and resources.

Three basic hazards have been identified by the Element:

Wildland Fire Hazards, Geologic Hazards and Flood Hazards. Discussion of these hazards are included with the Environmental Setting, Section 2 of this document.

Seismic Safety Element. The general goal of this element is to reduce loss of life, injuries, damage to property, and economic and social dislocations resulting from earthquakes. The seismic hazards associated with the Laguna Seca area are shown in Table 2.

Table 2
Geotechnical Hazards
Identified at the Laguna Seca Office Park Site

Hazard Type	Hazard Severity+
Faulting	
Subsidence and Uplift	Moderate to Major
Ground Shaking	
Vibration Damage	Major
Ground Failure	Major
Liquefaction	Major
Lurch Cracking	Minor to Major
Lateral Spreading	Minor to Major
Slope Stability	Minor to Major

+Hazards occur locally. Further investigation is needed to identify whether the hazard is severe on the project site.

Further discussion of these hazards and their relation to the proposed development is included in Section 2.2, Geology, of this Report.

1.3.3 General Development Plan for Laguna Seca Ranch

In 1959 a General Development Plan for Laguna Seca Ranch was approved by the County of Monterey. The plan proposed a range of 1445-1580 units, neighborhood commercial, a golf course, elementary school, and a riding stable. In 1961 a final map was filed with the County for 46 lots. A tentative subdivision map was filed in 1964 for 48 more lots, but later expired. The 1959 plan was amended in 1967 to provide a range in total residential units from 1218 to 2452. A tentative map for 60 lots was filed on this amended plan in 1968, but it too expired for failure to act within the specified time period.

There are no specific development plans at present for the remainder of Laguna Seca Ranch.

1.3.4 Other Applicable Plans and Policies

The project may affect the Cities of Seaside and Del Rey Oaks, particularly in regard to traffic, runnoff and water supply. Policies pertaining to these topics in the General Plans of the Cities of Seaside and Del Rey Oaks were reviewed to determine possible conflicts with the project. Conflicts and issues pertaining to the project are discussed below.

- Increased erosion hazard, water runoff, siltation and construction of storm drainage facilities on Canyon Del Rey watershed would be impacted.

- Seaside seeks to improve and protect the water quality in Laguna Grande and Roberts Lake. The project would contribute runoff containing contaminants and sediments to these lakes.

- Coordination among local jurisdictions in preventing channel erosion and siltation in Canyon Del Rey due to increased runoff from development in upland areas will be necessary.

- Increased traffic problems along Highway 218 may result from project development, including (1) stacking of traffic on State Route 218 due to left turns onto Fremont Avenue; (2) increased traffic on State Route 218 and related noise effects.

The Monterey Peninsula Airport District operates the Monterey Peninsula airport, which serves the Peninsula and those areas immediately surrounding. The Monterey Peninsula Airport Master Plan presents the types and schedules of developments recommended for the airport for the 20 year period from 1975 to 1995. Both the Airport District and the Airport Master Plan encourage coordination with adjacent communities in order to establish compatible land uses in the airport environs and to accommodate the projected growth in all phases of commercial and aviation demand for the region served by the airport. The developer has coordinated with the Airport Commission and has indicated that he will sign agreements with that Commission.

The Monterey County Transportation Plan, a regional transportation plan, is a systems plan addressing transportation needs from 1978 to 1995. The plan was adopted on October 4, 1978, by the Monterey County Transportation Commission Advisory Committee in an effort to coordinate comprehensive transportation planning to meet future regional needs.

The Monterey County Economic Development Policies. In January, 1982 the County Board of Supervisors adopted a number of economic development policy statements which are applicable to this proposed General Plan change and Office Park development. According to these policies the County shall:

a. Support the retention and expansion of the viable and attractive tourist, retail trade, consumer and business establishments, and existing businesses.

b. Promote the continued growth of compatible industry on sites designated for industry and commerce and incorporate this policy in its General Plan.

c. Encourage positive governmental procedures which do not inhibit expansion and/or initiation of economic growth.

According to the Monterey County Economic Adjustment Strategy, prepared for the Monterey County Board of Supervisors by the Title IX Sudden and Severe Economic Dislocation Committee (August, 1981), there have not been a sufficient number of jobs produced to match increases in the labor force. This labor force expansion is mainly due to an increasing number of Monterey County residents entering the labor market rather than in-migration. According to this report, one way to increase jobs that will benefit the labor force will be to encourage small businesses. The Office Park would accomplish that objective.

Association of Monterey Bay Area Governments (AMBAG) is involved in continued planning, research and technical assistance to the area's governments, and has published numerous reports in an effort to develop cooperative regional land use planning.

1.3.5 Zoning

The site proposed for the Office Park development is currently zoned "K-B-4-D-V" (Agricultural Residential) 500 feet deep along Highway 68, and "T-V-B-4" (Transitional) beyond. After General Plan amendments have been approved new zoning designation to allow Professional Office can be requested.

1.4 Project Economics

The fiscal impact of the proposed office park will be positive, because the revenues generated by the project will exceed the costs to Monterey County for supporting the project for an annual surplus of $80,000. This is primarily a function of commercial land development which does not, in and of itself, create a population-based demand for services.

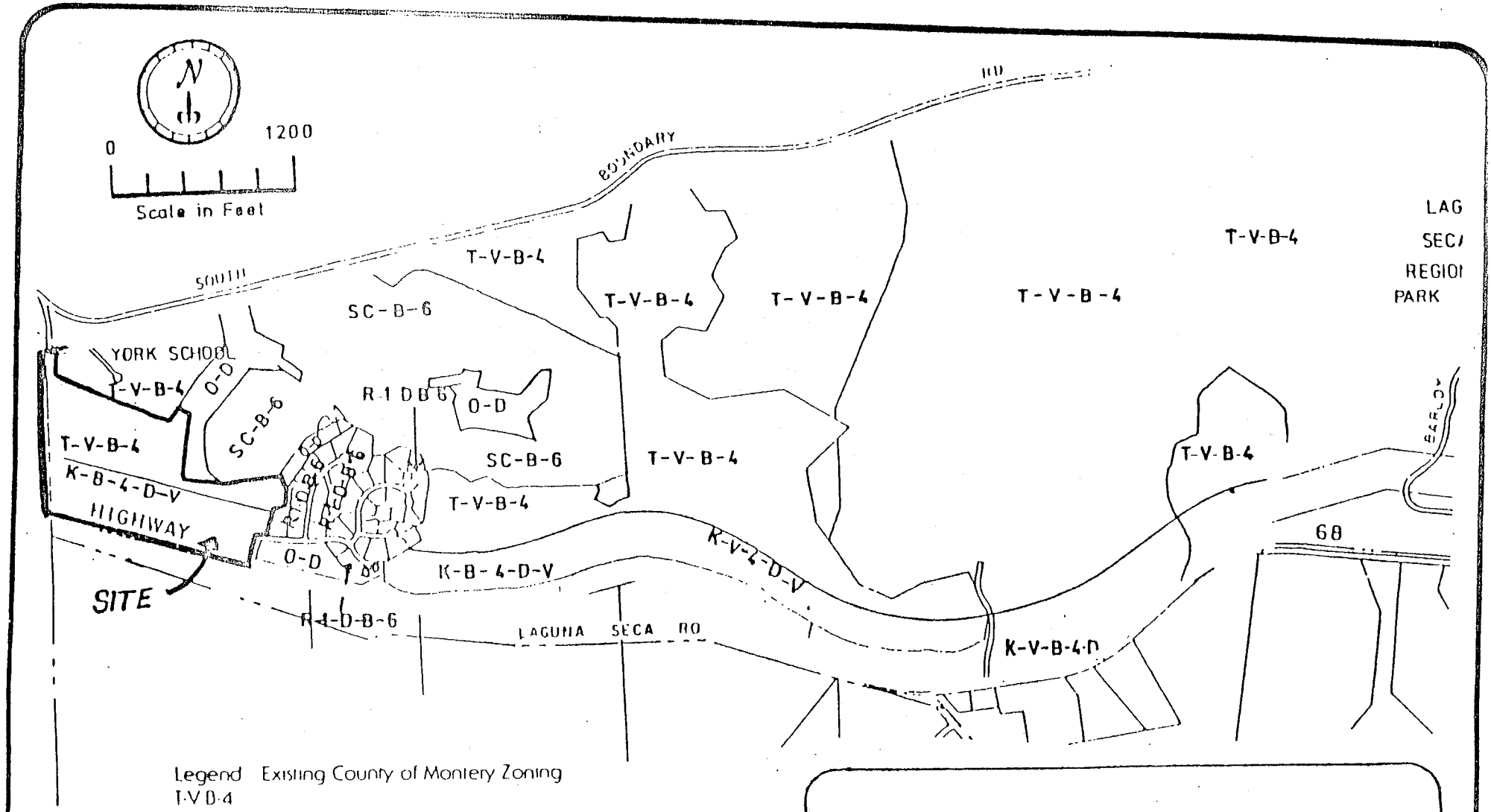
Low costs will be generated by the project, since the developer plans to provide most of the urban services through private utilities or some form of assessment district, thereby relieving the County of the responsibility for providing such services. There will be some degree of cost associated with the use of County (as well as City of Monterey) streets for commute purposes to the proposed project. These costs cannot be projected, but they are offset to some degree by general government and "other costs" which were considered.

While cost of the sewage treatment improvements will fall on the developer, the Regional Water Quality Control Board will only approve "private" systems if a governmental agency agrees to monitor and accept responsibility for management. In this instance a County Sanitation District would need to be formed, and managed by Monterey County Department of Public Works. Fees could be charged to allay costs.

Revenues will be generated by the project in several ways, the most important of which will be via the property tax. In addition, there are sales tax subventions and other taxes attributed to the business users of the project which will accrue to the benefit of the County of Monterey, and the total of these revenues will outweigh the projected costs to the County.

1.5 Economic Impact Upon the Monterey Area

The Office Park development has the potential of creating 1,000-1,200 new jobs. This estimate may vary, depending upon the type and size of office activities.



LAGUNA SECA OFFICE PARK

Existing Zoning

FIGURE 4

2.0 ENVIRONMENTAL SETTING

2.1 Regional Setting

Laguna Seca Office Park lies along the north side of Highway 68, about two miles east of the Monterey Airport and 2.5 miles southeast of the City of Seaside. The York School abuts the northerly line of the property. The Laguna Seca County Park is approximately 4 miles to the east. The intermittent stream of Canyon del Rey lies along the southerly edge near Highway 68. This stream has an incised channel about 20 feet deep which contains the flood waters and prevents flooding of the valley floor. The property rises in elevation from the floor of Canyon del Ray toward the north.

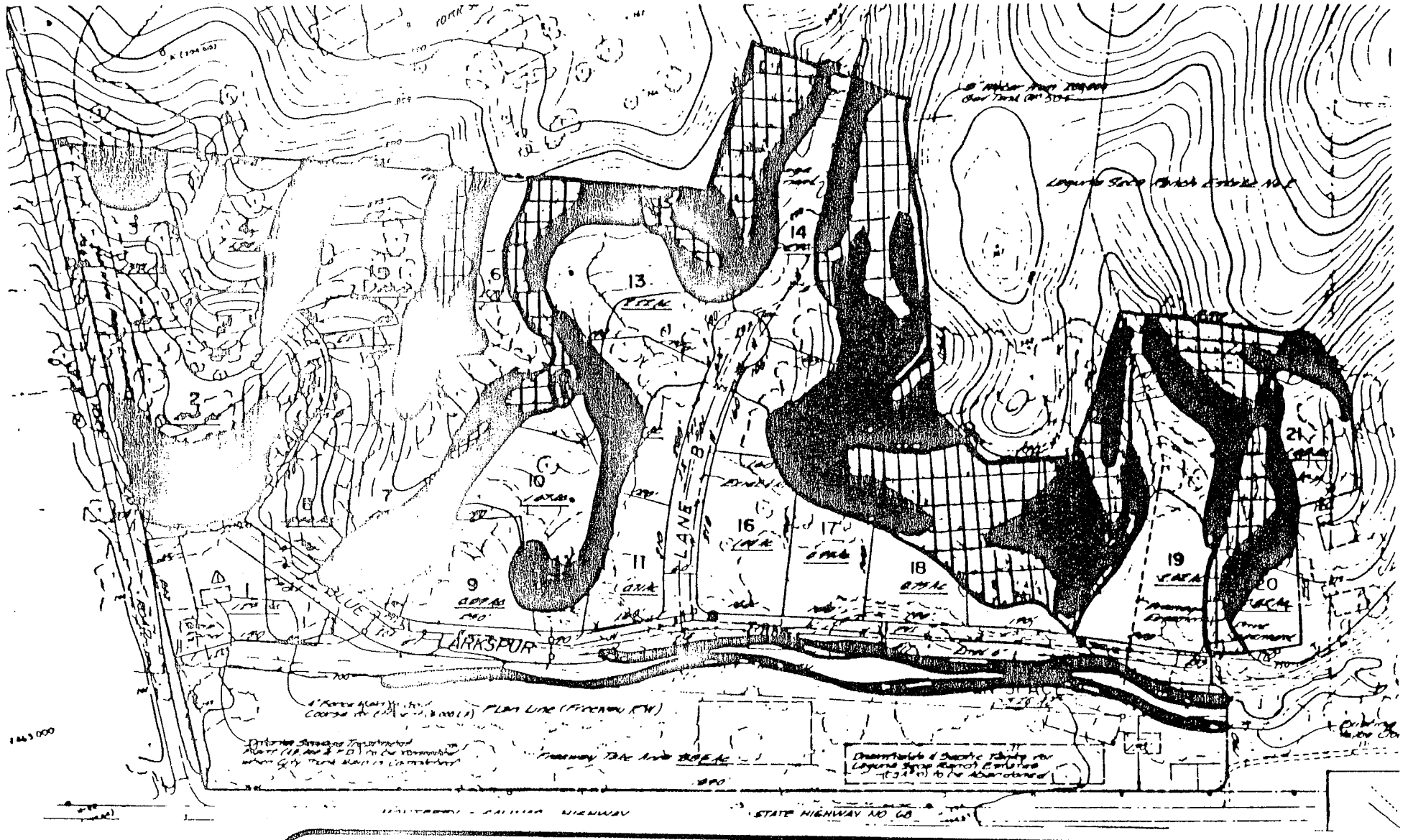
South of Highway 68 the hills rise abruptly to a height of 880 feet and are covered heavily with brush. This vegetative cover serves to control runoff into Canyon del Rey from this long ridge. Figure illustrates the topography of the project site.

2.2 Regional Geology

The Monterey Peninsula is located on the northern end of the Santa Lucia Mountain Range within the Coast Ranges Geomorphic Province of California. This province is a linear system of more or less parallel and discontinuous mountain ranges and intervening valleys trending northwest/southeast and extending from the Klamath Mountains in the north to the Traverse Ranges in the south. The geologic structure of the Coastal Ranges is highly complex. The rock masses have been closely folded, substantially eroded, and broken into fault blocks.

The project site is located south of geologically young continental deposits between Salinas and Monterey. These poorly indurated sediments of Pliocene through Recent age overlie much older marine sedimentary rocks of Miocene age at various depths throughout much of this area. Thin bedded marine shales and siltstones of the Middle Miocene Monterey Formation are exposed at the surface throughout most of the ridge area to the south between Canyon Del Rey and Carmel Valley. These older rocks have been uplifted along the northwest trending Chupines Fault, which cuts through the Canyon Del Rey area.

In common with the remainder of California, the site is within a region of high seismic activity. The Coast Ranges include numerous northwest trending faults. The San Andreas Fault, which is the most notable, extends for more than 600 miles. The San Andreas Fault passes through the area between Salinas and Hollister about 25 miles from the project area.



LAGUNA SECA OFFICE PARK

Local Vicinity Topography

FIGURE 5

Regional Faulting

The two largest faults in the County are the active San Andreas fault, along the eastern edge of the county, and the Palo Colorado-San Gregorio fault zone, which lies along the coast.

Between these two boundary faults lies a network of many parallel faults of different lengths and types. Some lie wholly within crystalline rocks, some in the sedimentary and some cut in both. Some are buried beneath the valley alluvium.

Information pertaining to regional faulting which threatens property and human life is summarized in Table 3 (Jennings et al., 1975; Green, 1977). Figure 7 illustrates the regional faulting.

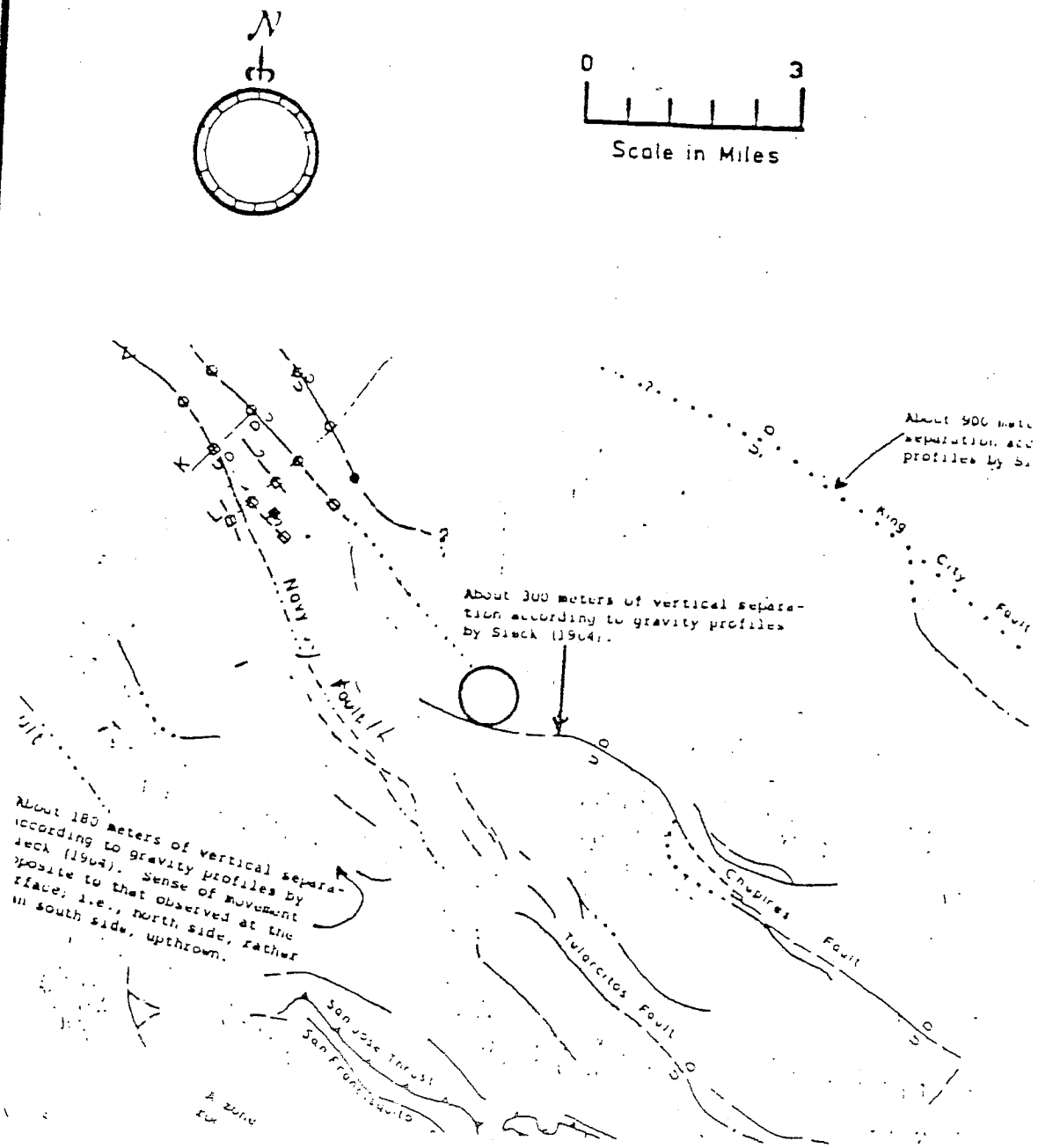
Local Faulting. Many small, inactive faults lie wholly within Miocene shales and form a secondary network of faults whose orientation is nearly at right angles to the northwest/southeast trend of the larger faults. Figure 6 illustrates the local area faulting.

Table 3
Regional Faulting

Faults and Fault Zones	Least Miles From Project	Maximum Richter Magnitude	Susceptibility to Property Damage
San Andreas System**	23.1	7+	Extreme
Vergeles	22.3	6	Extreme
Sargent	24.4	5 to 6	Extreme
Monterey Bay	8.4	5 to 6	Extreme
Palo Colorado	13.9	6 to 7	Extreme

**Includes the Hayward and Calveras Faults.

In the general Hidden Hills area, Clark and Dibblee (1974) mapped 6 faults between Cypress Point and the northern limit of the City of Seaside, all of which they considered to be potentially active. The faults identified by Clark and Dibblee include the Cypress Point, Navy, Berwick Canyon, Chupines, Seaside and Ord Terrace faults.

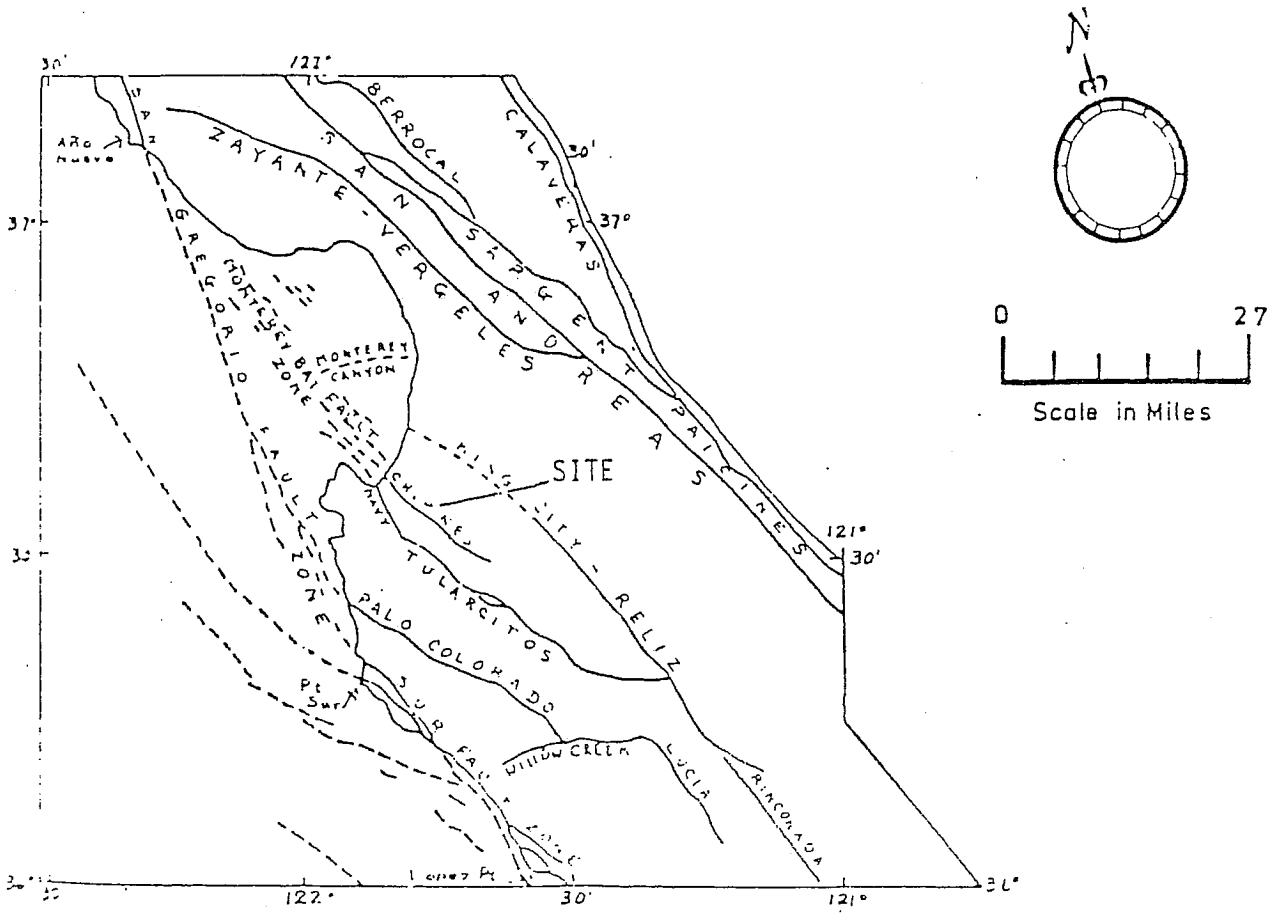


LAGUNA SECA OFFICE PARK

Local Faulting

FIGURE 6

Modified after Greene and others (1973)



...al Fault Zones
...terey Bay and Vicinity
...ified after Buchanan Banks et al 1978

LAGUNA SECA OFFICE PARK

FIGURE 7

Source Richard R Thorp Consulting Geologist

The Chupines fault is about 11 miles long and offsets Pleistocene strata against the older Miocene shales. It begins in the mountains northeast of Carmel Valley, cuts through Hidden Hills a short distance south of Highway 68, follows along Canyon del Rey Boulevard and into Monterey Bay.

Site Geology

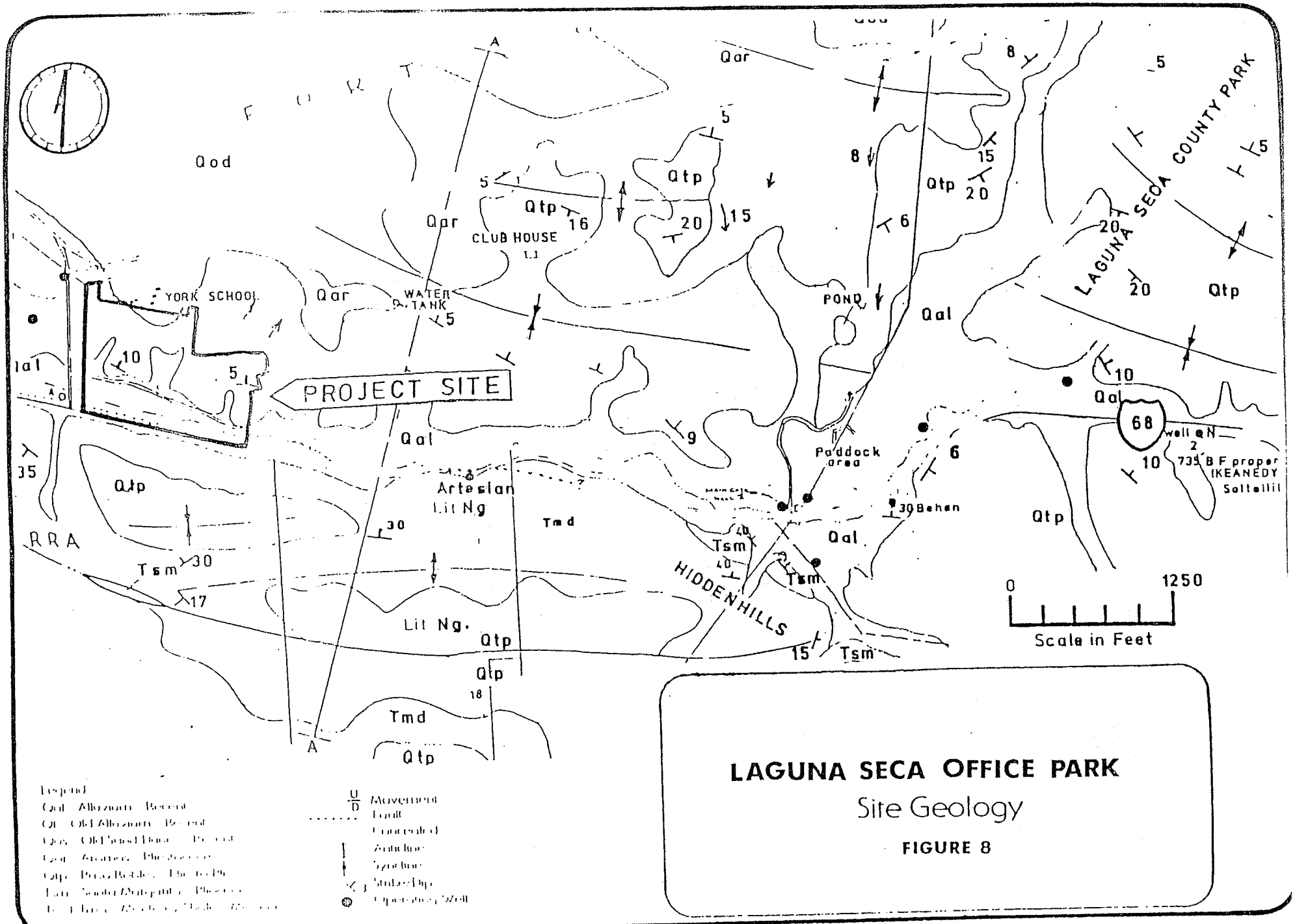
Three geologic units occur within the general project area. In order, from oldest to youngest, these are: non-marine sediments of Plio-Pleistocene age (equivalent to the Paso Robles Formation and the Aromas Sand); alluvial terrace deposits of Pleistocene and Recent age; and Recent soil materials, predominantly tributary canyon and stream channel alluvium. Figures 8 and 9 illustrate the geological setting at the site.

Sixty to seventy percent of the ranch property is underlain by non-marine sedimentary deposits of the Plio-Pleistocene age. The bedrock underlying the hills consists of a gently folded sequence of soft to moderately indurated sands, clays and gravels of the Aromas and Paso Robles stream-laid formations of Pleistocene age. These are capped in the higher elevations, near the westerly boundary, by two patches of red-brown soft old sand dunes, one of which is occupied by York School. Materials are probably not over 30 feet thick.

The Recent soil materials present consist of reddish brown silty and clayey to fairly clean sand and clayey to sandy silt. The sand is generally fine to medium grained, but is locally coarse grained and pebbly. The predominant material type present is a fairly homogeneous, moderately friable, fine grained, slightly clayey silty sand. Bedding within the deposits is sub-horizontal with dips of 10 to 15 degrees present locally. Very friable silty and clean sands dominate within certain sections in the upper areas of the property, and preferential erosion of these dominantly sandy deposits has produced the badlands canyons which exist in this area.

Alluvial terrace levels formed during late Pleistocene and Recent time exist at various elevations above the existing stream channel. Within the property limits, these terrace surfaces exist principally as small isolated remnants, although a few larger areas exist. The deposits consist principally of poorly sorted sands and gravels. The gravels are made up almost wholly of well rounded fragments of Monterey shale and siltstone of pebble and cobble size. The sands vary from fine to coarse grained and pebbly and are silty to fairly clean. In many areas the deposits are thin or have been removed entirely by erosion, leaving only a bench cut in the underlying Plio-Pleistocene deposits.

Recent alluvium fills the Canyon del Rey bottom and extends back into most of the major tributary canyons. These alluvial deposits are predominantly granular and consist almost entirely of fine to



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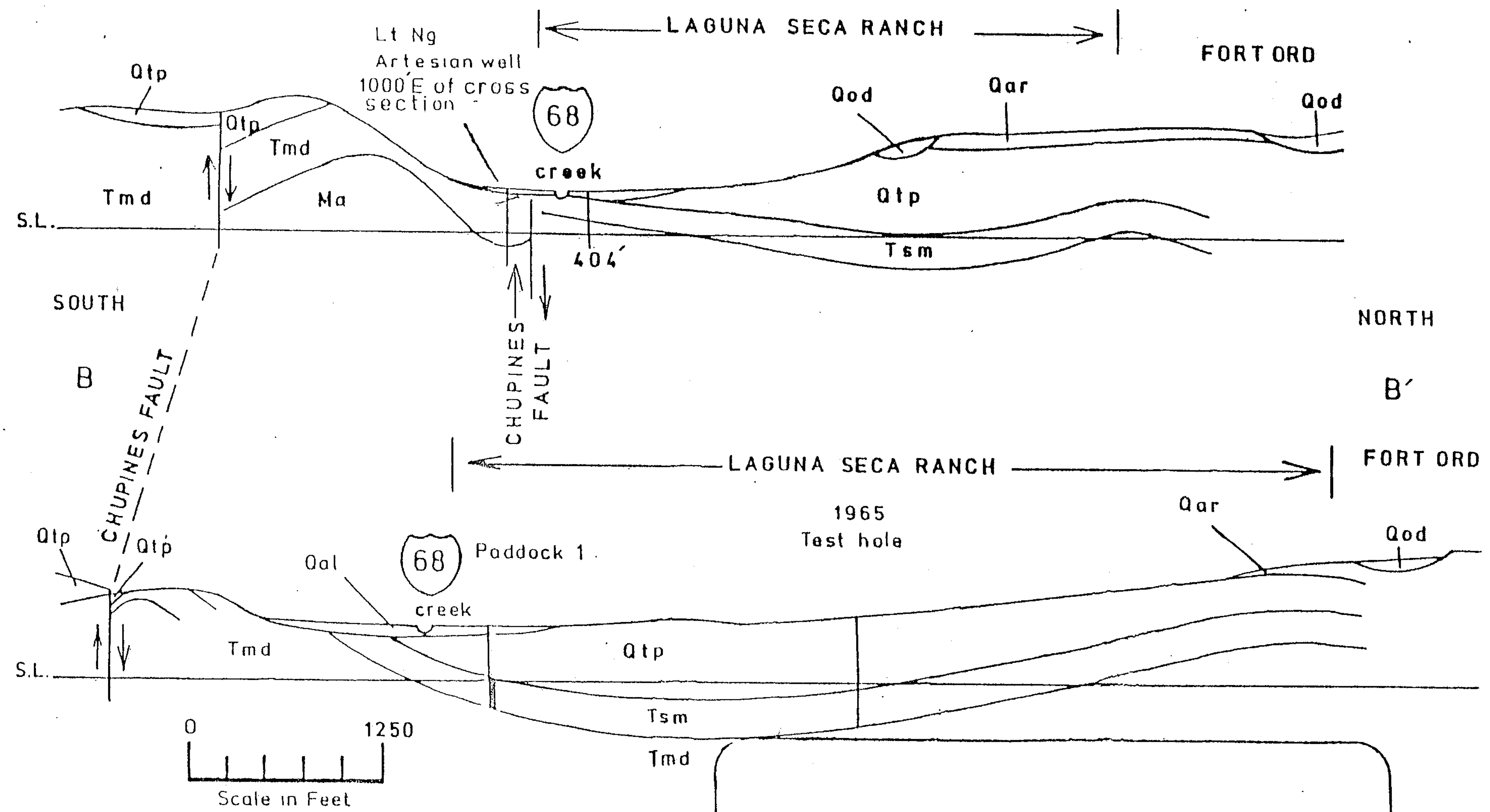
Site Geology

FIGURE 8



Legend
Qal Alluvium Sand Silty Clay Few Hard Streaks

LAGUNA SECA OFFICE PARK

Geologic Cross Sections

FIGURE 9

medium grained silty to fairly clean sand. A layer of gray-brown silty sand topsoil 1 to 2 feet thick exists throughout most of the area; and locally, surface deposits of white, loose, clean sand washed down from the higher areas exist in some of the canyons. Below these surface soils, the alluvium consists of horizontally bedded light brown medium dense sand with a few gravel interbeds.

The alluvial plain is about 1,000 feet wide at the easterly edge of the property and narrows to about 300 feet at the westerly edge. The alluvial sediments grade from sand to sandy clay and clay from east to west. These deposits are 30 to 40 feet thick.

A shallow water table lies at about 30 feet below the surface within the alluvium. This source of water feeds the lush vegetation in the alluvial plain.

A branch of the Chupines Fault lies along the south side of Highway 68. The most recent evidence from field mapping (Bowen, 1980) in the project area indicates that there is no fault trace on Laguna Seca Ranch. In the USGS Map MF-577 (1974), the fault is shown as lying parallel to and south of Highway 68, with no trace north of the highway.

Seismic Hazards and Earthquake Potential. The Chupines Fault has produced several earthquake epicenters which appear on a number of published fault epicenter maps. Hence, it must be presumed to be active even though no major earthquake can be attributed to it. The fault does not appear to have caused surface rupture in historic time. An investigation was performed by Oliver E. Bowen in August 1980 in order to precisely locate the Chupines Fault. The report indicates that the fault has been located to the south of the project site across Highway 68.

The Tularcitos Fault, which lies along the south side of Carmel Valley, is an active fault capable of generating strong motion [illegible] there may well have been ground rupture in the [illegible] Carmel Valley Village and farther to the southeast in [illegible].

The King City Fault, which lies along the base of the Sierra de [illegible] has produced small magnitude epicenters in historic time and surface rupture in the Greenfield-Chualar area within the last few hundreds of years.

By far, the fault most likely to generate ground rupture and to cause an earthquake of magnitude of 7 or 8 on the Richter scale is the San Andreas fault, which passes along the eastern edge of the San Juan Bautista and northwest through Logan on the eastern edge of Watsonville.

The proposed subdivision is located within earthquake intensity zones VI-VII on the Rossi-Forel scale. (Refer to Appendix B.) The zones are plotted, from historical ground failure, on USGS Map MF-903 (McCrory et al., 1977) and are illustrated in Figure 10.

Slope Stability. The most critical soils problem in the project area is their high erodability. The problem will be aggravated by the proposed development. No active or inactive landslides of mappable size occur on the property.

Impact

Based on existing data and a geological field investigation per-formed on the project site, the following geologic hazards may pose significant constraints to the proposed development.

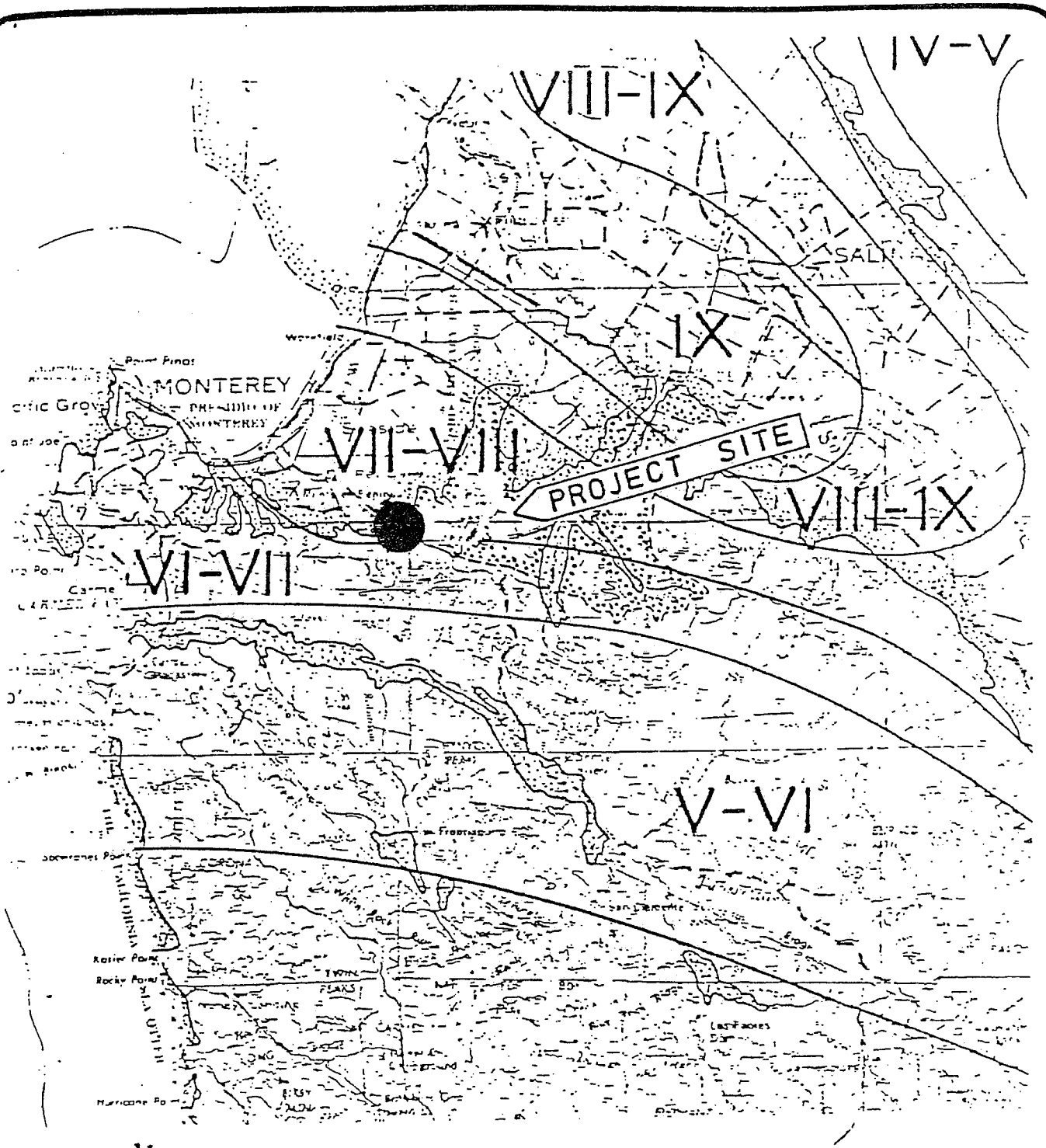
Faults and Seismicity. In the event of a major seismic event on any one of the active or potentially active faults in the Monterey Bay region, the site could be subjected to severe ground shaking. This ground shaking could cause extensive damage to buildings, roadways and utility lines, particularly if they are not designed to with-stand horizontal accelerations produced during earthquakes. Severe ground shaking also could trigger landslides, particularly on graded slopes not constructed to resist seismic forces.

The Chupines Fault, which lies on the south side of Highway 68, is considered potentially active. No surface rupture should occur on the project. However, active faults, such as the San Andreas, Mon-terey Bay Fault Zone and the Sur-Nacimiento, are all close by and can cause severe shaking and possible lurch cracking.

No faults have been mapped within the property boundaries and no surface ruptures should be expected. However, strong shaking from an earthquake of 8.0 intensity probably will be experienced during the lifetime of the site. Possible lurch cracking and per- [illegible] soft sand [illegible] and [illegible] westerly edge of the prop-[illegible] It has been recommended by the consulting geologist that these areas should be tested for possible liquefaction.

Slope Stability. The County Standards do not allow development to be located on [illegible] Therefore the development of the Office Park complex would have to conform to these standards. No development as shown on Figure 3, Office Park Development, ex-ceeds slopes of 30%.

Erosion by surface water will constitute a major problem on any sur-face where the protective natural topsoil and vegetation is removed. The materials underlying the hillside slopes are predominantly gran-ular and poorly indurated and are therefore susceptible to erosion.



Seismic Hazard Zone VII-VIII

LAGUNA SECA OFFICE PARK

Earthquake Intensity Zones

FIGURE 10

Source: McCrory et al 1977

A "surface skin" has developed on natural badlands exposures through the deposition of dissolved minerals. These natural exposures have developed over long periods of time, and the present rate of erosion is very slow. Cut slopes in these sandy materials do not have this protective surface layer and characteristically develop a gullied or "fluted" appearance soon after construction. If preventative measures are not instituted, this condition will worsen rapidly, possibly leading to a long term failure of a portion of the slope. The erosion potential of fill slopes constructed with these materials will generally be even greater than adjacent cut slopes.

The bedrock of the property, for the most part, consists of a series of sands, clays, sandy clays and gravels of the Paso Robles formation. They generally are buff to gray in color and contain pebbly zones of Monterey shale debris. They are mostly soft to moderately indurated. Seven percolation test holes, located in the hilly area in Laguna Seca Ranch No. 2, record from 2 to 3 feet of "peat muck," an unstable, wet, black, mushy type of deposit. There may be other sites where this muck occurs.

No other soil problems appear to be associated with the Paso Robles formation. The area to the east of the Ranch is literally dotted with homes which have been built on this formation. The degree of induration is generally sufficient to support steep-sided gulleys and ravines without caving.

Parts of the alluvial area contain loose sand in the upper few feet which, under unusual conditions of a heavy winter and strong shock, may possibly be subject to liquefaction. Tests should be made to determine the liquefaction potential.

Mitigation Measures

1. Care must be exercised to control erosion in excavated areas and along Arroyo del Rey. Vegetation should be left as is, or scraped areas should be protected by the replanting of a vegetative cover. Sound engineering practices in planning for building sites will be necessary, and soil tests should be performed where deemed advisable.

2. Construction design should be based on an expected 7-8 magnitude of earthquake located on that portion of the San Andreas Fault nearest the project. This magnitude can be considered as the maximum probable and maximum possible for this location. Structural earthquake regulations should apply to buildings in accordance with Chapters 23 and 25 of the latest adopted edition of the Uniform Building Code. The use of properly fastened plywood sheathing on either the interior or exterior of the structures, gypsum board sheathing on the interiors, or wood steel strap diagonal bracing, could be implemented to reduce risk on single family wood frame structures.

3. The project must comply with the Seismic Safety Element of the Monterey County General Plan. This would include a detailed geotechnical and soils investigation and report which would be performed to provide grading, foundation and construction recommendations prior to submittal of the Tentative Map.

4. To insure a stable design and construction procedure for the cut slopes and fill areas, the final grading plans should be reviewed by a soils engineer and engineering geologist prior to construction.

5. Grading in hillside areas should be minimized. Required grading should be finished to match or blend with the countours of the natural terrain. Grading activities should be confined to the summer, dry season, unless adequate erosion control measures are included within project specifications to preclude irreparable damage to slopes and to prevent siltation of Canyon del Rey Creek.

6. Grading of large building pads and excessive terracing should not be permitted. Graded sections generally should be limited to portions of the site to be covered by buildings and roadways.

7. Vegetation removal should be minimized, particularly in major drainage-ways, areas of steep slopes and highly erosive soils.

8. Building, roadways and utility lines should be designed according to the specifications adopted by the State Uniform Building Code (1976) for a seismically active area.

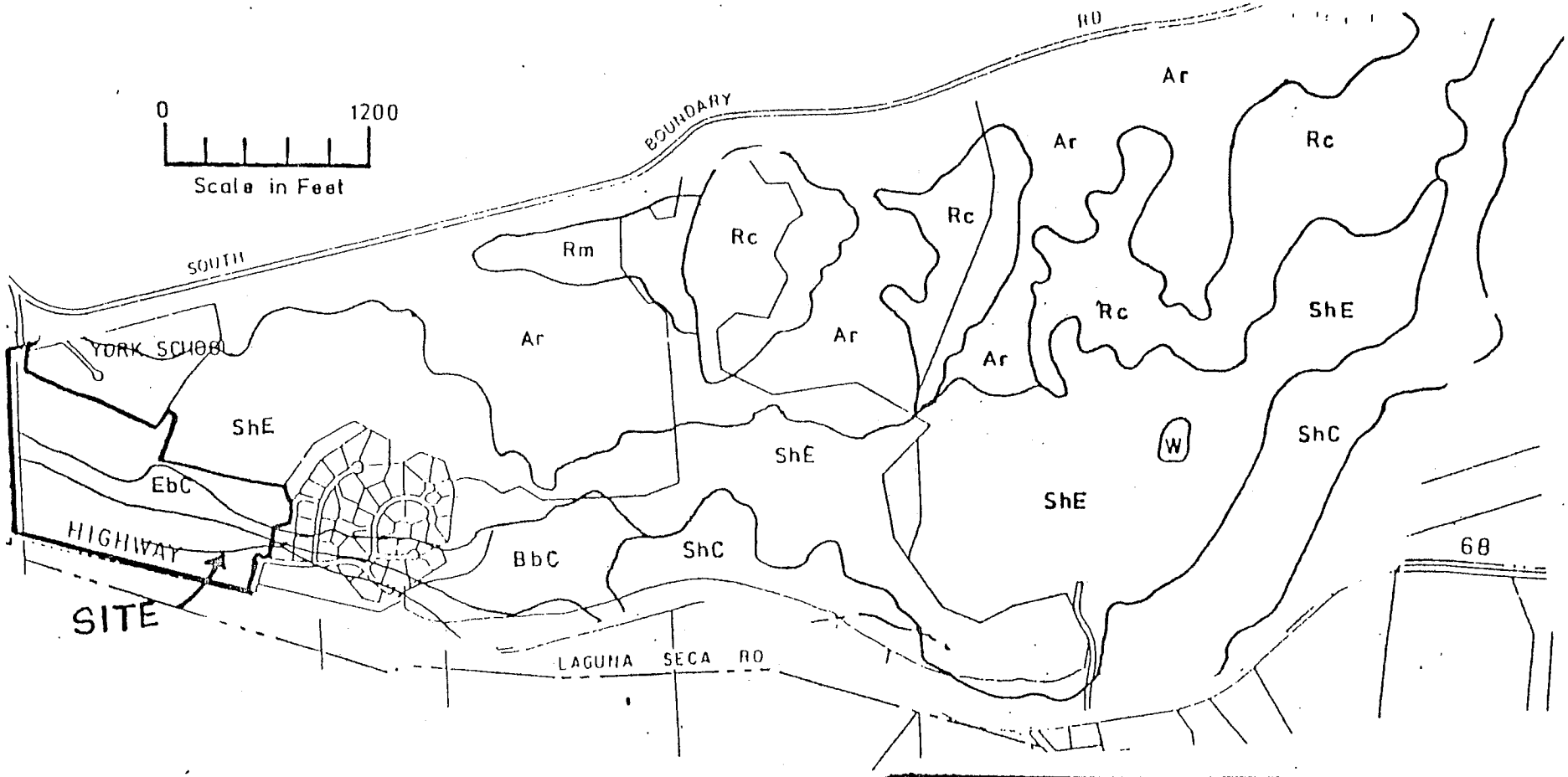
4.3 Soils

The locations and extent of the various soil types on the property are depicted on Figure 11. The major soil type is Ebc, Elder fine sandy loam.

The Soil Conservation Service rates EbC as "moderately erodable".

Historically, soils of the Laguna Seca area have been protected from erosion by a natural process of crusting through the depositing of minerals in the surface soils over a very long period. This surface crusting, together with vegetative cover, has tended to minimize surface erosion (with notable exceptions in the gullies where the surface crust has been broken and surface water runoff has been allowed to make serious intrusion).

The soils at or near the Site are classified into the following categories according to the Soil Survey of Monterey County.



ShC Santa Ynez fine sandy loam (2-9% slopes)
ShE Santa Ynez fine sandy loam (15-30% slopes)
EbC Elder fine sandy loam
BbC Baywood Sand
Rc Rock outcrop Xerorthents association
Ar Arnold Santa Ynez Complex
Pm Pits and dumps

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Soils

FIGURE 11

Source: soil conservation service

ShE Santa Ynez fine sandy loam is a hilly soil on dissected terraces, with slopes of 15% to 30%. Runoff is rapid and the erosion hazard high.

*EbC Elder fine sandy loam, is a well drained soil appearing on gently sloping areas in narrow valleys. Permeability of this soil is moderate, runoff slow and the erosion hazard is moderate.

*Site soils.

Impact

The construction of the Office Park development and the implementation of the proposed development will result in grading activity, the removal of vegetation, and the addition of impervious materials to the site, thus resulting in an increased runoff and erosion potential. A grading plan has not yet been prepared for the Office Park development.

Grading operations associated with development and road construction could expose areas of moderately erodable soil to erosive forces.

Further significant impacts will occur as the soils are disturbed to provide for the placement of building pads, utility lines and extensive site preparations. These could include the following impacts.

- Removal of existing vegetative groundcover and exposure of unstable soils.
- Removal and/or compaction of organically rich and valuable top soil.
- Trenching for utility lines could further disturb extensive areas.
- Exposure of cut slopes along the drainage courses of the site could pose an erosion problem depending upon the drainage plan for the site. Without proper design, storm drainage could flow down the face of cut slopes causing erosion with resulting sediment deposition in Canyon del Rey.
- Exposure and susceptibility of slopes to various forms of erosion would be a problem, during and shortly after construction and grading, due to the lack of vegetative covering.

Mitigation Measures

9. County design review procedures should require a detailed soils investigation for each building site within the Office Park development to provide information on slope stability, erosion potential and drainage features and should establish setback lines. A specific grading plan is required for this development and the final grading plans should be reviewed by a soils engineer and engineering geologist prior to construction.

10. Future grading on the project area should be confined to a limited area of the site and be required to be engineered for a minimum of cut and fill. Care should be taken to reduce impacts through proper building placement, particularly in the areas which presently are being impacted by erosion. An erosion control plan should be prepared to ensure development has specific designs to control these hazards associated with the project site. Roadways and driveways should be located so as to minimize cutting and filling. Contouring of roads should be done wherever possible. Cut and fill should be balanced on site (i.e., the amount of cut should be used as fill). To reduce the erosive velocity of runoff water, the length and the angle of graded slopes should be minimized.

11. Each site should be revegetated as soon as possible after grading is finished on any part of the site with regard to soil scarification, hydro-muching and vegetative cover planting to control erosion and maintain slope stability after grading is completed.

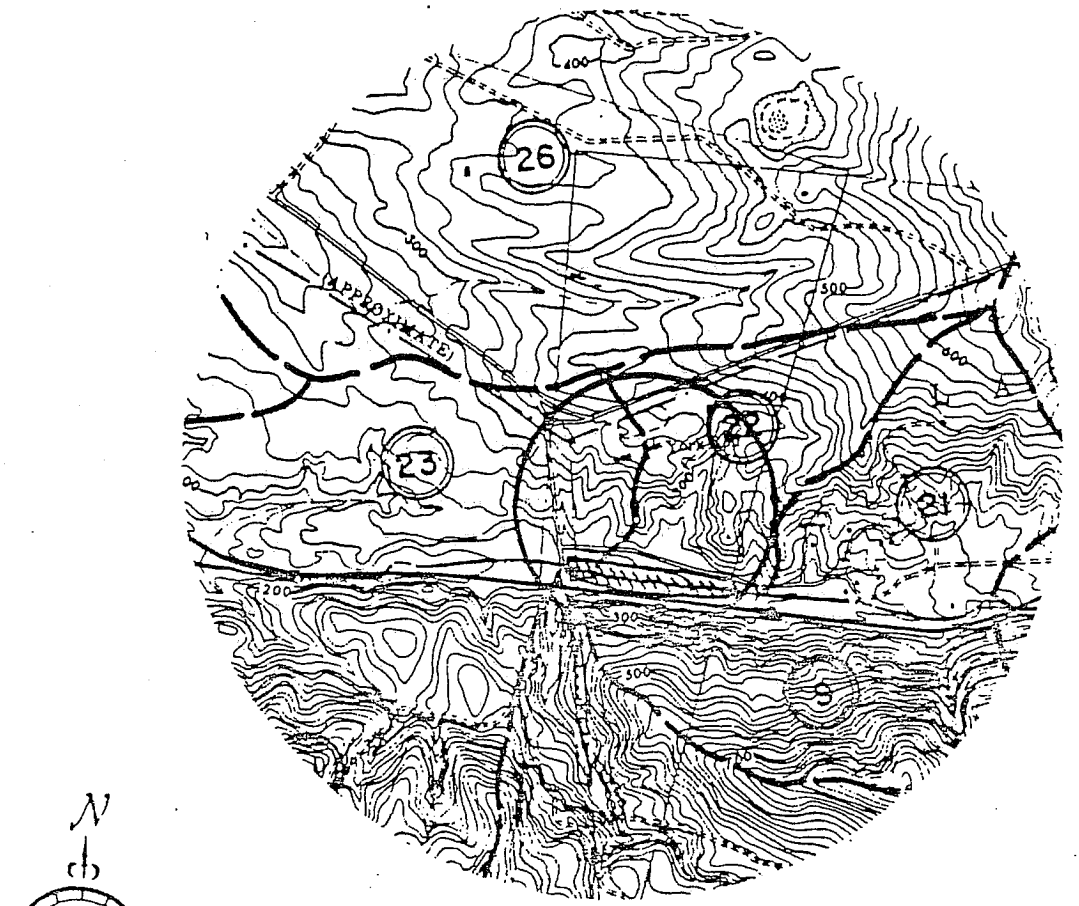
2.4 Hydrology

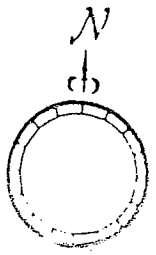
Surface Hydrology

The project site is located in the Canyon del Rey Watershed, which begins just east of Laureles Grade and flows westerly along Highway 68 and Highway 218, through Laguna Grande and Roberts Lakes and into Monterey Bay. The entire watershed contains a total area of 16.8 square miles.

The Laguna Seca Office Park makes up 54± acres within the Canyon del Rey Watershed. This watershed was the subject of a Master Drainage Plan in June of 1977.

In addition to the special basin drainage study, a Water Quality Management Plan for the Monterey Bay Region was prepared by AMBAG. This project was funded through a grant under Section 208 of the Federal Water Pollution Control Act, and expressed specific concerns over the potential impact of development on Laguna Grande and Roberts Lakes. These two coastal lakes are located on the border between Seaside and Monterey.





Source. Monterey County Master Drainage Plan 1977

① sub watershed

flood hazard area, 100-year flood plain

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Drainage

FIGURE 12

The Master Drainage Report shows an annual precipitation of 13 inches at the northeast corner of the Laguna Seca Office Park. Mean annual precipitation within the entire drainage area varies from 12 to 16.5 inches. Incident rainfall generally does not produce large quantities of runoff. During large infrequent storms or when there has been substantial antecedent precipitation, the surface soils become saturated and a much larger proportion of the precipitation runs off as stream flow. (MCFC & WCD, 1977).

The extent of the 100 year flood in Canyon del Rey is also shown in Figure 12. The 100 year flood is the flood magnitude which has a probability of occurring on the average of once every 100 years or a 1% probability of occurring in any given year.

The 100 year flood has been established by the Federal Insurance Administration as the basis for flood hazard evaluation and the determination of flood insurance rates. As shown in Figure 12, there is a flood prone area proposed for office park development mainly located on Lot #1. Flood waters are generally confined to the channel, except where there is ponding in low areas behind culverts which are inadequate to convey the flow. The Canyon del Rey watershed is identified as an area of low flood hazard in the Environmental Hazards Element of the Monterey General Plan.

According to the Developer, on-site drainage facilities within each portion of the Ranch development will consist of street gutters, catch basins, stormdrain pipes, and the aforementioned siltation/detention ponds. These are proposed to be designed to remove the peak runoff from a 10 year storm without street flooding. They also are to include supplementary facilities to allow surface flow in more intense storms without inundating any buildings. No drainage plan for the Office Park development has been prepared at this time.

Impacts

Certain low lying areas along Canyon del Rey Creek are subject to inundation by floodwaters in intense storms. Development is planned to be set back from the creek, with one lot in the Office Park having actual creek frontage. Lot 1 of the Office Park is partially located within the 100 year flood plain of Canyon del Rey Creek.

The flood hazard to the facilities and flow characteristics of the floodwaters would depend on the elevations of the buildings and future channel improvements in Canyon del Rey Creek. No other portion of the site proposed for development is within the 100 year flood plain, as shown in Figure 12.

The project development plan states that Lot 1 of the Office Park will require flood proofing in the form of minor channel enlargement and fill in actual building area. If implemented properly, these

features could successfully mitigate danger from future flood hazard. However, improper or inadequately implemented flood hazard control measures included within project specifications would result in loss or damage to property in the event of a flood.

In order to prevent greater peak flood flows in Canyon del Rey Creek after project development, a system of on site retention basins will be needed. The purpose of retention basins would be to delay certain runoff components produced on the site entering Canyon del Rey Creek during peak flood discharges, until the channel has cleared sufficiently to accommodate the additional flow. Drainage design plans, including size and locations of basins, have not yet been established at this preliminary stage of development. The project developer would bear the costs of constructing any drainage improvements on site and a proportionate share of new drainage facilities in Canyon del Rey.

The project will alter the hydrologic characteristics of the site by covering an estimated 15% of the site with impervious surfaces, including roadways, parking lots and buildings. Without proper mitigation, this increase in impervious surfaces could produce 3 potentially significant effects:

1) increase in the amount and rate of stormwater flow drainage from the site during and immediately after a rainstorm;

2) an increase in the volume of sediment erosion on site; and

3) reduction in the amount of groundwater recharge. (Refer to "Groundwater," in Section 2.3 of this Report.)

Mitigation Measures

12. The Project Engineer should design and submit for approval a complete drainage plan, including engineering studies and calculations, future runoff courses, and present and future volume of runoff and silt load. The location of the 100 year flood plain should be identified clearly on the tentative map. Development should be set back from the Canyon del Rey Creek.

13. As proposed by the developers, the project should contribute to a pro-rata share to any neccessary improvements of downstream structures, as identified in the Canyon del Rey Drainage Report, prior to any land improvements, the proportionate share to be determined by the Monterey County Flood Control and Water Conservation District.

14. All natural drainage swales should be designated on the final map by easements labelled "natural drainage easements."

15. New drainage culverts should be identified as such on the final map, consistent with the preliminary map.

16. The subdivider should pay for all maintenance and operation of storm drainage from the time of installation until acceptance of the improvements for the subdivision by the Board of Supervisors and until an agency, with legal authorization to collect fees sufficient to support the service, be formed to assume responsibility for the service.

17. The project plans should give precise location of the area within the flood hazard zone prior to the filing of the final map. Should any development be within the flood prone area, it shall be subject to conditions of the Monterey County Flood Control District.

18. A regular street maintenance program should be implemented to reduce urban runoff contaminants from street and parking lots.

Groundwater

The groundwater of the Laguna Seca area was reviewed in a report prepared by Richard R. Thorup in 1981 (See Appendix C). The purpose of the report was to furnish a summary report updated from a previous study by the same author on the groundwater of the Laguna Seca watershed and Laguna Seca Ranch and the long term relationship between resources, yield, and population growth to the year 2,000. This study included a Fall 1980 Water Table Map on the Toro-Laguna Seca-Seaside area, updated from a previous map prepared by that report's author in 1974.

Many facets of groundwater were reviewed within this report, including a review of the amount of water present on the ranch, the past history of water use, what effects the future development will have on the water table of the overall area, and how the future development of the water resources will affect the groundwater of the Ranch's neighbors, including the City of Seaside.

A discussion of the geology of the ranch, including soil types, is included in an edited version in the following text.

Groundwater Report

The Laguna Seca Office Park lies in an east-west sedimentary trough containing several hundred feet of saturated fresh water sands and gravels and extending for nine miles from the Harper fault (near San Benancio Canyon) on the east, to Canyon del Rey, one mile west of the Ranch. The south flank of this trough is bordered by a steep line of hills, abruptly rising to the south, approximately along the lines of the Chupines Fault.

The two principal aquifers in this district are the Pleistocene Aromas-Paso Robles sands and gravels and the underlying Pliocene Santa Margarita sand. The total saturated thickness of these two aquifers exceeds 800 feet in the thickest part of the basin. The Aromas-Paso Robles is the principal aquifer in San Benancio Canyon, parts of Corral de Tierra and all of Seaside, whereas the Santa Margarita produces most of the water in Laguna Seca, Hidden Hills and, locally, in Corral de Tierra. It is not uncommon for wells to produce from both aquifers. Well capacities in the thickest Aromas-Paso Robles produce up to 500 gpm of generally acceptable water, whereas many wells, where these sediments are thin or poorly developed, produce but a few gallons per minute. The Santa Margarita is about 230 feet thick in the center of the basin and yields up to 650 gpm of water which ranges from 850 to 1050 ppm TDS.

Less extensive, but locally important aquifers, are located in the upper few hundred feet of exposed Monterey shale and the underlying basal Monterey sands near the outcrop areas. Fresh water has largely displaced the marine waters in these areas. The resulting quality has been found to be locally acceptable. One recent well in upper San Benancio Canyon was test pumped at 100 gpm of 900 ppm TDS water from a basal Miocene sand underlying the Monterey shale. This well, though fairly deep (900 feet) suggests that other wells in nearby areas can be completed successfully in this aquifer. An artesian well in the area drilled in 1974, appears to be producing from the same zone.

Groundwater in Storage

In 1973, Thorup stated that the total amount of groundwater in storage in the Laguna Seca Watershed (3830 acres) is 82,300 acre-feet (36,500 acre-feet in the Aromas-Paso Robles, and 45,500 in the Santa Margarita). The Laguna Seca Ranch, which comprises roughly one quarter of the watershed, was estimated to contain approximately 22,000 acre-feet of groundwater.

Table 4, patterned after Muir's formula shows the total storage to be 120,000 acre-feet in the Laguna Seca Watershed. The present calculations have incorporated the drilling results of the last four years and are felt to be more accurate than the previous amounts.

Muir lists a total of 730,000 acre-feet of total water stored in his study area. Area 1, which covers the easterly half of Ford Ord and the Laguna Seca Ranch, contains 410,000 acre feet of groundwater in storage from an average saturated thickness of 550 feet in an area of 6200 acres. On this basis, Laguna Seca Ranch, which comprises roughly 1/6 of Area 1, would appear to contain 68,000 acre-feet of storage. However, it does not appear to the groundwater consultant that the saturated thickness of the entire ranch averages 550 feet

and is more likely to be 250-300 feet. Therefore, the total storage is estimated to be 37,000 acre-feet.

Table 4
Groundwater in Storage in Laguna Seca Water Shed

Aquifer	Average Saturated Thickness (Ac Ft)	Surface Area (Acres)	Volume (Ac Ft)	Weighted Average Specific Yield (%)	Storage Capacity (Ac Ft)
LAGUNA SECA RANCH					
Aromas-Paso Robles	150	800	120,000	12	14,400
Santa Margarita	150	1000	150,000	15	22,500
TOTAL					36,900
LAGUNA SECA SUBWATERSHED					
Aromas-Paso Robles	300	2000	600,000	12	72,000
Santa Margarita	200	2000	400,000	12	48,000
TOTAL					120,000

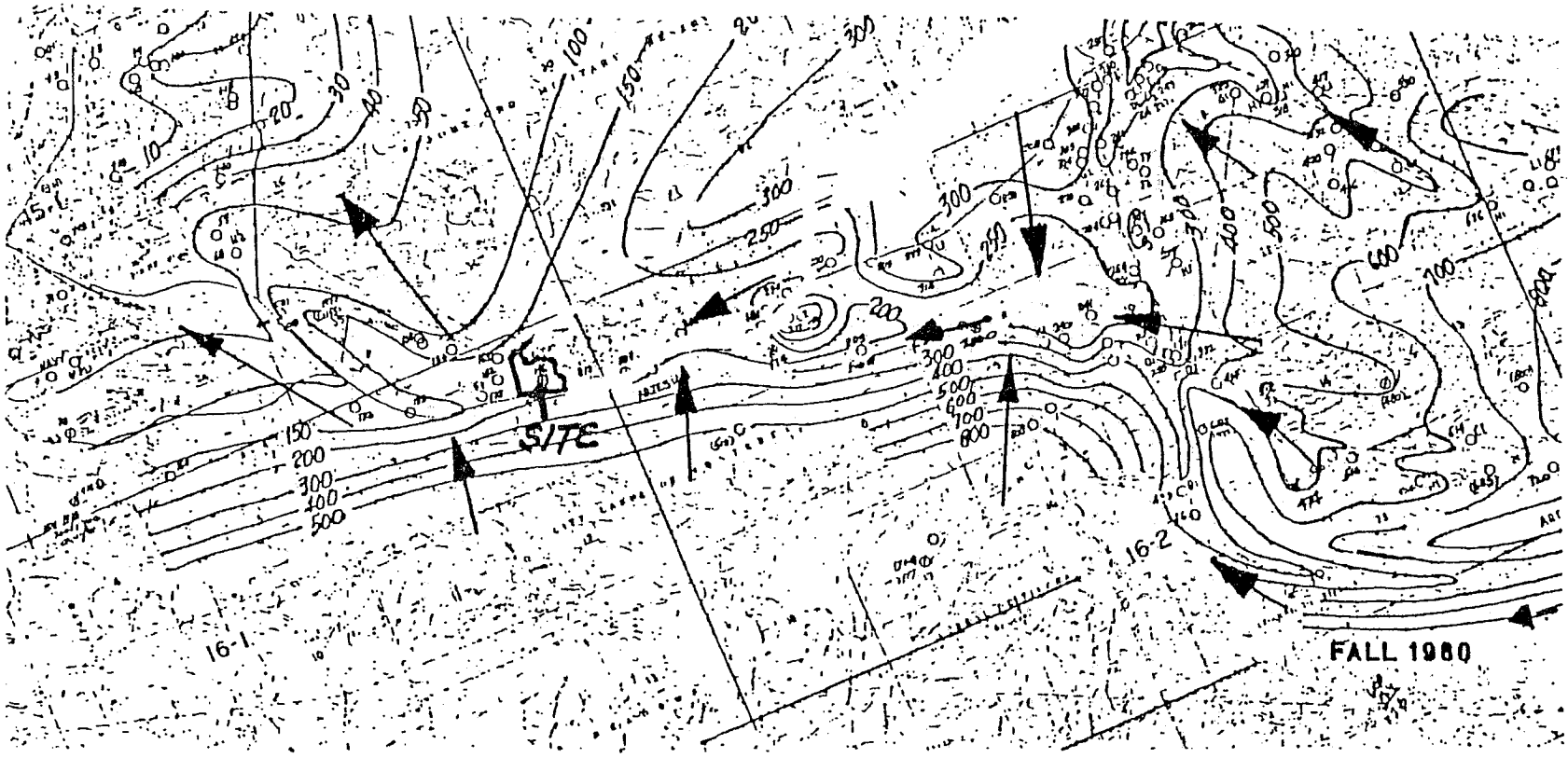
Water Level Measurements

Figure 13 is a revised water table map for Fall 1980. Covering the area from San Benancio Canyon to Seaside, the map gives well water measurements. Sources for well measurements are as follow:

1. Flood Control measurements in San Benancio, Corral de Tierra, Calera Canyon and Laguna Seca comprise 40 of their regularly measured wells and 53 additional wells from which measurements were obtained in 1977, 1979 and 1980. The purpose in obtaining these latter measurements was to allow a more precise determination of the water table, particularly in the vicinity of Corral de Tierra Road and Calera Canyon, to ascertain whether groundwater from Calera Canyon is migrating into the Laguna Seca area, as stated by Thorup.

2. California American Water Company and the City of Seaside provided measurements in the Seaside area.

3. Fort Ord supplied measurements on several of their wells.



←Groundwater
200 Groundwater Level
2O Well Water Level

N

0 7500

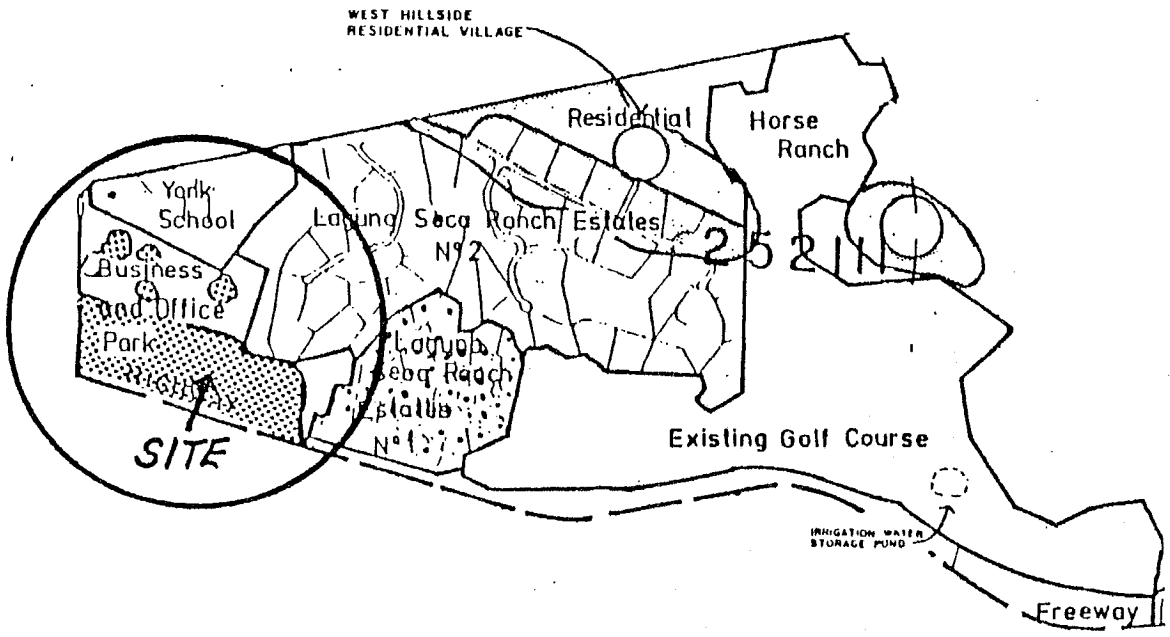
Scale in Feet

LAGUNA SECA OFFICE PARK

Watertable Map

FIGURE 13

Source:Richard R Thorup,Consulting Geologist



Legend

Residential
Multifamily
Mobile Home Estates
Subdivision
Retirement

Foothill Woodlands
Coastal Phase Chaparral

LAGUNA SECA OFFICE PARK

Vegetative Communities

FIGURE 14

Source: Dr. Richard Robinson, Consulting Biologist

4. The Monterey area was not included in the Flood Control investigation. Scattered measurements for the more recently drilled wells have been obtained from the contractors.

5. Wallace Holm provided measurements for Monterra and Ryan Ranch.

6. Hidden Hills supplied measurements for two wells.

7. A few scattered measurements were obtained from contractors and land owners.

Water Table Map: Fall 1981

Figure 13 illustrates the Water Table for Fall 1980. The contour lines are derived from the water surface elevations, which are shown plotted at the well locations. A summary of the groundwater flow is discussed below.

At the easterly edge, groundwater in the San Benancio area is shown to flow downstream along San Benancio Creek, thence northerly toward the Salinas River. Upper Corral de Tierra and Calera Canyon groundwater flows down the water courses, and down the regional dip of the strata into the Hidden Hills-Laguna Seca area. Some of this groundwater may transfer into the older sediments, such as the Aromas-Paso Robles Santa Margarita Sandstone, and the Monterey Shale. Lower Corral de Tierra measurements show the groundwater percolating downstream northerly into Toro Creek.

The steep southerly flank of the water table begins at the Santa Margarita-Monterey Shale contact. Three measurements in the shale wells show a steep rise in the water level elevations, probably caused by a sharp reduction in permeability in the shale as compared to the Aromas-Paso Robles and the Santa Margarita. Along the southeasterly border of the map, on the south side of Calera Creek, the steep contours begin at the sedimentary-granitic contact.

Whether, or how much, groundwater percolates through the Laguna Seca Ranch into the Seaside and Fort Ord area is not known definitely from the existing data.

Recharge and Safe Yield

The amount of safe yield relates to the Thorup report of 1977 and the current Muir report. In the former, the conclusion was made that, in the opinion of the writer, 2000 acre-feet of groundwater originating in Calera Canyon, migrates on an annual average down the gradient into the Laguna Seca trough. The water table map, and the volume of groundwater generated in Calera Canyon, were used as evidence for the conclusion. The California Department of Water Resources (Fresno Office) supported the conclusion on the direction

of groundwater flow, but stated they thought that the amount of 2000 acre-feet was too high. They did not indicate what they thought the actual amount was. The groundwater consultant believes the amount to be in the 2000 acre-foot range, particularly because the present water table map shows groundwater also entering the trough from the Watson Creek Watershed in upper Corral de Tierra, as well as from Calera Canyon.

According to Muir, pumping data in the coastal portion of Seaside demonstrates a safe yield of 2600 acre-feet. Inflow, or recharge, into the area is estimated at 3000 acre-feet. It appears, according to Muir, that groundwater flow into the ocean of 400 acre-feet per year is required to prevent salt water intrusion.

Muir states that, in his opinion, 95% of the recharge comes from annual rainfall, which is made possible by the porous soils and low relief of the hills east of Seaside, and the fact that the groundwater passes directly from the old sand dunes into the underlying Aromas-Paso Robles sands and gravels. He does not believe the Santa Margarita contributes any water to the Seaside wells.

Water Use

The average annual recharge for the Laguna Seca watershed, as stated by Thorup (Table 4), was 2737 acre-feet as of 1975. Water use for that year was estimated at 791 acre-feet. This yearly amount has increased modestly since then. About 100 new wells have been drilled in the Toro-Laguna Seca area since the 1977 report, evenly scattered in distribution throughout the entire basin. At a consumptive rate per well of 0.366 acre-feet per year for single family dwellings, about 40 acre-feet per year additional water throughout the entire area is now being produced, some of which is returning back into the soil. Buildups within existing subdivisions have increased the water use somewhat. Total present consumptive use in the Laguna Seca watershed is probably not over 900 acre-feet per year in 1980, as compared with 791 acre-feet in 1975. For instance, Laguna Seca Ranch production has remained essentially stable at 500 acre-feet per year through 1980, including the golf course. This amount will, of course, rise steadily as future demands are met.

The actual water use for the Professional Offices will be approximately 22,000 gallons per day. (.084 gallons per day per square foot) plus another 27,000 gallons per day for irrigation.

The latest water quality reports from the three operational wells show that in two of the wells perforated in the Santa Margarita formation, the TDS and chloride are slightly higher than the Public Health Drinking Water Limits. The third well, Paddock No. 4, was perforated in the Aromas-Paso Robles, and falls well within the limits for both. Only the Main Gate No. 2 is too high in iron, and none are too high in manganese.

Paddock No. 4 is the shallowest of the wells and is developed solely in the Aromas-Paso Robles formation. The water quality in this well is superior in every category. If an additional supply of better water is needed, it can be developed from this shallower aquifer. The pump test indicates that this well does not have the output of the other wells and cannot be expected to produce as much volume per well. Copies of the most recent analyses of the three wells are included in the Appendix.

A 1975 Report on the Laguna Seca County Park water well (16S/1E/5G) lists the TDS at 693 ppm at 270 feet, and 735 ppm at 350 feet. Chloride is 140 ppm. Iron and manganese are both slightly high. This well is perforated only in the Santa Margarita Sandstone. This suggests that better quality water might be found on Laguna Seca Ranch in the Santa Margarita sandstone.

Cross sections A-A' and B-B' (Refer to Figure 9, Section 2.2, Geology) depict quite clearly the close relationship between the shale outcrops, the alluvium and the Santa Margarita sandstone. It is probable that groundwater originating in the shale is being fed into the Santa Margarita. This suggests that wells drilled closer to the axis of the syncline might provide a better quality of groundwater.

Effect of Increased Pumping on Contiguous Parcels

Laguna Seca Office Park is fortunate in being in a geologic and geographic position of having ample groundwater reserves and pumping capacity and, at the same time, being located in a position where pumping the groundwater has little or no effect on its neighbors.

Muir has demonstrated through his cross sections and tests that Seaside does not pump its groundwater from the Santa Margarita formation, which is the primary aquifer on Laguna Seca Ranch. Furthermore, the recharge for Seaside is generated within its own local area.

Laguna Seca County Park produces from the Santa Margarita. It is 3500 feet from the nearest Laguna Seca Ranch well pumping from the same aquifer. When the well first was test pumped on 6/24/75, the water level was 168 feet from the surface. On 10/7/80, the level was 179.6. The last measurement, taken 3.5 months later in the season, would most likely have been 2 to 3 feet higher in June. The actual probable drop is, therefore, about 10 feet in 5 years. This is a normal drop for a comparatively new well in this area.

Hidden Hills wells intercept groundwater before it reaches Laguna Seca. The other neighbors to the east pump from the Aromas-Paso Robles, not the Santa Margarita.

An artesian well of unacceptable quality and modest yield, perforated in the Miocene, similar to the Monterra artesian well, was completed on the Lt Ng parcel. There is no possibility of production from either the Santa Margarita or Aromas-Paso Robles on this parcel.

The Ryan Ranch wells are 900 feet downstream from the Main Gate well and 6000 feet from the new Laguna Seca Golf Course well. John Logan states that the water levels in the Ryan Ranch wells are unaffected by Laguna Seca pumping [oral communication]. These low-producing wells are in close proximity to structurally high Monterey shale and near the depositional edge of the Santa Margarita sandstone. The combination of these geologic factors has no doubt resulted in the low productivity of the sand.

The Monterra project lacks Santa Margarita sandstone and is unaffected by Laguna Seca pumping.

Conclusions

The Laguna Seca Office Park has adequate groundwater resources and projected pumping capacity to sustain this and future developments.

Projected pumping requirements on the property will not cause the deterioration of the groundwater capabilities of the adjoining properties nor those of the City of Seaside.

Groundwater quality appears to be degrading slightly with time in the Santa Margarita aquifer in the Main Gate No. 2 and Paddock No. 1 wells. However, considerably higher quality water is being pumped from the Aromas-Paso Robles aquifer in the Paddock No. 4 well. Groundwater quality can be improved, when necessary, by increased use of this aquifer and/or a blending of the waters from the two aquifers.

Safe yield has not as yet been reached in this area. Eventually, exorbitant pumping costs and/or poor quality water will be the determining factor. Yearly annual recharge for the Laguna Seca subwatershed appears to be around 3000 acre-feet per year.

The 1980 Fall Water Table Map (Figure 13) contains approximately 150 measured water levels covering the entire sedimentary trough from San Benancio Canyon to Seaside and Fort Ord. This map shows that Upper Corral de Tierra and Calera Canyon water is percolating into the Laguna Seca-Hidden Hills area. The consulting groundwater geologist feels that the 1980 data, which includes additional wells located east of, but in proximity to, the Divide, confirms his interpretation of the direction of flow of the groundwater into this area.

Groundwater storage within the confines of Laguna Seca Ranch area appears to be around 37,000 acre-feet of groundwater. The Laguna Seca subwatershed contains some 120,000 acre-feet. Both of these estimates are made by using Muir's formula, as outlined in his study of Seaside. These amounts are an increase over the figures cited in the writer's earlier reports, which cited 22,000 acre-feet and 85,000 acre-feet, respectively.

Muir's Report on the Seaside coastal area shows conclusively that, by cutting down yearly production from 5090 acre-feet in 1976 to 2577 acre-feet in 1979, the water table has risen to a safe elevation above sea level, and the threat of sea water intrusion along the coast is ended. He also states that Seaside receives 400 acre-feet in excess of the safe yield along the coast. Muir considers production on Laguna Seca Ranch, most of which is developed within the Santa Margarita Sandstone, does not interfere with the Seaside wells.

Mitigation Measures

19. As production is increased by the drilling of new wells, the wells should be carefully located to spread the production out along the lease, so as to prevent the concentration of pumping in one small area.

20. The water from the wells should be periodically checked by Bishop Water Company, at least twice a year, for chemical content. If the TDS and chloride continue to rise, serious consideration should be given to drilling a new well and cutting back the yield of the existing well.

21. Water conservation practices should be considered and implemented where at all possible. This will contribute to the longevity of the well pumpage and may become very important in the years to come. There may be a potential for reclamation of on-site generated wastewater. (Refer to Section 2.10, Public Services and Utilities.)

2.5 Biological Resources

Vegetation

Canyon del Rey and the surrounding Santa Lucia Mountains are comprised of largely undeveloped land in a natural state. There is some development along State Route 68 (including office buildings, residences, a golf course and schools) that has locally displaced natural habitat in these areas. The local ecology also has been altered, but to a lesser degree than the aforementioned development, by cattle grazing. Despite these disturbances, most of the region

east of State Route 1 and along State Route 68 is considered to be wildlands that contain areas of productive wildlife habitat and culturally valuable native vegetation. Vegetation along the State Route 68 corridor contains elements of the following plant communities: annual grassland, chaparral, oak woodland, and Monterey pine woodland.

Applicable Plans and Policies. The Conservation and Open Space Element of the County of Monterey General Plan was reviewed to identify the planning policies relevant to the project area's ecology. The County's Conservation and Open Space Element supports the conservation of natural habitat and preservation of all species of wildlife. It also encourages the preservation of forests and wooded areas for scenic, recreational and economic purposes.

Fire Hazard. Vegetation type, weather and slope influence the fire hazard of an area. The project vicinity consists of moderate and high fire hazard areas. Dry brush and grasses in this area are flammable, particularly on steep slopes where preheating can cause fires to spread rapidly. Grasses tend to burn faster than brush, but provide less fire fuel. Fires in brush areas and in upper tree foliage tend to burn hottest and are more difficult to control, thereby posing a greater hazard to residences in the area.

Site Description

An Ecological Survey of the entire Laguna Seca Ranch was conducted by Dr. Richard H. Robinson, Professional Biologist, in January of 1981. The primary purpose of the survey was to identify those ecologically sensitive areas that are planned for development in the future.

Vegetation. In surveying what remains of this original biota, it is apparent that, prior to the Spanish Era, there were 4 distinct communities within the boundaries of the present ranch. The Foothill Woodland was well represented in the patches and in protected valleys at lower elevations, with large areas of the Valley Grassland interspersed. The steeper slopes nearby where characterized by the Coast Sagebrush Scrub while the higher slopes and mesas above were dominated by the coastal phase of the Chaparral.

Most of the western end has been developed. Included there are Laguna Seca Estates No. 1, Laguna Seca Estates No. 2 and York School. Most of this area was a mixture of the Foothill Woodland, Valley Grassland and Coast Sagebrush Scrub. Little remains of the original types. The extreme southwestern portion, however, remains relatively undisturbed and includes a superb example of the Foothill Woodland on the flood plain of Del Rey Creek.

In the course of this development, there is one major area of vegetative community that is of significant concern: The Foothill Woodland in the southwestern section. This area is illustrated in Figure 14, and is considered in more detail below.

Foothill Woodland Community: The most evident example of this community lies along Del Rey Creek in the southwestern section and is identified as Business and Office Park in the development plan. It houses an almost continuous canopy of healthy old coast live oaks, along with the typically associated species of plants and animals. There are riparian species associated with Del Rey Creek but, because it is intermittent, confined to a gully and flowing rapidly, the diversity is rather limited. No Rare or Endangered or Rare Species were observed and none are expected to be present.

Wildlife

The project site supports stable wildlife populations due to its relatively undisturbed state. No RARE and ENDANGERED or RARE animal species were observed during the field survey conducted by the consulting biologist. Golden eagles, redtailed hawks and white-tailed kites have been observed foraging locally, however. A species list identifying the typical species present at the project site is included as Appendix D of this Report.

Impacts

The Foothill Woodland could be impacted seriously. The area of primary concern is the Business and Office Park. Almost any plan of construction on the flood plain, by Del Rey Creek, will severely alter this community. A complex of the type as proposed on the tentative map for the Office Park development with its roadways and parking lots, could mean significantly impact the Foothill Woodland community. However, over 1/3 of the total area of woodland is indicated as freeway easement which presents a different problem, which is not associated with this particular development.

The proposed project would be subject to the high fire hazard of remaining adjacent natural areas. Historically, the statistical incidence of fire occurrence increases proportionately with population growth in or near wildland areas. The final project plans would need to incorporate measures to reduce this hazard, including fuel-breaks, fire flow and road design standards of the County, fire resistant construction materials, building separations, and unimpeded access for fire fighting equipment. The proposed project plans will be reviewed by the County of Monterey Subdivision Committee and Salinas Rural Fire District to assure that adequate access, water and building, road and landscaping design are provided for fire safety purposes.

No detailed landscaping plan is available yet to assess the extent of needed tree removal; hence, there is a major potential for conflict with tree preservation objectives of the County's Conservation/Open Space Element, especially in the area of the proposed Office Park development. The development itself could accommodate the Woodlands community with proper planning, i.e., it can be planned with and around the Woodlands.

Mitigation Measures

The patches of Foothill Woodland included within the two residential building sites can be protected in part by Deed restriction on tree removal and by careful Plot Plan review. The impacts to the most extensive area of this community, at the Business and Office Park cannot be mitigated by Deed restrictions. To preserve the park-like woodland in the flats along Del Rey Creek, the entrance road could be designed to follow the dirt trail already in existence and thus prevent further impact. Construction of any major business or office buildings must be carefully monitored to retain any significant part of this site. If the anticipated construction is confined to the low rolling hills north of the creek, that aim can be accomplished. That band of forest will shield the development from the freeway.

22. Preserve the existing mature and healthy coast live oak and Monterey pine trees on the site thru the use of a detailed landscape plan to be submitted on a site by site basis. Include the planting of young oaks within the landscape plan as replacement for those that are removed because of construction.

23. Use drought resistant plants for landscaping on individual development parcels. Native plants are generally more valuable as wildlife food sources and require less irrigation, ferti izers and pesticides than exotic species. When planted near oaks, drought resistant plants help mitigate the hazards of excess water at the root zone of these trees. Species that are fire resistant should be used around buildings.

24. Vegetation should be preserved along drainageways for wildlife cover and shelter.

25. A vegetation corridor to screen Highway 68 from development and vice versa should be established.

To reduce fire hazards to the proposed development the following measures are recommended.

26. Follow recommendations of the California Department of Forestry. These recommendations address fuelbreak design, as well as other site design features.

27. Prior to the filing of the final map, a landscape plan should be prepared detailing the removal and replantings proposed.

28. Homesite designation on lots should be required and coordinated with the presentation of existing vegetation.

2.6 Viewshed

The project site is located within the Highway 68 corridor of the Monterey Peninsula.

State Route 68, a designated state scenic highway, winds through Canyon del Rey, from the City of Monterey to the Salinas Valley. The road is bordered by pastoral, semi-rural land consisting of open rolling grassland, oak and pine woodlands and prominent wooded ridges.

State Highway 68 was officially designated as a Monterey County Scenic Route in 1969. The entire project site lies within the scenic corridor of Highway 68, according to the Monterey County Scenic Highway Element.

A computer-assisted visual analysis of the project site prepared for the developer in 1975 by Whisler-Patri shows that the site is of low to moderate visibility when viewed from the area of Highway 68 bordering the project site. Another, more recent visual survey (1980) was conducted on site by Hall, Goodhue, Haisley and Barker. They indicated that fully 85-90% of the site has low visibility from Highway 68.

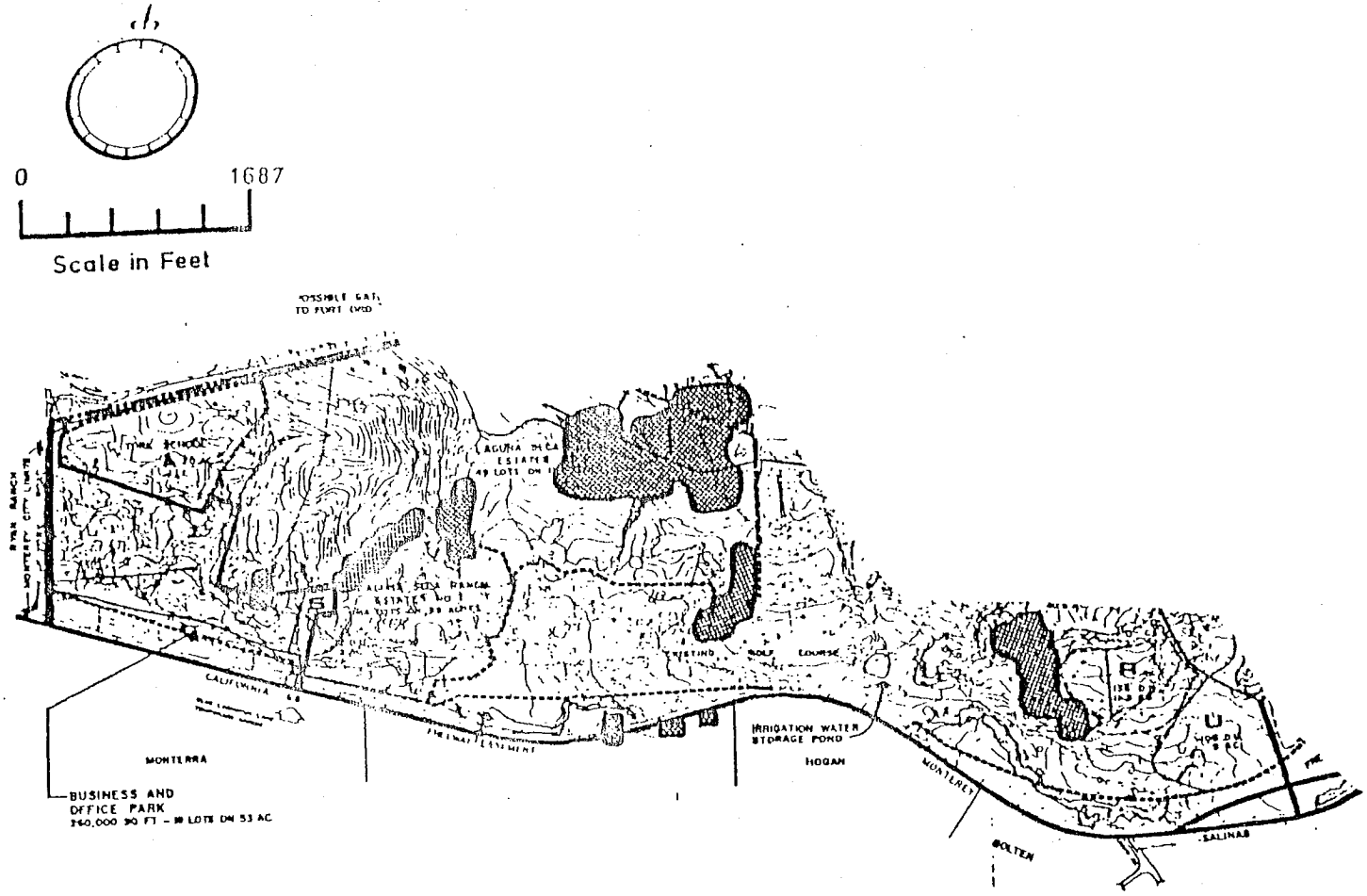
The border along the project site is visible to persons driving along State Route 68 for approximately 1 minute, assuming a driving speed of 45 miles an hour. From the roadway, the trees along the roadway in the foreground are the most apparent. Most of the immediate view along the northeastern portions of the development are blocked by these existing oak trees.

Development along State Route 68 should blend into the natural terrain. Innovative site design should be used to minimize grading and vegetation removal.

Impact

The discussion of impacts of development of the proposed project is limited by the existing general level of project design. The final, more detailed site design will be subject to review by the County's Planning Department and compliance to applicable County policies.

Removal of vegetation, grading and office construction will cause some visual impacts, especially in the areas of moderate visibility. Since the Patri computer model was based on topography, structures built above ground level could increase visibility of developed areas as viewed from Highway 68. Areas proposed for two story



Areas moderately and highly visible from Highway 68

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Viewshed

FIGURE 15

Source: EMC viewshed survey

development may increase the impact resulting from development of the area. However, the on site visual survey conducted by Hall, Goodhue indicates this impact may be minor.

The rural project site setting would be partially replaced by more highly developed environment, i.e, the Office Park Development. Detailed architectural and grading plans are not yet available for analysis at this preliminary stage of development. It is important that the final site plan reflects the stated design standards and policies of the County of Monterey and is responsive to the visual sensitivity of the area. The project should maintain a 100 foot setback from the future plan lines of Highway 68. More detailed site planning will be necessary to determine conformance for the rest of the site.

Mitigation Measures

29. As proposed by project developers, development in areas viewed from State Route 68 should be inconspicuous in order to maintain the natural rural character along this scenic corridor.

    Applicable plans and policies suggest that no development take place along the State Route 68 corridor which would compromise the natural scenic resources. The development should be set back an appropriate distance from the Creek and down from the slopes of the hillsides in order that it not be visible from Highway 68. Particular attention should be given to Lot 1.

30. Site placement should take into consideration existing vegetation which can be utilized as a screen to limit visual impacts.

    Additional planting of vegetation will aid in reducing visual problems.

31. The minimum building setback from future four lane Highway 68 should follow the suggested City of Monterey standard of 100 feet. This setback should be landscaped with natural vegetation.

Design Criteria. The following design criteria are presented as guidelines for use by the County of Monterey's Planning Department when evaluating the final detailed site development plans. These criteria are general in nature because overly prescriptive standards of design, given the current preliminary planning stage of the project plan, could be deterimental to the ultimate success of the project.

Site Design

32. Development should be designed to blend with the natural terrain, by using innovative site design, grading techniques, building types and spacing of buildings, particularly along the Highway 68 corridor.

33. Removal of native vegetation, particularly trees, should be minimized.

34. Grading in hillside areas should be minimized to the portion of the site covered by the structure. Required grading should be finished to blend with the natural contours by avoiding abrupt changes in grade and by rounding off sharp angles along the sides of cut and fill slopes. The mass grading of large building pads and excessive terracing should be avoided. (No grading plan has been submitted to date, so full extent of grading is not known at this time.)

35. Roadways should be designed to reflect the natural topography in order to minimize grading of hillsides.

Architectural Characteristics. The following, more detailed guidelines, could be incorporated into the final site design.

36. Exterior colors and materials that blend, rather than contrast, with the surrounding soil and vegetative cover should be used. Highly reflective surfaces and colors should be avoided.

37. Structures should not greatly exceed the height of the tree canopy.

38. External lighting should be of low profile design, unobtrusive and compatible with the rural character of the project area. Consider using warm tone lights on Dark Standards.

39. Roofs of buildings at lower elevations should be attractively designed to enhance views of these buildings from adjacent hillside residential areas. In general, sloping, gabled or vaulted roofs constructed of wood shingles, wood shakes or tiles are preferred over flat, gravel type roofs. Mechanical equipment on roofs should be screened so that it is not apparent from the hillside areas.

40. Parking and service areas for office uses such as the loading/unloading areas, should be screened from view, probably with fences and landscaping.

41. Architectural detail should consider the appearance of buildings as seen from the hillside areas, as well as from on grade with the building. Awnings, balconies and planters could be used to add interest when viewed from above.

42. Edges between the office area and adjacent private residential areas should be defined by landscaping.

43. Utility lines serving the project should be placed underground.

44. Signage should be minimized, particularly along Highway 68, and complement the adjacent natural areas. There should be a comprehensive sign motif which is compatible with the building design and surrounding natural setting.

45. Natural landscaping should be provided around buildings to screen them from internal roadways and from surrounding areas, especially Highway 68.

46. Roadway guard rails and fences should blend into the landscape as much as possible.

Project Proponents' Design Control Standards

The developer has suggested that the following design control measures will be incorporated into deed restrictions and the CC and R's:

All roads, paths, buildings, etc., will be planned to preserve the natural character of the site. Excessive exposed earth cuts and large land fills will not be permitted. Care should be taken during planning and construction to preserve healthy trees.

All signs shall conform to an overall sign concept coordinated throughout the entire development. This overall sign design concept will control color, shape, size and content of all signs. Symbols rather than words shall be used wherever possible. The overall sign design concept plan shall be submitted to and approved by the Planning Commission prior to any sign construction.

Additionally, design control standards are proposed by the developer to be subject to approval of Laguna Seca Ranch Architectural Review Board. The Board will review all proposals for conformity with the intent and requirements of the Design Control Standards.

On public and private roads, curbs are to be minimized to retain a rural character and to avoid a "hard edge definition." All road surfacing shall be coarse aggregate asphaltic concrete with color and texture uniform throughout the Ranch Development.

The design of landscaping shall be guided by the concept of the natural oak woodland penetrating developed areas. The selection and placement of plant materials shall be in aesthetic and horticultural sympathy with the natural plant materials of the forest preserve areas which adjoin developed areas.

Fences shall be vertical and painted white or stained a natural color. Fencing along the boundaries of the development, if needed, shall be rural in character.

Street furniture, such as lamp posts, benches, litter containers, hydrants, plant containers, et cetera, shall be of a design compatible with the architecture and the character of the land and shall be consistent throughout the development.

All signs shall conform to an overall sign design concept coordinated through the entire development. This overall sign design concept will control color, shape, size and content of all signs. Symbols rather than words shall be used wherever possible.

Shingle roofs and/or tile stucco and natural wood siding exterior walls, arranged with particular attention to human size, shall dominate the architectural design of all buildings. Building complexes shall be designed to follow the existing slope of the land and be planned to minimize exposed earth cuts and fills and to preserve existing trees. In all cases, the forest shall take aesthetic precedence over structures and shall penetrate building complexes. Colors shall be selected from a recommended color palette. Color accents, in general, will be in doorways, windows, and on selected wall areas.

Exposed mechanical devices, such as radio and TV antennas, blowers, air conditioning devices, et cetera, will be minimized and blended. All utilities are to be underground.

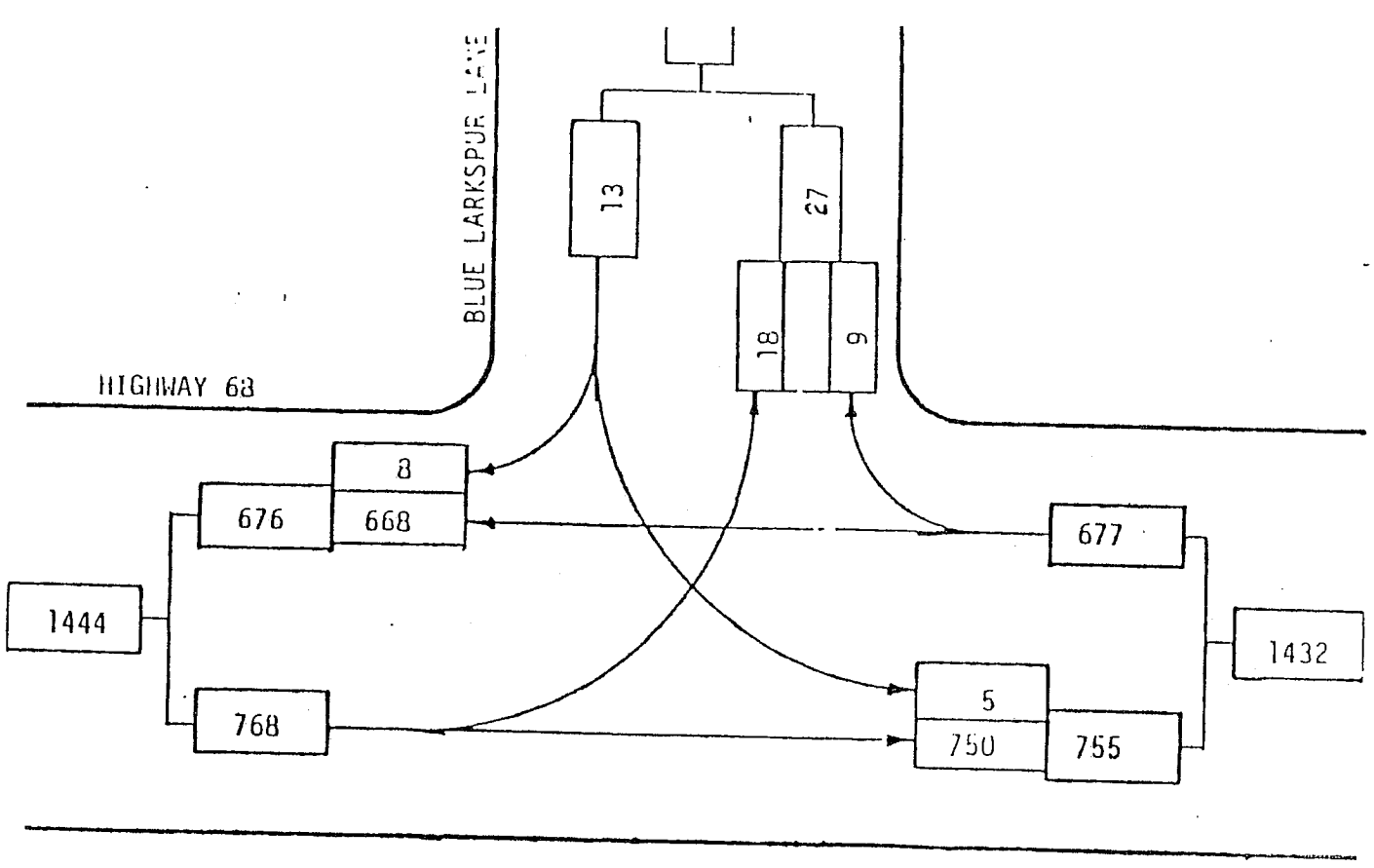
2.7 Traffic and Circulation

Traffic Volumes

The following discussion is taken from traffic reports prepared for the area by William Dryden, Consulting Engineers and George W. Nickelson, P. E., Traffic Engineer.

Access to the project vicinity is provided by State Highway 68 (Monterey-Salinas Highway), which is a two-lane rural highway which runs in an east/west direction. It is the main traffic corridor between Salinas and Monterey. Current daily traffic volumes near the project site on Highway 68 average about 12,700 with peak hour volumes of approximately 1,250, based upon recent CalTrans counts summarized in Table 5 and illustrated in Figure 16. The peak hour level of service (L.O.S.) is D, with a volume to capacity (v/c) ratio of .67.

Additional access to the project vicinity is provided by State Highway 218 (Canyon del Rey Boulevard), which is a two-lane rural highway, in the vicinity of its intersection with Highway 68 -- approximately a half mile west of the Office Park. It provides service to State Highway 1 in Seaside via Del Rey Oaks. Average daily traffic (ADT) on Highway 218 is presently about 4800 near the junction of Highway 68.



Legend
Existing traffic counts
ADT – Average Daily Traffic

N

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1980 Peak Hour Volumes

FIGURE 16

Source: William Dryden Consulting Engineers

Table 5

Traffic Characteristics

Street	Speed (MPH) Signed / Expected	Lanes of Travel 1980	Lanes of Travel 2000	Average Daily Traffic 1980 Project Traffic	Average Daily Traffic 2000 Project Traffic
Highway 68 (Monterey-Salinas Highway)	55 / 50-55	2	2-6	12,700-15,000 / 245-595	49,560-81-780* / 6,780-12,600
Highway 218 (Canyon del Rey Boulevard)	55 / 50-55	2	2-4	4800 / 150	21,920 / 2,520

Note:
A. Source: California Department of Transportation.
B. Peak Hourly Volumes (PHV) are approximately 10 percent of Average Daily Traffic (ADT).
C. 1980 Project Traffic includes York School, the golf course and 45 residential units.

* Includes Montera and Tarpy Flats Developments, which no longer exist because of the defeat of Monterey II.

Access to the on-site street network is presently provided from Highway 68 by Blue Larkspur Lane and York Road. Blue Larkspur Lane provides a two-lane temporary access to Laguna Seca Estates No. 1, with an estimated average dailty traffic (ADT) of about 450. Evening peak hour turning volumes at this intersection are illustrated in Figure 16. This is a temporary access that will be closed upon completion of the street network to the Office Park, located between Blue Larkspur Lane and York Road. York Road is a two-lane facility presently providing access to the golf course, York School and Fort Ord Military Reservation.

The north-south portion of York Road at the west end of the Ranch lies within a 70 foot wide strip owned in fee by Fort Ord. The owners of the Laguna Seca Ranch hold a license for use of this road. The owners of the Ranch have reserved a 60 foot roadway easement paralleling York Road so that a new road could be built along this westerly quarter mile should it ever become necessary that the Army revoke the existing license.

The intersection of Highway 68/York Road presently provides a 200 foot left turn lane for the eastbound Highway 68 traffic entering York Road. According to the Monterey County Planning Department, existing average daily traffic (ADT) on York Road is 550.

Public Transit Service

Existing public transit service is provided by the Monterey Peninsula Transit District Route 21. This route operates between Monterey and Salinas at a one hour headway from 6 a.m. to 7 p.m. on weekdays and Saturdays. Sunday service also is provided between 10 a.m. and 7 p.m. Ridership presently has an insignificant impact on vehicular traffic volumes.

Projected Future Traffic Volumes

Traffic from Off-Site Sources. A number of large developments on Highway 68 in the project vicinity are currently in various stages of planning or construction. These include the Garden Road Office Park, the Way Station motel and restaurant, the Trade Center, Monterra Ranch, the Airport Industrial Park, Ryan Ranch and Tarpey Flats, all located to the west of the project; and Hidden Hills. These developments are expected to be completed over the next 25 to 30 years. At that time, total daily external traffic generated from the projects to the west of Laguna Seca are expected to be approximately 84,500, based upon a traffic study for Monterra, Ryan Ranch and Tarpey Flats by TJKM Transportation Consultants. Approximately 25,000 (30%) of these trips are expected to be distributed to the east of their points of generation, and to pass the entrance to Laguna Seca Office Park on Highway 68. Approximately 8724 trip ends (10% of the ADT) are expected during the evening peak hour, with 3571 inbound and 5154 outbound. The resulting peak hour

volumes past Laguna Seca Office Park from these off-site developments are 2620 vehicles per hour, with a directional split of 1070 westbound and 1550 eastbound. Hidden Hills is expected to generate about 600 trips per day with about ten percent in the peak hour. This results in an additional 30 vehicle trips past the Office Park entrance during the peak hour, based upon the directional splits of other off-site projects.

Additional traffic growth on Highway 68 is expected to occur, due to regional growth, at a rate of two percent per annum. The resulting traffic volumes near the Office Park, excluding its future traffic, are shown in Figure 17.

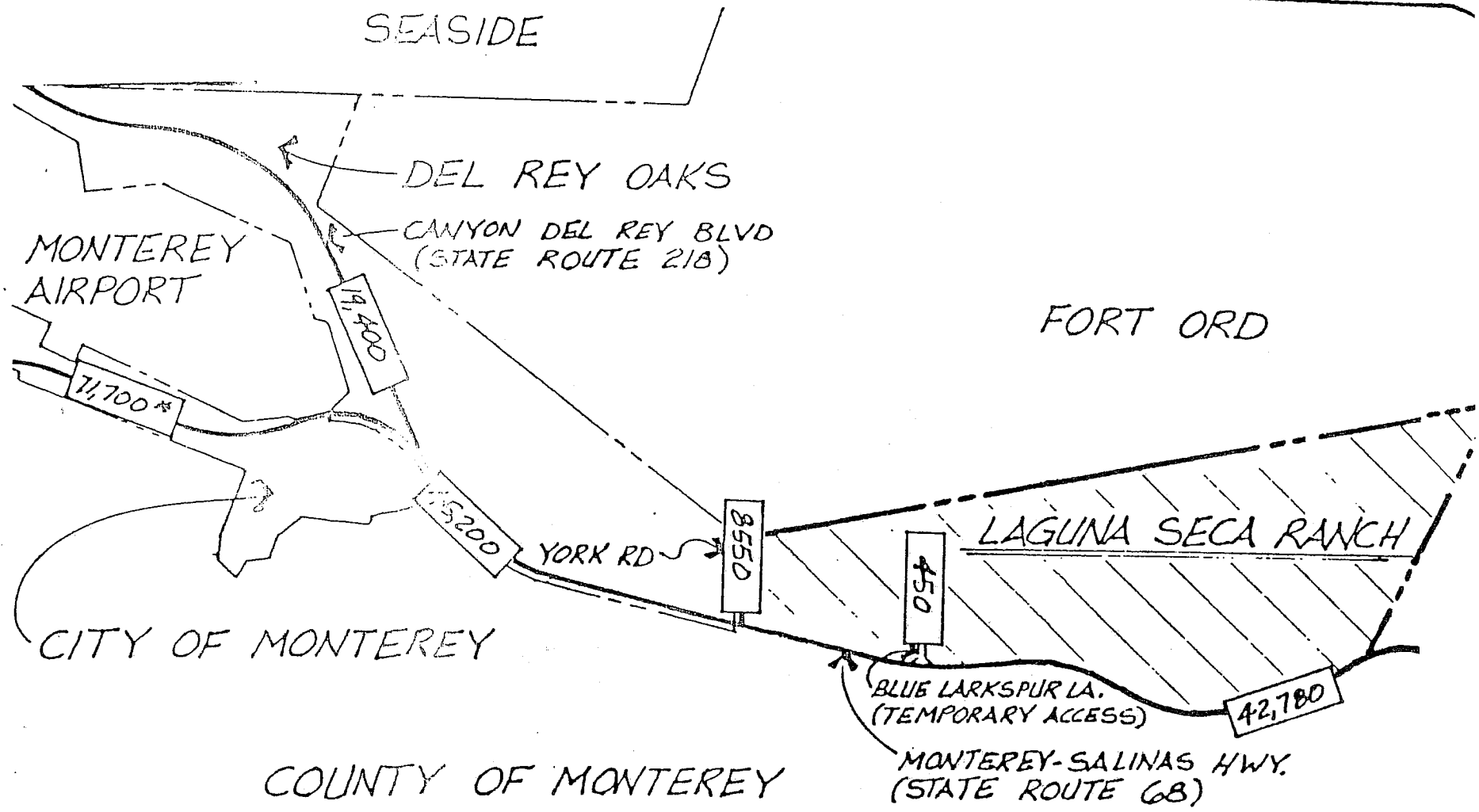
George W. Nickelson, Traffic Engineer, has pointed out in his Traffic Analysis of Laguna Seca Ranch (1981), that the magnitude of added development as projected by the TJKM Transportation Study may be grossly overstated. He indicated that the projected developments would represent a major increase in the employment and population characteristics of the entire County. Over 20,000 new jobs would need to be created along the Highway 68 corridor, as well as 3,400 new residential units (which, in themselves, could not balance the employment demand) in order to arrive at the 8,724 p.m. trip ends.

Furthermore, the projected developments in the TJKM study no longer exist because of the recent rejection of Monterey II. He concludes that the TJKM analysis is tenuous because the actual development along the Highway 68 corridor may be significantly less than projects currently proposed.

Freeway Plan Lines Plan Lines for future freeway construction have been adopted for the entire route between Monterey (Highway 1) and the end of freeway at River Road near Salinas. However, funding currently is unavailable and no specific forecast exists of the timing for conversion. A portion of the future right of way within the plan lines was granted as an easement to Monterey County by the owners of Laguna Seca Ranch at the recordation of the Laguna Seca Ranch Estates No. 2 Subdivision early in 1980.

The Ryan Ranch will utilize York Road as a major project entrance, and is expected to add 7,000 vehicle trips per day to York Road, with 1400 of these during the peak hour. The resulting turning volumes at the York Road intersection with Highway 68 are shown on Figure 18.

The preliminary plans for the freeway include an interchange to serve the Office Park development. This intersection at York Road, also will service Ryan Ranch and the east end of Monterra. The preliminary development plans include cooperation with the developers of Ryan Ranch in any necessary improvements to the present York Road/Highway 68 intersection.



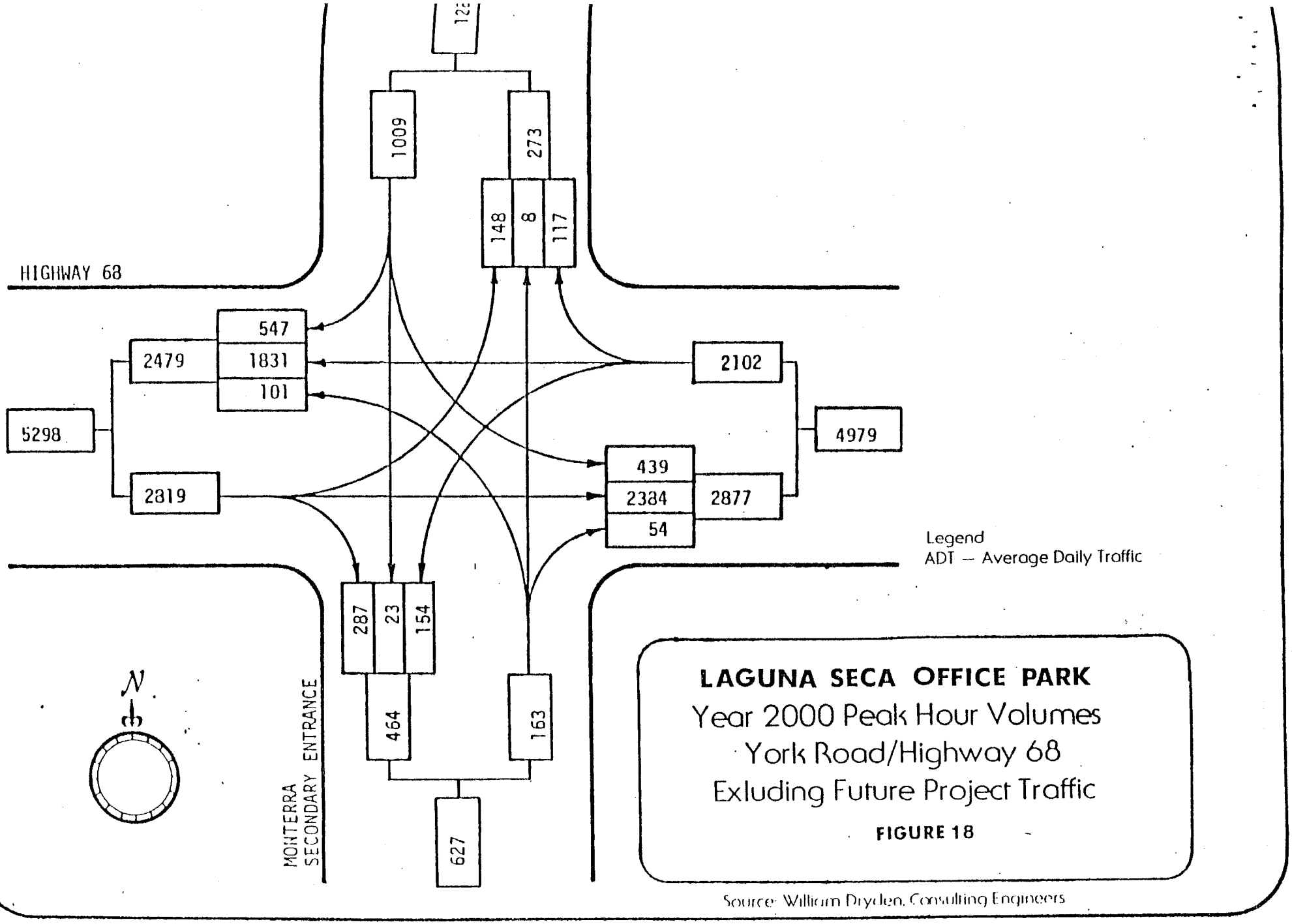
Legend
ADT – Average Daily Traffic East of Highway 68

N

LAGUNA SECA OFFICE PARK

Traffic Flow Map
Year 2000 Volumes
Excluding Project Traffic

FIGURE 17



LAGUNA SECA OFFICE PARK

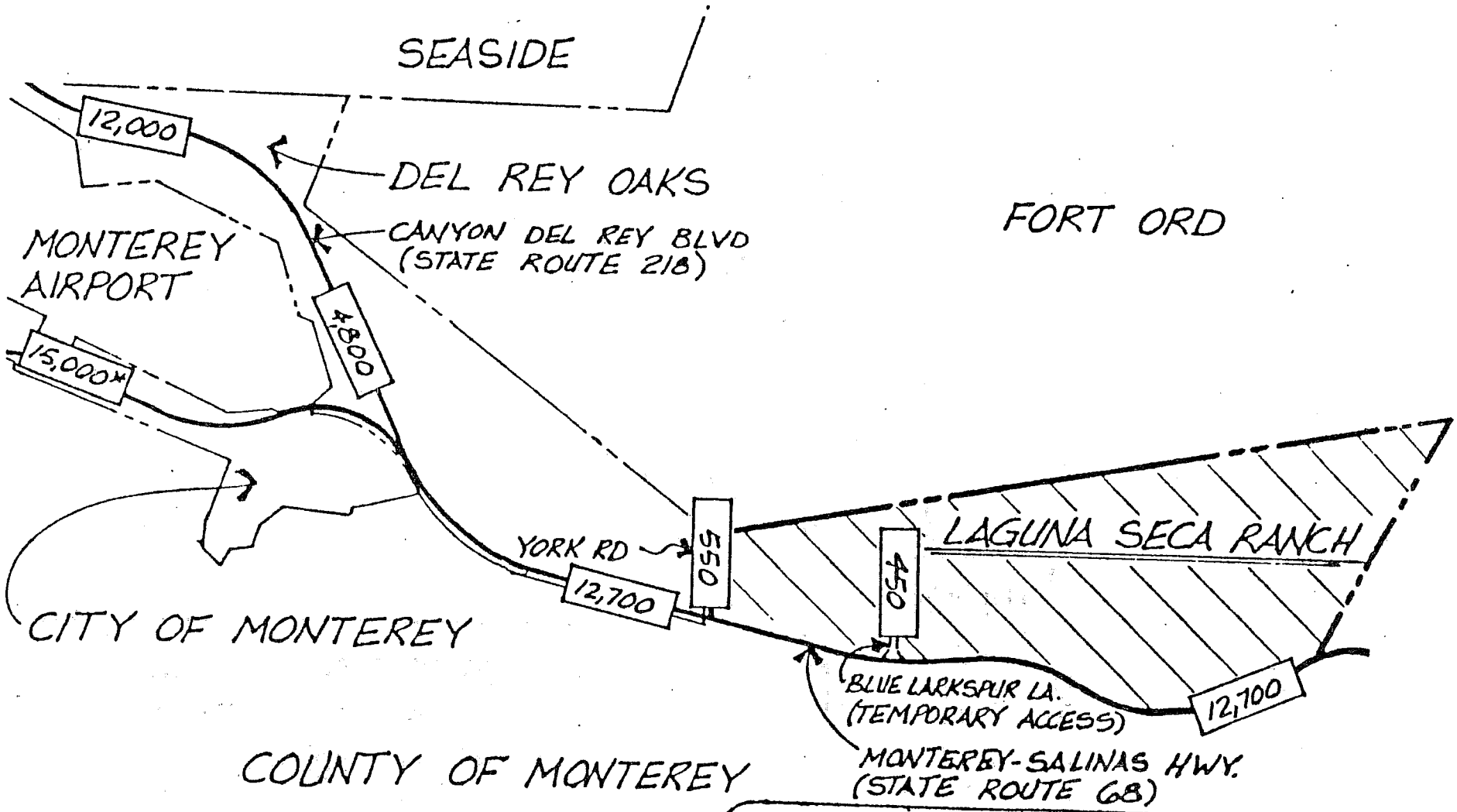
Year 2000 Peak Hour Volumes

York Road/Highway 68

Exluding Future Project Traffic

FIGURE 18

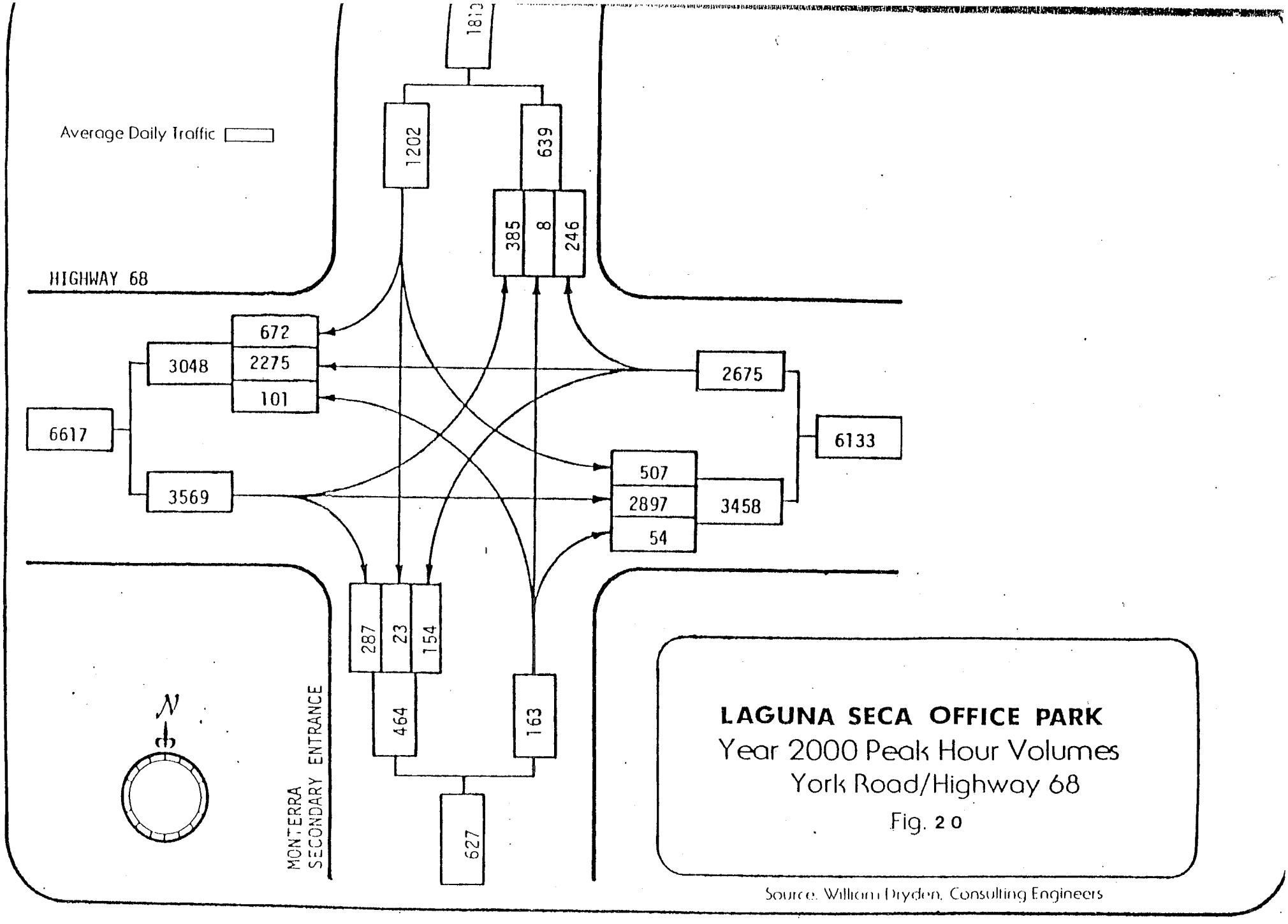
Source: William Dryden, Consulting Engineers



LEGEND
ADT – Average Daily Traffic
*East of Hwy 1

N

LAGUNA SECA OFFICE PARK
Traffic Flow Map
1980 (Existing) Volumes
Fig. 19



LAGUNA SECA OFFICE PARK

Year 2000 Peak Hour Volumes

York Road/Highway 68

Fig. 20

Source: William Dryden, Consulting Engineers

Project Traffic Generation and Distribution

On-site access to the project site will be provided by York Road which is an existing entrance to the property. Blue Larkspur Lane will be closed to through traffic after development occurs.

According to both Traffic Engineers, Dryden and Nickelson, expected project-generated traffic is 3,120 trips per day and 3,900 average trips per day (ADT).

It has been pointed out by Carl Hooper, Project Engineer for Laguna Seca Office Park, that with a small change in transportation mode, the average trips per day could be reduced by 30% to approximately 2,500 average trips per day. He suggests that 20% of the employees would car pool, 10% would use buses and the remaining 70% use individual cars. Also included in the 2,500 ADT would be 400 customer trips per day. The breakdown would be as follows:

70% in individual cars	= 700 employees X 2.5 trips	=	1,750
20% in car pools	= 200 employees X 2.0 trips	=	400
10% in buses	= 100 employees X 0 trips	=	0
	200 customers X 2.0 trips	=	400
	TOTAL TRIPS	=	2,550

Impacts

Traffic increases external to the project could include 85,120 vehicle trips added over the next 25 to 30 years from various developments near Laguna Seca Office Park plus about a two percent per annum increase due to regional growth.

The professional Office Park development will produce between 2,500 to 3900 average daily trips (ADT).

According to the TKJM Report, near the proposed Office Park Highway 68 presently operates at a D L.O.S., with a v/c ratio of .67. The expected level of service in the year 2000 on a proposed six-lane expressway will be F with a v/c ratio of 1.01 without project traffic.

Traffic signals will be warranted at the project entrance. Additional study of the necessary signal control and intersection geometrics will be required when the type of Highway 68 facility to be constructed is determined.

Additional examination of traffic control will be necessary at York Road/Blue Larkspur Road intersection at the time of development.

Mitigation Measures

47. Traffic signalization should be provided. Additional study is necessary for the intersection of York Road and Highway 68. Determination of signal phasing, location, timing and intersection geometrics will be required. It has been determined by Public Works that Larkspur Road will be closed.

48. Care should be taken to provide adequate sight distances at all on-site intersections.

49. Additional study by the County Public Works Department should be made of the usage of Ryan Ranch roads as access routes to Highway 218 from York Road.

50. Additional bus transit service should be provided to and from Monterey.

51. The Office Park business organizations should cooperate with one another to provide flexible or staggered business hours and to assist in the formation of carpools or vanpools.

2.8 Air Quality

The northern portion of the Salinas Valley, to which this area is connected, is considered a part of the same air basin as all of the coastal areas of Monterey County. It is identified as the North Central Coast Air Basin. Motor vehicles are the largest source of gaseous pollutants in the North Coastal basins. Carbon monoxide, nitrogen oxides and hydrocarbons comprise the basic category of air pollutants emitted from automobiles. Though the emissions from a particular car do not seem exorbitant, it is the volume which accounts for the pollution potential.

Under the Federal Prevention of Significant Deterioration Program (PSD), areas which are maintaining federal air quality standards currently are being classified. Monterey County presently fails to meet standards designated as Non-Attainment Areas, and is required to prepare a Non-Attainment Plan. A Non-Attainment Plan has been prepared by the Association of Monterey Bay Area Governments (AMBAG); it proposes general measures regarding traffic flow and transit services which should enable this district to meet federal standards by 1982. In addition, general policies pertaining to mobile-source and land-use controls are suggested. Although there are no specific policies for North Monterey County, the plan recommends that all large residential developments be reviewed by AMBAG according to the A95 review process.

The North Central Coast Air Basin as been designated as non-attainment for one of five "criteria" pollutants -- that of oxidants. Hourly averages of oxidant levels measured between 1973 and 1977 in Salinas showed a total of twelve days and 19 hours when the levels exceeded the national Ambient Air Quality Standards. However, at this time the federal standard was 0.08 parts per million (ppm). Since that time it has been relaxed to .12 ppm. A 50% reduction of total allowable emissions is the goal for 1982.

Impact

The proposed project will contribute to the following potential impacts:

- Cumulative increase in existing levels of air pollutants.
- Incremental degradation of air quality in the northern Salinas Valley and its surrounding vicinity.

Because the Salinas Valley is susceptible to air quality degradation, the proposed project would contribute to a cumulative increase in existing levels of air pollutants resulting mainly from automobile emissions.

Project pollutant levels in conjunction with existing and future development in the North County Area will result in an incremental degradation of air quality, at least in the short term. In the long term, automotive emission controls devices will result in an overall reduction of emission per automobile, as shown in Table 6. Cumulative increases in traffic volumes could result in a continued or increased frequency of air quality maintenance standards being exceeded (unless technology improves substantially within the next 10 years).

National energy policy may result locally in a shift to more mass transit with a reduction in the overall vehicle miles traveled and a beneficial impact on overall air quality.

Mitigation Measures

52. As specified in the Air Quality Maintenance Plan, project plans should be reviewed by AMBAG. Project design feasibly could provide mitigation for reducing energy usage by incorporating measures that reduce traffic trips and trip lengths. Project design should be evaluated by appropriate agencies to determine whether optimal design criteria to reduced fuel consumption and air quality degradation has been met in this development.

Table 6

Mobile Source Table

MPUTATION SHEET	PROJECT .....LAGUNA SECA
SOURCE IMPACT COMPUTATIONS	
DAILY TRAFFIC..... 12700	POLLUTANT : HYDROCARBONS
LENGTH..... 2.5	EMISSION FACTORS IN GRAMS/MILE
TRAFFIC..... 1250	AT AVERAGE LINK SPEED. 1.36
.....4:30-5:30	AT 10.00 MPH..... 5.67
-HR..... 8500	
..... NOON-8PM	EMISSION RATES : MICROGRAMS/METER-SECOND
FIC - 6-9am 2540	
ACITY..... 18955	HOURLY EMISSION RATE..... 1226
LINK SPEED..... 45	8-HOUR EMISSION RATE..... 254
OF UTILIZATION..... 1983	24-HOUR EMISSION RATE..... 121
	TOTAL DAILY EMISSIONS..... 43180
HOUR VOLUME CAPACITY	
RATIO-SLOW DIRECTION. 0.67	
TANT : CARBON MONOXIDE	POLLUTANT : NITROGEN OXIDES
ION FACTORS IN GRAMS/MILE	EMISSION FACTORS IN GRAMS/MILE
T AVERAGE LINK SPEED. 14.23	AT AVERAGE LINK SPEED. 4.87
AT 10.00 MPH..... 65.16	AT 10.00 MPH..... 3.01
N RATES : MICROGRAMS/METER-SECOND	EMISSION RATES : MICROGRAMS/METER-SECOND
EMISSION RATE..... 14091	HOURLY EMISSION RATE..... 651
EMISSION RATE..... 2661	8-HOUR EMISSION RATE..... 911
R EMISSION RATE..... 1265	24-HOUR EMISSION RATE..... 433
DAILY EMISSIONS..... 451803	TOTAL DAILY EMISSIONS..... 154623
ANT : SULFUR OXIDES	POLLUTANT : PARTICULATES
N FACTORS IN GRAMS/MILE	EMISSION FACTORS IN GRAMS/MILE
AVERAGE LINK SPEED. 0.21	AT AVERAGE LINK SPEED. [illegible]
10.00 MPH..... 0.21	AT 10.00 MPH..... [illegible]
N RATES : MICROGRAMS/METER-SECOND	EMISSION RATES : MICROGRAMS/METER-SECOND
EMISSION RATE..... 45	HOURLY EMISSION RATE..... 515
EMISSION RATE..... 39	8-HOUR EMISSION RATE..... 445
EMISSION RATE..... 19	24-HOUR EMISSION RATE..... 212
DAILY EMISSIONS... . 6668	TOTAL DAILY EMISSIONS..... 75505

ROADSIDE CO CONCENTRATIONS IN MICROGRAMS PER CUBIC METER: 7327
ROADSIDE CO CONCENTRATIONS IN MICROGRAMS PER CUBIC METER: 692

53. The use of public transit as a substitute for private automobile trips is the only practical means of mitigating a project in a decentralized area such as the Highway 68 corridor area, where few commercial services are available, to reduce vehicle miles traveled. A bus stop exists along Highway 68 and York Road, although the project site is not presently serviced by other public transit. Services could be extended into the site at the time of project implementation. Service extension and project design should be coordinated with the Monterey Peninsula Transit Service to facilitate the provision of transit service to the project site.

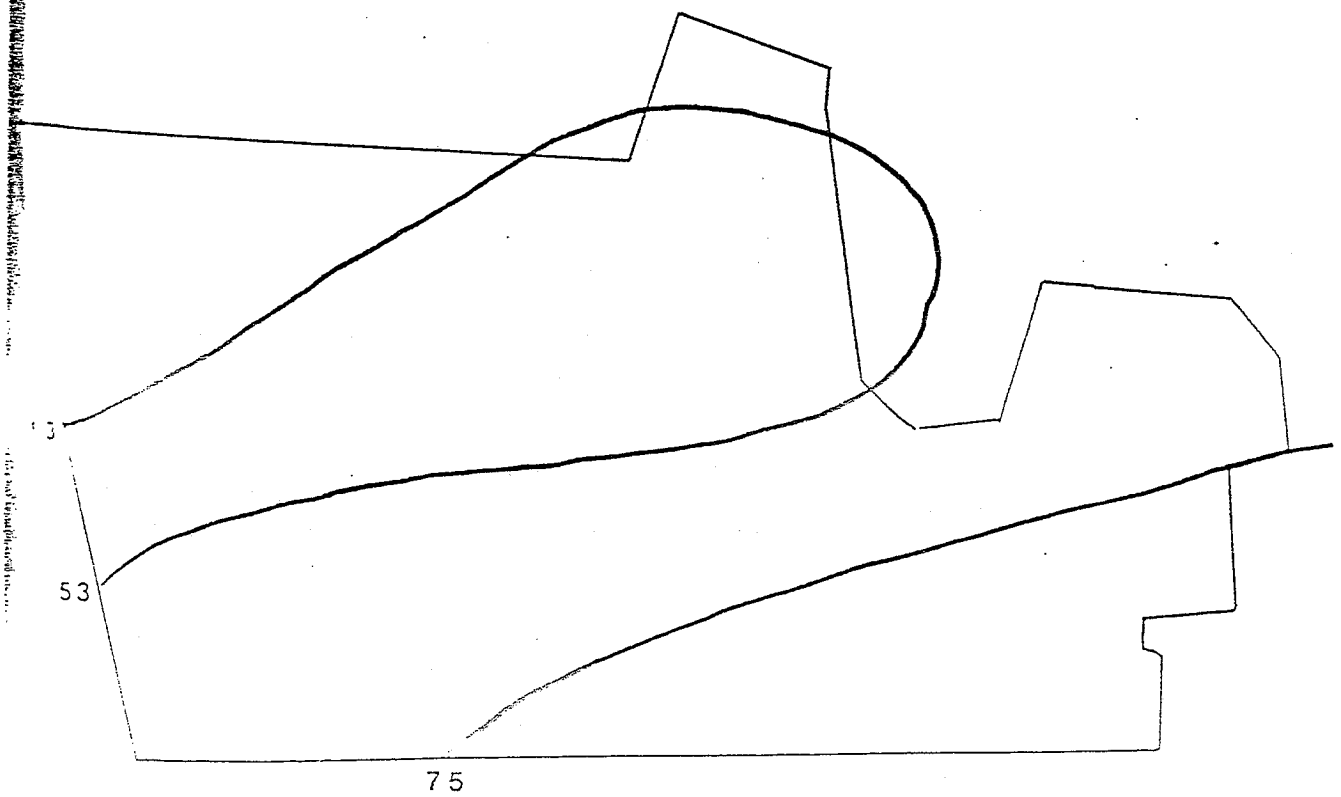
54. Encourage carpooling for commuters (particularly office workers) by providing local informational and coordinating centers with an open file of employee destinations. A portion of the most conveniently situated office parking spaces should be reserved for carpool participants.

2.9 Noise and Airport Safety

The primary noise generators in the project vicinity are aircraft operations at the Monterey Peninsula Airport and traffic on Highway 68. Occasional military operations at Ford Ord and car racing at Laguna Seca Raceway also contribute to the areawide noise environment. The following is a discussion of these noise sources and their effects.

Environmental Management Consultants, Monterey, California conducted a noise survey on the entire Laguna Seca Ranch property on January 24, 25 and 26, 1981, to determine on-site noise decibel levels. A sound level meter, calibrated at 114 decibels (dbA) was used. Noise decibel levels were taken at peak traffic hours and were measured at 23 points on the property, including various building sites, elevations and proximity to Highway 68 and the Airport. The readings were measured at 15 second intervals at all locations. Table 7 summarizes the decibel measurement results for those areas around the Office Park and Figure 21 illustrates the noise contours of the Laguna Seca Office Park property. Appendix E provides a noise reading location map.

The average noise level was 57.1 decibels (dbA). The minimum reading was 43 dbA, which was taken in an area with vegetative screening and at a significant distance from any noise source. The maximum reading was 80, which occurred near Highway 68.



LAGUNA SECA OFFICE PARK

Existing Noise Contours

FIGURE 21

Table 7
Office Park Noise dbA Readings

Site Number	Reading Average dbA	Range	
		Minimum dbA	Maximum dbA
1	72	60	80
2	53	48	70
3	48	43	65
10	53	49	70
11	50	48	60
13	67	50	83

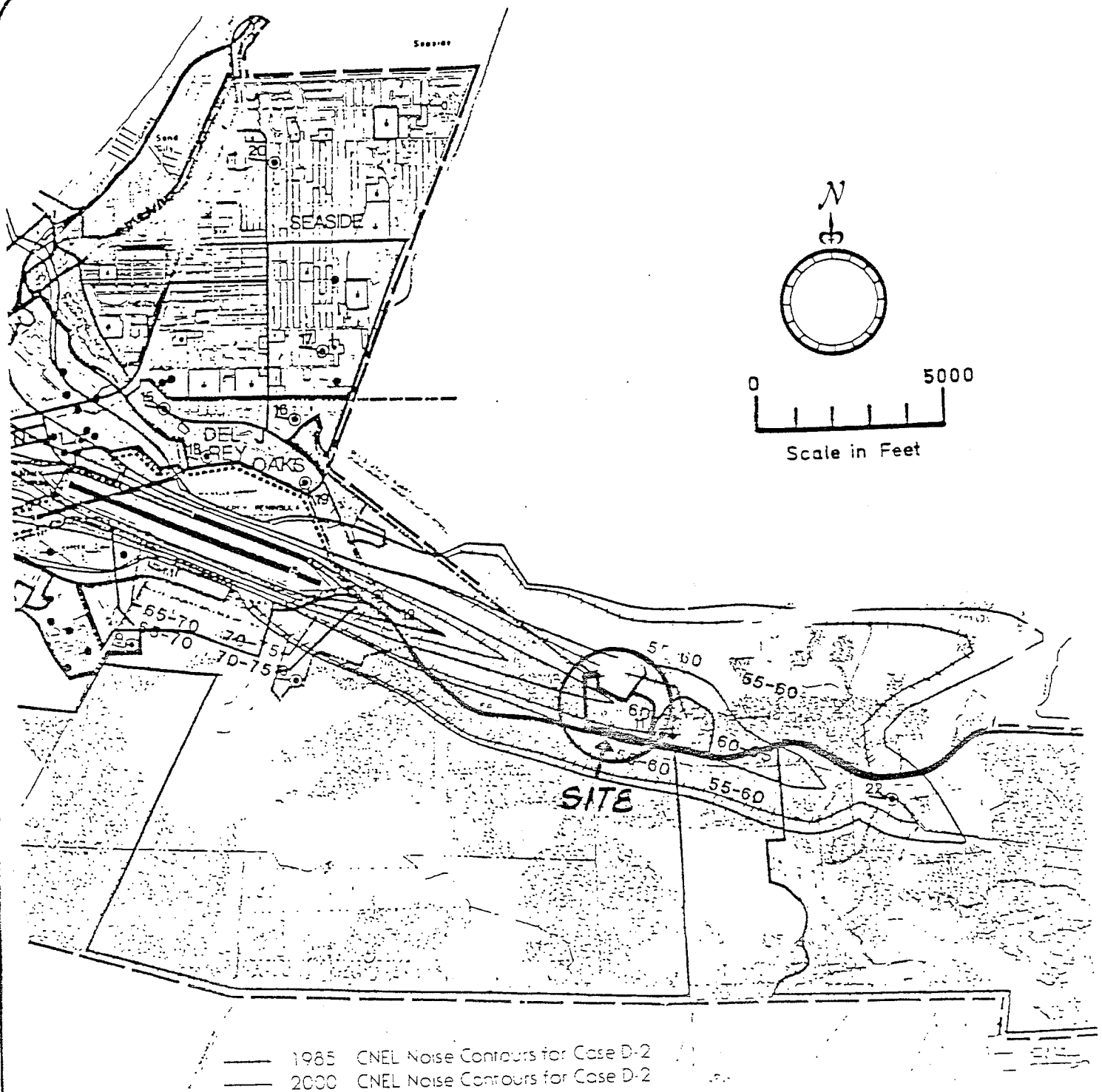
SEE APPENDIX FOR NOISE SITE READING LOCATIONS

Land use types can be compared to noise compatibility levels to provide standards for development and to determine whether or not special noise attenuation measures should be provided in proposed developments. Table 8 shows the compatibility of existing and proposed land uses with present and projected noise levels.

Frequent operations of both air carrier and general aviation aircraft are generated by Monterey Peninsula Airport. Both aircraft noise and safety are of concern in the airport environs because of the proximity to the airport of potentially developable and presently developed lands.

Due to its proximity to the Monterey Peninsula Airport, the project area is vulnerable to aircraft noise, safety from falling aircraft, and subject to provisions of the Monterey County Airport Approach Ordinance #1856. These provisions generally pertain to height limitations.

Approximately 50% of all flights arriving or departing from Monterey Peninsula Airport use the easterly flight path which passes directly over the project site. These aircraft overflights generate a great deal of noise. For the purposes of this report the following reports were consulted: The Proposed Master Plan for the Monterey Peninsula Airport (1975) and the Whisler-Patri Environmental Reconnaissance, prepared by Buonaccorsi and Associates (1975). In both reports, noise exposure is described in decibel (dbA) levels, using the CNEL system. The Whisler-Patri study depicts higher noise levels on the project site than does the airport Master Plan, with the 65 dbA CNEL countour impacting a larger portion of the site. Accordingly, the 60 CNEL contour in the Whisler-Patri report covers a larger area of the site than it does in the Airport Master Plan. (Figure 22 depicts the future noise contours on the site, according to the study conducted by Buonaccorsi and Associates.)



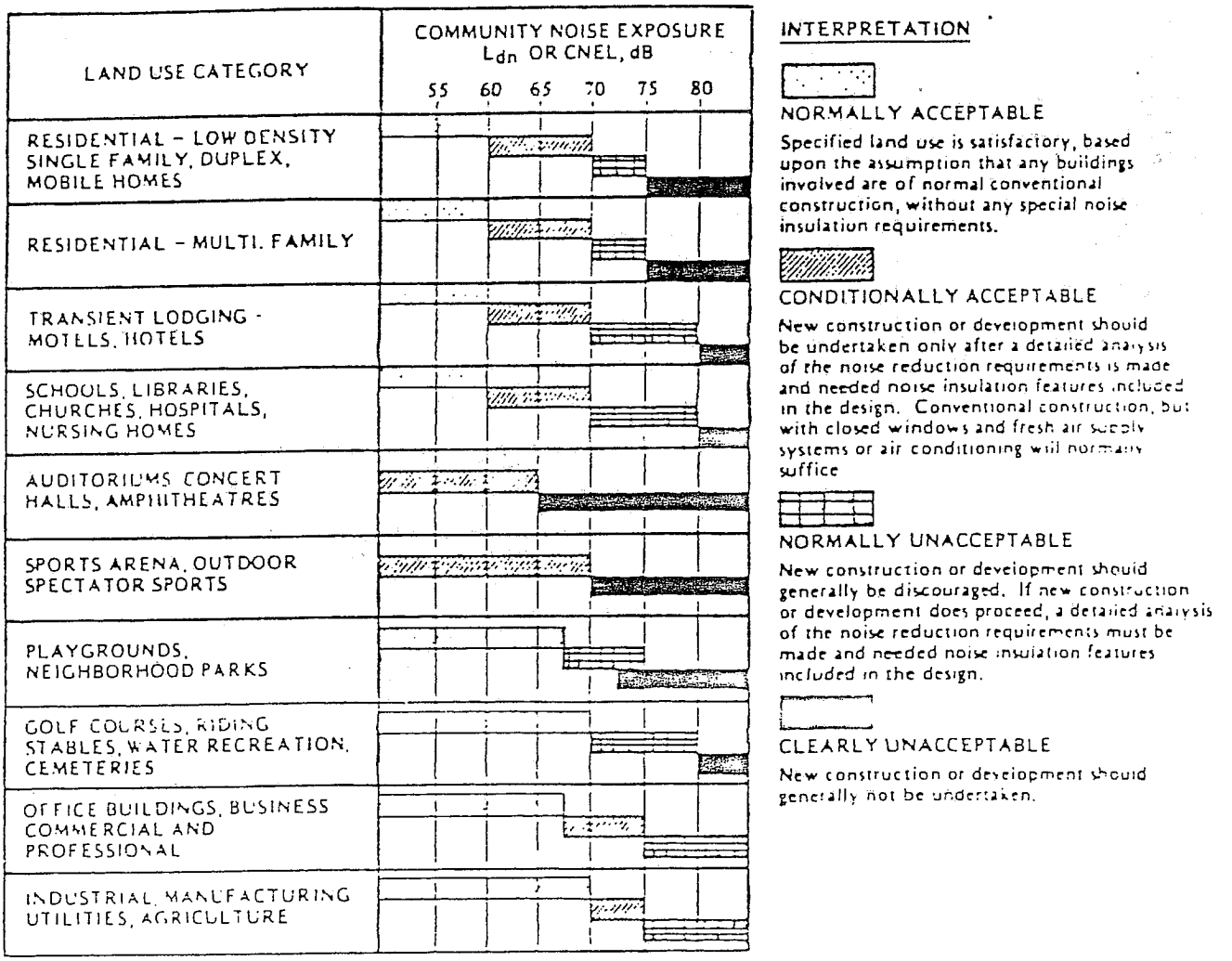
LAGUNA SECA OFFICE PARK

Airport Future Noise Conditions

FIGURE 22

Source Airport Noise Control — Land Use Compatibility Study

Table 8
Land Use Compatibility for Community Noise Environments
Outdoor Noise Levels



Source: California State Department of Health, Office of Noise Control, February 1976.

Several noise regulations and guidelines are applicable to Monterey Peninsula Airport. California Administrative Code, Title 21 Subchapter 6, Noise Standards, establishes limitations on airport noise in residential communities. For Monterey Peninsula Airport, the criterion CNEL is 70 dbA until December 31, 1985, and 65 dbA thereafter.

A steering committee of the Monterey Peninsula Airport Board and surrounding cities recently have completed an Airport Noise Control and Land Use compatibility (ANCLUC) Study for Monterey Peninsula Airport. The ANCLUC Study analyzed six aircraft operational alternatives and their noise impacts. The six alternatives were screened to the two alternatives with the least noise impact (Cases D1 and D2). After further analysis, Case D2 was selected. Case D2 assumes 1) runway 28L would be extended 1000 feet to the east; 2) a new runway would be constructed parallel to runway 28L; and 3) runway 6-24 would be closed. Correspondingly, flight paths would be modified. There also would be general aviation training. Figure 32 presents the noise contours presented by the ANCLUC Study for Case D2.

The Laguna Seca area is contained in the planning area agreed upon by the Airport Noise Control and Land Use Compatibility (ANCLUC) Study's Steering Committee and adopted by ALUC Resolution 74-1. This planning area started with the Airport Land Use Commission's area of influence for the airport and was then expanded to include all of Monterey, Pacific Grove, Seaside, Del Rey Oaks and an area extending out to Corral de Tierra Road and bounded by parallels 5000 feet either side of the center line of Runway 10-28. This area is substantially larger than the original Airport Area of Influence about the Monterey Peninsula Airport.

The jet aircraft providing air carrier service to Monterey Peninsula Airport are the primary contributors to noise levels in the airport vicinity. Presently, five commercial airliners serve Monterey, including two major airlines and three smaller commuter airlines. Recently, new CNEL contours for Monterey Peninsula Airport have been developed as part of the ANCLUC Study (Perry, 1979). The contours show that the airport vicinity is exposed to average aircraft noise well above 55 CNEL in 5 dbA increments. These contours suggest that airport CNEL noise levels have decreased by about 5 dbA or more from 1974 levels.

In an attempt to reduce aircraft noise levels and noise annoyance in the vicinity of Monterey Peninsula Airport, three ordinances have been adopted recently by the Monterey Peninsula Airport District. These ordinances have been designed to limit the hours of operation of the airport, regulate traffic pattern altitudes and the altitude of aircraft making turns while departing from the pattern, and regulate touch and go operations. Also, the chosen ANCLUC alternative, Case D2, would allow no general aviation training activities at Monterey Peninsula Airport.

Airport Safety

The Laguna Seca Office Perk development can be described as an area of varying contour, lying outside the extended clear zone of Runway 10-28. The major concern would be the safety of people working in the area, and the noise impact due to departing and approaching planes. The ALUC has commented that a study of aircraft falling near an airport would show that the large majority hit within 2 miles of the end of the runway, and in a fan shaped area either side of the runway center line as these aircraft attempt to turn back or are making turns in preparation for landing. The number of easterly take-offs will increase from Monterey Peninsula Airport, and the number of landings from the east has increased since aircraft from the south are coming in in greater number over the hills from Carmel Valley above the Corral de Tierra-Hidden Hills area. These aircraft turn west near the Laguna Seca Golf Ranch and follow Highway 68 to Runway 10-28.

Safety Requirements. The areas where safety is of greatest concern is in the vicinity of the runway approaches to the airport. To maintain compatible land uses in the airport influence area, the Monterey County Airport Land Use Commission reviews proposed developments that:

a) have residential characteristics exceeding plan designations

b) have high intensity

c) involve the use or storage of explosive, flammable, toxic, corrosive or other hazardous materials

d) promote population concentration

e) involve utilities and services required for areawide population, where disruption would have an unusually large impact

f) concentrate people such as children, the elderly, the handicapped, etcetera

g) promote extended duration of population concentration

h) otherwise pose hazards to aircraft operations or to the safety of persons or property on the ground.

The ANCLUC also has recently recommended specific areas where safety is a concern with respect to Runway 28, for airport operational alternative D2. These areas are generally known as clear zones and approach zones, according to the degree of hazard and the type of facilities and uses that would be allowed. These clear

and approach zones were developed in coordination with FAA; hence, the FAA finds these designated areas to be generally acceptable. The FAA concurrently prepared their own safety/land use compatibility guidelines for Runway 28 that are agreeable with the ANCLUC designated areas.

The project site is situated within the Federal Aviation Administration defined imaginary surface that affects the airport's navigable airspace. Consequently, Federal Aviation Regulation (FAR) Part 77, which establishes standards for determining if an object is an obstruction to air navigation, is applicable to the project site. An object is considered an obstruction if it exceeds certain height limits, if it encroaches into specific imaginary surfaces, or if it affects established minimum instrument height altitudes. Section 77.24 of Part 77 defines imaginary surfaces for civil airports. These include: horizontal, conical, primary, approach and transitional surfaces.

Based on FAA regulations, Airport Approaches Zoning Ordinance Number 1856 was developed. Subsequently, an Airport Hazard Zoning Map was prepared in 1975 for the Airport Master Plan. The new FAA/ANCLUC clear and approach zones supersede other County hazard zones. The developer has indicated he will inter into navigational easements in order to minimize airport safety liability. The Office Park will comply with Ordinance 1856.

Other Noise Sources

Motor vehicle traffic on State Route 68 is another significant source of noise in the project vicinity. Noise level readings were taken along the State Route as well as in various representative sites within the project site. The noise readings taken along the Highway were often as high as 83 with the passing of large motor vehicles being the major noise contributor. Presently, areas of the project site within approximately 100 to 200 feet of the highway are exposed to noise levels above the County of Monterey's normally acceptable guidelines for residential and commercial land use, respectively.

Impacts

The project would increase local noise levels through increased traffic and construction. It also would be affected by the noise environment, particularly operations at the Monterey Peninsula Airport. Noise impacts will be felt at various times and for short periods due to the noise from aircraft overfly and Highway 68.

The site is within Monterey Peninsula Airport's Airport Area of Influence, adopted by Airport Land Use Commission Resolution 74-1. This area will be subject to land use planning as determined by the Commission's Land Use Plan for the airport. This plan has not as

yet been adopted; however, data from the ANCLUC Study can be consulted. Projections of CNEL noise contours for years 1985 and 2000 recently have been developed as part of the ANCLUC study for the selected aircraft operational alternative D2 (the extended runway 8 case), as shown on Figure 22.

Laguna Seca Office Park will be subjected to the increase in aircraft noise, which will be in addition to the ambient noise level caused by vehicular ground traffic. The project is accessed by State Route 68, which tends to follow parallel to the airport property. The area adjacent to Route 68 likely will become highly impacted by increased vehicular traffic. This route, only a short distance from the airport, will be impacted by airport noise, high density, and an increase in probable injury to people in the event of an aborted takeoff or landing in which the aircraft is unable to make it to the runway.

The increase in noise levels at the project site during construction activities may result in a temporary impact upon York School and nearby residences. Contractors at the site are subject to regulations regarding noise, usually having the option of operating noisy equipment one piece at a time if it is necessary. The types of construction equipment that are identified as major noise sources and their typical sound levels (dbA) at 50 feet are: dump trucks (88), portable air compressors (81), truck concrete mixers (85), jackhammers (88), scrapers (88), bulldozers (87), pavers (89), generators (76), piledrivers (101), rock drills (98), pumps (76), pneumatic tools (85) and backhoes (85). Therefore, the choice of equipment would be important to the level of impact experienced by the adjacent land uses during construction. Heavy delivery and construction vehicles would subject residences adjacent to the haul routes to loud noise levels.

Noise levels at the proposed Office Park along Highway 68 fall within the conditionally acceptable category, requiring that noise insulation features as recommended by an accoustical analyst be included in the design.

Off-site project and non-project traffic increases on Highway 68 would significantly increase motor vehicle noise levels above existing conditions.

Mitigation Measures

55. Muffle all construction vehicles and equipment to meet state noise standards.

56. Limit construction activities to specific hours; schedule equipment operations for the "noisiest" time of day relative to surrounding noise levels; and utilize the quietest equipment possible.

57. Require that building plans be reviewed by the County Building Inspector to insure adequate interior noise levels.

58. Consider noise barriers that utilize a combination of berms, walls, fences and landscaping.

59. The developer shall agree to such conditions as are determined appropriate by the Board of Supervisors of the County of Monterey relative to aviation noise and safety, required prior to the approval of any development upon the project site.

60. Prepare an acoustical analysis for the proposed Office Park development or residential units within 400 feet of Highway 68, with the assistance of a qualified acoustical specialist, when design level plans are developed.

61. Encourage Monterey Peninsula Transit to serve the office development.

62. Hazards to pilots approaching the airport from project generated light and glare can be reduced by using non-reflective surfaces on rooftops.

63. Enter into navigational easements with the airport.

3.10 Public Services and Utilities

Sanitary Sewer. The provision of sanitary sewer service is organized at two levels in the Monterey area. Local cities and sanitation districts are responsible for maintenance and extension of sewer lines, whereas the Monterey Regional County Sanitation District (MRCSD) is responsible for development and operation of treatment facilities.

The Monterey County Regional Sanitation District became a formal operating entity on July 1, 1977. It took title to and is now responsible for the operation and maintenance of the wastewater treatment and disposal facilities of Pacific Grove, Monterey and the Seaside County Sanitation District. Member entities are now responsible for only local wastewater collection and not treatment and disposal.

As the first stage of a regional wastewater management system, the Pacific Grove and Monterey sewage systems became consolidated, combining their treatment at an upgraded Monterey Plant. The plant was expanded to treat an average dry-weather flow of 6 million gallons per day (mgd). The Seaside Plant currently is at its capacity of two million gallons per day (mgd).

A $100 million project, including a regional secondary treatment plant, new interceptors and a land and a marine outfall, has been proposed for construction. The location of the treatment plant has not yet been decided (MRCSD, 1980). The older Monterey and Seaside plants would be phased out with the opening of the regional plant. However, the Monterey Treatment Plant will remain in operation until the Regional Wastewater plant is constructed.

If the Regional System were operable, development in the general vicinity of the proposed project would be served by the pump station to be built at the present Seaside Wastewater Treatment Plant location. However, until such time as the pump station is built and the regional treatment plant also is built, or some interim capacity increase is provided at the Seaside plant site, it would be impossible to accommodate any additional flows such as those from the proposed development. The time schedule at this point for the pump station to become operable is 1984, but the treatment plant itself currently is unscheduled with respect to grant funding priorities. Therefore, no startup date presently can be projected.

The existing development on the ranch is all served by individual or community septic tank systems. York School, the Golf Ranch Clubhouse, the ranch offices and ranch area residences all are on individual septic tanks. The 45 homes of Laguna Seca Ranch Estates No. 1 are served by a public sewage collection system and master septic tanks and underground drainfields, owned and operated by County Service Area #10. The 49 lots of Laguna Seca Ranch Estates No. 2 are served by a collection system (dry lines) without a connection to treatment facilities. All of the above septic tanks systems will eventually be abandoned when off-site trunk mains and treatment facilities become available.

A sewer system project is anticipated with the approval of the proposed Office Park development. This proposed system will serve the 95 lots of Ranch Estates No. 1 and No. 2, York School, and the Laguna Seca Office Park. The proposed sewer project would include, according to project plans:

a. Completion of collection system.

b. Construction of pump stations and force main.

c. Construction of 50,000 gpd secondary treatment plant, with coagulation, filtration and chlorination.

d. Construction of storage ponds for up to 120 days wet weather storage of treated effluent.

e. Conversion of approximately 70% of golf course irrigation system to accept blended effluent and well water.

f. Observation wells to monitor groundwater activity.

The system would require a formal application to the Board of Supervisors to expand County Service Area #10. The proposed system is detailed in Appendix F of this document and is illustrated in Figure 23.

The sewage treatment plant would include a booster pump and lift station at the proposed Office Park development; the sewage from the Office Park and the Ranch Estates would be pumped to the secondary treatment plant location shown on Figure 23. Sewage would be treated; two storage ponds would be used to store wastewater; and eventually the blended reclaimed wastewater would be irrigated onto the existing golf course area, in the area shown on Figure 23, which is comprised of Fairways 1 through 9 and 16 through 18.

The existing 20,000 gallon septic tanks and drainfields currently serving the Estates are to remain as standby units. According to the County Health Department, the facilities are continually subject to failure and have recently been updated.

According to project proponents, the proposed system would be owned and operated by CAS #10, built at developer's expense, and would be capable of later expansion to provide the following capabilities:

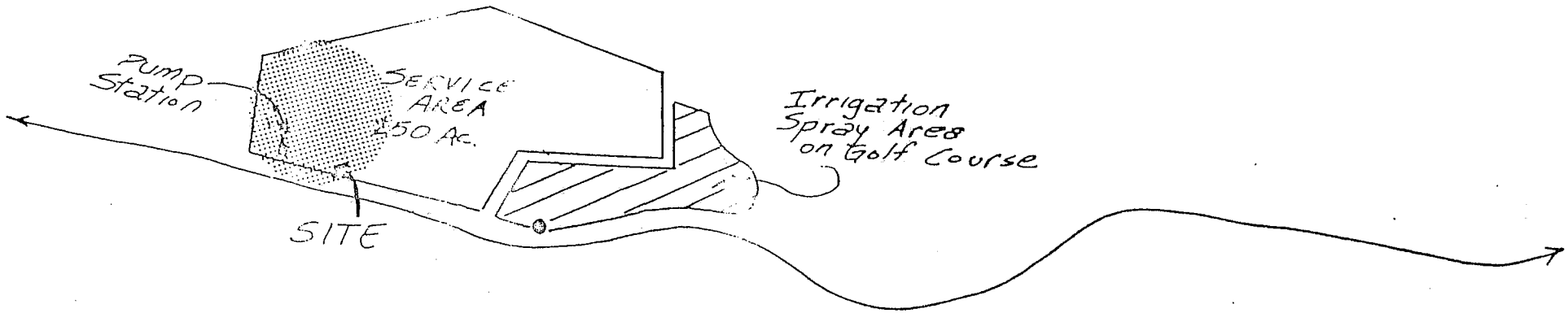
a. Treatment and disposal of sewage from early phases of expansion, up to about 200,000 to 250,000 gallons per day.

b. Wastewater reclamation to satisfy the irrigation needs of about 70% of the golf course and a tree farm. This will permit reduction in peak hour flows, allowing use of smaller trunk mains and more efficient use of off-site treatment facilities.

Impacts

At buildout, the office project would generate an estimated 40,000 gallons daily.

It is recognized that the proposed development be connected to a sanitary sewer system at such time as one is available. The community septic tank system serving Laguna Seca Ranch Estates No. 1 subdivision has failed in the past, and improvements have been completed recently. Another community system in this area must be carefully reviewed for environmental constraints and hazards. The proposed system could provide an interim or long range solution to the recurring problems of failures in County Service Area 10 soil absorption system serving Laguna Seca Ranch Estates No. 1.



Legend
Laguna Seca Wastewater Reclamation System
Service Area Boundaries
Pump Station
Treatment Plant
Irrigation Spray Area

0 2500
Scale in Feet

LAGUNA SECA OFFICE PARK
Proposed Sewage Facility
FIGURE 23

Source: Bestor Engineers, Inc

However, the plant design criteria and specific implementation measures will be subject to ultimate review by the California Regional Water Quality Control Board, the County of Monterey Health Department and the City of Monterey Public Works Department.

Possible ground water impacts may occur due to the proximity of the proposed sewage treatment plant to the Canyon del Rey Creek. Studies will have to be conducted to determine the exact depth to groundwater at the project site. The consulting geologist has given the depth to groundwater in the vicinity of the proposed treatment plant as approximately 46 feet from the surface. This information is deducted from well water measurements in the area; however, due to the nature of wells, an upper level of water may be present behind the well casing, giving a slightly shallower groundwater level. The depth to groundwater east of the area is closer to 60 to 70 feet. The groundwater level is assumed to be below the level of the ravine that is present at the treatment site (20 to 30 feet).

The County of Monterey Health Department has commented that the agency conceptually agrees to the concept of the proposed wastewater reclamation system. However, the Department would require greater detailing and specifications for the system. The treatment system would have to obtain a waste discharge permit from the California Water Quality Regional Control Board.

Mitigation Measures

64. Specific site inspections should be administered by Monterey County Health officials to determine adequacy of the site of the proposed sewage system. Test holes at least 40 to 60 feet deep (or until groundwater is reached) should be drilled at the treatment facility site to determine exact depth to groundwater. No irrigation of the golf course should occur within 25 feet of the existing homesites. The treatment plant is proposed by the project engineers to be located within the Highway 68 expansion area. Alternative sites should be selected in case the site is unacceptable to County and State officials.

65. Implementation of the proposed sewage system for the development should concur with the State of California Basin Plan and Monterey County Ordinance 1836.

Water Service

Laguna Seca Ranch domestic water supply is provided by Bishop Water Company, a public utility. Bishop Water presently serves the developed area at the west end of the Ranch, including Laguna Seca Ranch Estates No. 1 and No. 2, York School, and the clubhouse at the Golf Ranch. It also serves the ranch offices and residences.

Bishop Water Company was organized in 1962 and operates under the rules and regulations of the California Public Utilities Commission. The Company owns and operates three wells with an aggregate capacity of approximately 900 gallons per minute. Water is treated for removal of iron and manganese, and the present plant is sized for 275 gallons per minute. Storage is provided in two zones. A 200,000 gallon tank at elevation 495 serves areas between elevation 200 and 400. A new 100,000 gallon tank installed in 1980 at elevation 703 serves areas to elevation 600. Water mains in sizes from 6 inch to 12 inch have been sized to meet PUC requirements for domestic and fire flow. According to developers, "additional wells will be drilled as the need arises. Should water require treatment, a larger treatment plant will be constructed. Additional storage will be provided in each zone as the east end of the Ranch is developed. Higher zone(s) will be established, including booster pumps and storage tanks, as development proceeds above to 600 foot elevation."

Impact

At buildout of Laguna Seca Office Park, an estimated 35 acre-feet per year would be used according to the project's engineer. (Refer to "Groundwater," discussed in Section 2.3, for a complete discussion of impacts related to water use on the proposed site.)

Mitigation Measures

66. Provide certification that the Bishop Water Company can and will supply sufficient water flow, pressure, fire flow standards.

67. Submit plans for the proposed water system to the County Health Department for its approval and construct the system according to the approved plan.

68. Landscaping should be done with drought resistant plants whenever possible.

69. Water conserving fixtures should be installed as a means of reducing the consumption of water.

70. As proposed by the developer, additional treatment facilities, storage tanks and distribution mains will be constructed by Bishop Water as required to serve the proposed development. Funds for this expansion will be provided by the developer under standard refund contractual agreements.

    All improvements to the Bishop system will meet the requirements of the Public Utilities Commission, and the State Department of Public Health. Fire flows, hydrant locations and storage facilities will be subject to review and approval by

the Salinas Rural Fire District. All additives to the system, including services, will be subject to review and approval by the Monterey Peninsula Water Management District.

Fire Protection

The project currently lies within the Salinas Rural Fire District and is served from Station #3, located at 19900 Portola Drive, Salinas. The response time from Station #3 to Laguna Seca Ranch Estates is approximately 15 minutes.

Station #3 is manned full time by a 3-man shift, with one shift on duty the entire 24-hour period. It is equipped with 3 vehicles, with access to a fourth vehicle when necessary. Vehicle descriptions are as follow:

1.	Engine Pumper	1,000 gallons/minute
2.	Tanker	1,500 gallons/minute
3.	Smaller Pumper	4 wheel drive, used for brush fires
4.	O.E.S. #114 Truck	State Office of Emergency Services, access during emergencies

Services provided by the Salinas Rural Fire Protection District are fire prevention and suppression, rescue, first aid, resuscitation, response inspections, public safety training and subdivision preplanning for fire safety. The District's Insurance Services Office (I.S.O.) rating is 7.9 (on a scale of 1 to 9) and they presently have three fire stations. The District also has mutual aid agreements with the Castroville Fire District, the Pajaro Fire District, and the California Department of Forestry.

Impacts

Impacts would increase with the greater potential for wildlands of vegetation fires within the project area. If this were to happen, the responsibility for protecting this area would fall on the Salinas Rural Fire District. It will be desirable for the wildlands fire control capability in the area to be increased. If strict fire prevention measures were practiced in the Office Park, the Salinas Rural Fire and California Department of Forestry engine companies would be able to handle the hazard, if they were equipped for wildland fire-fighting. An engine with both structural and wildland capabilities could serve the needed purpose. Fire prevention control required would include street design, fire breaks, construction materials, water supply and facilities, structure clearance, building codes and possible presuppression measures (controlled burns).

The Office Park development would be served by the Salinas Rural Fire District and the ultimate layout of the site would be subject to their approval.

Mitigation Measures

71. The Office Park development would be subject to approval of Salinas Rural Fire District and its fire protection requirements.

72. Development shall provide safe and ready access for fire and other emergency equipment and to handle possible evacuations. Drives provided for access to buildings and hydrants shall be dedicated to the County for emergency access as provided by amendment to Section 10.31(d) of the 1979 Edition of the Uniform Fire Code. Parking shall be prohibited in turnaround berths; signs so indicating shall be posted.

73. Emergency access points shall be provided to all significant public and private water supplies.

74. Water distribution and source facilities shall be required of sufficient design to support the fire flows necessary for the type of development proposed.

75. A minimum water supply meeting the criteria of the County of Monterey shall be available before a building permit may be issued.

76. Flammable ground cover shall be cleared in a 30-foot area [illegible] property line, and replaced with a low fire spread evergreen groundcover or other suitable material approved by the Fire Chief and Planning Director. Where the property line is less than 30 feet from any structure, the Fire Chief shall evaluate the hazard and may require non-combustible siding, exterior sprinkler or other methods of protection which will reduce the risk of fire spread.

77. All buildings shall be designed and sited so that roofs and other areas may be kept free of leaves, needles and other dead vegetative growth.

78. Roof coverings for buildings shall be fire retardant, as defined in the latest adopted edition of the Uniform Building Code.

79. Buildings shall be spaced in such a manner as to minimize the exposure risk from fire spreading from building to building.

80. All easements for fire breaks for the fire safety of built-up areas shall include access for firefighting personnel and equipment.

81. Fire breaks shall be periodically cleared by owners of dead wood and vegetation.

82. When parking lanes are not provided, turnouts 8 feet wide and 15 feet long on each side of fire hydrants shall be provided and posted "No Parking".

83. Highly flammable underbrush shall be removed from within 20 feet of each side of all roadways. Individual or small groups of trees, ornamental shrubbery or similar plants of low combustibility which are used as groundcover need not be removed.

84. All trees shall be kept trimmed to provide a minimum 15-foot vertical clearance from finished roadway surfaces.

85. Hydrants shall be located so that any structure requiring a fire flow of less than 1,000 gpm shall be within 500 feet of a hydrant; any structure requiring 1,000 gpm or more shall be within 350 feet of a hydrant.

86. Fire flows for individual buildings shall be computed using Insurance Services Office's "Guide for Determination of Required Fire Flow" and must meet County fire flow standards.

Police Protection

The Monterey County Sheriff's Department provides police protection to unincorporated areas in the project vicinity, including the project site. The response time from the County Sheriff's substation on Aguajito Road to the project area is from three to ten minutes.

The project is located in Beat 6 of the Sheriff's Department's service areas. Beat 6 covers the north and south side of Highway 68 to Laureles Grade Road, the Aguajito area, Asilomar, Pebble Beach and Highway 1 to the proximity of Carmel.

Beat 6 is subdivided into 6-A and 6-B for statistical purposes. It normally is considered by a double unit from midnight to daylight, a single man unit during the day shift, and a double unit from four to midnight (after dark). It is a densely populated beat area as well as geographically extensive.

Highway 68 is under the jurisdiction of the California Highway Patrol.

Impacts

If the Office Park development is approved, a minor impact relative to increased service requests would be felt by the Monterey County Sheriff's Department.

Mitigation Measures

87. The Crime Prevention Unit of the Sheriff's Department should be consulted to provide input prior to final selection of security systems to be used in the development.

88. The project access and parking should be of sufficient width to allow access and turning of fire protection and emergency vehicles.

89. Addresses and locations should be clearly visible from the street.

Public Utilities

The initial study provided by the County of Monterey has determined that the impacts will be insignificant regarding public utilities. Therefore, no discussion is included within this Report.

Energy Conservation

The proposed project is at a conceptual level of development, so that specific energy conservation measures have not yet been developed. However, the characteristics of the site may offer excellent solar access and, at this stage of project plans, some passive solar design features (such a large south-facing windows) should be encouraged to be incorporated into eventual building design. Given both the favorable exposure of the site and climate of the area, more aggressive measures are recommended for energy conservation. Conservation of all energy resources is both a timely and an economically favorable undertaking.

The following measures are recommended for maximum energy conservation, and also are applicable to the eventual residents of the area:

90. Incorporate passive solar heating in all buildings and utilize solar heating for office hot water use where feasible.

91. Use local, low energy requiring materials.

92. Use a close analysis of building design needs to avoid the overuse of materials.

93. Design for the multifunctional use of materials such as siding for weather protection and insulation.

94. Match lighting, heating and ventilation use to area needs.

95. Consider orientation, color, micro-climatic data, the physiography of the site, building form response, choice of materials, construction practices and passive sources in site planning.

2.11. Archaeology

Archaeology was deemed an insignificant impact on the initial study prepared for this project. A preliminary archaeological investigation failed to locate any direct evidence of archaeological resources on the parcel. Therefore, it is recommended that the proposed project not be delayed for archaeological reasons.

Mitigation Measures

96. If cultural resources are located during construction, work should be halted in the area of the finds and the County Planning Department, the Regional Office of the California Archaeological Site Survey (408/425-6294) or other appropriate authorities should be notified.

3. ENVIRONMENTAL EVALUATION

3.1 Cumulative Impacts

The purpose of this cumulative impact analysis is to identify and summarize major environmental impacts that are expected as a result of planned development within the general area of the Laguna Seca Office Park. Each project that is discussed in this section is still in the planning stages, therefore is subject to continued evaluation and plan modification. This is particularly true since the Monterey II Plan which included many of the projects below was recently subjected to an initiative vote by the people of the City of Monterey. The Monterey II Plan was repealed as a result of that vote and a new plan will need to be developed. Until then, Monterra and Tarpey Flats remain as zoned and planned.

The following briefly discusses the developments:

1. Laguna Seca Park: Regional park with planned expansion of facilities to include an amphitheater and day camping.

2. Laguna Seca Ranch: There is currently developed Laguna Seca Ranch Estates No 1 (46 homes on 36 acres), and Ranch Estates No. 2 (49 lots on 135 acres) plus York School. There is no development currently proposed on the remaining 1000 acres±.

3. Monterra Development: This development was part of the Monterey II Plan for the City of Monterey. This development is in limbo and no development proposal is currently under discussion. It is being reviewed by the City of Monterey for its development potential.

4. Tarpey Flats: This County property is zoned agricultural. It is also being reviewed by the City of Monterey for its future development potential. No development proposal is currently under discussion.

5. Ryan Ranch: Borders the north side of State Highway 68 between Canyon del Rey Boulevard on the North and York Road on the southeast. The area is part of the Work Ranch, along with the areas identified as Tarpey Flats and Monterra, the ranch still being held in a single ownership. The property recently has been rezoned to IR-X (industrial, administration and research uses with development controls placed on the rezoning). The developers have submitted the Ryan Ranch General Development Plan to the City of Monterey; ;the plan proposes an industrial park of 207 acres, partitioned into 20 sites, a city community park of 75 acres and a 3.5 acre service commercial area. Approximately 21 acres are to be in road rights-of-way.

The Planning Department of the City of Monterey has indicated that development could be initiated in 1982. Because the site already is in the city limits, the project will move faster than other proposed development in the Highway 68 corridor. The developer has indicated that five tenants are waiting for project approval, two committed and three with letters of intent.

6. Hidden Hills: This area has been experiencing substantial growth in the past decade and more recently a number of development proposals have been introduced for the Hidden Hills area. A major portion of the land within the Hidden Hills is developed, approved for development, or proposed for development. Table 9 relates the status of these developments.

   The County of Monterey has determined that the maximum amount of building sites allowable under the present zoning would be 852. This applies specifically to the Hidden Hills North area, across from the proposed subdivision under discussion within this Report. The Lit Ng property (410 acres adjacent to the Monterra project site) has no specific development plans at this time, but the area warrants attention. Any development on the property would increase the cumulative impacts to the area.

7. Toro Area: A number of development proposals located in the Toro Area of Monterey County will impact the Highway 68 corridor and its region. This includes development within the Corral de Tierra and San Benancio areas of Monterey County.

8. Aguajito Area: Additionally, the Pebble Beach Corporation owns 900 acres within the Aguajito area; no development proposal is pending.

In terms of cumulative impacts, the aforementioned developments are closely tied by traffic circulation patterns, drainage boundaries, soils, geologic constraints and jurisdictional boundaries. The cumulative impacts discussed within this section consider the area as a whole.

Possible cumulative impacts that could result as a part of the office park development proposal and the proposed area-wide developments are described as follows:

Loss of Open Space. The natural vegetation and wildlife of the Highway 68 area is slowly disappearing as a result of subdivision activity and urbanization. This loss of open space has a direct correlation with several factors:

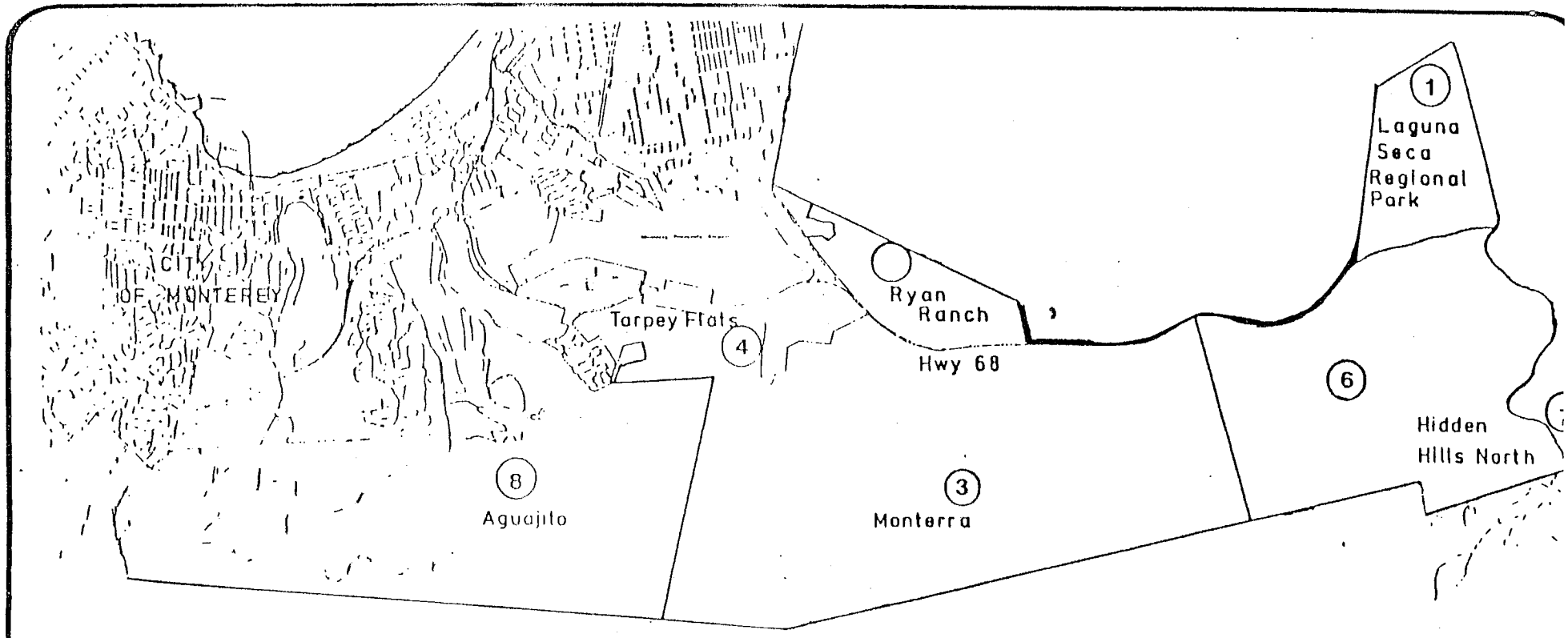
a. Aesthetics
b. Wildlife Habitat
c. Watershed Area

Table 9
Cumulative Impact Review
Hidden Hills Development

Proposed Projects	Description Lots	Description Acres	Status	Environmental Review
Mesa Hills West	47	125.5	denied	EIR prepared
Halcyon Hills	10	40.0	approved	
Mesa Hills	12	40.0	approved	EIR prepared
Shaffi	4	40.0	approved	EIR used
M. Palmeri	10	40.0	approved	EIR prepared
Mansfield	10	40.0	approved	EIR prepared
Saunders	10	40.0	pending	EIR prepared
Reordan	10	4.0	withdrawn	EIR prepared
Hogan	4	34.0	denied	Negative declaration
Feldman (rezone to 1 lot, 20 acre minimum)	1	20.0		Negative declaration
Standex (20 clustered units)	86	295.0	approved	EIR in progress
Lotz	9	40.0	approved	EIR in progress
TOTAL PROPOSED	10	40.0	pending	
	142	555	approved	
	51	159	denied	

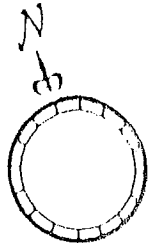
Represents analysis of 772.5 acres (65%) of Hidden Hills Area

Approved/Developed		
Baronet Estates	14	35.0
Mar Mac	20	20.5
Adjacent to Mesa Hills W.	4	8.0
Adjacent to Standex	17	34.0
TOTAL APPROVED/DEVELOPED	55	92.5



Schematic presentation

Legend
1 Laguna Seca Regional Park
2 Laguna Seca
3 Monterra
4 Ryan Ranch
5 Tarpey Flats
6 Hidden Hills North
7 Toro Area
8 Aguajito



LAGUNA SECA OFFICE PARK

Regional Area Developments

FIGURE 24

Source: County of Monterey Planning Department

A change in the viewshed area is a current result of increased urbanization. The cumulative impact of numerous subdivision approvals and their implementation results in the loss of native flora, fauna and habitat area. This is accentuated by the continual conversion of native vegetation and topography to housing structures, access routes and fence lines. Particular impact will be placed upon the Oak Woodland.

Removal of vegetation for development purposes results in a loss of valuable watershed and habitat area. This has direct correlation with increased runoff and erosion in the Highway 68 corridor. With the recent development in this area, the fauna is being threatened increasingly as the terrain in which it competes for food is decreased. Upon urbanization, conflicts between animals and human residents also arise. Humans often bring domesticated aniamals, as well as increased noise, which threaten faunal existence.

Land Use and Planning: The major projects, including Ryan Ranch, Monterra and development within Tarpey Flats should be consistent with the planning effort now being undertaken by the City of Monterey.

Traffic and Circulation: The Office Park development will generate betweeen 2,500 and 3,900 average trips per day which will be added to Highway 68. The traffic increase to Highway 68 from all developments along this highway corridor will affect the highway's service level. Additional turning movements from York Road into Highway 68 will increase the potential for accidents and will require improvements along those roads.

The other developments, planned, pending or approved which will use this transportation corridor will have a major impact that will necessitate major regional improvements along the highway. Unfortunately, funding for these projects is currently unavailable.

Section 2.7 of this report addressed the projected cumulative traffic volumes which took into account the developments previously discussed. Traffic increased external to the project may include an additional 85,000 vehicle trips over the next 25 to 30 years from those various developments near the Laguna Seca Office Park.

Currently, Highway 68 operates at a level of service of D. The expected levels of service in the year 2000 on the proposed six lane expressway would be F with and without the Office Park project.

Air Quality. A contribution to the cumulative air quality degradation in the North Central Coast Air Basin is inevitable with the implementation of this project. The proposed subdivision as a lone entity will create a moderate air quality problem. However, the cumulative effect of additional traffic movements in the area will lead to an eventual, significant decrease in air quality. In addition,

grading and construction will increase the cumulative effect of particulate matter in the air, thus contributing to the temporary degradation of air quality.

The initial source of air pollution resulting from the proposed projects would be construction. Carbon monoxide and nitrogen oxide emissions during construction would be short term and insignificant, in terms of both the amount of local and regional emissions and air quality. Large amounts of particulates would be generated during soil distribution activities, but can be controlled to acceptable levels.

Additional traffic generated by the projects would be the most significant source of air pollution. The projected daily emissions would consist of carbon monoxide, particulates, nitrogen oxides, and reactive hyrdocarbons.

Viewshed: Viewshed from Highway 68 may be changed because of this project. Proper site selection for office structures can partially mitigate this impact.

Any proposed commercial, light industrial or residential land uses would be partially apparent from Highway 68, a designated scenic highway, and from parts of the City of Monterey, including the Toyon residential area. Development within the Highway 68 view corridor would include 1) the Laguna Seca office park development along Highway 68; 2) residences on portions of north facing slopes and ridgetops of Monterra which are visible from the roadway; 3) any Tarpey Flats development along Highway 68; and 4) probably to a lesser extent, the Ryan Ranch industrial buildings. The wooded ridges would contribute, in combination with other urbanized areas in the watershed, to degradation of the water quality in downstream areas. Erosion rates can be expected to increase two to five times above present levels, aggravating the existing sedimentation problems in Laguna Grande and increasing the frequency and costs of maintenance in some of the drainage facilities.

Noise: Increased noise to the area also is a significant cumulative impact that is difficult to mitigate.

Traffic noise levels are expected to increase substantially on Highway 68 and 218 with future development along Highway 68, west of Olmsted Road and east of York Road, Ldn noise levels resulting from the projects would increase noticeably by approximately 7 and 4 dbA, respectively, above existing levels. In combination with expected nonproject traffic through 1999, Ldn noise levels would increase above existing levels by 7 and 5 dbA, respectively. A smaller increase in Ldn noise levels is expected on State Route 218.

Noise modeling performed in the project vicinity suggests that the 60 Ldn noise contour would extend approximately 700 feet from Highway 68, west of Olmsted Road (compared to 350 feet from the roadway without the projects). East of York Road, the respective project and no project distances to the 60 Ldn level would be 550 and 400 feet, respectively. Noise sensitive uses should be avoided in these areas and certain uses at Laguna Seca, Monterra and Ryan Ranch should be carefully evaluated. The widening of State Route 68 to a freeway facility could cause additional noise sensitive uses to be exposed to noise levels in excess of the generally accepted noise guidelines. There is also a possibility of danger to the project vicinity from aborted aircraft landings.

Runoff: Cumulative increase in runoff, the result of a large number of dwelling units in the Hidden Hills area will require careful attention to the provision of adequate drainage structures and protection against erosion.

Several improvements have been proposed in a Master Drainage Plan for the Canyon del Rey watershed. Depending on the detailed drainage plans that will be submitted for any future projects, the Canyon del Rey Master Drainage Plan may have to be reviewed and updated to assure that planned facilities are adequate to accommodate the ten year and 100 year floods. With adequate detention facilities on the sites, peak flow impacts of the projects should be mitigated successfully.

Runoff from the proposed development would carry minor amounts of contaminants associated with higher density activities such as oil, grease, lead particulates and litter into Canyon Del Rey Creek.

Energy. The proposed development of the projects would result in construction, operational and transportation energy comsumption. Of these three categories, operational and transitional related energy consumption would be the most significant, since they would extend over the life of the project.

Implementation of solar design options as well as energy conservation measures for the project would partially mitigate the impacts. Additionally, implementation of public transit and the encouragement of car pooling would aid in relieving the problem.

Sewage and Water: Table 10 lists the projected water use in the year 2000 of the anticipated principal light groundwater producers/ consumers in the general area.

Table 10
Projected Water Use: Laguna Seca Watershed / Year 2000

User	Location	Aquifer Aromas-Paso-Robles	Santa Margarita	Monterey Shale	Projected Maximum Use AC/Ft
Toro Water	Hwy 68	X			183
Laguna Seca Heights	Hwy 68	X			25
Laguna Seca County Park	Hwy 68		X		100
Laguna Seca Ranch	Hwy 68	X 1/8	X 7/8		940
Hidden Hills	Laureles Grade	X 1/6	X 5/6		238
* Monterra	Hwy 68			X	783
+ Ryan Ranch	Hwy 68		X		180
					2449

* = Groundwater reserves must be developed from Miocene shale for project to become self-sufficient.

\+ = Plans for greatly increased expansion now being considered within the planning process.

SFDU rated at .366 Ac/Ft per year per unit

MFDU rated at .313 Ac/Ft per year per unit

Note: Ryan Ranch projects 3712 employees by year 2000. Logan projects ultimate water use at 150 acre-feet per year, without allowance made for landscaping. Above figure of 180 acre-feet provides for 30 acre-feet per year landscaping.

Note: The parcel owned by Lit Ng is omitted from the above calculations.

Logan, the groundwater consultant for these properties, states that wells 2, 4, 5 and 7 on Ryan Ranch have a combined pumping capacity of 234 gpm. Long range effects of pumping on aquifer will not be known for many years.

Services: The population growth creates an increased need for fire protection and crime prevention. These services will be significantly impacted by this individual project. The lack of funds to expand the services is the critical factor.

There is no specific funding, timing or implementation schedule to as-sure the adequate financing and phasing of the necessary improvements to the Highway 68 area. It is recommended that such a plan for providing services be required to be coordinated through the various agencies currently providing services, the City and County of Monterey and the area developers.

Vegetation and Wildlife: Any development of areas known to support rare and endangered plant species poses a threat to the limited populations of those species.

Other impacts that will become increasingly significant as the area developes include fire hazards, water consumption, erosion, runoff and the sedimentation of streams and lakes in the vicinity.

3.2 Adverse Effects Which Cannot Be Avoided if the Project is Implemented

This proposed Office project will commit this property to a specific office use for a long period of time. Grading and the construction of structures are virtually irreversible uses of the property.

The project will generate approximately 2,500 to 3,900 additional vehicle trips per day to the Northern Monterey County Area. These additional trips, especially on Highway 68, will increase traffic volume and accident potential.

The overall air quality for the northern Monterey County area will be decreased in proportion to the number of vehicle trips generated.

The proposed project will decrease groundwater resources.

Increased runoff will result directly from the removal of vegetation and the addition of impervious materials to the subject property.

The use of gas and electricity within the development and energy to travel is an irreversible consumption.

Temporary construction activities will disturb soil, animal, plant and water cycles, and will create noise, dust and visual scars.

The location of structures will significantly alter the aesthetic value of this region, resulting in the loss of the natural landscape which now characterizes the area.

An increase in the number of persons exposed to potential noise and safety hazards from Monterey Peninsula Airport operations will occur as a result of the project.

An increased demand for public services and a corresponding increase in county costs will occur. The Office Park development, would require a new sewage system. A proposed treatment plant project currently is being evaluated and therefore, no completion date for this facility has been determined. The project would pay for all costs required for sewer and stormdrain improvements. Water supply for the project is proposed from on site wells to be developed at the expense of the project applicants; the long term reliability of the onsite aquifer has been determined adequate by the groundwater report prepared for this EIR. The project would also demand additional fire protection, police protection, and street maintenance. These costs would be paid by additional tax revenues from the Laguna Seca Office Park Project.

3.3 Alternatives

No Project

This alternative would retain the property in its present state and would retain existing open space values. This alternative would result in a non-productive investment for the applicant. Under present County regulations, the applicant would be permitted a single home site on each legal parcel without obtaining a Use Permit.

The no project alternative would create no adverse impacts on traffic circulation, traffic related noise, energy consumption, air pollutant emissions, native plant and wildlife habitats, water supply, the quantity and quality of stormwater runoff from the site, erosion of the site, the need for public services, the rural visual character of the Highway 68 scenic corridor and archaeological resources. Also, the no project alternative would not increase exposure of persons to seismic hazards and to noise annoyance from occasional flyovers by aircraft associated with the Monterey Peninsula Airport.

The no project alternative would not provide needed commercial, uses; it also would generate significantly less tax revenues than the project and no jobs.

All Residential Development

This alternative would allow development to occur at 2-4 units per acre. This alternative could reduce the impacts on traffic, vegetation, and viewshed which would result from the proposed Office project. It would, however, increase sewer and water consumption.

Fifty to 100 units could be constructed on site. The project would remain in the jurisdiction of the County of Monterey and would be a suburban type residential development, as intended in the County Rancho Laguna Seca General Plan. This alternative would be consistent with the current County of Monterey General Plan.

The advantages of this alternative relative to the proposed project include its reduced scale and a reduction in traffic generated; significantly less energy consumption for associated traffic; less air pollutant emissions; less runoff, urban contaminant loads in runoff and erosion rates. It would, however, consume more water and produce more sewage.

Higher Density Residential

An increase in densities over those proposed above will result in more cuts and fill, greater impacts on vegetation and wildlife, greater exposure of people to hazards from geological contraints and proportional increases in traffic volumes, water consumption, sewage, air pollution, surface runoff and sedimentation. A greater number of housing units would be built under this alternative. No long term jobs would be created.

3.4 The Relationship Between Local Short Term Uses of Man's Environment and the Maintenance and Enhancement of Long Term Productivity

Short term impacts of the project would result from construction activities include increased traffic, motor vehicle and construction equipment noise, energy consumption, air pollutant emissions, and incresed erosion rates on the site. Except for erosion rates, these types of impacts would be even greater for long term operation of the project because of the magnitude of the development.

The project would have the following long term effects:

- Increase job opportunities.
- Increase County revenues.
- Increase County costs for public services.
- Generation of between 2,500 to 3,900 vehicle trips per day.

- Hazards to structures on the site due to seismically induced ground shaking.

- Increased stormwater runoff from the site. Increased concentrations of pollutants and sediments in this runoff.

- Increased erosion rates on the site. Increased sedimentation in downstream areas, including the proposed retention ponds and Laguna Grande Lake.

- Increased water demand.

- Removal of approximately 54 acres of open space. A corresponding loss on the wildlife habitat value of the site and adjacent area due to the loss of this open space.

- A decrease in the natural, rural character of the Highway 68 scenic corridor and other local view corridors.

- Increased noise from traffic on Highway 68. Possible noise annoyance to the proposed Office Park.

- Noise annoyance to employees on site from occasional private and commercial aircraft overflights.

- Minor hazards to proposed uses from aircraft crashes.

- Minor increase in the oxidant levels in the air basin attributable to increased traffic.

- Increased energy consumption for operation of the proposed facilities and project generated traffic.

3.5 Irreversible Environmental Changes Which Will be Involved in the Proposed Action Should it be Implemented

The proposed development will commit the site to professional use for a permanent period of time. Grading and the construction of structures would be irreversible uses of the land. The viewshed of the Highway 68 corridor would be altered and the forfeiture of open space. Additionally, there would be a significant consumption of energy during construction and operation of the project.

3.6 Growth Inducing Impacts

The general area in which the project site is located has not been developed intensively to date; development of the proposed project may prompt other development proposals in the vicinity of Laguna Seca. Development of the proposed Office Park would commit the site to sustained, long range commercial use.

The development of an office park complex on the existing boundaries of the City could set a precedent for higher intensity development to be located in semi-rural areas.

4.0 BIBLIOGRAPHY, PERSONS CONSULTED AND STAFF

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4.2 Persons Consulted

Bill Fell - City of Monterey Planning Department

Carl Hooper - Project Engineer

Lynne Mounday - County of Monterey Planning Department

Gary Tavernetti - Applicant's Representative

4.2.1 Persons Consulted Laguna Seca Ranch Annexation E.I.R.

Jim Abercrombie, Monterey Bay Unified Air Pollution Control District.

Peter Aldrete, Director, City of Monterey Parks and Recreation Department.

Steve Driver, Salinas Rural Fire District.

William Dryden, Consulting Engineer.

FAA Tower Personnel, Monterey Peninsula Airport.

Bill Fell, City of Monterey Planning Department.

Nick Ford, Monterey Peninsula Airport District

Carl Hooper, Project Engineer.

Leo McIntyre, Director, City of Monterey Public Works Department.

John Montenero, Chief, Monterey Fire Department.

Monterey County Health Department.

Monterey County Regional Sanitation district.

Monterey County Transportation Study.

Monterey Unified School District.

Richard Robinson, Consulting Biologist.

Salinas Union High School District.

Owen Stewart, Monterey County Flood Control and Water Conservation District.

Gary Tavernetti, Applicant's Representative.

4.3 Staff

This Draft Environmental Impact Report was prepared by Scott Lefaver, A.I.C.P.

Appendix A

Initial STudies: County of Monterey

ENVIRONMENTAL RECOMMDATION AND INITIAL STUDY

MEETING: PLANNING COMMISSION OF APRIL 9, 1980

PROJECT: BISHOP, McINTOSH & McINTOSH FILE NO. PC-3834

APPLICATION TYPE : GENERAL PLAN AMENDMENT

LOCATION: LAGUNA SECA AREA, NORTH SIDE OF HWY 68

PRESENT: PLAN DESIGNATES SUBURBAN 2-4 UNITS/ACRE

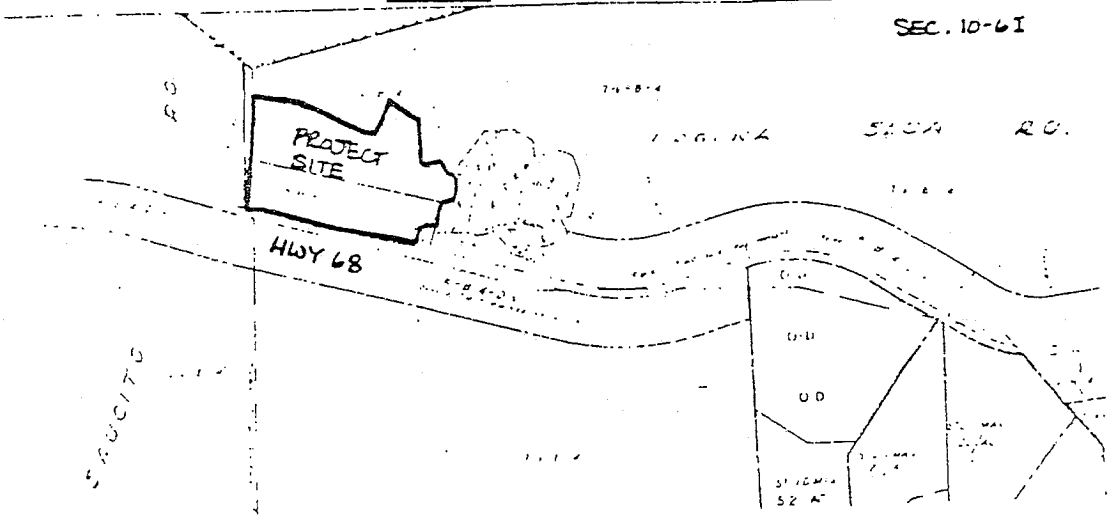
PROPOSED: PROFESSIONAL OFFICE DESIGNATION TO ALLOW DEVELOPMENT OF A 21 LOT SUBDIVISION ON 55 ACRES.

PLAN: RANCHO LAGUNA SECA GENERAL PLAN

PLAN DESIGNATION: SUBURBAN 2-4 UNITS/ACRE

PROJECT CONSISTENCY STATUS: N.A. CONSISTENT N.A. INCONSISTENT

SEC. 10-6I



THE (STAFF) PLANNING COMMISSION OTHER _____ MAKES

THE FOLLOWING ENVIRONMENTAL RECOMMENDATION: FROM AN INITIAL STUDY (SEE REVERSE)

IT HAS BEEN DETERMINED THAT THIS PROJECT [X] MAY, [ ] WILL NOT HAVE A SIGNIFICANT IMPACT(S) UPON THE ENVIRONMENT AND IT IS RECOMMENDED THAT A

_____ NEGATIVE DECLARATION, OR

_____ NEGATIVE DECLARATION WITH MITIGATION MEASURES (attached),

OR

X ENVIRONMENTAL IMPACT REPORT (EIR), BE PREPARED.

PREPARER CATHY STEIN TITLE PLANNER II DATE APR. 1, 1980

IF YOU HAVE ANY QUESTIONS ABOUT THE MEANING OF THIS INFORMATION PLEASE CONTACT THE ENVIRONMENTAL SECTION OF THE COUNTY PLANNING DEPARTMENT PRIOR TO THE MEETING DATE AT THE TOP OF THIS PAGE BY CALLING 422-9018.

INITIAL STUDY

FILE NO. PC-3834

BASIC ENVIRONMENTAL QUESTIONS

SIGNIFICANT IMPACT	CAN BE MITIGATED	INSIGNIFICANT IMPACT	YES	NO		
X	X		X		1.	Within a high seismic hazard zone? Zone: V, II
X	X		X		2.	Development on slopes over 30%?
X	X		X		3.	Potential erosion problem?
X	X		X		4.	Evidence of geologic instability? CHOPLINES FAULT, GROUNDSHAKING
X	X		X		5.	Soil constraints for development? SANDY LOAM SOILS, HIGH EROSION HAZARD, SHRINK-SWELL POTENTIAL
X	X		X		6.	Potential to degrade surface water? Affected water(s) CANYON DEL REY
						a. Reduce water quality?
						b. Reduce downstream availability?
		X		X	7.	Potential to degrade groundwater?
						a. Quality?
						b. Increase overdraft?
X	X		X		8.	Would increased project runoff be detrimental?
X	X		X		9.	Within a 100 year floodplain?
X	X		X		10.	Eliminate native vegetation? Type: CHAPARREL
X	X		X		11.	Rare or endangered species? Species: PAJARO MANZANITA, CEANOTHUS RIGIDUS, HAPLOPAPPUS EASTWOODEA.
		X		X	12.	Impact any unique or fragile biotic community?
X	X		X		13.	Impact a wildlife use area? Type:
X	X		X		14.	Designated scenic area? HWY 68
X	X		X		15.	Any significant visual impact?
		X		X	16.	Obnoxious odors?
X	X		X		17.	Unacceptable noise? OPR / HWY NOISE
X	X		X		18.	Traffic impact?
X	X		X		19.	Conflict with any airport land use plan or land use? MTY AIRPORT
		X		X	20.	Project access inadequate?
X	X		X		21.	Air quality degradation on a
						_____ temporary basis CUMULATIVE
						_____ permanent basis
X	X		X		22.	Sewage disposal problem?
		X		X	23.	Water supply problem?
		X		X	24.	Inadequate school facilities? District:
		X	X		25.	Increased fire hazard?
		X		X	26.	Inadequate access for fire trucks?
		X		X	27.	Extension of utilities 1/2 mile or more?
		X		X	28.	Inefficient use of energy?
X	X		X		29.	Archaeological site?
		X		X	30.	Historical site?
		X		X	31.	Loss of prime row crop or irrigated farmland?
		X		X	32.	Loss of grazing land?
X			X		33.	Inconsistent with Growth Management Policies?
		X		X	34.	Conflicts with neighboring land use?
X	X		X		35.	Generates the need for new housing?
X	X		X		36.	Adverse cumulative effect? MITIGATION MEASURES MAY BE LONG-TERM.
		X		X	37.	Displace existing residents?
X	X			X	38.	Is growth inducing?
						TO BE ANSWERED FOR SPECIFIC OR GENERAL PLAN PROJECTS ONLY:
					39.	Short term benefits at expense of long-term benefits?
					40.	Irreversible commitment of land or irreplaceable resources?

NOTES:

Appendix B

Geology

ROSSI-FOREL
GROUND SHAKING INTENSITY SCALE
(SCALE SIMPLIFIED ISC6)

I — PERCEPTIBLE, only by delicate instruments

II — VERY SLIGHT, shocks noticed by few persons at rest

III — SLIGHT SHOCK, of which duration and direction were noted by a number of persons

IV — MODERATE SHOCK, reported by persons in motion; shaking movable objects; cracking of ceiling

V — SHARP SHOCK, generally felt; furniture; some clocks stopped; some sleepers awakened

VI — SEVERE SHOCK, general awakening of sleepers; stopping of clocks; some window glass broken

VII — VIOLENT SHOCK, overturning of loose objects; falling of plaster; striking of church bells; some chimneys fall

VIII — Fall of chimneys; cracks in the walls of buildings

IX — Partial or total destruction of some buildings

X — Great disasters; overturning of rocks, fissures in surface of earth; mountain slides

(From Lawson and others, 1908)

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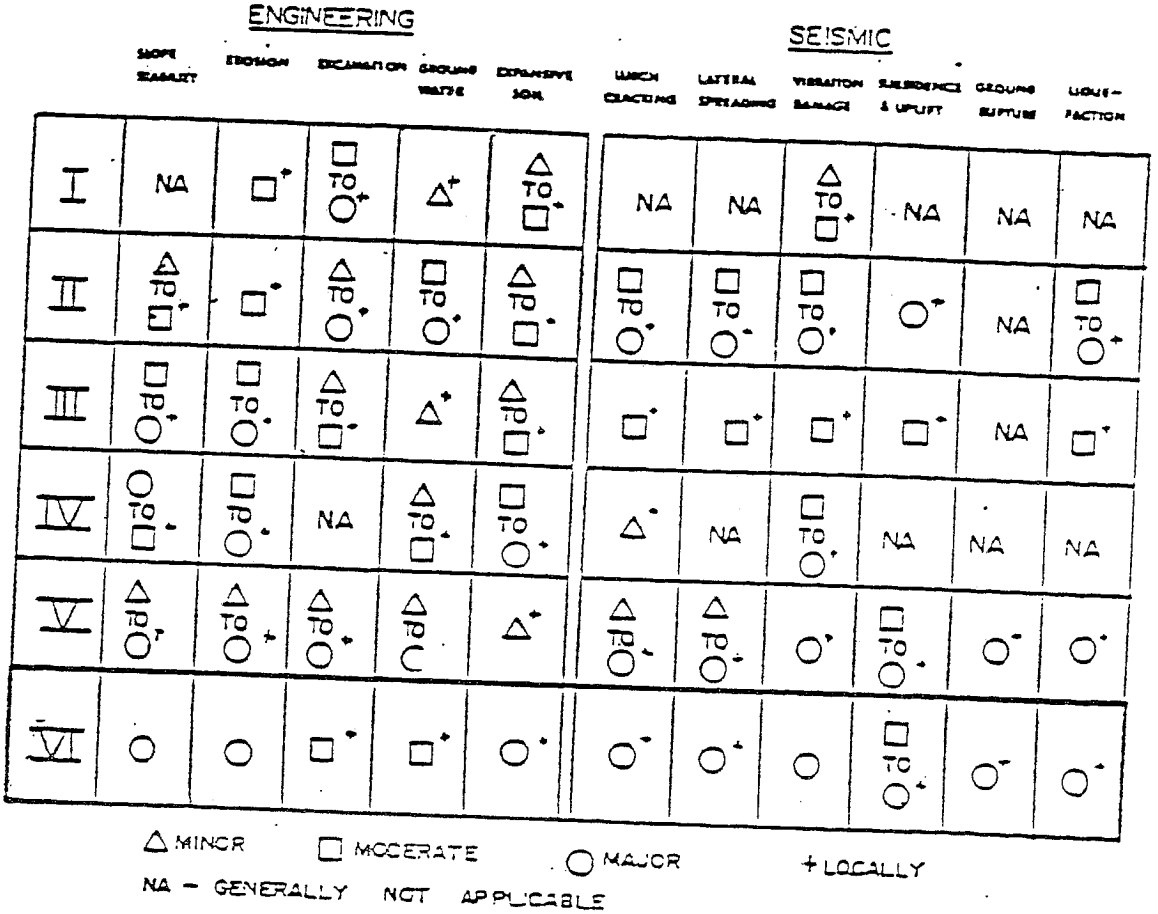
DISTRIBUTION OF HAZARDS*

Applies to: Map of Monterey Peninsula Cities (1:12,000)



The triangles indicate that the potential geotechnical hazard is of concern in less than about 10% of the zone so designated. The squares indicate that the potential hazard is of concern in less than about 40% of that zone, whereas the circles indicate that the potential hazard is of concern in more than about 40% of that zone. A cross is used as a modifier to indicate that a particular geotechnical hazard is a localized one as well as being a potential problem through-out the zone. The symbols, then, are intended to indicate the potential for distribution within a zone rather that the severity of the hazard within that zone. In the case of slope stability in Zone IV, the sequence of symbols is reversed from that in all other cases to emphasize that slope instability is a major potential hazard in many parts of this zone.

OPR and Growth Management
Checklist

FILE NO. PC-3834

Areas of Possible
Conflict:

_____1. Applicable Plan RANCHO LAGUNA SECA GENERAL PLAN
(a) Plan Designation SUBURBAN
(b) Plan Density 2-4 UNITS/ACRE
(c) Is there any internal Plan inconsistency relative to the project?_____Yes
X No If "yes", give most restrictive Plan designation_____
(d) If no density is depicted on the Plan which covers the project site, give the appropriate designation and density from the OPR Extension Letter_____
Is project consistent with this designation_____Yes_____No

_____2. Does the proposed project conform to the County Low and Moderate Income Housing Ordinance? _____Yes X No NO ORDINANCES ADOPTED

_____3. What is the project areas wildland fire hazard rating? MEDIUM
Has applicant submitted "adequacy of access" report?_____Yes X No

_____4. Does project include frontage on lakes, beaches, rivers, or streams inventoried in the Conservation/Open Space Element or other portions of the General Plan?
_____Yes X No If yes, has applicant delineated areas of existing and/or potential access to the resources?_____Yes_____No

_____5. Is the project located in close proximity to any of the following?
(a) highways and freeways X Yes_____No
(b) primary arterials and major local streets_____Yes X No
(c) passenger and freight railroad systems_____Yes X No
(d) ground rapid transit systems_____Yes X No
(e) airports X Yes_____No
(f) industrial plants_____Yes X No
(g) other ground stationary sources_____Yes X No
If any of the above are checked "yes", indicate distance from noise source
If yes, has applicant submitted Community Noise Equivalent Level (CNEL) Contours_____Yes X No NOISE TESTS WILL BE DONE AT TIME OF EIR.

_____6. Is the project in close proximity to any of the following?
(a) schools X Yes_____No YORK SCHOOL
(b) hospitals_____Yes X No
(c) resthomes_____Yes X No
(d) long term medical or mental care facilities_____Yes X No
(e) other noise sensitive areas?_____Yes X No
if yes, specify_____
If any of the above are checked "yes", indicated distance to project site
If any of the above are checked "yes", has applicant submitted results of on-site noise monitoring_____Yes X No

_____7. Is the proposed project any of the following?
(a) school_____Yes X No
(b) hospital_____Yes X No
(c) resthome_____Yes X No
(d) long term medical or dental care facility_____Yes X No
(e) other noise sensitive use_____Yes X No
if yes, specify_____
If any of the above are checked "yes", has applicant submitted results of on-site noise monitoring?_____Yes_____No

_____8. Is the proposed use in compliance with State Office of Noise Control Guidelines (1/1/76)? X Yes_____No WITH MITIGATION MEASURES PROJECT WILL BE CONSISTENT.

_____9. A review of the project with regard to the Growth Management Amendment to the General Plan indicates that: PROJECT IS INCONSISTENT (POLICIES 2 & 3)

11/19/79

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Oliver E. Bowen
Registered Geologist
California No. 979

Appendix C

Ground Water Survey

RICHARD R. THORUP
Consulting Geologist
381 Via Del Rey Monterey, California 93940 (408) 372-2466

May 22, 1981

Ms. Denise Duffy
Environmental Management Consultants
P.O. Box 414
Monterey, California 93940

Re: "Groundwater Survey and Geology of Laguna Seca Ranch and Monterey II", dated March 30, 1981. Revised May 22, 1981.

Dear Ms. Duffy:

Enclosed are six (6) copies of the abovementioned report. My conclusions on groundwater are that Laguna Seca Ranch has sufficient groundwater reserves to furnish planned development of the Ranch. Pumping capacity is about 835 gpm from three (3) wells. The Laguna Seca Golf Course well recently was completed and tested at 758 gpm, bringing the total capacity up to 1593 gpm. The water quality of the two large wells is slightly over 1000 ppm TDS. This quality can be improved by blending with the Paddock 4 water and also probably by locating future wells farther away from the shale outcrops on the south side of Highway 68.

No faulting can be observed within the confines of the Ranch. No ground rupture is expected to occur on the property. However, strong earth shaking with local lurch cracking from the San Andreas Fault, or other large active or potentially active faults, may occur during the life of the project from intensities which may be as high as 8.0 on the Richter scale. This situation is faced by the entire Central Coast Region, not just Laguna Seca Ranch.

Soft, loose sands occur in localized areas of the Ranch. These areas are subject to possible erosion from building site operations. The surface areas must be replanted. Erosional ruts and small gullies must be channelled. Setbacks must be set for location of structures in the areas containing the steep erosional ravines. Tests must be made in the alluvial area for the possibility of liquefaction, which may be caused by the presence of loose sand at or near the surface in some localities. Finally, before the wastewater treatment for golf course water is constructed, the depth to groundwater must be determined by the drilling of shallow wells to determine the suitability of the location.

My original report of March 30, 1981, has been amended on pages 4, 14, 16, 17 and 18 to reflect two important revisions:

1. The ultimate demand of Ryan Ranch has been lowered in Table 1 from 500 acre feet per year to 180 acre feet per year. My previous calculations did not deduct for weekends and holidays, and my unit water use for employees was too high. I have decided to accept Ryan's estimated total annual use at buildout of 150 acre feet, to which I have added 30 acre feet per year for landscaping.

2. The pumping results of the Laguna Seca Golf Course new well have beem added to the total pumping capacity of the Laguna Seca Ranch.

Very truly yours,

Richard R. Thorup

RRT:mt
Enc

For: Environmental Management Consultants

through The City of Monterey

Groundwater Survey and Geology of Laguna Seca Ranch and Monterey II

Richard R. Thorup

Consulting Geologist

Revised May 22, 1981

GROUNDWATER SURVEY AND GEOLOGY OF
LAGUNA SECA RANCH AND MONTEREY II

TABLE OF CONTENTS

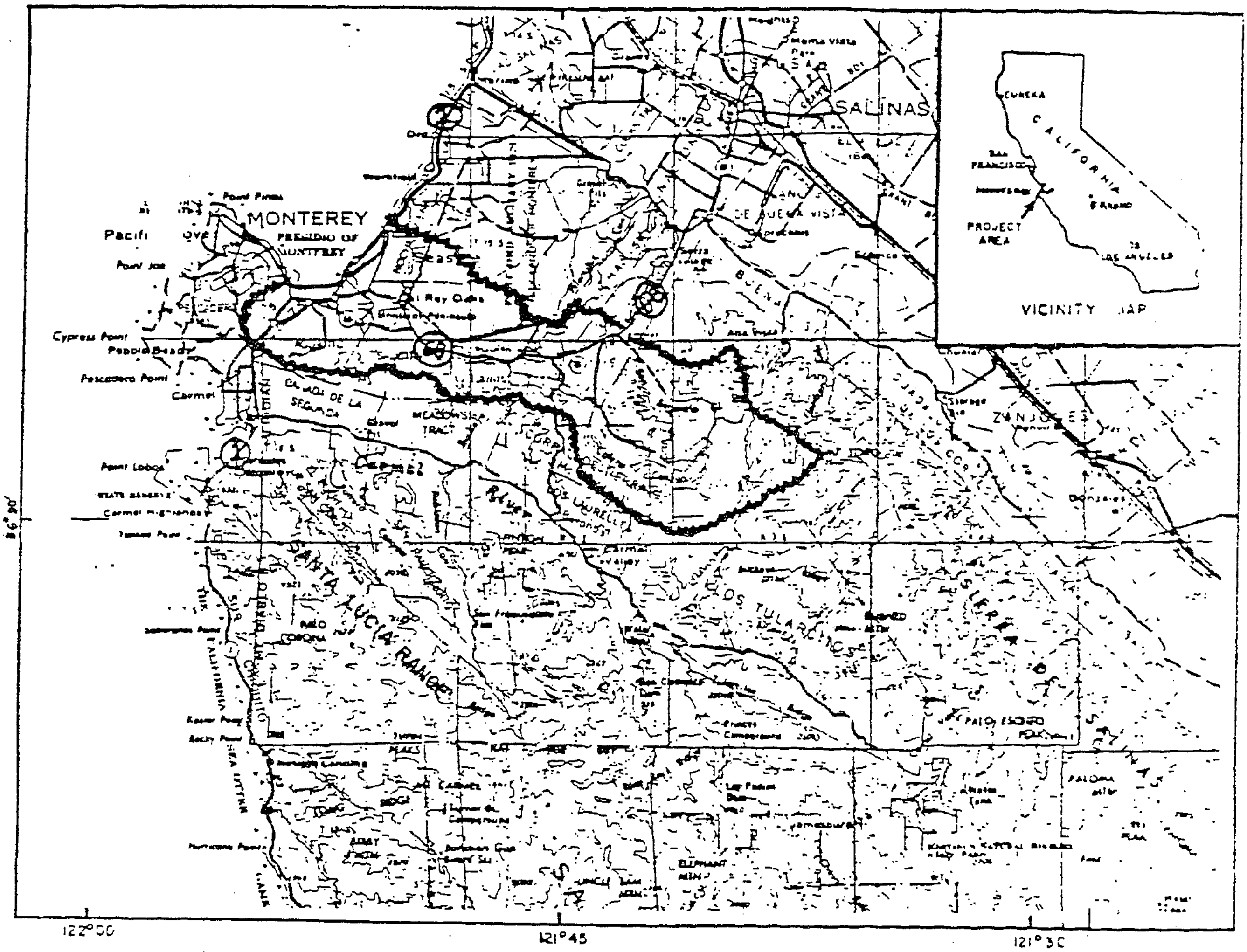
Table of Contents, Continued

INTRODUCTION

The General Development Plan for Laguna Seca Ranch is now being implemented within the planning process. This plan calls for a total build-out, by the end of this century, to a resident population housed in 2,900 building units. Such diverse structures as a professional complex, condominiums, single and multi family homes, a school, fire station and other types of services call for the necessity of a review of the geology and the groundwater, among other things, to ascertain to what degree, or level, of development these natural resources are capable of sustaining.

This report deals with the many facets of groundwater, such as the amount present on the ranch, the past history of water use, what effects the future development will have on the water table of the overall area, and how the future development of the water resources will affect the groundwater of the Ranch's neighbors, including the City of Seaside.

A discussion of the geology of the ranch, including soil types, faulting, folding, erosional hazards and the like are discussed. A review of Oliver Bowen's report on the Geology of Laguna Seca II [2] is included, as are some comments on John Muir's current U.S.G.S. report on the Groundwater of the Seaside area [12].



RICHARD R. THORUP

MAR 30 1981

PURPOSE

The purpose of this report is twofold:

1. To furnish a summary updated report on the groundwater of the Laguna Seca watershed and Laguna Seca Ranch and the long term relationship between resources, yield, and population growth to the year 2,000. This study includes an updated Fall 1980 Water Table Map on the Toro-Laguna Seca-Seaside area.

2. To provide a Geologic Review of Report entitled "Geology of Laguna Seca II Pertinent to Subdivision of the Land for Residences", by Oliver E. Bowen, dated June 25, 1979; and to list a set of mitigation measures for the various geologic hazards.

SCOPE

The following lines of research were pursued:

1. Pertinent literature reviewed;
2. Aerial photographs studied;
3. Field geology reviewed;
4. Water levels of the area studied and Fall 1981 Water Table Map constructed;
5. Past and present water use of the area reviewed;
6. Water use of Laguna Seca and other users projected to the year 2000;
7. Safe Yield estimated;
8. Relationship of Seaside area to Laguna Seca Ranch analyzed.

CONCLUSIONS

1. The Laguna Seca Ranch has adequate groundwater resources and projected pumping capacity to sustain the full anticipated growth.

2. Projected pumping requirements on the property will not cause the deterioration of the groundwater capabilities of the adjoining properties nor those of the City of Seaside.

3. Groundwater quality appears to be degrading slightly with time in the Santa Margarita aquifer in the Main Gate No. 2 and Paddock No. 1 wells. However, considerably higher quality water is being pumped from the Aromas-Paso Robles aquifer in the Paddock No. 4 well. Groundwater quality can be improved, when necessary, by increased use of this aquifer and/or a blending of the waters from the two aquifers.

4. Safe yield has not as yet been reached in this area. Eventually, exorbitant pumping costs and/or poor quality water will be the determining factor. Yearly annual recharge for the Laguna Seca subwatershed appears to be around 3000 acre-feet per year.

5. The 1980 Fall Water Table Map contains approximately 150 measured water levels covering the entire sedimentary trough from San Benancio Canyon to Seaside and Fort Ord. This map shows that Upper Corral de Tierra and Calera Canyon water is percolating into the Laguna Seca-Hidden Hills area. The writer feels that the 1980 data, which includes additional wells located east of, but in proximity to, the Divide, confirms his interpretation of the direction of flow of the groundwater into this area.

6. Projected maximum water use for Monterey II, plus an area of development between Laureles Grade and Corral de Tierra Road, is anticipated to be 2449 acre-feet per year. This figure will be reached only if all projects reach the maximum projected development. The area included east of Laureles Grade, lying outside of Monterey II, is projected to use around 308 acre-feet. The lands in Monterey II therefore are projected to use 2141 acre-feet by the year 2000.

8. Groundwater storage within the confines of Laguna Seca Ranch appears to be around 37,000 acre-feet of groundwater. The Laguna Seca subwatershed contains some 120,000 acre-feet. Both of these estimates are made by using Muir°s formula, as outlined in his study of Seaside. These amounts are an increase over the figures cited in the writer°s earlier reports, which cited 22,000 acre-feet and 85,000 acre-feet, respectively.

9. Muir's Report on the Seaside coastal area shows conslusively that, by cutting down yearly production from 5090 acre-feet in 1976 to 2577 acre-feet in 1979, the water table has risen to a safe elevation above sea level, and the threat of sea water intrusion along the coast is ended. He also states that Seaside receives 400 acre-feet in excess of the safe yield along the coast. This 400 acre-feet percolates to the Bay and prevents salt water from encroaching on land. The recharge area for Seaside is the Fort Ord area east of the city and also lands within the City limits. He considers that all of the groundwater within the City's well system pumps exclusively from the Aromas-Paso Robles, and none from the Santa Margarita groundwater. Production on Laguna Seca Ranch, most of which is developed within the Santa Margarita Sandstone, does not interfere with the Seaside wells.

10. No surface evidence of any faulting is visible on Laguna Seca Ranch.

11. Patches of loose sand are present, which may tend to cause problems when stripped of vegetation or subjected to bulldozer cuts. Unless care is exercised in cut and fill design, erosion can pose a hazard.

RECOMMENDATIONS

1. As production is increased by the drilling of new wells, the wells should be carefully located to spread the production out along the lease, so as to prevent the concentration of pumping in one small area. This existing situation may be the cause of a slight deterioration of the water quality in the Main Gate No. 2 and Paddock No. 1 wells.

2. The water from all of the wells should be periodically checked, at least twice a year, for chemical content. If the TDS and chloride continue to rise, serious consideration should be given to drilling a new well and cutting back the yield of the existing well.

3. Pumpage leakage has always been a problem at Laguna Seca Ranch. If these leaks still exist, a strong effort should be exerted to eliminate them.

4. Water conservation practices should be considered and implemented where at all possible. This will contribute to the longevity of the well pumpage and may become very important in the years to come.

5. Certain geologic hazards are present on the property, in the form of erosional ruts and areas of soft, loose sand in the hills, which may be difficult to control when vegetation is removed or bulldozer cuts are made. Care must be exercised in these fragile areas. Engineering tests should be made on each building site for site stability.

6. No faults can be mapped within the property and no surface ruptures should reasonably be expected. The Chupines Fault, which lies on the south side of Highway 68, is considered potentially active. active faults, such as the San Andreas, Monterey Bay Fault Zone, Sur-Nacimiento, and the San Gregorio-Pablo Colorado are are all close by and can cause severe shaking and possible lurch cracking. Some soft sand is present in the valley floor in the easterly half of the ranch and also occurs as dune sand along the northwesterly edge of the property. It is recommended to test these areas for the possibility of liquefaction.

TOPOGRAPHY

Laguna Seca Ranch lies along the north side of Highway 68, about two miles east of the Monterey Airport and 2.5 miles southeast of the City of Seaside. The Fort Ord Military Reservation abuts the northerly line of the property for 2.5 miles. The Laguna Seca County Park joins the easterly edge. The intermittent stream of Arroyo del Rey lies along the southerly edge of the ranch near Highway 68. This stream has an incised channel about 20 feet deep which contains the flood waters and prevents flooding of the valley floor. The property rises in elevation from the floor of Canyon del Rey toward the north. Small draws and ravines have been etched along the south side of a long ridge which rises from 350 feet at the westerly edge to 850 feet at the northeastern corner. The soft bedrock in the upper elevations has been locally severely cut by erosion into several sharply-incised ravines.

South of Highway 68 the hills rise abruptly to a height of 880 feet and are covered heavily with brush. This vegetative cover serves to control runoff into Canyon del Rey from this long ridge.

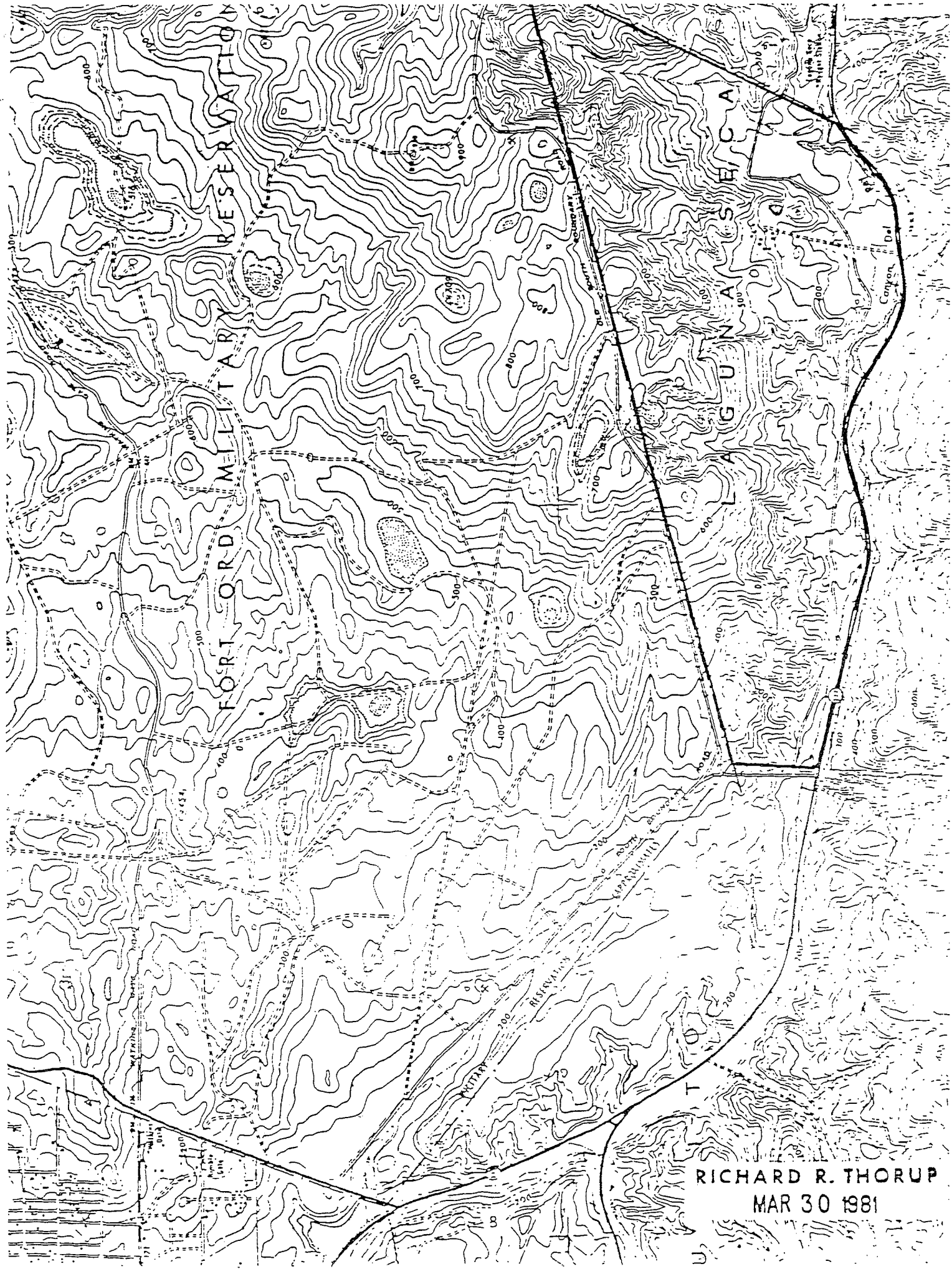
GEOLOGIC SETTING

The bedrock underlying the hills consists of a gently folded sequence of soft to moderately indurated sands, clays and gravels of the Aromas and Paso Robles stream-laid formations of Pleistocene age. These are capped in the higher elevations, near the westerly boundary, by two patches of red-brown soft old sand dunes, one of which is occupied by York School. Materials are probably not over 30 feet thick.

The alluvial plain is about a thousand feet wide at the easterly edge of the property and narrows to about 400 feet at the westerly edge. The alluvial sediments grade from sand to sandy clay and clay from east to west. These deposits are 30 to 40 feet thick.

A shallow water table lies at about 30 feet below the surface within the alluvium. This source of water feeds the lush vegetation in the alluvial plain.

A branch of the Chupines Fault lies along the south side of Highway 68. There is no evidence of faulting within the confines of Laguna Seca Ranch.


FORT ORD MILITARY RESERVATION
LAGUNA SECA
RICHARD R. THORUP
MAR 30 1981

GROUNDWATER

General

The Laguna Seca Ranch lies in an east-west sedimentary trough containing several hundred feet of saturated fresh water sands and gravels. It extends for nine miles from the Harper fault (near San Benancio Canyon) on the east, to Canyon del Rey, one mile west of the ranch. The south flank of this trough is bordered by a steep line of hills, abrupt ly rising to the south, approximately along the lines of the Chupines Fault. This fault is considered to be potentially active because it has offset strata of Pleistocene age.[4] In the southeasterly portion of the area, along Calera Canyon, in Sections 22, 23, 25 and 26, T16S, R2E, the fault has offset Monterey shale against granite. The long granite ridge along the south side of Calera Canyon rises to over 2000 feet in elevation.

The northerly boundary of the sedimentary trough is formed by an east-west line of hills lying about one mile north of Highway 68. It separates Laguna Seca Ranch and Laguna Seca Park from Fort Ord on the north side. The ridgetop roughly coincides with a long echelon anticlinal crest, the eastern half of which is called the Guidotti Anticline; the western portion is called the Laguna Seca Anticline. Exposures of Santa Margarita sand and the lower part of the Paso Robles formation along the crest indicate the presence of a structural high. The hills in Fort Ord contain northerly and westerly dipping exposures of Paso Robles and Aromas strata. Muir [12] includes the strip between Highway 68 and the ridgeline within Area 1, which contains the Fort Ord portion of the Seaside Watershed.

The two principal aquifers in this district are the Pleistocene Aromas-Paso Robles sands and gravels and the underlying Pliocene Santa Margarita sand. The total saturated thickness of these two aquifers exceeds 800 feet in the thickest part of the basin. The Aromas-Paso Robles is the principal aquifer in San Benancio Canyon, parts of Corral de Tierra and all of Seaside, whereas the Santa Margarita produces most of the water in Laguna Seca, Hidden Hills and, locally, in Corral de Tierra. It is not uncommon for wells to produce from both aquifers. Well capacities in the thickest Aromas-Paso Robles produce up to 500 gpm of generally acceptable water, whereas many wells, where these sediments are thin or poorly developed, produce but a few gallons per minute. The Santa Margarita is about 230 feet thick in the center of the basin and yields up to 650 gpm of water which ranges from 850 to 1050 ppm TDS.

Alluvial sands and gravels, though not extensively developed, produce groundwater in San Benancio and lower and upper Corral de Tierra in sufficient amounts to supply family residences and a number of small subdivisions. Quality is generally good. However, in those areas where the alluvium is in contact with the Monterey Shale, the TDS rises to 900-1100 ppm. This aquifer is not important in Laguna Seca, Monterey or Seaside.

Less extensive, but locally important, aquifers are the upper few hundred feet of exposed Monterey shale and the underlying basal Monterey sands near the outcrop areas. Fresh water has largely displaced the

marine waters in these areas. The resulting quality has been found to be locally acceptable. One recent well in upper San Benancio Canyon, Section 17, T16S, R3E, was test pumped at 100 gpm of 900 ppm TDS water from a basal Miocene sand underlying the Monterey shale. This well, though fairly deep (900 feet) suggests that other wells in nearby areas can be completed successfully in this aquifer. An artesian well in Section 24, T16S, R2E, drilled in 1974, appears to be producing from the same zone.

Groundwater in Storage

In 1973, Thorup [18] stated that the total amount of groundwater in storage in the Laguna Seca Watershed (3830 acres) is 82,300 acre-feet (36,500 acre-feet in the Aromas-Paso Robles, and 45,500 in the Santa Margarita). The Laguna Seca Ranch, which comprises roughly one quarter of the watershed, was estimated to contain approximately 22,000 acre-feet of groundwater.

In this report, Table 1, patterned after Muir's formula [12] shows the total storage to be 36,900 acre-feet on Laguna Seca Ranch and 120,000 acre-feet in the Laguna Seca Watershed. The present calculations have incorporated the drilling results of the last four years and are felt to be more accurate than the previous amounts.

Muir (Table 3) lists a total of 730,000 acre-feet of total water stored in his study area. Area 1, which covers the easterly half of Fort Ord and the Laguna Seca Ranch, contains 410,000 acre feet of groundwater in storage from an average saturated thickness of 550 feet in an area of 6200 acres. On this basis, Laguna Seca Ranch, which comprises roughly 1/6 of Area 1, would appear to contain 68,000 acre-feet of storage. However, it does not appear to this writer that the saturated thickness of the entire ranch averages 550 feet, being more like 250-300 feet, so that the total storage is probably more like 37,000 acre-feet.

Water Level Measurements

Plate 2 is a revised water table map for Fall 1980. It covers the area from San Benancio Canyon to Seaside. Sources for well measurements are as follow:

1. Flood Control measurements in San Benancio, Corral de Tierra, Calera Canyon and Laguna Seca comprise 40 of their regularly measured wells and 53 additional wells from which measurements were obtained in 1977, 1979 and 1980. The purpose in obtaining these latter measurements was to allow a more precise determination of the water table, particularly in the vicinity of Corral de Tierra Road and Calera Canyon, to ascertain whether groundwater from Calera Canyon is migrating into the Laguna Seca area, as stated by Thorup [18].

2. California American Water Company and the City of Seaside provided measurements in the Seaside area.

3. Fort Ord supplied measurements on several of their wells.

4. The Monterey area was not included in the Flood Control investigation. Scattered measurements for the more recently drilled wells have been obtained from the contractors.

5. Wallace Holm provided measurements for Monterra and Ryan Ranch.

6. Hidden Hills supplied measurements for two wells.

7. A few scattered measurements were obtained from contractors and land owners.

Water Table Map: Fall 1981

Plate 2 is the Water Table Map for Fall 1981. The contour lines are derived from the water surface elevations, which are shown plotted at the well locations.

Summary

1. At the easterly edge, groundwater in the San Benancio area is shown to flow downstream along San Benancio Creek, thence northerly toward the Salinas River.

2. Upper Corral de Tierra and Calera Canyon groundwater flows down the water courses, and down the regional dip of the strata into the Hidden Hills-Laguna Seca area. Some of this groundwater may transfer into the older sediments, such as the Aromas-Paso Robles, Santa Margarita Sandstone and the Monterey Shale.

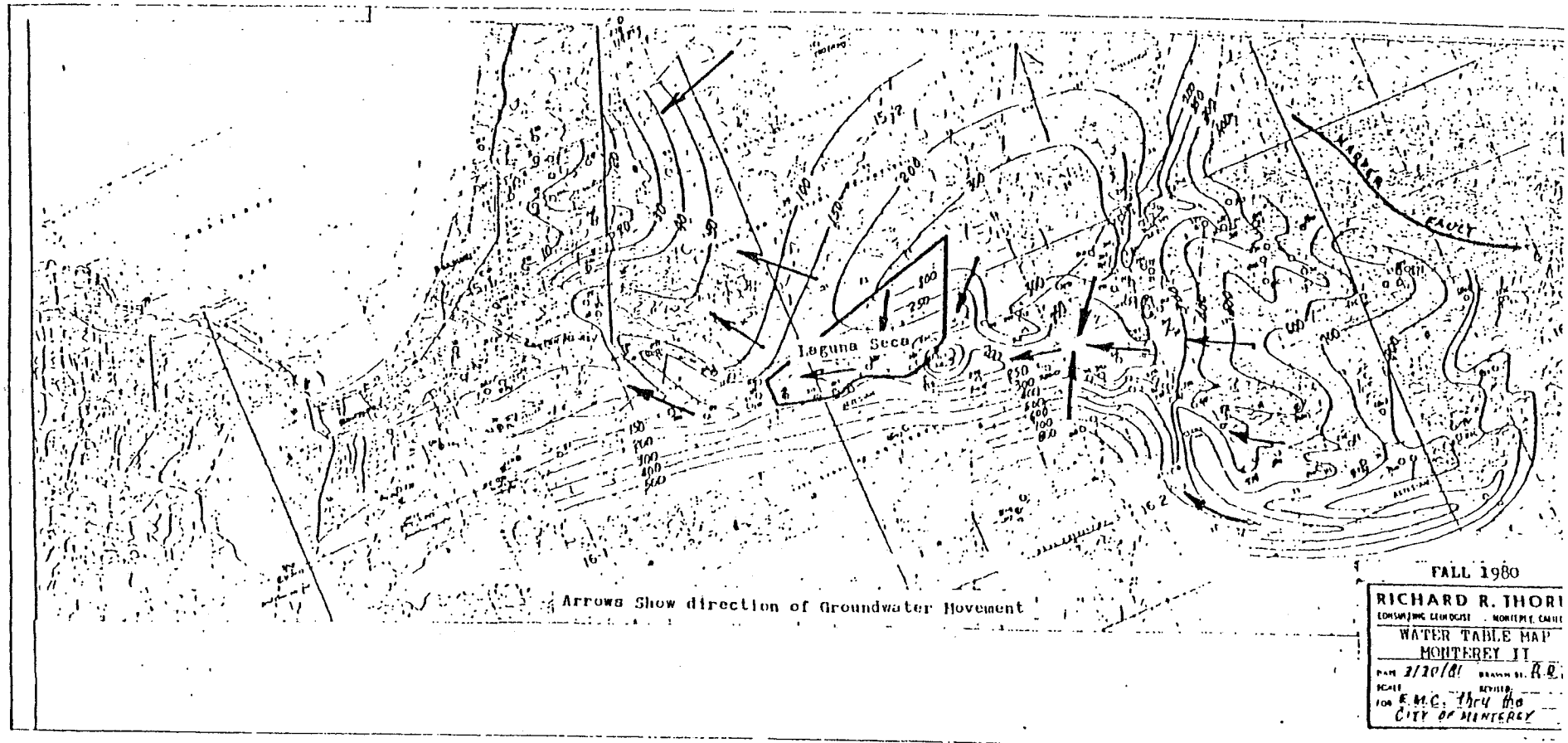
3. Lower Corral de Tierra measurements show the Groundwater percolating downstream northerly into Toro Creek.

4. A definite groundwater mound lies along Corral de Tierra Road west of the Golf Course. This mound separates the waters in lower Corral de Tierra from Laguna Seca.

5. Watson Creek, in upper Corral de Tierra, and Calera Creek converge at the 4 Corners intersection. Measurements in this local area show that groundwater percolates from both these courses areas into the Hidden Hills-Laguna Seca area.

6. The Laguna Seca trough extends from near Corral de Tierra Road, through Hidden Hills and the Laguna Seca Ranch, down the gradient along Arroyo del Rey into Monterey and Seaside.

7. The Muir water table map covers principally the Seaside Area and Fort Ord. Unfortunately, it does not spill over in sufficient detail into the Laguna Seca and Corral de Tierra areas.. Had all the measurements shown on the Thorup map been available to Muir, the 300 foot line would not have been drawn as shown. For example, a corrected surface elevation at the Laguna Seca County Park, G1 on Muir's Water Table Map, shows that the true water table elevation is 210 feet, not 305 feet as shown by Muir. Also, in February 1981,


Laguna Seca
Arrows Show direction of Groundwater Movement
FALL 1980
RICHARD R. THORI
WATER TABLE MAP
MONTEREY II
3/20/81
R.R.
FOR E.M.C. Thru the
City of Monterey

Flood Control measured a well 3500 feet due south of G1 and recorded a water level elevation of 208 feet. Well perforations are in the Santa Margarita sandstone. These two measurements, plus others, delineate the Laguna Seca trough as extending uninterrupted from the Corral de Tierra Road, down the gradient, into Monterey and Seaside.

Another example of an incorrect water surface elevation is well C1, located in the upper center of Muir's Water Table Map. This is the Fort Ord Huffman well, drilled in 1939 and now caved in and abandoned. The static water level, as plotted on the original Fort Ord driller's log, was 80 feet above sea level. The level on Muir's map is +175. The level today probably is closer to 60 feet.

8. The steep southerly flank of the water table begins at the Santa Margarita-Monterey Shale contact. Three measurements in shale wells show a steep rise in the water level elevations, probably caused by a sharp reduction in permeability in the shale as compared to the Aromas-Paso Robles and the Santa Margarita. Along the southeasterly border of the map, on the south side of Calera Creek, the steep contours begin at the sedimentary-granitic contact.

9. Whether, or how much, groundwater percolates through the Laguna Seca Ranch into the Seaside and Fort Ord area is not known definitely from the existing data. Muir's Water Table Map shows a positive gradient toward Fort Ord and Seaside. The writer's map is inconclusive in the critical area along the northerly border of Laguna Seca Ranch. This writer is fairly certain that groundwater percolates down Arroyo del Rey toward the Monterey Peninsula Airport. Groundwater also percolates into Seaside. A test well drilled 3000 feet easterly along the northerly property line from the northwest corner of the Ranch most likely would supply the necessary information for a more conclusive answer.

Recharge and Safe Yield

The amount of safe yield relates to the Thorup report of 1977 [18] and the current Muir report [12]. In the former, the conclusion was made that, in the opinion of the writer, 2000 acre-feet of groundwater originating in Calera Canyon, migrates on an annual average down the gradient into the Laguna Seca trough. The water table map, and the volume of groundwater generated in Calera Canyon, were used as evidence for the conclusion. The California Department of Water Resources (Fresno Office) supported the conclusion on the direction of groundwater flow, but stated they thought that the amount of 2000 acre-feet was too high. They declilned to state what they thought the amount was. The writer still believes the amount to be in the 2000 acre-feet range, particularly because the present water table map shows groundwater also entering the trough from the Watson Creek Watershed in upper Corral de Tierra, as well as from Calera Canyon.

According to Muir, pumping data in the coastal portion of Seaside (Areas 2, 3a and 3b) demonstrates a safe yield of 2600 acre-feet. Inflow, or recharge, into the area is estimated at 3000 acre-feet. It appears, according to Muir, that groundwater flow into the ocean of 400 acre-feet per year is required to prevent salt water intrusion.

Muir states that the average annual inflow in the entire Seaside study area between 1961 and 1979 was 6400 acre-feet. The Seaside coastal area averaged 3300 acre-feet and Area 1 averaged 3100 . About 40% of Area 1, or 1240 acre-feet of yield per year, lies in the Laguna Seca watershed. Muir's Area 1 boundary contained only about 60% of the Laguna Seca subwatershed. This amount does not include the 2000± acre feet percolating from Calera Canyon and Upper Corral de Tierra. Total recharge into the Laguna Seca subwatershed might, therefore, be 3,240 acre-feet. This writer's 1977 estimated was 2737 acre-feet. An amount of 3000 acre-feet is used in this report.

Muir states that, in his opinion, 95% of the recharge comes from annual rainfall, which is made possible by the porous soils and low relief of the hills east of Seaside, and the fact that the groundwater passes directly from the old sand dunes into the underlying Aromas-Paso Robles sands and gravels. He does not believe the Santa Margarita contributes any water to the Seaside wells, as shown in his two cross sections, A-A° (Figure 3) and B-B° (Figure 4).

The Laguna Seca trough is unlike the hills east of Seaside, in that here the rain falls directly on the slightly folded Aromas-Paso Robles (and, to a lesser extent, on the Santa Margarita) and percolates down the structural dip in confined or semi-confined sand and gravel strata lying between layers of clay and sandy clay.

Water Use - Laguna Seca Subwatershed

The average annual recharge for the Laguna Seca watershed, as stated by Thorup [17] (Table 3), was 2737 acre-feet as of 1975. Water use for that year was estimated at 791 acre-feet. This yearly amount has increased modestly since then. About 100 new wells have been drilled in the Toro-Laguna Seca area since the 1977 report, pretty evenly scattered in distribution throughout the entire basin. At a consumptive rate per well of 0.366 acre-feet per year for single family dwellings, about 40 acre-feet per year additional water throughout the entire area is now being produced, some of which is returning back into the soil. Buildups within existing subdivisions have increased the water use somewhat. Total present consumptive use in the Laguna Seca watershed is probably not over 900 acre feet per year in 1980, as compared with 791 acre feet in 1975. For instance, Laguna Seca Ranch production has remained essentially stable at 500 acre-feet per year through 1980, including the Golf Course. This amount will, of course, rise steadily as future demands are met.

Table 1 lists the projected water use in the year 2000 of the anticipated principal light groundwater producers/consumers in the Monterey II area. This table is a substantial update of Table 1 [17], of 1975.

If the expansion plans for Monterey II are all approved substantially, as requested, Laguna Seca Ranch, Ryan Ranch and Monterra combined will consume on the order of 1903 acre-feet of water per year by the year 2000. Of these three entities, Laguna Seca Ranch has the highest degree of self sufficiency in groundwater reserves and pumping capacity.

COMPONENTS OF MONTEREY II

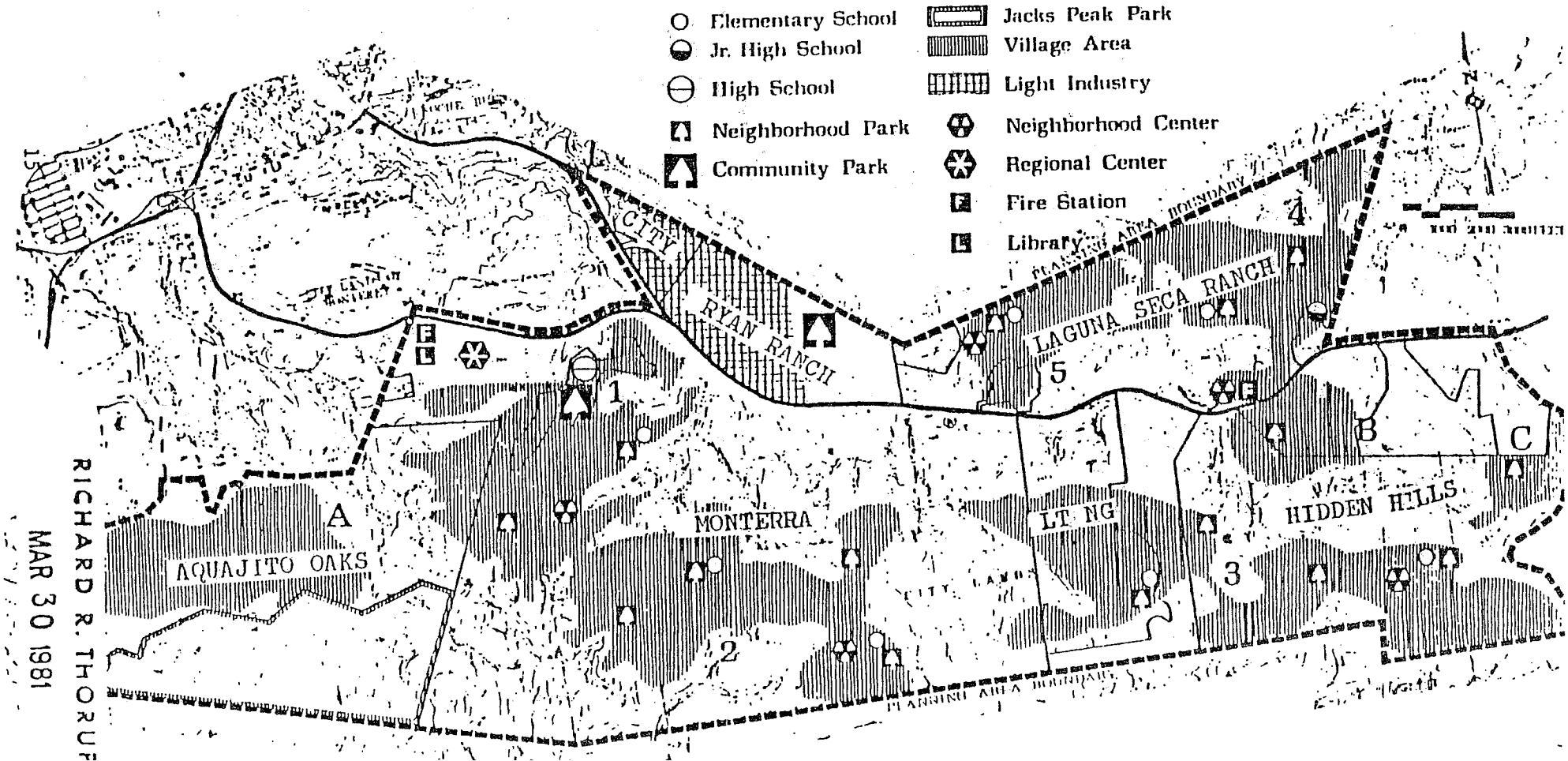


Table 1
Projected Water Use: Laguna Seca Watershed
Year 2000

User	Location	Aquifer			Projected Maximum Use Ac/Ft
		Aromas-Paso-Robles	Santa Margarita	Monterey Shale	
# Toro Water	Hwy 68	X			183
# Laguna Seca Heights	Hwy 68	X			25
# Laguna Seca County Park	Hwy 68		X		100
+ Laguna Seca Ranch	Hwy 68	X 1/8	X 7/8		940
Hidden Hills	Laureles Grade	X 1/6	X 5/6		238
+*Monterra	Hwy 68			X	783
+ Ryan Ranch	Hwy 68		X		180
					2449

* = Groundwater reserves must be developed from Miocene shale for project to become self sufficient.

\+ = Plans for greatly increased expansion now being considered within the planning process.

SFDU rated at .366 Ac/Ft per year per unit
MFDU rated at .313 Ac/Ft per year per unit

Note: Ryan Ranch projects 3712 employees. Logan projects ultimate water use at 150 acre feet per year, but no allowance made for landscaping. Above figure of 180 acre feet provides for 30 acre feet per year.

\# = These lands are located outside of Monterey II.

Note: The parcel owned by Lit Ng is omitted from the above calculations.

Logan states that wells 2, 4, 5 and 7 on Ryan Ranch have a combined pumping capacity of 234 gpm. Long range effects of pumping on aquifer will not be known for many years. Monitoring wells are to be established. If Monterra is to develop more water, it must be found in the Monterey Shale, because of the thin cover of overlying water-bearing sediments existing on the ranch and the unfavorable recharge capability of these sediments. The shale, however, may offer a possibility for production of reasonably good quality groundwater. For example, one Navy well on the north side of the airport produces 300 gpm of water from shale which falls within the acceptable quality limits as set by Public Health. It is conceivable, but doubtful, that this acceptable quality and high yield may extend into a portion of the property.

Operating Wells and Groundwater Production

The Laguna Seca Ranch has three operating wells as of the present date. They are:

1) Main Gate No. 2
2) Paddock No. 1
3) Paddock No. 4.

Since the report of August 9, 1975, Racetrack and Main Gate No. 1, drilled in 1959, were abandoned. The Main Gate well was replaced by the No. 2. The old Racetrack well now is being replaced by the Laguna Seca Golf Course No. 1, which is 130 feet north of the old well. This well will be used to supply the Golf Course. The productive capacity is 758 gpm.

Present production, as determined by PG&E pump tests of March 6, 1981, are as follow:

Main Gate No. 2	258 gpm	
Paddock No. 1	527 gpm	
Paddock No. 4	50 gpm	(estimated; not measured)
TOTAL	835 gpm	

The Main Gate well originally tested 468 gpm in 1977 with a 50 hp motor, and is now being pumped with a 30 hp submersible. A larger pump probably could raise the production to near its original level.

The total estimated production, with the addition of the new Golf Course well, is as follows:

Main Gate No. 2	258	
Paddock No. 1	527	
Paddock No. 4	50	(estimated)
Golf Course	758	
	1593	gpm

Future needs, as the project develops, will require added production from additional wells. Since the subsurface geology is favorable for the production of groundwater over about one third of the property along the Laguna Seca syncline, there should be no difficulty in developing the required amount when the need arises. An additional large storage tank would help to alleviate the need for peak production during periods of hot weather or the temporary breakdown of a particular well. This would be a future consideration as the population buildup increases.

Groundwater in Storage

Groundwater storage in Laguna Seca Ranch is as follows:

Aquifer	Average Saturated Thickness (Ac Ft)	Surface Area (Acres)	Volume (Ac Ft)	Weighted Average Specific Yield (%)	Storage Capacity (Ac Ft)
LAGUNA SECA RANCH					
Aromas-Paso Robles	150	800	120,000	12	14,400
Santa Margarita	150	1000	150,000	15	22,500
TOTAL					36,900
LAGUNA SECA SUBWATERSHED					
Aromas-Paso Robles	300	2000	600,000	12	72,000
Santa Margarita	200	2000	400,000	12	48,000
TOTAL					120,000

Water Levels

The following is a list of available Water Surface Elevations for Laguna Seca Wells:

Main Gate No. 1

10/61	201	
12/10/62	219	Raised 18.0' in 1 year
9/10/64	220	
9/23/75	190	
9/1/76	189.4	
5/2/77	198.3	
10/2/79		
10/10/80		
3/6/81	196.0	Level in Oct/80 10± ft. lower than this figure.

Racetrack		
9/19/60	215	
9/16/64	202	
9/23/75	197.8	
9/1/76	199.4	
10/2/79	200.3	
10/10/80	200.4	Has lowered 1.6' in 16 years.
Paddock No. 1		
10/2/79	180.1	
10/7/80	184	
3/6/81	199.0	Raised 15.0' in 5 months.
Paddock No. 4		
9/23/75	255	
9/1/76	244.2	
10/4/79	234.8	
10/7/80	---	

The Main Gate No. 2 and Paddock No. 1 are perforated in the Santa Margarita sandstone. Although neither well has been measured regularly, the levels appear to have lowered slowly over the past 15 to 20 years. The Racetrack well has a flat hydrograph. The Main Gate No. 2 is located about 50 feet from the abandoned No. 1, so the levels should be comparable. The water table lowered about 30 feet in the late 1960s. Sketchy records since then show a drop of perhaps a foot per year.

The level in the shallow well appears to be dropping. However, there is no record of this well ever having been pulled and cleaned out. It is an old well and, although it has been trouble-free, it should be pulled, a TV survey run, and treated as required. No drillers log is available for this well.

Although the water level readings are scarce and random, still there is occasional evidence that groundwater moves into this district rapidly in good years. For example, the level rose 18 feet between Oct/61 and Oct/62 in the Main Gate No. 1. This year in Paddock No. 1, the level rose 15 feet between Oct. 7, 1980 and March 6, 1981. There is a positive response to wet and dry cycles. It indicates an increase in groundwater storage in the range of 1250± acre-feet in the past five months. The level in the Pratt well, near the main office in Hidden Hills, rose 10 feet in the same period. It would seem that, if the Laguna Seca subwatershed were not receiving water from Calera Canyon and Upper Corral de Tierra, this volume of recharge could not be generated. The 1250 acre-feet of recharge is more than the calculated recharge generated from within the subwatershed. Furthermore, this is recharge from just the Santa Margarita sandstone and does not include any in the Aromas-Paso Robles.

Water Quality

The latest water quality reports from the three operational wells show that in two of the wells the TDS and chloride are slightly higher than the Public Health Drinking Water Limits. The third well, Paddock No. 4, falls well within the limits for both. Only the Main Gate No. 2 is too high in iron, and none are too high in manganese.

longer acceptable, then that particular well would of necessity be abandoned by the owner, or he might choose to cut down the pumping rate and let the well recover. In any event, the safe yield for that well will have been exceeded in that particular aquifer. It then might be necessary for the owner to also produce from the Aromas-Paso Robles, and blend the waters to improve the quality.

The safe yield for the Laguna Seca Ranch wells, or for the subwatershed, has not been reached. At some time in the future it will be. At that point, production in the Santa Margarita will have to be cut back to allow the aquifer to restore itself. It is apparent from the history of the water levels that a substantial amount of water moves into the ranch area during certain winters, as demonstrated by this year's levels.

Table 2
Laguna Seca Projected Water Use, Ultimate Buildout

Residential						
1. L.S. Estates No. 1		SFDU	46	x .366	= 16.8	
2. L.S. Estates No. 2		SFDU	49	x .366	= 17.9	
3. Single family	(5.5 du/Ac)	SFDU	500	x .366	= 183.0	
4. Patio Homes/Townhouses	(9.9 du/Ac)	SFDU	451	x .366	= 165.1	
5. Retirement Homes	(11.75 du/Ac)	MF	712	x .313	= 222.9	
6. MF	(16 du/Ac)	MF	650	x .313	= 203.0	
					791.9	792.0
Horse Ranch - 10 Ac pasture						
Comm Shopping Facilities - 80,000 sq ft						
Resort Hotel - 200 rooms, restrnt, bar & 25,000 sq. ft. shops						
Professional Offices - 51 Ac (19 lots, .6-2.6 Ac)						
East Park					100	100
School						
Community Center (17 Ac, bldgs, reservoir)						
York School						
Fire Station						
Golf Course - 18 holes					250	250
						1142
Less Wastewater Reclamation Plant					100	
Less Yearly Perc. into Golf Course					100	
					200	200
ESTIMATED PROJECTED WATER USE AFTER BUILDOUT, YEAR 2000						940

Effect of Increased Pumping on Contiguous Parcels

Laguna Seca Ranch is fortunate in being in a geologic and geographic position of having ample groundwater reserves and pumping capacity and, at the same time, being located in a position where pumping the groundwater has little or no effect on its neighbors.

Paddock No. 4 is the shallowest of the wells and is developed solely in the Aromas-Paso Robles formation. The water quality in this well is superior in every category. If an additional supply of better water is needed, it can be developed from this shallower aquifer. The pump test indicates that this well does not have the output of the other wells and cannot be expected to produce as much volume per well. Copies of the most recent analyses of the three wells is included in the Appendix.

A 1975 Report on the Laguna Seca County Park water well (16S/1E/5G) lists the TDS at 693 ppm at 270 feet, and 735 ppm at 350 feet. Chloride is 140 ppm. Iron and manganese are both slightly high. This well is perforated only in the Santa Margarita Sandstone. This suggests that better quality water might be found on Laguna Seca Ranch in the Santa Margarita sandstone.

Cross sections A-A' and B-B' (Figure 6) depict quite clearly the close relationship between the shale outcrops, the alluvium and the Santa Margarita sandstone. It is probably that groundwater originating in the shale is being fed into the Santa Margarita. This suggests that wells drilled closer to the axis of the syncline might provide a better quality of groundwater.

Water Use

The water use schedule shows a maximum use at buildout of 940 acre-feet in the year 2000. This figure will probably be subjected to criticism as being both too high and too low. If anything, it is probably too high, as the figures of .366 acre-feet per year for a single family dwelling, and the .322 for a multiple family unit may be too high. It is of interest that the amount for a dwelling unit in Hidden Hills for 1979 and the first six months of 1980 was 0.2 acre feet per dwelling unit per year for 132 units. The metered amount in Laguna Seca Ranch Estates No. 1 (46 homes) was slightly higher in 1980 than the 0.366 acre-feet per year. This is a place with a considerable amount of landscaping, which may account for the higher figure. The evidence seems to suggest that a case may be made that the submitted figure of 940 acre-feet per year may be too high.

Recharge and Safe Yield

In some areas, the amount of recharge and the safe yield are the same. In some areas they are not. For example, in his report on Seaside, Muir points out that the recharge along the coast is 3000 acre-feet and the safe yield is 2600 acre-feet. The remaining 400 acre-feet is the amount needed to prevent salt water intrusion. He also states that safe yield is the rate at which water can be pumped year after year without decreasing groundwater in storage to the point where the pumping lift would not be economically feasible, or where water of poor quality would begin to intrude the reservoir. One must conclude, therefore, that if it were demonstrated that heavy pumping materially lowered the water table to a depth at which further pumping would not be feasible, or because the water quality has deteriorated to a point where it is no

Muir has demonstrated through his cross sections and tests that Seaside does not pump its groundwater from the Santa Margarita formation, which is the primary aquifer on Laguna Seca Ranch. Furthermore, the recharge for Seaside is generated within its own local area.

Laguna Seca County Park produces from the Santa Margarita. It is 3500 feet from the nearest Laguna Seca Ranch well pumping from the same aquifer. When the well first was test pumped on 6/24/75, the water level was 168 feet from the surface. On 10/7/80, the level was 179.6. The last measurement, taken 3.5 months later in the season, would most likely have been 2 to 3 feet higher in June. The actual probable drop is, therefore, about 10 feet in 5 years. This is a normal drop for a comparatively new well in this area.

Hidden Hills wells intercept groundwater before it reaches Laguna Seca. The other neighbors to the east pump from the Aromas-Paso Robles, not the Santa Margarita.

An artesian well of unacceptable quality and modest yield, similar to the Monterra artesian well, was completed on the Lit Ng parcel. There is no possibility of production from either the Santa Margarita or Aromas-Paso Robles on this parcel.

The Ryan Ranch wells are 900 feet downstream from the Main Gate well and 6000 feet from the new Laguna Seca Golf Course well. John Logan states that the water levels in the Ryan Ranch wells are unaffected by Laguna Seca pumping [oral communication]. These low-producing wells are in close proximity to structurally high Monterey shale and near the depositional edge of the Santa Margarita sandstone. The combination of these geologic factors has no doubt resulted in the low productivity of the sand.

The Monterra project lacks Santa Margarita sandstone and is unaffected by Laguna Seca pumping.

GEOLOGY

The geology of the ranch is described herein in the section entitled Geologic Setting. Bowen also describes the geology (Reference 2).

Paso Robles Formation

The bedrock of the property, for the most part, consists of a series of sands, clays, sandy clays and gravels of the Paso Robles formation. These strata occupy about 60% of the hilly surface in an east-west band that stretches from the edge of the alluvium nearly to the northerly property line.

They generally are buff to gray in color and contain pebbly zones of Monterey shale debris. They are mostly soft to moderately indurated. Seven percolation test holes, located in the hilly area in Laguna Seca Ranch No. 2 record from 2 to 3 feet of "peat muck", an unstable, wet, black, mushy type of deposit. There may be other sites not tested where this muck occurs.

Mitigation Measure: Sites within the Ranch Estates No. 2 Project should undertake tests to determine the presence and nature of this unstable material as an aid in selecting a particular homesite and planning the foundation.

No other soil problems appear to be associated with the Paso Robles formation. The area to the east of the Ranch is literally dotted with homes which have been built on this formation. The degree of induration is generally sufficient to support steep-sided gulleys and ravines without caving.

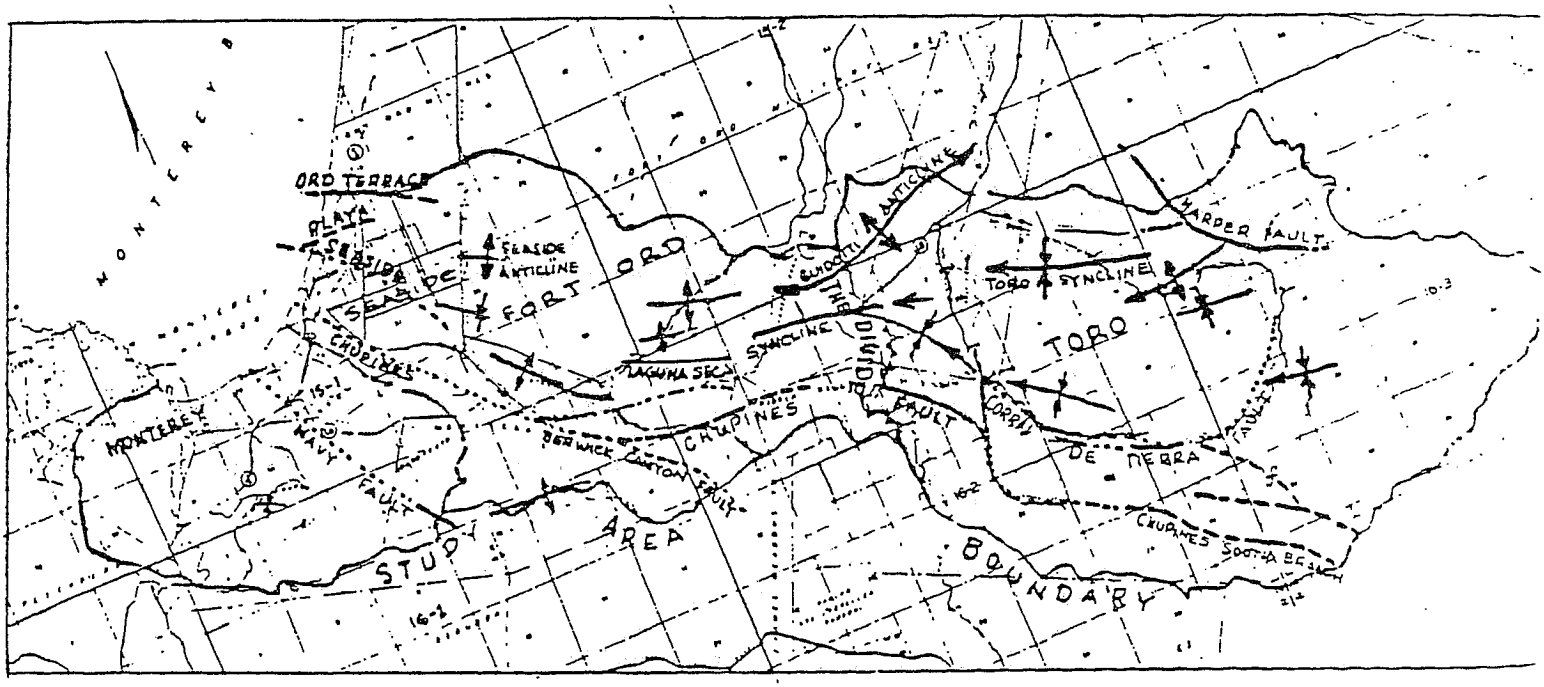
As a precautionary note, it might be well to add that the available soil data from test holes was limited to Laguna Seca Ranch Estates No. 2, there being none available on the rest of the property.

Aromas Formation

Overlying the Paso Robles and occupying a higher position, topographically, than the Paso Robles formation is the red or orange-stained Aromas Formation, consisting of loose to somewhat compact fine-grained, well sorted sand. A thin, hard cemented layer a few feet thick, resembling what is called "rimrock", is present over a part of the outcrop surface.

Mitigation Measure: Care must be exercised to control erosio in excavated areas. Vegetation should be left as is, or scraped areas protected by the replanting of a vegetative cover. Sound engineering practices for building sites will be necessary, and soil tests should be performed for building foundations. Groundwater from possible local perched water should be diverted and controlled by drainage channels.

FIGURE 4



TECTONIC MAP
Seaside to Toro

RICHARD R. THORUP
MAR 30 1981

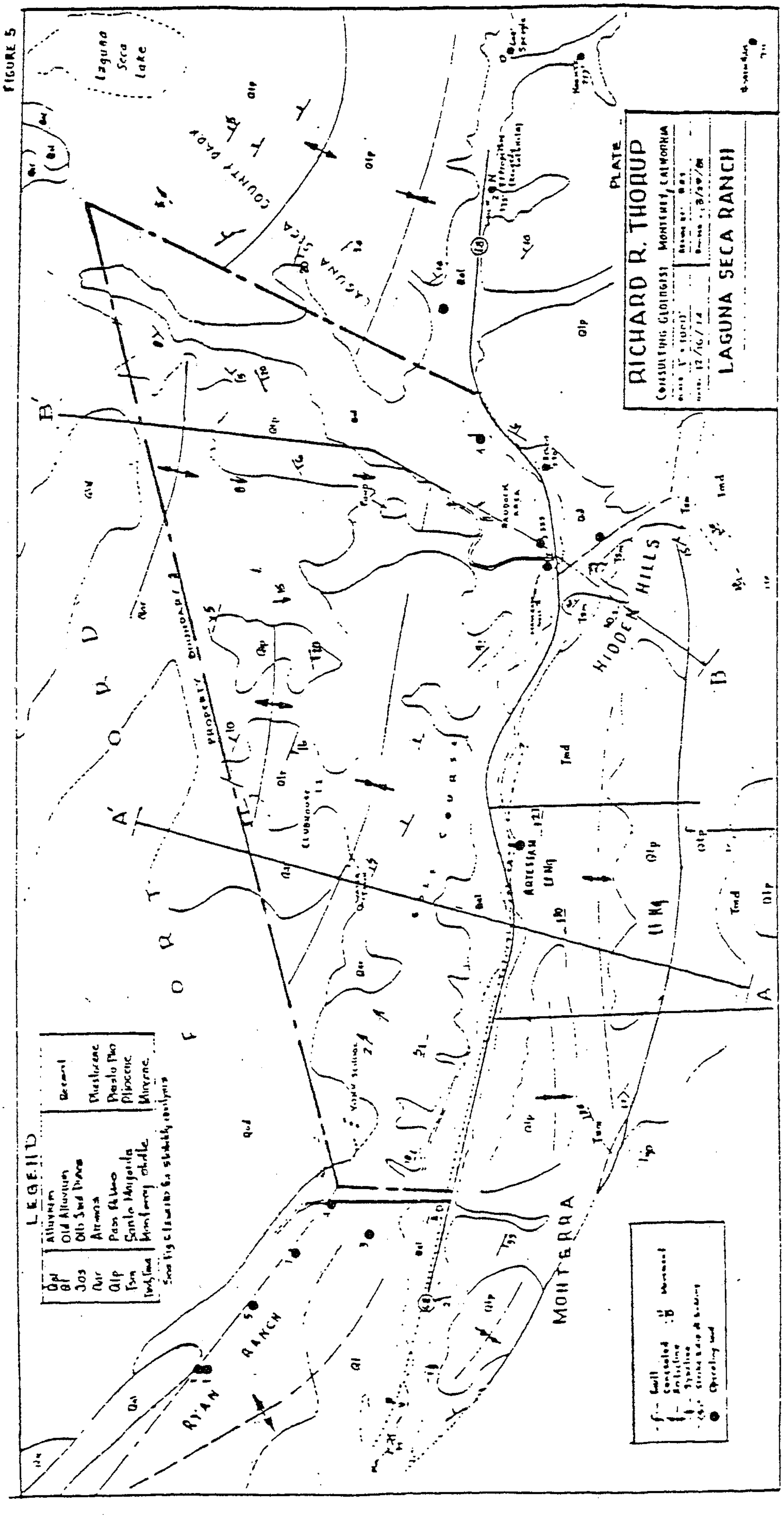
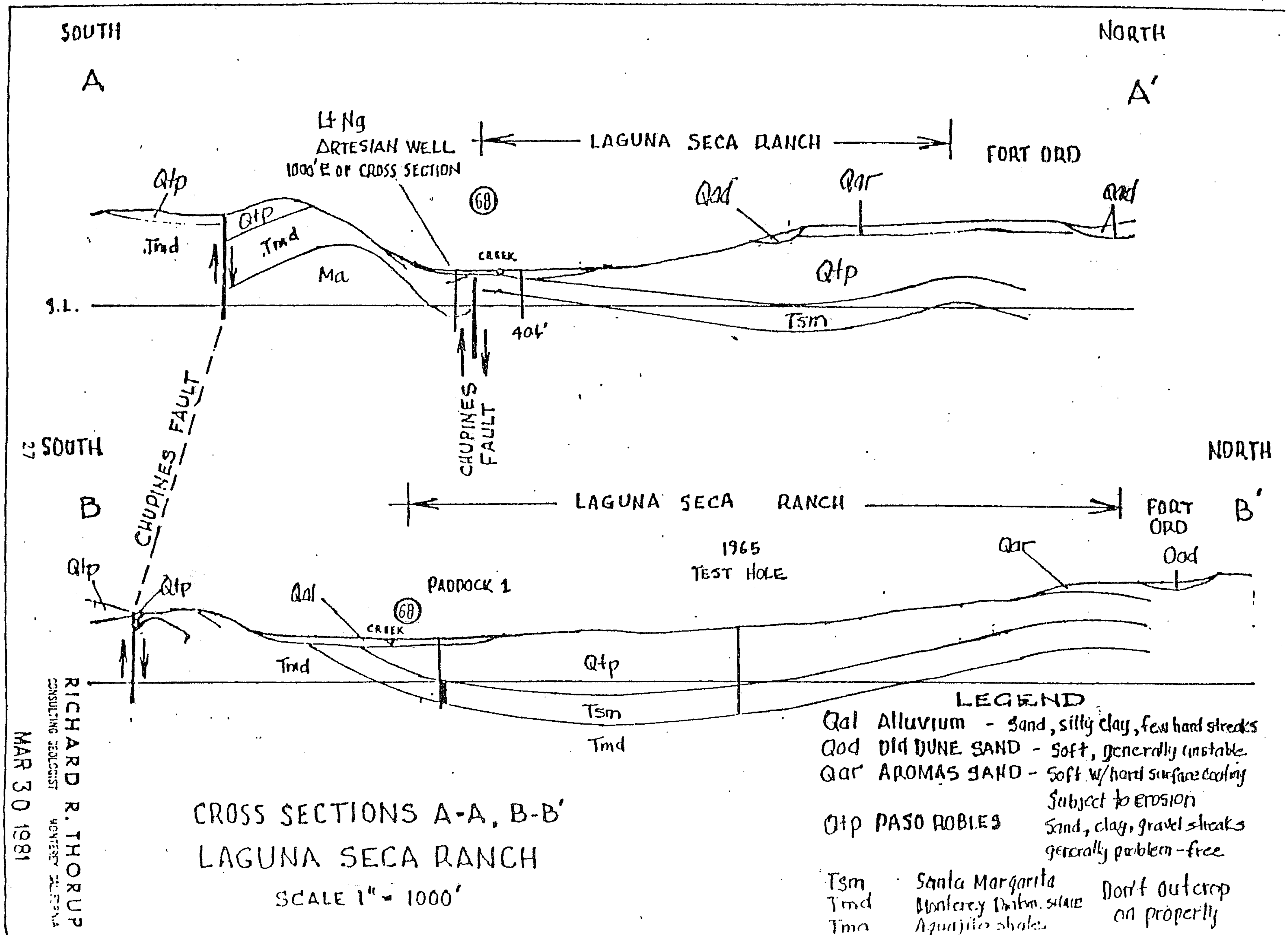


FIGURE 5
Laguna Seca Lake
COUNTY PARK
LAGUNA SECA
PROPERTY BOUNDARY
FORT ORD
HIDDEN HILLS
MONTERRA
RYAN RANCH
CLUBHOUSE
ARTESIAN
LEGEND
Alluvium
Old Alluvium
Aromas
Paso Robles
Santa Margarita
Monterey shale
Recent
Pleistocene
Plio-Pleistocene
Pliocene
Miocene
PLATE
RICHARD R. THORUP
CONSULTING GEOLOGIST
MONTEREY, CALIFORNIA
LAGUNA SECA RANCH


SOUTH
NORTH
A
A'
Lt Ng
ARTESIAN WELL
1000'E OF CROSS SECTION
LAGUNA SECA RANCH
FORT ORD
68
Qtp
Qad
Qar
Tmd
Ma
CREEK
S.L.
40'
Qtp
Tsm
CHUPINES FAULT
CHUPINES FAULT
SOUTH
NORTH
B
B'
LAGUNA SECA RANCH
FORT ORD
1965
TEST HOLE
Qar
Qod
Qtp
Qal
PADDOCK 1
68
CREEK
Tmd
Qtp
Tsm
Tmd
LEGEND
Qal Alluvium - Sand, silty clay, few hard streaks
Qod Old DUNE SAND - Soft, generally unstable
Qar AROMAS SAND - Soft w/hard surface cooling
Subject to erosion
Qtp PASO ROBLES Sand, clay, gravel streaks
generally problem-free
Tsm Santa Margarita
Tmd Monterey Diatom. shale
Tma Aguajito shale
Don't outcrop on property
CROSS SECTIONS A-A, B-B'
LAGUNA SECA RANCH
SCALE 1" = 1000'
RICHARD R. THORUP
CONSULTING GEOLOGIST MONTEREY CALIFORNIA
MAR 30 1981

Old Dune Sand

Overlying the Aromas-Paso Robles formation are a couple of areas of dune sand consisting of loose, fine sand. Foundations for building sites must be tested if located in this material. Precautions against erosion must be applied.

Alluvium

Alluvium covers the main valley floor and extends up into the main ravines. The alluvium is 30-50 feet thick and consists of sand, gravel, silt and clay, a few beds of which are fairly indurated. Vertical cliffs along Arroyo del Rey exhibit undercutting in soft sand lying below a hard, sandy clay layer. Two of these undercut areas are growing and are beginning to encroach upon the Golf Course.

Mitigation Measure: Stop the headward erosion or take the chance of losing part of the Golf Course.

Parts of the alluvial area contain loose sand in the upper few feet which, under unusual conditions of a heavy winter and strong shock, may possibly be subject to liquefaction. Tests should be made to determine the danger factor, if any.

The Dump Area

It has been stated [13] that, from a foundation standpoint, the dump area is unsuitable for support of even a light structure because total settlements of 15% of the dump thickness (up to 150 feet) can be expected. Even roads across this area will be subject to settlement and recurring surface problems. Special foundation investigations should be undertaken should building on the dump area be seriously considered.

No active or inactive landslides of mappable size occur on the property.

No faulting can be observed within the property boundaries. However, strong shaking from an earthquake of 8.0 intensity probably will be experienced during the lifetime of the site. No surface ruptures should be expected, but lurch cracking and perhaps lateral spreading of loose soils might occur.

Mitigation Measure: The building codes are designed to mitigate the potential shaking due to a large earthquake.

Summary

Business and Office Park: No problems, except erosion must be controlled along Arroyo del Rey.

Laguna Seca Ranch Estates No. 2:

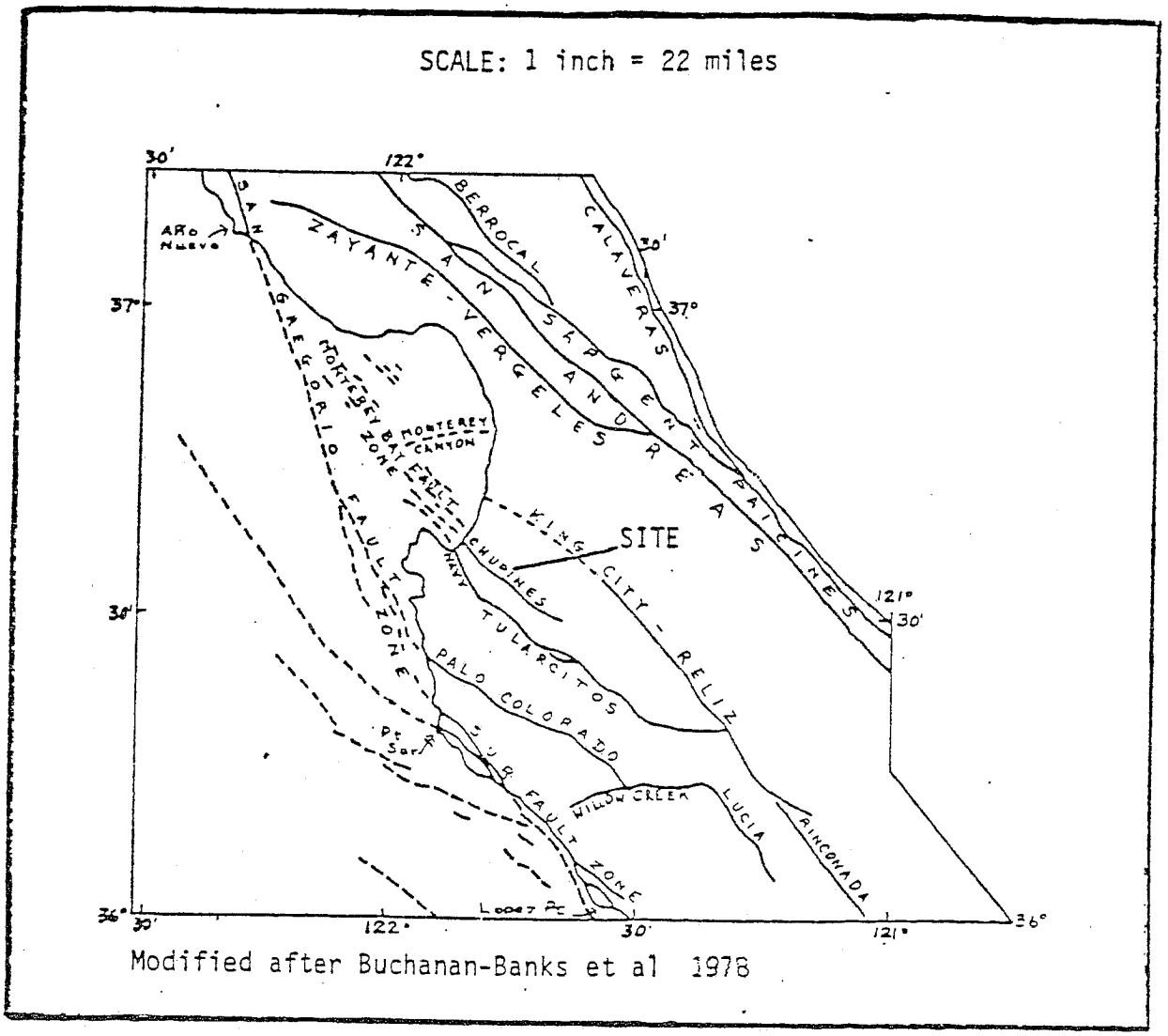
A. Southerly half contains unstable "peat muck" in 5 widely spaced locations at shallow depth. All building foundations should be tested for this material. If found, the building specifications should provide for its removal or satisfactory containment.

B. The northerly half contains extremely porous soft sand which will erode when the vegetation is removed or extreme cuts are made. This habitat becomes fragile when stripped of vegetation. Replanting should be undertaken to control erosion. Fifty foot setbacks should be established around the steep incised eroded ravines. Controlled channeling should be established for surface drainage, ruts and small gullies.

Old Dump Area: This has been termed unsafe for structures and even roads in Reference 14 because of predicted slumping over bodies of compacted waste.

S-10, M-1, M-2, S-9, S-7, U-7: Setbacks of 50 feet for building sites along erosional ravines. Protection against erosion after removal of vegetation.

S-3, U4, U2, S2, C-1, S-1, C2, U1, School Site: Should be tested for possibilities of liquefaction.



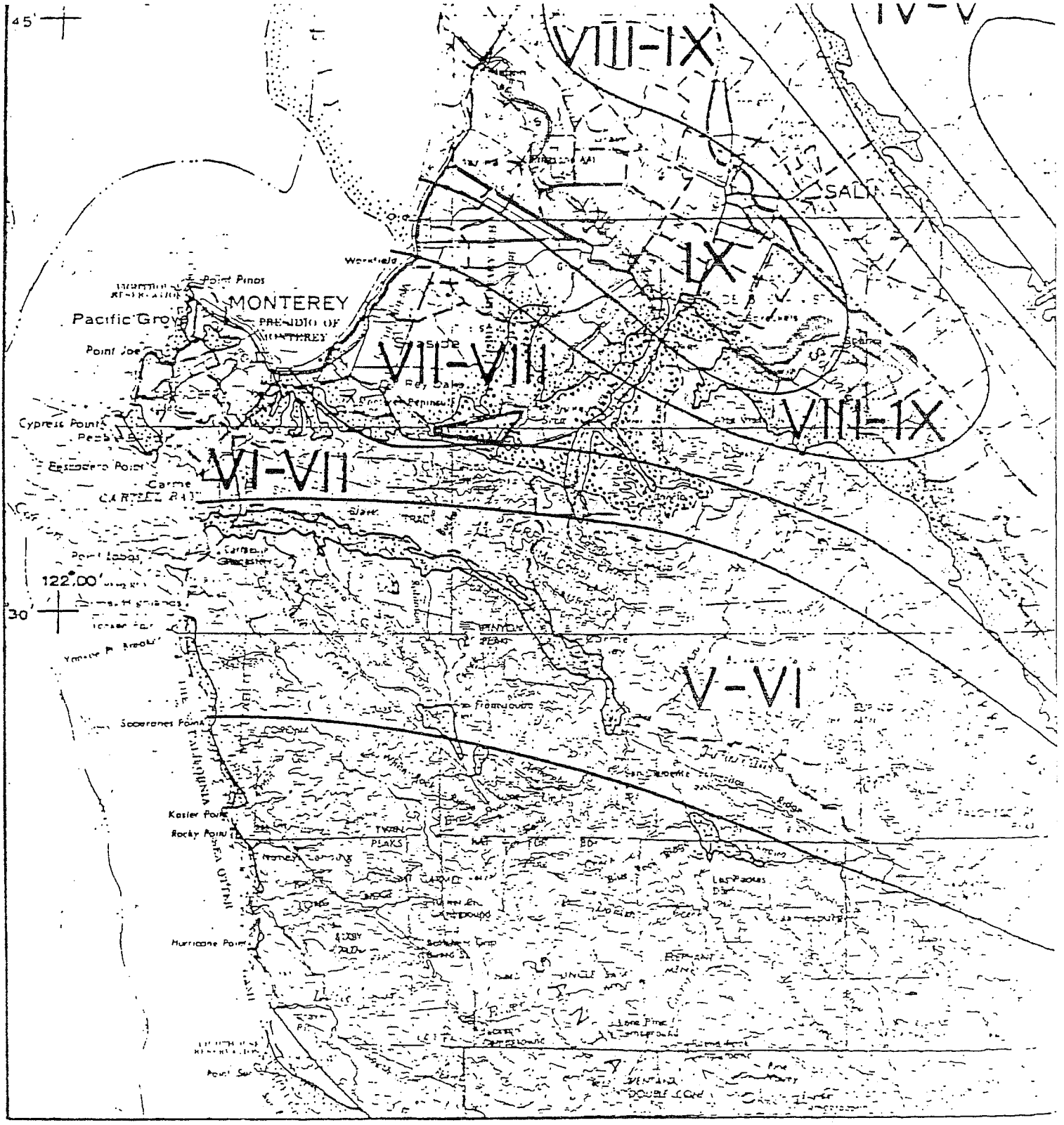
REGIONAL FAULT ZONES

MONTEREY BAY AND VICINITY

MONTEREY COUNTY, CALIFORNIA

RICHARD R. THORUP

MAR 30 1981



McCrory et al 1977

Scale: 1 inch = 4 miles

EARTHQUAKE INTENSITY ZONING MAP

RICHARD R. THORUP
MAR 30 1981

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APPENDICES

Appendix 1

Chemical Analysis of Laguna Seca Ranch Wells, dated 9/19/80

Pump Test Main Gate No. 2, March 5, 1981

Pump Test Paddock No. 1, March 5, 1981

Appendix 2

Ground Shaking Intensity Scales

Rossi-Forel Ground Shaking Intensity Scale
and
Modified Mercali Scale of Earthquake Shock Intensities

KINGSLEY PACKER

408 724 5422
408 724-4427

SOIL CONTROL LAB

1234 HIGHWAY 1
WATSONVILLE
CALIFORNIA
95076
USA

penetrates your problems!

3H46229

Bishop Water Co.
P.O. Box 308
Monterey, CA 93940

Aug. 29, 1980

CERTIFIED ANALYTICAL REPORT

MATERIAL: 3 water samples received Aug. 18, 1980
IDENTIFICATION: Paddock Wells #1 & #4 + Main gate well
REPORT: Quantitative chemical analysis is as follows expressed as milligrams per liter where not otherwise stated:

	#1	#4	MAIN GATE	*PUBLIC HEALTH DRINKING WATER LIMITS*[1]
pH value (units) :	6.63	7.17	7.21	*10.6*
Conductivity(micromhos/cm) :	1585	855	1610	*900*
Carbonate Alk. (as $CaCO_3$) :	0	0	0	*120*
Bicarbonate Alk.(as $CaCO_3$) :	104	101	214	-
Total Alkalinity(as $CaCO_3$) :	104	101	214	-
Total Hardness (as $CaCO_3$) :	418	161	508	-
Total Dissolved Solids	1076	578	1093	*500*
Nitrate (as NO_3) :	27	0.3	14.7	*45*
Chloride (Cl):	271	194	310	*250*
Sulfate (SO_4):	400	29	160	*250*
Fluoride (F):	0.5	0.2	0.6	*1.0*
Calcium (Ca):	81	36	143	-
Magnesium (Mg):	52	17	37	-
Potassium (K):	6.2	5.8	6.0	-
Sodium (Na):	195	128	165	-
Total Iron(Fe):	0.11	0.01*	0.05	*0.3*
Manganese (Mn):	0.03	0.01*	0.04	*0.05*

*less than figure stated

[1] *California Administrative Code; Title 22*

The undersigned certifies that the above is a true and accurate report of the findings of this laboratory.

COAST VALLEY Division — MONTEREY Office

Customer Account # KBM5144101 · Location = 07911847946099
Meter # 2T1933
Motor GENERAL ELECTRIC HP 50.0 Volts 460
Rated RPM 1765 Serial # ERJ502323
Pump PEERLESS Type TURBINE

Near BISHOP WTR : Test Date 03/05/81

Below are the results of the recent test on your pumping
. Please let us know if you have any questions or if we can be of
rther service.

PGandE

BISHOP WTR

BOX 308

MONTEREY CA 93940

Remarks:

- MOTOR LOAD IS 115% OF FULL LOAD CAPACITY.
- THE OVERALL EFFICIENCY OF THIS PLANT IS LOW UNDER EXISTING WATER AND OPERATING CONDITIONS.

Number of Copies:
Customer 2
Office 1

Paddock No.1

Well Location- MAIN GATE TURBINE WELL
Customer Plant Identification- 094675
Test Engineer- ANTHONY VARGAS, BRUCE CALL

TEST 1

		* Min. (*=24 hrs.
Shutdown Time		
Standing Water Level Below	CENTER LINE OF DISCHARGE PIPE	152.1Ft.
Draw Down from Standing to Pumping Level		69.0Ft.
Pumping Water Level Below	CENTER LINE OF DISCHARGE PIPE	221.1Ft.
Discharge Level Above	CENTER LINE OF DISCHARGE PIPE	2.3Ft.
Discharge Pressure Measured at Gauge		1P.S.I.
TOTAL LIFT (Water to Water)		223.4Ft.
WATER PUMPED		527G.P.M.
Yield of Well (G.P.M. per foot draw down)		7.6G.P.M./Ft.
Water Pumped in 24 Hours		2.33 ACRE FT.
HORSEPOWER INPUT TO MOTOR		64.3H.P.
Kilowatt Input to Motor		48.0KW.
KILOWATT HOURS PER ACRE FT.OF WATER PUMPED		496.65Kwh/ ACRE F
OVERALL PLANT EFFICIENCY		46%

GET THE MOST GALLONS FOR YOUR MONEY WITH EFFICIENT PUMPS!

PG and E

PUMP TEST REPORT

03/1

COAST VALLEYS Division — MONTEREY Office

[illegible] BISHOP WTR : Test Date 03/05/81

Below are the results of the recent test on your pumping unit. Please let us know if you have any questions or if we can be of further service.

PGandE

BISHOP WTR

BOX 308

MONTEREY CA 93940

[illegible] KBM5144001 [illegible] 07411844046100

[illegible] 79442

[illegible] NO NAME TAG [illegible] 30.0 Volts: ___

[illegible]

Pump: NO NAME TAG [illegible] SUBMERSIBLE ___

Remarks:

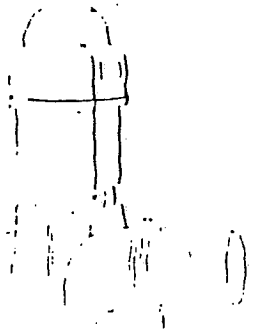
- MOTOR LOAD IS 118% OF FULL LOAD CAPACITY.
- THE OVERALL EFFICIENCY OF THIS PLANT IS LOW UNDER EXISTING WATER AND OPERATING CONDITIONS.
- THE TEST RESULTS MAY BE IMPAIRED DUE TO A POOR HYDRAULIC TEST SECTION.

[illegible]

[illegible]

Number of Copies:
Customer 2
Office 1

[illegible] Location- MAIN GATE DOMESTIC WELL
[illegible]stomer Plant Identification- 091550
[illegible]st Engineer- ANTHONY VARGAS, BRUCE CALL



	TEST 1
Shutdown Time	* Min. (* = 24 hrs.
Standing Water Level Below CENTER LINE OF DISCHARGE PIPE	146.8Ft.
Draw Down from Standing to Pumping Level	25.4Ft.
Pumping Water Level Below CENTER LINE OF DISCHARGE PIPE	172.2Ft.
Discharge Level Above CENTER LINE OF DISCHARGE PIPE	25.4Ft.
Discharge Pressure Measured at Gauge	11P.S.I.
TOTAL LIFT (Water to Water)	197.6Ft.
WATER PUMPED	258G P.M.
Yield of Well (G.P.M. per foot draw down)	10.1G.P.M./Ft.
Water Pumped in 24 Hours	1.14 ACRE FT.
HORSEPOWER INPUT TO MOTOR	38.6H P.
Kilowatt Input to Motor	28.8KW.
KILOWATT HOURS PER ACRE FT OF WATER PUMPED	606.23KWh/ ACRE F
OVERALL PLANT EFFICIENCY	33 %

GET THE MOST GALLONS FOR YOUR MONEY WITH EFFICIENT PUMPS!

The first scale developed to indicate the varying intensities of earthquake shock was developed in Europe in the 1880's by De Rossi of Italy and Forel in Switzerland. The Rossi-Forel Scale, with values from I to X, was widely used for about two decades as a means of investigating earthquakes and comparing the effects of various shocks throughout the world. The scale's main defect was that it lumped a great deal of major damage under classification X. This was fine during the early stages of technology, but as the science of seismology progressed, the need for a more refined scale was greatly increased.

In 1902, the Italian seismologist Mercalli set up a new scale, which was based on a I to XII range and provided for more refined analysis of major damage. The Mercalli Scale was modified in 1931 by two American seismologists, Harry O. Wood and Frank Neumann, to take into account modern features such as tall buildings, motor cars and trucks, and underground water pipes. It is this Modified Mercalli Scale (frequently abbreviated to MM) that is still used today. In the version printed here, the language has been slightly changed, but the basic ideas are the same as those used by professional seismologists to rate earthquakes.

The varying intensity grades of an earthquake frequently are expressed in an isoseismal map, with roughly circular lines drawn through areas of equal intensity. Several such maps appear in the following chapters.

All intensity figures used in this book are MM. The Rossi Forel numbers given to earthquakes before 1900 have been adjusted to fit the more modern Mercalli system.

I **Not felt by people, except under especially favorable circumstances. However, dizziness or nausea may be experienced.**
Sometimes birds and animals are uneasy or disturbed. Trees, structures, liquids, bodies of water may sway gently, and doors may swing very slowly.

II **Felt indoors by a few people, especially on upper floors of multistory buildings, and by sensitive or nervous persons.**
As in Grade I, birds and animals are disturbed, and trees, structures, liquids and bodies of water may sway. Hanging objects swing, especially if they are delicately suspended.

III **Felt indoors by several people, usually as a rapid vibration that may not be recognized as an earthquake at first. Vibration is similar to that due to passing of a light, or lightly loaded trucks, or heavy trucks some distance away. Duration may be estimated in some cases.**
Movements may be appreciable on upper levels of tall structures. Standing motor cars may rock slightly.

IV **Felt indoors by many, outdoors by few. Awakens a few individuals, particularly light sleepers, but frightens no one except those apprehensive from previous experience. Vibration like that due to passing of heavy, or heavily loaded trucks. Sensation like a heavy body striking building, or the falling of heavy objects inside.**
Dishes, windows and doors rattle, glassware and crockery clink and clash. Walls and house frame creak, especially if intensity is in the upper range of this grade. Hanging objects often swing. Liquids in open vessels are disturbed slightly. Stationary automobiles rock noticeably.

V **Felt indoors by practically everyone, outdoors by most people. Direction can often be estimated by those outdoors. Awakens many, or most sleepers. Frightens a few people, with slight excitement; some persons run outdoors.**
Buildings tremble throughout. Dishes and glassware break to some extent. Windows crack in some cases, but not generally. Vases and small or unstable objects overturn in many instances, and a few fall. Hanging objects and doors swing generally or considerably. Pictures knock against walls, or swing out of place. Doors and shutters open or close abruptly. Pendulum clocks stop, or run fast or slow. Small objects move, and furnishings may shift to a slight extent. Small amounts of liquids spill from well-filled open containers. Trees and bushes shake slightly.

VI **Felt by everyone, indoors and outdoors. Awakens all sleepers. Frightens many people; general excitement, and some persons run outdoors.**
Persons move unsteadily. Trees and bushes shake slightly to moderately. Liquids are set in strong motion. Small bells in churches and schools ring. Poorly built buildings may be damaged. Plaster falls in small amounts. Other plaster cracks somewhat. Many dishes and glasses, and a few windows, break. Knick-knacks, books and pictures fall. Furniture overturns in many instances. Heavy furnishings move.

VII **Frightens everyone. General alarm, and everyone runs outdoors.**
People find it difficult to stand. Persons driving cars notice shaking. Trees and bushes shake moderately to strongly. Waves form on ponds, lakes and streams. Water is muddied. Gravel or sand stream banks cave in. Large church bells ring. Suspended objects quiver. Damage is negligible in buildings of good design and construction; slight to moderate in well built ordinary buildings; considerable in poorly built or badly designed buildings, adobe houses, old walls (especially where laid up without mortar), spires, etc. Plaster and some stucco fall. Many windows and some furniture break. Loosened brickwork and tiles shake down. Weak chimneys break at the roofline. Cornices fall from towers and high buildings. Bricks and stones are dislodged. Heavy furniture overturns. Concrete irrigation ditches are considerably damaged.

VIII **General fright, and alarm approaches panic.**
Persons driving cars are disturbed. Trees shake strongly, and branches and trunks break off (especially palm trees). Sand and mud erupts in small amounts. Flow of springs and wells is temporarily and sometimes permanently changed. Dry wells renew flow. Temperature of spring and well waters varies. Damage slight in brick structures built especially to withstand earthquakes, considerable in ordinary substantial buildings, with some partial collapse, heavy in some wooden houses, with some tumbling down. Panel walls break away in frame structures. Decayed pilings break off. Walls fall. Solid stone walls crack and break seriously. Wet ground and steep slopes crack to some extent. Chimneys, columns, monuments and factory stacks and towers twist and fall. Very heavy furniture moves conspicuously or overturns.

IX **Panic is general.**
Ground cracks conspicuously. Damage is considerable in masonry structures built especially to withstand earthquakes; great in other masonry buildings—some collapse in large part. Some wood frame houses built especially to withstand earthquakes are thrown out of plumb, others are shifted wholly off foundations. Reservoirs are seriously damaged, and underground pipes sometimes break.

X **Panic is general.**
Ground, especially when loose and wet, cracks up to widths of several inches; fissures up to a yard in width run parallel to canal and stream banks. Landsliding is considerable from river banks and steep coasts. Sand and mud shifts horizontally on beaches and flat land. Water level changes in wells. Water is thrown on banks of canals, lakes, rivers, etc. Dams, dikes, embankments are seriously damaged. Well-built wooden structures and bridges are severely damaged, and some collapse. Dangerous cracks develop in excellent brick walls. Most masonry and frame structures, and their foundations, are destroyed. Railroad rails bend slightly. Pipe lines buried in earth tear apart or are crushed endwise. Open cracks and broad wavy folds open in cement pavements and asphalt road surfaces.

XI **Panic is general.**
Disturbances in ground are many and widespread, varying with the ground material. Broad fissures, earth slumps, and land slips develop in soft, wet ground. Water charged with sand and mud is ejected in large amounts. Sea waves of significant magnitude may develop. Damage is severe to wood frame structures, especially near shock centers, great to dams, dikes and embankments, even at long distances. Few if any masonry structures remain standing. Supporting piers or pillars of large, well-built bridges are wrecked. Wooden bridges that "give" are less affected. Railroad rails bend greatly, and some thrust endwise. Pipe lines buried in earth are put completely out of service.

XII **Panic is general.**
Damage is total, and practically all works of construction are damaged greatly or destroyed. Disturbances in the ground are great and varied, and numerous shearing cracks develop. Landslides, rock falls, and slumps in river banks are numerous and extensive. Large rock masses are wrenched loose and torn off. Fault slips develop in firm rock, and horizontal and vertical offset displacements are notable. Water channels, both surface and underground, are disturbed and modified greatly. Lakes are dammed, new waterfalls are produced, rivers are deflected, etc. Surface waves are seen on ground surfaces. Lines of sight and level are distorted. Objects are thrown upward into the air.

ROSSI-FOREL
GROUND SHAKING INTENSITY SCALE
(SCALE SIMPLIFIED 1906)

I	PERCEPTIBLE, only by delicate instruments
II	VERY SLIGHT, shocks noticed by few persons at rest
III	SLIGHT SHOCK, of which duration and direction were noted by a number of persons
IV	MODERATE SHOCK, reported by persons in motion; shaking movable objects; cracking of ceiling
V	SMART SHOCK, generally felt; furniture; some clocks stopped; some sleepers awakened
VI	SEVERE SHOCK, general awakening of sleepers; stopping of clocks; some window glass broken
VII	VIOLENT SHOCK, overturning of loose objects; falling of plaster; striking of church bells; some chimneys fall
VIII	Fall of chimneys; cracks in the walls of buildings
IX	Partial or total destruction of some buildings
X	Great disasters; overturning of rocks, fissures in surface of earth; mountain slides

(From Lawson and others, 1908)

Appendix D

Vegetative and Wildlife

Species List

SPECIES LIST - LAGUNA SECA RANCH

Foothill Woodland Community

Plants:
Cerastium arvense - chickweed
Dryopteris arguta - deer fern
Elymus condensatus - ryegrass
Galium aparine - bedstraw
Geranium molle - geranium
Lathyrus sp. - wild sweet pea
Marah fabacea - wild cucumber
Mimulus aurantiacus - sticky monkey flower
Montia perfoliata - miners' lettuce
Pteridium aquilinum - bracken
Quercus agrifolia - coast live oak DOMINANT
Rhamnus californica - coffee berry
Rhus diversiloba - poison oak
Ribes speciosum - fuchsia flowered gooseberry
Rubus vitifolia - California blackberry
Salix lasiolepis - arroyo willow
Satureja Douglasii - yerba buena
Silybum marianum - milk thistle
Stachys bullata - wood mint
Symphoricarpos mollis - snowberry
exotic grasses in openings
additional annuals will be apparent as the season progresses

Animals:
abundant evidence of black-tailed deer, racoons, valley quail and typical perching birds of the oak canopy.

No RARE and ENDANGERED or RARE plants or animals were observed and none are expected to be present in this community.

Coastal Phase Chaparral Community

Plants:
Adenostoma fasciculatum - chamise LOCAL DOMINANT
* Arctostaphylos Hookeri - Hooker manzanita
** Arctostaphylos montereyensis - Monterey manzanita
** Arctostaphylos pumila - sandmat manzanita LOCAL DOMINANT
Arctostaphylos tomentosa - woolyleaf manzanita COMMON
Artemesia californica - California sagebrush
Baccharis pilularis - coyote bush
Ceanothus dentatus - dwarf ceanothus
* Ceanothus rigidus - Monterey ceanothus COMMON
Garrya elliptica - silk tassel
Helianthemum scoparium - rock rose
Heteromeles arbutifolia - toyon
add Eriophyllum confertiflorum - yellow yarrow
continued on the next page

Horkelia sp. - horkelia
Lotus scoparius - deerweed
Mimulus aurantiacus - sticky monkey flower
Quercus agrifolia - coast live oak SCRUB FORM
Rhus diversiloba - poison oak
Salvia melifera - black sage COMMON

Animals:
Black-tailed deer, valley quail, brush rabbits, wren tits, California thrashers and scrub jays were observed.

** RARE AND ENDANGERED (C.N.P.S. List)
* RARE (C.N.P.S. List)

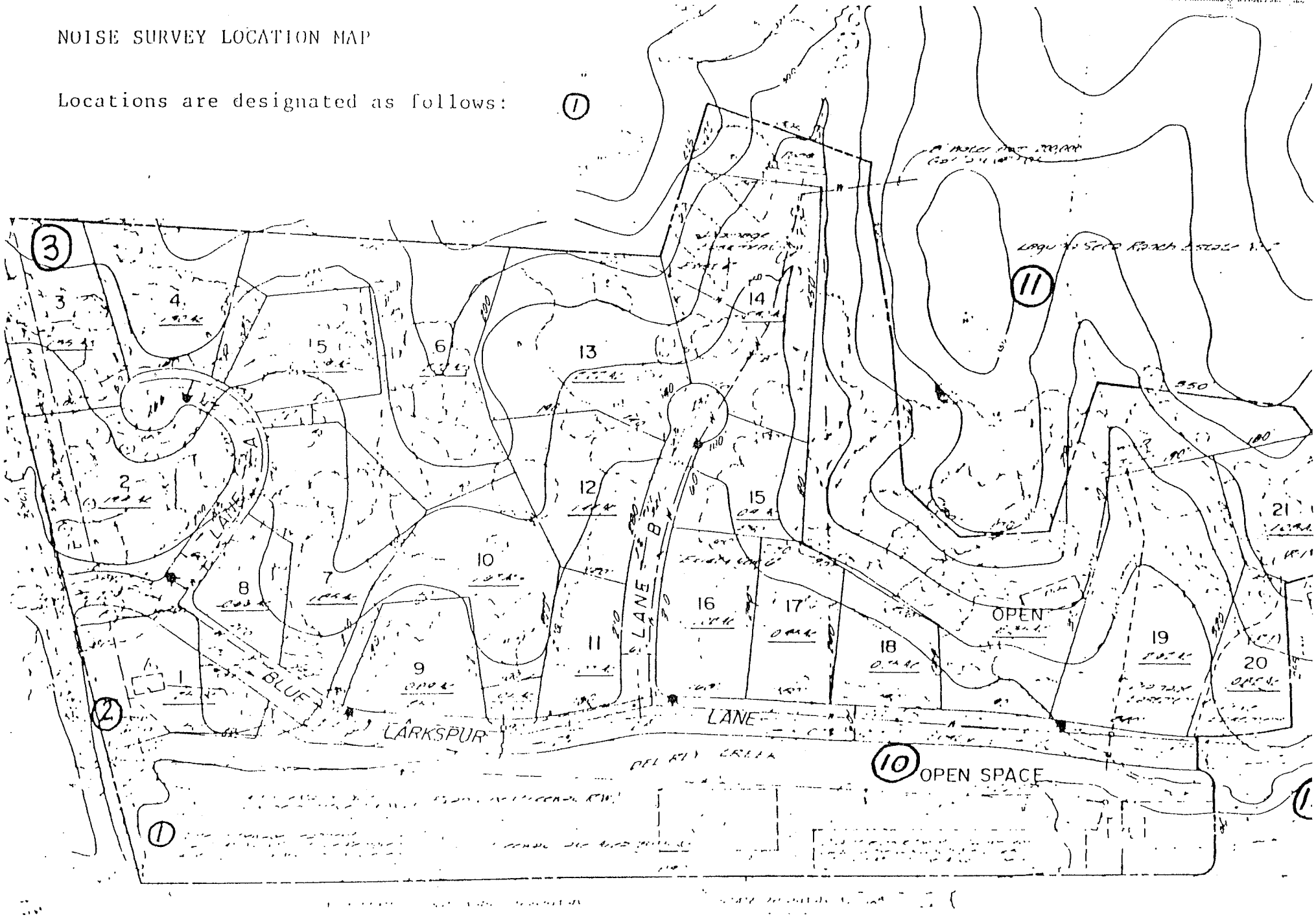
No additional RARE AND ENDANGERED or RARE plants or animals were observed or are expected to be present in this community.

Appendix E

Noise Survey Location Map

NOISE SURVEY LOCATION MAP

Locations are designated as follows:



Appendix F

Wastewater Reclamation System

L. HOOPER
Licensed Civil Engineer

M. VAN ZANDER
Licensed Civil Engineer
and Land Surveyor

JON M. NERVA
Licensed Civil Engineer

BESTOR ENGINEERS, INC.
CIVIL ENGINEERING - SURVEYING - LAND PLANNING
400 CAMINO AGUAJITO, MONTEREY, CALIFORNIA 93940
TELEPHONE (408) 373-2941 FROM SALINAS 424-7681

22 May 1980

MR. WILLIAM D. CURTIS
District Attorney
P. O. Box 1369
Salinas, California 93901

Dear Mr. Curtis:

This letter will confirm information given you verbally on 21 May 1980. We have been authorized by Bishop, McIntosh & McIntosh to perform all necessary engineering and to make all necessary applications to permit the construction of a wastewater reclamation system for the westerly end of their Laguna Seca Ranch.

This letter will set forth the basic content of that system and will establish a schedule for its completion.

1. The purpose of the system is to provide wastewater treatment for the following developments:

a. Laguna Seca Ranch Estates, the 46 lots (45 present homes plus one future home) presently served by master septic tanks and drainfields under the ownership of County Service Area #10. This system will replace the tanks and drainfields which may not continue to function during wet weather next year.

b. Laguna Seca Ranch Estates No. 2, the 49 recently approved large lots, which are approved individual septic tanks, but which will have a sewage collection system.

c. The York School, which is presently on septic tanks.

d. Possible future development on the 50 acres west of Laguna Seca Ranch Estates and south of York School, where an Office Park has been proposed.

2. The proposed system is basically as was outlined in our letter to the Monterey County Health Department on 13 December 1979 (copy enclosed) consisting of:

a. An extended collector sewer system to serve the above listed four areas, consisting of approximately 2000 lineal feet of 6 inch sewer mains, 3600 lineal feet of 10 inch or larger sewer mains, and appurtenant manholes. About half is in the golf course, the remainder in the "Office Park" area.

b. A secondary sewage treatment plant with adequate capacity to treat all anticipated wastewater from the four areas upon total buildout, probably 50,000 gallons per day. This will consist of a "package plant", pre-engineered by the manufacturer to include all facilities necessary to provide the level of treatment required by the Water Quality Control Board and the County Health Department. Originally, we had proposed an extended aeration plant, with lift station, grinder, aeration chamber, clarifier, sand filtration, and chlorination. The staff of the Water Quality Control Board has suggested that the process include also flocculation and coagulation, so that a different type system may be required. This will be cleared up in conference with the reviewing agencies. The plant will occupy about 4000 to 5000 square feet near York Road, north of Del Rey Creek.

c. A booster pump station and force main to deliver the treated wastewater to a holding pond on the Laguna Seca Golf Course. The force main will be approximately 6000 feet in length, either 4 inch or 6 inch pipe, depending upon economics of construction and operation costs.

d. The storage pond on the golf course will be approximately 18 acre feet in size (6,000,000 gallons), to provide for total detention during a four month extended wet period. It will occupy about two acres at a total maximum depth of about 12 feet, located south of clubhouse.

e. The golf course irrigation system will be modified to allow blending of reclaimed wastewater with the present well water, at an ultimate average rate of 25 to 30% reclaimed water, using the existing pumps and a flow controlled valve system.

3. The proposed schedule for this system is:

a. Design conferences with Water Quality Control Board, County and State Health, County Public Works (operators of CSA #10) and City of Monterey Public Works (ultimate operators after annexation to the City) June 3 -13.

b. Formal applications to Board of Supervisors to expand CSA #10 and to Water Quality Control Board for amended discharge requirements on June 18; for hearing by Board of Supervisors on June 24; hearing by Water Quality Control Board on 8 August.

c. Plant preliminary design completed, placement of order to manufacturer - 27 June.

d. Plant final design (four weeks) shop drawing approval - 8 August

e. Plant fabrication completed (12 weeks) site delivery - 7 November

f. Installation completed, plant start-up - 26 November.

g. Collector sewer design complete, submitted for review - 27 June.

h. Collector construction (six weeks required) completed - 10 October.

i. force main and pond design complete, submitted for review - 3

j. Pond construction (three weeks) - completed 3 October.

k. Force main and irrigation system conversion construction (three week required) completed - 30 October.

l. Plant appurtenance construction (foundations, control house, electrical supply and controls, pump stations, etc., six weeks required) completed - 14 November.

The most critical dates in the above schedule are the Water Quality Control Board approval (8 August) which must precede actual approval of shop drawings for plant fabrication or the issuance of contracts for any onsite construction and the completion of the earthwork and trenching (30 October) which should precede onset of rainy weather. The plant installation is not quite so critically affected by wet weather, but any delay in approvals will obviously delay its completion. Delay of approval until the September Water Quality Control Board meeting would jeopardize the entire schedule, as it would delay earthwork into the rainy period and would delay plant plant start-up beyond the first of the new year, 1981.

We will look forward to cooperation from all of the reviewing agencies to permit this tight schedule to be maintained.

Very truly yours,

CARL L. HOOPER

W. O. 2085.16
CC: Rip McIntosh
Leonard McIntosh
Charles Keller

CLH/j

Laguna Seca Ranch
Wastewater Reclamation System

1. Purpose

The proposed Laguna Seca Ranch Wastewater Reclamation System is intended to:

A. Provide a long range solution to a recurring problem of failures in the existing County Service Area No. 10 soil absorption system which serves 46 homes in Laguna Seca Ranch Estates No. 1.

B. Conserve groundwater supplies by permitting use of reclaimed wastewater for irrigation on portions of the Laguna Seca Golf Ranch.

C. Allow future wastewater treatment for 49 homes on lots of Laguna Seca Ranch Estates No. 2.

D. Provide for expansion to allow the future connection of other development in the western portion of the Ranch as it may occur.

E. Provide for sewerage service for York School in the event of failure or difficulties in the existing soil absorption system.

F. Be compatible with long range plans for sewerage service to the central and eastern portions of the Ranch.

2. General Description

Laguna Seca Ranch is a 1000 acre property in unincorporated Monterey County, lying north of Highway 68, approximately six miles east of Monterey. It has been planned for annexation to the City of Monterey for ultimate development as a part of Monterey II to provide a total of 2410 dwelling units of varying types, along with a 200 room resort hotel, professional offices, and neighborhood commercial uses. This development is intended to be phased over a 20 to 30 year period.

The Ranch presently contains 46 existing homes on Laguna Seca Ranch Estates No. 1, 49 lots being developed in 1980 for custom homes, horse ranch operation with 8 residences, stables and offices, a private school, and a golf course. The 46 homes are provided sewerage service by County Service Area #10, which operates master septic tanks and drainfields near Highway 68, about a quarter mile east of York Road. The new lots are provided with a sewage collection system, but are presently intended to be served by individual septic tanks until public sewers become available. All other facilities utilize individual septic tanks.

As a part of the long range plan, City of Monterey sewers will be extended to serve the Ranch. This trunk main extension will pass through approximately 1.5 miles of the undeveloped Ryan Ranch, development proposals presently pending before the City of Monterey which would allow several years of light industrial buildout to proceed on individual septic tanks. In addition, approximately three miles of trunk main will be required to connect the Ryan Ranch to Monterey city mains or to regional plant in Seaside. Major development on Laguna Seca Ranch must await the completion of the trunk main and any necessary treatment facility expansion.

3. Project Description

The Reclamation System will consist of the following items, shown schematically on Figure 1:

a. Collection systems within Laguna Seca Ranch Estates No. 1 and No. 2 (existing) totalling approximately 15,000 feet of mains.

b. Collector extensions from five points on Laguna Seca Ranch Estates No. 2 to the proposed plant and a proposed lift station, totalling approximately 4800 feet of sewer mains.

c. Lift station #1, located south of York School, at about 200 foot elevation, to pump raw sewage from 67 homes, York School, and possible future development on 55 acres through a 3100 foot force main to a treatment plant.

d. The treatment plant located near the west end of the golf course at about elevation 280. The plant will provide secondary treatment, plus coagulation, filtration, and chlorination, to convert sewage into water acceptable for irrigation on the golf course.

e. Storage ponds located adjacent to the plant and near golf course maintenance building, approximately 3000 feet east of the plant. The ponds will provide storage for treated wastewater during wet weather periods when no irrigation is permitted, totalling 120 days capacity.

f. Modification to the existing golf course irrigation system to allow blending of reclaimed wastewater with the well water presently used, isolating approximately a third of the course for well water use only.

4. Plant Criteria

The plant will have an initial capacity of 0.050 mgd (50,000 gallons per day) provided by two separate functioning plants. Each will be capable of treating 25,000 gallons per day at a peak flow rate of 75 gallons per minute. It will consist of steel tank equipment mounted on concrete slabs, above ground, in an open space surrounded by trees. Principal plant equipment will consist of the following items:

A. Lift Station No. 2, 75 gallons per minute at 20 foot lift, 1.5 Hp duplex submersible pumps. It will serve the easterly 30 homes of Laguna Seca Ranch Estates No. 2, and will be situated to ultimately serve also the proposed future apartment development of 400 dwelling units north of York Road, west of the abandoned sanitary landfill. Standby power will be a part of plant generator capacity.

B. Lift Station No. 1, 3100 feet to the west, will be 110 gallons per minute at 100 foot lift, with 10 Hp duplex pumps and a standby generator. It will serve the 46 homes of Estates No. 1 plus the westerly 19 lots of Estates No. 2, with capacity to ultimately serve also York School and future development in the southwest 55 acres of the ranch (20,000 gpd reserve capacity). This reserve capacity is inherent in the lift station, since the necessary lift of 100 feet can only be met with 10 horsepower pumps of over 100 gpm capacity. No smaller non-clog pumps will produce the necessary pressure.

A second holding pond site is available on the golf course between Highway 68 and the maintenance building, just west of the creek. This site could also provide for about 6 or 8 acre feet of storage, adding 40 to 50 days of storage at full buildout of the west end of the ranch.

Evaporation losses are estimated at 36 inches per year, net, (54 inches of evaporation, 18 inches of rainfall) or about 300,000 gallons from the initial pond and 400,000 gallons from the future east pond.

K. Irrigation System - Effluent will be pumped by a submersible well turbine pump from the main storage pond direct to the golf course irrigation system. Check valves will be added to prevent any flow to the easterly end of the golf course where fairways and greens drain directly into Canyon del Rey Creek. Automatic timers will be utilized to permit reclaimed water pumping to occur only when the main irrigation pumps are in operation. Pump capacity will be 140 gallons per minute, allowing the addition of 66,000 gallons during a normal eight hour irrigation period. This will allow full use of all treated water under normal conditions, and will permit disposal of up to 16,000 gallons per day from surplus storage following a wet period, in addition to the normal inflow of 50,000 gallons per day. The stored water from a full pond at the end of an extended wet period will thus take about four months for total disposal - about 3000 to 5000 gallons per day by evaporation and 16,000 gallons per day by pumping to irrigation.

The existing pumps for the irrigation system can supply approximately 1200 gallons per minute, using all three pumps. Under those circumstances, and with only west end sprinkler zones in use, dilution of reclaimed water would be to 9% strength (140 gpm reclaimed water, 1200 gpm well water). Should only the smallest existing pump be in operation, approximately 200 gpm, dilution would be to 40% strength (140 gpm reclaimed water, 200 gpm well water). Should all sprinkler zones on the west end be shut down by their automatic timed controls, an over-pressure switch will shut down the reclaimed water pump.

L. Safeguards - A time switch on the reclaimed water pump will prevent operation during daylight hours when persons could be present on the course. A tilting bucket rain guage switch will automatically shut down the reclaimed water pump when rainfall exceeds 0.1 inches, thus preventing any accidental runoff of reclaimed water. This control will be arranged to require manual reset, so that the pump will not function until the operator determines that weather conditions will require golf course irrigation.

The course has been examined by representatives of Monterey County Health Department to select those areas where reclaimed water will not be permitted. Since no fairway west of the proposed check valve drains direct to the creek, and since all present and proposed homes are substantially setback from or are above irrigated fairways, all reclaimed water can be fully contained on the golf course.

The system is totally isolated from the domestic water system. Present operation of the irrigation system provides for well pump discharge into a holding pond on Canyon del Rey Creek, with three turbine pumps drawing from that pond to pump direct to irrigation. Separate piping systems provide all domestic water to the clubhouse. Service from that system (Bishop Water Company) will be extended to the plant site for use in the laboratory and for washdown. The plant and pond will be fenced.

Alarms will be provided at pump stations and within the plant to signal significant malfunctions.

M. Redundancy - is provided for lift station pumps, using duplex pumps, each sized for full design load, with standby power. It is also provided in the extended aeration system, since two complete systems will be constructed, along with four separate air compressors any three capable of full capacity operation. Each system will have 25,000 gpd capacity. When normal flow exceeds 25,000 gpd, a third identical system will be provided so that total flow at full buildout can be processed with any one of the three units out of service due to breakdown or normal maintenance. Redundancy is also present in the filtration units, sized so that any two of three units can pass the full flow. Coagulant chemical feed pumps will be duplex. The chlorinator will be a duplex unit. Standby power will be provided to drive the lift station pumps, comminutor, and two compressors. This will be in the form of two generators - 10 Kw at lift station #1, 20 Kw at the plant.

No duplication is provided for the following items, since they do not normally incur mechanical failures, or have inherent bypass characteristics:

a. Comminutor (bar screen bypass).
b. Coagulation chamber and chemical mixing chamber.
c. Secondary clarifier.
d. Final clear well-chlorine contact chamber.
e. Storage pond.
f. Irrigation pump or its power supply.

Finally, redundancy is provided for the total system as it relates to the 46 homes of Laguna Seca Ranch Estates No. 1, since the existing septic tanks and drainfields will remain in place. Merely removing a plug from one pipe and inserting it in the Blue Larkspur main line will direct flow back to that system. This system can handle the approximate 12,000 to 14,000 gallons per day from the 46 homes under normal circumstances and for brief periods even in wet weather.

5. Operation - The entire collection treatment and storage system up to the irrigation pump will be owned and maintained by County Service Area #10. This county agency, administered by Public Works under the direct control of the Board of Supervisors, will be required to provide a licensed operator, either on staff or by contract. He will perform or direct the normal maintenance and all testing and reporting required by the Health Department and/or Water Quality Control Board. He will be provided with an onsite maintenance/laboratory building, equipped to perform the normal periodic tests.

The irrigation pump and all downstream piping will be owned and maintained by Laguna Seca Golf Ranch.

Costs of operation will be borne by a users fee. Budget has not been developed at this time. Construction costs for the entire systems including the irrigation revisions, will be borne by Bishop, McIntosh, and McIntosh owners and developers of the Ranch.

6. Groundwater Effect

Groundwater locally is used as a source of domestic supply by Bishop Water Company. The Bishop wells all lie to the east (upstream) from the proposed irrigation area, the nearest being 2200 feet east, the next 2800 feet east. These wells draw primarily from the Santa Margarita formation which obtains recharge primarily from the Corral de Tierra Area, as reported by Thorup in his 1976 report on groundwater in the Highway 68 corridor. Upper level groundwater is unused. Depth to water beneath the golf course is generally in excess of 30 feet, as was noted in percolation tests run on the adjacent lots of Laguna Seca Ranch Estates No. 2.

The soils are Baywood Sands (BoC) in the westerly portion of the Golf Course, Santa Ynez fine Sandy Loam (ShC & ShE) on the easterly portions. Both types will accept substantial amounts of irrigation water and have good permeabilities, the Baywood being considerably more permeable (6-20 inches per hour) than is the Santa Ynez (0.6-2.0 inches per hour) Runoff is consequently quite low on the flatter areas in both soil cases, and filtration characteristics are good.

For these reasons, the Monterey County Health Department has determined that extensive soil moisture probes are not warranted in this project.