FINAL
SUPPLEMENTAL
ENVIRONMENTAL IMPACT REPORT
RANCHO DEL REY SECTIONAL PLANNING AREA (SPA) III PLAN

EIR #89-10
SCH #90010292

Prepared for:

The City of Chula Vista
Environmental Review Coordinator
276 Fourth Avenue
Chula Vista, CA 92010

Prepared by:

P&D Technologies, Inc.
401 West "A" Street
Suite 2500
San Diego, CA 92101
(619) 232-4466

November 1990

CITY OF
CHULA VISTA

Environmental Impact Report

RANCHO DEL REY SPA III EIR
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STATE OF CALIFORNIA—OFFICE OF THE GOVERNOR
GEORGE DEUKMEJIAN, Governor

OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

Oct 04, 1990

BARBARA REID
CITY OF CHULA VISTA
276 4TH AVENUE
CHULA VISTA, CA 92010

Subject: RANCHO DEL REY SPA III
SCH # 90010292

Dear BARBARA REID:

1 The State Clearinghouse has submitted the above named draft Environmental Impact Report (EIR) to selected state agencies for review. The review period is now closed and the comments from the responding agency(ies) is(are) enclosed. On the enclosed Notice of Completion form you will note that the Clearinghouse has checked the agencies that have commented. Please review the Notice of Completion to ensure that your comment package is complete. If the comment package is not in order, please notify the State Clearinghouse immediately. Remember to refer to the project's eight-digit State Clearinghouse number so that we may respond promptly.

Please note that Section 21104 of the California Public Resources Code required that:

> "a responsible agency or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency."

Commenting agencies are also required by this section to support their comments with specific documentation. These comments are forwarded for your use in preparing your final EIR. Should you need more information or clarification, we recommend that you contact the commenting agency(ies).

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact Terri Lovelady at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

David C. Nunenkamp
Deputy Director, Permit Assistance

Enclosures

cc: Resources Agency

i. This letter from the State of California Office of Planning and Research acts as a transmittal for the comment letters which they received during the period of public review for the EIR. As indicated in the checklist, Caltrans - District 11 was the only agency responding directly to the State Clearinghouse. Other State agencies including the Department of Conservation, Department of Fish and Game, and Department of Water Resources responded directly to the City of Chula Vista, and these letters of comment have been included in the Final EIR.

NOTICE OF COMPLETION AND ENVIRONMENTAL DOCUMENT TRANSMITTAL FORM

Mail to: State Clearinghouse, 1400 Tenth St., Rm 121, Sacramento, CA 95814—916/445-0613

SEE NOTE Below

SCH # 90010292

1. Project Title: RANCHO DEL REY SPA III
2. Lead Agency: City of Chula Vista   3. Contact Person: Barbara Reid
3a. Street Address: 276 Fourth Avenue   3b. City: Chula Vista
3c. County: San Diego   3d. Zip: 92010   3e. Phone: (619)691-5097

PROJECT LOCATION 4. County San Diego   4a. City/Community: Chula Vista
4b. Assessor's Parcel No. ______   4c. Section ______   Twp. ______   Range ______
5a. Cross Streets: ______ ______   5b. For Rural, Nearest Community: ______
6. Within 2 miles: a. State Hwy # 805   b. Airports ______   c. Railways ______   d. Waterways ______

7. DOCUMENT TYPE

CEQA
01. ___ NOP
02. ___ Early Cons
03. ___ Neg Dec
04. ___ Draft EIR
05. ___ Supplement/Subsequent EIR (Prior SCH No.: ______)
06. ___ NOE
07. X NOC
08. ___ NOD

NEPA
09. ___ NOI
10. ___ FONSI
11. ___ Draft EIS
12. ___ EA

OTHER
13. ___ Joint Document
14. ___ Final Document
15. ___ Other ______

8. LOCAL ACTION TYPE
01. ___ General Plan Update
02. ___ New Element
03. ___ General Plan Amendment
04. ___ Master Plan
05. ___ Annexation
06. X Specific Plan
07. ___ Community Plan
08. ___ Redevelopment
09. ___ Rezone
10. ___ Land Division (Subdivision, Parcel Map, Tract Map, etc.)
11. ___ Use Permit
12. ___ Waste Mgmt Plan
13. ___ Cancel Ag Preserve
14. ___ Other ______

9. DEVELOPMENT TYPE
01. X Residential: Units 1380 Acres 206
02. ___ Office: Sq. Ft. ______ Acres ______ Employees ______
03. ___ Shopping/Commercial: Sq. Ft. ______ Acres ______ Employees ______
04. ___ Industrial: Sq. Ft. ______ Acres ______ Employees ______
05. ___ Water Facilities: MGD ______
06. X Transportation: Type Major Circulation Routes
07. ___ Mining: Mineral ______
08. ___ Power: Type ______ Watts ______
09. ___ Waste Treatment: Type ______
10. ___ OCS Related
11. ___ Other: * (see below)

RECEIVED
AUG 20 1990
STATE CLEARINGHOUSE

10. TOTAL ACRES: 404.6   11. TOTAL JOBS CREATED: ______

12. PROJECT ISSUES DISCUSSED IN DOCUMENT
01. X Aesthetic/Visual
02. ___ Agricultural Land
03. X Air Quality
04. X Archaeological/Historical
05. ___ Coastal Zone
06. X Economic
07. ___ Fire Hazard
08. X Flooding/Drainage
09. X Geologic/Seismic
10. ___ Jobs/Housing Balance
11. ___ Minerals
12. ___ Noise
13. X Public Services
14. X Schools
15. ___ Septic Systems
16. X Sewer Capacity
17. X Social
18. X Soil Erosion
19. ___ Solid Waste
20. ___ Toxic/Hazardous
21. X Traffic/Circulation
22. X Vegetation
23. ___ Water Quality
24. X Water Supply
25. ___ Wetland/Riparian
26. X Wildlife
27. ___ Growth Inducing
28. ___ Incompatible Landuse
29. X Cumulative Effects
30. ___ Other ______

13. FUNDING (approx.) Federal $ ______ State $ ______ Total $ ______
14. PRESENT LAND USE AND ZONING: Present land use - vacant
15. PROJECT DESCRIPTION: Rancho Del Rey Spa III consists of detailed plan for residential development, community facilities, park and open space on 405 acres, southeast of East H Street, north of Telegraph Canyon Road, in Chula Vista.
16. SIGNATURE OF LEAD AGENCY REPRESENTATIVE: ______ DATE: 08/17/90 (Cont. Pg. 2)

NOTE: Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. from a Notice of Preparation or previous draft document) please fill it in.

FORM REVISED 1/84 - REPLACES CSIS   [illegible]

*Parks, 10.0, Junior High 24.7 13
Open space areas, 147.6.

CLEARINGHOUSE CONTACT: 916/445-0613
TERRI LOVELADY

STATE REVIEW BEGAN: 8-20-90
DEPT REV TO AGENCY: 9-27
AGENCY REV TO SCH : 10-2
SCH COMPLIANCE : 10-4

PLEASE RETURN NOC WITH ALL COMMENTS

AQMD/APCD: 27 (Resources: 3/25)

CMT SNT
___ ● Resources Agency
[redacted]
___ ● Conservation
___ ● Fish & Game
[redacted]
___ ● Parks & Rec/OHP
___ ● Reclamation
[redacted]
___ ● DWR
[redacted]
X ● Caltrans # ______
[redacted]

CMT SNT
[redacted]
___ ● OLA (Schools)
[redacted]
___ ● ARB
[redacted]
___ ● Reg. WQCB # 9
[redacted]

State of California
Business, Transportation and Housing Agency

Memorandum

To : State Clearinghouse

Attention T. Lovelady

Date September 28, 1990

File No.: 11-SD-805
6.1-7.8

From : DEPARTMENT OF TRANSPORTATION
District 11

Subject: Draft SEIR for the Rancho del Rey
Sectional Planning Area III Plan, SCH 90010292

2 We note that there will be a project-specific ADT of 42,306 (page S-4) and that the cumulative traffic impacts of the Rancho del Rey Specific Plan Area will contribute to the degradation of the existing circulation element and would, therefore, be considered significant but mitigable (page 7-1). The SEIR needs to analyze those traffic impacts that can be expected at Interstate Route 805 and commit to the indicated mitigations.

Our contact person for Interstate 805 is Jim Linthicum, Project Manager, Project Studies Branch "B", (619) 688-6952. For traffic information, locally funded projects, and encroachment permits our initial contact person is Richard Coward, Project Services Branch Manager, (619) 688-3303.

James T. Cheshire
JAMES T. CHESHIRE, Chief
Environmental Planning Branch

MO:ec

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2. I-805 is the responsibility of Caltrans and improvements to I-805 are out of the purview of the developer or the City of Chula Vista. This project conforms to the General Plan designation and does not exceed that projected since 1985. Traffic generated by the proposed project contributes incrementally to the congestion on I-805. Since I-805 is a regional facility, this growth, as projected through the General Plan, was anticipated in Caltrans' I-805 planning process. The City of Chula Vista should work with Caltrans to ensure that the anticipated growth of the General Plan and associated traffic is not exceeded. The City should also encourage alternative modes of transportation in support of Transportation Demand Management which promotes mass transit, ride sharing, and bicycle routes as measures to reduce single-occupant automobile traffic. Since this EIR is a site specific evaluation of project impacts, regional issues with impacts which are not solely caused by the proposed development are not evaluated in detail.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE ENHANCEMENT
SOUTHERN CALIFORNIA FIELD STATION
Laguna Niguel Office
Federal Building, 24000 Avila Road
Laguna Niguel, California 92656

October 1, 1990

Barbara Reid
City of Chula Vista
276 Fourth Ave
Chula Vista, California 92010

Re: Rancho Del Rey Spa-3, Chula Vista, California

Dear Ms. Reid:

3 In May of 1990 the City of Chula Vista (City) requested that the Fish and Wildlife Service (Service) review the document titled Preliminary Draft Supplemental Environmental Impact Report Rancho Del Rey Sectional Planning Area (Spa) III Plan, City of Chula Vista, San Diego County, California. At the time of review the Service expressed concerns to the City regarding the impact of the project on biological resources, particularly long term adverse affects to coastal sage scrub habitat, vernal pools and the California gnatcatcher (*Polioptila californica*).

4 As you know, the Service has the legal responsibility for the welfare of all migratory birds, anadromous fish and endangered animals and plants occurring in the United States. The project as proposed will result in the direct loss of 256 acres of Diegan coastal sage scrub and the degradation of the remaining habitat due to indirect impacts resulting from adjacent disturbances. Coastal sage scrub is a declining habitat type in San Diego County. It is estimated that over 70% of the original acreage of this habitat in the County has been destroyed. Several candidate species for listing as endangered are dependent upon coastal sage scrub habitat including the California gnatcatcher. Forty-six individuals consisting of nine pairs of this sensitive bird were detected on-site.

5 The large scale destruction of coastal sage scrub in southern California has had a corresponding impact on the California gnatcatcher. In 1980, only 1,000 to 1,500 pairs of this species were estimated to occur in southern California, with less than 400 occurring in San Diego County. Given the rate of development that has occurred since that estimate was made, in coastal areas a greatly reduced number of California gnatcatchers probably remain. The California gnatcatcher has been extirpated from Ventura and San Bernardino Counties. Remaining concentrations

3. Section 4.5 of the EIR addresses the impacts of the project on coastal sage scrub habitat, vernal pools, and the California gnatcatcher, and mitigation measures to reduce those impacts are recommended. Impacts have been identified as significant and unmitigated.

4. This comment identifies legal responsibility of the Service and summarizes project impacts. It does not address the adequacy of the EIR.

5. See response 4.

of this species in the United States reside in Orange, Riverside and San Diego Counties.

6 A second sensitive species of concern to the Service is the coastal cactus wren (Campylorhynchus brunneicapillus sandiegensis). Only 230 pairs of this rare bird remain in San Diego County. Cactus wren nests were located on-site within cactus thickets.

7 The Service would like to emphasize our increasing concern with the cumulative impacts of development projects on coastal sage scrub habitat. The Service strongly urges the City of Chula Vista and other local jurisdictional agencies to plan for its preservation, protection of remaining coastal sage scrub habitat of sufficient size and quality can help preserve existing populations of sensitive species.

8 Subsequent site inspections and meetings with the project proponent, McMillin Communities, Inc. and the City of Chula Vista have resulted in the development of additional mitigation measures. These measures are described in the document titled "Additional Mitigation Measures for Rancho Del Rey Spa-3" dated July 17, 1990 (enclosed). The Service believes these mitigation measures represent an appropriate approach to avoiding or mitigating the impact of the subject project on sensitive resources including coastal sage scrub habitat, vernal pools and the California gnatcatcher.

We appreciate the cooperation that the Service has received from the City of Chula Vista and McMillin Communities, Inc. and we commend you for your efforts in the protection of biological resources. If we can be of any further assistance or if you have any questions regarding these comments, please contact Nancy Gilbert of this office at (714) 643-4270.

Sincerely,

Brooks Harper

Brooks Harper
Office Supervisor

cc: CDFG, Long Beach, CA
CDFG, San Diego, CA (Attn: T. Stewart)
McMillin Company, Inc., National City, CA (Attn: C. Fukuyama)
County of San Diego, CA (Attn: County Parks, Ann Rast)

Enclosure

1-6-90-TA-508

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6. See response 4. It should be noted that specific mitigation measures to reduce impacts to the cactus wren, a sensitive species of concern, are presented on page 4-38 of the EIR.

7. The EIR has identified both site specific and cumulative impacts to biological resources. Mitigation measures to reduce impacts to biological resources are set up as conditions for certain permits (i.e., grading) and Tentative Map approval. This allows the City to monitor activities which may affect resources and to guarantee that resources are preserved.

8. It is recognized that extensive coordination between the Service, McMillan, and the City of Chula Vista has resulted in a mitigation program that the Service can support. The mitigation measures referred to as "Additional Mitigation Measures for Rancho Del Rey SPA-3" dated July 17, 1990 have been incorporated into the EIR beginning on page 4-40. Mitigation measures beginning on page 4-37 of the EIR set up a program of on-site and off-site measures to compensate for the loss of the 256 acres of Diegan coastal sage scrub and to reduce the impacts to the California gnatcatcher.

ADDITIONAL MITIGATION MEASURES FOR RANCHO DEL REY SPA-3

July 17, 1990

California Gnatcatchers

9 Prior to the issuance of a grading permit which would disturb coastal sage scrub on the specialty housing area of SPA-3 (Figure 1), the applicant shall acquire and preserve an area of coastal sage scrub habitat as described in one of the following options:

1. Acquire and preserve an off-site area of coastal sage scrub habitat encompassing at least 187 acres which supports at least 17 pairs of California gnatcatcher, or
2. Acquire and preserve an off-site area of coastal sage scrub habitat encompassing at least 256 acres which supports 10 pairs of California gnatcatcher, or
3. If an off-site mitigation area cannot be found, shall preserve the 70 acres of coastal sage scrub habitat in the Specialty Housing Area on-site in addition to the 117 acres of coastal sage scrub habitat proposed for open space as described in the Rancho Del Rey SPA-3 EIR.

This mitigation is to satisfy the take and replacement for all of SPA-3, not just for the specialty housing area. The proposed mitigation site can be outside the city limits, however, first priority shall be given to the acquisition of areas with the General Plan area, and then to other areas within San Diego County. The preservation of this site is the responsibility of either a public or private entity that is satisfactory to the City of Chula Vista (acceptable private entities are - Nature Conservancy, Sierra Club; acceptable public entities- Bureau of Land Management, California Department of Fish and Game, U.S. Fish and Wildlife Service, County of San Diego, City of Chula Vista). Interim responsibility for preservation of the mitigation site shall remain with the project applicant until an acceptable public or private entity is secured. The proposed mitigation site must be acceptable to the City of Chula Vista, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) in evaluating the site. The criteria for determining the acceptability of the mitigation site will be (1) its use by the California gnatcatcher, and (2) its long-term conservation potential.

The mitigation site will be evaluated for use by California gnatcatcher through surveys of the site on a minimum of three days at least a week apart. If no gnatcatchers are heard after the first visit, tapes of gnatcatchers will be used. A minimum of one hour should be expended for each 25 acres of habitat surveyed. Surveys will be conducted in the morning between sunrise and 11:00 a.m., or after 3:00 p.m. Surveys should be conducted when air temperatures are between 55 and 95 degrees Fahrenheit, and winds are below 15 miles per hour.

The mitigation site should be within, adjacent to, or connected by an appropriate landscape corridor to a larger area or interconnected set of patches of habitat that are currently in public ownership or designated open space or

9. These measures have been incorporated in the EIR beginning on page 4-40.

reasonably expected to remain in a natural state. The gnatcatcher habitat within this block or interconnected set of patches should be between 800 to 1,000 acres in area. This mitigation/replacement site can be located outside the City of Chula Vista, if necessary, but must be within San Diego County.

No grading or activities which would adversely affect the habitat on the specialty housing area, other than the construction of sewer improvements (as shown on Figure 2), the extension of Paseo Ranchero, and the grading of the disturbed area on the northeast end adjacent to Paseo Ranchero which is not included in the 70 acres of quality coastal sage scrub habitat, shall occur prior to accomplishing the off-site acquisition.

The project proponent will make an irrevocable offer to dedicate the off-site acquisition/mitigation site to the City of Chula Vista, County of San Diego, or other appropriate open space holder at the time of issuance of the grading permit. If ownership of the site does not transfer prior to the issuance of a grading permit, the applicant shall record a conservation easement with an agency of appropriate jurisdiction over the off-site mitigation area (186 or 256 acres) prior to issuance of the permit.

Vernal Pools

Prior to issuance of a grading permit which would disturb the mima mound area indicated on Figure 1, the project proponent will acquire and preserve 0.4 acres of vernal pool-associated lands. The vernal pool acquisition area is not required to be in the City of Chula Vista. This mitigation area is equivalent to twice the vernal pool area (0.2 acre) lost as a result of grading on the proposed project area. The proposed vernal pool mitigation site must be acceptable to the City of Chula Vista in consultation with USFWS. The criteria for determining the acceptability of the mitigation site will be (1) the presence of vernal pool habitat, and (2) its long-term conservation potential.

The acquired vernal pool mitigation area shall be an area recognized by the USFWS as an area supporting pool habitat and it shall be a vernal pool area that is currently in private ownership and not protected by conservation easements. The mitigation site can have existing vernal pools occurring on it, or it may be an area that is historically known to support vernal pools and that could be restored (reconstructed). If an area requiring restoration is chosen as the site, a vernal pool restoration plan shall be prepared and implemented that is acceptable to the City of Chula Vista in consultation with USFWS. The site shall be adjacent to or connected by an appropriate landscape corridor to a larger area or interconnected set of patches of preserved vernal pool habitat that are currently in designated open space.

No grading or activities which would adversely affect the habitat in the vernal pool area (Figure 1) shall occur prior to accomplishing the off-site acquisition. Immediately upon acquisition of a suitable vernal pool mitigation area, the acquired site shall be fenced with a six-foot chain-link fence to protect the area. The applicant will be required to secure a conditioned Nationwide permit, to be issued by the U.S. Army Corps of Engineers (Section 404 of the Clean Water Act), that contains the conditions outlined in this section concerning vernal pools. This Corps permit shall be applied for and received prior to grading.

The project proponent will make an irrevocable offer to dedicate the off-site acquisition/mitigation site to the City of Chula Vista, County of San Diego, or other appropriate open space holder at the time of issuance of the grading permit. Interim responsibility for the preservation of the site shall remain with the project applicant until an acceptable dedication of the land has occurred.

State of California

The Resources Agency

10/4

Memorandum

Date : SEP 12 1990

To :
1. Gordon F. Snow, Ph.D.
   Assistant Secretary for Resources
2. City of Chula Vista
   276 Fourth Avenue
   San Diego, CA 92010
   Attention: Barbara Reid

From : Department of Water Resources
Los Angeles, CA 90055

Subject : DEIR for Rancho Del Rey SPA III, on 405 Acres, SCH 90010292

Your subject document has been reviewed by our Department of Water Resources staff. Recommendations, as they relate to water conservation and flood damage prevention, are attached.

10 After reviewing your report, we also would like to recommend that you further consider implementing a comprehensive program to use reclaimed water for irrigation purposes in order to free fresh water supplies for beneficial uses requiring high quality water supplies.

For further information, you may wish to contact John Pariewski at (213) 620-3951. Thank you for the opportunity to review and comment on this report.

Sincerely,

Charles R. White

Charles R. White, Chief
Planning Branch
Southern District

Attachments

bcc: Nadell Gayou, Room 215-4
     Ruth Lambert, Room 733

JPariewski:map (WSEVL/SCH EIR)

10. As noted on page 4-88 of the EIR, " . . . project development plans involve the implementation of water pipes for the use of reclaimed water when available in the future for areas such as playgrounds, parks, and project-related landscaping."

Department of Water Resources Recommendations for Water Conservation and Water Reclamation

11 To reduce water demand, implement the water conservation measures described here.

Required

The following State laws require water-efficient plumbing fixtures in structures:

- o Health and Safety Code Section 17921.3 requires low-flush toilets and urinals in virtually all buildings as follows:

  "After January 1, 1983, all new buildings constructed in this state shall use water closets and associated flushometer valves, if any, which are water-conservation water closets as defined by American National Standards Institute Standard A112.19.2, and urinals and associated flushometer valves, if any, that use less than an average of 1-1/2 gallons per flush. Blowout water closets and associated flushometer valves are exempt from the requirements of this section."

- o Title 20, California Administrative Code Section 1604(f) (Appliance Efficiency Standards) establishes efficiency standards that give the maximum flow rate of all new showerheads, lavatory faucets, and sink faucets, as specified in the standard approved by the American National Standards Institute on November 16, 1979, and known as ANSI A112.18.1M-1979.

- o Title 20, California Administrative Code Section 1606(b) (Appliance Efficiency Standards) prohibits the sale of fixtures that do not comply with regulations. No new appliance may be sold or offered for sale in California that is not certified by its manufacturer to be in compliance with the provisions of the regulations establishing applicable efficiency standards.

- o Title 24 of the California Administrative Code Section 2-5307(b) (California Energy Conservation Standards for New Buildings) prohibits the installation of fixtures unless the manufacturer has certified to the CEC compliance with the flow rate standards.

- o Title 24, California Administrative Code Sections 2-5352(i) and (j) address pipe insulation requirements, which can reduce water used before hot water reaches equipment or fixtures. These requirements apply to steam and steam-condensate return piping and recirculating hot water piping in attics, garages, crawl spaces, or unheated spaces other than between floors or in interior walls. Insulation of water-heating systems is also required.

11. As noted on pages 4-88 and 4-89 of the EIR, water conservation measures such as low flush toilets and low water use sprinklers have been recommended to reduce impacts to regional water supplies. It should be noted that these "Recommendations" are actually State law and the project is required to adhere to all applicable State and Federal laws.

State of California THE RESOURCES AGENCY OF CALIFORNIA

Memorandum

10/4

To : Dr. Gordon F. Snow
Assistant Secretary for Resources

Ms. Barbara Reid
City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 92010

Date : September 26, 1990

Subject: Draft Supplemental
Environmental Impact
Report for Rancho
Del Rey SPA III,
SCH# 90010292

From : **Department of Conservation—Office of the Director**

The Department of Conservation's Division of Mines and Geology (DMG) has reviewed the Draft Supplemental Environmental Impact Report (SEIR) for the Rancho Del Rey Spa III project. The project site is located in the eastern foothills of Chula Vista and includes a 206-acre residential development for 1,380 single-family residences. We are unable to perform an adequate geological assessment of the project because the geotechnical report by GEOCON (1989), and detailed grading plan, were not included in the SEIR. However, we offer the following comments. 12

Seismic Hazards - We recommend that a seismic hazards analysis be done to assess the potential for strong ground shaking and surface rupture at the project site. The Rose Canyon Fault is less than 7 miles from the project site, and is considered active (Lindvall et al., 1989, and Anderson, 1989). It has a maximum credible earthquake (MCE) of M 7.1 (moment-magnitude) (Wesnousky, 1986), and may produce a mean peak ground acceleration of 0.36g at the project site (Joyner and Boore, 1982). Other faults that may impact the site include the Elsinore, San Clemente, Coronado Banks, San Jacinto, San Andreas, and La Nacion Faults which have MCEs of magnitude 7.0, 7.7, ≥ 6, 7.5, 8.0, and 6.5, respectively (Anderson, 1989). The Rose Canyon Fault, as well as these other faults, should be considered when evaluating potential strong ground shaking at the project site. Because the project site is located on the trace of the La Nacion Fault, the potential for surface rupture should also be evaluated. Ground motion parameters to be considered for the project site should include peak ground acceleration, duration of strong shaking, and site amplification. 13

According to the 1988 Uniform Building Code (UBC), the San Diego area is located in seismic zone 3, which has an effective peak ground acceleration of 0.3g. Since a mean peak ground acceleration of 0.36g can be expected from a MCE event on the Rose Canyon Fault, the UBC design requirement for seismic zone 3 may not be adequate for the project.

Grading - The Draft SEIR does not clearly show the proposed project grading in sufficient detail to allow adequate review. The Draft SEIR refers to the geotechnical report (GEOCON, 1989) for data on the project's geologic hazards. This report should be appended to the SEIR to allow for review of the geologic and seismic impacts, and adequacy of the proposed mitigations. 14

12. The geotechnical report by GEOCON (1989) was included in the appendices to the DEIR. These appendices were bound in a separate volume which was available through the Planning Department at the City of Chula Vista. The grading plan is included as Figure 4-2 on page 4-15 of the EIR. It is acknowledged that the grading details may be difficult to read at the reduced scale. As part of the Mitigation Monitoring Program, the City Engineer would review all grading plans before issuance of a grading permit to ensure that grading is in conformance with City regulations and requirements. A one inch to 200 foot scale grading map has been forwarded to the Department of Mines and Geology.

13. As regards seismic hazards, the text on page 4-5 of the EIR has been revised to read:

> Based on the findings of the Geocon report (dated March 8, 1989), the branch of the La Nacion Fault present on the site dies out in a series of small folds on adjacent property to the north. In addition, the fault does not displace sediments of the Pleistocene Lindavista Formation. Therefore it is the opinion of the project geologist that the fault does not represent a significant seismic or ground rupture hazard to the development. However, the site could be subjected to moderate-to-severe groundshaking in the event of a major earthquake on more remote faults such as the Coronado Banks, Rose Canyon, or Eisinore faults.

14. Please refer to response 12.

15 The Draft SEIR states that adverse geological conditions, such as cut slopes containing clay beds dipping out of slope, exist on the project site and may require remedial measures. Potentially-unstable slopes should be stabilized, as well as all other adverse geologic conditions. The amount and type of remediation for unstable slopes may significantly impact the proposed site grading plan. The SEIR should address the proposed remedial grading in sufficient detail that the impacts can be evaluated. Therefore, the Final SEIR should include the grading recommendations so that they can be reviewed.

SUMMARY:

16 Geologic and seismic data needed for adequate review were not included or appended to the Draft SEIR. The referenced geotechnical report and a complete listing of the recommendations for mitigating geologic hazards and soils/grading impacts are contained in Appendix A, which was not provided for our review. The Draft SEIR does not contain a grading plan at a scale that can be reviewed. Thus, the relevant geologic and seismic data which should be included in the SEIR was not available and, therefore, could not be adequately reviewed.

17 Based on the information provided, we recommend additional evaluation of the seismic hazards at the project site, including ground shaking and the potential for surface rupture. Ground motion parameters to be considered should include peak ground acceleration, duration of shaking and site amplitude. We recommend that all relevant faults, including the Rose Canyon, Elsinore and La Nacion Faults, be considered in the seismic hazard evaluations. In addition, any exposure of the La Nacion Fault during grading should be documented by a Certified Engineering Geologist.

If you have any questions regarding these comments, please contact Roger Martin, Division of Mines and Geology Environmental Review Project Manager, at (916) 322-2562.

Dennis J. O'Bryant
Dennis J. O'Bryant
Environmental Program Coordinator

DJO:CG:skk

cc: Roger Martin, Division of Mines and Geology
Catherine Gaggini, Division of Mines and Geology

15. Pages 4-6 through 4-8 of the EIR include recommended mitigation measures which alleviate the impacts of the soils/geology and associated grading. The project must submit detailed grading plans to the City Engineering Department before grading can begin. Additional precautions to assure stability of the landforms includes: monitoring of "on-site grading by a qualified geotechnical consultant to confirm soil conditions as anticipated, and if differences are noted, to provide modifications to initial recommendations relative to geotechnical aspects. A Testing and Observation Report would be completed by the geotechnical consultant and provided to the City prior to issuance of a building permit which verifies that the design and constructions recommendations were complete according to approved grading plans and which details any changes to the initial recommendations as identified during field observation."

16. Please refer to response 12.

17. Please refer to responses 13 and 15.

References:

Anderson, J.G., 1989, Past and Possible Future Earthquakes of Significance to the San Diego Region, Earthquake Spectra, Vol. 5, No. 2, 1989.

Joyner, W.B., and Boore, D.M., (1982), Prediction of Earthquake Response Spectra, U.S. Geological Survey Open-File Report 82-977, 16 pp.

Lindvall, S.C., Rockwell, T.K., and Lindvall, C.E., 1990, The Seismic Hazard of San Diego Revised: New Evidence for Magnitude 6+ Holocene Earthquake on the Rose Canyon Fault Zone, Proceedings of the Fourth U.S. National Conference on Earthquake Engineering, May 20-24, 1990, Palm Springs, California.

Wesnousky, S.G., 1986, Earthquakes, Quaternary Faults, and Seismic Hazard in California; Journal of Geophysical Research, Vol. 91, No. B12, p. 12,587-12,631, November 10, 1986.

State of California

The Resources Agency

Memorandum

To : 1. Projects Coordinator
Resources Agency

2. Ms. Barbara Reid
City of Chula Vista
276 Fourth Avenue
San Diego, CA 92010

Date : October 3, 1990

From : Department of Fish and Game

Subject : Draft Supplemental Environmental Impact Report (DEIR) - Rancho Del Rey Sectional Planning Area III - San Diego County - SCH 90010292

18 The Department of Fish and Game (DFG) has received the subject document Rancho Del Rey Sectional Planning Area III project. We recommend that the lead agency appropriately condition the project, and that it fully implement the mitigation and monitoring requirements of the California Environmental Quality Act and the California Endangered Species Act to offset adverse impacts to the following resources, if your analysis indicates they exist on this property:

19 1. Informal consultation with DFG is necessary to determine the adequacy of mitigation measures to offset adverse impacts to any endangered or threatened species of plants and animals. If the project would result in take of any State-listed species, applicant must obtain authorization from the DFG pursuant to Fish and Game Code Section 2081.

20 2. Compliance with the DFG's Wetland Resources Policy requires that there should be no net loss of wetland habitat or values due to project development. A mitigation and monitoring plan subject to Department approval should be required for loss of sensitive habitats, including, but not necessarily limited to, freshwater marsh, riparian woodland, oak woodland, and riparian scrub vegetation.

21 3. The DFG is opposed to the elimination of natural watercourses or their conversion into subsurface drains. We recommend that all watercourses, whether intermittent or perennial, be retained in their natural condition and provided with appropriate buffers along both banks. Earthen channels should be interconnected with adjacent large open space areas to increase their effectiveness as wildlife corridors in urban surroundings. The DFG may require such mitigation measures through jurisdiction established under Fish and Game Code sections 1601-1603.

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18. Mitigation and monitoring measures to reduce impacts to biological resources are covered on pages 4-37 through 4-42 of the EIR. This has been completed in accordance with provisions stated in AB 3180.

19. On page 4-31 of the EIR, it is noted that "No state- or federally-listed rare, endangered, or threatened plant species were observed within the SPA III Project site." The same is noted on page 1 of the biological resource technical study included in Appendix C of the EIR.

20. Based upon the biologist's reconnaissance, it appears that the implementation of the proposed project would not result in impacts to wetlands vegetation. Although it appears that a U.S. Army Corps of Engineers 404 permit will not be required, it does appear that activities associated with construction of the road crossing the drainage may require a Streambed Alteration Agreement.

21. Page 4-42 of the EIR addresses the need to acquire a Streambed Alteration Agreement, Section 1601-1603 of the California Fish and Game Code "for proposed access road (Paseo Ranchero) that would cross a major drainage on the site." As part of the Mitigation Monitoring Program, the applicant would be required to complete a Streambed Alteration Agreement with the CDFG prior to receiving a grading permit.

This notification (with fee) and the subsequent agreement must be completed prior to initiating any streambed alteration work. Notification should be made after the project is approved by the lead agency.

22 In conclusion, if your analysis reveals that the above mentioned concerns have been fully addressed throughout your decision making process, we would not object to the project approval. However, we request that you provide us a copy of the final environmental document immediately upon approval and prior to filing the Notice of Determination. If you have any questions, please contact Mr. Fred Worthley, Regional Manager of Region 5, at 330 Golden Shore, Suite 50, Long Beach, CA 90802 or by telephone at (213) 590-5113.

Pete Bontadelli
Director

22. Comment has been noted; and Final EIR will be forwarded when available.

RANCHO DEL REY
2727 HOOVER AVE
P.O. BOX 9016
NATIONAL CITY
CA 92050 0625
(619) 477 4117

September 27, 1990

Mr. Doug Reid
Planning Department
CITY OF CHULA VISTA
276 Fourth Avenue
Chula Vista, CA 92010

Re: Draft supplemental EIR No. 89-10 Rancho del Rey SPA III

Dear Mr. Reid:

23 We have received the Draft EIR for Rancho del Rey SPA III and offer our comments. Attached are Attachments 1-6 which are our comments to the Draft EIR. Thank you for providing us the opportunity to comment.

Please contact me if you have any questions regarding our comments.

Sincerely,

Craig Fukuyama

CF/kls

cc: Bob Leiter, Planning Department
Cliff Swanson, Public Works Department
Tony Lettieri, Lettieri - McIntyre and Associates
Betty Dehoney, P and D Technologies

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23. This letter serves as a transmittal for the following six letters. Responses for the comments follow.

ATTACHMENTS

Attachment No. 1: Bankston/Pine letter dated September 20, 1990

Attachment No. 2: Cinti and Associates letter dated September 26, 1990

Attachment No. 3: RECON letter dated September 24, 1990

Attachment No. 4: Project Design Consultants letter dated September 25, 1990

Attachment No. 5: McDonald, Hecht and Solberg letter dated September 21, 1990

Attachment No. 6: GEOCON letter dated September 21, 1990

Bankston/Pine Associates, Inc.

2030 Addison Street, Suite 310
Berkeley, California 94704
(415) 843-9746

ATTACHMENT NO. 1

September 20, 1990

Mr. Craig Fukuyama
McMillin Development
2727 Hoover Avenue
National City, CA 92050

Subject: Review of Rancho Del Rey-SPA III DEIR Traffic Study

Dear Mr. Fukuyama,

At your request, we have reviewed the SPA III DEIR dated August, 1990. This DEIR represents a revision of the SPA III DEIR completed on April,1990.

24 Bankston/Pine Associates prepared the base traffic analysis for both the earlier DEIR and the August, 1990 version. The Traffic Analysis for the earlier DEIR was prepared in the classic traffic impact analysis format. At the request of City staff, the traffic analysis for the most recent DEIR was prepared using the then existing ECVTPP to estimate existing plus cumulative and existing plus cumulative plus project (SPA III) traffic forecasts. This work was completed in July, 1990.

25 Meanwhile, the City's consultant, Willdan Associates, was in the process of completing a revision of the ECVTPP which was made public August, 1990. The difference in the August, 1990 ECVTPP and the previous one is that the land use and cordon trip making for all traffic analysis zones outside of the area was updated from a 1986/1987 base to a 1995 base. This was done to provide a data base outside of East Chula Vista which is more consistent with the future projected by the model. ie., a cumulative future for the ECVTPP area which includes all Approved Projects or projects with Tenative Maps. In addition, the section of East H Street between I-805 and Hidden Vista Drive was upgraded from 6 to 8 lanes.

The effect of changing the base data outside the ECVTPP area from 1986/1987 to 1995 and increasing the capacity (6 to 8 lanes) of East H Street, was to attract more residential trips outside the ECVTPP area which in turn increased projected ADT on major streets near the boundaries of the area. That is, the projected traffic on East H Street and Telegraph Canyon Road east of I-805 increased to 78,000 and 57,000 ADT respectively with Approved Projects plus SPA III. The previous equivilent projected traffic was 69,200 ADT on East H Street and 55,800 ADT on Telegraph Canyon Road.

The August, 1990 ECVTPP analyzed a future with Approved Projects without and with RDR SPA III. The future with RDR SPA III revealed a potential problem at the intersections of East H Street/Hidden Vista Drive and Telegraph Canyon Road/Crest Drive. This is information not available at the time of preparation of the July, 1990 SPA III Traffic Analysis. However, we have already began to restudy mitigation measures for these two intersections and expect to have that

24. Page 4-47 of the DEIR notes the preparation of the traffic analysis and the City's request for the revised analysis.

25. This information was not available at the time that the DEIR was prepared. This analysis has been revised and a supplemental report provided to the City's decision makers in the form of an addendum to the Final EIR.

work completed prior to the certification of the FEIR.

26 Our review of the August, 1990 DEIR indicates that the conclusions about Intersection LOS (Table 4-7) and the section on Mitigation/Monitoring has been revised to be consistent with the July, 1990 Traffic Analysis. In addition, the July, 1990 Traffic Analysis is included in the DEIR Appendix. However much of the text of the August, DEIR reflects the earlier text based on the earlier Traffic analysis. Since the findings and recommended mitigations are included in the August DEIR the attached comments by us could be incorporated in the FDEIR at the appropriate time.

The attached represents our recommended editing of the transportation section of the August, 1990 DEIR to make it entirely consistent with the current traffic Analysis.

Given that, we intend to work expeditiously on potential mitigations to the two problem intersections noted above.

Finally, I will be in attendence at the October 10, 1990 Planning Commission Public Hearing on the SPA III DEIR to answer questions as appropriate.

Sincerely,

BANKSTON/PINE ASSOCIATES, INC.,

Kenneth M. Bankston

Kenneth M. Bankston, P.E.
Principal

Attachments

26. The comment refers to an attachment which follows. Responses are made to each comment as follows.

4.7 TRANSPORTATION

EXISTING CONDITIONS

27 Impacts to traffic associated with the Rancho Del Rey project have been examined in several previous studies. An analysis of the ERDR Specific Plan was completed by Urban Systems Associates, Inc. (USA), in 1985. Another analysis was completed by USA in October 1986 and revised in March 1987 which evaluated the impacts associated with development of SPA I. A traffic evaluation for SPA II by Bankston/Pine Assoc. was completed/October, 1988. In 1989, Bankston/Pine Associates, Inc. prepared a traffic evaluation for SPA III. A revised traffic evaluation was prepared in July 1990 in response to the City of Chula's Vista Traffic Department. The revised traffic study is found in Appendix E. See Figure 2 for location of SPA III relative to SPA'S I and II

SPA III of the El Rancho Del Rey Specific Plan is located in the area east of I-805 and south of East H Street, bounded roughly by East H Street on the north, Telegraph Canyon Road to the south ~~and by~~ Buena Vista Way to the east.

28 The project is planned for a total of 1,380 residential units plus a junior high school on 25-acres of the site. Phasing in of proposed land use is as follows:

Phase 1. 530 multi-family (retirement) dwelling units.
Phase 2. 245 single family dwelling units.
Phase 3. 365 single family dwelling units.
240 townhouse dwelling units.
1 junior high school on 25 acres.

Figure 3 shows the location of SPA3 phases 1, 2, and 3 as they relate to development phasing in SPA's 1 and 2.

29 The SPA 3 Project will have primary access via East "H" Street, Paseo Ladera, Paseo RAnchero, and East 'J' Street with secondary access via Paseo Del Rey and Telegraph Canyon Road. (See Figure 4.)

30 East "H" Street between I-805 and Otay Lakes Road is a 6-lane divided roadway running east/west.

Otay Lakes Road between East "H" Street and Bonita Road is 4 lanes and runs generally north/south.

Telegraph Canyon Road between I-805 and Paseo Ladera is a 4 lane divided east/west roadway. It is 2 lanes between Paseo Ladera and Otay Lakes Road. This roadway link is now being widened to 6 lanes.

I-805 is an 8 lane north/south freeway in the Project vicinity with interchanges at Telegraph Canyon Road, East "H" Street, and Bonita Road; and a separation structure at "J" Street.

27. Figure 2-2 on page 2-3 in the project description portion of the DEIR indicates the location of the three SPA areas. It is not necessary to reproduce this SPA boundaries figure in each and every issue analysis.

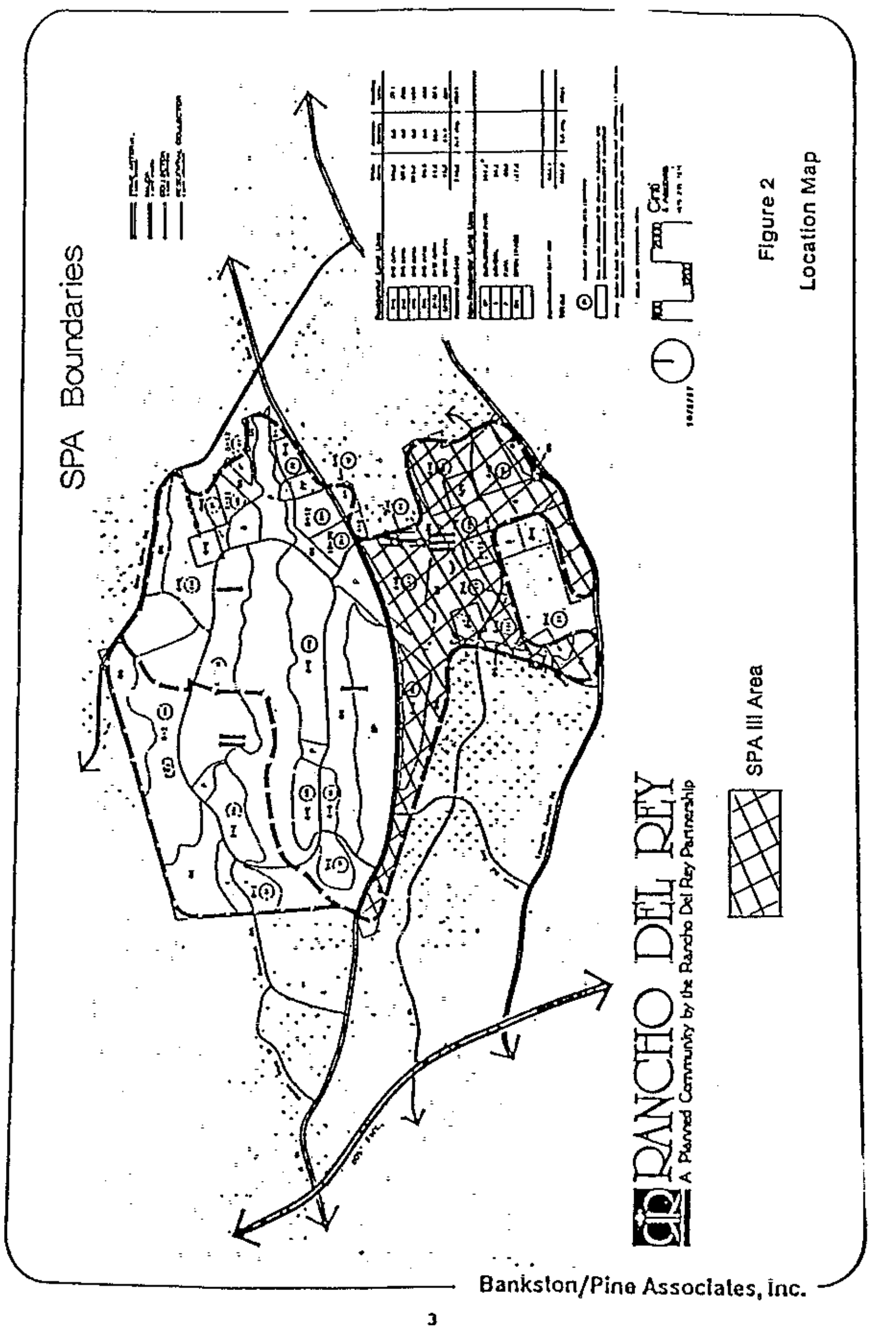
28. This discussion is not an existing condition, but rather a description of the proposed development. This description is included in the impact section of the EIR analysis.

29. Access for RDR SPA III is described on page 4-47 of the EIR.

30. Descriptions of the existing street network are included in the first full paragraph on page 4-48 of the EIR.

31. This figure is included as Figure 2-2 on page 2-3 of the EIR.

31



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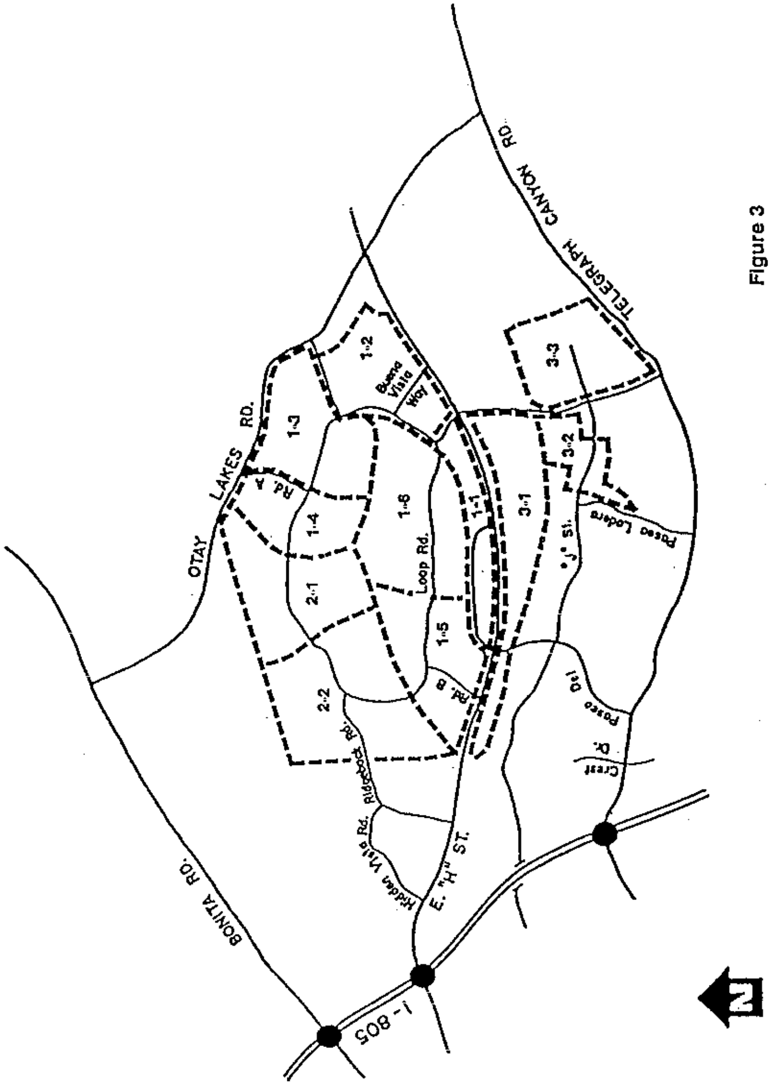

Figure 3

SPA I, SPA II, and SPA III Development Phases

00-00: SPA NO.-PHASE NO

Bankston/Pine Associates, Inc.

4

32. The impact analysis did not address each phase, but evaluated full buildout impacts. As such, this figure did not contribute to either the identification of the existing conditions or evaluation of the impacts. It was not included in the EIR.

33

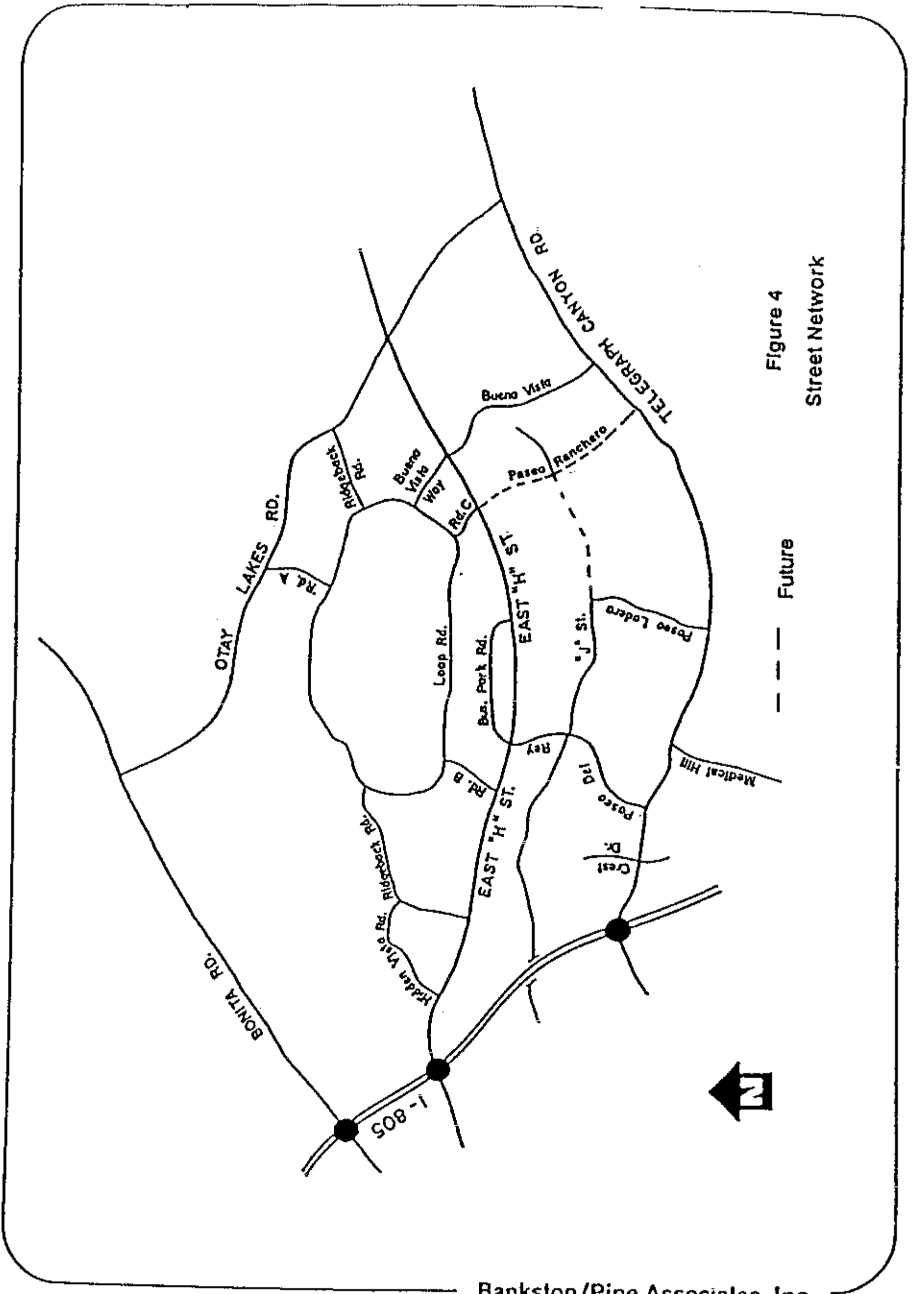

Figure 4
Street Network

33. This figure is included as Figure 4-6 of the EIR. It should be noted that "future roadways" are not a part of existing conditions. They have, however, been added to the graphic.

34

Traffic signals exist at the following intersections:

Telegraph Canyon Road at the I-805 Northbound And Southbound Ramp terminals, Crest Drive, Paseo Del Rey, and at Medical Center Drive.

East "H" Street/ I-805 Northbound Off-ramp.

East "H" Street/ Hidden Vista Road.

East "H" Street/Otay Lakes Road.

East "H" Street/Paseo Del Rey.

East "H" Street/Buena Vista Way.

Bonita Road and I-805 Northbound and Southbound Ramp terminals.

Bonita Road/ Otay Lakes Road.

Otay Lakes Road/Ridgeback Road.

Southwestern College Driveway and Shopping Center Entrance.

I-805 Southbound On-ramp.

Paseo Ranchero.

Otay Laks Road/Avenida Del Rey

~~and the I-805 northbound off-ramp, and at the Hidden Vista Road, Paseo Del Rey, Otay Lakes Road, and Buena Vista Way intersections. The I-805 northbound and southbound terminals at Bonita Road and the intersections are also signalized as well as the Bonita Road/Otay Lakes Road intersection, the Otay Lakes Road and Ridgeback Road intersection and the Southwestern College Driveway.~~

Figure 5 shows existing (1989) average 24 hour weekday traffic levels (ADT).

34. The list of traffic signals is included in the text of a paragraph on page 4-48 of the EIR.

35

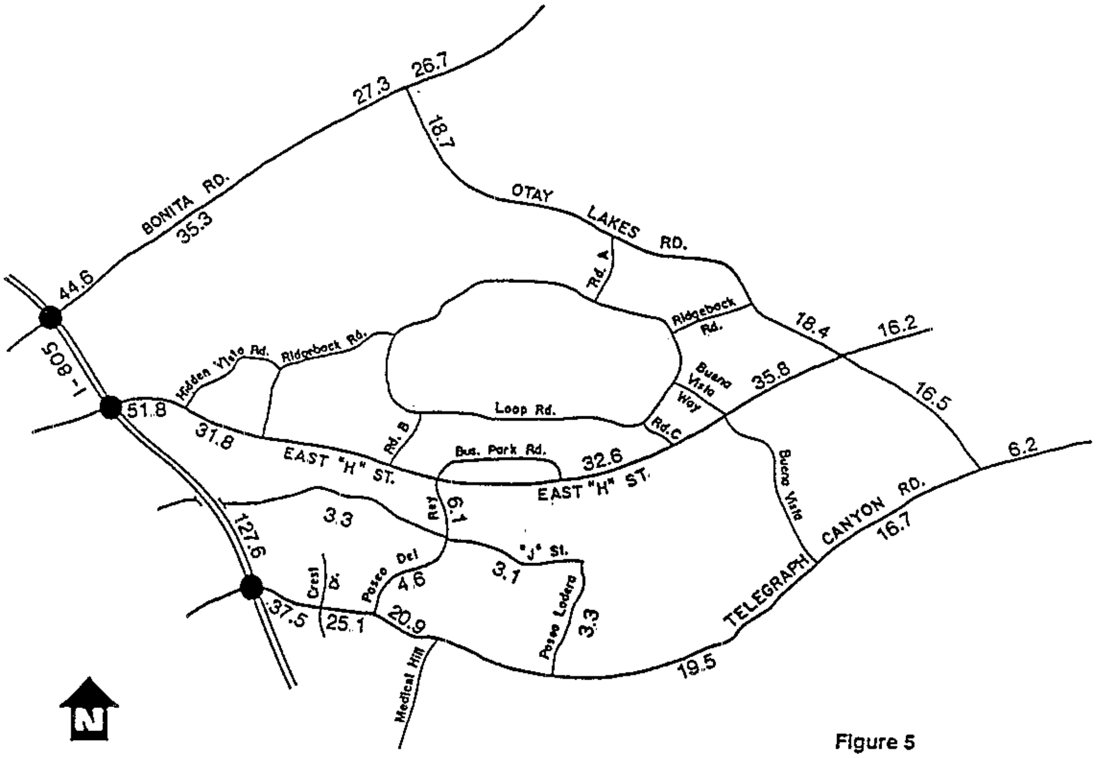

Figure 5

1989 Average Daily Traffic

35. This figure is included in the EIR as Figure 4-7 on page 4-50.

~~A compa[illegible] of the approved SPA I and now proposed SPA I, II and III is shown in Table 4-6. The principal difference between the approved and the proposed project is that 2,166 dwelling units are in the approved SPA I and 3,897 dwelling units are proposed for SPA I, SPA II and SPA III. This results in a corresponding increase in estimated traffic generation from 28,976 ADT with the approved SPA I increasing to 42,306 ADT with the proposed project.~~

Several assumptions were included in the analysis of potential impacts of the proposed project on the transportation system of Chula Vista. Guidelines and assumptions for this analysis include the following:

36 1. An interim roadway within the State Route 125 corridor in Chula Vista will not be completed within the time frame of this analysis by phase. Phases 1,2, and 3 are shown in Figure 3.

2. Traffic requirements related to City policy on intersection Level of Service are observed and maintained for this analysis. That is, all intersections are mitigated to operate at Policy Threshold Standards set by the City of Chula Vista.

37 3. East "J" street would not be extended easterly to Buena Vista Way but would end at a cul-de-sac east of Paseo Ranchero.

~~3~~ 4. **Phasing for the project is as follows:**

Phase 1.	**530 multi-family (retirement) dwelling units.**
Phase 2.	**245 single family dwelling units.**
Phase 3.	**365 single family dwelling units.** **240 townhouse dwelling units.** **1 junior high school on 25 acres.**

38 5. Cumulative traffic conditions are determined from the ECVTPP traffic model run for existing traffic plus traffic resulting from approved projects, projects with tentative maps filed and the Olympic Training Center.

The Threshold Policy regarding traffic seeks to provide and maintain a safe and efficient street system within the City by establishing standards for all signalized intersections. These standards are reproduced below:

39
- **Maintain level of service (LOS) "C" or better at all intersections city-wide, with the exception that LOS "D" may occur at signalized intersections for a period not to exceed a total of two hours per day. If these threshold levels are exceeded, the City's Growth Management Oversight Committee holds hearings to evaluate a moratorium on growth.**

36. This information is included on page 4-51 of the EIR.

37. Although not included in the list of assumptions, the project description for the proposed development includes the elimination of the East J Street link connecting Paseo Ranchero and Buena Vista from the Circulation Element (it would not be built and the existing section of East J Street would be a cul-de-sac). Because it is included in the project description, by definition it is an assumption of the traffic analysis. This new information has been included in the text of the Final EIR.

38. These data were not included in the technical report submitted to the City. It has been incorporated into the Final EIR.

39. The following text has been reproduced from the EIR, no response is required.

o Intersections west of I-805 may continue to operate at their current (1987) LOS, but shall not worsen.

o No intersection shall operate at LOS "F" as measured for the average weekday peak hour.

Notes to Standards as discussed in the threshold standards include:

1. LOS measurements shall be for the average weekday peak hour, excluding seasonal and special circumstance variations.

2. The measurement of LOS shall be by the ICU (Intersection Capacity Utilization) calculation utilizing the City's published design standards.

3. Intersections of City arterials with freeway ramps shall be excluded from this policy.

4. Circulation improvements should be implemented prior to anticipated deterioration of LOS below established standards.

Implementation measures delineated include:

Should the GMOC determine that the Threshold Standard is not being satisfied, then the City council shall, within 60 days of the GMOC's report, schedule and hold a public hearing for the purpose of adopting a moratorium on the acceptance of new tentative map applications, based on all of the following criteria:

1. That the moratorium is limited to an area wherein a causal relationship to the problem has been established; and,

2. That the moratorium provides a mitigation measure to a specifically identified impact.

Should a moratorium be established, the time shall be used to expeditiously prepare specific mitigation measures for adoption which are intended to bring the condition into conformance.

The City of Chula Vista has adopted a Transportation Phasing Plan (TPP) to establish an orderly progression of street improvements to correspond with the development of the Eastern Territories of which this project is a part. Street Improvements to maintain an acceptable level of service on the circulation system have been identified as necessary to serve the total development of the Eastern Territories as opposed to any individual development. The timing of each improvement is tied to a specific amount of development (number of dwelling units or gross acres of Industrial or commercial land uses) as opposed to the development of any particular parcel of land. Since the geographic order and intensities of development are not certain, the TPP is reviewed and revised annually to reflect current land development proposals and changing conditions in the community. The review process begins in January of each year and culminates in a noticed public hearing approximately April of each year, at which time the City Council may consider any modifications to the TPP requirements. As part of the Eastern Territories, Rancho del Rey SPA III is subject to the East Chula Vista Transportation Phasing Plan and to all current or future updates of the overall circulation improvements.

IMPACTS

40 Trip generation for project trips except for retirement community are based on The San Diego Association of Governments (SANDAG) trip generation rates. Retirement community trip rates are City of San Diego rates and recommended for use by the City of Chula Vista. Trip generation rates are as follows:

Residential	
Single Family	10 ADT/DU
Townhouses	8 ADT/DU
Retirement	4.5 ADT/DU
Junior High School	40 ADT/Acre

Trip generation for the proposed project is shown by phase in Table 1. As shown in Table 1, the proposed project is estimated to generate 11,405 ADT.

Project trip distribution was estimated by separating out SPA 3 assigned ADT from that generated by other sources. This was done by computing the ADT difference for the cumulative future condition without and with SPA 3 as estimated by separate ECTPP model runs. Figure 6 shows the percentage of project trips by direction as distributed by the model.

40. The trip generation information is included page 4-54 in the text of the EIR.

41

Table 1

Project Trip Generation

Phase	Land Use	A.M. In	A.M. Out	P.M. In	P.M. Out	ADT
1	530 Retirement D.U.'s	38	153	167	72	2385
2	245 S.F.D.U.'s	39	157	172	74	2450
3	240 Townhouse D.U.'s	30	121	133	57	1920
	365 S.F.D.U.'s	59	235	257	110	3650
	25 Acres Jr. High School	97	257	247	130	1000
TOTALS		263	923	976	443	11405

41. Table 4-6 has been revised to show the trips generated by land use and phase. An EIR is prepared for the general public and decision makers' use. In accordance with CEQA (Section 15140), "EIRs shall be written in plain language . . . so that the decision makers and the public can rapidly understand the document." As such, technical data which does not contribute to the understanding of the impacts and mitigation measures are often retained in the appendices.

42. This figure was included as Figure 4-9 on page 4-57 of the EIR.

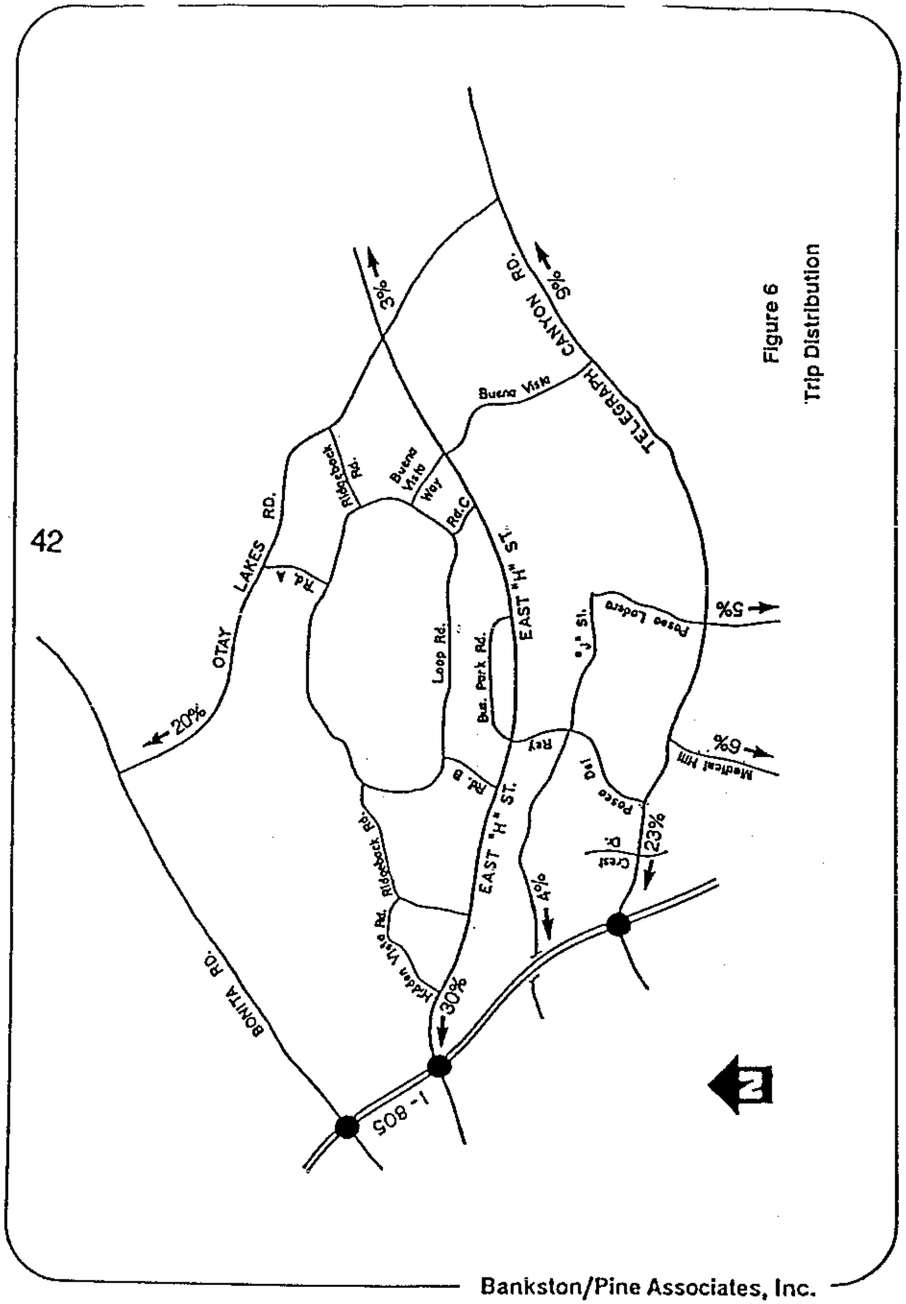

Figure 6
Trip Distribution

43 Using the trip distribution shown in Figure 6, project trips were assigned to the road system. These trips were then added to cumulative traffic volumes on the appropriate road segment. Average Daily Traffic based on ECVTPP model run output for the cumulative future without SPA 3 and with SPA 3 is shown in Figures 7a and 7b, respectively. SPA 3 only ADT is shown in parentheses in Figure 7b.

44 The 1989 ADT shown on Figure 5 for East "H"Street between I-805 and Ridgeback Road was counted by City staff during the week of February 6, 1989. These counts were taken at selected locations including East "H" Street and on Telegraph Canyon Road. It is apparent from these counts that approximately 4,000 ADT (Average Daily Traffic) has shifted from Telegraph Canyon Road to East "H" Street. This shift in traffic is believed to be due to the recent opening of the widened East "H" Street and the fact that congestion exists now on Telegraph Canyon Road. The congestion on Telegraph Canyon Road is a temporary condition which will be relieved when the current improvements are completed in 1990. At that time, the 4,000 ADT is expected to shift back to Telegraph Canyon Road from East "H" Street. Accordingly, Figures 7a and 7b reflect this temporary shift from Telegraph Canyon Road to East "H" Street and back again.

~~is apparent from these [illegible]~~

~~Telegraph Canyon Road to East H Street. This shift in traffic is believed to be due to the recent opening of the widened East H Street and the fact that congestion exists now on Telegraph Canyon Road. The congestion on Telegraph Canyon Road is a temporary condition which will be relieved when the current widening project on Telegraph Canyon Road is completed in 1990. At that time, the 4,000 ADT is expected to shift back to Telegraph Canyon Road from East H Street. Accordingly, figures 4-7 and 4-9 reflect this temporary shift from Telegraph Canyon Road to East H and back again.~~

~~The effect of passerby trips to/from the Terra Nova Plaza Shopping Center were accounted for by deducting ADT from forecasts on East H Street east of I-805. Passerby trips would primarily effect PM peak hour traffic. For example, a portion of residents living in the East H Street corridor east of I-805 traveling home from work may turn into the shopping center at any of the four entrances. After shopping they would continue on east via either of the three exists. This activity is expected to increase with time and reach a maximum in 1994, the end of the study time frame. Accordingly, 3000 ADT was deducted in 1994. This deduction only effects East H Street between I-805 and Hidden Vista Drive.~~

~~[illegible] Street would not be expanded to its General Plan length [illegible] would result in a cul-de-sac street. Of the 43.58 [illegible] proposed~~

4-56

43. The text of the EIR has been revised to reflect the information provided.

44. This information is included on page 4-56 of the EIR.

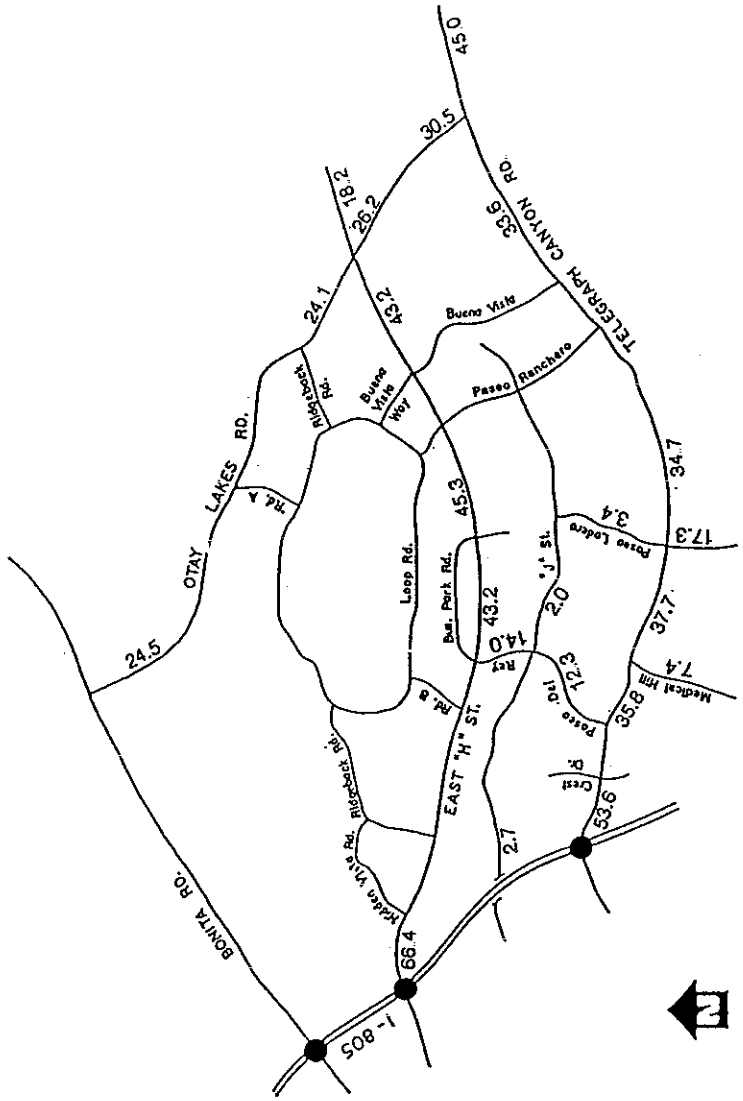

Figure 7a
Average Daily Traffic
Existing + Cumulative

Bankston/Pine Associates, Inc.

45. As noted in response 41, an EIR is prepared for the general public and the decision makers' use. In accordance with CEQA (Section 15140), "EIRs shall be written in plain language . . . so that the decision makers and the public can rapidly understand the document." As such, technical data which does not contribute to the understanding of the impacts and mitigation measures are often retained in the appendices.

46. This figure is included as Figure 4-10 on page 4-58 in the EIR text.

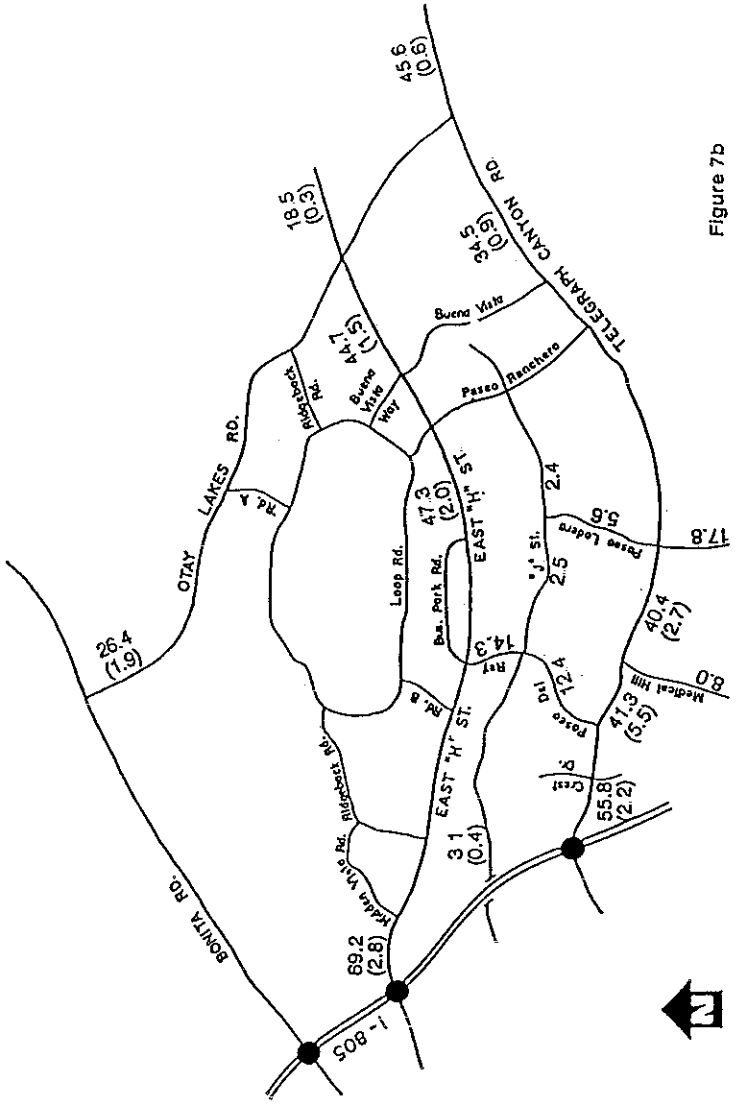

Figure 7b

Average Daily Traffic
Existing + Cumulative + Project

(oo.o) Project Only

Bankston/Pine Associates, Inc.

Table 4-7
LEVEL OF SERVICE AT RELEVANT INTERSECTIONS
RANCHO DEL REY SPA III

	PEAK HOURS									
	Existing		Existing + Cumulative		Existing + Cumulative + Phase 1		Existing + Cumulative + Phase 1 + 2		Existing + Cumulative + Phases 1 + 2 + 3	
Intersection	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
East H Street/Paseo del Rey	A	B	B	C	B	C	B	D	C	D
East H Street/East Business Park Road	-	-	B	A	C	C	C	C	C	C
East H Street/Paseo Ranchero	-	-	A	A	A	A	B	B	B	C
East J Street/Paseo del Rey	A	A	A	B	A	C	B	C	B	C
East J Street/Paseo Ladera	-	-	-	-	-	-	A	A	A	A
East J Street/Paseo Ranchero	-	-	-	-	-	-	A	A	A-B	A-C
Telegraph Canyon Road/ Paseo Ladera	A-E*	A-E*	B	B	B	B	B	B	B	C
Telegraph Canyon Road/ Paseo Ranchero	-	-	-	-	-	-	A-E*	A-E*	A	A

Source: Bankston/Pine Associates, Inc.

* Stop sign controls on minor street.

~~project approximately 210 trips would pass through the proposed intersection. It is anticipated that if there were no connection of East J Street to Buena Vista Way the 210 trips could easily reach this destination via Paseo Ranchero (Bankston, Keo, Lettec, Bankston/Pine).~~

47 Morning and afternoon Peak Hour LOS analyses were made for existing, existing + cumulative, existing + cumulative + Phase 1 of SPA III, existing + cumulative + Phase 1 + Phase 2 of SPA III, and existing + cumulative + Phase 1 + Phase 2 + Phase 3 of SPA III conditions. Existing conditions are based on current traffic volumes within the roadway facilities now in place. Existing + cumulative + Phase 1 + Phase 2 + Phase 3 of SPA III analyses assume Project and Cumulative projects build-out along with roadway mitigations.

Table 4-7 shows results from these analyses by LOS based on volume/capacity (V/C) criteria. LOS levels range on a continuum from LOS "A" through "F" with LOS "A" reflecting optimal conditions with minimal delays and LOS "F", total breakdown in traffic movement. LOS results based on analysis of signalized intersections indicate the overall level of service at which an intersection operates. Signalized intersection results are based upon volumes relative to intersection capacity ratios. Unsignalized intersection analysis results produce operational levels by movement. A range of levels by movement is shown in Table 4-7 when an intersection is analyzed as unsignalized.

As Table 4-7 shows, all intersections relevant to the project will operate at LOS "C" or better in the AM and PM peak hours with completion of project with the exception of the East H Street/Paseo del Rey intersection. The East H Street/Paseo del Rey intersection operates at LOS "D" (with a Volume/Capacity ratio of (V/C) 0.84) in the PM peak hour at completion of project. Volume/Capacity ratios as discussed earlier in this section are used to determine LOS A-F in the City of Chula Vista. According to the City of Chula Vista's Threshold Standards, LOS "D" is an acceptable LOS for up to two hours a day. The third highest hour cannot exceed a V/C ratio of 0.79 which is the upper limit for LOS "C". The third highest hour for this intersection was determined to be at a LOS "C". Therefore, all of the intersections shown on Table 4-7 meet this threshold.

47. The following information was reproduced from the EIR, no response is necessary.

in summary, with the mitigations recommended below along with improvements already under construction or in place, all facilities will operate at an acceptable level of service in accordance with City of Chula Vista Policy Threshold Standards.

MITIGATION/MONITORING

48 As identified in the Bankston-Pine study, certain mitigations are needed to accommodate project traffic. Recommendations are made to mitigate study area roadways to acceptable levels of service. In accordance with the development schedule shown in Table [illegible], the following site specific project related mitigation is needed. 1

Existing + Cumulative Mitigation Measures

- o Signalize Telegraph Canyon Road and Paseo Ladera.

Existing + Cumulative + Phase I of SPA III Mitigation Measures

- o Open up the south leg of East H Street/East Business Park Road intersection where Phase I traffic is assumed to enter and exit.

Existing + Cumulative + Phase I of SPA III Migitation Measures

- o Construct Paseo Ranchero between H Street and Telegraph Canyon Road.
- o Extend J Street to provide a through two-lane road between Paseo del Rey and Paseo Ranchero.
- o Place stop sign controls on Paseo Ladera at East J Street, East J Street at Paseo Ranchero, and Paseo Ranchero at Telegraph Canyon Road. (The intersection of Telegraph Canyon Road/Paseo Ranchero operates at LOS E for left turns out of Paseo Ranchero; however, low traffic volumes on the minor street do not meet signal warrants.)

Existing + Cumulative + Phase 1, 2, and 3 of SPA III Mitigation Measures

- o Signalize Telegraph Canyon Road and Paseo Ranchero.

49 Mitigation measures noted above relate to those roadway facilities significantly affected by ~~SPA I, SPA II, and~~ SPA III development. It is assumed that all streets internal to the project would be designed according to the classifications provided in the project description. The developer will be required to implement the above mentioned mitigation measures.

48. Table 4-6 has been revised to indicate the number of trips generated by phase of development.

49. The text of the EIR has been revised accordingly.

Mitigation measures beyond the nearby project environs resulting from either the project or cumulative projects traffic is being accounted for in the on-going East Chula Vista Transportation Phasing Plan (ECVTPP). The ECVTPP is being managed by the City of Chula Vista. The ECVTPP area will be reanalyzed on an annual basis to stay ahead of development and to insure that a comprehensive annual review is made to maintain acceptable levels of service on all affected intersections and roadways.

The City Engineer has informed the Rancho Del Rey Partnership that the SPA III EIR should indicate that SPA III, as in all other developments, is subject to any current or future updates of the City-wide Transportation Phasing Plan.

~~ANALYSIS OF SIGNIFICANCE~~ (Rewrite this section to conform to revised study.)

~~The proposed project involves the development of SPA III of the El Rancho del Rey Specific Plan area. For purposes of this traffic analysis, the future traffic to be generated by SPA I, SPA II, and SPA III combined were analyzed. The average daily traffic calculated to be generated is 43,581 which is 10,217 ADT greater than the 33,364 calculated for SPA I and SPA II. The total traffic to be generated was distributed to the circulation system and impacts were evaluated. The future traffic volumes on adjoining circulation system were calculated to be within the Threshold ADT determined by the City and no significant impacts are expected, provided that mitigation measures noted are implemented. It should be noted that current update of the ECVTPP using 1995 Regional Transportation Travel Data indicates that significant traffic impacts may result from the cumulative effect of all developer proposed land developments constructed prior to the completion of SR-125. The phasing of developments for Rancho del Rey SPA III should be in conformance with the East Chula Vista Transportation Phasing Plan to ensure that there is sufficient system wide roadway capacity to serve project plus existing plus other development traffic volumes. As part of Chula Vista's ongoing Traffic Monitoring Program, it should be noted that many of the above mitigations are on streets to be evaluated under the Transportation Phasing Plan and as such, further mitigations on these segments of streets could be required by the Phasing Plan to stay in conformance with the City's threshold standards.~~

50. This section has been revised to reflect the impacts of the most recent information available.

ATTACHMENT NO. 2

Cinti
& Associates
Land Planning

September 26, 1990

Mr. Craig Fukuyama
McMillin Communities, Inc.
2727 Hoover Avenue
National City, CA 92050

Subject: Comments on RDR SPA III Draft EIR

Dear Craig:

I have reviewed the Draft EIR being circulated for the SPA III project and offer the following comments/suggestions with page references for your consideration (any changes made in the body of the text should also be carried forward to the summaries):

51 S-1 Par. 2, last sentence: "The closure of East J Street..." This language infers that an existing street is being closed to traffic. In fact, the proposal is to eliminate a proposed link in the planned circulation system. This is an important distinction.

52 S-4 Cultural Resources. As detailed below, the mitigation program required for SPAs II and III is complete and published.

53 S-5 Public Services. The components of project which alleviate existing adverse infrastructure/service conditions should be documented. Especially the elimination of two sewer pump stations.

54 S-11 Biology. The comparison of these alternatives to the proposed project does not appear to address the off-site mitigation program component of the project mitigation plan.

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51. The text of the EIR has been revised to read: "The elimination of the East J Street link connecting Paseo Ranchero to Buena Vista will require a Specific Plan and General Plan Amendment.

52. The text of the EIR has been revised to read: "The mitigation program has been completed and approved by the City."

53. The public facilities impacts and mitigation measures are discussed in more detail in Section 4.12 Services and Utilities of the EIR. The Executive Summary is intended to focus on the major issues related to the impacts of the project without detailed explanation.

54. The reason for examining alternatives is to avoid impacts, when feasible, in such a way that off-site mitigation is unnecessary. The fact that the proposed project results in significant impacts requiring off-site mitigation measures indicates that an alternative evaluation is necessary. As noted on pages 6-8 and 6-16 of the EIR, the design alternatives would reduce impacts to biological resources by limiting development in certain sensitive resource areas. This translates into a decrease in impacts to biological resources on the project site. This would necessitate less mitigation.

Page

The EIR should evaluate the comparative merits of preservation of relatively small areas within a development project (Alt. Designs 1 & 2) versus the preservation of larger areas which are components of a large scale habitat conservation program.

55

S-12 Land Use/General Plan/Zoning. The discussion of the Design Alternatives suggests that no impacts to land use compatibility would occur even through a substantial reduction in development acreage is involved. The proposed project yields a total of 1,380 du with an average density of 6.6 du/ac. Alt. Design 1, at 1,380 du on 130 net acres, would have an average density of 11 du/ac and Alt. Design 2 would be 8.3 du/ac on 166 net acres. The development of Area D under Alternative 1 is extremely problematic. The loss of this 24 acre area would reduce the Alternative Design 1 area to approximately 106 acres which would yield an average density of 13 du/ac.

These density increases would definitely change the character of the community away from the single family detached neighborhood of the proposed project to one with a significantly larger single family attached/multi-family components. Such a character change could easily create significant land use conflicts and disrupt the established single family detached neighborhood pattern on the surrounding properties. Such increased density projects would not as readily fit in the community context for the project. Both alternatives would require General/Specific Plan Amendments for increased density, among other reasons.

56

S-18 Off-Site Alternatives. It should be noted that some or all of the off-site alternatives fail to meet some of the goals of the project (i.e., the "project" is more than simply building houses) which must be achieved on the project site and/or within the City limits: 1) implementing the City's General Plan; 2) implementing the El Rancho del Rey Specific Plan; 3) alleviating the current shortage of park and recreation facilities in the project area; 4) completing infrastructure links such as East J Street and Paseo Ranchero; and, 5) providing a junior high school site which is a current need of the school district. These issues affect both current and future residents of the project area. The school site is addressed in the alternatives discussion, but the other issues which are equally important should also be included under each appropriate topic.

55. The EIR evaluated land use and determined that with the incorporation of a GPA (and SPA) that the impacts due to the increased density were not significant from an environmental perspective. Any potential conflicts could be resolved with sensitive design and buffering. If the project proponent preferred a reduced density, the EIR evaluated a worst case scenario. As such, should this alternative be adopted, the subsequent density could be anything from that described in the EIR or less.

56. The discussion related to off-site alternatives has been necessitated by recent litigation referred to as the Goleta cases. It is recognized that when a project is in substantial conformance with the General Plan that the "relocation" of that project does not necessarily implement General Plan goals/policies or provide for the orderly development of infrastructure. At the time of the EIR preparation, the City had determined that to minimize concerns related to legal insufficiencies of the EIR that an alternative siting evaluation be included.

Page

Further, to the degree that each alternative site is not an "in-fill" location, potentially significant growth inducement impacts are associated with the extension of services to new areas. The EIR should identify such environmental impacts.

57 1-2 Par. 1. The SPA III Plan and tentative map are not required to receive Planning Commission "approval". The Commission recommends to the Council on these matters and the City Council is the only "approval" required.

58 2-4 Par. 1. The paragraph appears to be a series almost random sentences. Chapter I of the SPA Plan contains background information which could be utilized to clarify this information.

59 2.3 Par 1. Parcel CF-1, a community facilities site, should be mentioned in the project description. Provision of a such site for church, daycare, or public/quasi-public use is an important component of the neighborhood concept.

60 2.3 Par. 2. The issues involved with the Specific Plan Amendment and General Plan Amendment should be explained. The EIR should convey to the reader the necessity to change adopted plans (i.e., the area of conflict and what adopted policy/map/element must be changed or is proposed to be changed). Such information is provided in the SPA III Plan in Chapter I, Chapter II (density transfer), and Chapter III (East J Street). 61 Also, same comment as above on "closure" of East J Street.

62 2-5 Figure 2-3. This is not the proposed General Development Plan which is Exhibit 2 in the proposed SPA III Plan and is dated 7/23/90. In addition, the statistics in Table 2-1 are not correct. Exhibit 2 in the SPA III Plan includes the current statistics.

63 2-6 The description of the location of the 10 acre park is actually the location of parcel CF-1. An accurate description of the park location should be provided.

64 3-1 3.0 Par. 1. The project is 404.6 acres in size, not 408.4. The project site not located in the Eastern Territories Planning Area. It is within the Sweetwater Planning Area.

57. The text of the EIR has been revised to read: "The SPA III Plan and associated tentative map will require approval of the City of Chula Vista City Council."

58. This paragraph presents a chronology of the approval and construction record for the Rancho del Rey planning areas.

59. The EIR identified a two acre community facilities area as part of the project description. Page 2-6 of the EIR states, "The community facilities, which may include a church, day care or other quasi-public facility, includes 2 acres."

60. The necessity of changing adopted plans is not an EIR issue. The EIR is required to evaluate the environmental implications.

61. See response 51.

62. The figure has been replaced with the most recent figure provided and the table has been revised to reflect the most recent information available.

63. The text of the EIR has been revised to read: "The 10.0 acre park is located south of East J Street."

64. The text of the EIR has been revised to read: "The proposed 404.6-acre project site is located in the Sweetwater Planning Area of the City of Chula Vista and the ERDR Specific Plan Area."

Page

65 Par. 4. The Rancho del Rey Business Park is not 184 acres in size and the proposal to include an auto park in this area has been formally abandoned for some time. The Rancho del Rey SPA I General Development Plan indicates that the Employment Park is 102.4 acres (gross).

66 3-2 The EIR language infers that the EastLake project is in close proximity to the east of the project site. In fact this project is located 2 miles east of the site and has little, if any, influence on the project setting.

67 4-11 4.3 Landform Alteration/Aesthetics. This section does not discuss the provision of an open space buffer along East "H" Street which is a significant issue of consistency with the El Rancho del Rey Specific Plan.

68 4-14 par. 2, last line. Fill volumes are estimated to be 2.0 to 2.5 million cubic yards.

69 4-15 Figure 4-2. This is not the proposed Grading Plan, as it shows East "J" Street extended to Buena Vista Way. The proposed Grading Plan is included as Exhibit 14, dated 7/23/90, in the SPA III Plan.

70 4-38 First "o". Only one sewer lateral is proposed to cross open space and it is not located in an area identified as containing rare plant populations or bird habitat. If there are other specific impacts associated with its location, they should be detailed. See also mitigation measures.

71 4-45 Mitigation/Monitoring. The mitigation program for SPAs II and III has been completed and accepted by the City. The report, entitled *Data Recovery and Sampling Strategy Evaluation at SDi-9893*, was prepared by RECON and published August 1, 1990. The discussion of a mitigation/monitoring program is irrelevant at this point. The EIR should document the analysis and conclusions of the work which has been completed.

72 4-51 First "o". The City's Growth Management Oversight Committee is not authorized to hold hearings; any Growth Management hearings are held by the City Council based on input from the GMOC (see page 4-53 of the EIR).

4-63 4.8 Land Use/General Plan/Zoning. Because the project involves both General Plan and Specific Plan amendments, a

65. According to the final map for SPA I, the business park is approximately 100 gross acres. This includes about 83 gross acres buildable area and about 13 acres open space areas. The EIR text has been changed to reflect the current information.

66. The text of the EIR has been revised to state: "The Eastlake Community and commercial/light industrial park are located approximately two miles to the east of the site." The previous language was not intended to infer that Eastlake was adjacent to the Rancho del Rey site.

67. The section referred to is in the existing conditions. This is a Supplemental EIR. As a supplemental document, this EIR should focus on new information or differences between the previously reviewed project and the current plan. As such, the Supplemental EIR focuses more on parameters which were not addressed in the previous document. Adherence to the previous plans are not evaluated unless additional impacts would occur because of changing conditions.

68. The text of the EIR has been revised to read: "Fill volumes are estimated at approximately 4.0 million cubic yards, resulting in balanced volumes." This information is based on telephone conversations with the engineer for the project.

69. A revised grading plan has been incorporated into the EIR.

70. The text for this mitigation measure is taken from page 8 of the technical biological resources report which is included in Appendix C of the DEIR. If subsequent design has resulted in fewer impacts, the EIR has evaluated the worst case.

71. The EIR text has been revised to reflect that the City has reviewed and accepted the cultural resources mitigation program.

72. The language for the implementation of the GMOC is taken directly from the Traffic Section of the City of Chula Vista "Threshold Standards and Growth Management Oversight Committee", Final, dated November 17, 1987. Please note: ". . . then the City Council shall, within 60 days of the GMOC's report, schedule and hold a public hearing for the purpose . . . ." The sentence indicates that the City Council shall take responsibility for the holding of a hearing based on the GMOC's report.

<u>Page</u>

73 complete discussion of these issues should be provided in this section. However, these issues are mentioned in passing, if at all. It must be assumed that the existing plans had some level of logic and were adopted based on a balancing of environmental impacts and public policy benefits which would be potentially disturbed by amendments. The EIR should present sufficient information so that the reader can understand why the amendments are proposed and which environmental impacts are avoided or minimized through the amendments.

74 4-64 Figure 4-11. Given the overwhelming importance of the El Rancho del Rey Specific Plan as compared to the General Plan Land Use Map, in the evaluation of land use and adopted plan consistency, this discussion should emphasize the provisions of the Specific Plan. A greater level of detail regarding the Specific Plan would allow the reader to have a better understanding of the adopted planned uses for the project site and the areas of consistency/inconsistency between the proposed SPA Plan and the adopted Specific Plan.

75 4-65 Par. 1. The density transfers among the development parcels within SPA III are also the result of logical planning and an effort to avoid adverse land use/intensity conflicts with existing development. The EIR should provide a discussion of these aspects of the density transfer issue (see Chapter II of the SPA III Plan text).

76 Par. 3. The area south of the project site is Otay Ranch which is not zoned PC nor within the City of Chula Vista (see Otay Ranch off-site alternative). Sunbow is to the west and south.

77 4-67 The parcel statistics and descriptions provided on this and the following page are not consistent with those presented in the SPA III Plan, specifically on the Site Utilization Plan, Exhibit 5, dated 7/23/90. Examples: the SPA Plan indicates 1,380 units on 208.8 acres at an average density of 6.7 du/ac; parcel R-2 contains 151 units; parcel R-6 contains 232 units; there is no parcel R-8a in this proposal; OS-2 is 53.7 acres in size. Parcels OS-1, OS-2 and OS-6 comprise the southern leg of Rice Canyon which drains primarily to the west. While each "neighborhood" in SPA I and II was partially surrounded by open space, this is not true in SPA III (e.g., R-4 & R-5). This discussion should include parcel CF-1 which is currently not mentioned.

73. As noted in the EIR, the proposed project "is substantially in conformance with the ERDR Specific Plan and with existing and proposed land uses in the vicinity of the project site" (page 4-70). Because this is the land use section, the impacts associated with the Specific Plan Amendments focused on land use. Because the major land use issue related to the amendments was related to density transfer, the section focused on the impacts related to density.

74. This figure is designed to depict the off-site land uses as a comparison to the land uses proposed for the ERDR project. As such, the General Plan map was considered to present more information to the reader.

75. The EIR addresses the results of the changes on the environment; it is not intended to judge the reasoning behind the changes.

76. It is recognized that Otay Ranch lies south of the project moving eastward along Telegraph Canyon Road. However, it should be noted that the Planned Community of Sunbow lies south adjacent to the western segment of RDR SPA III along Telegraph Canyon Road.

77. The text of the EIR has been revised to reflect the changes in the Site Utilization Plan dated 7/23/90.

<u>Page</u>

78 The selection of lot sizes and residential character in various locations was carefully evaluated in preparing the SPA III plan to insure maximum compatibility at all edges. This is a very important environmental issue for an in-fill project and deserves discussion in the EIR. This issue of consistency/ compatibility of the proposed project with the existing adjacent uses becomes very important when comparing it to the Alternative Designs which cannot readily blend with the existing community because of their higher average densities.

79 4-77 Parks, Recreation and Open Space. City staff has indicated that one aspect of the need to provide more park acreage than that required by the adopted Specific Plan is the local shortage of facilities. This issue is not discussed in the EIR. This is another issue which becomes important in the evaluation of alternatives. Provision of park area in some other location, while consistent with a 3 ac./1000 population standard, will do nothing to alleviate the existing adverse situation in this area which the proposed project will directly address. The fact that this additional park acreage necessitates a specific plan amendment probably should be mentioned in this section. The need for additional parkland, both for existing and project residents, is a readily understandable as a reason for the proposed amendment.

80 The fact that the 2.0 park was a part of a balanced park system for the specific plan area as a whole and the subsequent credit determinations for SPA I which led to the "shortfall" would also be appropriate. This would help the reader understand why the City has determined that a net deficiency of 2.3 acres is not a significant impact (p. 4-78).

81 4-84 Par. 3. Planning for the middle school within SPA III would be the responsibility of the Sweetwater Union High School District. The discussion should note that the district is relying on this site to accommodate a new facility to serve existing as well as future needs. The district does not have an alternative site available in the short term to meet these needs.

4-84 Impacts. The EIR should identify the adverse existing conditions which will be improved (benefits) as well as the

78. The last paragraph on page 4-69 of the EIR addresses the compatibility of the project with adjacent land uses and the reasons for placement for some of the elements of development:

> The residential areas have been designed so that each 'neighborhood' area is at least partially surrounded by open space areas. Placement of the various residential units is compatible with surrounding land uses. Placement of the specialty housing along H Street was carefully planned because of the estimated generation of less traffic associated with seniors' housing. The neighborhood park, to be located on East J Street, will be easily accessed by residents of Rancho del Rey SPA III.

79. The EIR is concerned with the impacts of the project's development. The park acreage requirement for the project is based on the population generated by the project. The EIR text on page 4-78 states that the proposed project is expected to add approximately 4,101 new residents to the City of Chula Vista and the impact of the proposed project is as follows:

> The proposed development plan proposes a 10-acre park on-site. This would be located south of East J Street in the southeast corner of the proposed project site, adjacent to the junior high school site. Under the City of Chula Vista parkland dedication ordinance which requires 3 acres of parkland per 1,000 people, 12.3 acres of parkland would be required in SPA III. However, the City of Chula Vista has agreed to allow a net deficiency of 2.3 acres provided the project proponent provides a greater number of amenities in the park, and the adjacent junior high school site is utilized for after hours recreation.

80. The EIR addresses the "shortfall" in parkland dedication and shows how the project in and of itself provides for the deficiency. On page 4-79, the EIR text notes:

> Although under the proposed SPA III Plan there would be a deficiency of 2.3 acres of parkland, additional facilities would be provided through the use of the junior high school site, and there would not be a significant impact to parks.

81. The discussion of existing conditions indicates that the school district has begun "preliminary planning" for the middle school. The discussion in existing conditions does not focus on future conditions or future needs.

Page

82 negative potential impacts of the project. As noted above, the project will have clearly positive impacts to sewer service and schools by providing needed new facilities.

4-87 School. It should be noted that the seniors housing project, which is a significant fraction of the 1,380 total units would generate no school age children, if it is fully implemented. The EIR should note that the analysis presented here is a worst case scenario and assumes no seniors housing component. The seniors housing would be subject to the Mello-Roos tax however, potentially creating a financial benefit to the school districts (additional revenue without additional children to serve). 83

5-1 Compliance with Threshold Policy. The text in this section seems to confuse threshold compliance with project impacts. It is quite possible to have an impact while maintaining threshold compliance. The traffic threshold requires maintenance of specified intersection LOS; the threshold compliance discussion should make reference to LOS not ADT. The police threshold requires maintenance of specified response times not staffing levels. Changes in equipment or efficiency could easily change staff levels required to achieve the necessary performance. Same with fire protection. 84

6-1 Alternatives. The second paragraph in this section states that consideration of alternative sites is not necessary. Section 6.4 is a consideration of alternative sites. This inconsistency should be resolved. 85

6-2 No Project - Existing Specific Plan. Given that the features of the proposed project which require Specific Plan and General Plan Amendments avoid some potential adverse environmental impacts, this alternative which does not include these features would have some additional adverse impacts when compared with the proposed project. These issues should be discussed in this section. 86

6-3 Alternative Designs. As noted earlier, both of these alternatives have potentially significant land use/intensity compatibility impacts associated with them. Each alternative substantially reduces the amount of land devoted to residential development. So to maintain a project yield of 1,380 units, significantly higher average densities are required. These densities change the character of develop- 87

82. If the proposed project were to have negative impacts, the EIR would be required to evaluate those conditions. The EIR addresses the impacts of the project on existing conditions. If that development incorporates infrastructure or facilities to accommodate the growth, no adverse impacts will be assessed. The EIR is to make an objective assessment of the project impacts on existing services. If the project accommodates its growth through internal amenities, implementation of the project would not have an impact on the existing condition.

83. The text of the EIR has been revised to indicate that this is a worst case scenario because of the inclusion of the senior housing project.

84. The Compliance With Threshold Policy section is a summary of the conflicts and/or conformance with the policies. It is recognized that in the impact section for each issue that impacts may occur with or without relation to the threshold policies. The traffic section of the Compliance with Threshold Policy of the EIR has been revised to read "within the Threshold levels of service (LOS) determined by the City" (page 5-1). Accordingly, the fire and police sections have been revised to reflect the specified response times necessary to meet the policy limits.

85. The text of the EIR has been revised.

86. Given that the substantive differences between the proposed project and the adopted ERDR Specific Plan are the density transfer and the elimination of the East J Street link connecting Paseo Ranchero and Buena Vista, development under this alternative would have similar impacts to the project. The text has been revised to indicate that this alternative has increased impacts to biological resources and landform alteration associated with the extension of East J Street. In addition, this alternative has a smaller neighborhood park and no community facility.

87. As noted in the EIR on pages 6-3 and 6-11, the goal of the alternative designs was to reduce impacts to biological resources and landform alteration. On pages 6-9 and 6-17, the EIR text notes that "Adoption of this alternative would not be in conformance with the adopted ERDR Specific Plan." See response 54.

Page

ment by increasing the amount of attached and multi-family units which are inconsistent with surrounding projects as well as Specific Plan designations. Potential incompatibility impacts associated with each of these alternatives should be clearly identified.

88 The biological analysis for each of these alternatives should compare and evaluate the conservation of on-site areas, which will be impacted by adjacent development (as discussed in the biology analysis of the proposed project), to the off-site mitigation proposed by the project. The off-site mitigation component does not appear to enter into these discussions, yet it is a critical factor to be considered. It should also be noted that some disturbance in the areas taken out of development will occur in order to extend roads and infrastructure.

89 6-24 Otay Ranch Alternative. Since there is no adopted plan for Otay Ranch, the reader should be informed as to which development plan is being compared to the SPA III development concept. Because the site is not within the City, the planning analysis should describe fully the required steps for project development (in the City or County?), annexation to service agencies, GPA, zone change, etc. This alternative would also impact the current City/County Task Force Planning Program for the Otay Ranch as a whole. Extension of infrastructure to this area would have growth inducing impacts and additional expense, and development of this site would do nothing to solve the infrastructure and facilities problems existing in the area of the proposed project site. The EIR should include these facts in its discussion of this site alternative.

Many of these same impacts/shortcomings are associated with the other alternative sites.

88. Under CEQA, the alternatives are designed to evaluate the impacts of the proposed project on the property. The alternatives are designed to evaluate ways in which the impacts can be avoided. Off-site mitigation is one alternative to allow for development in spite of impacts, just as other design changes provide additional alternatives for development. See response 54.

89. Under CEQA and Goleta II, financial considerations and ownership of the property being studied as an alternative site are not issues which preclude evaluation. Additionally, concerns related to relatively routine planning processing should not eliminate an alternative from consideration. The issue is whether the parcel is amenable to meet most of the goals of the proposed project.

This concludes our comments. If you have any questions regarding them, please give me a call.

Sincerely,
CINTI & ASSOCIATES

Jay Kniep
Associate

ATTACHMENT NO. 3

RECON Regional Environmental Consultants

September 24, 1990

Mr. Craig Fukuyama
McMillin Development
2727 Hoover Avenue
National City, CA 92050

Reference: Comments on the SPA 3 EIR (RECON Number R-1559E)

Dear Mr. Fukuyama:

I have reviewed the biology section of the SPA 3 Environmental Impact Report (EIR) and find it to be substantially factual and accurate. In reviewing the mitigation measures, I do have a concern regarding the sixth itemized measure concerning the mitigation of California gnatcatcher habitat (page 4-39).

90 The language which requires the acquisition and conservation of either (1) off-site property of specific minimum size and resident gnatcatcher population density, or (2) the on-site Specialty Housing area, eliminates the candidacy of potential conservation sites which might have higher conservation value to California gnatcatcher while not meeting the requirements of the measure's language.

Resolution of this concern might be accomplished by adding a new item "d" to the measure stating:

> d. Or acquire and preserve an off-site area of coastal sage scrub habitat acknowledged by the U.S. Fish and Wildlife Service and the City of Chula Vista to equal or exceed the conservation goals of the options listed above.

This would allow the acquisition of properties in satisfaction of this mitigation measure which might be recognized critical links in natural open space design, which do not meet the specific area or density requirements of the first three options, while providing for continued U.S. Fish and Wildlife Service involvement.

Please call if you have questions.

Sincerely,

Cameron Patterson
Director, Biological Services

CCP:st

1276 Morena Boulevard • San Diego, CA 92110-3815 • (619) 275-3732 • FAX (619) 275-3619

5099 East Grant Road, Suite 301A • Tucson, AZ 85712 • (602) 325-9977 3050 Chicago Avenue • Riverside, CA 92507 • (714) 784-9460

90. Text of the EIR has been revised to reflect this additional option for mitigation of impacts to the California gnatcatcher and Diegan coastal sage scrub habitat. It is recognized that the alternative measure can only be implemented with the full concurrence of the City of Chula Vista and the Service.

ATTACHMENT NO. 4

File: 671.40

VIA FAX

September 25, 1990

Craig Fukuyama
McMillin Communities
2727 Hoover Avenue
National City, CA 92050

SUBJECT: Review Comments to the Draft EIR dated August 1990 for Rancho Del Rey

Dear Craig,

Following are our comments to the draft EIR listed by Page Number:

	PAGE NO.	COMMENTS
91	4-9	The last sentence of the second paragraph of this page should be deleted and the following added: "Other smaller existing storm drains include a 24-inch pipe in Buena Vista Way at East "J" Street; a 24-inch pipe in Paseo Ladera at Paseo Entrada; and a 24-inch pipe in Forester Glenn Drive at East "J" Street.
92	4-14	Second Paragraph. This paragraph discusses maximum cut and fill slopes and volume of earthwork for the project. The maximum cut slope will be 25 feet located in the vicinity of the community facility east of Paseo Ladera and the maximum fill slope will be 70 feet located in the vicinity of the specialty housing area south of East "H" Street. The total cut volume and fill volumes for the project are estimated at 4.0 million cubic yards each including 1.6 million cubic yards for the specialty housing area.
93	4-14	Last paragraph, second to last sentence should be revised to read: "Many of the large manufactured slopes would be visible to motorist transiting along East "H" Street, Telegraph Canyon Road, and Paseo del Rey.

91. The text of the EIR has been revised to include the added information.

92. The text of the EIR has been changed to reflect the most recent information on grading and cut/fill volumes. This latest information was not made available when the EIR was being prepared. The information in this comment has been supplemented with subsequent conversations with Mr. William Dick, the author of this letter. The maximum cut slope of 25 feet is located in the vicinity of the middle school northeast of the intersection of Paseo Ranchero and Telegraph Canyon Road. The lower 25 feet is cut and the upper 32 feet is fill. The effect of the combined cut and fill will give the appearance of a 57 foot manufactured slope.

    The slope located in the vicinity of the community facility east of Paseo Ladera is actually composed of a 20 foot cut with top fill of 19 feet which gives the appearance of a manufactured slope of about 40 feet.

    The EIR text has been revised to reflect the total estimate of cut and fill as approximately 4.0 million cubic yards, as noted in the comment.

93. Text of the EIR has been revised to reflect this information.

94 4-35 Fourth paragraph. The first sentence should be revised to read: "The proposed access road (Paseo Ranchero) that connects East "H" Street and Telegraph Canyon Road through SPA III project site would cross the south leg of Rice Canyon, a major drainage channel on the site."

95 4-35 Sixth paragraph. The second sentence should be revised to read: "The City of Chula Vista requires that each major storm drain outlet be accessible by a road."

96 4-82 The discussion in the third paragraph should be continued as follows: "In 1990 the City of Chula Vista entered into an agreement with Eastlake Development Company allowing them to temporarily divert pumped sewage flows to the Telegraph Canyon Road trunk sewer until the necessary gravity systems are developed. The diversions could affect the capacity of the Telegraph Canyon Road sewer, in which case, the agreement also provides for Eastlake Development to increase the capacity of the affected sewers when required."

97 6-2 First paragraph. The fourth sentence should be revised to read: "In addition, beneficial affects associated with the project, including completion of important circulation element streets, provisions of housing tax revenues and construction of a junior high school site would not be achieved."

98 6-6 Second paragraph. This section of the EIR discusses Alternative Number 1 Site Development. Area D is an area now designated open space laying along Telegraph Canyon Road west of Paseo Rancho. This paragraph discusses development potential for the Area D site, however, it fails to recognize that the site abuts Telegraph Canyon Road and a major drainage channel which occupy most of the flat portions of the site. The remainder of the site is steep hillside slopes abutting the existing residential property. The site has no development potential beyond open space designation.

99 6-6 Insert the following sentence after the fourth sentence in the sixth paragraph: "Elimination

94. Text revisions have been made to include the name of the drainage which the road is crossing.

95. The word "major" has been incorporated into the text of the EIR as a point of clarification.

96. This updated information which was not available at the time the EIR was prepared has been incorporated in the revised text of the Final EIR.

97. The text of the EIR has been revised to include the beneficial effect of the completed circulation element improvements.

98. Since the riparian vegetation is not associated with the drainage channel, no impacts to sensitive biological resources will result, and adequate setbacks will mitigate potential problems with the impacts to the drainage area. Adequate setbacks from Telegraph Canyon Road would mitigate potential noise impacts and access to the area would be via Paseo Ranchero to eliminate the potential traffic impacts of taking access along Telegraph Canyon Road.

99. Adoption of this alternative would create an imbalance in the amount of cut and fill material resulting in the need to export or import soils. This information has been incorporated into the EIR.

of development in Area E would reduce the amount of canyon placed fill requiring a significant amount of soil export in order to develope Area B."

100 6-16 Second paragraph. This paragraph should also include discussion on the gravity sewer to be built through Area A even if the area is not developed. Also, see comments to the biology section discussion of Alternative 1 on Page 6-8.

Following are some general comments to the EIR:

101 1. The overall tone of the EIR would suggest that either one of Alternatives Number 1 or 2 would be preferred over the proposed project. In addition, the EIR fails to adequately portray the importance of the public facilities built with SPA III that are required irregardless of the proposed development here. Those facilities include the completion of East "H" Street and Paseo Ranchero and the elimination of existing pump stations and force mains which were built in anticipation of completion of an ultimate gravity sewer network with the SPA III plan. Elimination of any of these facilities would be critical to the ultimate development of the community and the impact of their not being constructed should also be analyzed.

102 2. Enclosed with this letter is a revised version of the mitigation and monitoring program marked to reflect the time frame of mitigation as discussed in the EIR.

The above constitutes our comments to the EIR.

Very truly yours,

William R. Dick, P.E.
Project Manager

WRD/cw

Enclosures

c: Keith Keeter
Thom Fuller
Gary Cinti

100. Construction of the gravity sewer may result in minimal impacts in Area A. The EIR text has been revised to reflect this information.

101. If the project is not developed, many of the facilities mentioned will no longer be needed. If off-site development requires improvement to these facilities, it would be the responsibility of the City/developer to ensure the improvements at that time.

102. Comment noted and the Mitigation and Monitoring Program has been changed except where noted by response.

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM
(Continued)

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete,Dat and Verific
Parks, Recreation and Open Space					
Provide a detailed concept plan for proposed park.	TM	Applicant	Chula Vista Department of Parks and Recreation and Parks and Recreation Commission		
Design 4:1 slopes or less for park.	TM	Applicant	Chula Vista Department of Parks and Recreation		
Enter in an agreement with the Sweetwater Union High School District and the City of Chula Vista to insure public access to the recreational amenities of the proposed junior high school which would include soccer fields, basketball courts, and tennis courts.	TM	Applicant	Chula Vista Department of Parks and Recreation		
103 Provide funding for the difference in cost between facilities built to school standards and facilities built to City standards.	~~TM~~ FM	Applicant	Chula Vista Department of Parks and Recreation		
Design and construct recreational facilities to City of Chula Vista standards and in consultation with City staff.	~~TM~~ FM	Applicant	Chula Vista Department of Parks and Recreation		
Design park so that it would not be isolated with only backs of buildings facing onto the park.	TM	Applicant	Chula Vista Department of Parks and Recreation		
Design park to provide adequate visibility from East J Street.	TM	Applicant	Chula Vista Department of Parks and Recreation		
Provide access to the school parking lot for overflow parking from park.	TM	Applicant	Chula Vista Department of Parks and Recreation		

103. The City Park and Recreation Department asked that the following two measures remain as conditions of the Tentative Map (Pers. comm., May, 1990).

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM
(Continued)

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete, Dated and Verified
Cultural Resources (Continued)					
Prepare reports detailing the investigations of both sites and submit to the City of Chula Vista, SDSU Clearinghouse, and The Museum of Man.	TM	Applicant/Cultural Resource Consultant	Chula Vista Department of Planning		
Transportation					
104 Signalize Telegraph Canyon Road and Paseo Ladera.	FM ~~TM,~~ Phase 1	Applicant	Chula Vista Department of Planning		
Open south leg of East H Street/East Business Park Road intersection where Phase 1 traffic is assumed to enter and exit.	~~TM~~ FM PHASE I	Applicant	Chula Vista Department of Planning		
Construct Paseo Ranchero between H Street and Telegraph Canyon Road.	~~TM, Phase 2~~ FM PHASE 2	Applicant	Chula Vista Department of Planning		
Extend J Street to provide a through two-lane road between Paseo del Rey and Paseo Ranchero.	~~TM,~~ Phase 2 FM	Applicant	Chula Vista Department Planning		
Place stop sign controls on Paseo Ladera at East J Street, East J Street at Paseo Ranchero, and Paseo Ranchero at Telegraph Canyon Road.	~~TM,~~ Phase 2 FM	Applicant	Chula Vista Department of Planning		
Signalize Telegraph Canyon and Paseo Ranchero.	~~TM,~~ Phase 3 FM	Applicant	Chula Vista Department Planning		
Complaince with ECVTPP for current and future updates to maintain acceptable levels of service on all affected intersections and roadway segments.	~~TM~~ ALL FM	Applicant	Chula Vista Department Planning/City Traffic Engineer		

104. The City Assistant Traffic Engineer recommended that all transportation measures be placed as conditions of the Final Map (Pers. comm., May, 1990).

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM
(Continued)

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete, Date and Verified
Biology (Continued)					
105 Record a conservation easement with an agency of appropriate jurisdiction over the off-site mitigation area if ownership of the mitigation site does not transfer prior to issuance of a grading permit.	Grading Permit ≤ FM	Applicant	Chula Vista Department of Planning		
Implement gnatcatcher mitigation program.	TM	Applicant	Chula Vista Department of Planning		
Acquire and preserve 0.4 acres of vernal pool associated lands that is acceptable to the City of Chula Vista and the USFWS.	Grading Permit	Applicant	Chula Vista Department of Planning		
Prepare and implement vernal pool restoration plan if mitigation site requires restoration.	Grading Permit	Applicant/Biological Consultant	Chula Vista Department of Planning		
Prohibit grading in RDR SPA III vernal pool area prior to accomplishing the off-site acquisition.	Grading Permit	Applicant	Chula Vista Department of Planning		
Fence off vernal pool mitigation site with a six-foot chain-link fence immediately upon acquisition of the site.	Grading Permit	Applicant	Chula Vista Department of Planning		
Secure a U.S. Army Corps Nationwide permit.	~~TM~~ GP	Applicant/Biological Consultant	Chula Vista Department of Planning		
Dedicate the off-site acquisition/mitigation vernal pool site to the appropriate public agency.	Grading Permit	Applicant	Chula Vista Department of Planning		
Implement vernal pool mitigation program.	~~TM~~ GP	Applicant/Biological Consultant	Chula Vista Department of Planning		
Secure a Streambed Alteration Agreement as stated under Section 1602-1603 of the California Fish and Game Code, for proposed access road (Paseo Ranchero).	Grading Permit	Applicant/Biological Consultant	Chula Vista Department of Planning		

105. City Planning staff asked that the measure be met "Prior to the issuance of a grading permit" (Pers. comm., May, 1990).

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM
(Continued)

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete, Dated and Verified
Biology (Continued)					
Design and implement monitoring program to determine the effect of the SPA III development on the population of California gnatcatchers.	Final Map	Applicant/Biological Consultant	Chula Vista Department of Planning		
Design and incorporate project-wide revegetation plan that includes a transplant program for cacti and a five year maintenance and monitoring plan.	Final Map	Applicant/Biological Consultant	Chula Vista Department of Planning		
Acquire and preserve an area of coastal sage scrub habitat to reduce impacts to the California gnatcatcher according to conditions established in the SPA III EIR.	TM	Applicant/Biological Consultant	Chula Vista Department of Planning		
Evaluate mitigation site for use by California gnatcatcher.	TM	Applicant/Biological Consultant	Chula Vista Department of Planning		
Approve gnatcatcher mitigation site.	TM	Chula Vista Department of Planning, USFWS, CDFG	Chula Vista Department of Planning		
Insure that gnatcatcher mitigation site is within, adjacent to or connected by an appropriate landscape corridor to a larger area or interconnected set of patches of habitat that are currently in public ownership or designated open space or reasonably expected to remain in a natural state. The habitat would be 800-1,000 acres.	TM	Applicant/Biological Consultant	Chula Vista Department of Planning		
106 Prohibit grading activities which would adversely affect the habitat of the specialty housing area.	~~TM~~ G-P	Applicant/Biological Consultant	Chula Vista Department of Planning		
Dedicate off-site acquisition/mitigation site to the responsible public agency.	Grading Permit	Applicant	Chula Vista Department of Planning		

106. City Planning staff asked that the measure be met "Prior to the issuance of a grading permit" (Pers. comm., B. Reid, 1990).

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM
(Continued)

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete, Dated and Verified
Air Quality (Continued)					
Implement mitigation measures to reduce potential for air pollution "hot spots" at intersections.	TM	Applicant	Chula Vista Department of Planning		
Adhere to recommendation made by the 1982 SIP regarding local participation in air emission reduction measures and the forthcoming San Diego Air Quality Plan.	TM	Chula Vista Department of Planning	Chula Vista Department of Planning		
Biology					
Monitor grading to reduce impacts to coastal sage scrub habitat.	Grading Permit	Applicant/Biological Consultant	Chula Vista Department of Planning		
Hand clear fire buffers that encroach into open space areas.	Grading Permit	Applicant	Chula Vista Department of Planning		
107 Revegetate open space areas and areas impacted by sewer laterals with coastal sage scrub species native to the site.	~~TM~~ GP	Applicant/Biological Consultant	Chula Vista Department of Planning		
Insure that biologist has been retained to devise revegetation program and that a five-year revegetation program has been designed that is acceptable to City staff.	~~FM~~ GP	Applicant	Chula Vista Department of Planning		
Position sewer laterals to cause minimum impacts to biological resources.	~~Occupancy Permit~~ GP	Applicant/Biological Consultant	Chula Vista Department of Planning		
Locate staging areas for construction to minimize impacts to sensitive biological resources.	~~Occupancy Permit~~ GP	Applicant/Biological Consultant	Chula Vista Department of Planning		
Stake sewer installation corridors prior to design finalization. Adjust corridors if requested by monitoring biologist.	~~Occupancy Permit~~ GP	Applicant/Biological Consultant	Chula Vista Department of Planning		

FM = FINAL MAP

107. City Planning staff asked that the measure be met "Prior to issuance of a building permit" (Pers. comm., B. Reid, 1990).

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM
(Continued)

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete,Dates and Verified
Geology and Soils (Continued)					
Insure that temporary slopes meet the minimum requirements of applicable Health and Safety Codes.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Insure that outer portion of fill slopes are composed of compacted granual soil fill.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Bring site to final subgrade elevations with structural fill compacted in layers.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Monitor for presence of groundwater.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
108 Remove alluvial/colluvial deposits in the canyons adjacent to the proposed toes of fill slopes.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Undercut portion of transition settlements a minimum of three feet and replace by low expansive granual soils.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Grade site to allow soils within three feet of finish grade to possess an expansion index of less than 50.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Include the design and construction recommendations on the final grading and foundation plans.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Review final grading plans.	Grading Permit	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Monitor on-site grading to confirm soil conditions as anticipated.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
109 Provide testing and observation report to verify that design and construction recommendations are completed according to grading plans.	Building Permit	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		

108. The task has been revised to read: "Design for the removal of alluvial/colluvial deposits in the canyons adjacent to the proposed toes of fill slopes" (Pers. comm., B. Reid, 1990).

109. City Planning staff asked that the measure be met "During construction" (Pers. comm., B. Reid, 1990).

RANCHO DEL REY SPA III
MITIGATION AND MONITORING PROGRAM

Task	Time Frame	Responsible for Task	Responsible for Verification	Date of Completion	Mitigation Complete, Dated and Verified
Geology and Soils					
110 Approve and evaluate fill material at least two days prior to fill importation.	Tentative Map (TM)	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Evaluate cut and fill slopes for conformance with specifications established by geotechnial report.	TM	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Analysis and evaluation of appropriate location of stabilization fills.	~~TM~~ Grading Permit (GP)	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Install subdrains at the base of fills in canyons and draws or over areas of potential seepage. Determine locations during grading.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Conduct grading in accordance with City of Chula Vista Grading Regulations.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Adhere to uniform building code for construction.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Design foundations, slabs, footings, and retaining walls in accordance with specifications identified by geotechnical report.	TM GP & BP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Review and approve final grading and foundation plans for the project site.	~~TM~~ GP + BP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Place bentonitic clays used as fill material a minimum of 10 feet below finished grade and 15 feet inside fill slopes.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Place expansive soils correctly.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		
Move fill not removed by planned grading operations to firm natural ground.	~~TM~~ GP	Applicant/Geotechnical Consultant	Chula Vista Department of Engineering		

GP = Grading Permit
BP = Building Permit

110. See response 106.

ATTACHMENT NO. 5

McDONALD, HECHT & SOLBERG
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS
ATTORNEYS AT LAW
SUITE 100, GREAT AMERICAN BUILDING
600 "B" STREET
SAN DIEGO, CALIFORNIA 92101

TELEPHONE
(619) 239-3444
TELECOPIER
(619) 232-6828

A. CARL MCDONALD*
[illegible] JOHN HECHT*
DARRYL D. SOLBERG*
JEROLD H. GOLDBERG*
PAUL E. ROBINSON*
THOMAS C. NELSON*
ROBERTA S. ROBINSON*
DAVID W. BAGLEY, III*
CHARLES R. GILL*
MICHAEL J. MAHER
ANN Y. MOORE
RICHARD A. SCHULMAN
DAVID N. PUGH
LAURI CROCE STREETER

*DENOTES A PROFESSIONAL CORPORATION

September 21, 1990

VIA TELECOPIER/U.S. MAIL

Mr. Craig Fukuyama
McMillin Communities
2727 Hoover Avenue
National City, California 92050

Re: <u>McMillin/Rancho Del Rey/Draft Environmental Impact Report for SPA III</u>

Dear Craig,

You requested that we review and provide our comments to the above referenced Environmental Impact Report (EIR) for SPA III.

You provided for our review the EIR. Subsequent to receipt of the document and our initial review, we discussed this matter with you and Betty Dehoney of P&D Technologies. During our telephone conversations, we indicated a concern that the EIR does not consider the impact that the proposed amendment of the Specific Plan will have previous development entitlements.

111 We suggest that written comment be provided to the City which questions if the change in the level of service standard of the Specific Plan necessitates any reconsideration or further environmental analysis for projects which have already been approved within SPA I and SPA II. Pursuant to our telephone conversation with Ms. Dehoney, she indicated that in her opinion, the EIR is adequate as it relates to the level of service issue and that no further environmental review is necessary. We will be more comfortable with Ms. Dehoney's opinion if the response to the written comments specifically address this issue and that it is adequate to meet the requirements of the California Environmental Quality Act.

112 Our second area of concern relates to specific provisions of the text. Specifically, on Page S-12 (Table S-2) under the "transportation" issue, in the columns designated "alternative design 1" and "alternative design 2", the following sentence occurs:

> "No full length General Plan of East "J" Street would occur."

We are unable to determine the intent or meaning of the above referenced sentence.

111. The EIR evaluated impacts associated with the implementation of SPA III and associated specific plan amendments. It is assumed that the issue relates to previous environmental documentation that required an LOS C or above. This EIR mandates that the project adhere to threshold policies which currently do allow LOS D for specified time periods. Because this is a Supplemental EIR which evaluates the differences in existing conditions and thresholds, the impact assessment fully documents that this project will adhere to current threshold determination of significance. At the present time, the threshold for significance in traffic issues is the City's Threshold Policy. This policy was not in force when the original impact evaluation was completed.

112. The text of the EIR has been revised to state that "East J Street will not be extended in accordance with the Circulation Element of the General Plan."

113 The EIR discusses grading for SPA III in several different locations. Specifically, on Page 4-4 under "impacts" a reference is made to "conventional mass grading techniques involving the cutting of ridge tops and filling of canyons". We suggest that a comment to the draft EIR be submitted to soften the references throughout the document to the mass grading of the site (See also Page 4-14).

We hope this information is of assistance to you in preparing your response to the draft EIR. Should you have any questions or wish to discuss this matter, please do not hesitate to call.

Sincerely yours,

Charlie
Charles R. Gill
McDONALD, HECHT & SOLBERG

CRG/mq

113. The text of the EIR on page 4-4 has been revised and the word "mass" has been deleted in reference to the grading techniques. As regards page 4-14, the grading section remains the same as the amount of dirt being moved is 4.0 million cubic yards or approximately 10,000 cubic yards per acre. This is a significant amount of landform alteration.

ATTACHMENT NO. 6

GEOCON
INCORPORATED
Geotechnical Engineers and
Engineering Geologists

File No. 04228-03-01
September 21, 1990

McMillin Communities Incorporated
2727 Hoover Avenue
National City, California 92050

Attention: Mr. Craig Fukuyama

Subject: DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)
SPA III
SAN DIEGO COUNTY, CALIFORNIA
MODIFICATION TO PAGE 4-5

Gentlemen:

In accordance with your request, we have reviewed the geology and soils section of the draft EIR and suggest that the Geologic Hazards section page 4-5 be changed as follows:

Geologic Hazards

114 o Based on the findings of the Geocon report (dated March 8, 1989) the branch of the La Nacion Fault present on the site dies out in a series of small folds on adjacent property to the north. In addition, the fault does not displace sediments of the Pleistocene Lindavista Formation. Therefore it is the opinion of the project geologist that the fault does not represent a significant seismic or ground rupture hazard to the development. However, the site could be subjected to moderate-to-severe groundshaking in the event of a major earthquake on more remote faults such as the Coronado Banks, Rose Canyon, or Elsinore Faults.

If you have any questions, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Michael W. Hart
CEG 706

MWH:slc

6960 Flanders Drive
San Diego, CA 92121-2974
619 558-6900
FAX 619 558-6159

114. The text of the EIR has been revised to reflect the comment by the project geologist.

San Diego Biodiversity Project
P.O. Box 1944 Julian, CA 92036

RECEIVED
SEP 26 1990

September 21, 1990

Planning Director, (Environmental Review Coordinator)
City of Chula Vista
276 Fourth Avenue
Chula Vista, CA. 92010

RE: Biological Impacts Associated with the Rancho Del Rey Planning Area

To Whom it May Concern,

115 After reviewing the Draft Environmental Impact Report for the Rancho Del Rey Planning Area, the San Diego Biodiversity Project offers the following comments for your consideration. We found the contents of this biological report to be extremely incomplete concerning adequate mitigation for the numerous sensitive species and habitats found in the planning area. We would hope that the City of Chula Vista takes the following comments seriously to avoide conflicts further into the planning process.

COMMENTS:

116 1) We will begin with the difficult vernal pool issue. First, the entire southern California region has been in the state of drought for close to four years now. Vernal pools, difficult to find in wet years, are near impossible to find in dry years. The statement that "Normaly, even in dyy years, weeds and plants of the surrounding associations do not invade the pools." is false. Many pools, such as those in Poway and on Del Mar Mesa, are invaded by species such as the spike moss and buckwheat. This is due to the extreme dryness of the soil after such a long period of drought. One cannot assume a basin is not a vernal pool when these plants are found in the basin area. A soil hydration test, (to locate aquatic insects and plants in a controled environment), is something that must be required for all areas of mima-mound topography when the area might support vernal pools in wet years. A thorough survey of basins surrounding the single onsite vernal pool must be conducted during the wet season (January) in an effort to locate vernal pool plants that may be found without the pressence of water. Surveys of vernal pools in this area (M series) were undertaken in 1979 and in 1986. Ellen Bauder must be contacted to verify the number of pools at this project site.

Also, as part of a total vernal pool petition package, the riverside Fairy Shrimp, a fresh water vernal pool shrimp, is now being considered for ENDANGERED SPECIES status by the Federal Government. Soil hydration tests must be taken to determine the presence of this species. (Riverside Fairy Shrimp have been found into San Diego County). Contact Marie Simovich at USD Biology Department for more information on these tests.

117 Mitigation proposed for the loss of the single onsite vernal pool is not acceptable. A 4:1 mitigation ratio is the minimum acceptable ratio for vernal pool replacement. (USFWS and San Diego Biodiversity Project Requirements) An alternative mitigation proposal for this project is in the works. It will include an acceptable vernal pool mitigation proposal.

115. Please refer to responses 1 through 7 of the USFWS letter and responses 1 through 5 of the CDF&G letter. The EIR states that impacts to biological resources are significant and unmitigated.

116. Page 4-41 and 4-42 document the mitigation measures for the impacts to the vernal pool. These mitigation measures were taken directly from the recommendations of the USFWS. A subsequent field reconnaissance (November 2, 1990) by U.S. Fish and Wildlife Service, Dr. Ellen Bauder, and the City of Chula Vista was inconclusive in determining the presence/absence of vernal pools. As a result, an additional mitigation measure requiring a spring survey and appropriate mitigation in the event that an additional vernal pool is located has been added to the Mitigation Monitoring Program.

117. The USFWS recommended acquisition of 0.4 acres for mitigation of the 0.2 acre vernal pool impact. See the USFWS letter above and responses 3 through 9. The U.S. Army Corps of Engineers in consultation with USFWS will have the final determination of adequacy of mitigation measures. The San Diego Biodiversity Project may contribute comments, but has no authority in issues related to 404 permitting or the Endangered Species Act.

(Letter Continued...)

2) Because there is no such thing as an ENDANGERED habitat Act, we will
simply focus on the numerous sensitive species that depend on these habitats.
118 The two most sensitive habitats onsite, besides the vernal pool(s) include
Coastal Sage Scrub, and the sub-habitat, Coastal Sage Scrub Cactus Thicket.
The Coastal Sage Scrub habitat onsite is home to three increasingly rare species
including the California Gnatcatcher, the San Diego Horned Lizard, and the
Orange Throated Whiptail Lizard. Coastal Sage Scrub, in the most recent
estimates, has been reduced by 85% in San Diego County. California Gnatcatchers,
119 due to their relience on this habitat, have also been reduced population wise
by at least the same percent. In fact, due to proposed developments, this
bisd could easily be extinct within seven years. The two reptile species,
although lacking studies, are probably also facing the same decline.
The sub-habitat, Coastal Sage Scrub Cactus Thicket, is home to the
recently described Cactus wren, Campylorhynchus brunneicapillus ssp. sandiegensis.
This is an ENDANGERED sub-species, with no more than 400 individuals
remaining IN THE WORLD. The USFWS, in connection with the California Gnatcatcher
120 is considering the Cactus Wren for ENDANGERED species status. This species
is simply glossed over in the EIR for this project. This population of Wrens
MUST NOT BE IMPACTED IN ANY WAY. Buffer areas of at least one hundred yards
must remain in place around all cactus patches with corridors of at least
twenty yardswide must connect these patches with offsite protected open space.
The mitigation proposed in the EIR for the Cactus wren and its habitat (trans-
plantation of cactus patches) is TOTALY UNACCEPTABLE. This would eliminate this
population of Wrens. Appropriate mitigation plans will be included as a part
o6 the upcoming Alternative Mitigation Proposal. We, as well as the USFWS,
will require no impacts to the onsite population of Cactus Wrens.
In regards to the California Gnatcatcher mitigation proposed by RECON;
we feel the proposed gnatcatcher peserve is not big enough to adequatly
mitigate the onsite Gnatcatcher loses. An alternative proposal will be
121 included in our Alternative Mitigation Proposal. Impacts to the onsite
population of the two reptile species will be mitigated by the Gnatcatcher
Preserves.
3) After the purchase of the off-site California Gnatcatcher and vernal pool
preserves, these properties will not be placed into the hands of the BLM for
122 managment. this federal agency is well noted foe its pathetic mis-managment
of public lands. Any of the other suggested land managment agenciies are
acceptable.
4) The EIR mentioned the presence of two state listed plant species, however,
no detail was provided. What are these species? (We are assuming they are
123 Acanthomintha ilicifolia and Hemizonia conjugens) How will impacts to these
species be mitigated?
5) Back to the subject of the California Gnatcatcher, it is now thought
that a pair of gnatcatchers requires at least 26 acres for a territory.
124 (EIR for State Route 56 East: Black Mountain Road to I-15) This will have
an effect on the size of the proposed Gnatcatcher Preserve.

San Diego Biodiversity Project
P.O. Box 1944 Julian, CA 92036

118. Beginning on page 4-34 of the EIR, the text documents the potential impacts to the specific habitats and notes the sensitive species both floral and faunal associated with the habitats.

119. Refer to USFWS letter which notes: "It is estimated that over 70% of the original acreage of this habitat in the County has been destroyed."

120. Mitigation measures addressing the impacts to the cactus wren habitat are included on pages 4-38 and 4-39 of the EIR.

121. Please refer to comments 3 through 9 and responses 18 through 22.

122. The determination of the custodian of the preserve area would be a joint consideration between the City of Chula Vista and the natural resource protection agencies. The purpose of the EIR is to address the impacts of the proposed project and to recommend mitigation measures to reduce the impacts. The designation of this land will be a biological preserve, not for multi-use (recreation) purposes. Depending upon the site selected, the custodian selected will be based upon many factors.

123. As noted on page 4-31 of the EIR, "No state- or federally-listed rare, endangered, or threatened plant species were observed within the SPA III project site." In additional, the two state-listed plants observed on SPA II were San Diego thornmint and Otay tarplant, as noted on page 4-29 of the EIR.

124. Please refer to the USFWS letter above.

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(letter Continued...)
6) Wetlands that are to be disturbed willneed to be mitigated on a 4:1 ratio
as part of the Army Corps of Engineers permit process. The USFWS will act
125 as an advisor to the Army Corps; Basicaly, the Army Corps will only grant the
permit if the USFWS says its O.K. This process will have an effect on the rest
of the sensitive species issues associated with this project.

To conclude, we hope that the City of Chula Vista will take these comment
into account before granting permits for this project. Our opinion is taken
seriously by the USFWS, as we would hope the case would be with the City of
126 Chula Vista. Within two weeks, we will submit an Alternative Mitigation
Proposal for this project with more detailed guidelines for the mitigation
of the many onsite sensitive species. In the meantime, please submit this letter
to RECON for consideration. In the future, we would hope that the city of
Chula Vista hire the Consultants for all projects. This would allow an
unbiased opinion to be issued in regards to the actual impacts of any project.
At this point in time, consulting firms are basicaly in the pocket of
the company or individual that hires them. This is the cause of MANY
faulty biological surveys in San Diego County and elswhere.
The San Diego Biodiversity Project requests a reply to these comments
127 within a week of their recient. Thank you for your time....

Sincerly,
David Hogan
David Hogan,
San Diego Biodiversity Project

Please feel free to call 755-7593 or 765-1965 for more information.

125. It is recognized that there is the U.S. Army Corps of Engineers 404 permit process with input from the USFWS. The typical mitigation requirements are based upon quality of impact. There is no fixed mitigation ratio. It should also be noted that there is nationwide permitting authority in relation to projects with impacts of less than one acre in certain conditions.

126. This does not address the adequacy of the EIR; therefore no response is necessary. It should also be noted that although RECON conducted baseline surveys and coordinated extensively with USFWS, an independent third party review of the biology report was conducted by ERCE (aka WESTEC) through contract with the EIR preparers. As noted in the comments from USFWS and CDF&G, the agencies whose mandates are protection of natural resources, the EIR biology report was considered adequate.

127. The inclusion of this letter of comment in the Final EIR is adequate to meet the requirements of CEQA. Individual letters of response are not a requirement of CEQA.

October 6, 1990

Enviormenta Review Coordinator;
City of Chula Vista

128

I am submitting two comments regarding the adequacy of the draft EIR for Rancho Del Rey:

① that the plot of land at the Northeast corner of Paseo Entrada and Paseo Ladera continue to be designated for a community park rather than be changed to a church site as proposed by the McMillan Co. those of us homeowners who live to the east of the site have been waiting for the past five years for that site to be used as a park for our familes.

② that the open space area on the North side of Telegraph Canyon Road and
(over)

128. This comment refers to modifications in land use patterns. Due to requirements of the Park and Recreation Department for a larger park, the previously designated park was relocated and enlarged to 10 acres. Once completed, the park will be open to the public-at-large.

The community facility land use designation may include a church, day care facility, or public/quasi-public.

129 between the proposed Paseo Ranchero and Paseo Ladera remain an open space area at all costs! Whatever negotiations and compromises are made with the McMillan Co. that area must remain an open space area. there are too many varieties of animal and birdlife in this area. Plus it would destroy the beautiful open space scenic route along Telegraph Canyon Road that begins just east of Paseo Del Rey.

Please consider these comments during the decision making process regarding the Rancho del Rey development.

Sincerely,

Conrad Kellenberger
Homeowner
1064 Paseo La Cresta
Chula Vista, Calif. 92010
Phone # 482-1683

129. The project as currently proposed and reviewed designates the area north of Telegraph Canyon Road in the vicinity of Paseo Ranchero and Paseo Ladera as open space. No development is planned for these areas.

VERBATIM TRANSCRIPT OF PUBLIC HEARING HELD 10/10/90 REGARDING DRAFT ENVIRONMENTAL IMPACT REPORT EIR-89-10, RANCHO DEL REY III

130 Thank you. For the record, my name is Duard Houck, H-o-u-c-k, and I reside at 1125 Paseo del Cerro in Chula Vista. I've looked at the draft environmental report and I found it inadequate in a couple of areas in particular. The first has already been mentioned as biology. I don't think an adequate job has been done addressing essential habitat candidate, threatened or endangered species, and how that'll be mitigated.

131 My second concern is on the open space and distribution of parks. The amount of open space is a problem, I think, but more important than that is the distribution. I've seen in Chula Vista as it's grown that parks, public parks, have been placed in centralized locations requiring people who wish to use those parks to travel by car to get to those parks, which has an obvious impact on the climate, but also on crime, place for our children to play. As it is now, the few places there are to play are the very canyons that are now scheduled for development by this project. (change of tape) They seem to be put under high tension lines, and I don't think they adequate addressed the health affects of the non-ionizing radiation on children who play on these parks. Thank you.

Chair: Peter Watry.

132 Madam Chairman, my name is Peter Watry. I live at 81 Second Avenue, and we have one suggestion we'd like to make--one addition. In Section 4.3, it talks about landform alteration and aesthetics and there's quite a few pages about how they are going to change the slopes and manufacture the slopes and change the contours and so on and so forth. And then on page 4.18, it talks about mitigation, and the first sentence kind of sums up what all of the previous pages have been describing. It says the proposed SPA III project would result in significant landform aesthetic impacts which would include 50-foot manufactured slopes. These impacts can be partially mitigated by instrumenting the community's design guidelines detailed in this SPA III plan. It goes on to talk about grading standards and slope bank standards, and so forth. The point is that almost all of the problems can be taken care of by manufactured slopes. We would like to have another mitigation factor looked at and that is somehow by redesign, more natural slopes left. I'm apologizing for not doing my homework until the last minute. I was going to check into the General Plan. I believe in the General Plan, trying to keep slopes and the hillsides in natural form is the first alternative when it can be done. And it seems to us in this case that wasn't even considered, so we'd like to have another mitigation listed by some redesign allowing more of the slopes, more of the canyons, to be left in their natural form and not all to be turned to natural sloping. Thank you.

Chair: Craig Fukuyama.

133 Madam Chairman, members of the Commission, my name is Craig Fukuyama. My address is 2727 Hoover Avenue, National City, and I'm representing the Rancho del Rey Partnership this evening. We've submitted our comments to you in a letter dated September 27, which is a part of your agenda package, I believe. I really don't have anything further to add regarding that--our comments. However, I do wish to offer -- our consultants are here this evening to assist and answer any technical questions that you might have from the biologist. We have our--Recon is here, our traffic engineer, and also our civil engineer and land planner is here this evening. So, if you may have any technical questions, I offer their services to assist in your deliberations. Thank you. Are there any questions?

130. The EIR has determined that development of the proposed project will result in significant and unmitigated impacts. Page 4-42 of the EIR notes, "The implementation of the mitigation/monitoring program would partially reduce the level of significance. Please refer to responses 3 through 9.

131. The proposed project has increased the size of the park from 2 acres in the adopted SPA to 10 acres in SPA III. The neighborhood park is not located near the SDG&E power lines. The power lines are located in the open space area, a good distance from the active park area. It should be noted that the effects of non-ionizing radiation are currently under consideration; however, there is no conclusive scientific evidence of dangers to public health and safety using areas near power lines.

132. The alternative section of the EIR examines alternatives to reduce significant and unmitigated impacts of the proposed development. There are two design alternatives discussions on pages 6-3 through 6-20 of the EIR. As noted on page 6-3, both design alternatives are based on "conceptual site designs that are environmentally sensitive to on-site biological resources and topography, in particular to canyons and slopes in excess of 25 percent.

133. Responses 23 through 106 address the comments submitted by the Rancho del Rey Partnership. No further response is required.

134 Commissioner Tugenberg: I haven't really had a chance to study this yet, but I got a copy of the 1983 EIR, and there's a line here that says, "approximately 3 million cubic yards of material would need to be exported from the property in order to preserve the canyon areas and develop the site in conformance with the plan designations." Are you going to continue with that project--that idea of exporting 3 million cubic yards?

Fukuyama: No, we will not export any soil. We're going to try to balance the project on-site.

Tugenberg: Thank you.

Chair: Is there anyone else wishing to speak to the Planning Commission this evening on this issue? We'll close the public hearing. Any comments from Commissioners?

135 Commissioner Casillas: Following up on a comment relative to the grading and the notion of maintaining more of the natural slope, I went back to East "H" Street and took a look at that area around the water tank where to the east and to the west they propose the senior housing. And I just wonder if that is not a good candidate--that area in there--to maintain more of Rice Canyon in its natural state. Perhaps by placing the housing on some kind of a terraced sort of a thing. I don't know what engineers call that, but that might be a possibility, and I just wonder if they couldn't examine that just a little further to minimize the destruction of the natural contours. As you walk around in that area, you really see the beauty of Rice Canyon and I think it would be terrible to destroy some of that beauty. There's too little of that left. Could we direct staff to maybe take another look at that?

Chair: We can ask them to do whatever you like.

Casillas: Thank you.

136 Commissioner Carson: Along that same tone, when we were doing our field trip and we were up on the hill, and I think Hal can recall better because we were having our conversation, the one area that the suggestion is to grade it all the way down so it would be level with the homes that are down below--I'm very concerned and I'd like to see how you can eliminate the amount of dust and the poor air quality that is going to take place at that time. Because with the in-fill project, it's different where you are starting out, you know, in the boonies and doing you work and then the dust filters in and I get a little bit of dust and everybody else gets the dust. But when you're doing a great deal of grading and moving a lot of dirt around, and the people that are already settled there are going to have an inch and a half of dust, probably daily, in their house. And I'm not stretching it; it's just from a homemaker's standpoint that it's going to be very dirty. And that doesn't bother me; what is in the air and is going to end up in all of our lungs, and the fact that we have a high absenteeism for children because of poor air quality, and we have a lot of children out in that area, and I think we need to look at again a study about air quality. I think the air quality dates are back--what, '87 or something? When I read through it? They're not the most--unless I got off into another area.

Associate Planner Reid: We're just going to check that.

Commissioner Decker: Before we move on further, I would just like to add to your comment, Mr. Casillas. The staff report says on page 2, "50 foot manufactured slopes which are considered significant landform and visual impacts..." As far as I'm concerned, you are correct that this one area that

134. This represents discussion between the applicant and Planning Commissioner; thus, no response is necessary. As noted on page 4-14 of the EIR, the project proposes a balanced cut and fill of 4.0 million cubic yards.

135. As noted on page 4-12 of the EIR, the adopted ERDR Specific Plan includes the following policy on grading:

> Grading Design: It is the intent of the Specific Plan area that graded areas will be contoured to blend with natural landform characteristics. Rounding both vertical and horizontal intersections of graded planes, obscuring slope drainage structures with a variety of plant material massing, incorporating the use of variable slope ratios for larger slope banks, use of landscape planting for erosion control and to obscure manmade banks, architectural solutions to topographic changes, and other similar techniques should be used. Artificially appearing slope banks with rigid angular characteristics shall not be permitted.

In addition, as noted on page 4-18 of the EIR,"The final grading plans would be reviewed by the City Planning Department prior to issuance of a grading permit to confirm that the design standards have been included in the grading plans."

136. The EPA estimates that there are about 120 pounds of dust released per workday per acre under disturbance if no dust control measures are applied to control these emissions. With dust control measures as required by the San Diego Air Pollution Control District rules regulating nuisance dust, total dust emission levels can be reduced by 50-70 percent. The proposed RDR SPA III development would disturb 274 acres (256 acres for general development plus an additional 18 acres in open space for utility easements) within the project during grading for residential pads, roads, community facilities, utilities, and so forth. Projected dust emissions (at 50 percent control) for the proposed project are anticipated to be 8.2 tons/day. This figure assumes that all 274 acres would be graded at one time. A project the size of RDR SPA III would be expected to have no more than approximately 10 percent of the project being graded at any one time, the estimated dust emission (at 50 percent control) would be 0.82 tons/day or less than one ton/day (pers. comm., Giroux, 1990). These emissions are referred to as total suspended particulates (TSP). The clean air standard applies only to the respirable 10-micron diameter (pm-10) fraction of the TSP. Emissions data for the PM-10 have not been developed to predict the PM-10 burden from the development projects. A large portion of the TSP, however is comprised of larger diameter particles outside the TSP size range. Much of these larger dust particles will quickly settle back out on nearby surfaces within approximately 500 feet of the construction activity source. Such dust therefore comprises more of a soiling nuisance within the immediate proximity of the project site rather than any adverse health impact to local populations.

we are talking about is certainly more than 50 foot thing, and so obviously more than a significant impact. And, as I recall from reading the General Plan and I'm paraphrasing it now, it says--the plan says something to this effect
137 without quoting it exactly--existing topography will be maintained as much as possible. And I just wonder if cutting a slope 70 feet is maintaining as much as possible. That's all the comments I have.

Carson: I have one other comment. It deals with the number of options that we have to reduce the impacts that may take place on the various plants and animals that are out in the area. And I realize that was one of your first opening statements that you've done an excellent job that you feel of working with McMillin and U. S. Fish & Wildlife, but every project that comes before
138 us, we have the same species that we're talking about. Pretty soon we won't have those species. I don't care what we do to try to mitigate it. When there's people around, the species will not stay because of dogs and cats and people noise, and things of this sort. And I know you have listed three options on page 4-39 in our EIR and I am concerned as to when we will know what option you go with and who will be selecting those options.

Chair: Any further questions or directions?

Associate Planner Reid: Did you want an answer to that question now?

Chair: No. When you come back.

Chair: Okay, I would direct that staff prepare the final EIR, taking into consideration what they've heard here this evening.

Environmental Review Coordinator Reid: Madam Chair, in response to Commissioner Tugenberg's question regarding the year of the data, that's for the Chula Vista monitoring station through '88.

Commissioner Carson: Mine. Thank you.

137. Page 4-19 of the EIR states:

> While the SPA III Plan is consistent with the adopted specific plan in terms of landform and visual character, the project would result in significant landform/aesthetic impacts including the use of 50-foot manufactured slopes. The SPA III site would be modified from a vacant area of canyons and ridges to a planned residential community. The visual impacts associated with the cut and fill slopes would be partially mitigated by adherence to the SPA III design guidelines. Implementation of these guidelines in the construction of the project would not reduce landform alteration impacts to a level below significance.

138. The decision as to which of the three options will be selected would occur after certification of the EIR but prior to issuance of grading permits. Timing of the determination will be based on availability, acceptability, and acquisitions of the land. The selection of the appropriate measure would be at the discretion of the City of Chula Vista, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game in consultation with the applicant. As noted in the EIR on pages 4-39 through 4-40:

> To reduce impacts to the habitat of the California gnatcatcher, the applicant would acquire and preserve an area of coastal sage scrub habitat as described in one of the following options:
>
> a. Acquire and preserve an off-site area of coastal sage scrub habitat encompassing at least 187 acres which supports at least 17 pairs of California gnatcatchers, or
>
> b. Acquire and preserve an off-site area of coastal sage scrub habitat encompassing at least 256 acres which supports 10 pairs of California gnatcatchers, or
>
> c. If an off-site mitigation site cannot be found, the applicant would preserve the 70 acres of high quality coastal sage habitat in the Specialty Housing Area on-site in addition to the 117 acres of coastal sage scrub habitat proposed for open space.

The Mitigation Monitoring Program requires that the mitigation site would be acquired and approved prior to issuance of a grading permit for the Specialty Housing Area. At this time, the applicant has indicated a preference for acquisition of an off-site area of coastal sage scrub to mitigate project impacts to coastal sage scrub and the California gnatcatcher (pers. comm., Fukuyama, 1990). When the determination has been made, the Mitigation Monitoring Program will be returned to the Planning Commission.

EXECUTIVE SUMMARY

This document is a Supplemental Environmental Impact Report (SEIR) which addresses the proposed Rancho del Rey Sectional Planning Area (SPA) III project. This SEIR should be read in conjunction with the previously prepared Final EIR (EIR-83-2). The project applicant, Rancho del Rey Partnership, is proposing development of the third phase (SPA III) of the El Rancho del Rey Specific Plan. The first and second phase of the project, SPA I and SPA II, are currently under construction.

The El Rancho del Rey Specific Plan area encompasses approximately 2,450 acres located east of Interstate 805, south and west of Otay Lakes Road, and north of Telegraph Canyon Road in the City of Chula Vista. SPA III consists of a detailed plan for residential development, community facilities, and park and open space uses on approximately 405 acres located southeast of East H Street and north of Telegraph Canyon Road. The SPA III Plan is in conformance with the overall specific plan. Included within the provisions of the El Rancho del Rey Specific Plan is a mechanism to transfer density from one category to another as a part of the SPA Plan approval process. The density transfer will involve the transfer of 171 residential units within the SPA III project area. The approval of SPA III will include the SPA III Plan, a tentative map, a Public Facilities Financing Plan, Design Guidelines, a Development Agreement, and a Specific Plan Amendment for density transfers and park acreage additions. The elimination of the East J Street link connecting Paseo Ranchero and Buena Vista will require a Specific Plan and General Plan Amendment.

PROJECT DESCRIPTION

The Rancho del Rey SPA III Plan proposes the construction of 1,380 single-family dwelling units (DU) ranging in density from from 3.8 to 10.6 DU/ac on eight residential parcels on approximately 206 acres. Included among the planned dwelling units are 583 DUs of specialty housing on approximately 85 acres for a small retirement community which will be composed of detached and attached housing. In addition, a junior high school site totalling 24.7 acres, a neighborhood park totalling 10.0 acres, eight open space areas totalling 147.6 acres, and major circulation routes totalling 13.7 acres are proposed.

The environmental analysis performed for the proposed project includes the following issues: geology/soils, drainage/groundwater/water quality, landform/aesthetics, air quality, biology, cultural resources, transportation/access, land use/general plan/zoning, community social factors, community tax structure, parks/recreation/open space and public services. The EIR includes an analysis of project conformance with the City's Threshold Policy standards for fire, police, sewer, water, parks/recreation and drainage. All of the threshold standards are met.

ENVIRONMENTAL ANALYSIS

Geology/Soils

Development of the proposed project will involve grading of ridge-tops and filling of canyons and side slopes. Soils such as the San Diego Formation are susceptible to erosion. Although the La Nacion Fault traces cross the western portion of the site, they are not considered active. Most of the required excavations can be made by conventional heavy grading equipment. The geotechnical report identifies detailed grading and earthwork recommendations. The geotechnical consultant would monitor grading to confirm that field conditions are consistent with the conditions predicted by the preliminary investigations.

Drainage/Groundwater/Water Quality

The proposed project will result in additional impervious surface area which will increase surface water runoff rates. Development of the site will result in a change in the type and amount of contaminants contained in surface runoff. This represents a cumulative impact to local water quality. Existing drainage facilities are sufficient to handle runoff from the project and no mitigation or monitoring is necessary. Potential impacts to groundwater/water quality would be reduced to below a level of significance through adherence to the regulations of the National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge.

Landform/Aesthetics

Development of SPA III would significantly alter landforms on-site and create manufactured slopes of approximately 50 feet. These are considered significant landform and visual impacts. Grading would primarily be confined to the ridge-top areas, with the major canyon areas retained as open space. The degree of visual alteration is consistent with what was anticipated when the specific plan was approved. Grading associated with the project will be in conformance with the general grading slope bank standards set forth in the SPA III Plan. Implementation of the community design guidelines would partially reduce significant impacts. They include landscaping, fencing design, community signing, lighting, and parking design/street furniture.

Air Quality

The development of the proposed project would result in increased traffic on new and existing roadways as well as additional air emissions and would result in cumulative impacts to the San Diego Air Basin. The project will be in conformance with the forthcoming State Implementation Plan (SIP) which is based on Series VII population projections. Short-term emissions from construction activities would generate dust and diesel emissions resulting in short-term emissions impacts. Emissions from residential activitiy and from the Junior High school site including the use of paint, industrial strength cleaners, fumigation, barbecues and gasoline powered lawnmowers are not considered significant on a project level, but would have cumulative impacts to regional air quality. To reduce potential impacts to air quality the use of mass transit and bicycles within the project would be facilitated, and recommended actions to prevent the development of pollution "hot spots" at intersections would be implemented.

Biology

Implementation of Rancho del Rey SPA III as proposed would result in significant impacts to coastal sage scrub (on a local and regional basis), vernal pools, California gnatcatchers, cactus wren, and snake cholla. Impacts to the coastal sage scrub community would also include losses of sensitive plants such as the San Diego barrel cactus and ashy-spike moss. In addition to the California gnatcatcher and cactus wren, impacts to the orange-throated whip-tail, the coast cholla, and the San Diego horned lizard may result. With implementation of the proposed mitigation and monitoring measures, significant impacts to biology would not be reduced to below a level of significance.

Cultural Resources

Two archaeological sites located on the SPA III property have been identified as significant cultural resource sites and contain evidence which can address the question of the presence of early man in San Diego. The development of the proposed project would significantly impact these sites. The implementation of an extensive mitigation and monitoring program would reduce impacts to the sites to below a level of significance. The mitigation program has been completed and approved by the City. All impacts have been reduced to a level below significance.

Transportation

The proposed project is expected to generate 11,405 ADT. All intersections relevant to the project will operate at LOS C or better in the morning and afternoon peak hours under buildout conditions with the exception of the East H Street/Paseo del Rey intersection. This intersection will operate at a LOS D during the afternoon peak period but not for greater than two hours and thus would be within the limits of the City of Chula Vista's Threshold Policies for traffic. Potentially significant impacts would be mitigated to below a level of significance with implementation of the proposed mitigation.

Land Use

The Rancho del Rey SPA III Plan as proposed, is in conformance with the land use policies and plans of the City of Chula Vista, the El Rancho del Rey Specific Plan, and with existing and proposed land uses in the vicinity of the project site. Development of SPA III would not result in significant land use impacts and mitigation/monitoring is not necessary.

Community Social Factors

No potential adverse impacts regarding community social factors are associated with the development of the proposed plan. Impacts to population, housing, and employment are consistent with the El Rancho del Rey Specific Plan. No significant impacts would be associated with the proposed project; no mitigation or monitoring measures are necessary.

Community Tax Structure

Implementation of the proposed Rancho del Rey SPA III would result in a net fiscal benefit of approximately $64,800 annually to the City of Chula Vista; therefore no adverse impacts would result to the community tax structure. No mitigation or monitoring measures are required.

Parks, Recreation and Open Space

As part of the proposed project, a 10.0-acre neighborhood park would be developed on-site. A large portion of the site (36%) would be dedicated as open space. Although the park does not meet the required acreage as set forth in the City's parkland ordinance, upon meeting the conditions established by the City, the project would not significantly impact Parks, Recreation and Open Space. As a condition of approval of the tentative map, City staff would ensure that conditions for the 10.0-acre park have been implemented.

Public Services

The 1989 Water Allocation Report distributed by OWD limits the number of new dwelling units that can receive water in one year. The receipt by the City of Chula Vista of a service letter from the OWD regarding the proposed project would allow the project to meet the Threshold Standards related to water, and potential impacts would be reduced to below a level of significance. Due to the regional shortage of water, the project proponents would work with the City of Chula Vista to develop a project level water conservation program to reduce water consumption. The development of on-site sewage facilities consistent with the 1986 sewer study would provide adequate infrastructure to accommodate project flows. The

City of Chula Vista has a surplus of contract capacity in the METRO sewage system and no significant impacts are anticiapted. SDG&E would provide utility services to the project site and there would be no impacts associated with the provision of utilities. The proposed project would be served by the Chula Vista Police Department. Development of the project would significantly impact police protection from the development of the proposed project; however, the addition of 4.6 police personnel would reduce impacts to below a level of significance. Emergency fire and medical protection would be supplied in compliance with the Threshold Policy and no significant impacts are anticipated. Both the Sweetwater Union High School District and the Chula Vista City School District are involved in the planning and construction of new facilities which would provide adequate facilities for the additional students generated by the project. Project related impacts to schools would be mitigated through the phased implementation of additional facilities in eastern Chula Vista. The two Mellos Roos Community Facilities Districts, (Sweetwater Union High School District Community Facilities District No. 3 and the Chula Vista City Schools Facilities District No. 3) will provide tax moneys directly to the school districts for implementation of their long-range development plans.

Table S-1

ENVIRONMENTAL CONSEQUENCES SUMMARY

Issue	Impact	Mitigation	Monitoring
Geology/Soils	Potential impact from proximity to La Nacion Fault zone.	Adherence to Uniform Building Code would reduce impacts to below a level of significance.	Prior to building permit issuance, geotechnical recommendations would be made a condition of the tentative map.
Drainage/ Groundwater/ Water Quality	Potential impacts to groundwater/water quality from runoff.	Adherence to NPDES permit regulation for stormwater discharge would reduce impacts to below a level of significance.	Prior to issuance of the occupancy permit, the City would ensure that the project is in conformance with NPDES regulations.
Landform/ Aesthetics	Significant alteration of on-site landforms. Significant impacts to landform and visual quality.	Grading would conform with standards established in SPA III Plan. Implementation of community design lines would partially reduce level of impacts to landform and visual quality.	Prior to or as a condition of tentative map approval, grading plans would be inspected by Planning and Building departments to ensure that grading standards have been adhered to.
Air Quality	Cumulative impacts to regional air quality	Adherence to SIP regarding local participation in air emission reduction measures, encourage use of alternate transportation, and accommodate mass transit vehicles in front of retirement community would partially reduce cumulative impacts.	Prior to or as a condition of approval of the tentative map, City staff would ensure that recommended mitigation measures have been implemented.

Table S-1 (Continued)

ENVIRONMENTAL CONSEQUENCES SUMMARY

Issue	Impact	Mitigation	Monitoring
Biology	Significant impacts to coastal sage scrub, California gnatcatchers, cactus wren and snake cholla.	Qualified biologist to monitor encroachment of open fill slopes. Revegetation of coastal sage scrub native species on manufactured s slopes. Transplant program for cactus. Monitoring program for California gnatcatchers. Acquisition of land for a preservation of gnatcatcher and vernal pool habitat.	Prior to or as a condition of the grading permit, tentative and final map approval, the City Planning Department would ensure that recommended mitigation measures have been implemented.
Cultural Resources	Significant impacts to two resource sites.	Implementation of extensive recovery program would reduce impacts to below a level of significance.	Prior to or as a condition of tentative map approval, City staff would ensure that recommended mitigation measures have been implemented.
Transportation	Potentially significant impacts of the proposed project would be mitigated to below a level of significance with implementation of the proposed mitigation.	Mitigation measures proposed for buildout include signalization, reconfiguration to provide dual lanes, construction of new road segments, and placement of stop signs.	Annual monitoring program as directed by City Transportation Department. Other site specific measures will be made conditions of of Tentative Map and Public Facilities Finance Plan.
Land Use	None	None	None
Community Social Factors	None	None	None

Table S-1 (Continued)
ENVIRONMENTAL CONSEQUENCES SUMMARY

Issue	Impact	Mitigation	Monitoring
Community Tax Structure	None	None	None
Parks/ Recreation/ Open Space	Potential impacts due to net deficiency of of 2.6 acres of parkland.	Addition of amenities in proposed park and utilization of adjacent junior high school site would reduce impacts to parks. Park would also meet conditions established by the City. Would reduce impacts to below a level of significance.	Prior to or as a condition of approval of the tentative map. City staff would ensure that conditions for the 10.0-acre park have been implemented.
Public Services	Potential impacts to water, fire prevention, police and schools.	The receipt of a service letter from the OWD would reduce potential impacts to water to below a level of significance. The addition of another Fire Inspector would reduce impacts to fire prevention to below a level of significance. The addition of 4.6 police personnel would reduce impacts to police to below a level of significance.	Prior to building permit issuance City staff would ensure that the project proponent has received a water service availability letter, has entered an agreement with the City of Chula Vista to provide an additional Fire Inspector and 4.6 police personnel, and entered into the Mello Roos for school facilities.

Table S-2

SUMMARY OF ALTERNATIVES

ISSUE	NO PROJECT/EXISTING SPECIFIC PLAN	ALTERNATIVE DESIGN 1	ALTERNATIVE DESIGN 2
Project Description	Development would be based upon the existing General Development Plan for Rancho del Rey SPA III. Includes a maximum potential development of 1,380 du's consisting of single family-conventional (2-4 DU/ac), single family and specialty housing (4-6 DU/ac) and townhouses (6-8 DU/ac). This alternative also includes a 23.0 acre school site and a 2.0 acre park. A density transfer of 95 residential units as proposed in the SPA III plan would not occur. East J Street would be extended to its full General Plan length with this alternative.	Dwelling units range from 780-1,380 units with density opportunities ranging from 3-11 du's/ac on approximately 160 developable acres. Allowable uses within this design include single family dwelling-conventional, cottages, townhouses, specialty housing, open space, schools, and parks. Development in Areas A and E would be eliminated, leaving these areas in natural open space. East J Street would not be extended to its full General Plan length and would be designed as a cul-de-sac street. This alternative would reduce impacts to biological and cultural resources, landform alteration, and park/recreation and open space.	Dwelling units range from 894-1,380 units with density opportunities ranging from 3-11 du's/ac on approximatley 200 developable areas. Development in Area A would be eliminated, leaving this area in natural open space. Area E, originally proposed as open space in the proposed project, would have optional developable uses including single family dwelling-conventional, cottages, townhouses and specialty. East J Street would not be extended to its full General Plan length and would be designed as a cul-de-sac street. This alternative would reduce impacts to biological resources, landform alteration, and parks/recreation and open space.
Geology/Soils	Impacts to Geology/Soils would be the same as the proposed project. The site could be subject to moderate-to-severe groundshaking in the event of a major earthquake on the Coronado Banks, Rose Canyon, or Elsinore Faults.	Potential constraints associated with geologic and soils resources would be somewhat reduced with the elimination of grading in Areas A and E. Potentially significant impacts from ground shaking would be reduced with Area A left in open space. Potential surficial erosion and instability would not result in Area A with incorporation of this alternative. A geo-technical analysis would be required to determine appropriate mitigation measures.	Potential constraints associated with geologic and soils resources as identified in the proposed project would be somewhat reduced with the elimination of grading in Area A. Adoption of this alternative would reduce potentially significant impacts due to ground shaking in Area A. Potential surficial erosion and instability would not result in Area A. Slope failures may occur in Area D if developed. A geotechnical analysis would be required to determine appropriate mitigation measures.
Drainage/Groundwater/Water Quality	Potential impacts to Drainage/Groundwater/Water Quality would be similar to the proposed project. This Water Quality alternative will create large areas of impervious ground surface with the overall effect of facilitating water runoff during rainy periods. An increase in urban pollutants would result. No significant impacts to Drainage/Groundwater/Water Quality would occur.	Land development with this alternative would result in an increase in water impervious surfaces and potential impacts to on-site water quality and quantity may result. Elimination of development in Area A and E would reduce the amount of urban pollutants and impervious surfaces associated.	Land development with this alternative would result in an increase in the impervious surfaces, and potential impacts to on-site water quality and quantity may result. Elimination of development in Area A would reduce the amount of urban pollutants and impervious surfaces associated.
Landform Alteration/ Aesthetics	Impacts to landform alteration/aesthetics would be essentially the same as the proposed project, with the exception of additional grading required for the extension of East J Street with this alternative.	Impacts to landform alteration would be reduced Alteration with a fewer number of building pads required overall. Elimination of development in areas A and E would reduce impacts to visual quality. Impacts to landform aesthetics are considered adverse but substantially reduced from the proposed project with this alternative.	Impacts to landform alteration would be reduced with a fewer number of building pads required overall. Elimination of development in Area A would reduce impacts to visual quality. Impacts to landform/aesthetics are considered adverse, but substantially reduced from the proposed project with this alternative.

* No Project/No Development Alternative was not summarized in this table

Table S-2

SUMMARY OF ALTERNATIVES (Continued)

ISSUE	NO PROJECT/EXISTING SPECIFIC PLAN	ALTERNATIVE DESIGN 1	ALTERNATIVE DESIGN 2
Air Quality	Impacts to air quality would be the same as the proposed project. The development of this alternative would result in increased traffic on new and existing roadways and additional air emissions, and would result in cumulative impacts to regional air quality.	Decreased traffic volumes would decrease project emissions; however, cumulative impacts to regional air quality would result.	Decreased traffic volumes would decrease projected emissions; however, cumulative impacts to regional air quality would result.
Biology	Impacts to biology would be similar to the proposed project. Impacts to coastal sage scrub, California gnatcatchers, cactus wrens and snake cholla are considered significant and unmitigable.	This alternative would result in greater amounts of preserved open space with the elimination of development in areas A and E. Approximately seven California gnatcatcher habitats would be preserved, as well as greater than 50% of the Diegan coastal sage scrub on-site. This alternative is considered the biologically preferred alternative and would result in a significant reduction of impacts to biology, if mitigation measures similar to the proposed project are implemented.	This alternative would result in greater amounts of preserved open space with the elimination of development in Area A. Approximately five California gnatcatcher habitats would be preserved, as well as approximately 40% of the Diegan coastal sage scrub on-site. Portions of cactus wren habitat and snake cholla would be preserved with this alternative. This alternative is considered the biologically preferred alternative. Adoption of this alternative would result in impacts that are considered significant, and partially mitigable, if mitigation measures similar to those discussed in the proposed project are implemented.
Cultural Resources	Impacts to cultural resources would be similar to those of the proposed project. This alternative would have significant impacts on two archaeological sites. Mitigation measures of a similar magnitude as identified in the proposed project would be required.	Adoption of this alternative would result in reduced impacts to archaeological site SDi 960/961. Impacts to cultural resources are considered significant with this alternative. Implementation of the proposed mitigation would reduce potential impacts to below a level of significance.	Adoption of this alternative would result in similar impacts to significant cultural resources as those identified for the proposed project. Impacts to cultural resources with this alternative are regarded as significant. Implementation of the proposed mitigation identified with the proposed project would reduce impacts to the sites to below a level of significance.
Transportation	This alternative would result in similar traffic impacts to the proposed project. Adoption of this alternative would result in the full extension of East J Street to Buena Vista Way according to the General Plan No significant impacts to transportation would result with adoption of this alternative, provided that mitigation measures as discussed for the proposed project are implemented.	Adoption of this alternative would result in a potentially lower number of ADTs than the proposed project. East J Street would not be developed to its full length per the Circulation Element of the General Plan. Impacts to the regional circulation network would be similar. Mitigation measures of a similar magnitude as identified in the proposed project would be required.	Adoption of this alternative would result in a potentially lower number of ADTs than the proposed project. East J Street would not be developed to tis full length per the Circulation Element of the General Plan. Impacts to the regional circulation network would be similar. Mitigation measures of a similar magnitude as identified in the proposed project would be required.

Table S-2

SUMMARY OF ALTERNATIVES (Continued)

ISSUE	NO PROJECT/EXISTING SPECIFIC PLAN	ALTERNATIVE DESIGN 1	ALTERNATIVE DESIGN 2
Land Use/General Plan/Zoning	Land Use is in conformance with the Specific Plan. No impacts to land use would result with the adoption of this alternative.	Development of this alternative would be consistent with surrounding land uses and with the current General Plan on a plan-to-plan level. On a plan-to-ground level, this alternative would reduce intrusion into steep slopes and reduce the destruction of sensitive biological resources in Areas A and E. Adoption of this alternative would not be in conformance with the adopted Rancho del Rey Specific Plan. Impacts to land use would not be considered significant with implementation of this design alternative.	Development of this alternative would be consistent with surrounding land uses and with the current General Plan on a plan-to-plan level. On a plan-to-ground level, this alternative would reduce intrusion into steep slopes and reduce the destruction of sensitive biological resources. Adoption of this alternative would not be in conformance with the adopted ERDR Specific Plan. Impacts to land use would not be considered significant with implementation of this design alternative.
Community Social Factors	Adoption of this alternative would result in similar impacts to the proposed project. No significant impacts to community social factors would result with this alternative.	This alternative would generate fewer or an equal amount of people based on density opportunities. Population generated with this alternative would not exceed growth expectation as outlined in the ERDR Specific Plan Amendment; therefore, no adverse population impacts are anticipated. Implementation of this alternative would allow for the development of up to 1,380 units on approximately 160 acres. Development of this alternative as proposed would not be consistent with the adopted plan. No employment opportunities would be generated by the alternative. No significant impacts to community social factors would result with this alternative.	This alternative would generate fewer or an equal amount of people based on density opportunities depending on final design. As a result, population generated with this alternative would not exceed growth expectations as outlined in the ERDR Specific Plan Amendment. No adverse population impacts are anticipated. With respect to housing, implementation of this alternative would allow for the development of up to 1,380 units on approximately 200 acres. Development of this alternative as proposed would not be consistent with the adopted plan. No employment opportunities would be generated by the alternative. No significant impacts to community social factors would result with this alternative.
Community Tax Structure	Impacts to community tax structure would be similar to those of the proposed project. As a result, this alternative wold have an overall positive fiscal impact on the City of Chula Vista. No adverse impacts to community tax structure would result with this alternative.	Implementation of this alternative would result in a fewer or equal number of residential units being constructed. It is unknown what the impact would be to the City of Chula Vista.	Implementation of this alternative would result in a fewer or equal number of residential units being constructed. It is unknown what the impact would be to the City of Chula Vista.

Table S-2

SUMMARY OF ALTERNATIVES (Continued)

ISSUE	NO PROJECT/EXISTING SPECIFIC PLAN	ALTERNATIVE DESIGN 1	ALTERNATIVE DESIGN 2
Services and Utilities	Impacts to services and utilities would be similar to those of the proposed project and are summarized as follows: Water: If water facilities are constructed in accordance with specifications included in the water master plan, adequate infrastructure would exist to serve the project. No significant impacts to water are anticipated. Sewer: No adverse impacts related to sewage capacity are anticipated, provided that on-site infrastructure and off-site improvements outlined in the 1986 sewer study are implemented. Utilities: SDG&E would be able to provide gas and electricity for this alternative. No impacts to utilities would result. Police: No significant impacts to police would result, provided that threshold policy standards are met for augmenting police staff. Fire: Eventual construction of a fire station within the ERDR planning would allow for adequate service for this alternative. School: Capacity to service an increase in elementary and high school students is not available. The capacity to satisfy future demands is not adequate. New schools in the planning and construction phases would satisfy future demands. No adverse impacts to schools are anticipated.	Water: Adoption of this alternative would result in water demand of 60-100% of that estimated for the proposed project. No significant impacts would result to water if water facilities are constructed in accordance with the specifications included with the water master plan. Sewer: Adoption of this alternative would result in a reduction or equal sewer demand as the proposed project. It is anticipated that on-site infrastructure and designed off-site improvements would provide an adequate sewer system to accommodate flows associated with this alternative. Utilities: It is anticipated that SDG&E would be able to service this design and no impacts to utilities would result. Police: Development of this alternative would involve the addition of up to approximately 3,600 persons to the sector. As a result, it is anticipated that this design alternative would require additional police staff at buildout. This number would depend on the number of additional persons generated from this alternative. Fire: Eventual construction of a fire station within the ERDR planning would allow for adequate service for this alternative. School: Capacity to service an increase in elementary and high school students is not available. The capacity to satisfy future demands is not adequate. New schools in the planning and construction phases would satisfy future demands. No adverse impacts to schools are anticipated.	Water: Adoption of this alternative would result in water demand of 60-100% of that estimated for the proposed project. No significant impacts would result to water if water facilities are constructed in accordance with the specifications included with the water master plan. Sewer: Adoption of this alternative would result in a reduction or equal sewer demand as the proposed project. It is anticipated that on-site infrastructure and designed off-site improvements would provide an adequate sewer system to accommodate flows associated with this alternative. Utilities: It is anticipated that SDG&E would be able to service this design and no impacts to utilities would result. Police: Development of this alternative would involve the addition of up to approximately 3,600 persons to the sector. As a result, it is anticipated that this design alternative would require additional police staff at buildout. This number would depend on the number of additional persons generated from this alternative. Fire: Eventual construction of a fire station within the ERDR planning would allow for adequate service for this alternative. School: Capacity to service an increase in elementary and high school students is available. The capacity to satisfy future demands is not adequate. New schools in the planning and construction phases would satisfy future demands. No adverse impacts to schools are anticipated.

Table S-2

SUMMARY OF ALTERNATIVES (Continued)

ISSUE	NO PROJECT/EXISTING SPECIFIC PLAN	ALTERNATIVE DESIGN 1	ALTERNATIVE DESIGN 2
Parks, Recreation and Open Space	Impacts to parks, recreation and open space would be similar to those of the proposed project. Significant impacts to parks, recreation and open space would result with the proposed two acres of parkland. Significant impacts would be mitigated to a level below significance with mitigation proposed in conformance with the City of Chula Vista's parkland dedication ordinance.	Adoption of the alternative design would potentially decrease the number of residents in this area and cause a corresponding decrease in the demand for recreational facilities. The alternative design would base acreage of parkland required on a generated population using the City Threshold Standards of 3 acres of parkland per 1,000 population. This alternative would potentially result in less park space than the proposed project. This alternative would also preserve approximately 250 acres of open space or approximately 60 percent of the site, an increase of approximately 100 acres over the proposed project. No significant impacts to parks, recreation and open space would result with this alternative.	Adoption of the alternative design would potentially decrease the number of residents in this area and cause a corresponding decrease in the demand for recreational facilities. The alternative design would base acreage of parkland required on a generated population using the City Threshold Standard of 3 acres of parkland per 1,000 population. This alternative would potentially result in less park space than the proposed project. This alternative would also preserve approximately 210 acres of open space or approximately 50 percent of the site, an increase of approximately 60 acres over the proposed project. No significant impacts to parks, recreation and open space would result with this alternative.

Table S-3
SUMMARY OF OFF-SITE ALTERNATIVES

ISSUE	OTAY RANCH ALTERNATIVE SITE	OTAY MESA ALTERNATIVE SITE	EASTLAKE VISTAS AND WOODS
Project Description	Under this alternative scenario, development of the proposed project site would occur on this site instead of the proposed Otay Ranch project. No conceptual plans have been developed for this alternative site, but it would consist of similar components found in the proposed Rancho del Rey project such as 1,380 single-family dwelling units, including specialty housing, a junior high school site, a neighborhood park, open space areas, and major circulation routes.	Under this alternative scenario, development of the proposed project site would occur on this site instead of the proposed Otay Mesa project. No conceptual plans have been developed for this alternative site, but it would consist of similar components found in the proposed Rancho del Rey project such as 1,380 single-family dwelling units, including specialty housing, a junior high school site, a neighborhood park, open space areas, and major circulation routes.	Under this alternative scenario, development of the proposed project site would occur on this site instead of the proposed Eastlake Vistas and Woods project. No conceptual plans have been developed for this alternative site, but it would consist of similar components found in the proposed Rancho del Rey project such as 1,380 single-family dwelling units, including specialty housing, a junior high school site, a neighborhood park, open space areas, and major circulation routes.
Geology/Soils	Because of the close proximity of the proposed alternative site, geologic conditions are roughly the same. Severe groundshaking may occur on-site in the event of a major earthquake from known active faults in the San Diego area. It is anticipated that strong groundshaking could cause landslides to occur on the property, particularly where slopes are steep such as Poggi Canyon, and where alluvium is located. Many of the major soil units present on the western portion of the property contain expansive clays, which could pose potential geotechnical problems for the design and construction of buildings, roadways, and pavements. In addition, the Otay and Sweetwater Formations identified on-site contain beds of expansive clays, such as bentonite, which would likewise present such problems, due to their moderate to severe expansive properties. A significant part of the area on the western portion of the Otay Rancho property contains formations with these characteristics. In addition, grading during development could decrease the stability of existing slopes. An on-site specific geotechnical investigation would, however, have to be conducted to determine specific geologic hazards to the proposed project. Due to the potential for groundshaking, landslides, and expansive soils on the alternative site associated with active faults in the San Diego area, potentially significant impacts to geology could result.	Based on surrounding proposed projects' geotechnical investigations, it is anticipated that potential geologic hazards such as ancient landslides (associated with bentonitic clay layers) and faults cold exist on the project site. Potential landslide localities associated with the Otay formation are also anticipated to exist on-site, as well as expansive soils associated with bentonitic clays. This site would be influenced by several fault systems in the region including the Rose Canyon Fault Zone, the Coronado Banks Fault Zone, and the San Miguel Fault Zone. A northeast-southwest trending fault probably related to the La Nacion is located to the east and should be considered potentially active. Alluvial materials located in ravines and canyons may be subject to landsliding in association with potential earthquakes. Potential impacts to geology are considered significant. As a result, a site-specific geotechnical investigation should be conducted to determine geotechnical constraints and provide mitigation recommendations as necessary.	The absence of known fault traces on the site and the low seismic history of the Chula Vista area indicate that fault displacement would not pose a threat to future development. There is a possibility that future earthquake activity in the San Diego region could produce moderate to severe groundshaking on the project site. This is a hazard existing throughout Southern California. In addition, several ancient landslides and possible landslide features have been identified on the site by Leighton and Associates (1979). There is the potential for the occurrence of liquefiable soils in localized areas of alluvial deposits on-site in combination with perched groundwater during the rainy season. Potentially significant geology impacts could result with construction of the proposed project onto this site. A site specific geotechnical study would be conducted to determine these impacts if this alternative is adopted.

Table S-3
SUMMARY OF OFF-SITE ALTERNATIVES
(Continued)

ISSUE	OTAY RANCH ALTERNATIVE SITE	OTAY MESA ALTERNATIVE SITE	EASTLAKE VISTAS AND WOODS
Biology	Based on the biological resources mapped in the preliminary Otay Ranch program EIR, development of the proposed project on this site would result in impacts to agricultural land, maritime succulent scrub, Diegan coastal sage scrub, and native grassland (RECON, 1989). No sensitive plants were mapped within the boundaries of this alternative site. If this alternative site were selected, a thorough biological survey would be necessary to determine potential impacts. Based on preliminary biological resource information it is anticipated that adoption of this alternative would result in fewer biological resource impacts.	The on-site biological resources are not known at this time; however, based on existing topography and the presence of intermittent streams on the alternative site, it is anticipated that Diegan coastal sage scrub and low quality riparian vegetation may exist on-site. Slopes with a northern exposure may support chaparral. If this alternative site were selected, a thorough biological survey would be necessary to determine potential impacts. The site may be subject to applicable portions of the City of San Diego's Resource Protection Ordinance pertaining to biological issues.	The alternative site is primarily composed of agricultural uses (ERCE). Impacts to biology would not be anticipated to be significant.
Cultural Resources	There are no known cultural resources on this site; therefore, no impacts to cultural resources would occur (Reid, pers. comm., 1990). Impacts to cultural resources for the proposed project were reduced to below a level of significance.	The on-site cultural resources are not known at this time. If this alternative were selected, a thorough archaeological investigation would be necessary to locate sites and determine potential impacts.	Cultural resources were discovered on-site during the environmental review conducted for the Eastlake Vistas and Wood project. As a result, potentially significant impacts to cultural resources could result with placement of the proposed project on this site. If this alternative is selected, a thorough archaeological investigation to locate sites and determine potential impacts would be necessary.
Transportation	Development of this area would create traffic volumes greater than those planned for the Otay Ranch project and those planned by the General Plan. As a result, an on-site specific traffic study would have to be conducted to determine potential significance of the impacts and required mitigation . The East Chula Vista Transportation Phasing Plan would be used as the basis for determining traffic impacts. It is anticipated that these impacts could be mitigated to below a level of significance.	Development of this alternative site with the proposed project would create comparable traffic volumes as the proposed General Plan uses. A site specific traffic study would be conducted to determine potentially significant traffic impacts if this alternative site is selected.	It is estimated that development of residential uses as proposed would result in higher generation rates of traffic to that of the Eastlake Vistas and Woods facility. The East Chula Vista Transportation Phasing Plan (ECVTPP) would be used as the basis for determining traffic impacts. It is anticipated that the traffic volumes generated with Rancho del Rey SPA III on this site would create significant traffic impacts that would require circulation improvements as mitigation measures.
Land Use/General Plan/Zoning	This alternative site is located within proposed development areas of the Eastern Territories of Chula Vista. Development of this alternative site with the proposed project would be partially in conformance with the proposed low-medium density (3-6 du/ac) and open space residential land uses; however, it would be considered a more intensive use than both the proposed Otay Rancho project and general plan designation. Development of the proposed project on this site	Development of this alternative site would be in substantial conformance with the General Plan's proposed residential, park and school uses; however, it is anticipated that placement of residential uses on the alternative site would require processing of a Specific Plan Amendment. Although the surrounding area is for the most part presently undeveloped. this area is planned for future development. A portion of the site depending on site design may be subject	This residential project as proposed would not be in full conformance with land uses prescribed by the Eastlake Planned Community for the Eastlake Vistas and Woods. As a result, a General Plan Amendment would have to be submitted and given discretionary approval before implementation. Prescribed residential. school and park uses is considered more land use intensive than the Eastlake Vistas and Woods prop-

Table S-3
SUMMARY OF OFF-SITE ALTERNATIVES
(Continued)

ISSUE	OTAY RANCH ALTERNATIVE SITE	OTAY MESA ALTERNATIVE SITE	EASTLAKE VISTAS AND WOODS
Drainage/Groundwater/Water Quality	As in the proposed project, development of the alternative site would involve covering of surface soils during grading for building pads and roads and would create large areas of impervious ground surface with the overall effect of facilitating water runoff during rainy periods. Development of the site with urban uses would result in a change in the type and amount of contaminants contained in surface runoff, but would not result in greater impacts to water quality than the proposed project. Development of the site would not significantly impact drainage or groundwater/water quality.	The site contains unnamed intermittent streams which drain south to north in the northern half of the alternative site. Buildout of the proposed residential project onto this site would result in increased impervious surfaces which would drain into the local drainage system. In addition, additional urban pollutants associated with traffic and project buildout would contribute to runoff. A hydrological analysis would need to be conducted prior to development to determine significance of potential impacts and needed infrastructure.	The site contains the south-flowing Salt Creek which drains a major portion of the site. Buildout of the site would result in increased impervious surface which would increase urban runoff into the creek; as a result, additional urban pollutants could eventually enter the lower Otay Reservoir and the San Diego Bay with this runoff. It may be feasible to alter the drainage pattern to divert the runoff away from Otay Lakes into detention facilities, thereby minimizing impacts to the reservoir.
Landform Alteration/Aesthetics	Development of the proposed project at this alternative site would result in alteration of the existing landform for the construction of roads and housing pads. It is anticipated that changes to landform would not be as great as landform alteration on the proposed Rancho del Rey site because the existing topography on the Otay Ranch alternative is relatively level. The impacts would probably be below a level of significance.	Development of the proposed project at this alternative site would result in alteration of the existing landform for the construction of roads and housing pads. The alternative site is fairly hilly, but with flat portions which should be considered for the majority of proposed development. Incorporating sensitive design features would probably result in impacts to landform that are below a level of significance. Because the surrounding land is primarily vacant, the change in visual quality would be dramatic and is considered potentially significant.	Development of the proposed project at this alternative site would result in alteration of the existing landform for the construction of roads and housing pads. Topography of this alternative area is fairly hilly and may result in significant impacts to landform if sensitive design of clustering is not implemented. Local sections of Telegraph Canyon Road, Otay Lakes Road and East H Street (Proctor Valley Road) have been designated Scenic Roadways and visual impacts may result if proposed residential uses are not sensitively located. It is expected that increased landform alteration would result in this alternative area because of the more intensive residential land uses than those proposed in this area.
Air Quality	Adoption of this alternative would allow development of residences that would generate automobile trips and result in increased vehicular emissions (long-term air quality impacts). Short-term emissions from construction activities would generate dust and diesel emissions resulting in short-term emissions impacts. Because the density prescribed by the development of the Rancho del Rey project is higher than that projected in the General Plan for the Otay Ranch project in this 500-acre portion, it is expected that this alternative site would be expected to generate more vehicle emissions This would result in significant cumulative air impacts to the San Diego Air Basin.	Adoption of this alternative would allow development of residences, schools, and parks and would generate automobile trips that would, in turn, generate emissions. Proposed land uses of the proposed project onto this site are comparable and, as a result, it is anticipated that the proposed project would not generate significantly greater vehicular emissions than the General Plan proposed land uses. Development of the proposed project on this site would result in adverse cumulative air quality impacts to the San Diego Air Basin.	Adoption of this alternative would allow development of residences and schools, resulting in a greater number of residential units to be developed. A greater level of vehicular emissions would result. Construction on this alternative site would result in cumulative significant impacts to air quality.

Table S-3
SUMMARY OF OFF-SITE ALTERNATIVES
(Continued)

ISSUE	OTAY RANCH ALTERNATIVE SITE	OTAY MESA ALTERNATIVE SITE	EASTLAKE VISTAS AND WOODS
Land Use/General Plan/Zoning (cont.)	would require a General Plan Amendment and clustering of development in accordance with proposed General Plan open space areas. Incorporation of this clustering would avoid potentially significant impacts to land use.	to potentially significant noise impacts from Brown Field to residential and park uses (i.e., noise ratings above 60dB). No other land use impacts are expected.	osal, but not dramatically so. As a result, no significant impacts to land use would result.
Community Social Factors	Adoption of this alternative would result in the generation of a greater number of people than that proposed for this portion of Otay Ranch. However, the greater population, housing, and employment requirements induced would not be significantly greater and as a result, would not result in adverse impacts to community social factors.	It is anticipated that population, housing, and employment requirements generated from the proposed project onto this site would result in similar volumes. As a result, no impacts to community social factors would result.	With incorporation of these uses on this site, impacts to population, housing and employment requirements would be greater than those of Eastlake Vistas and Woods but would not result in significant impacts to community social factors.
Parks, Recreation and Open Space	Adoption of this alternative would require the construction of a 12.3-acre park on-site. Under the City of Chula Vista parkland dedication ordinance, three acres of parkland per 1,000 people is required. Open space acreages would need to be designated at the project design stage. It is anticipated that no impacts to Parks, Recreation and Open Space would occur provided that sufficient parkland is dedicated. This alternative assumes the retention of Poggi Canyon as a natural, open space corridor.	Adoption of this alternative would require the construction of a 12.3-acre park on-site . Under the City of Chula Vista parkland dedication ordinance three acres of parkland per 1,000 people is required. It is anticipated that no impacts to Parks, Recreation and Open Space would occur provided that sufficient parkland dedication is provided.	Adoption of this alternative would require the construction of a 12.3-acre park on-site. Under the City of Chula Vista parkland dedication ordinance three acres of parkland per 1,000 people is required. It is anticipated that no impacts to Parks, Recreation and Open Space would occur provided that sufficient parkland dedication is provided.
Service and Utilities	The alternative site is located in a substantially developed area and would have access to all infrastructure requirements. The additional population generated by the project would place a greater demand on all utilities and services than with land uses proposed for Otay Ranch; however, the increase would not be substantially greater to create significant impacts. An increase in police staff would be required as well as tax monies provided to the school districts for implementation of this long-range development plan to avoid potential impacts to police and schools.	The alternative site is located in a substantially developed area and would have access to all infrastructure requirements. The additional population generated by the project would place a similar demand on all utilities and services as land uses proposed by the General Plan for this area. An increase in police staff would be required as well as tax monies provided to the school districts for implementation of this long-range development plan to avoid potential impacts to police and schools.	It is anticipated that construction of the residential uses on the alternative site would result in increased demands for water, sewer, fire, school and police services. It is anticipated that no significant impacts to water would result if construction of proposed facilities coincides with the anticipated growth. It is anticipated that the proposed project would result in significant sewage impacts due to lack of existing capacity. Construction of additional sewage facilities and provision of treatment capacity would mitigate project-specific impacts to below a level of significance. At buildout of the project site, additional police staff may be required to serve the population generated by the proposed project. Cumulative impacts to schools may result and can be mitigated by provision and/or funding of appropriate facilities.

1.0 INTRODUCTION

1.1 PURPOSE

This document is a Supplemental Environmental Impact Report (SEIR) which addresses the proposed Rancho del Rey Sectional Planning Area (SPA) III project proposed by the Rancho del Rey Partnership. This SEIR should be read in conjunction with the previously prepared Final EIR (EIR-83-2) a copy of which is available for public inspection at the City of Chula Vista, Planning Department, 276 Fourth Avenue, Chula Vista, California, 92010. The proposed SPA III project is the third development phase of the El Rancho del Rey Specific Plan area. The project includes a detailed plan for residential development, community facilities, and park and open space uses on 404.6 acres located southeast of East H Street and north of Telegraph Canyon Road.

The El Rancho del Rey Specific Plan encompasses approximately 2,450 acres located east of Interstate 805 (I-805), south of East H Street and west of Otay Lakes Road, and north of Telegraph Canyon Road in the City of Chula Vista. The El Rancho del Rey Specific Plan serves as the General Plan for development within the plan boundaries and is divided into three sectional planning areas (SPA I through SPA III). The SPA I Plan and Planned Community District Regulations (PCDR) were approved by the City Council in December 1987. The SPA II Plan and PCDR were approved by the City Council in August 1989.

The purpose of this SEIR is to analyze the environmental consequences from development of this proposed plan, including approval of the SPA III Plan and tentative map. This SEIR has been prepared in accordance with the criteria, standards, and procedures of:

- the California Environmental Quality Act (CEQA) of 1970 (Public Resources Code Sections 21000 et seq.);
- the State CEQA Guidelines (Cal. Admin. Code Sections 15000 et seq.);
- the Environmental Review Procedures of the City of Chula Vista; and
- the regulations, requirements and procedures of any other responsible agency with jurisdiction by law.

The City of Chula Vista is the Lead Agency for the proposed project in accordance with Section 15367 of the State CEQA Guidelines, which defines the lead agency as "the public agency which has the principal responsibility for carrying out or approving a project". The necessity to prepare an SEIR and the scope of the analysis was determined by the City of Chula Vista's Environmental Review Coordinator. The SPA III Plan and associated tentative map will require approval of the Chula Vista City Council. The City Design Review Committee will also have jurisdiction over portions of the property which require a Precise Plan.

In accordance with Section 15150 of the CEQA Guidelines, the information contained in the previous EIR is hereby incorporated by reference. To avoid redundant discussion, the incorporated language shall be considered to be set forth in full as part of the text of the EIR. The Final EIR for El Rancho del Rey Specific Plan was certified by the City of Chula Vista in March 1985. This document discusses the potential environmental impacts of the proposed SPA III. Since the project substantially conforms to the adopted Specific Plan, the CEQA mandated sections from the original EIR "Relationship Between Local Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity" and "Irreversible Environmental Changes that will result from the Proposed Project" are incorporated by reference. The previous EIR did not identify significant environmental impacts in relation to these CEQA sections beyond the cumulative traffic impacts.

Recent California legislation (AB 3180) requires the adoption of a mitigation or reporting program in conjunction with approval of Mitigated Negative Declarations or certification of Final EIRs. The purpose of the law is to establish a reporting or monitoring program to assure implementation of recommended mitigation measures. This report contains a monitoring program included in the Mitigation/ Monitoring section of each issue analysis in the Impacts Section.

An effort has been made during the preparation of the SEIR to contact all affected agencies, organizations, and persons who may have an interest in this project. Information, data, and observations resulting from these contacts are included where relevant. In addition, all interested agencies and persons will have the opportunity to comment on the project during the circulation of the Draft SEIR.

Comments received by the City of Chula Vista, together with responses to such comments, will be included in the Final SEIR.

1.2 BACKGROUND/THRESHOLD POLICY

In 1987, the City Council of Chula Vista established a Threshold Policy and Growth Management Oversight Committee (GMOC). The goal of the Threshold Policy is to assure maintenance of a high quality environment and adequate public services. The program involves implementation of standards, or thresholds, as determined by the City Council. Standards have been determined for eleven issues: fire/emergency medical service, police, traffic, parks/recreation, drainage, libraries, air quality, economics, schools, sewer, and water. The GMOC is responsible for the periodic review of the Threshold Policy standards and compliance with the standards. The GMOC must prepare a yearly status report for the City Council. If any standards are being exceeded, the GMOC must inform City Council and the Council is required to hold a public hearing. Funding and enforcement of suggested recommendations are the responsibility of the City Council.

In addition, project-by-project review is required for six of the eleven issues: fire, police, sewer, water, parks/recreation, and drainage. This review is scheduled to occur during the environmental review phase. For each issue, the relationship between anticipated project impacts and threshold standards must be evaluated. In compliance with the Threshold Policy program, pertinent issue analyses in this document will incorporate an evaluation of the proposed project for conformance with the applicable Threshold Policy standards.

2.0 PROJECT DESCRIPTION

2.1 LOCATION

The Rancho del Rey SPA III is located in the City of Chula Vista east of I-805. The regional location of the site is shown in Figure 2-1. The project site is within the southeastern portion of the El Rancho del Rey Specific Plan area as illustrated in Figure 2-2. SPA III is located east of I-805, south of East H Street, and north of Telegraph Canyon Road.

2.2 BACKGROUND

The El Rancho del Rey (ERDR) Specific Plan has been incorporated by reference into the City of Chula Vista General Plan and governs the development of the 2,450-acre site. The ERDR Specific Plan area has been divided into subcommunities or SPAs for the purpose of guiding the implementation of Planned Community (PC) zoning. The ERDR Specific Plan was originally adopted in 1978 and included 10 SPAs. The original EIR for the project (EIR-78-2) was certified in February 1978. The specific plan was amended in 1985 (GPA-83-7) at which time six of the SPAs were combined to form the ERDR Specific Plan Amendment area. The Rancho del Rey Sectional Planning Area Criteria Report describes the division of the specific plan area into four sub-areas known as SPA I, SPA II, SPA III and SPA IV. These SPAs have since been combined so that Rancho del Rey includes only three SPAs (see Figure 2-2).

An EIR for the ERDR Specific Plan Amendment was adopted in March of 1985. This 1985 EIR (El Rancho Del Rey Specific Plan Amendment Final EIR), which incorporated the analysis and conclusions of the 1978 EIR, comprises the Master EIR for the subject property. The ERDR Specific Plan Amendment EIR (EIR-83-2) was approved as well as an addendum to EIR 83-2 which was prepared due to subsequent modifications to the specific plan. In addition, a supplemental EIR (EIR-83-2(B)) was prepared due to significant new information pertaining to biological resources on-site.

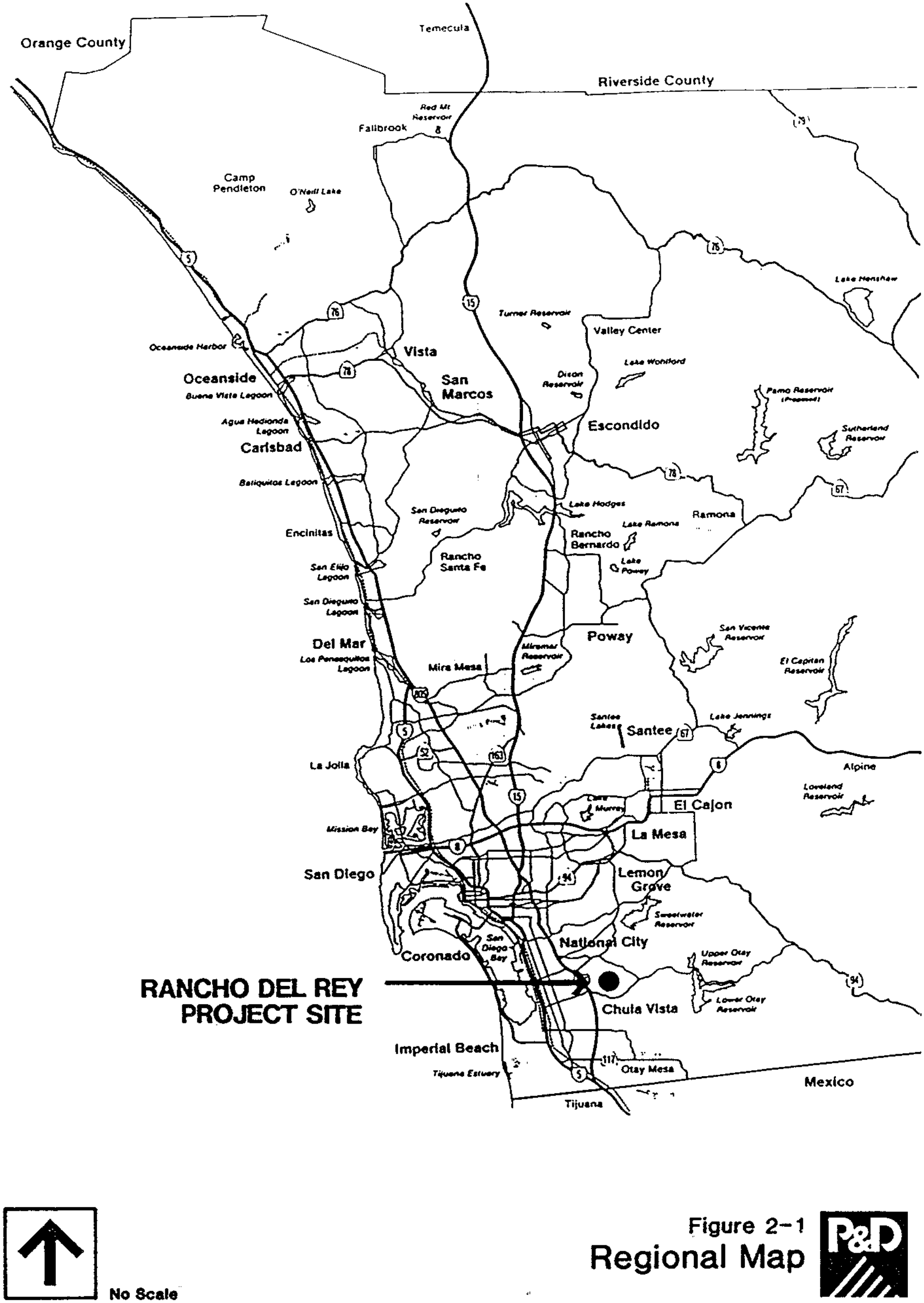
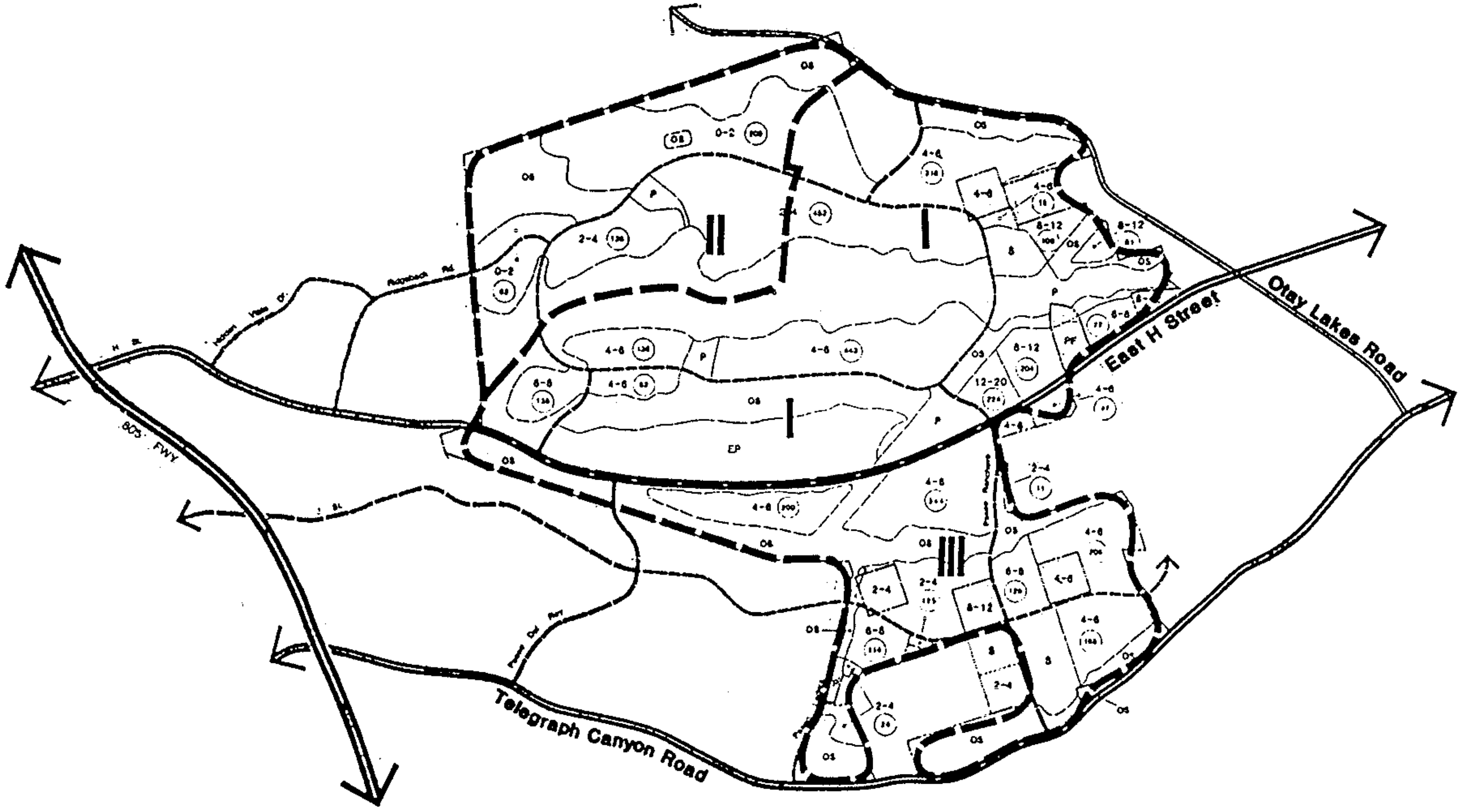


Figure 2-1
Regional Map



Source: Cinti & Associates

Figure 2-2
Boundaries of SPA's I-III

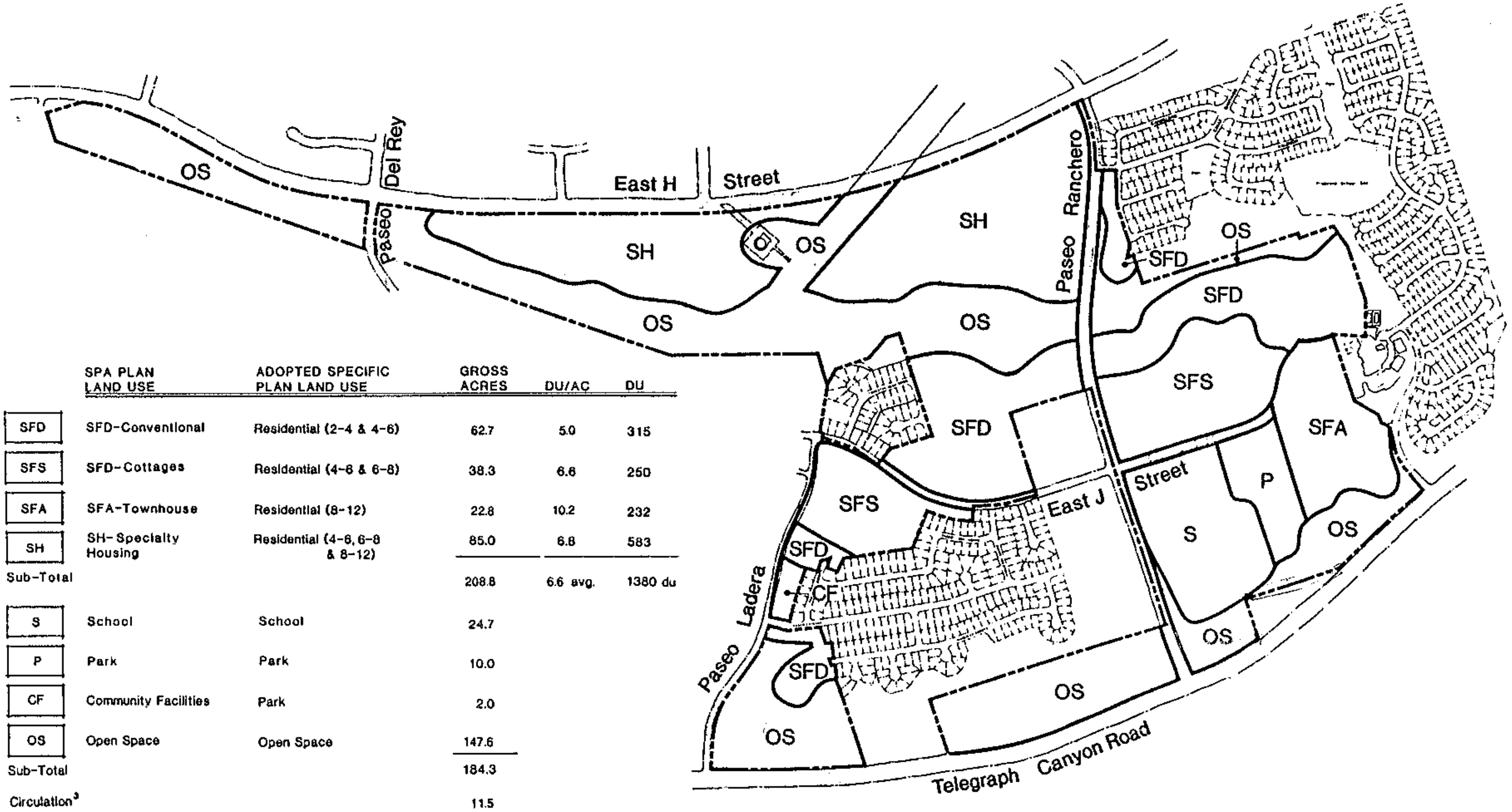
The SPA I Plan was approved in December 1987 and is now under construction. Following the approval of Rancho del Rey SPA I, detailed planning for the majority of the site north of East H Street was completed. The EIR for the SPA II Plan was certified in August 1989 and constsruction is now underway. The Chula Vista City Council subsequently approved the current SPA boundaries and labels as shown on Figure 2-2.

2.3 PROJECT CHARACTERISTICS

The proposed project involves a SPA Plan and tentative map for approximately 405 acres. The plan for the SPA III area is consistent with the Specific Plan although very minor land use changes have been made during the detailed planning process. The Rancho del Rey SPA III Plan proposes the construction of 1,380 single-family dwelling units (DU) from 3.8 to 10.6 DU/ac on eight residential parcels on approximately 206 acres. Included among the planned dwelling units are 583 DUs of specialty housing on approximately 85 acres for a small retirement community which will be composed of detached and attached housing. In addition, a junior high school site totalling 24.7 acres; a neighborhood park totalling 10.0 acres; community facilities totalling 2.0 acres; eight open space areas totalling 147.6 acres; and major circulation routes totalling 13.7 acres are proposed (Table 2-1). The general development plan (Figure 2-3) illustrates the layout of these uses.

Included within the provisions of the El Rancho del Rey Specific Plan is a mechanism to transfer density from one category to another as a part of the SPA Plan approval process. The density transfer will involve the transfer of 171 residential units within the SPA III project area. The approval of SPA III will include the SPA III Plan, a tentative map, a Public Facilities Financing Plan, Design Guidelines, a Development Agreement, and a Specific Plan Amendment for density transfers and park acreage additions. The elimination of the East "J" Street link connecting Paseo Ranchero and Buena Vista will require a Specific Plan and General Plan Amendment.

There are 315 conventional single-family detached residential units and 250 single-family detached cottage residential units proposed. These units are located throughout SPA III. There are three separate single-family conventional lot areas



SPA PLAN LAND USE		ADOPTED SPECIFIC PLAN LAND USE	GROSS ACRES	DU/AC	DU
SFD	SFD-Conventional	Residential (2-4 & 4-6)	62.7	5.0	315
SFS	SFD-Cottages	Residential (4-6 & 6-8)	38.3	6.6	250
SFA	SFA-Townhouse	Residential (8-12)	22.8	10.2	232
SH	SH-Specialty Housing	Residential (4-6, 6-8 & 8-12)	85.0	6.8	583
Sub-Total			208.8	6.6 avg.	1380 du
S	School	School	24.7		
P	Park	Park	10.0		
CF	Community Facilities	Park	2.0		
OS	Open Space	Open Space	147.6		
Sub-Total			184.3		
Circulation³			11.5		
Project Total			404.8 ac		1380 du

RANCHO DEL REY
A Planned Community by the Rancho Del Rey Partnership

Scale

Source

Cinti
& Associates
(619) 239-1815

7/23/90

Figure 2-3

General Plan Development

Table 2-1

PROPOSED LAND USES

RANCHO DEL REY SPA III

Land Use	PROPOSED SPA III DU	 Acres	 Percent of Land Area
SFD Conventional	315	62.7	16%
SFD Cottage	250	38.3	9%
SFA Townhouse	232	22.8	6%
Specialty	583	85.0	21%
Public park	---	10.0	2%
Junior High School	---	24.7	6%
Community Facilities	---	2.0	1%
Open Space	---	147.6	36%
Major Circulation Routes	---	11.5	3%
TOTAL	1,380	404.6	100%

* SFD - Single Family Detached, SFA - Single Family Attached

which total 62.7 acres. There are three separate single-family detached cottage lot areas that total 38.3 acres. There are 232 single-family attached townhouse units and 583 specialty units for a retirement community proposed. The single-family attached townhouse lot totals 22.8 acres and the specialty housing for the retirement community totals 85 acres. The 10.0 acre park is located south of East J Street. The community facilities, which may include a church, day care or other quasi-public facility, includes 2 acres. The junior high school site which totals 24.7 acres, is located on the east side of Paseo Ranchero near Telegraph Canyon Road. There are eight open space areas which are located throughout the site. Open space is discussed in the Parks, Recreation and Open Space Section 4-11.

The proposed project would be developed in three phases. The first phase would involve the development of the proposed retirement community. The second phase would involve the development of the area west of Paseo Ranchero. The third and final phase would involve the development of the area on the east side of Paseo Ranchero which would include the junior high school site and the neighborhhod park.

3.0 ENVIRONMENTAL SETTING

The proposed 404.6-acre project site is located in the Sweetwater Planning Area of the City of Chula Vista and the ERDR Specific Plan Area. The ERDR Specific Plan Area encompasses approximately 2,450 acres. The ERDR Specific Plan serves as the General Plan for development within the plan boundaries and is divided into three sectional planning areas (SPA I through SPA III). The proposed SPA III project is the third development phase of the ERDR Specific Plan Area. The project site is approximately eight miles south of the metropolitan area of San Diego and six miles north of the U.S.-Mexico border. The site is located east of I-805, south of East H Street, west of Otay Lakes Road and north of Telegraph Canyon Road in the City of Chula Vista.

Topographically the site is characterized by gently to steeply sloping hillside terrain and deep westerly draining canyons. The ridgelines are incised by a number of draws. The site lies between East H Street and Telegraph Canyon Road. The hills to the south of the project site are utilized as agricultural areas and are vacant. The hills to the north have been graded for the planned Rancho del Rey SPA I residential development and employment park. The hills to the east and west are utilized as residential areas. A SDG&E transmission line and a water tank are located on the project site.

The proposed project is located within an area of coastal sage scrub, maritime desert scrub, grassland and chaparral and is typical of Southern California coastal canyonlands and ridgetops. Human encroachment including illegal dumping and off-road vehicle (ORV) use has caused the quality of habitat to decrease.

The north side of East H Street consists of residential development along with an approximately 100-acre business park which includes about 83 gross acres for building and about 13 acres for open space. This business park has been built as part of Ranchero del Rey SPA I and is located on the north side of East H Street facing proposed residential areas within SPA III. Southwestern Community College is located approximately one mile east of the site. Commercial shopping centers are located at the Intersection of I-805 with East H Street and East H Street with

Otay Lakes Road. The Eastlake Community and commercial/light industrial park are located approximately two miles to the east of the site. The Otay Lakes County Regional Park is located approximately three miles south and east of the site.

4.0 ENVIRONMENTAL ANALYSIS

4.1 GEOLOGY/SOILS

EXISTING CONDITIONS

Soils and Geology - A preliminary geotechnical investigation was completed by GEOCON in March 1989 (Appendix A). This investigation included a review of previous geologic, soils engineering and seismologic reports pertaining to the project site. The report is summarized below and is on file with the Environmental Review Section of the City of Chula Vista Planning Department. The body of the report (excluding appendices and plates) is appended to this EIR under separate cover.

Topographically the site is characterized by gently to steeply sloping hillside terrain and deep westerly-draining canyons. The ridgelines are incised by a number of draws. The hillsides slope at gentle to steep gradients. Elevations on the site range from about 200 feet near the northwestern corner to 490 feet above mean sea level near the eastern portion of the property.

The project site lies within the Coastal Plains Province of California. In general, this province consists of a series of gently westward sloping dissected terraces. The lowering of sea levels and the subsequent erosion of the mesas, as well as regional uplifting, have formed the landform on-site.

As shown in Figure 4-1, the site itself is underlain by four major sedimentary rock units. The Sweetwater Formation consists of slightly silty fine to coarse sandstone. This unit is found at the approximate elevation of 375 feet in the southern portion of the site. The Otay Formation rocks consist mostly of silty fine to medium sandstone. Also present in the Otay Formation are sandy to clayey siltstones, claystone lenses, and continuous seams of bentonitic claystones about one to three feet thick. Exposures of the Otay Formation were observed along the canyon slopes at elevations between approximately 385 and 430 feet. The expansion potential of these materials ranges from very low for the sandstones to

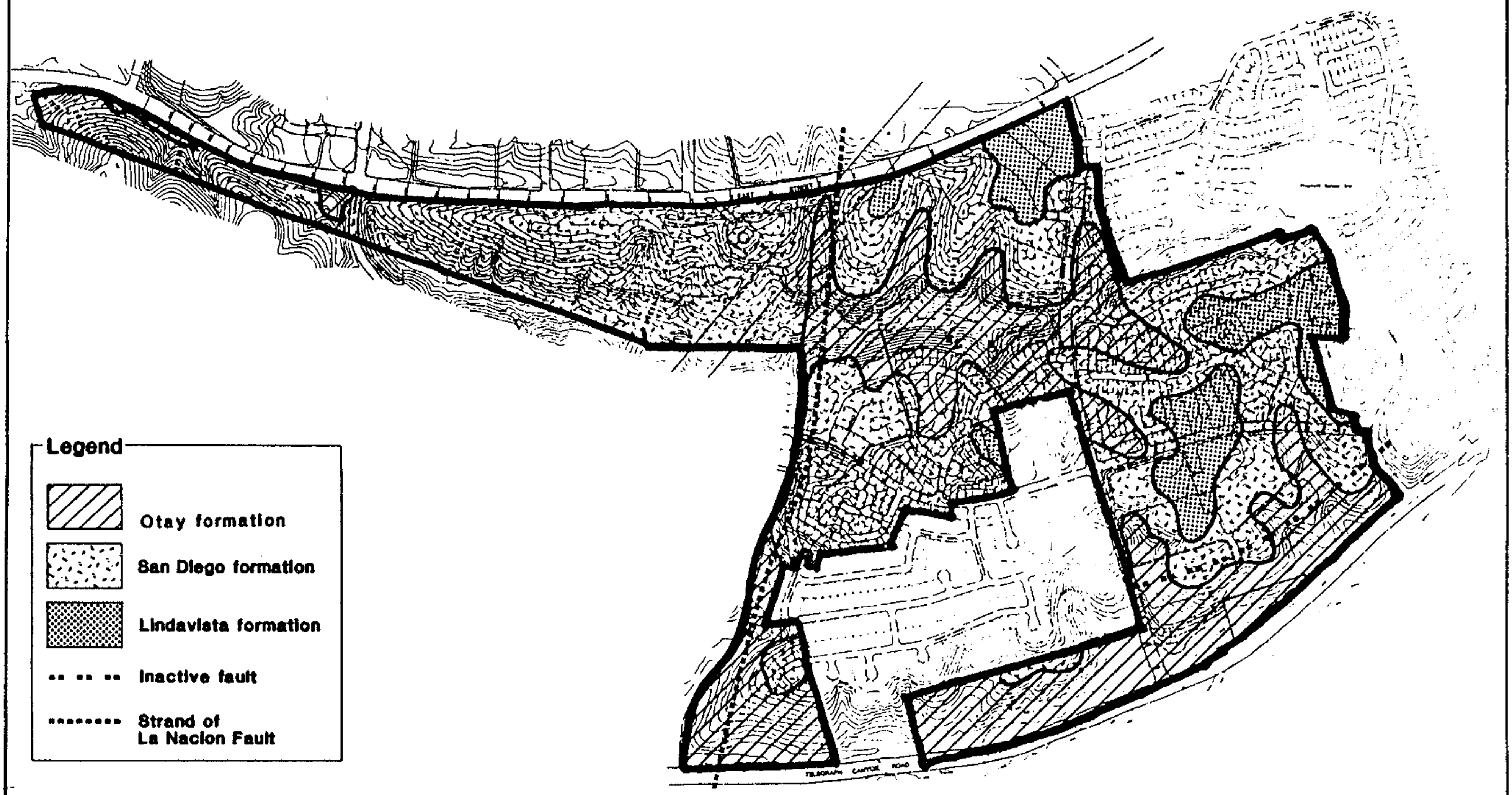


Figure 4-1

Geological Formations within SPA III

Source: Kennedy and Tan, 1977; Kuper, 1977; Woodward-Clyde Consultants, 1978 very high for the bentonitic clays. The San Diego Formation is found at higher elevations throughout the site and consists of silty fine sandstone with some poorly lithified, very friable zones. Because the unit is friable and cohesionless, it may be susceptible to erosion of cut and fill slopes.

The above-mentioned rock units are capped on the higher ridges by a terrace deposit, and by surficial units consisting of alluvium and colluvium. The Linda Vista Formation terrace deposit forms a thin cover of fine to coarse sandstone with occasional cobbles. Alluvial deposits were observed in most of the swales and small gullies on-site as well as the major drainages. The thickest deposits are encountered to depths in excess of 17 feet in the upper reaches of the south leg of Rice Canyon, south of H Street. The colluvium deposits located on slopes are typically three to six feet thick. The top soil is generally two to three feet in thickness.

Geologic Hazards - Generally, geologic hazards include seismic risk, expansive soils and compressible alluvial soils. The Rancho del Rey site is crossed by the La Nacion Fault Zone which has one prominent fault, running north to south, with other potential traces (Figure 4-1). The La Nacion Fault Zone is considered potentially active. An unnamed east-west trending fault was observed in the vicinity of the proposed junior high school site. This fault is considered inactive. Numerous fault traces have been mapped or inferred south and east of the site; however, their locations in the project area are not well defined. The fault traces shown in Figure 4-1 were encountered during the GEOCON investigation.

Although the La Nacion Fault is considered potentially active, seismic risk is considered low to moderate as compared to some parts of Southern California. Seismic hazards within the site result from ground shaking caused by events on distant, active faults. The distant, active faults which could affect the site are given in Table 4-1. A regional fault location map is provided in Appendix A.

It is the opinion of the project geologist that the maximum probable earthquakes that are most significant are either a 7.0 magnitude event on the Elsinore Fault or a 7.3 magnitude event on the San Clemente Fault. According to GEOCON the most significant earthquakes relative to the site would be those occurring on the

Table 4-1

CTIVE FAULTS WITHIN 100 MILES OF PROJECT

Fault	Distance from Site	Maximum Probable Earthquake
Elsinore	41 miles NE	7.0
San Clemente	44 miles W	7.3
Coronado Banks	17 miles W	6.0
San Jacinto	64 miles NE	7.5
San Andreas	90 miles NE	8.0
La Nacion*	0	6.0
Rose Canyon*	7 miles NW	6.0

* Potentially active

Coronado Banks Faults, 17 miles west of the site. The Coronado Banks Fault Zone is considered to be active under criteria set forth by the California Division of Mines and Geology.

Due to the density and gradation of soils underlying the project site and the depth to groundwater, the liquefaction potential of formational material is very low. Some expansive soils may be encountered during grading. Ground rupture is not likely at the site due to the absence of active faulting. The site is not subject to innundation by tsunamis and seiches due to its elevation above sea level and the lack of fresh water bodies. Seismically induced landsliding does not appear to be a significant hazard on the site. Alluvial soils are compressible and subject to settlement if fill or structures are placed on them.

IMPACTS

Soils and Geology - Development of the proposed project would involve grading for installation of utility facilities and creation of streets and building pads. Building pads will be constructed by conventional grading techniques involving cutting of ridge-tops and filling of canyons and side slopes. In general, graded slopes would be constructed at 2 to 1 (horizontal to vertical) slope ratios based on height. The maximum cut and fill slopes are approximately 50 feet, excluding remedial grading. The associated canyon fill ranges from two feet to approximately 85 feet in depth.

Considering the proposed grades, it does not appear that the Sweetwater Formation will be exposed during grading. The Otay and San Diego formations would be exposed after grading. However, it is anticipated that bentonitic clay seams will crop out at finished grade in large cut areas. Cut slopes containing bentonitic clays, clay beds dipping out of slope, or other adverse geologic conditions may require remedial measures such as stabilization or buttress fills. The observed materials of the San Diego formation are expected to exhibit a very low potential for expansion. As mentioned above, the San Diego formation may be susceptible to erosion of cut and fill slopes. Impacts to the Linda Vista Formation are not anticipated due to its dense and massively bedded nature.

The alluvium, colluviu,m and similar compressible materials would not support development without adequate treatment. Recompaction of the soil would provide stable and developable building pads. The potential for liquefaction on-site is low and would not impact the developability of the site. The alluvial and colluvial soils encountered on-site have permeability characteristics that could be susceptible to water seepage under seasonal conditions.

Geologic Hazards - Based on the findings of the Geocon report (dated March 8, 1989) the branch of the La Nacion Fault present on the site dies out in a series of small folds on adjacent property to the north. In addition, the fault does not displace sediments of the Pleistocene Lindavista Formation. Therefore it is the opinion of the project geologist that the fault does not represent a significant seismic or ground rupture hazard to the development. However, the site could be subjected to moderate-to-severe groundshaking in the event of a major earthquake on more remote faults such as the Coronado Banks, Rose Canyon, or Elsinore Faults.

MITIGATION/MONITORING

The geotechnical report prepared by GEOCON identifies detailed grading and earthwork mitigation recommendations for potential project related impacts associated with geologic units, seismicity, earthwork, slope stability, foundation stability, drainage, shrinking and bulking, compaction, expansion, and erosion and seepage. The following is a list of the key mitigation measures. Refer to Appendix

A for the complete list of recommendations. These mitigation measures would be implemented by the project proponent prior to and during construction activities.

- All fill would consist of approved earth material. The geotechnical consultant would be contacted for evaluation of imported fill at least two working days prior to importation.

- The height, slope ratio, and compaction of all cut-and-fill slopes would conform to specifications identified by the geotechnical consultant, as appropriate. Fill slopes not conforming to the assumptions stated in the geotechnical recommendations would be individually studied prior to completion of grading. Cut slopes would be evaluated by the geotechnical consultant during grading. Grading would be done in accordance with Chula Vista Grading Ordinance number 1797 as amended by ordinances 1877 and 2128.

- Stabilization fills should be utilized in areas deemed appropriate by the geotechnical consultant. The types and specifications of stabilization fills would be determined during excavation by the geotechnical consultant.

- Subdrains would be installed at the base of fills placed in canyons and draws or over areas of actual or potential seepage. Specific locations would be determined in the field during grading, with installations being reviewed by the geological consultant prior to placement of fill.

- To reduce impacts from groundshaking during a major earthquake the project proponent would adhere to the Uniform Building Code and the Recommended Lateral Force Requirements of the Structural Engineer's Association of California.

- Foundations, slabs, footings, and retaining walls would be designed in accordance with specifications identified by the geotechnical consultant, based on the type of soils encountered and pertinent structural considerations.

- Final grading plans and foundation plans for the project site would be reviewed and approved by the geotechnical consultant and the City prior to construction.

- Highly expansive soils used as fill would be placed a minimum of 3 feet below finish grade and 15 feet inside of fill slopes. Bentonite, if used as fill, would be placed a minimum of 10 feet below finish grade and 15 feet inside of fill slopes.

- In areas that receive fill or settlement sensitive improvements, loose topsoil/colluvium, landslide debris, alluvial deposits, end-dump fills and undocumented fills not removed by planned grading operations would be removed to firm natural ground. The exposed natural ground would be scarified and properly compacted to at least 90 percent relative compaction prior to placing additional fill and/or structures.

- The outer portion of fill slopes would be composed of compacted granular soil fill to reduce the potential for surficial erosion.

- The site would be brought to final subgrade elevations with structural fill compacted in layers. Lifts of fill would be no thicker than will allow for adequate bonding and compaction. Variable lift thicknesses would not exceed 6 to 8 inches.

- Periodic on-site observations would be made by the soil engineer or engineering geologist during grading and/or construction to monitor for the presence of groundwater. Grading operations on the site would be scheduled to place oversize rock and expansive soils in the deeper canyon fills and to utilize granular materials having a low expansion potential to cap building pads and fill slopes.

In addition, the City of Chula Vista requires that a detailed grading and drainage plan be prepared in accordance with the Chula Vista Municipal Code, Subdivision Manual, applicable ordinances, policies and adopted standards. The plan would be approved and a permit issued by the Engineering Division prior to start of any grading work and/or installation of any drainage structures.

As part of the monitoring program the City Engineering Department would place the recommended mitigation measures as conditions on the tentative map. The final grading and foundation plans would include the design and construction recommendations provided by the geotechnical consultant. The final grading plans would be reviewed by the City prior to issuance of a grading permit to confirm that the rcommendations have been included in the plans. Onsite grading would be monitored by a qualified geotechnical consultant to confirm soil conditions as anticipated, and if differences are noted, to provide modifications to initial recommendations relative to geotechnical aspects. A Testing and Observation Report would be completed by the geotechnical consultant and provided to the City prior to issuance of a building permit which verifies that the design and construction recommendations were complete according to approved grading plans and which details any changes to the initial recommendations as identified during field observation.

ANALYSIS OF SIGNIFICANCE

Compressible alluvium, colluvium, and expansive bentonitic soils are unsatisfactory for development without remedial treatment. This is regarded as a significant, mitigable impact.

4.2 DRAINAGE/GROUNDWATER/WATER QUALITY

This section discusses the major hydrologic characteristics of the Rancho del Rey SPA III project area including drainage, surface waters, groundwater, and water quality. This section incorporates hydrologic and design data from the following documents: Drainage Study for the ERDR Specific Plan July 1986 by Rick Engineering and an Addendum drainage study for Rancho del Rey SPA III by Project Design Consultants in April 1989.

EXISTING CONDITIONS

Drainage - The subject parcel is located within portions of two major drainage basins as defined in the Special Study of Storm Drainage Facilities (The Fogg Report, 1964). The northern portion of the site is within the Rice Canyon Basin. The southern portion is located in the Telegraph Canyon Basin. Both of the basins drain to San Diego Bay, although they are within the Sweetwater River hydrographic unit as defined by the Regional Water Quality Control Board (SANDAG, 1985). The runoff calculations in the "Fogg Report" are based on General Plan land use designations. The City of Chula Vista uses the Fogg Report to size its major flood control improvements.

The three major east-west trending streams in Rice Canyon will ultimately contribute 1,794 cubic feet per second (cfs) of storm flow at a point near H Street based on a 50-year frequency storm. A siltation basin has been constructed at that point and a double 96-inch storm drain has been constructed westerly to an open channel outlet adjacent to I-805 to accommodate this ultimate flow. The north leg of Rice Canyon is calculated to ultimately contribute 959 cfs, while the center leg is calculated to contribute 280 cfs. The south leg of Rice Canyon, off-site but within the Specific Plan area, is calculated to contribute 474 cfs. A 66-inch pipe in South Rice Canyon at Paseo del Rey is designed to carry this flow. In Telegraph Canyon, 50-year storm flows are calculated at 2,163 cfs near Paseo Ranchero where the creek crosses from the south side of Telegraph Canyon Road to the north side as it flows westerly to the San Diego Bay. The flow increases to 2,446 cfs at the western jog in the boundary of Paseo Ladera. Other smaller existing storm drains include a 24-inch pipe in Buena Vista Way; a 24-inch pipe in Paseo Ladera at Paseo Entrada; and a 24-inch pipe in Forester Glenn Drive at East J Street.

Ground Water/Water Quality - The project site lies within the Sweetwater Hydrographic unit which encompasses an area of about 230 square miles, and is a narrow, northeasterly trending strip extending to the coast. The southwesterly flowing Sweetwater River has impoundments (dams) at Loveland and Sweetwater reservoirs.

Qualitative information on the water quality characteristics of surface runoff or groundwater at the project site has not been gathered; however, the quality of surface water is expected to be typical of runoff from a mixed grassland/sage scrub, agrarian and urban landscape. The Water Quality Control Plan (California Water Quality Control Board, 1975) and Water in the San Diego Region (SANDAG 1985) give water quality data for the hydrographic unit indicating that runoff is probably high in nutrients, micro-organisms and dissolved solids. This is due to runoff from urban as well as agricultural, non-urban sources. Development of the subject site must comply with all applicable regulations established by the Environmental Protection Agency (EPA) as set forth in the National Pollutant Discharge Elimination System (NPDES) permit requirements for stormwater discharge.

POTENTIAL IMPACTS

Drainage - Development of the project site will involve overcovering of the surface soils as a result of grading for building pads and roads. The project will create large areas of impervious ground surface with the overall effect of facilitating water runoff during rainy periods. Rick Engineering prepared a drainage study for the Rancho del Rey Specific Plan area in July 1986. A drainage study for East H Street was also prepared by Rick Engineering in February 1987. Project Design Consultants prepared a drainage study for SPA III in 1989. Preliminary drainage design for the specific plan area required three methods of analyses; U.S. Army Corps of Engineers HEC-1 and HEC-2 computer programs were used to calculate estimated discharges and corresponding water surface profiles, while the modified rational method was used to size the preliminary underground storm drain system. The 1986 Rick Engineering study analyzed the storm drain system for East H Street and the runoff to an existing culvert serving the South Rice Canyon Basin. According to the 1989 Project Design Consultant report, the off-site drainage facilities for SPA III are considered adequate to accommodate the potential flows after development, and there would be no significant impacts to drainage.

Groundwater/Water Quality - Development of the site with urban uses, would result in a change in the type and amount of contaminants contained in surface runoff. Contaminants such as oil, grease, and heavy metals from automobiles would increase. Planted lawns and landscaping associated with SPA III would afford greater erosion protection than the existing bare or partially vegetated ground. The increase in contaminants would potentially cause adverse impacts to ground-water/water quality. Continued buildout of the Specific Plan and adjacent development would generate a cumulative impact to local water quality.

MITIGATION/MONITORING

Potentially adverse impacts to groundwater/water quality would be reduced to below a level of significance through the adherence to regulations regarding stormwater discharge set forth in the NPDES permit requirements. As part of the monitoring program the City Engineering Department would ensure that the project is in conformance with NPDES regulations prior to issuance of the occupancy permit. The proposed project would not significantly impact drainage and no mitigation/monitoring is required.

ANALYSIS OF SIGNIFICANCE

The capacity of the existing drainage system is sufficient to serve the project, and there would be no significant impacts to drainage. In conformance with the Threshold standard, storm water flows and volumes would not exceed City Engineering standards. Urbanization would result in increased concentrations of automobile-related contaminants which would potentially impact groundwater/water quality. Potential impacts to water quality would be reduced to below a level of significance through adherence to regulations established in the NPDES permit requirements for stormwater discharge.

4.3 LANDFORM ALTERATION/AESTHETICS

EXISTING CONDITIONS

The topography of the Rancho del Rey SPA III is comprised primarily of gently to steeply sloping hillside terrain and deep westerly draining canyons. The ridgelines are incised by a number of draws. The northern edge of the site falls along the southern leg of Rice Canyon. The southern portion of the site falls along the north side of Telegraph Canyon.

Elevations on the ridge tops range from 190 feet above mean sea level (MSL) in the west end to 490 feet MSL in the east. Elevations at the bottom of Rice Canyon range from 240 to 320 feet MSL.

The project site is presently vacant land characterized by native scrub plant communities. Portions of the site have been previously disturbed by ORV use and SDG&E maintenance vehicles. Short-range views from the mesa tops include the canyons and valleys below. On a clear day, the long-range views of downtown San Diego, mountain ranges to the east, and Mexico to the south are possible. Due to the irregular topography of the site, unless located on one of the ridge tops, views are confined to other portions of the site.

The northeastern portion of the site is in proximity to existing residences which are considered sensitive view receptors. Views of the property can be obtained from Telegraph Canyon Road and East H Street. Both Telegraph Canyon Road and East H Street are designated as Scenic Highways in the Chula Vista Scenic Highway Element. Scenic highway policies address design review, beautification of scenic routes, landscaping and maintenance requirements. To implement the policies, the Scenic Highway Element recommends that developers create "pleasing streetscapes through landscaping techniques and varied building setbacks," or create "substantial open space areas adjacent to scenic routes" through the use of clustering or other innovative site design concepts.

The following design policies from the adopted ERDR Specific Plan are pertinent to the visual quality of proposed development on the project site:

- Grading Standards: Grading within the Specific Plan area shall be subject to Chapter 15.04 - Excavation, Grading and Fills, of the Municipal Code.

- Grading Design: It is the intent of the Specific Plan area that graded areas will be contoured to blend with natural landform characteristics. Rounding both vertical and horizontal intersections of graded planes, obscuring slope drainage structures with a variety of plant material massing, incorporating the use of variable slope ratios for larger slope banks, use of landscape planting for erosion control and to obscure manmade banks, architectural solutions to topographic changes, and other similar techniques should be used. Artificially appearing slope banks with rigid angular characteristics shall not be permitted.

- <u>Grading Policies</u>: General policies with regard to development within the ERDR Specific Plan area are as follows:

  a. Visually significant slope banks should be preserved in their natural state by clustering development.

  b. The natural character of the hillsides should be retained where practical.

  c. Intrusions of graded slopes into areas designated as open space on the Specific Plan map should be avoided except where necessary to construct infrastructure facilities and trails, or where it can be demonstrated that such intrusion would result in superior site design. Such intrusion should not be in areas of significant environmental sensitivity and shall be revegetated with indigenous species to recreate, to the extent feasible, the previous condition.

  d. A variety of housing, padding techniques, grading techniques, lot sizes, site design, density, arrangement, and spacing of homes and developments should be encouraged.

  e. Innovative architectural, landscaping, circulation, and site design should be encouraged.

  f. Safety against unstable slopes or slopes subject to erosion and deterioration should be provided.

  g. Facilities to rectify unstable slopes or slopes subject to erosion and deterioration should be provided.

  h. Grading may be accomplished beyond the boundaries of an approved SPA plan where necessary to implement the SPA plan uses or infrastructure facilities.

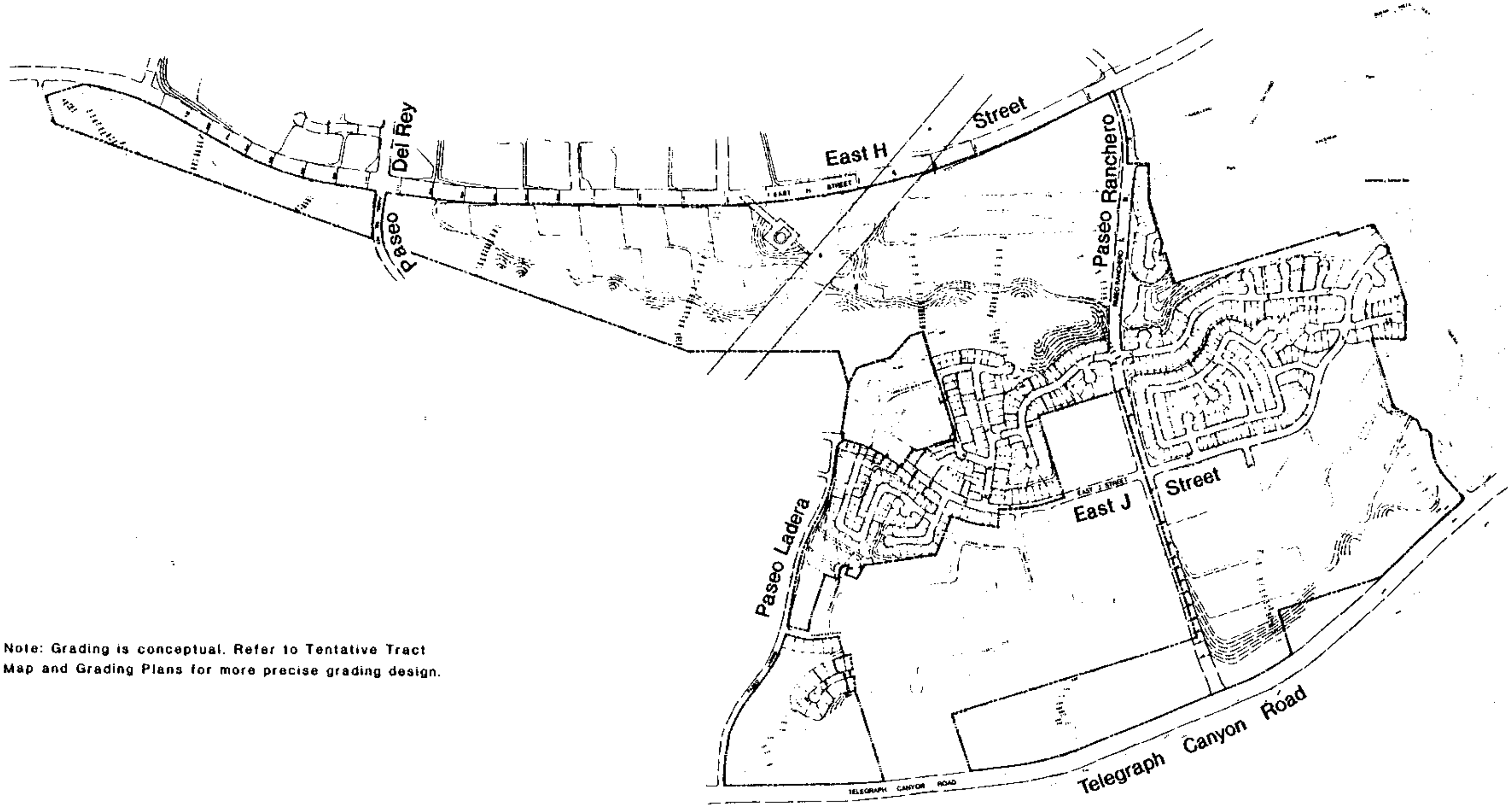
Additionally, a series of findings were adopted along with the El Rancho del Rey Specific Plan acknowledging that development of the project site under the adopted Specific Plan will require substantial landform alteration, including cutting of the ridge areas and filling of the lower elevations. Identified concerns in the findings pertinent to the proposed project include undeveloped open space and the potential for impacts to designated scenic highways.

IMPACTS

Development of SPA III, as proposed, would significantly alter existing landforms on-site. The conceptual grading plan (Figure 4-2) illustrates the placement of development areas on the plateau area south of Rice Canyon. Development areas are located on the higher elevations or plateaus, while the canyons and slopes are to remain primarily as natural open space with some recreational uses such as trails.

In general, implementation of the grading plan would entail cutting the ridge areas to create building pads and filling in the lower elevations, including most of the finger canyons. Grading would primarily be confined to the ridge-top areas, with the major canyon areas retained as open space. Many slopes would be maintained in a natural state in the open space areas. In general, graded slopes would be constructed at 2 to 1 (horizontal to vertical) slope ratios. The maximum cut slope of 25 feet is located in the vicinity of the proposed junior high school site northeast of the intersection of Paseo Ranchero and Telegraph Canyon Road. The lower 25 feet is cut and the upper 32 feet is fill. The effect of the combined cut and fill will give the appearance of a 57-foot manufactured slope. The slope located in the vicinity of the community facilitiy east of Paseo Ladera is actually composed of a 20-foot cut with top fill of 19 feet which gives the appearance of a manufactured slope of about 40 feet. The 50-foot manufactured slopes onsite would be a significant landform alteration and visual impact. Typical cuts and fills will range between 10 and 20 feet. Total excavation (cut) volumes for the proposed project are estimated at approximately 4.0 million cubic yards. Fill volumes are estimated at about 4.0 million cubic yards, resulting in balanced volume.

Due to the extent of the proposed grading, the topographic profile of the site would be significantly altered with implementation of the tentative map. Figures 4-3 and 4-4 illustrate the location of topographic cross-sections and three cross-sections of the existing and proposed site topography, respectively. The majority of the manufactured slopes would be located adjacent to open space areas and would contrast visually with the open space areas. Many of the large manufactured slopes would be visible to motorists transiting along East H Street, Telegraph Canyon Road, Paseo del Rey, and Buena Vista Way. In summary, although the landform alteration associated with SPA III would result in substantial changes to



Note: Grading is conceptual. Refer to Tentative Tract Map and Grading Plans for more precise grading design.

RANCHO DEL REY

A Planned Community by the Rancho Del Rey Partnership

7/23/90

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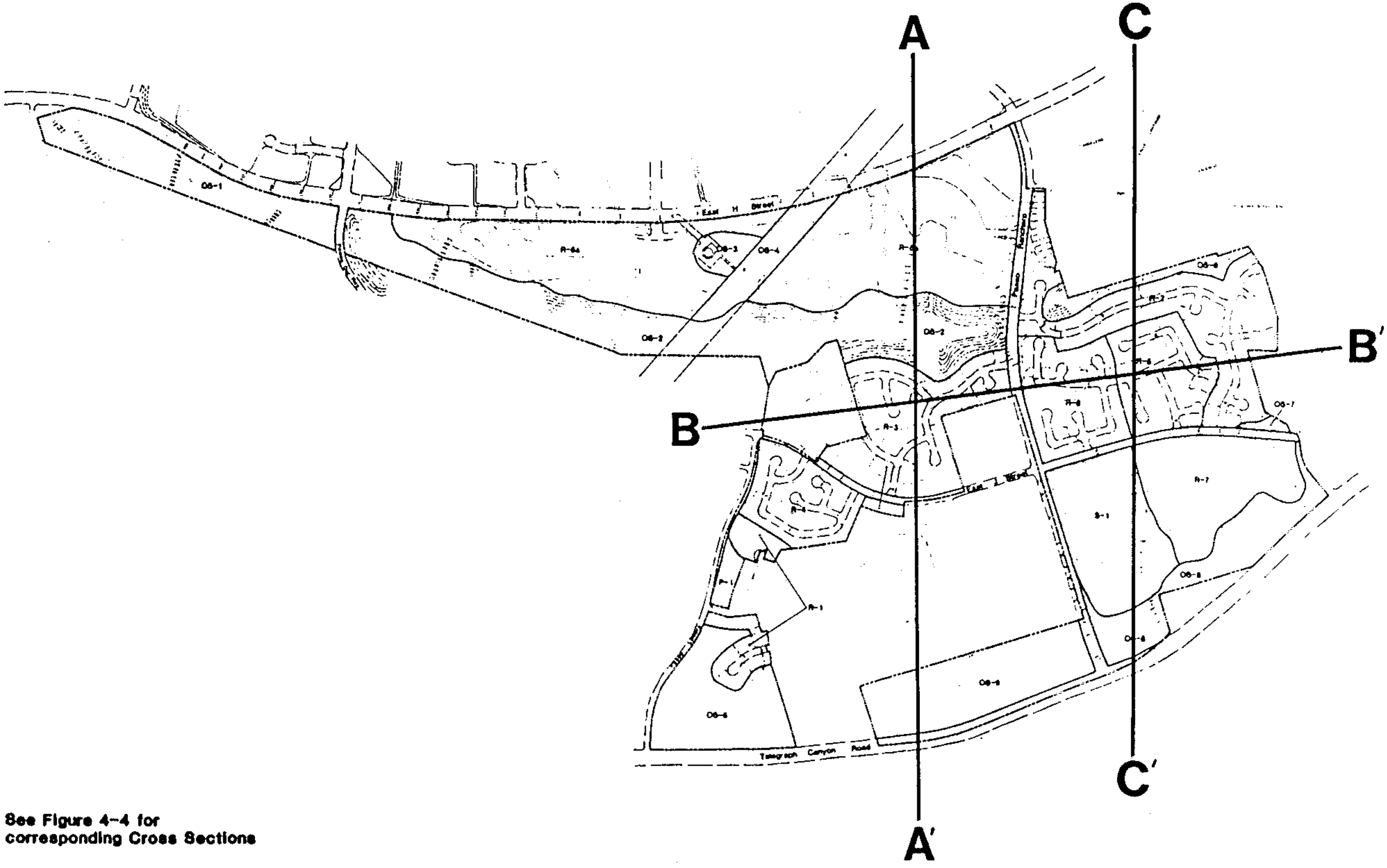
Cinti & Associates

Figure 4-2

Grading Plan



See Figure 4-4 for
corresponding Cross Sections

Source: Cinti & Associates

Figure 4-3
Locations of Cross Sections

the existing topography, the degree of visual alteration is consistent with what was anticipated when the specific plan was approved.

MITIGATION/MONITORING

The proposed SPA III project would result in significant landform/aesthetic impacts which would include 50-foot manufactured slopes. These impacts can be partially mitigated by implementing the community design guidelines detailed in the SPA III Plan. As stated in the plan, these guidelines would be consulted and refined/revised as development proceeds, as contrasted to absolute standards. A summary of the guildelines follows. Generally, buildings within SPA III would be low-profile with a variety of sizes, shapes, colors, and materials. The final grading plan would be in conformance with the general grading standards and slope bank standards set forth in the SPA III Plan.

The basic landscape themes proposed for SPA III are an extension of the themes utilized within SPA I. An overall landscaping scheme would provide a comprehensive framework for individual landscape plans. Planting would conform to the applicable City of Chula Vista standards for landscape planting.

As part of the monitoring program the Tentative Map would implement to the satisfaction of the City Engineering Department the grading standards outlined in the ERDR, the and SPA III plan, and the City's design guidelines. Prior to Final Map approval, the City would review and approve the map for consistency with adopted Planning Department grading and design guidelines. The final grading plans would be reviewed by the City Planning Department prior to issuance of a grading permit to confirm that the design standards have been included in the grading plans.

Prior to issuance of a grading permit, the final landscape plan which has been prepared by a licensed landscape architect would be submitted to and approved by the City Planning Department. The landscape plan would show appropriate landscaping of all slope areas and public rights-of-way. Landscaping within each phase would be installed prior to occupancy of the first building within the corresponding phase, and 100% coverage would be achieved for groundcover within nine months of planting.

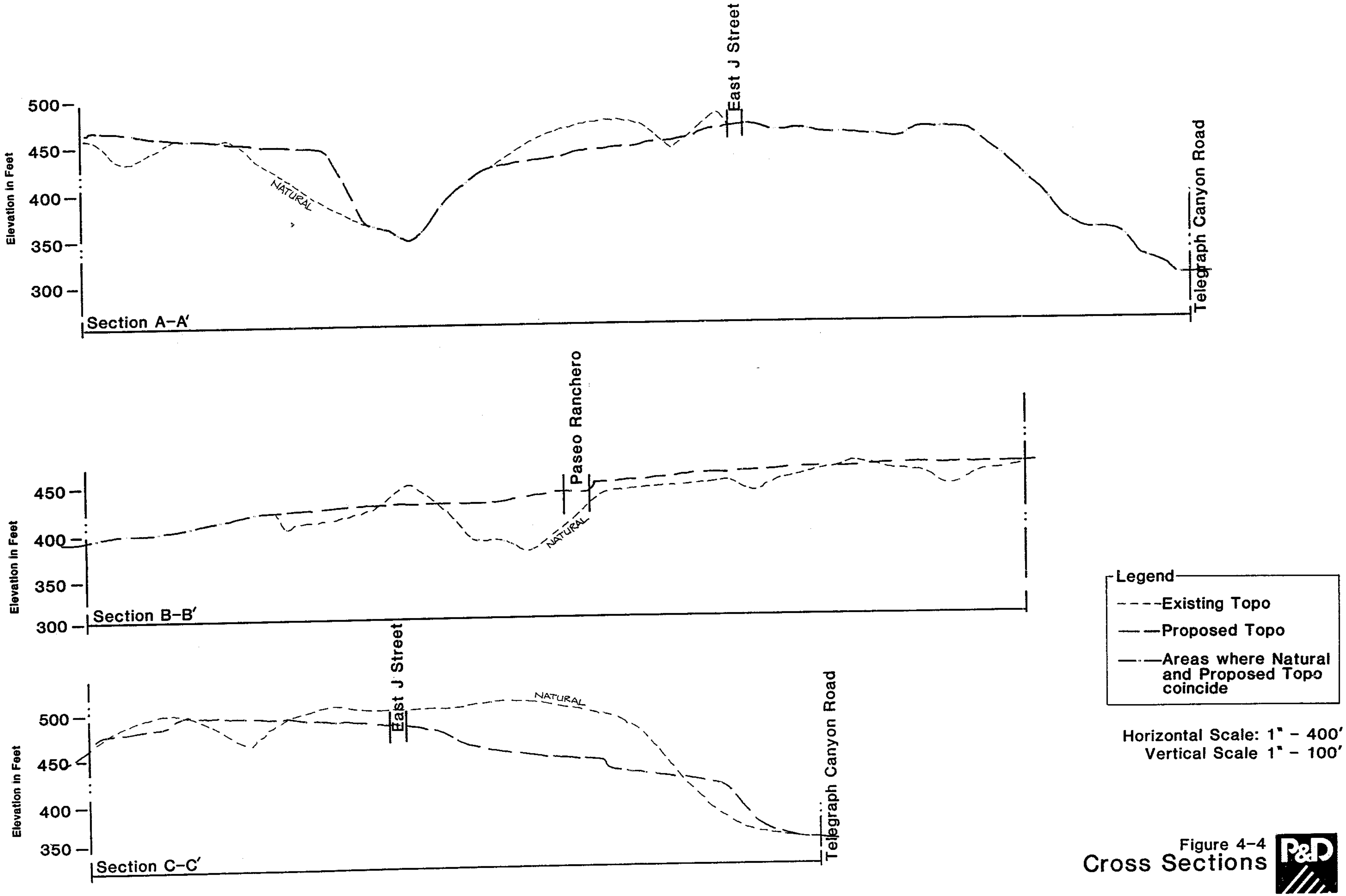


Figure 4-4
Cross Sections

Source: Cinti & Associates

If a rough grading permit is requested, the following mitigation measure would address erosion from early clearing: a temporary landscape and erosion control plan would be prepared by a licensed landscape architect to the satisfaction of the City. The plan would provide for installaton of temporary landscaping on all disturbed areas not proposed to be landscaped in accordance with approved final landscape plans.

ANALYSIS OF SIGNIFICANCE

While the SPA III Plan is consistent with the adopted specific plan in terms of landform and visual character, the project would result in significant landform/aesthetic impacts including the use of 50-foot manufactured slopes. The SPA III site would be modified from a vacant area of canyons and ridges, to a planned residential community. The visual impacts associated with the cut and fill slopes would be partially mitigated by adherence to the SPA III design guidelines. Implementation of these guidelines in the construction of the project would not reduce landform alteration impacts to a level below significance.

4.4 AIR QUALITY

EXISTING CONDITIONS

The climate of the Chula Vista area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and lower humidities, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild with rare extremes above 100 degrees Fahrenheit (F) or below freezing. The annual mean temperature is 62 degrees F.

Winds in the City of Chula Vista are almost always driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime on-shore sea breezes up to 20 miles per hour with an average of 7 miles per hour. At night the wind generally slows and reverses direction traveling towards the sea. Wind direction is altered by local canyons, with winds tending to flow parallel to the canyons.

Chula Vista is dominated by the coastal type climate with a significant amount of oceanic influence on the relative humidity. The relative humidity ranges from 40 percent to 80 percent in the winter and 30 to 60 percent in the summer. There is an average of 250 clear (not overcast) days per year.

The onshore flow of air provides the driving mechanism for both air pollution transport and dispersion. The winds described above control the horizontal transport in the region. The interior valleys of San Diego County also have numerous temperature inversions that control the vertical extent through which pollutants can be mixed. When the onshore flow of cool, marine air undercuts a large dome of warm, sinking air within the oceanic high pressure area, it forms a marine/subsidence inversion. These inversions allow for good local mixing, but they act like a giant lid over the area. As air moves inland, sources add pollution from below without any dilution from above. The boundary between the cool air near the surface and the warm air aloft is a zone where air pollutants become concentrated. As the air moves inland and meets elevated terrain, inland foothill communities such as Alpine are exposed to many of the trapped pollutants within this most polluted part of the inversion layer.

A second inversion type forms when cool air drifts into lower valleys at night and pools on the valley floor. These radiation inversions are strongest in winter when nights are longest and air is coldest. They may lead to stagnation of ground-level pollution sources such as automobile exhaust near freeways or major parking facilities.

The proposed project is located in the San Diego Air Basin and, jurisdictionally, is the responsibility of the San Diego Air Pollution Control District (SDAPCD) and the California Air Resources Board (CARB). The SDAPCD sets and enforces regulations for stationary sources in the basin. The CARB is charged with controlling motor vehicle emissions.

The SDAPCD, in coordination with the San Diego Association of Governments (SANDAG), has developed and updated the "1982 State Implementation Plan Revision for the San Diego Air Basin" (SIP). The 1982 plan had the goal of achieving healthful levels of air quality by 1987, mandated by state and federal laws; however, with the passage in time of the 1987 attainment deadline, a call for a new post-1987 SIP has been issued by the Environmental Protection Agency. Included in the SIP plan are new stationary and mobile source controls; carpooling, vanpooling, and other ride-sharing programs; and energy conservation measures. The air plan is designed to accommodate a moderate amount of new development and growth throughout the basin. This air quality planning document is based on SANDAG's adopted Series V regional growth forecasts. The document is being revised using the Series VII regional growth forecasts.

To assess the air quality impact of the proposed project, that impact, together with the baseline air quality levels, must be compared to the Ambient Air Quality Standards (AAQS). These standards are the levels of air quality considered safe, to protect the public health and welfare.

The Clean Air Act Amendment of 1970 first established national AAQS. States retained the option to adopt more stringent standards or to include other pollution categories. Because California already had standards in existence prior to 1970 and because of unique meteorological problems in California, there is considerable diversity between state and federal clean air standards. The standards currently in effect in California are shown in Table 4-2.

Air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Within the San Diego Air Basin, it has been calculated that mobile sources are the major source of regional emissions and are responsible for approximately 73 percent of the smog emissions in San Diego County ("Climate and Smog in San Diego County", SDAPCD).

The nearest air monitoring station operated by the SDAPCD is on H Street in Chula Vista. The data collected at this station is considered to be representative of the air quality experienced in the vicinity of the project area. Air quality data for 1983 through 1988 for the Chula Vista station is provided in Table 4-3.

Table 4-2

NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

POLLUTION	AVERAGING TIME	CALIFORNIA STANDARDS (1)		NATIONAL STANDARDS (2)		
		CONCENTRATION	METHOD	PRIMARY	SECONDARY	METHOD
OZONE	1 Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	0.12 ppm (235 μg/m^3)	Same as Primary Standards	Chemiluminescent Method
CARBON MONOXIDE	8 Hour	9 ppm (10mg/m^3)	Nondispersive Infrared Spectroscopy	9 ppm (10 mg/m^3)	Same as Primary Standards	Nondispersive Infrared Spectroscopy
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
NITROGEN DIOXIDE	Annual Average	–	Saltzman Method	0.05 ppm (100 μg/m^3)	Same as Primary Standards	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 μg/m^3)		–		
SULFUR DIOXIDE	Annual Average	–	Conductimetric Method	0.03 ppm (80 μg/m^3)	–	Pararosaniline Method
	24 Hour	0.05 ppm (131 μg/m^3)		0.14 ppm (365 μg/m^3)	–	
	3 Hour	–		–	0.5 ppm (1300 μg/m^3)	
	1 Hour	0.25 ppm (655 μg/m^3)		–	–	
SUSPENDED PARTICULATE MATTER	Annual Geometric Mean	PM-10 30 μg/m^3	High Volume Sampling	PM-10 50 μg/m^3	60 μg/m^3	High Volume Sampling
	24 Hour	PM-10 50 μg/m^3		PM-10 150 μg/m^3	150 μg/m^3	
SULFATES	24 Hour	25 μg/m^3	AIHL Method No. 61	–	–	–
LEAD	30 Day Average	1.5 μg/m^3	AIHL Method No. 54	–	–	–
	Calendar Quarter	–	–	1.5 μg/m^3	1.5 μg/m^3	Atomic Absorption
HYDROGEN SULFIDE	1 Hour	0.03 ppm (42 μg/m^3)	Cadmium Hydroxide Stractan Method	–	–	–
VINYL CHLORIDE (CHLOROETHENE)	24 Hour	0.010 ppm (26 μg/m^3)	Gas Chromatography	–	–	–
ETHYLENE	8 Hour	0.1 ppm	–	–	–	–
	1 Hour	0.5 ppm				
VISIBILITY REDUCING PARTICLES	One Observation	In sufficient amount to reduce the prevailing visibility to less than 10 miles when the relative humidity is less than 70%		–	–	–

ppm = parts per million
μg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

(1) CO SO$_2$(1 Hour), NO$_2$, O$_3$ and PM-10 Standards are not to be exceeded. All other Standards are not to be equaled or exceeded.

(2) Not to be exceeded more than once a year

Table 4-3

AIR QUALITY LEVELS MEASURED AT THE CHULA VISTA AMBIENT AIR MONITORING STATION 1983-1988

Pollutant	California* Standard	National Standard	Year	Maximum Level	Days Federal Std. Exceeded
Ozone	0.1 ppm for 1 hr.	0.12 ppm for 1 hr.	1983	0.21	6
			1984	0.15	4
			1985	0.20	4
			1986	0.14	2
			1987	0.16	2
			1988	0.22	4
Suspended Particulate	50 ug/m3 for 24 hr.	150 ug/m3 for 24 hr.	1983	103	0
			1984	88	0
			1985	96	0
			1986	119	0
			1987	100	0
			1988	109	0
CO	9 ppm for 8 hour	9 ppm for 8 hour	1983	9	0
			1984	7	0
			1985	7	0
			1986	7	0
			1987	7	0
			1988	8	0
NO_2	.25 ppm for 1 hour	0.05 ppm annual average	1983	.18	0
			1984	.20	0
			1985	.16	0
			1986	.14	0
			1987	.15	0
			1988	.21	0

* ppm = parts per million

The air quality data indicate that ozone is the air pollutant of primary concern in the project area. Ozone is a secondary pollutant; it is not directly emitted. Ozone is the result of the chemical reactions of other pollutants, most importantly hydrocarbons and nitrogen dioxide, in the presence of bright sunlight. Pollutants emitted from morning rush hour traffic react to produce the oxidant concentrations experienced in Chula Vista. Ozone is the primary component of the photochemical oxidants and it takes several hours for the photochemical process to yield ozone levels which exceed the standard. All areas of the San Diego County Air Basin contribute to the ozone levels experienced at Chula Vista, with the more significant areas being those directly upwind. The ozone levels at Chula Vista have not significantly increased or decreased over the last six years. On occasion the wind and weather patterns are such that oxidants produced in Los Angeles County are blown southward contributing to the smog level readings in San Diego County.

Particulate matter (PM-10) refers to suspended particulates which are respirable. PM-10 levels in the area are due to natural sources, grading operations, and motor vehicles. The federal standards for particulates have not been exceeded at the Chula Vista station since before 1982.

The carbon monoxide standards have not been exceeded over the past several years. The trend in maximum carbon monoxide concentrations experienced is less clear. Carbon monoxide is generally considered to be a local pollutant. That is, carbon monoxide is directly emitted from several sources (most notably motor vehicles), and the highest concentrations experienced are directly adjacent to the source.

Lead and sulfur oxide levels are also well below state and federal standards. Sulfur oxide levels are not exceeded anywhere in the San Diego Air Basin, primarily because of the lack of major industrial sources. Due to the introduction and increased usage of unleaded gasoline, lead concentrations are now well below the federal and state standards throughout the basin.

IMPACTS

The development of the proposed project would generate approximately 11,405 daily auto trips which would result in increased air emissions on new and existing roadways. Institutional facilities such as schools could also increase project related emissions. Short-term emissions from construction activities would generate dust and diesel emissions resulting in short-term emissions impacts.

Construction Impacts

Soil disturbance to prepare the project site would generate fugitive dust during the construction phase. Soil dust is typically chemically inert and much of the dust is comprised of large particles that are readily filtered by human breathing passages and also settle out on nearby surfaces. It comprises more of a potential soiling nuisance than an adverse air quality impact.

Construction activities for large development projects are estimated by the U.S. Environmental Protection Agency to add 1.2 tons of fugitive dust per acre of soil per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. While there would be project related dust emission levels during construction, their air quality impact would be minimal.

In addition to fugitive dust, construction activities would also cause combustion emissions to be released from on-site construction equipment and from off-site vehicles hauling materials. Heavy duty equipment emissions are difficult to quantify because of day-to-day variability in construction activities and equipment used. Typical emission rates for a diesel powered scraper are provided in Table 4-4, and were obtained from the San Diego Air Quality Management Division Air Quality Handbook (April 1987). A diesel powered scraper is the most common equipment used for grading operations.

Table 4-4
EMISSION RATES FOR GRADING SCRAPER

POLLUTANT	EMISSION RATE (Grams/Hour)
Carbon monoxide	660
Nitrogen oxides	2,820
Hydrocarbons	284
Sulfur oxides	210
Particulates	184

The emission rates above are provided in grams per hour. To provide a regional perspective of construction emissions generated by projects, the projected emissions for San Diego County (Year 2000) have been provided for comparison. These emissions are based on future construction of land uses and regional transportation facilities consistent with the "1982 State Implementation Plan Revisions for the San Diego Air Basin" (SIP), and are given in units of tons/day (Table 4-5).

Table 4-5
REGIONAL SAN DIEGO EMISSIONS
(Year 2000)

POLLUTANT	TOTAL EMISSIONS (Tons/Day)
Carbon monoxide	660
Nitrogen oxides	143
Particulates	255
Hydrocarbons	284

Mobile Source Impacts

Impacts to air quality result primarily from automobile emissions. The proposed project would result in an increase in air emissions. If future development has been anticipated in the 1982 SIP then air quality impacts are considered mitigated by adherence to the measures as outlined in the SIP. The proposed project is consistent with SANDAG Series VII projects and the 1982 SIP is based on Series V projections. Typically, Series VII projections are higher than Series V. Adherence to the policies and measures in the 1982 SIP may result in some residual impacts as not all growth has been anticipated.

The volume of carbon monoxide released when a large volume of slow moving vehicles are contained in one small area can create air pollution "hot spots". Often such "hot spots" can occur when intersection congestion is LOS D or below. If traffic on East H Street deteriorates to below LOS C conditions, "hot spots" which are potentially significant could result.

To comply with the California Clean Air Act, SANDAG is working on the Air Quality Plan for the San Diego Air Basin which is mandated to be completed in

June 1991. The California Clean Air Act will form the basis for the new SIP which will be used on Series VII projections.

SANDAG completed a Transportation Demand Management Plan in June 1989, as part of the adopted Regional Transportation Plan effort. The transportation control measures recommended in the Transportation Demand Management Plan will be the basis for such measures in the SIP. When the revised SIP, based on Series VII forecasts, is adopted, the proposed project will be in conformance. Until then, some residual air quality impacts would result. Because the proposed project is not in conformance with the current SIP, the project would impact air quality.

Future SIPs would develop measures for the growth anticipated in the Plan and the impacts to air quality would be reduced and no longer considered significant. On a cumulative basis, the additional emissions, combined with future emissions basin-wide, may be significant.

On-Site Impacts

Emissions from residential activity including painting, household cleaning, fumigation, gasoline powered lawnmowers, chemicals associated with swimming pools, wood buring fireplaces and barbecues, while not considered significant, would have a cumulative impact on regional air quality. Emissions from the Junior High School site including the use of gasoline powered lawnmowers, chemicals associated with maintenance activities and classroom activities are not considered significant on a project level, but could have cumulative impacts on regional air quality.

In accordance with Section 2115.3(a) of the California Public Resources Code, proposed and existing land uses with one-fourth of a mile of the proposed junior high school site have been evaluated for their potential to release hazardous air emissions. The proposed junior high school site would not be within one-fourth of a mile of facilities which emit hazardous air emissions.

MITIGATION/MONITORING

To decrease project level emissions, the City of Chula Vista would adhere to recommendations made by the 1982 SIP and the forthcoming San Diego Air Quality

Plan regarding local participation in air emission reduction measures. Measures outlined for City of Chula Vista action would be implemented on a project level to decrease project-related auto emissions below a level of significance include:

- The project proponent would facilitate the use of alternative transportation modes by promoting transit usage by project residents and providing bicycle facilities, including bicycle lanes and secure storage facilities at all public facilities within the project area.
- The project proponent would provide mass transit accommodations for convenience of customers (bus shelters) and vehicles (bus turnouts) including a transit stop in front of the retirement community on East H Street.
- To avoid creation of air pollution "hot spots" at intersections, mitigation measures recommended in the Transportation Section (Section 4.9) would be implemented to reduce potentially significant impacts to air quality. Maintaining the LOS to C or better decreasing congestion would minimize the number of idling cars that may be releasing carbon monoxide into the air.

To assure compliance with proposed mitigation measures, City staff would adhere to recommendations made by the 1982 SIP regarding local participation in air emission reduction measures and the forthcoming San Diego Air Quality Plan. The General Plan includes policies encouraging adherence to these measures. Prior to or as a condition of approval of the tentative map, the project design plan would be reviewed by the City Planning Department to insure that there are adequate bicycle facilities on-site, and that an area has been implemented to accommodate mass transit vehicles in front of the retirement community.

To reduce potentially significant impacts associated with congested traffic on East H Street, mitigation measures recommended in the Transportation Section would be implemented before issuance of the occupancy permit per the Public Facilities Finance Plan.

ANALYSIS OF SIGNIFICANCE

Development of the proposed project would result in increased traffic on new and existing roadways and additional air emissions. Fugitive dust released from construction is considered a short-term nuisance and would not constitute a significant impact. The development of the proposed project is consistent with SANDAG Series VII projections and not the Series V projections associated with the 1982 SIP which is considered a significant impact. Assuming the SIP revisions, which are currently being initiated using Series VII projections, are completed prior to buildout, and all projects are in compliance with the SIP measures, these significant impacts are expected to be minimized. Cumulatively, the additional air emissions would adversely impact the regional air basins. In addition, the implementation of the recommended mitigation measures would partially reduce potentially significant impacts to air quality.

4.5 BIOLOGY

Several previous biological studies have been conducted at various times for the ERDR Specific Plan area. An EIR (EIR-83-2, March 1985) was prepared to address the biological effects of the ERDR Plan. Biological impacts were found to be significant, and unmitigated. Appropriate CEQA findings of overriding consideration were made. Subsequent modifications to the specific plan which decreased adverse biological effects by consolidation of natural open space in Rice Canyon were made. An addendum to EIR-83-2 which determined that prior review was adequate to satisfy CEQA requirements was prepared. Significant new information pertaining to biological resources in the area was revealed in 1985, with the discovery of on-site populations of two state-listed endangered plant species (Michael Brandman Associates, 1984). A supplemental EIR (EIR-83-2(B)) was prepared to address potential impacts to these populations. This resulted in the incorporation of several additional mitigation measures into the specific plan, which were determined to adequately mitigate additional adverse impacts. The two endangered plants: San Diego thornmint and Otay tarplant, were found in the SPA II project area; however, they were not observed in the SPA III project area.

A draft biological impact analysis and mitigation plan for the SPA III project area was prepared by RECON in May 1989. Information provided in the report updates previous surveys performed on the site and briefly reviews the biological resources present on the SPA-III subdivision, and the potential for impacts to open space not anticipated in the Specific Plan EIR. An independent review for adequacy of RECON's biological impact analysis and mitigation plan was performed by ERCE (1989). The results of this review are contained in a separate letter of comment (see Appendix C). In response to the review, RECON performed a field survey and updated the original report (February 1990). Subsequent responses to comments with regards to impacts of the project are included in a RECON letter dated March 22, 1990 and are also found in the Biology Appendix.

EXISTING CONDITIONS

Vegetation

The vegetation on the 405-acre SPA III portion of the Rancho Del Rey development is predominantly Diegan coastal sage scrub (373.8 acres, Figure 4-5). Other plant communities occurring on-site include patches of riparian vegetation (1.1 acres) along the bottom of the canyon south of Rice Canyon, two areas of mima mound topography on the top of the disturbed mesa on the eastern portion of the site which include 0.2 acres of vernal pool habitat, and areas of non-native grassland (30.4 acres) along the lower slopes just to the north of Telegraph Canyon Road. Diegan coastal sage scrub and riparian habitats are considered high priority community types by the California Department of Fish and Game (CDFG) (State of California 1989).

The quality of the mima mound topography on-site was assessed and it was determined by field surveys that a 0.2 acre vernal pool area is located on the project site. Vernal pools are a highly specialized plant habitat occurring on undisturbed mesa tops and supporting a unique succession of floral species. These pools fill with rainwater which does not drain off or percolate away because of the mesa top topography and soil conditions. The plant species confined to these pools are referenced as the vernal pool ephemeral plant community or the San Diego mesa hardpan vernal pools. These pools are restricted to marine terraces.

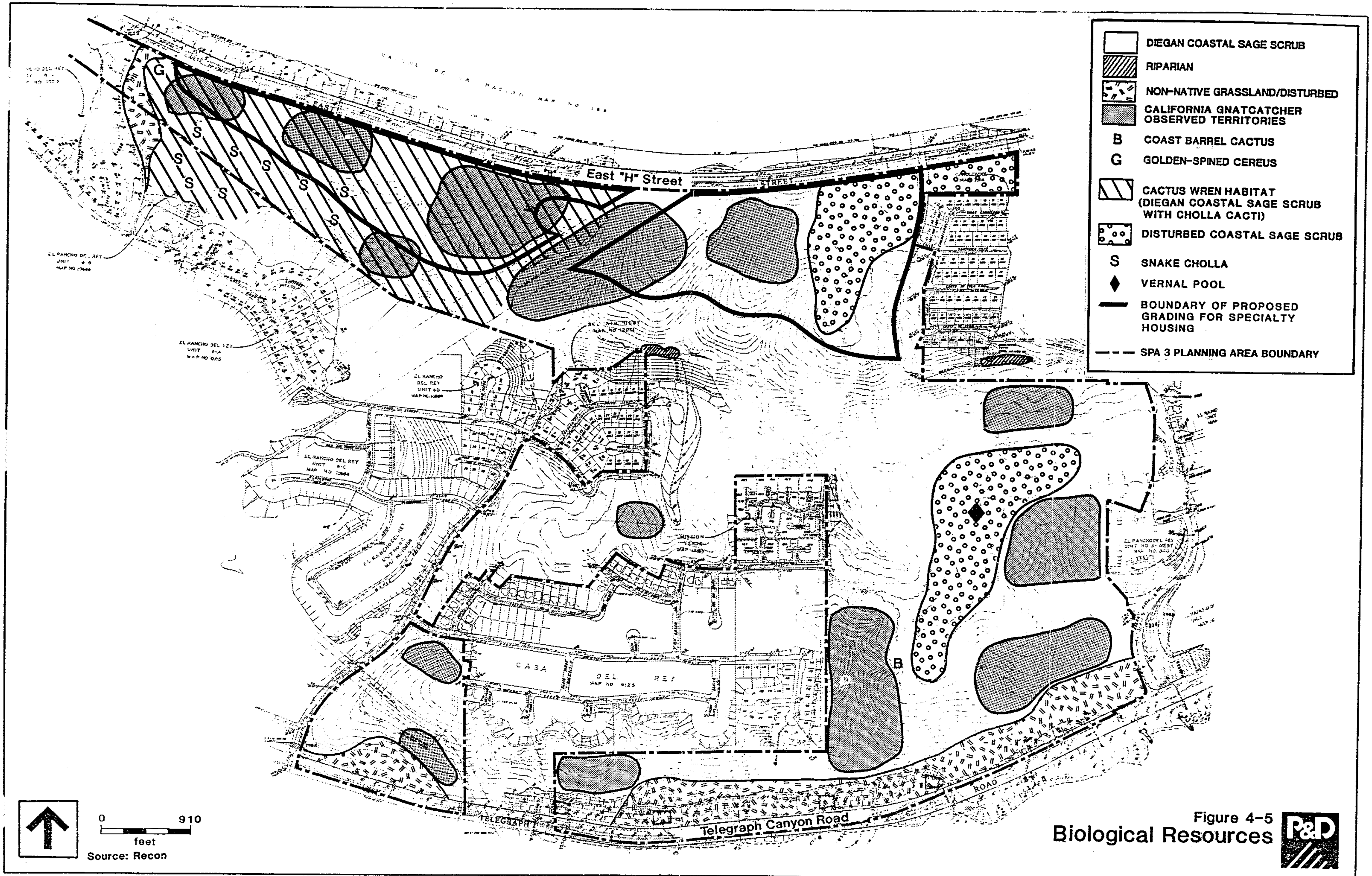
Normally, even in dry years, weeds and plants of the surrounding associations do not invade the pools.

No state- or federally-listed rare, endangered, or threatened plant species were observed within the SPA-III project site. Four plant species listed as sensitive by the California Native Plant Society (CNPS) (Smith and Berg 1988) were observed, San Diego barrel cactus (*Ferocactus vindescons*), snake cholla, (*Opuntia parryi var. serpentina*), golden-spined cereus (*Bergerocactus emoryi*), and ashy-spike moss (*Selaginella cinerascens*).

San Diego barrel cactus was observed on one south-facing slope in the southern portion of the project site (See Figure 4-5). This cactus species is listed as a Category 2 candidate species by the U.S. Fish and Wildlife Service (USFWS) and it is considered a California Native Plant Society (CNPS) List 2 plant. Category 2 is a designation for those species being considered for listing but which lack sufficient scientific information to warrant formal listing as endangered, at this time. A List 2 CNPS species is a designation referring to plants that are rare, threatened, or endangered in California but which are more common elsewhere. San Diego barrel cactus is found on south-facing slopes in the southwestern part of San Diego County, and in similar habitats in northern Baja California.

Snake cholla was observed on the slopes of the canyon in the north portion of the site (see Figure 4-5). It occurred on both the north- and south-facing slopes in the canyon and the main population occurred over approximately 12.5 acres on-site and 6.2 acres of adjacent off-site area. This cactus is a federal Category 2 candidate species and considered a CNPS List 1B plant. List 1B plants are those considered rare, threatened, or endangered in California and elsewhere. Snake cholla is only found in canyons near the coast of southwestern San Diego County and Northern Baja California.

An individual clump of Golden-spined cactus was observed in one location on the extreme northwest portion of the SPA-III project site (see Figure 4-5). This cactus species is a List 2 plant on the CNPS listing. It is known only from a few locations in California.



Source: Recon

Figure 4-5
Biological Resources

Ashy-spike moss was observed in openings in the sage scrub throughout the site. This species is considered a List 4 plant by CNPS. List 4 plants are those species suffering declines in population size that warrant monitoring to determine whether it is necessary to move the species to a more sensitive listing. This species is not currently considered to be threatened in San Diego County.

Wildlife

Sensitive bird species occurring within the SPA-III area are the California gnatcatcher (formerly the black-tailed gnatcatcher) and the cactus wren. The California gnatcatcher is a federal Category 2 candidate bird species and is considered a Species of Special Concern by CDFG as listed in their California Natural Diversity Database (State of California 1989). The cactus wren is listed as sensitive in San Diego County due to the continued loss of native cactus populations along the coastal lowlands (Everett 1979). This species was observed in the area of coastal sage scrub habitat which has large concentrations of coast cholla and snake cholla (see Figure 1). In addition to the above bird species, various raptor species would be expected to forage over the property. All raptor species are protected by the State of California.

The San Diego coast horned lizard and the orange-throated whiptail both have the potential for occurrence on the SPA-III site. The whiptail has been observed, according to information in the EIR 83-2, previously within the ERDR project area; however, exact locations of the observations were not quantified, due to the mobility of this species. Both the orange-throated whiptail and the San Diego horned lizard are known to occur in coastal shrub communities. Both are candidates for federal listing (Category 2) and are considered Species of Special Concern by CDFG and locally endangered by the San Diego Herpetological Society (SDHS).

California Gnatcatcher Survey

A detailed survey was conducted by RECON to determine the number of California gnatcatchers and the approximate areas utilized by the birds on the SPA-III project site. The survey was conducted on five different days in February of 1989. The site was thoroughly searched on-foot by using existing dirt roads and animal trails on all the ridges and ravines present within the project area. Sightings and vocalizations were recorded on a topographic map along with an estimate of the boundaries of the area utilized by the birds.

Forty-six California gnatcatchers were observed during the five days of surveying the project site. They were generally observed in both lemonadeberry and California sage shrubs, particularly in the ravines. Of the 46 individuals, 18 birds made up nine pairs where an interaction was observed in the same plant. Some individual birds probably constitute pairs due to their proximity of location but were not observed interacting. Care was taken to avoid duplication in counting the individuals and where there was any questions, the lower, more conservative count was used.

Based on this survey, the highest concentration of California gnatcatchers within the SPA-III project area were observed in two areas, each having 17 individual birds observed (see Figure 4-5). The first area was south of the proposed East J Street in the deep ravines that run north-south intersecting with Telegraph Canyon Road, and the other area occurred south of East H Street, west of Paseo Ranchero and east of Paseo Del Rey on south-facing slopes of the canyons.

IMPACTS

Vegetation

The implementation of the SPA III portion of the ERDR Specific Plan would impact approximately 256 acres of coastal sage scrub vegetation. This would be considered habitat loss for the California gnatcatcher, orange-throated whiptail, and the San Diego horned lizard since all of these species utilize this plant community. Included in the 256 acres of coastal sage scrub impacts is approximately 47 acres of sage scrub containing concentrations of coast cholla and snake cholla cacti. The loss of this 47 acres of sage scrub/cactus vegetation represents habitat loss of the cactus wren.

Impacts to the coastal sage scrub community would also include losses of sensitive plant species present on the project site including individuals of San Diego coast barrel cactus, approximately 6.3 acres of sage scrub containing snake cholla, and a large portion of the ashy-spike moss population.

Impacts would also include the loss of 0.2 acres of vernal pool habitat which would be a significant impact.

The loss of snake cholla and San Diego barrel cactus would contribute to the cumulative impacts to the populations of these cacti within the entire ERDR project. The golden-spined cereus cactus clump will remain in open space.

The riparian and non-native grassland habitats on the site would be included in designated open space areas and including the undisturbed coastal sage scrub, the open space area would amount to about 149.3 acres. Portions of the non-native grassland on the lower slopes adjacent to Telegraph Canyon Road have recently been disturbed due to the widening of the road and the channelization of a drainage. The road widening activities have reduced the total open space area by only a small degree.

The proposed access road (Paseo Ranchero) that connects H Street and Telegraph Canyon Road through the SPA III project site would cross the south leg of Rice Canyon, a major drainage on the site. This impact would require the notification of the CDFG to secure a Streambed Alteration Agreement as stated under Section 1601-1603 of the Fish and Game Code.

Sewer laterals and storm drains are proposed through the open space of SPA III. The majority of the sewer lines for this development are planned to be in future residential access roads throughout the project. One lateral is proposed to cross the open space area in the southwest portion of the property.

Several storm drains would enter the open space areas. Each runs from the top of a particular slope to the bottom of a drainage where they end with an energy dissipater. The City of Chula Vista requires that each major storm drain outlet be accessible by a road.

Coastal sage scrub habitat would also be impacted by fill slopes extending into natural open space areas. The proposed fill slopes that would encroach into Rice Canyon South on the north portion of the site would effectively narrow the canyon. The total estimated acreage of coastal sage scrub habitat lost from the natural open space area amounts to 18 acres.

Wildlife

Impacts to the coastal sage scrub habitat would significantly affect the population of California gnatcatchers on-site. About two-thirds of the population (30 birds) would be disrupted including the high density areas outlined above. The fragmentation of the coastal sage scrub habitat would have detrimental effects on the birds and limit the long-term carrying capacity and habitat viability for California gnatcatchers on-site. It is predicted that the amount of undisturbed coastal sage scrub remaining would support at best only about 12 to 23 individual birds based on a range of territory sizes (5 to 10 acres) estimated by Atwood (1980). The other portion of the population would be lost.

Habitat for the California gnatcatcher will be lost from the encroachment of fill slopes and by the construction of storm drains, sewer laterals, and access roads. Other indirect impacts to the gnatcatcher and other sensitive bird species in the open space areas (e.g. cactus wren) can be attributed to the isolation of habitat and increased rate of predation.

Isolation of portions of habitat in canyons and on slopes of canyons can have detrimental effects on the California gnatcatcher, cactus wren, and other native bird species. Recent studies (Soule et. al. 1988) indicate that bird species diversity in isolated canyon habitats in San Diego County decreases over time as the result of local extinctions of species in these canyons. Factors contributing to the increased rate of extinctions in these isolated pockets of habitat include environmental variation, habitat loss, loss of diversity within the species inbreeding, and increased rate of predation. Domestic and feral cats are the main cause for the increase in predation pressures. California gnatcatchers nest in low shrubs, and thus, they are especially susceptible to cat predation.

Impacts to the sage scrub community in the northwest portion of the site would include the loss of about 47 acres of sage scrub containing cacti thickets that are the preferred habitat of the cactus wren. The loss of habitat would have an adverse effect on the resident population of this species by reducing the area of habitat able to support the species. Losses of sage scrub containing coast cholla populations would contribute to the cumulative decline of potential cactus wren habitat in southern California.

Loss of coastal sage scrub habitat on-site would also affect potential populations of the orange-throated whiptail and the San Diego horned lizard. Although some loss of individuals would be expected to occur due to impacts from grading, some individuals would be expected to emigrate to undisturbed areas on- or off-site.

MITIGATION/MONITORING

Mitigation measures concerning impacts from the ERDR development adopted with the original environmental documents, amendments, and supplemental documents have been incorporated into the SPA III grading and construction plans.

Additional mitigation measures to compensate for impacts to open space areas not anticipated in the previous environmental documents are discussed below. Other mitigation measures may be required by the local resource agencies as conditions of permits or agreements required prior to project implementation and issued by these agencies for the specific project (i.e., 1603 Agreements).

- Impacts to the coastal sage scrub habitat in open space areas would be avoided; however, in areas where fill slopes must encroach, impacts would be minimized by having a qualified biologist monitor the grading of the site. Fire buffers that encroach into open space areas would be hand cleared instead of using heavy equipment. The monitoring biologist would have the authority to halt grading operations that impact or threaten protected coastal sage scrub habitat. Prior to or as a condition of the grading permit, the applicant would make arrangement to retain a biologist to monitor grading and hand clear fire buffers that encroach into open space areas.
- Manufactured slopes within open space areas and impacted areas along sewer laterals would be revegetated with coastal sage scrub species native to the

site. The revegetation effort would attempt to re-create the loss of coastal sage scrub habitat and enhance the biological value and function of the open space system. A monitoring biologist would be hired by the applicant to monitor and supervise the revegetation program which would last for five years. Prior to or as a condition of approval of the Tentative Map the Planning Department of the City of Chula Vista would ensure that a biologist has been retained by the applicant to implement the revegetation program, devise a five-year monitoring program acceptable to City staff, and initiate the revegetation program on-site.

- Sewer laterals would be positioned to cause minimum impact to biological resources, especially rare plant populations and sensitive bird habitat. Staging areas for construction would be located to minimize impacts to sensitive biological resources. The installation corridors for sewer laterals would be staked prior to design finalization and then checked by a qualified biologist for potential adjustments to minimize impacts to sensitive resources. The monitoring biologist would have the authority to halt construction activities if habitat area is damaged or threatened. Prior to or as a condition of approval of the occupancy permit, the Planning Department of the City of Chula Vista would ensure that sewer laterals have been implemented according to the specifications of the monitoring biologist.

- A monitoring program would be designed and implemented by a qualified biologist to determine the effect of the SPA III development on the population of California gnatcatchers. The program would be conducted for five years after the project is completed to assess the recovery of the gnatcatcher population including the number of pairs of birds present and their territories. The purpose of the program would be to provide basic population recovery information on the California gnatcatcher to be used in the design of future preserves for this species. The information of this study would be made available to resource agencies to help develop a regional set of guidelines for California gnatcatcher mitigation. The Planning Department of the City of Chula Vista would ensure that the program has been implemented prior to or as a condition of approval of the Final Map. The monitoring program would also incorporate open space areas within the SPA I and SPA II developments within the study area.

- A project-wide revegetation plan, that includes transplant programs for cacti, would be designed and incorporated in a project-wide specific plan. This revegetation plan would be reviewed and implemented by a qualified biologist or horticulturist with experience dealing with native plants. The transplant program would facilitate the introduction of cacti species from impact areas on SPA III and other SPA areas into coastal sage revegetation areas in an attempt to re-establish cactus wren habitat. The revegetation plan would include a maintenance and monitoring plan for five years to ensure the success of the revegetation effort. The Planning Department of the City of Chula Vista would ensure that the program has been implemented prior to or as a condition of approval of the Final Map. The monitoring biologist would submit reports to the Planning Department concerning the status of the program once a month for the first year of the program, and once every three months for the following five years of the program.

- To reduce impacts to the habitat of the California gnatcatcher, the applicant would acquire and preserve an area of coastal sage scrub habitat as described in one of the following options:

  a. Acquire and preserve an off-site area of coastal sage scrub habitat encompassing at least 187 acres which supports at least 17 pairs of California gratcatcher, or

  b. Acquire and preserve an off-site area of coastal sage scrub habitat encompassing at least 256 acres which supports 10 pairs of California gnatcather, or

  c. If an off-site mitigation cannot be found, the applicant would preserve the 70 acres of high quality coastal sage habitat in the Specialty Housing Area on-site in addition to the 117 acres of coastal sage scrub habitat proposed for open space.

  The proposed mitigation site can be outside Chula Vista city limits. First priority would be given to the acquisition of areas within the General Plan area, and then to other areas within San Diego County. The preservation and management of this site would be the responsibility of either a public or private entity that is satisfactory to the City of Chula Vista (acceptable private entities are - Nature Conservancy, Sierra Club; acceptable public entities - Bureau of Land Management, California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS) County of San Diego, City of Chula Vista). Interim responsibility for preservation of the mitigation site would remain with the project applicant until an acceptable public or private entity is secured.

- The proposed mitigation site would be acceptable to the City of Chula Vista, in consultation with the USFWS and the CDFG in evaluating the site. The criteria for determining the acceptability of the mitigation site would be (1) its use by the California gnatcatcher, and (2) its long-term conservation potential.

- The mitigation site would be evaluated for use by the California gnatcatcher through surveys of the site on a minimum of three days at least a week apart. If no gnatcatchers are heard after the first visit, tapes of gnatcatchers would be used on a subsequent visit to attract gnatcatchers that were not sighted on the first visit. A minimum of one hour would be expended for each 25 acres of habitat surveyed. Surveys would be conducted in the morning between sunrise and 11:00 a.m. or after 3:00 p.m. Surveys would be conducted when air temperatures are between 55 and 95 degrees Fahrenheit, and winds are below 15 miles per hour.

- The mitigation site would be within, adjacent to, or connected by an appropriate landscape corridor to a larger area or interconnected set of patches of habitat that are currently in public ownership or designated open space or reasonably expected to remain in a natural state. The gnatcatcher habitat within this block or interconnected set of patches would be between 800 to 1,000 acres in area. This mitigation/replacement site can be located outside the City of Chula Vista, if necessary, but must be within San Diego County.

- No grading or activities which would adversely affect the habitat on the specialty housing area would occur prior to accomplishing the off-site acquisition. Excluded are the construction of sewer improvements, the extension of Paseo Ranchero, and the grading of the disturbed area on the northeast end adjacent to Paseo Ranchero which is not included in the 70 acres of quality coastal sage scrub habitat.

- The project proponent would make an irrevocable offer to dedicate the off-site acquisition/mitigation site to the City of Chula Vista, County of San Diego, or other appropriate open space holder at the time of issuance of the grading permit. If ownership of the sites does not transfer prior to the issuance of a grading permit, the applicant would record a conservation easement with an agency of appropriate jurisdiction over the off-site mitigation area (186 or 256 acres) prior to issuance of the permit.

- Prior to or as a condition of approval of the Tentative Map, the Planning Department of the City of Chula Vista would ensure that the mitigation program for gnatcatcher habitat preservation has been implemented.

- Prior to issuance of a grading permit the Planning Department of the City of Chula Vista would ensure that the project proponent acquires and preserves 0.4 acres of vernal pool-associated lands. The vernal pool acquisition area is not required to be in the City of Chula Vista. This mitigation area is equivalent to twice the vernal pool area (0.2 acres) lost as a result of grading on the proposed project area. The proposed vernal pool mitigation site would be acceptable to the City of Chula Vista in consultation with USFWS. The criteria for determining the acceptability of the mitigation site will be (1) the presence of vernal pool habitat, and (2) its long-term conservation potential.

- The acquired vernal pool mitigation area would be an area recognized by the USFWS as an area supporting pool habitat. It would be a vernal pool area that is currently in private ownership and not protected by a conservation easement. The mitigation site can have existing vernal pools occurring on it, or it may be an area that is historically known to support vernal pools and that could be restored. If an area requiring restoration is chosen as the site, a vernal pool restoration plan which is acceptable to the City of Chula Vista in consultation with the USFWS would be prepared and implemented. The site would be adjacent to or connected by an appropriate landscape corridor to a larger area or interconnected set of patches of preserved vernal pool habitat that are currently in designated open space.

- No grading or activities which would adversely affect the habitat in the vernal pool area would occur prior to accomplishing the off-site acquisition.

Immediately upon acquisition of a suitable vernal pool mitigation area, the acquired site would be fenced with a six-foot chain-link fence to protect the area. The applicant would be required to secure a conditioned Nationwide permit, to be issued by the U.S. Army Corps of Engineers (Section 404 of the Clean Water Act), that contains the conditions outlined in this section concerning vernal pools. This Corps permit would be applied for and received prior to grading.

- The project proponent would make an irrevocable offer to dedicate the off-site acquisition/mitigation site to the City of Chula Vista, County of San Diego, or other appropriate open space holder at the time of issuance of the grading permit. Interim responsibility for the preservation of the site would remain with the project applicant until an acceptable dedication of the land has occurred.
- Prior to or as a condition of approval of the grading permit the Planning Department of the City of Chula Vista would ensure that the vernal pool mitigation program has been implemented.
- Prior to or as a condition of approval of the grading permit the applicant would secure a Streambed Alteration Agreement as stated under Section 1601-1603 of the California Fish and Game Code, for proposed access road (Paseo Ranchero) that would cross a major drainage on the site.

ANALYSIS OF SIGNIFICANCE

Impacts to coastal sage scrub, California gnatcatchers, vernal pools, cactus wrens, and snake cholla are significant. The implementation of the mitigation/monitoring program would partially reduce the level of significance.

4.6 CULTURAL RESOURCES

An investigation of the archaeological resources within the SPA III boundary was undertaken by RECON in April 1989. The information in this section is a summary of the RECON report. The full text of this report can be found in Appendix D.

EXISTING CONDITIONS

The proposed project area contains a mesa which is cut by two small canyons running to the west: Rice Canyon on the north and Telegraph Canyon to the south. These canyons are fed by drainages which run off the mesas to the north and south. The mesa affords a wide view of the surrounding mesa tops, coastal foothills, and ocean and bay. Geologically, the mesas were formed by alternating marine and riverine deposits laid down during the Eocene age of geologic history and subsequently cut by drainages forming the large valleys and steep canyons. The Eocene deposits are exposed on the surface of the mesas and on the slopes of the canyons and valleys. The exposed cobbles were commonly utilized as sources of raw materials for prehistoric man's production of stone tools.

Several vegetation zones are in proximity to the project area. Although the mesa tops have been highly disturbed, remnants of chamise and coastal scrub are present. The vegetation on the slopes is dense and consists of coastal sagebrush, buckwheat, laurel sumac, lemonadeberry, jojoba, snake cholla, prickly pear cactus, and white sage. Seeds, berries, and roots from these plants are known to have been utilized by the Native Americans for food and medicinal purposes (Hedges 1967). The nearby valleys, although now disturbed by development and road placement, would have consisted of riparian habitat and supported large game animals and a stable water source.

In 1984, an archaeological survey was performed within the boundaries of the ERDR Specific Plan by WESTEC Services, Inc. of San Diego. This survey resulted in the documentation of five previously unrecorded sites and the relocation of two previously recorded sites. The RECON report documents an archaeological investigation conducted at two sites within SPA III of the Rancho del Rey project area. The two sites, SDi-960/961 and SDi-9893 were investigated in conformance with the requirements of CEQA ,Section 21083.2 which requires the inclusion of information regarding the significance of cultural resources during the environmental review process. It was determined during the RECON investigation that the two sites represent significant resources which can contribute valuable information about the cultural prehistory of San Diego County.

Site SDi-960/961

Site SDi-960/961 contains evidence which can address the question of the presence of early man in San Diego. Broken stones seen on the surface possibly exhibit characteristics of human manufacture. These types of materials have been attributed, by virtue of their morphology, to a previously hypothesized early period of San Diego prehistory. The 1984 WESTEC archaeology report by Dennis Quillen describes the site as follows:

> Site SDi-960/961 contains crudely manufactured core tools fashioned from quartzite cobbles exposed in low lying areas between mima mounds and in roads. Dr. Bernard Reeves, University of Calgary, British Columbia, collected artifacts from this site and has used them to postulate a long, pre-San Dieguito occupation for southern California. Considerable discussion has arisen over these findings, with major criticism leveled at the speculated antiquity of the artifacts. Others suggest the quartzite cobble implements are not tools, but occur naturally due to thermal fracturing caused by periodic brush fires. An examination of the artifacts by Mr. Cerrutti, Mr. Richard Carrico, and the author found no cause for doubt that the majority of the quartzite cobble specimens at SDi-960/961 were manufactured by humans. The actual age of the site is, at the present time, unknown. More refined means for placing this site in a temporal framework, other than by development of type collections through analytical comparisons, is necessary.

Site SDi-9893

Site SDi-9893 consists of a surface and subsurface lithic scatter with the potential to yield important information regarding resource exploitation patterns in southern San Diego County. Analysis of the recovered materials revealed that the site probably functioned as a lithic reduction site where food processing also occurred. Some evidence was also found that the site might contain spatial separation of activity areas. Because the site has been undisturbed by agriculture, there is a possibility that features could be discovered which could yield microfaunal and microfloral data as well as material for absolute dating.

A modest amount of lithic material was recovered during the investigations at SDi-9893. Although the artifact recovery was not dense, the deposit is spread out over a wide area. In addition, the deposits at the site are relatively intact, rodent disturbance being the only factor noted during the excavations. The materials do not exhibit a variety through artifact class. With one exception, the assemblage consists of flaked stone artifacts and waste debitage only. The one metate fragment in addition to the lithic reduction indicated by the remainder of the artifacts indicates that some habitation occurred at the site. Secondary reduction was occurring at the site. It is probable that some materials from a nearby source (possibly site SDi-960/961) were being initially reduced before being taken from the site area.

IMPACTS

The two archaeological sites SDi-960/961 and SDi-9893, located on the SPA III property area, have been identified as significant cultural resource sites. Site SDi-960/961 contains evidence which can address the question of the presence of early man in San Diego. Site SDi-9893 consists of surface and subsurface lithic scatter with the potential to yield important information regarding resource exploitation pattern in southern San Diego County.

Development of the project site under the proposed Specific Plan would require extensive grading of the project area and would impact the identified resources. The destruction of these two sites would be regarded as a significant impact.

MITIGATION/MONITORING

The mitigation program is summarized below for each site. The mitigation program has been outlined by Dr. Timothy Gross and is included in the RECON report included in Appendix D. Mitigation measures for SPA's II and III have been completed. Mitigation measures for SPA III included:

SDi-960/961

- The examination of existing surface collections.
- A detailed grid-controlled surface collection to collect any artifacts remaining on the surface site. Broken cobbles would also be collected to evaluate whether or not they are of human manufacture.

- Surface disturbance would be recorded. Mapping and photographic documentation would be made.
- Mima mounds would be investigated to see whether the artifacts or broken cobbles are incorporated into the mounds, are found on the surfaces under the mounds, or are absent from the mounds.
- The site would be examined by a qualified geomorphologist to analyze the mima mounds, their site setting, age, and stratigraphic integrity.
- All material collected would be washed, cataloged, and analyzed.
- A report would be prepared detailing the investigation and would be submitted to the City of Chula Vista, San Diego State University Clearinghouse, and the Museum of Man.

SDi-9893

- The site would be analyzed through the excavation of 25 1 x 1-meter test units. These units would be analyzed to determine how much of the site would be excavated. A total of 150 meters of backhoe trenches would be excavated to search for potential hearth features.
- A report would be prepared detailing the investigation and would be submitted to the City of Chula Vista, San Diego State University Clearinghouse, and the Museum of Man.

The mitigation program has been completed and approved by the City.

ANALYSIS OF SIGNIFICANCE

Two sites within the SPA III boundary have been identified as being significant cultural resource sites. These sites would be significantly impacted by the development of the proposed project; however, the completion of the mitigation program has reduced significant impacts to below a level of significance.

4.7 TRANSPORTATION

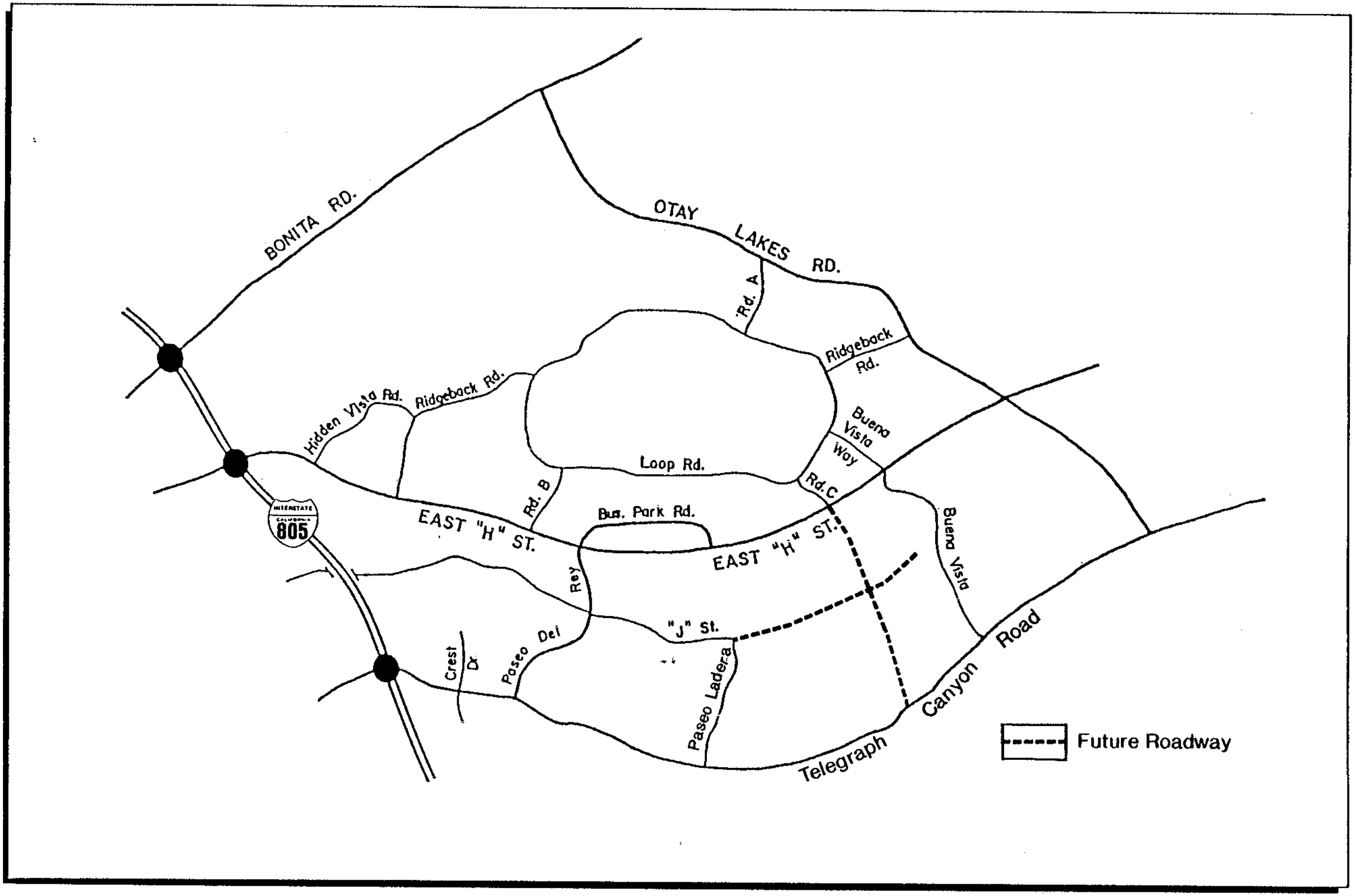
EXISTING CONDITIONS

Impacts to traffic associated with the Rancho Del Rey project have been examined in several previous studies. An analysis of the ERDR Specific Plan was completed by Urban Systems Associates, Inc. (USA), in 1985. Another analysis was completed by USA in October 1986 and revised in March 1987 which evaluated the impacts associated with development of SPA I. In 1989, Bankston/Pine Associates, Inc. prepared a traffic evaluation for SPA III. A revised traffic evaluation was prepared in July 1990 in response to the City of Chula's Vista Traffic Department. An addendum to the revised traffic study was completed in October 1990. The revised traffic study and the addendum are found in Appendix E.

SPA III of the El Rancho Del Rey Specific Plan is located in the area east of I-805 and south of East H Street; bounded roughly by East H Street on the north, Telegraph Canyon Road to the south and by Buena Vista Way to the east.

The Rancho del Rey project will have primary access via East H Street and secondary access via Otay Lakes Road and Telegraph Canyon Road. SPA I and SPA II residential traffic will initially access the the loop road and/or connect~~en~~or roads A, B, C, Ridgeback, and Buena Vista, and then on to East H Street or Otay Lakes Road. Business Park traffic will access East H Street only via Business Park Road. The SPA III project will have primary access via East H Street or Telegraph Canyon Road. SPA III traffic will access H Street and Telegraph Canyon Road via J Street, Paseo Ladera, and Paseo del Rey. East J Street, under the proposed project, would not be extended to Buena Vista Way, as per the Chula Vista General Plan, and would result in a cul-de-sac street. The project area and street network are illustrated in Figure 4-6.

East H Street between I-805 and Otay Lakes Road is a 6-lane divided roadway running east/west. Prior to recent road widening action (November 1988) this roadway existed as 2 lanes between Ridgeback Road and Buena Vista Way. Otay Lakes Road between East H Street and Bonita Road is 4 lanes and runs generally north/south. It has a right-of-way dedication for 6 lanes and in the future will be



No Scale

Source: Bankston, Pine Associates

Figure 4-6

Street Network

widened to six lanes. Ridgeback Road between East H Street and the westerly SPA II boundary is 2 lanes. Telegraph Canyon Road between I-805 and Paseo Ladera is a 4 lane divided east/west roadway. It is 2 lanes between Paseo Ladera and Otay Lakes Road. This roadway link is now being widened to 6 lanes. I-805 is an 8 lane north/south freeway in the project vicinity with interchanges at Telegraph Canyon Road, East H Street, and Bonita Road; and a separation structure at J Street.

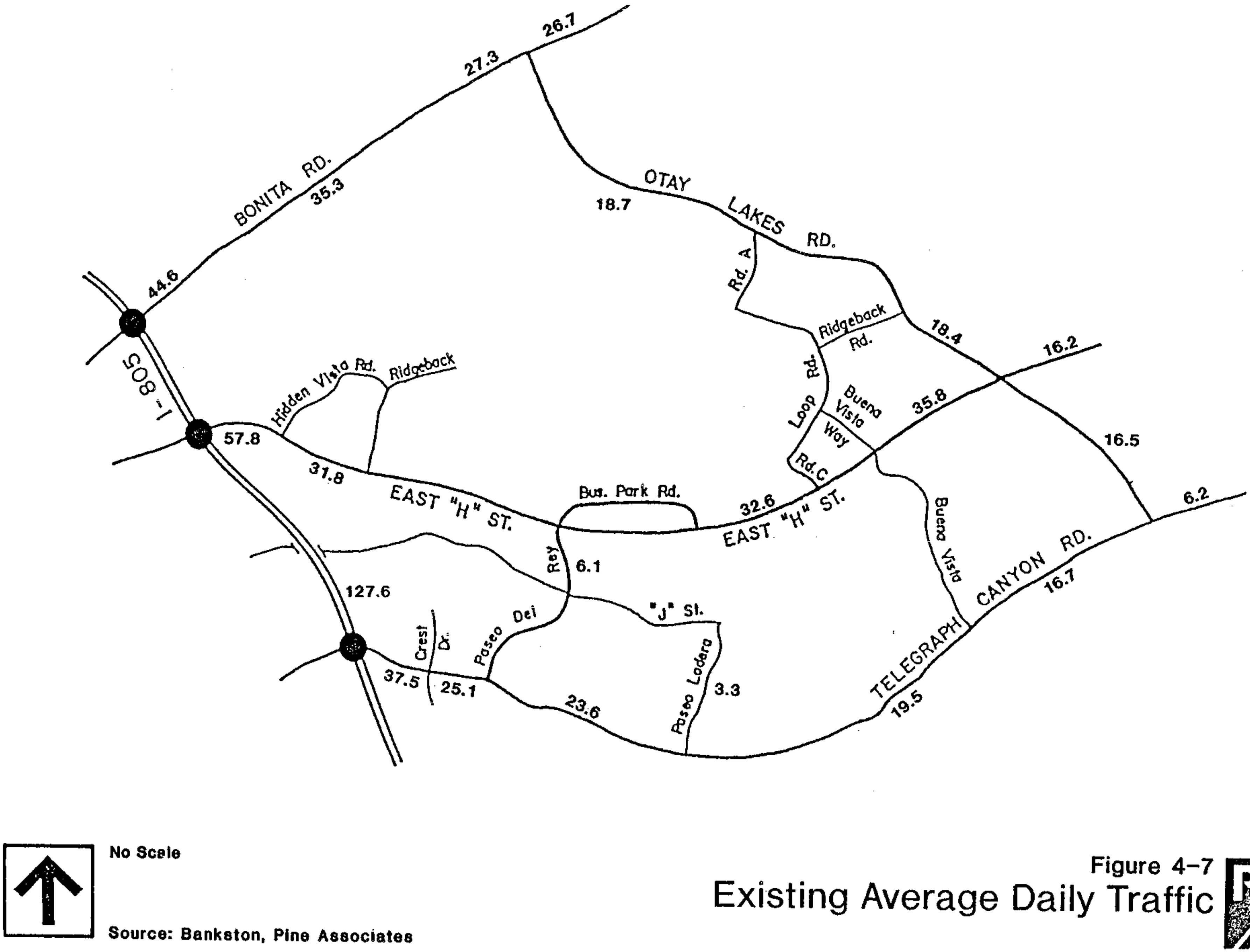
Traffic signals exist at several intersections in the project study area. There are currently traffic signals on Telegraph Canyon Road at the intersections of the I-805 northbound and southbound ramp terminals, Crest Drive, Paseo Del Rey and at Medical Center Drive. Traffic signals also exist at the intersection of Otay Lakes Road and Avenida Del Rey and East H Street and Paseo Ranchero. Signalized intersections occur at East H Street and the I-805 northbound off-ramp, and at the Hidden Vista Road, Paseo Del Rey, Otay Lakes Road, and Buena Vista Way intersections. The I-805 northbound and southbound terminals at Bonita Road and the intersections are also signalized as well as the Bonita Road/Otay Lakes Road intersection, the Otay Lakes Road and Ridgeback Road intersection and the Southwestern College Driveway.

The existing (1989) average 24-hour weekday average daily traffic volumes (ADT), for the most part, are based on traffic counts from the 1986 SPA traffic report with a 4 percent per year growth figure added to the previous count (Figure 4-7). The exception is I-805 where traffic counts were derived by adding 7 percent to 1987 CalTrans traffic counts.

Several assumptions were included in the analysis of potential impacts of the proposed project on the transportation system of Chula Vista. Guidelines and assumptions for this analysis include the following:

1. An interim roadway within the State Route 125 corridor in Chula Vista will not be completed before 1995.

2. Traffic related requirements related to City policy on intersection level of service (LOS) are observed and maintained for this analysis. That is, all intersections are mitigated to operate at Policy Threshold Standards set by the City of Chula Vista.



Source: Bankston, Pine Associates

Figure 4-7
Existing Average Daily Traffic

3. East J Street would not be extended easterly to Buena Vista Way, but would end in a cul-de-sac just east of Paseo Ranchero.

4. Phasing for the project is as follows:

Phase 1.	530 multi-family (retirement) dwelling units.
Phase 2.	245 single family dwelling units.
Phase 3.	365 single family dwelling units. 240 townhouse dwelling units. 1 junior high school on 25 acres.

5. Cumulative traffic conditions are determined from the ECVTPP traffic model run for existing traffic plus traffic resulting from approved projects, projects with tentative maps filed, and the Olympic Training Center.

The Threshold Policy regarding traffic seeks to provide and maintain a safe and efficient street system within the City by establishing standards for all signalized intersections. These standards are reproduced below:

- Maintain level of service (LOS) "C" or better at all intersections city-wide, with the exception that LOS "D" may occur at signalized intersections for a period not to exceed a total of two hours per day.
- Intersections west of I-805 may continue to operate at their current (1987) LOS, but shall not worsen.
- No intersection shall operate at LOS "F" as measured for the average weekday peak hour.

Notes to Standards as discussed in the threshold standards include:

1. LOS measurements shall be for the average weekday peak hour, excluding seasonal and special circumstance variations.

2. The measurement of LOS shall be by the ICU (Intersection Capacity Utilization) calculation utilizing the City's published design standards.

3. Intersections of City arterials with freeway ramps shall be excluded from this policy.

4. Circulation improvements should be implemented prior to anticipated deterioration of LOS below established standards.

Implementation measures delineated include:

Should the GMOC determine that the Threshold Standard is not being satisfied, then the City council shall, within 60 days of the GMOC's report, schedule and hold a public hearing for the purpose of adopting a moratorium on the acceptance of new tentative map applications, based on all of the following criteria:

1. That the moratorium is limited to an area wherein a causal relationship to the problem has been established; and,
2. That the moratorium provides a mitigation measure to a specifically identified impact.

Should a moratorium be established, the time shall be used to expeditiously prepare specific mitigation measures for adoption which are intended to bring the condition into conformance.

The City of Chula Vista has adopted a Transportation Phasing Plan (TPP) to establish an orderly progression of street improvements to correspond with the development of the Eastern Territories of which this project is a part. Street improvements to maintain an acceptable level of service on the circulation system have been identified as necessary to serve the total development of the Eastern Territories as opposed to any individual development. The timing of each improvement is tied to a specific amount of development (number of dwelling units or gross acres of industrial or commercial land uses) as opposed to the development of any particular parcel of land. Since the geographic order and intensities of development are not certain, the TPP is reviewed and revised annually to reflect current land development proposals and changing conditions in the community. The review process begins in January of each year and culminates in a noticed public hearing approximately April of each year, at which time the City Council may consider any modifications to the TPP requirements. As part of the Eastern Territories, Rancho del Rey SPA III is subject to the East Chula Vista Transportation Phasing Plan and to all current or future updates of the overall circulation improvements.

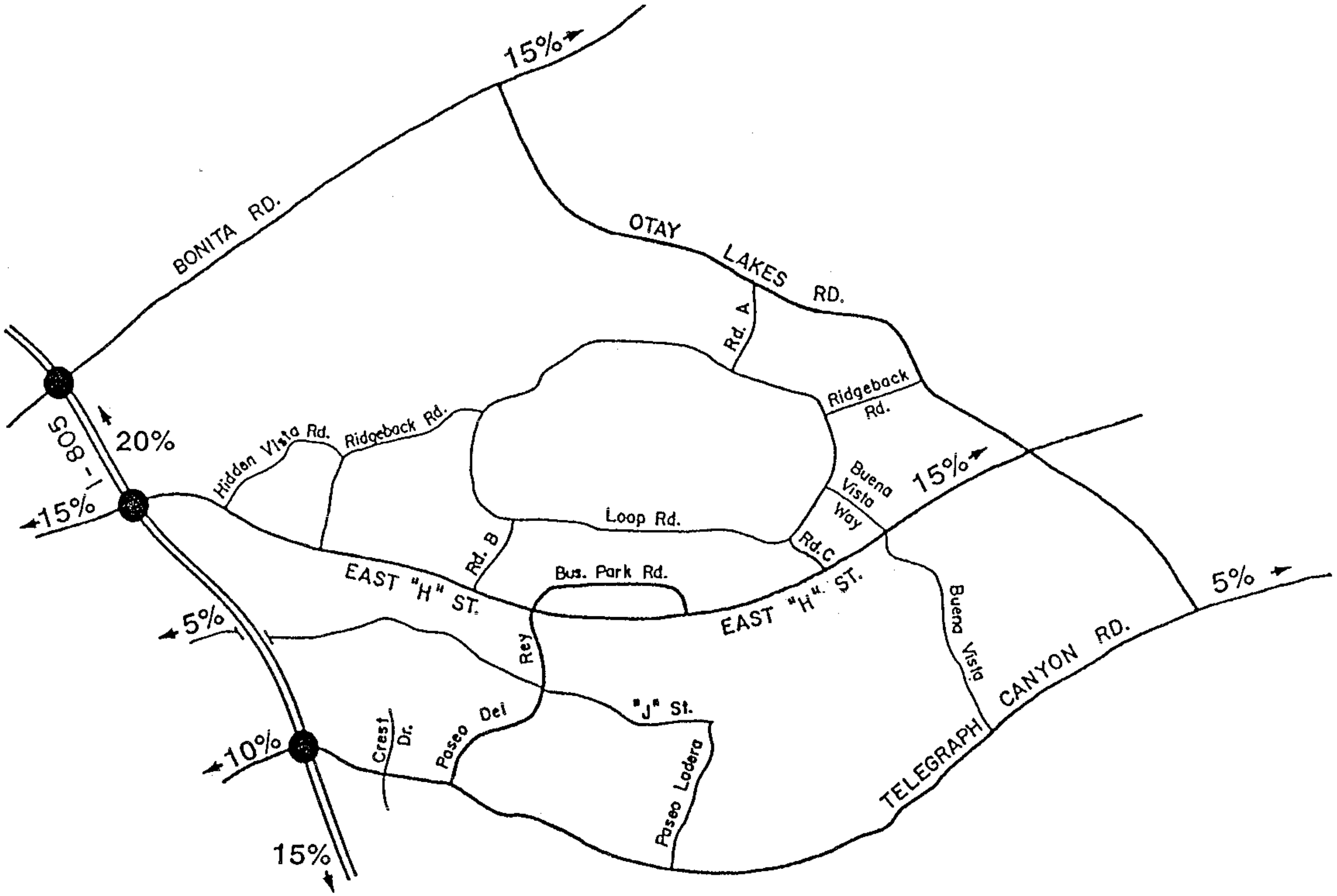
IMPACTS

For the purposes of this analysis, trip generation for project trips except for the retirement community is based on the SANDAG trip generation rates. Retirement community trip rates are City of San Diego rates and recommended for use by the City of Chula Vista. To assess the impacts of such development a calculation was made of the number of trips expected under the proposed project. Trip generation rates per land use designation are as follows: Residential, including: single family-10 ADT/DU, townhouses-8 ADT/DU, retirement dwellings-4.5 ADT/DU, and junior high school 40 ADT/acre. Trip distribution assumptions for the retirement community are shown in Figure 4-8. Trips will distribute differently for retirement trip generators because of fewer commute to/from work trips. As indicated in Figure 4-9, it is estimated that a higher proportion of work trips for the rest of the project will route north/south via I-805. As shown in Table 4-6, the proposed project is estimated to generate 11,405 ADT.

Table 4-6

TRIP GENERATION

Land Use	Units	Rate	ADT
PHASE 1			
Retirement	530 DU	4.5 ADT/DU	2,385
PHASE 2			
Single Family	245 DU	10 ADT/DU	2,450
PHASE 3			
Townhouses	240 DU	8 ADT/DU	1,920
Single Family	365 DU	10 ADT/DU	3,650
Junior High School	25 acres	40 ADT/AC	1,000
TOTAL			11,405

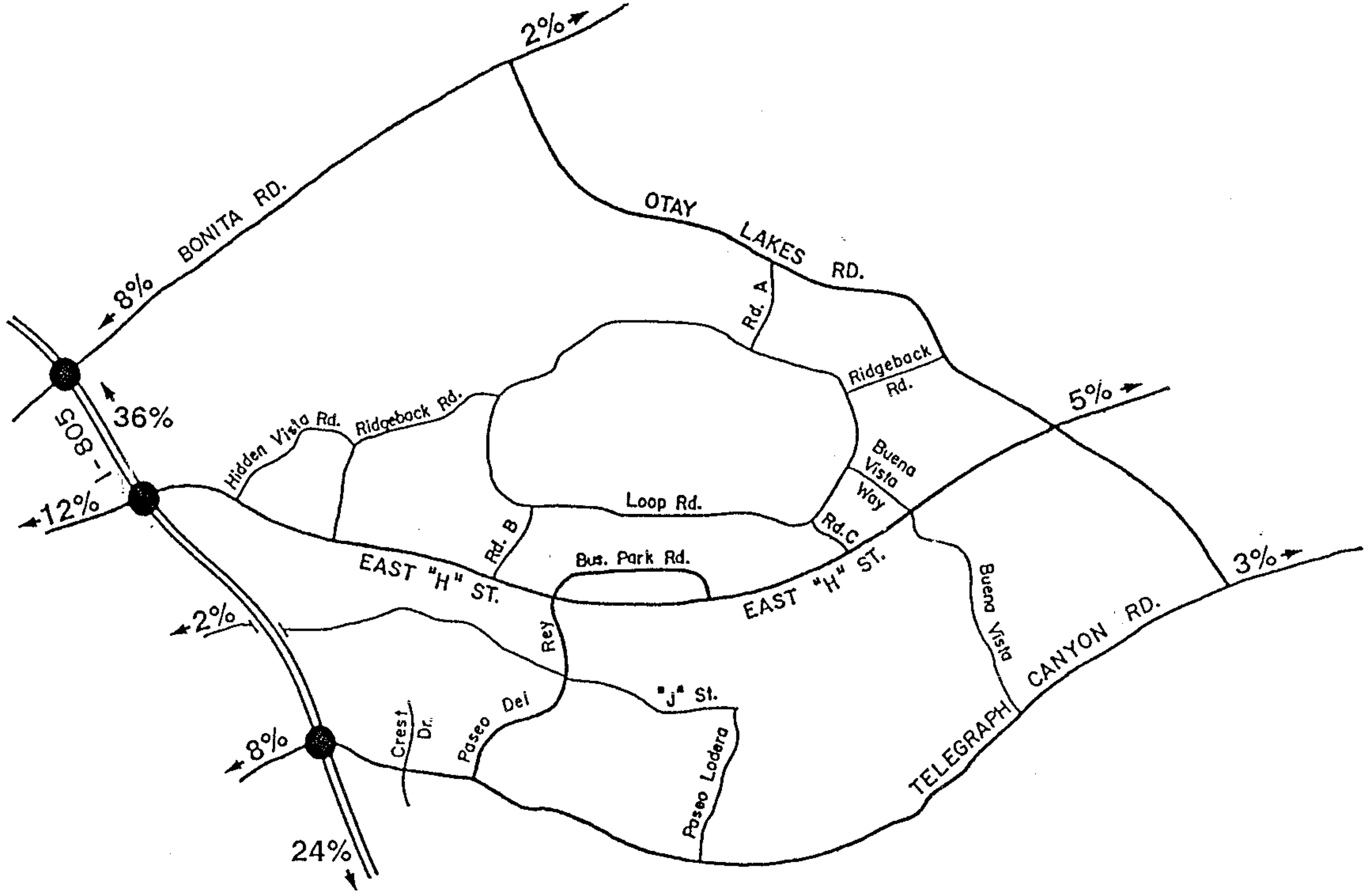


No Scale

Source: Bankston, Pine Associates

Figure 4-8

Trip Distribution Retirement Community Land Use



No Scale

Source: Bankston, Pine Associates

Figure 4-9
Trip Distribution

Using the trip distribution for the proposed project shown in figures 4-8 and 4-9, project trips were assigned to the road system for the proposed completion year 1994. These trips were added to 1989 traffic volumes on the appropriate road of freeway segment (Figure 4-10). In general, 22 per cent of the project traffic is oriented west of I-805 via East H Street, J Street, and Telegraph Canyon Road, while 24 percent is oriented south on I-805 and 36 percent is oriented north on I-805. For the remaining trips, 10 percent is oriented north on Otay Lakes Road to Bonita Road, and 8 percent is oriented east along H Street and Telegraph Canyon Road.

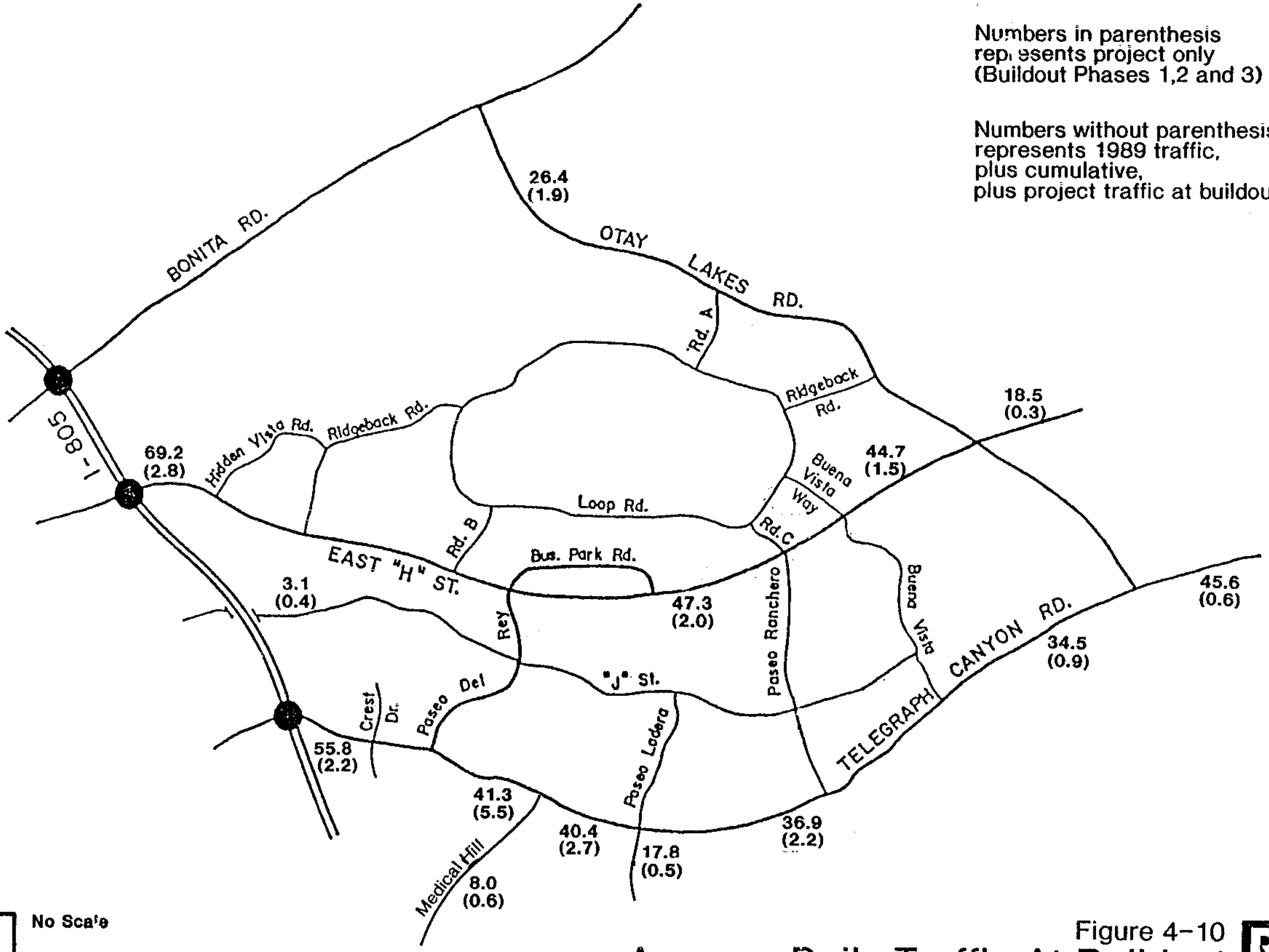
The 1989 ADT shown on Figure 4-7 for East H Street and Ridgeback Road was counted by City staff during the week of February 6, 1989. These counts were taken at selected locations including East H Street and on Telegraph Canyon Road. it is apparent from these counts that approximately 4,000 ADT has shifted from Telegraph Canyon Road to East H Street. This shift in traffic is believed to be due to the recent opening of the widened East H Street and the fact that congestion exists now on Telegraph Canyon Road. The congestion on Telegraph Canyon Road is a temporary condition which will be relieved when the current widening project on Telegraph Canyon Road is completed in 1990. At that time, the 4,000 ADT is expected to shift back to Telegraph Canyon Road from East H Street. Accordingly, Figure 4-10 reflect this temporary shift from Telegraph Canyon Road to East H and back again.

Morning and afternoon Peak Hour LOS analyses were made for existing, existing + cumulative, existing + cumulative + Phase 1 of SPA III, existing + cumulative + Phase 1 + Phase 2 of SPA III, and existing + cumulative + Phase 1 + Phase 2 + Phase 3 of SPA III conditions. Existing conditions are based on current traffic volumes within the roadway facilities now in place. Existing + cumulative + Phase 1 + Phase 2 + Phase 3 of SPA III analyses assume Project and Cumulative projects build-out along with roadway mitigations.

Table 4-7 shows results from these analyses by LOS based on volume/capacity (V/C) criteria. LOS levels range on a continuum from LOS "A" through "F" with LOS "A" reflecting optimal conditions with minimal delays and LOS "F", total breakdown in traffic movement. LOS results based on analysis of signalized

Numbers in parenthesis
represents project only
(Buildout Phases 1,2 and 3)

Numbers without parenthesis
represents 1989 traffic,
plus cumulative,
plus project traffic at buildout.



No Scale

Source: Bankston, Pine Associates

Figure 4-10
Average Daily Traffic At Buildout

intersections indicate the overall level of service at which an intersection operates. Signalized intersection results are based upon volumes relative to intersection capacity ratios. Unsignalized intersection analysis results produce operational levels by movement. A range of levels by movement is shown in Table 4-7 when an intersection is analyzed as unsignalized.

As Table 4-7 shows, all intersections relevant to the project will operate at LOS "C" or better in the AM and PM peak hours with completion of project with the exception of the East H Street/Paseo del Rey intersection. The East H Street/Paseo del Rey intersection operates at LOS "D" (with a Volume/Capacity ratio of (V/C) 0.84) in the PM peak hour at completion of project. Volume/Capacity ratios as discussed earlier in this section are used to determine LOS A-F in the City of Chula Vista. According to the City of Chula Vista's Threshold Standards, LOS "D" is an acceptable LOS for up to two hours a day. The third highest hour cannot exceed a V/C ratio of 0.79 which is the upper limit for LOS "C". The third highest hour for this intersection was determined to be at a LOS "C". Therefore, all of the intersections shown on Table 4-7 meet this threshold.

In summary, with the mitigations recommended below along with improvements already under construction or in place, all facilities will operate at an acceptable level of service in accordance with City of Chula Vista Policy Threshold Standards.

Preliminary analysis for the August 1990 ECVTPP identified two intersections, East H Street at Hidden Vista Drive and Telegraph Canyon Road at Crest Drive, as having potential problems with the addition of SPA III traffic. Subsequent refinements of the projected traffic volumes for the ECVTPP indicated that the intersection of Telegraph Canyon Road at Crest Drive would operate at an acceptable level of service.

Bankston Pine further analyzed the intersection of East H Street at Hidden Vista Drive using the TRANSYT-7F arterial analysis program. This program identifies the optimum signal timing and maximum back up of queueing vehicles in addition to level of service for an intersection. It also shows the relationship of a signal with adjacent signals. Several scenarios were evaluated. Scenario 1 assumes existing conditions except it provides for four travel lanes in each direction on East

Table 4-7
LEVEL OF SERVICE AT RELEVANT INTERSECTIONS
RANCHO DEL REY SPA III

	PEAK HOURS									
	Existing		Existing + Cumulative		Existing + Cumulative + Phase 1		Existing + Cumulative + Phase 1 + 2		Existing + Cumulative + Phases 1 + 2 + 3	
Intersection	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
East H Street/Paseo del Rey	A	B	B	C	B	C	B	D	C	D
East H Street/East Business Park Road	-	-	B	A	C	C	C	C	C	C
East H Street/Paseo Ranchero	-	-	A	A	A	A	B	B	B	C
East J Street/Paseo del Rey	A	A	A	B	A	C	B	C	B	C
East J Street/Paseo Ladera	-	-	-	-	-	-	A	A	A	A
East J Street/Paseo Ranchero	-	-	-	-	-	-	A	A	A-B	A-C
Telegraph Canyon Road/ Paseo Ladera	A-E*	A-E*	B	B	B	B	B	B	B	C
Telegraph Canyon Road/ Paseo Ranchero	-	-	-	-	-	-	A-E*	A-E*	A	A

Source: Bankston/Pine Associates, Inc.

* Stop sign controls on minor street.

H Street. Scenario 2 assumes four travel lanes in each direction plus a full service, signalized intersection at the Home Depot driveway immediately east of Hidden Vista Drive. The results of the analysis indicated that the intersection would operate at LOS C under both scenarios.

Scenario 3 used the assumptions of Scenario 2 with the exception of the directional split of incoming and outgoing traffic at the shopping center. Under scenarios 1 and 2, the existing split of 75 percent to/from the west and the remaining 25 percent to/from the east was assumed for future conditions too. Under Scenario 3 future conditions, the split was assumed to be 50 percent to/from the west and 50 percent to/from the east, which reflects projected development to the east. Under Scenario 3, the intersection of East H Street at Hidden Vista Drive is also expected to operate at LOS C as it does under scenarios 1 and 2.

The same three scenarios were evaluated using three travel lanes in each direction on East H Street. Under the alternate scenarios 1 and 2, the intersection of East H Street and Hidden Vista Drive would operate at LOS F and LOS E, respectively. Under the alternate Scenario 3, the level of service at the intersection would be LOS C. This indicates that if the directional flow of traffic out of the shopping center shifts substantially from the west to the east as assumed, then constructing a second intersection will mitigate the LOS at the East H Street intersection to an acceptable level of service without widening East H Street.

MITIGATION/MONITORING

As identified in the Bankston-Pine study, certain mitigations are needed to accommodate project traffic. Recommendations are made to mitigate study area roadways to acceptable levels of service. The following site specific project related mitigation is needed to reduce traffic impacts to a level below significance.

Existing + Cumulative Mitigation Measures

- Signalize Telegraph Canyon Road and Paseo Ladera.

Existing + Cumulative + Phase 1 of SPA III Mitigation Measures

- o Open up the south leg of East H Street/East Business Park Road intersection where Phase 1 traffic is assumed to enter and exit.

Existing + Cumulative + Phase 1 of SPA III Migitation Measures

- o Construct Paseo Ranchero between H Street and Telegraph Canyon Road.
- o Extend J Street to provide a through two-lane road between Paseo del Rey and Paseo Ranchero.
- o Place stop sign controls on Paseo Ladera at East J Street, East J Street at Paseo Ranchero, and Paseo Ranchero at Telegraph Canyon Road. (The intersection of Telegraph Canyon Road/Paseo Ranchero operates at LOS E for left turns out of Paseo Ranchero; however, low traffic volumes on the minor street do not meet signal warrants.)

Existing + Cumulative + Phase 1, 2, and 3 of SPA III Mitigation Measures

- o Signalize Telegraph Canyon Road and Paseo Ranchero.

East H Street/Hidden Vista Drive

There are a number of mitigation measures to bring the level of service at this intersection to an acceptable LOS C.

- o Widen East Street to four travel lanes in each direction;
- o Widen East H Street to four travel lanes in each direction and signalize at the Home Depot driveway; or
- o Widen north approach to provide three left turn lanes.

When SR-125 is in place, it is possible that none of the above noted mitigation measures may be necessary. Yearly monitoring of conditions at the intersection will provide the best guidance as to when and what type of mitigation measures are best.

Mitigation measures noted above relate to those roadway facilities significantly affected by SPA III development. It is assumed that all streets internal to the project would be designed according to the classifications provided in the project description. The developer will be required to implement the above mentioned mitigation measures.

Mitigation measures beyond the nearby project environs resulting from either the project or cumulative projects traffic is being accounted for in the on-going East Chula Vista Transportation Phasing Plan (ECVTPP). The ECVTPP is being managed by the City of Chula Vista. The ECVTPP area will be reanalyzed on an annual basis to stay ahead of development and to insure that a comprehensive annual review is made to maintain acceptable levels of service on all affected intersections and roadways.

The City Engineer has informed the Rancho Del Rey Partnership that the SPA III EIR should indicate that SPA III, as in all other developments, is subject to any current or future updates of the City-wide Transportation Phasing Plan.

ANALYSIS OF SIGNIFICANCE

The proposed project involves the development of SPA III of the El Rancho del Rey Specific Plan area. SPA III is expected to generate 11,405 ADT. The total traffic to be generated was distributed to the circulation system and impacts were evaluated. The future traffic volumes on adjoining circulation system were calculated to be within the Threshold ADT determined by the City and no significant impacts are expected, provided that mitigation measures noted are implemented. It should be noted that current update of the ECVTPP using 1995 Regional Transportation Travel Data indicates that significant traffic impacts may result from the cumulative effect of all developer proposed land developments constructed prior to the completion of SR-125. The phasing of developments for Rancho del Rey SPA III should be in conformance with the East Chula Vista Transportation Phasing Plan to ensure that there is sufficient system wide roadway capacity to serve project plus existing plus other development traffic volumes. As part of Chula Vista's ongoing Traffic Monitoring Program, it should be noted that many of the above mitigations are on streets to be evaluated under the Transportation Phasing Plan and as such, further mitigations on these segments of streets could be required by the Phasing Plan to stay in conformance with the City's threshold standards.

4.8 LAND USE/GENERAL PLAN/ZONING

EXISTING CONDITIONS

The project site is currently undeveloped and covered with native scrub vegetation except for several dirt trails which traverse the ridgetops. The majority of the

SPA III Planning Area is surrounded by single family residential development. Existing single family homes are located to the west of the site in the Linwood Hills development, and to the east. Rancho del Rey SPA I, which has an approved Plan, is adjacent to the north side of the project site and is currently under construction. Development plans for SPA I include residential estate and single-family detached uses, open space areas to the east and an open space area to the south. Proposed light industrial development is located to the north in SPA I across East H Street. SPA II, another phase of the ERDR Specific Plan, recently approved in August 1989, is located to the northwest of SPA I. Development plans for SPA II include estate and single family residential totalling 567 DU, a community facility and neighborhood park and 158 acres of open space. A recently constructed elementary school is located at the northern end of the eastern project boundry. A linear public park extends south from the school site, between the project and exising single family dwelling homes. A small townhouse development is located at the southern end of the park, at the northwest corner of East J Street and Buena Vista Way.

Near the center of the project site, a condominium project is being developed on a 10-acre site (Mission Verde subdivision) at the northwest corner of East J Street and Paseo Ranchero. The elementary school district owns the 10-acre parcel at the southwest corner of that intersection, but has no plans to construct facilities in the foreseeable future. SPA III will link the currently isolated segment of Paseo Ranchero and East J Street, improving the circulation pattern for existing residents as well as future SPA III residents.

Commercial sites are located nearby to the west along I-805 at East H Street and at Telegraph Canyon Road, and to the east along Otay Lakes Road. A major employment center is being developed along East H Street within the SPA I Planning Area. See Figure 4-11 for existing and surrounding land use designations.

General Plan and Zoning - The project site is located within the El Rancho del Rey Specific Plan area. The specific plan text describes the specific plan components, including guidelines and processes for its implementation. The specific plan map indicates the land use designations and corresponding density classification for each parcel in the plan area. In addition, an administrative plan assigns a specific

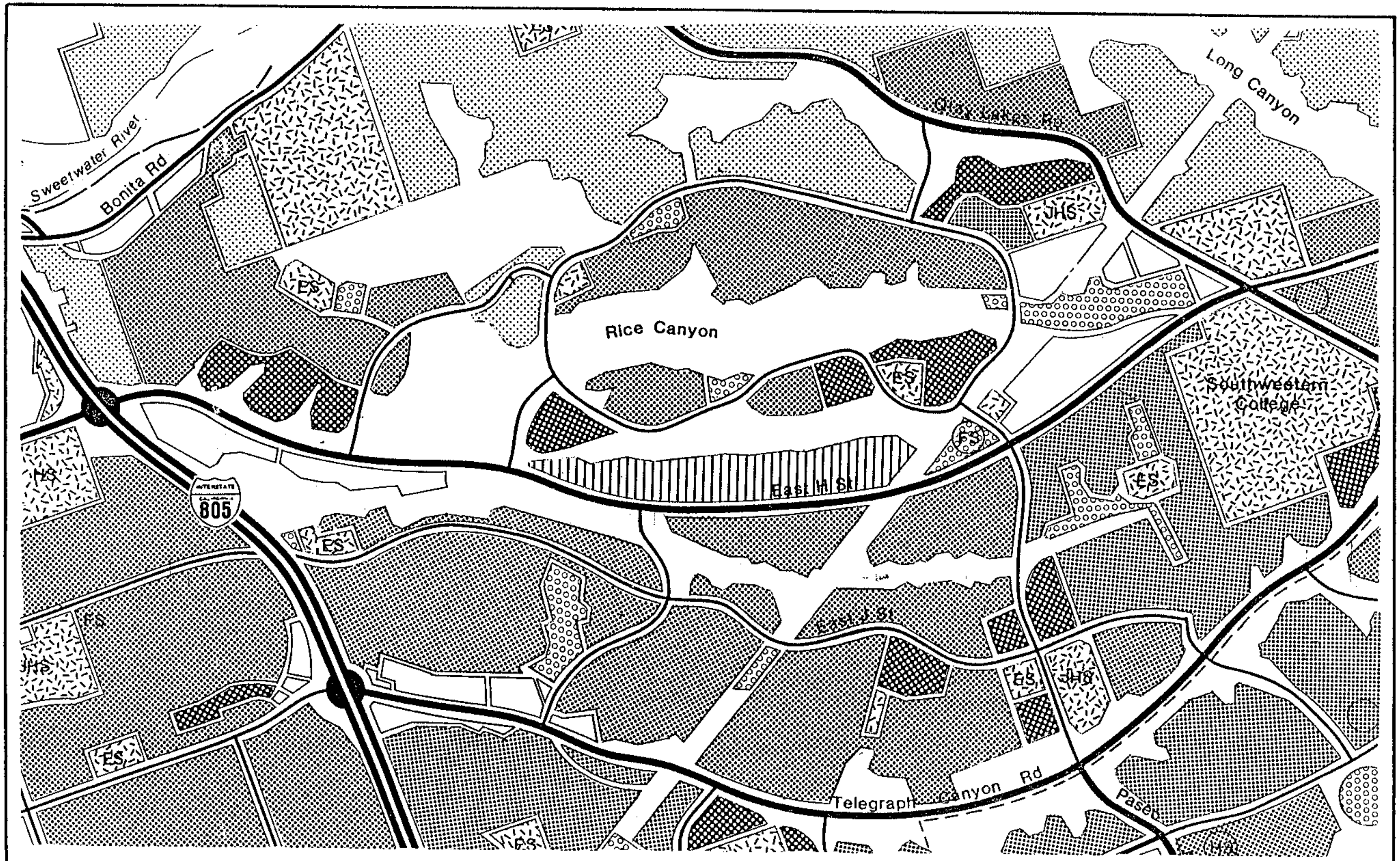


Figure 4-11
Land Use Map

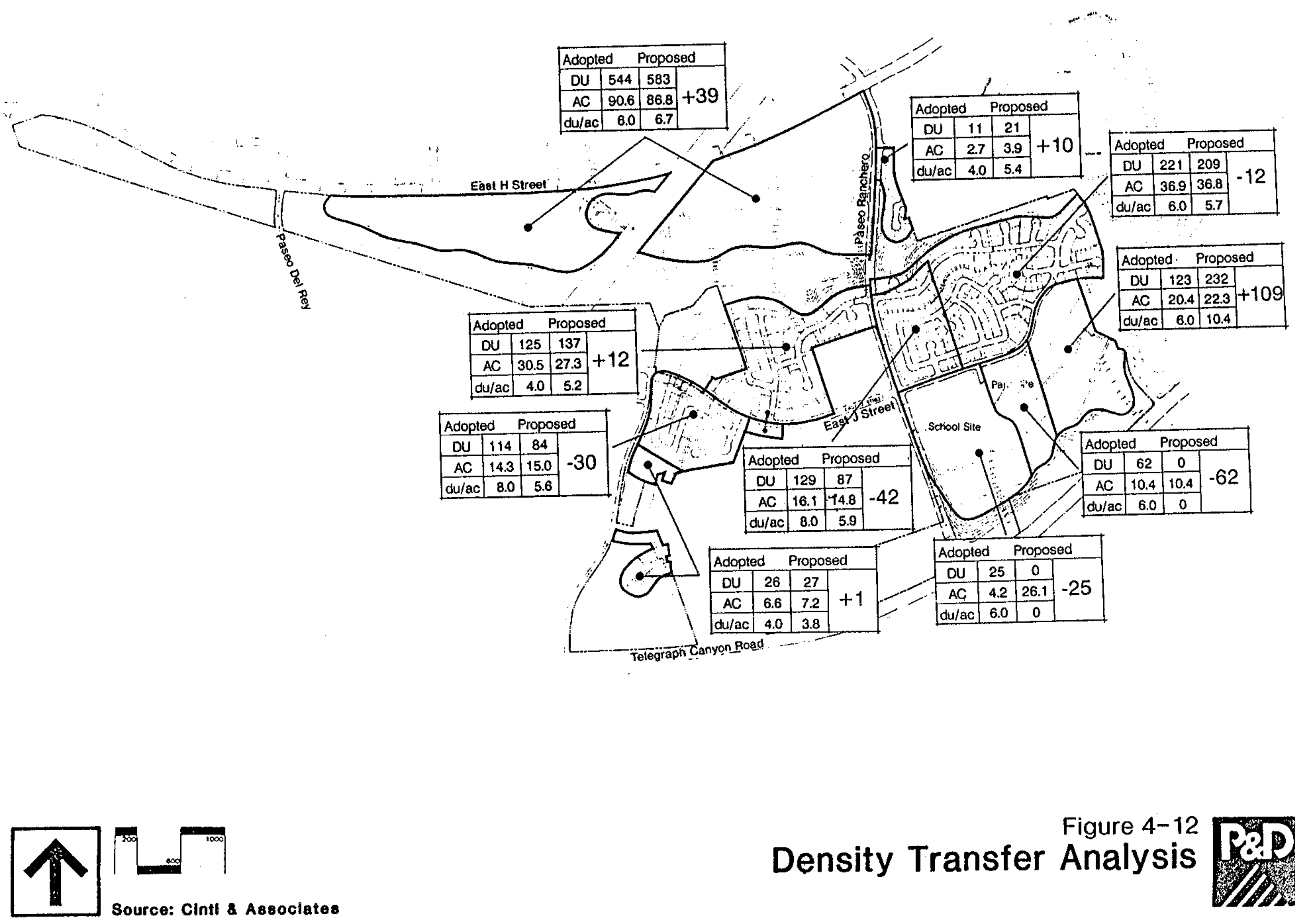
SOURCE: Chula Vista General Plan

number of units to each residential parcel based on the parcel's size and density classification. One of the provisions of the administrative plan is to allow for density transfers between residential parcels within an individual SPA area or between SPA areas. It should be noted that the proposed SPA III Plan does include density transfers within the SPA III development area. The density transfer involves the transfer of 171 total residential units. The density transfers are depicted in Figure 4-12.

The ERDR Specific Plan serves as the master development plan for the project area. The specific plan includes generalized guidelines which have been or will be refined by each of the three SPA plans within the specific plan area and further refined with each tentative map. Rancho del Rey SPA I was approved in December 1987. SPA II, recently approved in August 1989, was originally identified in the specific plan as SPA III; however, in June 1988 SPAs II and III were combined as the third SPA to be processed. In the process of refining the plans, each SPA plan is compared to the specific plan to ensure that the components of the SPA plan (general development plan, site utilization plan, development regulations, etc.) are consistent with the general goals and guidelines presented in the specific plan.

The Rancho del Rey SPA III Plan area is zoned Planned Community (PC). The purpose of the PC zone is to promote long-range planning and orderly development of large parcels of land which may contain a variety of land uses but which are under unified ownership or control. The specific plan is implemented through the PC zone which requires the use of SPA plans. SPA I and SPA II are located to the north of the project site and are zoned PC. Areas to the east and west of the project area are zoned residential. The area to the south and west of Rancho del Rey SPA III along Telegraph Canyon Road is zoned Planned Community and includes the Sunbow development project.

Proposed Land Use - The Rancho del Rey SPA III Plan consists of single-family detached lots and attached units, and specialty housing with residential support uses. There will be a total of 1,380 single family dwelling units on approximately 208.8 acres for an average density of 6.6 dwelling units per acre. In addition, a 24.7-acre junior high school site, a 10.0-acre public park site, a 2.0 acre community facility, and eight open space areas totalling 147.6 acres are proposed. Specialty



Source: Cinti & Associates

Figure 4-12
Density Transfer Analysis

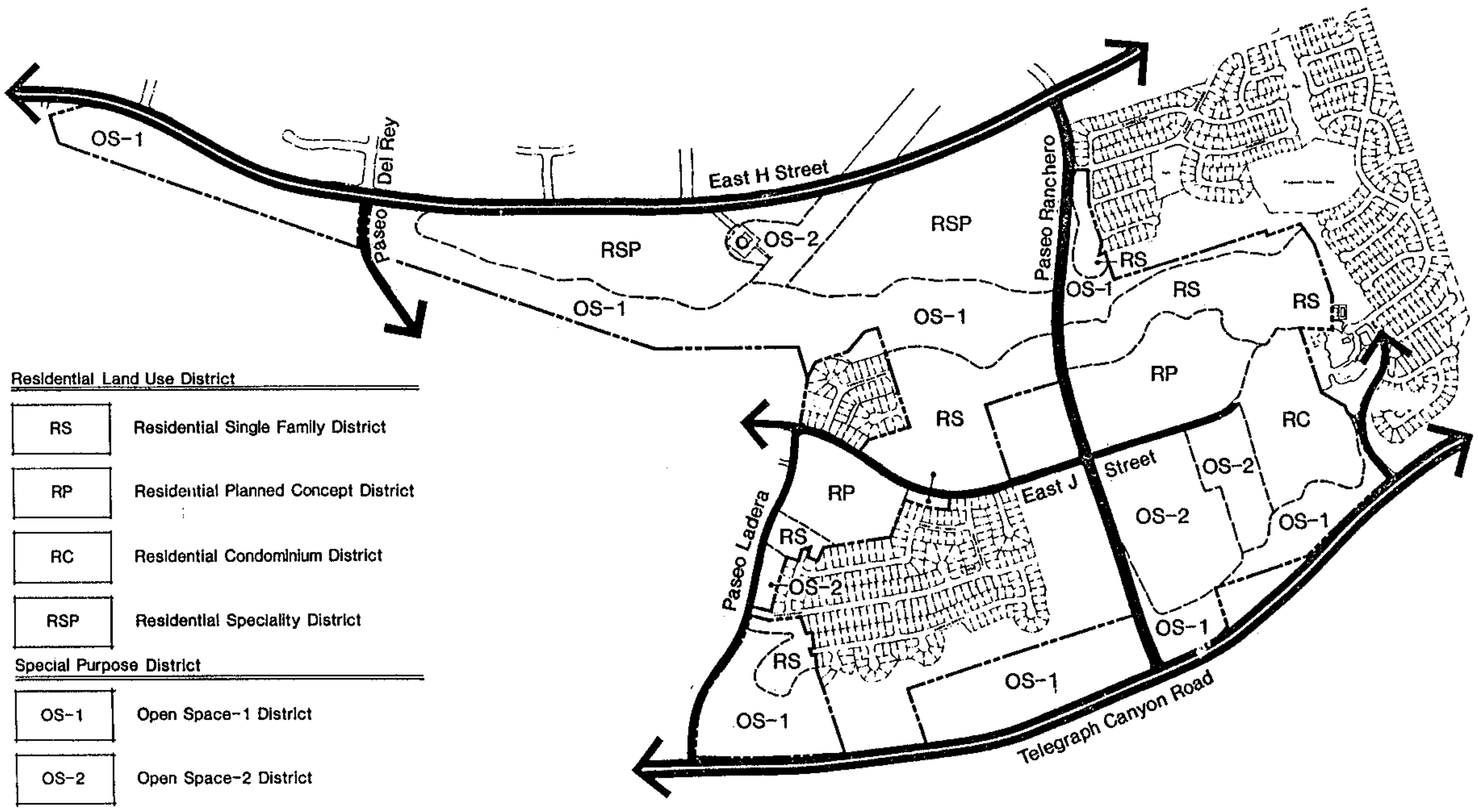
housing (the retirement community) which would be comprised of 85 acres is proposed within the project as part of 208.8 acres of residential development. Figure 4-13 illustrates proposed development within the proposed project area.

The single family conventional dwelling units are situated in four separate areas. Area R-1 is comprised of two separate site areas and consists of 27 units. They are located north of Telegraph Canyon Road east of Paseo Ladera and south of proposed East J Street. One site located just north of Paseo Marguerita, is the northerly site and the other site is located just south of Paseo Estrada and east of Paseo Ladera. R-2 is located in the northeast section and consists of 151 units. R-3 is located in the central portion of the site west of the proposed Paseo Rancheo and north of proposed East J Street. It is comprised of 137 units.

The R-4 through R-5 parcels are classified as single-family cottage dwellings and are composed of 250 total units on 38.3 acres. These units have an average density of 6.4 DU/ac. The R-4 parcel is located in the west central portion of the site just east of Paseo Ladera and south of proposed East J Street and consists of 84 units. The R-5 parcel is located in the northeast portion of the site north of the proposed East J Street and east of Paseo Ranchero and consists of 166 units.

The R-6 parcel adjacent to the R-5 area which is located just east of proposed Paseo Ranchero and south of proposed East J Street is designated as townhouse dwellings and consists of 232 units on 22.8 acres for a density of 10.2 DU/ac.

The R-7 area is a proposed retirement community site that contains 583 units and consists of 85 acres. This area will have an average density of 6.8 DU/ac. The R-7 parcel is broken up into two parcel areas. One parcel is located south of East H Street and east of Paseo Del Rey. There are a number of interval circulation roads within each of these areas. Primary access roads include Paseo Ladero, Paseo del Rey, East H Street, and Telegraph Canyon Road. Proposed Paseo Ranchero and East J Streets will criss-cross the proposed site area providing circulation to the inner sections of Rancho del Rey Spa III. There is one proposed 10.0 neighborhood park located in the southeast corner south of East J Street between the proposed junior high school site and residential area R-6.



RANCHO DEL REY
A Planned Community by the Rancho Del Rey Partnership

Scale 200 600 1000

Source Cinti & Associates (619) 239-1815

7/23/90

Figure 4-13

SPA III Proposed Development

There are eight open space areas; OS-1 (19.20 acres), OS-2 (53.7 acres), OS-3 (3.6 acres) OS-4 (6.3), OS-5 (18.7 acres), OS-6 (8.6 acres), OS-7 (14.8 acre), OS-8 (22.7acres). Area OS-1 includes a major southwest-trending drainage in the northwest corner of the plan area. Area OS-2 is primarily composed of a canyon drainage along the northern boundary of the project area between Paseo del Rey and Paseo Ranchero. Area OS-3 is located in the north central portion of the project area and surrounds an existing water tank. Area OS-4 is situated adjacent to the OS-3 area just north of the major canyon area. This space is primarily dedicated to a transmission line corridor and serves as a right-of-way for an existing 138 KV tower line. Future energy needs may require additional facilities to be located within this right-of-way (Rose, D., letter SDG&E). The OS-5 is situated in the furthest southwest corner of the project site area, north of Telegraph Canyon Road and east of Paseo Ladera. This area includes a southwest-trending drainage. The OS-6 area is located in the northeast corner of the project site and contains a northeast-trending drainage area and is adjacent to a nearby park and greenbelt. The OS-7 area is a small parcel located just west of Buena Vista Way and north of proposed East J Street. It is located in a southwest-trending drainage. OS-7 is situated in the southeast corner of the project site and is located just north of Telegraph Canyon Road and south of the proposed junior high school site. It is also located in a southwest-trending drainage.

The residential areas have been designed so that each "neighborhood" area is at least partially surrounded by open space areas. Placement of the various residential units is compatible with surrounding land uses. Placement of the speciality housing along H Street was carefully planned because of the estimated generation of less traffic associated with seniors' housing. The neighborhood park, to be located on East J Street, will be easily accessed by residents of Rancho del Rey SPA III.

POTENTIAL IMPACTS

The Rancho del Rey SPA III Plan, as proposed is substantially in conformance with the ERDR Specific Plan and with existing and proposed land uses in the vicinity of the project site. The residential land uses allowed under the adopted ERDR Specific Plan are compared to the proposed Rancho del Rey SPA III land uses in

Table 4-8. The density transfers were allowed under the Specific Plan. The ERDR was incorporated into the General Plan and is thus compatible with the land use.

The amount of acreage for non-residential development and open space are similar for both plans.

TABLE 4-8

RANCHO DEL REY SPA III
SPECIFIC PLAN VERSUS GENERAL DEVELOPMENT PLAN CONSISTENCY

Adopted Specific Plan			General Development Plan		
DU/ac Density	Product	Units Permitted	Product	Units Proposed	Units Transferred
2-4	Single Family Detached	162	Single Family Conventional	315	+153
4-6	Small lot single family, zero-lot line patio homes, duplexes, multiplexes, clustered development	975	Single Family and Specialty Housing	833	-142
6-8	Townhomes, patio homes, duplexes, multiplexes, condominiums, clustered development	243	Townhouses	232	-11
TOTALS		1,380 DU		1,380 DU	0

MITIGATION/MONITORING

The proposed Rancho del Rey SPA III Plan is compatible with existing land uses in the vicinity, and is consistent with the land use policies and plans of the City of Chula Vista including the ERDR Specific Plan. Because implementation of the

SPA III Plan would not result in significant land use impacts, no mitigation measures are required.

ANALYSIS OF SIGNIFICANCE

The SPA III Plan is compatible with the existing and planned land uses in the vicinity of the Plan area, the internal land use compatability of the SPA III Plan, and is consistent with the City of Chula Vista General Plan. There will be no significant land use impacts due to the implementation of the SPA III Plan.

4.9 COMMUNITY SOCIAL FACTORS

EXISTING CONDITIONS

Population - Based on SANDAG's Series VII Demographic Data, the City of Chula Vista had a total population of 124,254 in 1988. This population was 40,327 persons (32%) greater than the 1980 population of 83,927 persons and reflects growth within the City as well as a sizable annexation which resulted in a significant population increase. The City of Chula Vista accounted for 5.3 percent of the 2,327,697 people in the San Diego Region in 1988 and 4.5 of the 1,861,846 people in the San Diego Region in 1980.

Estimated population for the year 2010 for the City of Chula Vista is 186,900 people, an increase of 62,646 people from 1988, or a 33.5 percent increase. Estimated population for the year 2010 for the San Diego Region is 3,154,490 people, an increase of 988,801 from 1986 or a 45.7 percent increase. The expected population growth of the City of Chula Vista accounts for 4.9 percent of the San Diego Region population growth for the year 2010. The total population of Chula Vista and its sphere of influence (general plan area) was 139,400 in 1988 and is expected to increase by 27.9 percent to 193,242 by 2010.

Housing - In 1988, the City of Chula Vista contained 47,696 housing units of which 2,005 (4.2 percent) were unoccupied. Housing within the San Diego Region, in the same year, totaled 893,226 units of which 47,483 (5.3 percent) were vacant. The

City of Chula Vista's housing represents 5.3 percent of the region's housing stock. Within the City, 52.2 percent of the units are single-family, 40 percent are multi-family and 7.5 percent are mobile homes. Based on SANDAG Series VII projections the total number of occupied housing units will increase to 59,149 units in the City of Chula Vista by 2010. Including the Sphere of Influence, the total number of housing units will be 72,418 by 2010.

Employment - According to the 1980 census, the median household income in Chula Vista was $17,997, ranking the City eighteenth of the thirty-six areas of affluence for the County. Census figures for 1980 show 48.6 percent of the households had incomes below $17,500 while 3.7 percent had incomes exceeding $50,000; this is close to the County's 51 percent of household incomes under $17,500 and 5.4 percent above $50,000.

Chula Vista's civilian labor force totaled 36,576 in 1980 with an unemployment rate of 7.3 percent. This was slightly higher than the 6.6 percent unemployment rate experienced region-wide in 1980. By 1986 the number of civilian laborers had increased to 38,246 and it is expected to reach 63,320 by 2010. The total civilian labor force is expected to increase to 1,464,094 persons County-wide.

In 1980, the retail sales industry employed the largest percentage of workers, 21.5 percent. The durable goods manufacturing category follows, primarily due to Rohr Industries, with 14 percent. The next largest employment industry is educational services which comprises 10 percent of the total Chula Vista labor force.

IMPACTS

Population - The proposed development of Rancho del Rey SPA III would implement the approved ERDR Specific Plan and involve the construction of 1,380 single-family units. Based on a population generation rates supplied by the City of Chula Vista, full development of SPA III would ultimately result in 4,101 residents in the planning area.

The population within the City of Chula Vista is estimated to reach 186,900 persons by 2010, a growth of 62,646 people from 1988. The increase of 1,463 residents represents approximately 5.7 percent of the projected City growth for the years between 1988 and 2010. Because this growth is consistent with the growth expectations as outlined in the ERDR Specific Plan Amendment, no adverse population impacts are anticipated.

Housing - SPA III would allow for the development of 1,380 units on approximately 405 acres. The proposed plan is identical with the currently adopted El Rancho del Rey Specific Plan. Based on Series VII projections this increase represents 1.0 percent of the total number of housing units (59,149) anticipated in the City in 2010. Development of these units would be consistent with the adopted plan and would not, therefore, represent an adverse impact.

Employment - The proposed SPA III project would not result in any new employment opportunities; however, as part of the larger ERDR Specific Plan a 93.4 acre employment park would be developed in the vicinity. This park is anticipated to provide a minimum of 2,335 jobs and to serve industrial, office, and commercial support uses. Because of the employment opportunities in the nearby vicinity and the larger Chula Vista and San Diego Community, employment impacts are not considered adverse.

MITIGATION/MONITORING

Because no significant impacts would be associated with the proposed project, no mitigation measures or monitoring are required.

ANALYSIS OF SIGNIFICANCE

No significant community social impacts would result and mitigation/monitoring is not required.

4.10 COMMUNITY TAX STRUCTURE

EXISTING CONDITIONS

A preliminary fiscal impact analysis of the proposed Rancho del Rey SPA III project was completed by John McTighe & Associates in April 1989 (see Appendix

F). As part of this analysis, a review of the financial condition of the City of Chula Vista was conducted. Current (1988-89) operating expenditures and revenues were examined to determine existing and expected fiscal conditions. Because this project is expected to be built over several years, assumptions and base figures could vary substantially over the life of the project.

The analysis of municipal expenditures was prepared based on information gathered from a review of the City of Chula Vista's 1988-89 operating budget, as well as discussion with various department staff. Eighteen "direct service" expenditure activities were examined: general government, planning, community development, police protection/animal regulation, fire protection, building and housing, engineering design and construction, land development, traffic engineering, street maintenance, street sweeping, street tree maintenance, traffic operations, traffic signal and street light maintenance, pump station maintenance, parks and recreation, and library operations.

City revenue conditions were analyzed based on existing revenue sources. Incorporated into the analysis were revenues from the general fund and the special fund. General fund sources include: property tax, sales and use tax revenues, franchise taxes, property transfer taxes, utility users tax, bicycle and animal licenses, motor vehicle in-lieu taxes, cigarette taxes, fines, forfeitures, and penalties, municipal swimming pool fees, recreation programs, and investment earnings. Revenue sources such as the traffic safety fund, state library act fund, sewer service revenue fund, special gas tax fund, and open space maintenance district fund are considered special funds.

IMPACTS

The McTighe fiscal impact analysis attempted to determine all the operating costs and revenues that would be associated with the development of the project and to calculate the net impact to the City. Development would incur planning review, services, and general operation costs to the City, and would provide increased revenues to the City through assessed fees and taxes.

To determine the full costs of providing City services, a model was formulated to allocate indirect and overhead costs to the eighteen "direct service" activities.

This modelling is a best attempt to reflect the full costs of accommodating the proposed SPA III development. Of the eighteen activities reviewed for possible impact, ten activities were identified as having one-time only or on-going impacts. One-time impacts would occur to planning, building inspection, engineering, and fire prevention. It is assumed, that because fees are collected from the applicant to compensate for the cost of planning, inspection, and engineering services, no adverse impact to the City would occur. Fire prevention inspection fees, however, may not completely compensate for the costs incurred and an incremental impact may result.

The remaining City operating expenditure activities would be subject to on-going costs. These activities include public works operation (i.e., street maintenance, traffic operations) police services, library operation, and fire suppression.

City revenue projections were calculated based on the existing general fund and special fund revenue sources of the City. Computer modelling of the relationship of individual revenue accounts to population, land use, and other factors was completed to simulate the changes in revenue that could be expected over the development of SPA III. A separate model of assessed valuation/property tax changes was developed to project the effect on City property tax. Input regarding projection of buildout rate and product pricing was included in this model.

Based on this analysis, the development of Rancho del Rey SPA III is projected to have an overall positive fiscal impact on the City of Chula Vista. Basically, cumulative operating revenues are anticipated to exceed cumulative operating costs over the period of time analyzed in the fiscal impact analysis. The development is projected to result in excess revenues of approximately $64,800 per year after operating costs are considered. The results of the fiscal impact analysis, in constant 1989 dollars, are provided in Table 4-9.

It should be noted that actual net revenues would vary from the projections given above. Unanticipated and unforeseeable actions such as new legislation or changes in City operations may cause minor changes.

Table 4-9

PROJECTED ANNUAL OPERATING REVENUES AND COSTS

Fiscal Year	Revenue	Cost	Annual Net Impact
1990	$ 9,035	-0-	$ 9,035
1991	58,765	51,035	7,730
1992	315,478	275,311	40,167
1993	685,210	589,280	95,930
1994	836,397	747,107	89,290
1995	856,986	785,033	71,953
1996	849,910	785,033	64,877
1997	849,910	785,033	64,877
1998	849,910	785,033	64,877
1999	849,910	785,033	64,877
2000	849,910	785,033	64,877

Source: John McTighe and Associates. 1989.

MITIGATION/MONITORING

Because no adverse impacts would result to the community tax structure, no mitigation measures or monitoring are required.

ANALYSIS OF SIGNIFICANCE

Implementation of the proposed Rancho del Rey SPA III would result in a net fiscal benefit of approximately $64,800 annually to the City of Chula Vista. This money would be used to provide services to the City, and no adverse impacts would result to the community tax structure, and no mitigation measures or monitoring are required.

4.11 PARKS, RECREATION AND OPEN SPACE

EXISTING CONDITIONS

The Rancho del Rey SPA III project is located within the Sweetwater sub-area of the General Plan area. The Parks and Recreation Element of the General Plan delineates the project as being within Community Park District 12. The General Plan divides the City into park service districts to facilitate the even distribution of parklands throughout the City.

The General Plan maintains five classifications of park facilities: tot lots, play lots, mini-parks, neighborhood parks, and community parks. Tot lots are play areas for small children, usually within a larger community or neighborhood park. Play lots are small parks intended for high density areas to substitute for backyards. Children should not be required to cross a major arterial to reach a play lot. Mini-parks are limited parks, normally geared toward passive recreation green space or pedestrian ways. Neighborhood parks are primarily intended to provide neighborhoods with space and facilities for active as well as passive recreation. Community parks are designed to serve the residents of several adjoining neighborhoods and to provide recreation facilities which require more space than neighborhood park sites can accommodate.

There are currently six developed mini-parks, seventeen neighborhood parks, four community parks and a Nature Interpretative Center, which could be considered a special purpose park, in the City of Chula Vista. These provide a total of 279 acres of public parkland available City-wide. This parkland is supplemented by private golf courses and the J Street Marina which offer additional recreation opportunities. Regional park needs are met by the Sweetwater Regional Park, Otay Reservoir and Silver Strand State Beach. The park facilities closest to the project site include Independence Park and El Rancho del Rey Park.

The Chula Vista General Plan Open Space Element includes a variety of uses within their inventory of open space uses including: city parks, regional parks, slopes, marshlands, and schools. Two areas of proposed open space near the proposed project are located along Telegraph Canyon Road and Rice Canyon. Southwestern Junior College, just east of the site, is considered publicly owned open space. The Open Space Element states that open space should be preserved for the following reasons:

1. To divert development from hazardous areas;
2. To provide open space for outdoor recreation;

3. To provide areas of historic, scenic or cultural values;
4. To protect areas necessary for the production of food or fiber; and
5. To preserve areas in order to give shape and meaning to the urban form in order to avoid the uninterrupted sprawl of urban development across the landscape.

Policies are being developed by the Fire and Parks Departments to provide drought-tolerant plantings in open space areas and to address the issue of fuel loading on canyon slopes.

IMPACTS

Implementation of Rancho del Rey SPA III would increase the number of residents within the City and cause a corresponding increase in the demand for recreational facilities. The nearby recreation facilities would be taxed by the addition of approximately 4,101 residents.

The proposed development plan proposes a 10.0 acre neighborhood park on-site. This would be located south of East J Street in the southeast portion of the proposed project site, adjacent to the proposed junior high school site. Under the City of Chula Vista parkland dedication ordinance which requires 3 acres of parkland per 1,000 people, 12.3 acres of parkland would be required in SPA III. However, the City of Chula Vista has agreed to allow a net deficiency of 2.3 acres provided the project proponent provides a greater number of amenities in the park, and the adjacent junior high school site is utilized for after hours recreation.

The project also includes the conservation and preservation of eight parcels of open space. These eight parcels would preserve 147.6 acres or 36 percent of the site.

Although under the proposed SPA III Plan there would be a deficiency of 2.3 acres of parkland, additional facilities would be provided through the use of the junior high school site, and there would not be a significant impact to parks.

MITIGATION/MONITORING

A neighborhood park of 10.0 acres and 147.6 acres of open space have been incorporated into the design of Rancho del Rey SPA III. Under the City of Chula Vista parkland dedication ordinance this would result in a net deficiency of 2.3 acres of parkland. The City of Chula Vista has agreed to allow a deficiency in parkland if the project proponent provides a greater number of amenities in the park, and the adjacent junior high school site is utilized for after hours recreation. The City of Chula Vista requires that certain conditions be met prior to approval of the park site. The conditions are listed below:

- The project proponent would provide a detailed concept plan for the park acceptable to City staff and the Parks and Recreation Commission.
- Slopes within the park would be 4:1 or less. If slopes are greater than this ratio, the project proponent would be required to provide additional parkland.
- The project proponent would enter into an agreement with the Sweetwater Union High School District and the City of Chula Vista to insure public access to the proposed junior high school's recreational amenities which would include soccer fields, basketball courts, and tennis courts.
- The project proponent would provide funding for the difference in cost between facilities built to school standards and facilities built to City standards.
- School recreational facilities available to the public would be constructed to City of Chula Vista standards and designed in consultation with City staff.
- To insure adequate interface between the adjacent townhomes, the park, and the school, the park would be designed so that it would not be isolated with only backs of buildings facing onto the park.
- The park would be designed to provide adequate visibility into the park from East J Street.
- Access to the school parking lot for overflow parking would be provided.

Prior to or as a condition of approval of the tentative map, City staff would ensure that conditions for the 10.0 acre park have been implemented.

ANALYSIS OF SIGNIFICANCE

The proposed SPA III development plan would not meet the City's parkland requirement of 3 acres of parkland per 1,000 people. However, the City has agreed to allow a 2.3 acre net deficiency of parkland provided the project proponent meets conditions established by the City. There would be no significant impacts to parks and open space.

4.12 SERVICES AND UTILITIES

EXISTING CONDITIONS

Water - San Diego is a semi-arid region with limited surface and groundwater supplies. Less than 10 percent of the region's water supply is provided locally; over 90 percent is imported. Imported water is provided to the Metropolitan Water District (MWD) from the Colorado River and the California Water project (Feather River). The water is then made available by the MWD for distribution to various agencies and water companies including the San Diego County Water Authority (CWA). The CWA has 24 local member agencies which store and distribute water to the public, including the Otay Water District (OWD) which serves the proposed project area.

The MWD receives its water from the Colorado River Aqueduct. MWD's current allotment from the Colorado River is approximately 1.2 million acre feet; however, once the Central Arizona Project is complete and utilizes its total allotment, MWD's allotment could decrease to 450,000 acre feet. The Central Arizona Project, which was scheduled to be completed in 1985, is behind schedule, and there is presently a surplus of water in the Colorado River water, allowing MWD to receive its historical share. The water supply from the Colorado River to MWD is in a state of flux and will probably decrease in the next few years. MWD is negotiating with the Imperial Irrigation District (IID) to purchase IID's excess water. Water is also available from the State Water Project (northern California), but it is presently impossible to obtain the yield necessary for southern California without a new canal.

The proposed project would receive water from the OWD. The OWD encompasses a 128 square mile area between the City of El Cajon and the International Border. In 1987, approximately 30% of its service area was developed and 9% of its water was used for irrigation. The OWD's central area is bounded by I-805, the Otay River, the Lower Otay Reservoir and Bonita which are the approximate boundaries of the Eastern Territories. Water is provided to the area by the Second San Diego Aqueduct. The OWD does not own any reservoirs.

Due to the lack of adequate water availability to meet short-term peak demands, in general the water supply to the District has been limited to 38 cfs during high peak demand by the CWA. The two aqueducts operated by the CWA to import water into the San Diego region reach capacity during peak demand periods; the infrastructure of the importation system itself is occasionally not adequate to meet peak water quantity demand. To address this issue, the CWA is planning to construct an additional aqueduct, tentatively to be completed by 1994. The OWD receives excess water during non-peak periods to serve the additional demand during peak periods; however, the District does not have sufficient water storage facilities to assure year round availability. The District is currently negotiating with the Sweetwater Authority and the City of San Diego to increase their storage ability to ensure adequate water service during peak periods. The OWD Board of Directors approved a water allocation plan which will allow the District to provide service to future development conditioned on the construction of terminal reservoirs and limited to a maximum of 1,900 Equivalent Dwelling Units (EDUs) per year that can receive water service. This water allocation plan will be in effect until the District can build adequate terminal storage, find additional sources of water supply, or have the CWA lift the limitations of 38 cfs.

The goal of the Threshold Policy, related to water service, is to ensure that adequate supplies of quality water are available to the City of Chula Vista. It is the responsibility of the project proponent to request and deliver to the City a service availability letter from the Water District for the proposed project. It is the responsibility of the City to provide the County Water Authority, Sweetwater Authority and Otay Water District with a 12 to 15 month development forecast and request an evaluation of their availability to accommodate the forecast and continuing growth. The City requires that a sufficient water supply be provided on-site prior to the commencement of construction activities and that fire hydrant pressure not exceed 150 psi.

Sewer - The City of Chula Vista provides sewer service in the project vicinity. Sewage is transported by the City to the San Diego Metropolitan System (METRO) which treats and discharges sewage at the Point Loma Regional Plant. The City of Chula Vista currently has a contract capacity of 19 million gallons per day (mdg) in the Metro System and generates approximately 12.5 mgd under existing development. This translates to an available capacity of 6.6 mgd (Franko, Gena, CVED, pers. comm.).

In 1986 a sewer study was prepared by Rick Engineering (refer to Appendix E of the Rancho del Rey SPA I EIR) to estimate on-site sewage flows. The purpose of the study was to provide an on-site sewer master plan that would facilitate implementation of the El Rancho del Rey Specific Plan. Maximum densities were assumed when calculating sewage flows and pipe design. The trunk line in Rice Canyon was projected to flow at a maximum allowable flow of 3/4 of the pipe depth during peak flows. During project review of SPA I, City staff requested further evaluation of off-site sewer capacity. An Addendum Sewer Study was prepared by Rick Engineering in March 1987 (Appendix G). Based on this second evaluation, the off-site sewer facilities were determined to be adequate for ultimate development of the Specific Plan, given implementation of the master plan improvements.

The Threshold Policy contains standards regarding sewer flows to assure compliance with the stated objective. The sewage flows and volumes associated with each project should be reviewed by the City for compliance with City Engineering Standards. It is the responsibility of the City to prepare a 12-15 month development forecast for METRO to request confirmation that the projection is within the City's purchased capacity rights.

Utilities - The project site is served by SDG&E for gas and electricity.

Police Protection - The Chula Vista Police Department provides Police Protection in the project vicinity. The Department operates out of a single station located at 276 Fourth Avenue in Chula Vista with a staff of 147 sworn officers, one police chief, and 70 administrative staff including community services officers. Six sworn officers will be added to the staff in October 1989 (Hawkins, Keith, CVPD, pers. comm.).

The project site is located in an area designated as Beat 28. This Beat is patrolled by one 24-hour squad car which is broken into 3 one-man watches. The standard for police protection as outlined in the Threshold Policy requires that police units respond to Priority 1 (emergency calls) throughout the City within seven minutes in 84% of the cases with an average response time of 4.5 minutes or less and seven minutes in 62% of the cases for Priority 2 (urgent calls) with an average response time of seven minutes or less.

Fire Protection - On-site fire protection would be provided by the Chula Vista Fire Prevention Bureau. Fire response would come from Fire Station #4, located at 861 Otay Lakes Road, according to the City's Fire Station Master Plan. In the future the project would be served by a proposed fire station located at the corner of Paseo Ranchero and East H Street within SPA I, which is projected to be completed by 1993. The standard for fire protection as outlined in the Threshold Policy requires that 85% of residential units be within a 5.7 minute travel time from an existing or planned fire station, and 100% be within an 8.7 minutes travel time (Chase, Marty, CVFD, pers. comm.).

Schools - The project site is located within the jurisdiction of two school districts. The Chula Vista City School District serves grades kindergarten through sixth. The Sweetwater Union High School District provides education to middle and high school students. Schools in the project vicinity include Bonita Vista Junior High and Bonita Vista High and five elementary schools as listed below. The Bonita Vista High School is also occupied by the Special Abilities Cluster (SAC) which provides secondary school education for severely handicapped students.

The capacity of these schools and current enrollment (January 1990) is provided in Table 4-10. As can be seen, schools operate generally above capacity. The use of

Table 4-10

CURRENT SCHOOL ENROLLMENT

School	Capacity	Enrollment
Bonita Vista Junior High	1,494*	1,682
Bonita Vista High	1,632*	1,730
Special Abilities Cluster	210	190
Allen Elementary	704*	737
Tiffany Elementary	708*	613
Valley Vista Elementary	656*	656
Sunnyside Elementary	797*	800
Chula Vista Hills Elementary	602	741

* Includes relocatable classrooms

Source: Sweetwater Union High School District, Tom Silva
Chula Vista City School District, Kate Shurson

relocatable classrooms by the Chula Vista City School District and changes in classroom usage or classroom configuration can alter the enrollment capacity for individual elementary schools. In the case of Bonita Vista High, enrollment exceeds capacity. At the SAC, student enrollment does not exceed capacity. At Bonita Vista Junior High, although enrollment currently exceeds capacity, new teacher scheduling has allowed the school to absorb the excess capacity.

The Sweetwater Union High School district has begun grading for EastLake High School, in the EastLake development. This facility is expected to serve 2,000+ students and to be completed for the 1991-92 school year. The Elementary District is also in the process of planning new school facilities. An elementary school is under construction in EastLake on Hillside Drive. It is scheduled to be completed in late 1990. A new elementary school, Chula Vista Elementary, on Buena Vista Road south of East H Street opened in early 1989. The projected enrollment is 741 for the 1990-91 school year. An elementary school, Terra Nova, on Windrose Drive is projected to be completed in September 1991. Preliminary planning has begun on the middle school facility within Rancho del Rey SPA III, south of H Street on Paseo Ranchero. This facility was recently approved by the Chula Vista School District Board.

IMPACTS

Water - Development of Rancho del Rey SPA III would result in additional residential, park and community uses which would consume water. The projected daily on-site water requirement is 804,816 gallons per day. This is based on consumption rates contained in the Central Area Water Master Plan Update, in which the average consumption per account, per day, is calculated to be approximately 600 gallons. Assuming 1,380 residential units, the total water consumption associated with the project would be 804,816 gallons per day (583.2 gallons X 1,380 DU = 804,816 gallons/day). The average consumption of the school site would be 1.5 acre/feet per year per acre of 37.05 acre feet per year (24.7 acres X 1.5 acre/feet).

Assuming that water facilities are constructed in accordance with the specifications included in the water master plan, adequate infrastructure would exist to serve the project. However, water service is subject to the availability of the CWA distribution system and the regional availability of water. According to Manuel Arroyo of the OWD (1988), the existing aqueduct system reaches capacity during peak, hot weather periods which limits the amount of water delivered to OWD for distribution.

The 1989 Water Allocation Report distributed by OWD, limits the number of new dwelling units (EDU's) that can receive water in one year to 1,900. There will be quarterly maximum allocations of 475 EDU's, except for those quarters which include carry over of EDU's from a prior quarter. The receipt by the City of Chula Vista of a service letter from the OWD regarding the proposed project would allow the project to meet the Threshold Standards related to water.

Sewer - The Rick Engineering evaluation of the current, proposed project and the original sewer study determined that an update of the 1986 study was not necessary. Implementation of the on-site infrastructure and off-site improvements as outlined in the 1986 sewer study would provide an adequate sewer system to accommodate the increased flows associated with the project. No adverse impacts related to sewage capacity are anticipated.

Utilities - SDG&E has indicated that it would be able to serve the site and there would be no impacts to utilities.

Police Protection - Development of the site in accordance with SPA III would involve the addition of 3,576 persons to the sector. The Chula Vista Police Department maintains a 1.3 officer per 1,000 population ratio (Hawkins, 1989). Based on this ratio, at least 4.6 personnel should be added to meet the requirements of this project. It is the responsibility of the Police Department subject to funding by the City Council to ensure that additional police personnel have been employed prior to issuance of the occupancy permit.

Fire Protection - The existing Fire Station #4 and the fire station to be located at Paseo Ranchero and East H Street would adequately serve the proposed project. The increased demand on the Fire Prevention Bureau, caused by the buildout of the Rancho del Rey I-III, to conduct plan reviews, construction inspections, and on-going residential and commercial semi-annual inspections would require an additional Fire Inspector to be employed with the City of Chula Vista Fire Prevention Bureau. The addition of a Fire Inspector would mitigate the potential impact associated with inadequate fire prevention protection to below a level of significance. With the eventual construction of a fire station within the Specific Plan area, as recommended by the Fire Station Location Study and planned for within the Land Use Plan, the on-site residential and community uses would be adequately served. The standards as established in the Threshold Policy would also be satisfied (Chase, Marty, City of Chula Vista, pers. comm.).

School - The project would involve development of 1,380 residential units and an associated population increase of 3,576 persons. Based on generation rates supplied by the School Districts, the project would generate approximately 414 elementary school students, 262 middle school students, and 138 high school students. Capacity does not currently exist to accommodate the projected increase in high school and junior high school students. However, through the implementation of Sweetwater Union High School District Community Facilities District No. 3, classroom space for these students will be provided as new high school facilities become available and the District readjusts school attendance boundaries accordingly. New schools in the planning and construction phases would satisfy future demands and no adverse impacts to schools are anticipated. All of Rancho del Rey is within Sweetwater Union High School District, Community Facilities District (CFD) #3, and Chula Vista City School District CFD #3. As discussed previously in the Air Quality Section (4.4), the proposed junior high school site would not be within one-fourth mile from facilities which emit hazardous air emissions. The proposed school site has also been analyzed in order to determine if it would lie upon or abut a hazardous or toxic waste dump site. According to the geological study prepared by GEOCON (Appendix A) there are no hazardous or toxic waste dump sites on or near the proposed junior high school site.

MIGITATION/MONITORING

Water - A water service availability letter from the OWD would reduce potential impacts to water to below a level of significance. A service letter from OWD is also necessary for the project to comply with the Threshold Policy. In order to comply with the Threshold Policy and reduce potential water service impacts to below a level of significance, the City must annually provide development forecasts to water districts that provide water to residents in Chula Vista. The OWD service letter would include a construction schedule of reservoir, mains, and hydrants to be included on the project site. As part of the monitoring program the City would ensure that the project proponent has retained a water service letter from the OWD prior to issuance of the building permit.

It should be noted that the shortage of water is not a problem unique to Chula Vista; it is a regional issue. A project-wide water conservation program could be a mitigation measure to reduce the cumulative impacts associated with water consumption. To mitigate this problem serious efforts at water conservation should be made through the use of infrastructure that minimizes the water use. This could include low-flush toilets, low-water use sprinkler systems, drought resistant plants, and decrease the use of acres in parks which require substantial amounts of water (i.e., grassy areas). Efforts should be made to implement a community-wide water conservation program. It should be noted, however, that project development plans involve the implementation of water pipes for the use of reclaimed water when available in the future for areas such as playgrounds, parks, and project-related landscaping. The use of reclaimed water will be coordinated with the Otay Water District.

Sewer - The sewage system is adequate as designed. The City has sufficient capacity through its METRO contract to accommodate additional flows. In compliance with the Threshold Standard, the City should review the projected sewage flows and volumes for compliance with City Engineering Standards. Building permit issuance would be conditioned upon City staff's certification that the project meets the Threshold Standard for sewage.

Utilities - There would be no impacts to utilities and mitigation measures are not required.

Police Protection - The development of the proposed SPA III project would require the addition of 4.6 police personnel. The addition of police personnel would mitigate the potential impact associated with inadequate police protection below a level of significance. As part of the monitoring program, the City would ensure that additional police personnel have been employed prior to issuance of the occupancy permit.

Fire Protection - The existing Fire Station #4 and the fire station to be located at Paseo Ranchero and East H Street would adequately serve the proposed project. The cumulative impact on the Fire Prevention Bureau's Fire Inspector from the buildout of Rancho del Rey SPA's I-III would require an additional Fire Inspector. The addition of a Fire Inspector would mitigate the potential impact associated with inadequate fire prevention protection to below a level of significance. As part of the monitoring program, the City would ensure that a Fire Inspector has been employed prior to issuance of the building permit.

School - The proposed project would generate students, which would place demands on the local school system. Local school districts are currently in the planning and construction phases for several new school facilities, including the middle school in Rancho del Rey SPA III. Because new schools are currently being planned, no mitigation beyond participating in the Mello Roos Community Facilities District (CFD) is required. Due to the number of current and proposed growth projections in eastern Chula Vista, the capacity of the school districts to provide educational services are expected to experience cumulative impacts. Because the provision of additional capacity is a primary concern of the school districts and because the projected increases in the number of students have been incorporated into their long-range plans, these cumulative impacts should be mitigated by the phased implementation of additional facilities in eastern Chula Vista. Rancho del Rey is within two Mello Roos Districts, Sweetwater Union High School District CFD #3, Chula Vista City Schools CFD #3 which will provide tax moneys directly to the school districts for implementation of their long-range development plans. However, it should be noted that both CFDs are administered by different governing boards and that the issuance of bonds to provide funding for schools can occur at different time intervals. The participation of the project proponent in the CFDs will reduce potential impacts to below a level of significance.

ANALYSIS OF SIGNIFICANCE

Water - The 1989 Water Allocation Report distributed by OWD limits the number of new dwelling units that can receive water in one year. The receipt by the City of Chula Vista of a service letter from the OWD regarding the proposed project would allow the project to meet the Threshold Standards related to water and potential impacts would be reduced to below a level of significance. The regional shortage of water is an issue which must be addressed by serious efforts to conserve water. A water conservation program should be developed by the project proponents through the use of project design features that would reduce on-site water consumption, including low-flush toilets, low-water use sprinkler systems, drought resistant plants, and decrease in grassy areas in parks.

Sewer - Development of on-site sewage facilities consistent with the 1986 sewer study would provide adequate infrastructure to accommodate project flows. The City of Chula Vista has a surplus of contract capacity in the METRO sewage system and no significant impacts are anticipated.

Utilities - There are no impacts to utilities.

Police Protection - The proposed project would require the addition of 4.6 police personnel. The addition of these personnel would mitigate the potential impact of inadequate police protection to below a level of significance.

Fire Protection - The proposed SPA III project would by served by Station #4 and the future station within El Rancho del Rey. Emergency fire and medical response would be supplied in the criteria contained in the Threshold Policy and no significant impacts are anticipated. The increased demand on the Fire Prevention Bureau caused by the buildout of the Rancho del Rey SPAs I-III would require an additional Fire Inspector. The addition of a Fire Inspector would mitigate the potential impact associated with inadequate fire prevention protection to below a level of significance.

Schools - The number of students generated by the SPA III would place additional demands on the existing facilities. Elementary and high school facilities are at or are over capacity and would not be adequate. The Bonita Vista Junior High school facility is currently exceeding capacity and would be adversely impacted. The Chula Vista City School District CFD #3 will provide financing of a site and school to be located within SPA I. Without this new school there is no existing facility in the project area to serve students from Rancho del Rey SPA III. Both Districts are involved in the near-term planning and construction of new facilities which would provide adequate facilities for the additional students generated by the project.

5.0 COMPLIANCE WITH THRESHOLD POLICY

The City of Chula Vista has adopted a series of Threshold Standards and Policies as part of its Growth Management Program. As part of the preceding environmental discussion, six issues as required were evaluated for compliance. The following discussion provides a summary of the previous analysis.

Drainage

The goal of the drainage standard in the Threshold Policy is to "provide a safe and efficient storm drainage system to protect residents and property in the City of Chula Vista". The Threshold Policy states that "individual projects will provide necessary improvements consistent with the Drainage Master Plan(s) and City Engineering Standards". The development of the proposed project would not significantly impact drainage and meets the City's requirements established by the Drainage Master Plan and City Engineering Standards. This would allow the City to maintain the Threshold Standards for drainage.

Traffic

The main traffic objective contained in the Threshold Policy is to ensure adequate capacity while maintaining acceptable levels of service. Threshold Standards apply particularly to intersections. The implementation of the proposed project would add traffic to East H Street and Telegraph Canyon Road, but the levels of service on the street network in the project vicinity would be within the Threshold levels of service determined by the City.

Police

The Threshold objective is to "ensure that police staff, equipment and training levels are adequate to provide police service at the desired level throughout the City". The development of the proposed project without additional personnel staffing would affect the ability of the Police Department to maintain the Threshold Standards for police protection. The addition of 4.6 personnel to the

Department's staff at the time of project buildout would allow the City to maintain the Threshold Policy of 1.3 officers per 1,000 population ratio.

Fire Protection

The objective of this Standard is to "ensure that fire and emergency medical service staff are properly equipped, trained and funded to provide the desired level of service throughout the City". The project would increase the demand for fire protection services and would require an additional Fire Inspector. The addition of a Fire Inspector would reduce potential impacts to below a level of significance. This would permit the Fire Department to maintain the Threshold Standards and no adverse impact to Fire Protection would result from the implementation of the proposed project.

Water

The Threshold Standards for water involve two actions: the developer must request and deliver to the City a service availability letter from OWD and the City must annually provide development forecasts to water districts that provide water to residents in Chula Vista. For the project to meet the Threshold Standards for water, the developer must obtain a service availability letter from the OWD. The 1989 OWD Water Allocation Report limits the number of dwelling units that can receive water in one year to 1900.

Sewer

As stated in the objective, "individual projects will provide necessary improvements consistent with Sewer Master Plans and City Engineering Standards". This is to be accomplished by ensuring that sewage flows and volumes do not exceed City Engineering Standards. Development of on-site sewage facilities consistent with the 1986 SPA sewer study would provide adequate infrastructure to accommodate project flows.

6.0 ALTERNATIVES

CEQA requires a description of "reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project ... and the discussion of alternatives shall focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of project objectives, or would be more costly." The range of alternatives required in an EIR is governed by "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision-making and informed public participation.

The Master EIR for the Rancho Rancho del Rey Specific Plan Amendment (EIR-83-2) analyzed three alternatives to the project which includes Rancho del Rey SPA III: the No Project (existing Specific Plan) Alternative, the Alternative Specific Plan Amendment and the No Development Alternative in addition to alternatives discussed in this EIR.

6.1 NO PROJECT/NO DEVELOPMENT ALTERNATIVE

Generally, the No Project alternative is defined as development in accordance with the City's General Plan for the site. In this case, the No Project alternative has been redefined to mean no development at all on the site. This would involve leaving the property in its current, undeveloped condition. The site would remain vacant except for an existing water tank and SDG&E transmission lines. Wildlife and vegetation on-site would remain undisturbed. There would be no additional demand placed on any public service or utility providers including schools, police, fire, water or sewer. Significant and unmitigated impacts to biology and landform alteration with the implementation of the proposed project would not occur under the "No Project" alternative. However, the property is designated and zoned for urban development, and this alternative would not implement the City's General Plan. In addition, beneficial effects associated with the project, including provision of housing and tax revenues, construction of a junior high school site, provision of a two-acre community facilities site, and provision of a 10-acre neighborhood park would not be achieved. The potential for development in accordance with the adopted Specific Plan would remain unless a General Plan Amendment and/or zone change were initiated.

6.2 NO PROJECT - EXISTING SPECIFIC PLAN

With the adoption of the No Project/Existing Specific Plan alternative, the land use designations for the proposed project would remain as originally proposed under the adopted ERDR Specific Plan. Under this alternative there would be no density transfer between on-site residential land parcels. Open space and the junior high school site land parcels would remain the same under this alternative.

The No Project-Existing Specific Plan deviates only from the proposed project with the placement of housing units into varying densities, the extension of East J Street, the larger 10-acre neighborhood park, and the two-acre community facility site. The total number of units to be constructed would remain the same at 1,380 single family dwelling units. East J Street would be extended to Buena Vista Way. This alternative would be in conformance with the Chula Vista General Plan and the adopted Specific Plan of the ERDR planning areas. Since this alternative results in the implementation of the adopted Specific Plan for SPA III, and differs only from the proposed project with the elimination of the density transfer and the extension of East J Street, impacts to all issue areas addressed for the proposed project in this EIR would virtually be the same. Significant and unmitigated impacts would still result to biology and landform alteration. Increased impacts would result to biological resources and landform alteration with the proposed extension of East J Street. In addition, this alternative has a smaller park and no community facility.

6.3 ALTERNATIVE DESIGN

Alternative Designs 1 and 2 described below propose conceptual site designs that are environmentally sensitive to on-site biological resources and topography, in particular to canyons and slopes in excess of 25 percent. The SPA III project area is broken down into five areas, areas A - E. These areas in no means constitute a legal land parcel, but are simply designated in this report to assist in designating various portions of the alternative designs.

6.3.1 ALTERNATIVE DESIGN 1

The goals of this Alternative Design 1 plan are to primarily reduce impacts to biological resources and landform wtihin the Rancho del Rey SPA III area. Adoption of this design alternative would eliminate all development proposed along the ridge south of East H Street (Area A), leaving this portion in open space. It would also eliminate development on the ridge located along the north side of Telegraph Canyon Road (Area E) leaving this area in open space, as well as the remaining areas, areas B, C, and D, would have proposed various land uses used alone or in combination. The development of Area D, under this alternative would, require a General Plan Amendment to be removed from Open Space. The area is provided as open space to create a visual corridor for Telegraph Canyon Road.

Proposed land uses are described below for areas A - E. See Figure 6-1 for a graphic depiction of proposed uses for Alternative Design 1 and Table 6-1 for a summary of these uses.

The following single family dwelling categories in Area B which encompasses approximately 130 acres would be allowed: single family - conventional, cottages, townhouses, and specialty housing (i.e., retirement homes). Other allowable uses include open space, school, and park land. Density opportunities for this area with the proposed uses range from 3 to 11 dwelling units per acre. Potential buildout in Area B would range from 390 to 1,430 total dwelling units. With the incorporation of the option of a 20-acre school site and 10-acre park site, 100 acres would remain developable with the proposed single family and/or multi-family uses. Potential buildout with these proposed uses would range from 300 to 1,100 dwelling units.

In Area C there is proposed approximately six acres of developable area with allowable uses including single family - conventional, cottages, townhouses or specialty housing (3-11 DU/ac). Approximately 18 acres of this area would be left in open space. With the proposed density opportunity, potential development in this area would result in development of 18 to 66 dwelling units.

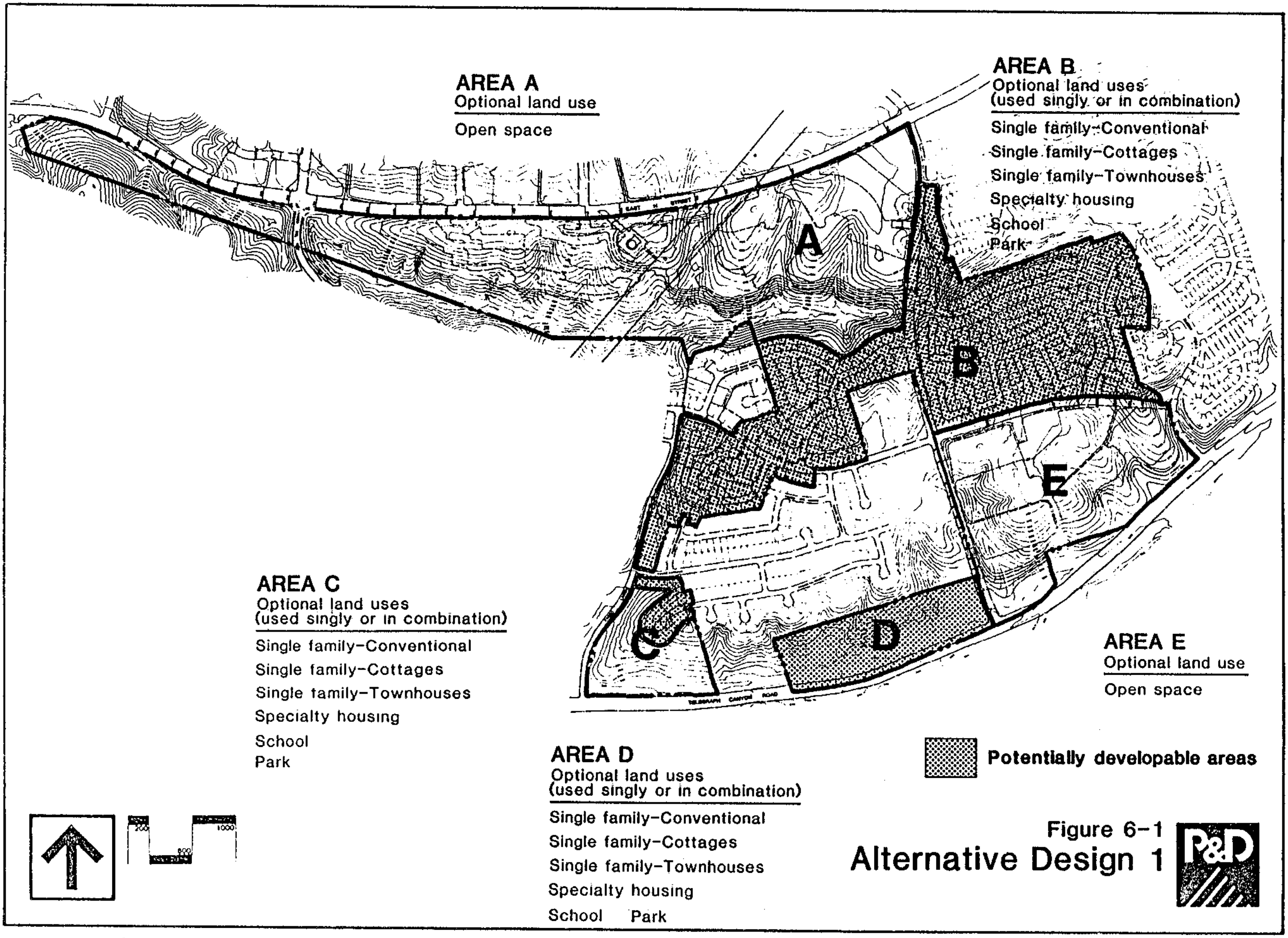


Figure 6-1
Alternative Design 1

Table 6-1

LAND USES FOR ALTERNATIVE DESIGN 1

Area	Acreage	Allowable Use	Density Opportunities (DU/ac)	Potential Buildout (DUs)
A	170	Open Space only	--	--
B	130	Single family dwelling conventional, cottages, townhouses, specialty housing (without school, open space, parking)	3-11	390-1,430
	100	Single family dwelling conventional, cottages, townhouses, specialty housing with 20 acre school site, and 10 acre park. No open space proposed in this area.	3-11	300-1,100
C	6	Single family dwelling conventional, cottages, townhouses, specialty housing.	3-11	18-66
	18	Open space	--	--
D	24	Single family dwelling - conventional, cottages, townhouses, specialty housing	3-11	72-264
E	60	Open Space	--	--
Total	408		3-11	780-1,380*

* 1,380 dwelling units would be the maximum number of dwelling units permitted under this alternative.

Area D, encompassing approximately 24 acres, proposes single family dwelling conventional, cottages, townhouses, and specialty housing. Density opportunitites range from 3 to 11 dwelling units per acre with a potential buildout scenario in this area of 72 - 264 dwelling units.

In addition to the proposed land uses described above, adoption of this alternative design would preclude development of the extension of East J Street to Buena Vista Way. East J Street in this alternative would end as a cul-de-sac street as it does in the proposed project.

The maximum number of dwelling units permitted under this alternative would be 1,380. Adoption of Alternative Design 1 would require a Specific Plan Amendment.

The following environmental impacts would be expected to occur under this alternative assuming the conceptual development proposed within this design.

Geology/Soils

Potential constraints associated with geologic and soils resources as identified with the proposed project would be somewhat reduced with the elimination of grading in areas A and E. With this alternative design development in Area A would not occur as this area would be left in open space. Adoption of this alternative would eliminate the potential for benching associated with the placement of fills in the canyon areas of Area A and would also eliminate potential surficial erosion and instability that may result in this area. Area D would have the option of development with adoption of this design alternative. Since this area is underlain by the Otay Formation, bentonitic layers may occur with soft, moist clays that may contribute to slope failures in the area if not stabilized. If this alternative is adopted suitable design measures should be incorporated to provide adequate foundation support. Adoption of this alternative could create an imbalance in the amount of cut and fill material resulting in the need to export or import soils.

Drainage/Groundwater/Water Quality - Development of roads and building pads would increase impervious surfaces on-site which would increase runoff under either the proposed project or this alternative. With the elimination of development in Area A it is anticipated that water quality impacts from urban pollutants would be somewhat reduced with this design alternative. A hydrologic analysis prior to development would identify potential impacts and appropriate mitigation measures.

Landform Alteration/Aesthetics - The adoption of this alternative design would reduce the amount of landform alteration that would result with the proposed project since the number of building pads created would be reduced overall. Adverse visual impacts to motorists transiting east and west along East H Street would be eliminated as Area A would be left in open space. Elimination of the extension of East J Street with adoption of this alternative would also reduce overall impacts to landform alteration and visual quality. Landform alteration and visual quality impacts may be greater than that of the proposed project in Area D, if development is placed there as proposed. Impacts to landform and visual quality with this alternative are considered adverse, but substantially reduced from the proposed project.

Air Quality

This alternative design could result in fewer units at higher densities which could effectively reduce traffic volumes and decrease emissions over the proposed project. Short-term impacts due to dust generated during the construction phase would result, as well as combustion emissions released from on-site construction equipment and from off-site vehicles hauling materials. These would be reduced in magnitude from the proposed project because some residual air quality impacts may result from the alternative design until the revised SIP is implemented.

Biology

The design alternative would result in greater amounts of preserved open space and less intense development with the elimination of development in areas A and E. A trunk sewer line would pass through Area A. Under this alternative, as with the proposed project development of the site would include roads and housing pads which would result in direct and indirect impacts to sensitive biological resources such as Diegan coastal sage scrub habitat, vernal pool habitat, coast barrel cactus, snake cholla, cactus wren, and California gnatcatcher territory. With adoption of this alternative approximately seven California gnatcatcher habitats would be preserved as well as greater than 50% of the Diegan coastal sage scrub that would otherwise be lost with the proposed project. Portions of cactus wren habitat and snake cholla species would be preserved with this alternative. Reduced impacts to Diegan coastal sage scrub and California gnatcatcher territory would also result with the elimination of the extension of East J Street. This alternative is considered the biologically preferred alternative because of its sensitive design in avoiding biological resources. Adoption of this alternative would result in a significant reduction in the impacts, if mitigation measures similar to those discussed in the proposed project are implemented.

Cultural Resources - Adoption of this alternative would result in reduced impacts to significant cultural resources located on-site. With elimination of development in Area E portions of archaeological site SDi 960/961 would be preserved. Site SDi-9893 would still be impacted with incorporation of this design. Although impacts to cultural resources would be reduced with this alternative, impacts are still regarded as significant. Implementation of the proposed mitigation identified with the proposed project would reduce potential impacts to the sites to below a level of significance.

Transportation - Adoption of this alternative could result in a potentially lower number of ADT than the proposed project if there are less than the maximum 1,380 dwelling units. Under this alternative East J Street would not be extended to Buena Vista Way and would result in a cul-de-sac street. Of the 11,405 project trips (ADT) estimated, approximately 210 trips would pass through the proposed intersection. It is anticipated that if there was no connection of East J Street to Buena Vista Way, the 210 trips could easily reach this destination via Paseo Ranchero. Despite the potential for lower ADT than the proposed project, impacts to the regional circulation network would be similar. Mitigation measures of a similar magnitude as identified in the proposed project would be required.

Land Use/General Plan/Zoning - Development of residential units with this alternative would be consistent with surrounding land uses and with the current General Plan on a plan-to-ground level. However, this alternative would require a Specific

Plan Amendment as well as a General Plan Amendment for not extending East J Street to its proposed General Plan length and for revisions to the land use plan. On a plan-to-ground level, this alternative would reduce intrusion into steep slopes and reduce the destruction of sensitive biological and cultural resources. Adoption of this alternative would not be in conformance with the adopted ERDR Specific Plan. Impacts to land use would not be considered significant with implementation of this design alternative.

Community Social Factors

Adoption of this alternative would result in the generation of fewer or an equal number of people, based on density opportunities. Population generated with this alternative would not exceed growth expectations as outlined in the ERDR Specific Plan Amendment. No adverse population impacts are anticipated. With respect to housing, implementation of this alternative would allow for the development of up to 1,380 units on approximately 160 acres. Development of this alternative, as proposed, would not be consistent with the adopted plan, but the difference does not represent a significant impact. No employment opportunities would be generated by the alternative. With adoption of this alternative a similar level of community social factors would result as the proposed project.

Community Tax Structure

Implementation of this alternative would result in a smaller or equal number of residential units being constructed. The net fiscal impact to the City of Chula Vista is unknown. However, due to higher overall density, lower unit values would potentially result in corresponding reduced property tax. This would potentially reduce the net income to the City over that of the proposed project.

Parks, Recreation and Open Space

Adoption of the alternative design would result in the generation of a smaller or equal number of people, based on density opportunities, when compared to the proposed project. There would be 780-1,380 dwelling units proposed with this design. The alternative design would base acreage of parkland on the City

Threshold Standard of 3 acres of parkland per 1,000 population generated. There would potentially be less park space under this alternative than that of the proposed project if there are fewer than 1,380 dwelling units. The alternative design would also preserve approximately 250 acres of open space or approximately 60 percent of the site, an increase of approximately 100 acres over the proposed project. Under this alternative Area D would be converted from open space to residential development.

Service and Utilities

Water - Adoption of this alternative would result in a range of 780 to 1,380 dwelling units to be served by the Otay Water District. This would represent a water demand of approximately 60% to 100% of that estimated for the proposed project. Assuming that water facilities are constructed in accordance with the specifications included in the water master plan, adequate infrastructure would exist to service this alternative, and the impacts to water would be similar to the proposed project.

Sewer - Adoption of this alternative would result in a reduction or an equal sewer demand as the proposed project. It is anticipated that on-site infrastructure and designed off-site improvements would provide an adequate sewer system to accommodate flows associated with this alternative. The impacts under this alternative would be similar to the proposed project.

Utilities: It is anticipated that SDG&E would be able to service this design, and no impacts to utilities would result which would be similar to the proposed project.

Police Protection - Development of this alternative would involve the addition of up to approximately 3,600 persons to the sector. As a result, it is anticipated that this design alternative would require additional police staff at buildout. Impacts to police protection would be reduced under this alternative.

Fire Protection - Adoption of this alternative would result in a reduction or an equal demand for fire protection services as that imposed by the proposed project. With the eventual construction of a fire station within the Specific Plan area, it is anticipated that the residential units proposed with this alternative would be adequately served.

School - This design alternative would result in 1,380 dwelling units at a maximum buildout and 780 units with a minimum buildout. This alternative would generate up to 414 elementary, 262 middle, and 138 high school students. Capacity does not exist to accommodate the projected increase in high school, junior high, and elementary school students. New schools in the planning stages and under construction would provide sufficient capacity for students generated by the project. This alternative would require the project proponent to participate in the Community Facilities Districts for both the Sweetwater Union High School District and the Chula Vista City School District to provide adequate financing for new school facilities. The participation of the project proponent in the CFDs would mitigate potentially significant impacts to schools to below a level of significance. The level of impacts to schools under this alternative would be similar to those of the proposed project.

In summary, no significant impacts to services and utilities would result with adoption of this alternative.

6.3.2 ALTERNATIVE DESIGN 2

The goals of the Alternative Design 2 plan are also to implement a design to reduce impacts to biological resources and landform alteration within the proposed project area. Adoption of this design alternative would eliminate proposed development primarily along the ridge south of East H Street (Area A), leaving this portion in open space. Area D would be left strictly in open space. The remaining areas B, C and E would have various single family residential, school, open space, and park land uses proposed, and used alone or in combination. Proposed land uses are described below for areas A - E and are summarized in Table 6-2. See Figure 6-2 for a layout of Alternative Design 2 and and associated proposed land uses.

In Area B which encompasses approximately 130 acres is proposed the following single family dwelling categories: single family - conventional, cottages, townhouses, and specialty housing (i.e. retirement homes). Other allowable uses include open space, school, and parkland. Density opportunities for this area range from 3 to 11 DU/acre. Potential buildout in Area B would range from 390 to 1,430 total

Table 6-2

ALTERNATIVE DESIGN 2 CONFIGURATIONS

Area	Acreage	Allowable Use	Density Opportunities (DU/ac)	Potential Buildout (DU/ac)
A	170	Open Space only	--	--
B	130	Single family dwelling conventional, cottages, townhouses, specialty housing (without school or park)	3-11	390-1,430
	100	Single family dwelling conventional, cottages, townhouses, specialty housing with 20 acre school site, and 10 acre park. No open space proposed in this area.	3-11	300-1,100
C	6	Single family dwellings - conventional only	4	24
	18	Open space	--	--
D	24	Open space only	--	--
E	60	Single family dwelling - conventional, cottages, townhouses, specialty housing.	3-11	180-660
TOTAL	408		3-11	894-1,380*

* 1,380 dwelling units would be the maximum number of dwelling units permitted under this alternative.

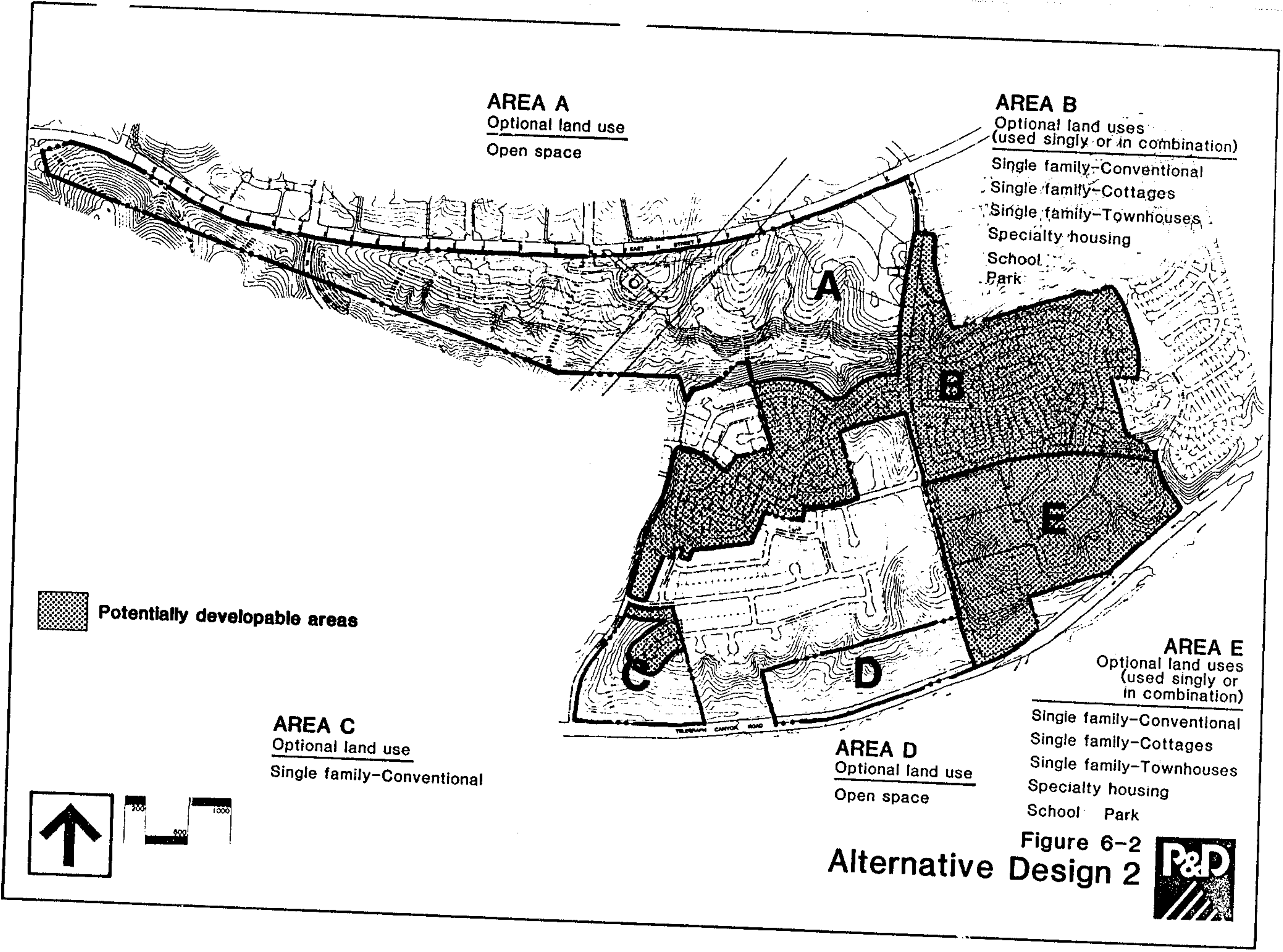


Figure 6-2
Alternative Design 2

dwelling units. With the incorporation of a 23-acre school site and 2-acre park site, 100 acres would remain developable with the proposed single family and/or multi-family uses. Potential buildout with these proposed uses would range from 300 to 1,100 dwelling units.

In Area C is proposed six acres of developable area with an allowable use of single family - conventional (4 DU/ac). Approximately 18 acres of this area would be left in open space. With this proposed land use, potential development in this area would result in 24 single family dwellings.

Area D, encompassing approximately 24 acres, is proposed as open space. No development would occur within this area. Area E, comprising 60 acres, is designated for development of single family residences including conventional, cottages, townhouses or specialty housing, used singularly or in combination. With the proposed density, approximately of 3-11 DU/acre, construction of 180-660 dwelling units would occur in this area. Adoption of this alternative design would preclude development of the extension of East J Street to Buena Vista Way. East J Street in this alternative would end as a cul-de-sac street (See Figure 6-2).

The maximum number of dwelling units permitted under this alternative would be 1,380. Adoption of Alternative Design 2 would require a Specific Plan Amendment.

The following environmental impacts would be expected to occur under this alternative assuming the conceptual development proposed within this design.

Geology/Soils

Potential constraints associated with geologic and soils resources as identified with the proposed project would be somewhat reduced with the elimination of grading in Area A. With this alternative design, development in Area A would not occur as this area would be left in open space. Adoption of this alternative would eliminate the potential for benching associated with the placement of fills in the canyon areas of Area A that would eliminate potential surficial erosion and instability that may result in this area.

Drainage/Groundwater/Water Quality - Development of roads and building pads would increase impervious surfaces on-site which would increase runoff under either the proposed project or this alternative. With the elimination of development in Area A, it is anticipated that water quality impacts from urban pollutants would be somewhat reduced with this design alternative. A hydrologic analysis prior to development would identify potential impacts and appropriate mitigation measures.

Landform Alteration/Aesthetics - The adoption of this alternative design would reduce the amount of landform alteration that would result with the proposed project since the number of building pads created would be reduced or equal overall. Adverse visual impacts to motorists transiting east and west along East H Street would be eliminated as Area A would be left in open space. Elimination of the extension of East J Street, with adoption of this alternative, would also reduce impacts to landform alteration and visual quality overall. Landform alteration and visual quality impacts may be greater than those of the proposed project in Area E if development proceeds at maximum buildout. Impacts to landform and visual quality with this alternative are substantially reduced over those identified for the proposed project.

Air Quality

This alternative design could reduce traffic volumes which would result in decreased emissions over those estimated for the proposed project. Short-term impacts due to dust generated during the construction phase would result, as well as combustion emissions released from on-site construction equipment and from off-site vehicles hauling materials. These impacts are reduced from those identified for the proposed project because less land would be graded. Some residual air quality impacts may result from the alternative design until the revised SIP is implemented.

Biology

The design alternative would result in greater amounts of preserved open space with the elimination of development in Area A. Development under this alternative would be less extensive than the proposed project because development within Area A would be eliminated with the exception of sewer lines which may need to traverse the area. Under this alternative as with the proposed project development of the site would include roads and housing pads which would result in direct and indirect impacts to sensitive biological resources such as Diegan coastal sage scrub habitat, vernal pool habitat, coast barrel cactus, snake cholla, cactus wren, and California gnatcatcher territory. With adoption of this alternative approximately five California gnatcatcher habitats would be preserved as well as approximately 40% of the Diegan coastal sage scrub that would otherwise be lost with the proposed project. Portions of cactus wren habitat and snake cholla would be preserved with this alternative. Reduced impacts to Diegan coastal sage scrub and California gnatcatcher territory would also result with the elimination of the extension of East J Street. This alternative is a biologically preferred alternative because of its sensitive design in avoiding biological resources. Adoption of this alternative would result in impacts that are considered significant and partially mitigable, if mitigation measures similar to those discussed in the proposed project are implemented.

Cultural Resources - Adoption of this alternative would result in similar impacts to significant cultural resources as those identified for the proposed project. Sites SDi-960/961 and SDi-9893 would, however, still be impacted with incorporation of this design. Impacts to cultural resources with this alternative, are regarded as significant. Implementation of the proposed mitigation identified with the proposed project would reduce potential impacts to the sites to below a level of significance. The mitigation for the two sites is currently being implemented.

Transportation - Adoption of this alternative could result in potentially fewer project related ADT than the proposed project. Under this alternative East J Street would not be extended to Buena Vista Way, as per the Chula Vista General Plan and would result in a cul-de-sac street. Of the 11,405 project trips (ADT) estimated for the proposed project approximately 210 trips would pass through the proposed intersection. It is anticipated that if there were no connection of East J Street to Buena Vista Way, the 210 trips could easily reach this destination via Paseo Ranchero. Despite an anticipated lower ADT than the proposed project, impacts to the regional circulation network would be similar. Mitigation measures of a similar magnitude as identified in the proposed project would be required.

Land Use/General Plan/Zoning - Development of residential units with this alternative would be consistent with surrounding land uses and with the current General Plan on a plan-to-plan level. On a plan-to-ground level, this alternative would reduce intrusion into steep slopes and reduce the destruction of sensitive biological resources in Area A. Adoption of this alternative would not be in conformance with the adopted ERDR Specific Plan. Impacts to land use would not be considered significant with implementation of this design alternative.

Community Social Factors

Adoption of this alternative would result in the generation of fewer or an equal number of people based on density opportunities when compared to those of the proposed project. As a result, population generated with this alternative would not exceed growth expectations as outlined in the ERDR Specific Plan Amendment. No adverse population impacts are anticipated. With respect to housing, implementation of this alternative would allow for the development of up to 1,380 units on approximately 200 acres. No employment opportunities would be generated by the alternative. With adoption of this alternative no significant impacts to community social factors would result which is similar to the proposed project.

Community Tax Structure

Implementation of this alternative could result in fewer or an equal number of residential units being constructed when compared to the proposed project. It is unknown at this time whether or not this alternative would result in any adverse impacts to the community tax structure. However, due to higher overall density, lower unit values would potentially result in corresponding reduced property tax. This would potentially reduce the net income to the City over that of the proposed project.

Parks, Recreation and Open Space

Adoption of the alternative design would result in the generation of fewer or an equal number of people based on density opportunities when compared to the proposed project. There are 894-1,380 dwelling units proposed with this design.

The alternative design would base acreage of parkland required the City Threshold Standard of 3 acres of parkland per 1,000 population. If the minimum number of dwelling units for this alternative are constructed, there would potentially be less park space than under the proposed project. The alternative design would also preserve approximately 250 acres of open space or approximately 60 percent of the site, an increase of approximately 100 acres over that in the proposed project.

Service and Utilities

Water - With adoption of this alternative, the Otay Water District would have to service a range of 894 to 1,380 dwelling units. This would result in a water demand of 65% to 100% of that estimated for the proposed project. Assuming that water facilities are constructed in accordance with the specifications included in the water master plan, adequate infrastructure would exist to service this alternative. Impacts would be similar to those of the proposed project.

Sewer - Adoption of this alternative could result in a reduction or an equal sewer demand as the proposed project. It is anticipated that on-site infrastructure and designed off-site improvements would provide an adequate sewer system to accommodate flows associated with this alternative. A sewer trunk line with an access road would be installed through Area A.

Utilities: It is anticipated that SDG&E would be able to service this design for gas and electricity. Impacts would be similar to those of the proposed project.

Police Protection - Development of this alternative would involve the addition of up to approximately 3,600 persons to the sector. As a result, it is anticipated that this design alternative would require additional police staff at buildout. The number of personnel would depend on the number of additional residents generated. Impacts to police protection under this alternative would be less than those of the proposed project.

Fire Protection - Adoption of this alternative could result in a reduction or an equal demand for fire protection services as that imposed by the proposed project. With the eventual construction of a fire station within the Specific Plan area, it is anticipated that the residential units proposed with this alternative would be adequately served.

School - This design alternative would result in 1,380 dwelling units at a maximum buildout, and 894 units with a minimum buildout. This alternative would generate up to 414 elementary, 262 middle, and 138 high school students. Capacity does not exist to accommodate the projected increase in high school, junior high, and elementary school students. New schools in the planning stages and under construction would provide sufficient capacity for students generated by the project. This alternative would require the project proponent to participate in Community Facilities Districts for both the Sweetwater Union High School District and the Chula Vista City School District to provide adequate financing for new school facilities.

The participation of the project in the CFDs would mitigate potentially significant impacts to schools to below a level of signficance. The level of impacts to schools under this alternative would be similar to those of the proposed project. It is anticipated that no adverse impacts would occur upon adoption of this alternative, since new schools in the planning and construction phases would satisfy future demands.

In summary, no significant impacts to services and utilities would result with adoption of this alternative. Because of reduced impacts to biological and cultural resources, Alternative Design 1 would be the environmentally preferred alternative. This alternative would also result in less traffic than the other alternatives and the proposed project. Alternative Design 1 would result in greater amounts of preserved open space with the elimination of development in areas A and E and would preserve greater amounts of Diegan coastal sage scrub habitat and California gnatcatcher habitat than Alternative Design 2, the No Project/Existing Specific Plan Alternative, and the proposed project.

6.4 OFF-SITE ALTERNATIVES

Recent court decisions have expanded the requirements for EIRs prepared pursuant to CEQA. In the Citizens of Goleta Valley vs. Board of Supervisors of the County of Santa Barbara, 243 Cal. Rptr. 339 (1988), and 214 Cal. App 3d176 Cal. Rptr. (1989) the Court ruled that EIRs must evaluate alternative sites for a project, in addition to project alternatives located upon the same site. In accordance with these court rulings, this EIR evaluates three off-site alternative locations selected by the City of Chula Vista. The analysis evaluates the differences between development of the proposed Rancho del Rey SPA III project in lieu of the current land use plan for these sites.

The methodology used for the off-site alternative identification involves several steps including: (1) identification of off-site alternative based on project purpose and need and siting criteria; (2) sorting of identified off-site alternatives into the classification of feasible and infeasible sites; and (3) selection of final alternative sites.

The process of identifying alternative sites began with a determination of project goals, objectives, purpose and need (Figure 6-3). As a portion of the entire El Rancho del Rey Specific Plan, the SPA III plan proposes the construction of 1,380 single-family dwelling units (DUs) ranging in density from 3.8 to 10.6 DU/ac on eight residential parcels on approximately 206 acres. In addition to the residential uses, a junior high school site, a neighborhood park, open space areas and associated circulation routes, the total area for the proposed project is in excess of 405 acres. The goal of the entire El Rancho del Rey Specific Plan is to propose the development of a well-balanced community. The promotion of orderly and economic growth, development, and conservation of the El Rancho del Rey Territory through comprehensive City planning is the goal of the El Rancho del Rey Specific Plan. The general purpose of the proposed project is to provide housing for residents of Chula Vista in the Eastern Territories of the City.

There are numerous sites available to provide housing throughout Southern California. It has been determined through this EIR to review sites in proximity to the proposed site versus alternatives. Numerous areas could be considered for development, but are constrained by physical or biological issues. Some of these issues include:

- topographically steep slopes (San Ysidro)
- floodplains (Sweetwater and Otay rivers)

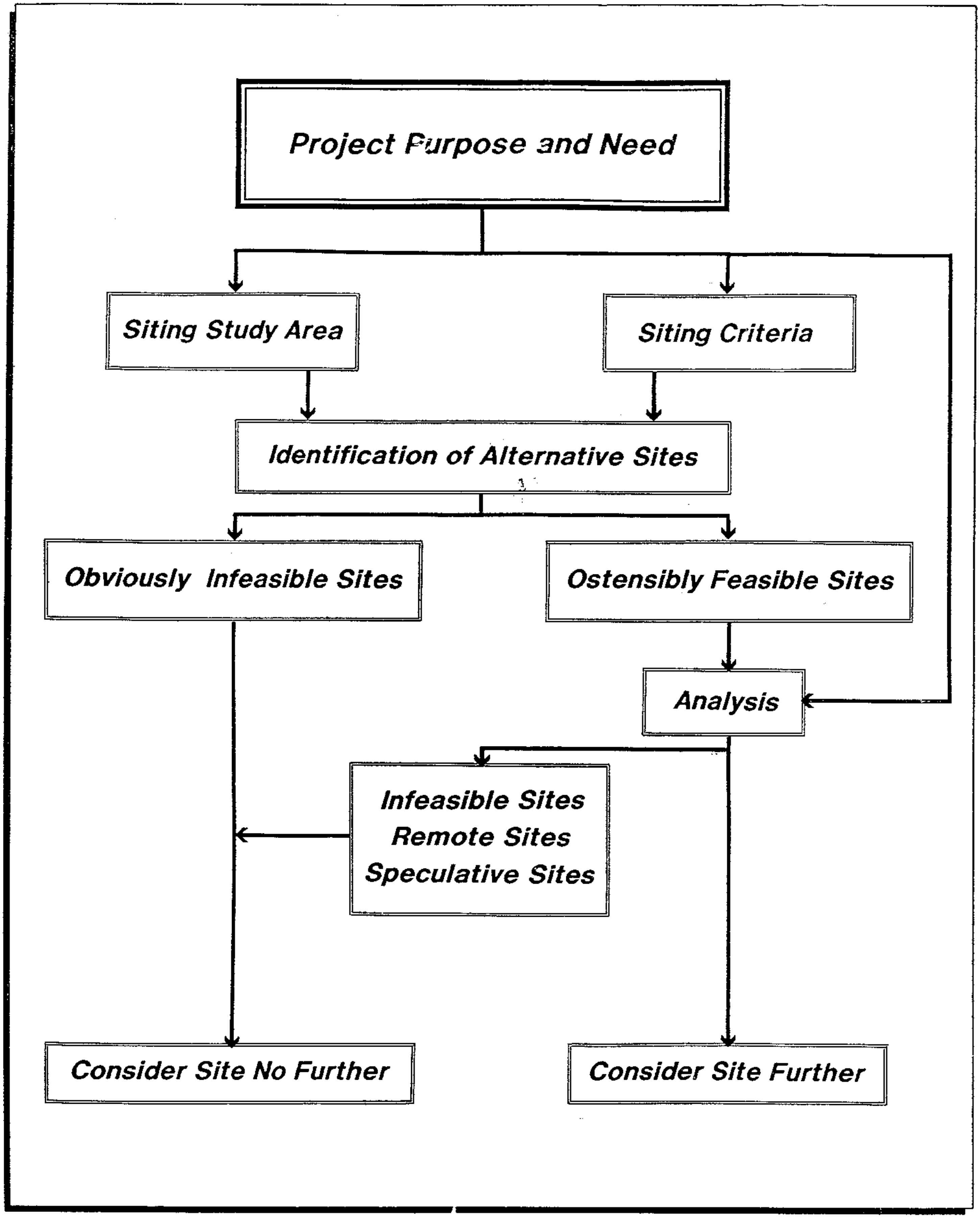


Figure 6-3
Alternative Sites Identification
Process Flow Chart

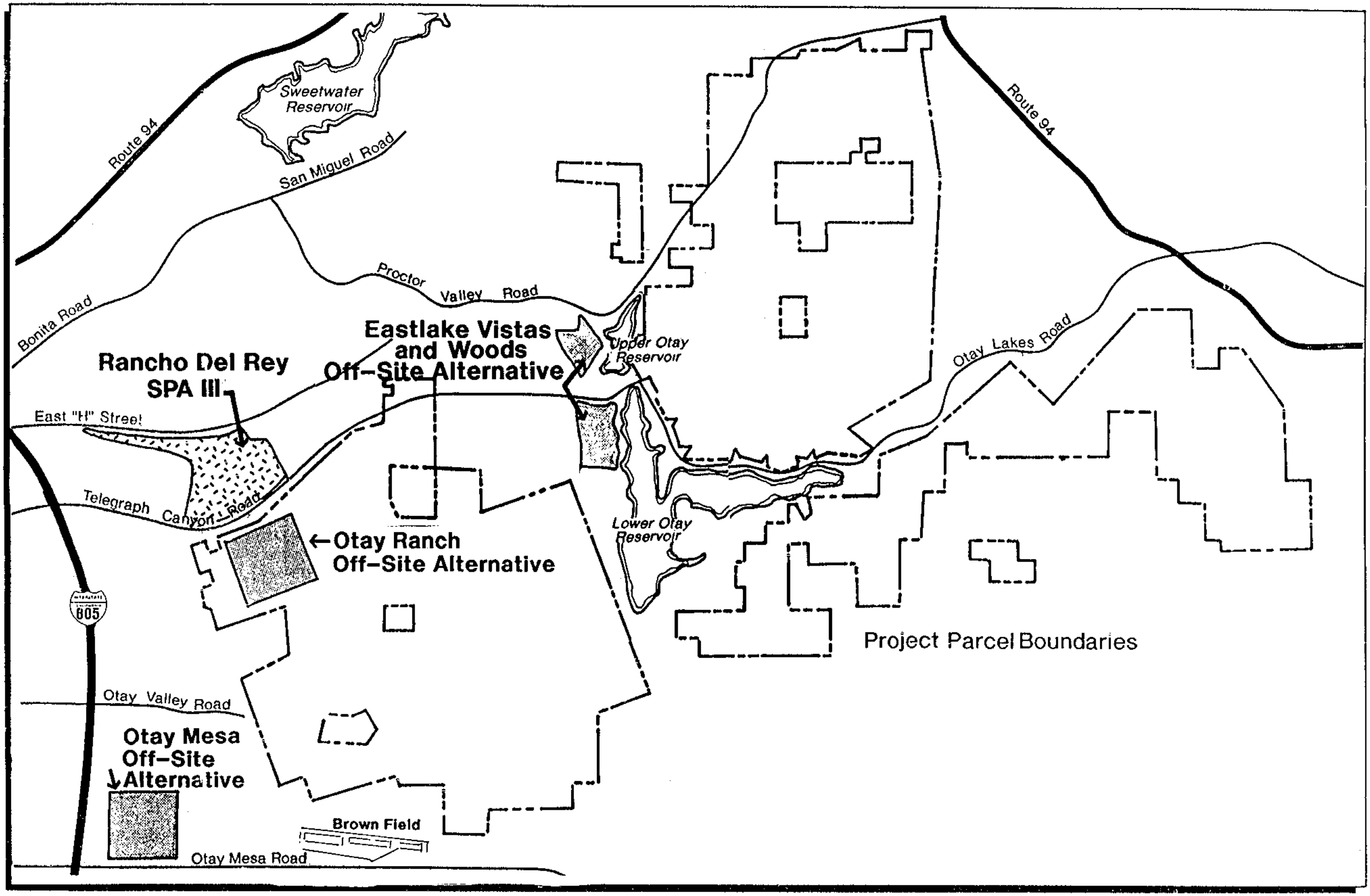
- flight pattern (Brown Field)
- sensitive biological areas/cultural resources
- limited or no transportation access

As a result of this review, the three sites were targeted for their proximity to the proposed project and either reduced topographic or biological impacts. Although numerous other alternatives could be evaluated, it was determined that these three alternative sites would provide the decision makers with a reasonable range of alternatives.

After defining the goals, objectives, purpose and need of the proposed project, three study areas were evaluated. Site criteria such as locations with suitable size acreage for the proposed 1,380 dwelling units, suitable topography, proximity to the urbanized or urbanizing areas and existing infrastructure, and areas designated or pre-planned for residential development were utilized in selecting feasible alternative sites for the proposed project. The siting criteria were applied throughout the study area resulting in the identification of (1) obviously infeasible sites which would not receive further consideration, and (2) obstensibly feasible sites which were further analyzed. The most feasible of these sites were then considered further. As a result of this methodology, three off-site alternative locations, meeting the criteria above, have been selected and include: (1) the Otay Ranch Alternative; (2) the Otay Mesa Alternative, and (3) the Eastlake Vistas and Woods alternatives (Figure 6-4). The proposed off-site alternatives and impact analyses are described below.

6.4.1 OTAY RANCH ALTERNATIVE SITE

This alternative would involve the development of a mixed residential project on the northwest portion of the proposed Otay Ranch site. The Otay Ranch property is comprised of three large, non-contiguous, irregular-shaped parcels, and four separate, smaller parcels totalling 23,297 acres of which the area selected for this off-site alternative would be comprised of approximately 500 acres of the Otay River parcel. The location of this project is illustrated in Figure 6-5. The off-site alternative is located in the unincorporated southwest area of San Diego County, and is bounded by the City of Chula Vista city limits on the west, Telegraph



North

No Scale

Figure 6–4

Off–Site Alternatives

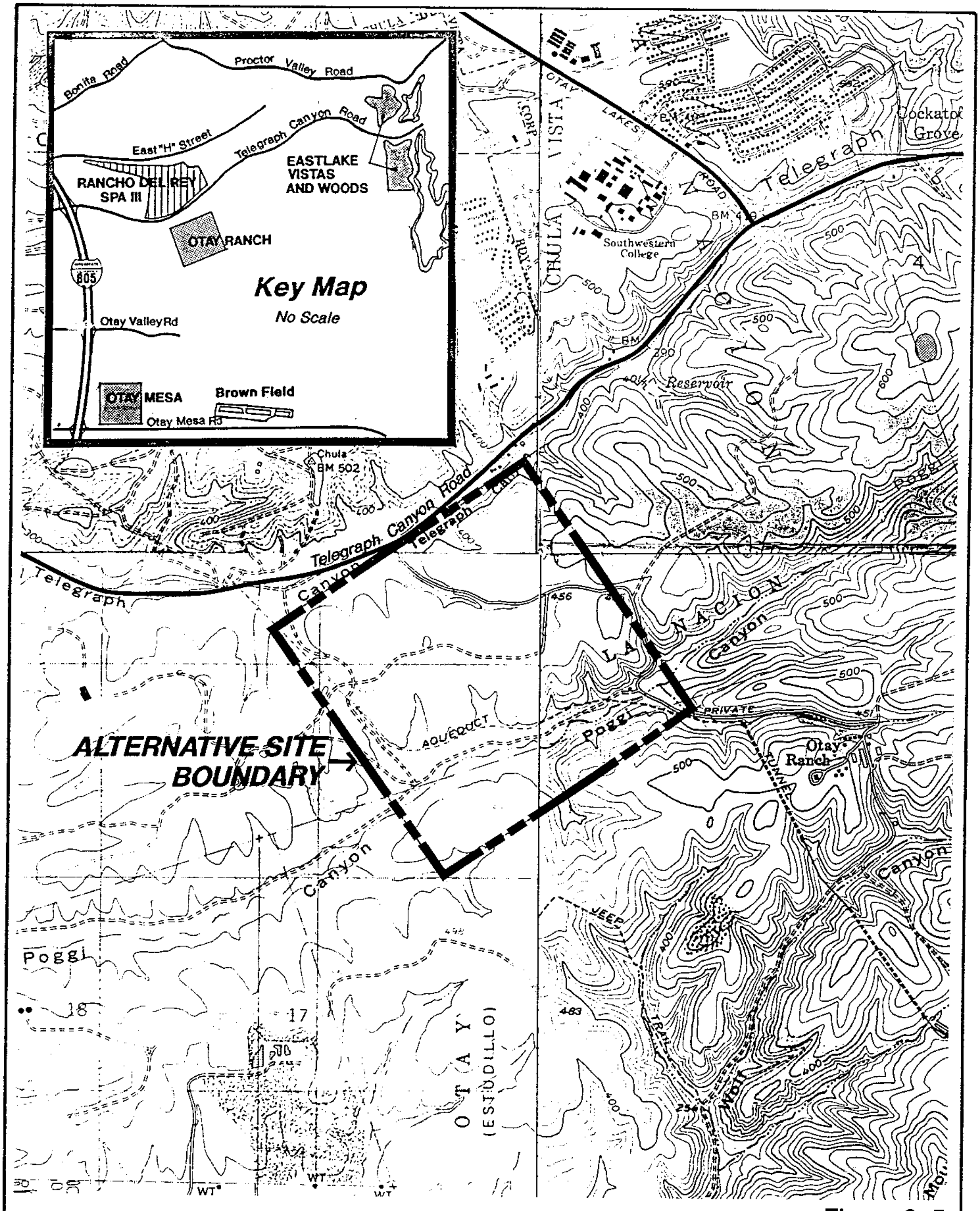


Figure 6-5

Source: U.S.G.S 7.5 min Quads- Imperial Beach, Otay Mesa, National City, Jamul Mts U.S
Scale: 1" = 2000'

Otay Ranch
Off-Site Alternative

It is anticipated that changes to landform would not be as great as landform alteration on the proposed Rancho del Rey site because the existing topography on the Otay Ranch alternative is relatively level. The impacts would probably be below a level of significance.

Air Quality

Adoption of this alternative would allow development of residences that would generate automobile trips and result in increased vehicular emissions (long-term air quality impacts). Short-term emissions from construction activities would generate dust and diesel emissions resulting in short-term emissions impacts. Because the density prescribed by the development of Rancho del Rey project is higher than that projected in the General Plan for the Otay Ranch project in this 500-acre portion, it is expected that this alternative site would be expected to generate more vehicle emissions. This would result in significant cumulative air impacts to the San Diego Air Basin.

Biology

Based on the biological resources mapped in the preliminary Otay Ranch program EIR, development of the proposed project on this site would result in impacts to agricultural land, maritime succulent scrub, Diegan coastal sage scrub, and native grassland (RECON 1989). No sensitive plants were mapped within the boundaries of this alternative site. If this alternative site were selected, a thorough biological survey would be necessary to determine potential impacts. Based on preliminary biological resource information it is anticipated that adoption of this alternative would result in fewer biological resource impacts.

Cultural Resources

There are no known cultural resources on this site; therefore, no impacts to cultural resources would occur (Reid, pers. comm., 1990). Impacts to cultural resources for the proposed project were reduced to below a level of significance.

Transportation

Development of this area would create traffic volumes greater than those planned for the Otay Ranch project and those planned by the General Plan. As a result, an on-site specific traffic study would have to be conducted to determine potential significance of the impacts and required mitigation. The East Chula Vista Transportation Phasing Plan would be used as the basis for determining traffic impacts. It is anticipated that these impacts could be mitigated to below a level of significance.

Land Use/General Plan/Zoning

This alternative site is located within proposed development areas of the Eastern Territories of Chula Vista. Development of this alternative site with the proposed project would be partially in conformance with the proposed low-medium density (3-6 du/ac) and open space residential land uses; however, it would be considered a more intensive use than both the proposed Otay Ranch project and general plan designations. Development of the proposed project on this site would require a General Plan Amendment and clustering of development in accordance with proposed General Plan open space areas. Incorporation of this clustering would avoid potentially significant impacts to land use.

Community Social Factors

Adoption of this alternative would result in the generation of a greater number of people than that proposed for this portion of Otay Ranch. However, the greater population, housing, and employment requirements induced would not be significantly greater and as a result, would not result in adverse impacts to community social factors.

Parks, Recreation and Open Space

Adoption of this alternative would require the construction of a 12.3-acre park on-site. Under the City of Chula Vista parkland dedication ordinance, three acres of parkland per 1,000 people is required. Open space acreages would need to be designated at the project design stage. It is anticipated that no impacts to Parks, Recreation and Open Space would occur provided sufficient parkland is dedicated. This alternative assumes the retention of Poggi Canyon as a natural open space corridor.

Service and Utilities

The alternative site is located in a substantially developed area and would have access to all infrastrucutre requirements. The additional population generated by the project would place a greater demand on all utilities and services than with land uses proposed for Otay Ranch; however, the increase would not be substantially greater to create significant impacts. An increase in police staff would be required as well as tax monies provided to the school districts for implementation of this long-range development plan to avoid potential impacts to police and schools.

Summary

The Otay Ranch alternative site would have fewer landform alteration and biological impacts. Infrastructure related impacts associated with the development of Rancho del Rey SPA III on the Otay Ranch site would be expected to be slightly higher because the existing General Plan land use designation for Otay Ranch is lower. Assuming that the Rancho del Rey SPA III site would eventually be developed, a greater intensity of use would occur under this scenario. This is also the only alternative site which would allow for the school to be constructed to meet the existing demand in Rancho del Rey. This alternative site would probably be environmentally preferred over the proposed site.

6.4.2 OTAY MESA ALTERNATIVE SITE

The Otay Mesa alternative site encompasses approximately 500 acres of vacant land within the City of San Diego (Figure 6-6). This alternative site is situated approximately 0.4 miles to the east of I-805 and is just north of Otay Mesa Road. The topography of this alternative site is described by rolling hills, ridges and small canyons with approximately one-third of the site being flat. Elevations on-site range from approximately 340 feet MSL in the northeast corner to approximately

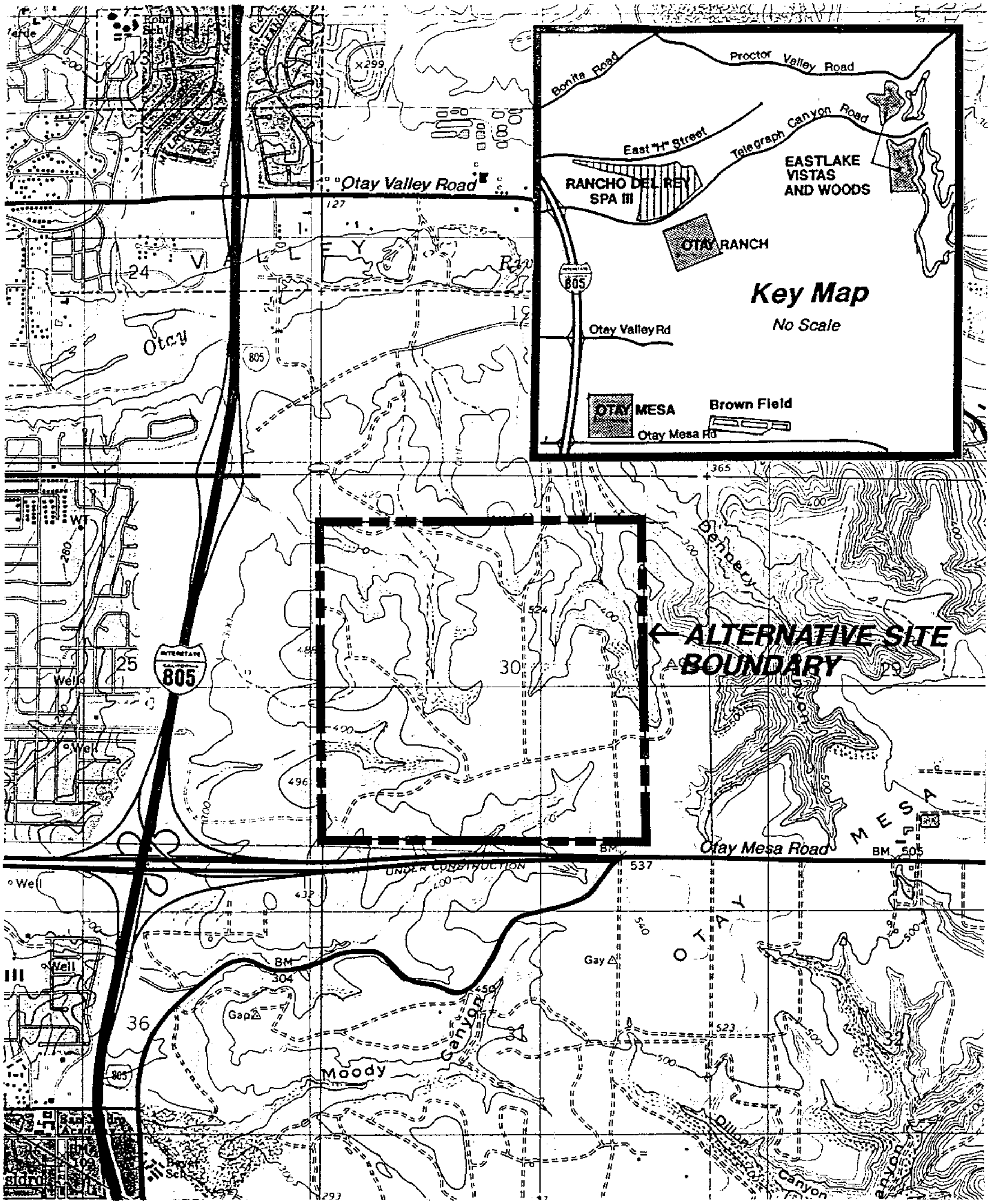


Figure 6-6

Source: U.S.G.S 7.5 min Quad-Imperial Beach

Scale: 1" = 2000'

Otay Mesa
Off-Site Alternative

7.0 CUMULATIVE IMPACTS

According to CEQA (Section 15355), "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The cumulative impacts of the Rancho del Rey SPA III project must be viewed together with other significant development in the immediate vicinity of the project. The entire Rancho del Rey Specific Plan area encompasses approximately 2,450 acres.

Traffic volumes will increase as the result of cumulative impacts associated with regional growth in Chula Vista. The Rancho del Rey development will contribute to the degradation of existing circulation element putting a demand on existing facilities, thus contributing to the cumulative impact to the community. These impacts would be considered significant but mitigable.

Currently, Southern California does not exceed the Air Quality Control Board standards for air quality. The Air Quality Plan for Southern California takes into account regional growth forecasts when establishing the air quality standards. This project, along with other developments, will contribute to the increase in pollutants to the regional air basin. Regional measures to reduce air quality impacts would include increasing mass transit availability and usage, facilitating the use of bicycles for commuters through the enhancement of existing bicycle lanes, and an increase in bicycle related facilities.

The project will create an overall increase in ambient noise levels in the project vicinity; however, existing noise standards established in the Chula Vista General Plan will ensure that ambient noise levels are reduced to a level below significance.

There will be an increase in the solid waste generated by these projects. Many of the County's landfill sites are reaching capacity, and increased demand for waste facilities will have a significant impact on service. Additionally, sites are becoming more difficult to locate to provide for the expanded landfill requirements. Regional impacts would be reduced significantly by the adoption of a mandatory household and business recycling policy, which would prohibit discarding all items that can be recycled. A program could also be adopted to educate citizens about reducing output of waste through a change in purchasing habits.

The projects have a predictable "buildout scenario" which conforms to an established pattern of development which could encourage the buildout of portions of the remaining vacant land within the vicinity.

There will be an increased demand for utilites and other services. Water and fossil fuels are limited resources in Southern California. Existing service facilities were established based upon General Plan growth forecasts. The use of water and fossil fuels would be reduced through the adoption of an energy and water conservation program.

The project would result in permanent land use changes from vacant areas to an urban environment. Buildout would therefore contribute cumulatively to a loss of overall vacant land within the vicinity of the City of Chula Vista as well as San Diego County.

The project would have a cumulative demand for school facilties. Presently, the Sweetwater Union and the Chula Vista City School Districts are operating above capacity. The cumulative demand on facilities which are already above capacity would contribute to significant but mitigatible impacts.

The increased population resulting from the development would place a demand on police protection. Increasing the number of police personnel would mitigate the impacts to below a level of significance.

Development of the project site would result in a significant unmitigable cumulative reduction of coastal sage scrub habitat, vernal pool habitat, California gnatcatcher populations, and plant communities such as the snake cholla and San Diego barrel cactus. Regional measures to reduce the impacts to biological resources would include the adoption of a policy prohibiting development in areas that contain sensitive plant and animal species.

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9.0 ORGANIZATIONS AND PERSONS CONTACTED

Bankston/Pine Associates, Inc.

Ken Bankston, Traffic Engineer

Cinti and Associates

Gary Cinti, President
Jay Kniep, Planner

Chula Vista School District

Kate Shurson, Director of Planning

City of Chula Vista Planning Department

Doug Reid - Environmental Coordinator
Barbara Reid - Associate Planner

City of Chula Vista Police Department

William Winters, Chief
Keith Hawkins, Captain

City of Chula Vista Engineering Department/Subdivisions

Gena Franko, Associate Civil Engineer
Donna Schneider, Assistant Civil Engineer

City of Chula Vista Public Works Department

Roger Daoust, Senior Civil Engineer
Hal Rosenberg, City Traffic Engineer
Cliff Swanson, Deputy Director of Public Words

City of San Diego Planning Department

Colleen Frost, Planner
Janet Meyers, Planner
Ellen Mosely, Senior Planner

ERCE

Stephen Lacy, Manager - Biological Resources Group

Lettieri-McIntyre and Associates, Inc.

Anthony Lettieri, Principal Planner
Marion Borg, Senior Environmental Planner
Mary May, Associate Planner

McMillan Communities

Craig Fukuyama, Project Manager
Darren Anderson, Planner

Otay Water District

Manuel Arroyo, District Planning Engineer

Project Design Consultants

William Dick, Project Manager

RECON

Gerry Scheid, Ecologist
Sue Wade, Archaeologist

SANDAG

George Frank, Senior Transportation Planner
Nan Velario, Senior Regional Planner

San Diego Gas and Electric

Don Rose, Senior Land Planner

Sweetwater Union High School District

Andrew Campbell, Administrator of Planning
Thomas Silva, Director of Planning

10.0 CONSULTANT IDENTIFICATION

This report was prepared by P&D Technologies, Inc. of San Diego, California. Members of P&D Technologies professional staff contributing to the report are listed below:

Brian Biamonte, Senior Environmental Analyst
Betty Dehoney, Director of Environmental Services
Serge Dedina, Environmental Analyst
Y. Sachiko Kohatsu, Senior Environmental Analyst
Elyssa Robertson, Biologist

CONSULTANTS

ERCE - Environmental Review of Biological Analysis
GEOCON Incorporated - Soil and Geologic Investigation

TECHNICAL APPENDICES
FINAL
SUPPLEMENTAL
ENVIRONMENTAL IMPACT REPORT
RANCHO DEL REY SECTIONAL PLANNING AREA
(SPA) III PLAN

Prepared for:

The City of Chula Vista
Environmental Review Coordinator
276 Fourth Avenue
Chula Vista, CA 92010

Prepared by:

P&D Technologies, Inc.
401 West "A" Street
Suite 2500
San Diego, CA 92101
(619) 232-4466

November 1990

CITY OF
CHULA VISTA

Environmental
Impact Report

APPENDIX A

PRELIMINARY GEOTECHNICAL INVESTIGATION

PRELIMINARY SOIL AND GEOLOGIC INVESTIGATION

FOR

RANCHO DEL REY - SPA III

CHULA VISTA, CALIFORNIA

FOR

RANCHO DEL REY PARTNERSHIP
C/O McMILLIN COMMUNITIES, INCORPORATED

NATIONAL CITY, CALIFORNIA

BY

GEOCON INCORPORATED

SAN DIEGO, CALIFORNIA

MARCH 1989

GEOCON
INCORPORATED

Geotechnical Engineers and
Engineering Geologists

File No. D-4228-M01
March 3, 1989

Rancho del Rey Partnership
c/o McMillin Communities, Incorporated
2727 Hoover Avenue
National City, California 92050

Attention: Mr. Ed Elliott

Subject: RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA
PRELIMINARY SOIL AND GEOLOGIC INVESTIGATION

Gentlemen:

In accordance with your request and our revised proposal dated May 9, 1988, we have performed a preliminary soil and geologic investigation for the subject project. The accompanying report presents the findings of our study and our recommendations relative to the geotechnical engineering aspects of developing the project as presently proposed.

Should you have any questions concerning our report or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Dorian E. Mills	David F. Leake	Elizabeth L. Herbert
CEG 1302	RCE 22527	Staff Geologist

ELH:DFL:DEM:dav

(6) addressee

6960 Flanders Drive
San Diego, CA 92121-2974
619 558-6900
FAX 619 558-6159

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PRELIMINARY SOIL AND GEOLOGICAL INVESTIGATION

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PRELIMINARY SOIL AND GEOLOGIC INVESTIGATION

Purpose and Scope

This report presents the results of a preliminary soil and geologic investigation of Rancho del Rey SPA III located in the City of Chula Vista, San Diego County, California (Figure 1). The purpose of this investigation was to evaluate the surface and subsurface soil and geologic conditions encountered and to provide preliminary recommendations pertaining to the geotechnical aspects of developing the property as presently proposed.

The field investigation consisted of reconnaissance-level geologic mapping and the excavation of 8 large-diameter exploratory borings, 29 exploratory trenches and 10 exploratory fault trenches (Appendix A). Laboratory tests were performed on selected representative soil samples obtained at various depths in the test borings to evaluate pertinent physical properties. A more detailed description of the procedures and methods utilized during the field and laboratory investigation are presented in Appendices A and B, respectively. Previous geotechnical studies performed for the property were reviewed as were relevant published and unpublished articles (Appendix C). U.S.D.A. stereoscopic aerial photographs dated 1953 were reviewed. Topographic maps provided by Project Design Consultants were also analyzed to aid in the preparation of this report. The base maps used for this investigation consisted of undated, untitled 200 scale tentative maps for the subject project provided by Project Design Consultants, (Figures 2 and 3, Map Pocket). The location of trenches and borings from this field investigation are presented on Figures 2 and 3, Geologic Maps, along with site conditions and geology. The conclusions and recommendations that follow are based on an analysis of the data obtained and our experience with similar soil and geologic conditions.

Site and Project Description

The subject property encompasses approximately 420 acres of essentially undeveloped land located in the City of Chula Vista, California. The site is irregular in shape and is bounded on all sides by previous development (see Geologic Maps, Figures 2 and 3, map pocket). Development within the site consists of an SDG&E easement and an earthen embankment apparently used for farming purposes within the south leg of Rice Canyon. In addition, a north trending canyon that drains to the south leg of Rice Canyon has been infilled during previous grading associated with Bel Air Ridge subdivision.

The northern limit of the property is H Street and the southern limit is Telegraph Canyon Road. The western boundary is Paseo Ladera and Paseo Del Rey and the eastern boundary is an existing development associated with Buena Vista Way.

Topographically, the property consists of gently to steeply sloping hillside terrain and deep westerly-draining canyons. Elevations range from a high of approximately 490 feet Mean Sea Level (MSL) near the eastern portion of the property to a low of approximately 270 feet MSL near the northwestern corner.

Surface drainage is presently accomplished through a generally northerly- and southerly-trending network of ravines that feed into the large westerly-trending canyon. This canyon is called the south leg of Rice Canyon, and is the largest of the drainages. Vegetation consists of mixed grasses over the majority of the site and chaparral covering the steeper portions of the site.

It is our understanding that the proposed development will include a residential subdivision with associated schools, parks and streets. Cut and fill slopes are planned at inclinations of 2.0 to 1.0 (horizontal to vertical). The maximum cut and fill slopes are on the order of 80 and 90 feet, respectively, excluding remedial grading. An existing fill slope has recently been constructed onsite. The existing fill slope has an inclination of 2.0 to 1.0 and is approximately 85 feet in height. The associated canyon fill ranges from 2 feet to approximately 85 feet in depth.

Preliminary Reconnaissance, Review and Research

A geologic reconnaissance and review of available geotechnical reports and maps pertaining to the site was performed prior to the field investigation. References utilized are listed in Appendix C.

Soil and Geologic Conditions

The property is situated within the Coastal Plains Physiographic Province which consists generally of a series of gently westward sloping, deeply dissected terraces. A worldwide lowering of sea levels and the subsequent erosional dissection of the mesas, as well as regional uplifting, have formed the geomorphic characteristics present on the site as well as the immediate area. A strand of the potentially active La Nacion Fault Zone bisects the site, trending north/south and is located immediately east of Paseo Ladera. Several minor faults associated with this zone have been mapped onsite.

Four geologic formations and four surficial soil types were encountered during the subsurface investigation. Formational deposits include the Sweetwater, Otay, San Diego, and Lindavista Formations (Figures 4 - 11). The surficial deposits consist of several small landslides outside of the proposed development, alluvium, documented and undocumented fill and topsoil/colluvium. Each of the geologic formations and surficial units is discussed below.

Sweetwater Formation (Tsw). The Sweetwater Formation, as exposed on this site, is typically a dense, tan, gravelly, fine to coarse sandstone which is locally well cemented. At least 25 feet of formation section was encountered, as presented on the Geologic Maps. The basal contact of the Oligocene-aged Sweetwater Formation was not exposed, however the top gradational contact with the overlying Otay Formation was encountered at the approximate elevation of 375 feet MSL in the southern portion of the site. Oversize material may be generated by grading procedures due to strong matrix cementation within the sandstone facies. Disposal of oversize material is discussed later in the "Conclusions and Recommendations" section of this report.

Otay Formation (To). The geologic contact between the Oligocene-aged Otay Formation and the overlying San Diego Formation is exposed in the southeastern half of the site. Exposures of the Otay Formation were observed along the canyon slopes at elevations between approximately 385 and 430 feet MSL. This formation is generally flat lying. Where exposed near faults, as in Fault Trench No. 10, Exploratory Trench Nos. 10, 20 and 24, and Boring No. 3, however, the Otay Formation dips northeasterly approximately 40 to 60 degrees. Faulting observed within the Otay Formation generally strikes 20 to 30 degrees to the northwest and dips to the east and west at high angles. Bentonitic layers within the Otay Formation contain bedding plane shears characterized by several inches in thickness. These shears are soft, moist clays. The shears, if exposed in cut slopes, may contribute to deep seated slope failures if not stabilized.

Where exposed, the Otay Formation consists of friable, clayey, fine- to medium-grained sandstones and siltstones with interbedded bentonite clays. The sandier portions of this formation are typically of low to moderate expansive potential and possess suitable shear strength for foundation and slope stability.

The observed bentonite layers vary in thickness from 1 to 3 feet, and consist of highly expansive clays that possess very low shear strength. Recommendations concerning the presence of bentonite layers exposed within proposed cut slopes or beneath the toes of fill slopes are discussed later in this report along with associated remedial measures.

San Diego Formation (Tsd). The Pliocene-aged San Diego Formation typically consists of massively bedded, well sorted, very fine- to medium-grained sandstones with occasional cemented gravel lenses, and cohesionless sand lenses. The basal contact of the San Diego Formation was encountered at elevations ranging from approximately 385 feet MSL to 430 feet MSL.

In general, the sediments of the San Diego Formation possess good shear strength and low expansive characteristics in either an undisturbed or properly compacted condition and, hence, should provide suitable foundation support.

Cohesionless soils were encountered (Boring Nos. 2, 5 and 8) and are susceptible to erosion. Where these soils are exposed in cut slopes, stabilization may be necessary to reduce the potential for surficial sloughage. These soils should not be utilized in the outer 15 feet in construction of fill slopes at 2.0 to 1.0 inclination. A well planned and maintained vegetation and irrigation program provided immediately after grading should significantly reduce the erosion potential.

Lindavista Formation (Qln). Sediments of the Quaternary Lindavista Formation were encountered overlying the San Diego Formation at an elevation of approximately 465 to 475 feet MSL (see Figures 2 and 3). Sediments generally associated with this formation consist of cobble and gravel sandstones with some minor clay lenses and locally cemented zones.

The soils of the Lindavista Formation typically possess excellent shear strength and generally low expansive potential in either an undisturbed or properly compacted condition. This formation, in general, should provide low expansive capping materials with the exception of local clay lenses.

Although the formation is relatively dense and slightly to moderately cemented, excavations should be accomplished with moderate to heavy ripping by conventional grading equipment. The occurrence of localized highly cemented zones or concretions should be anticipated, however, the need for blasting is considered highly unlikely.

Landslides (Qls). Several small landslides were mapped in the central portion of the site in the south leg of Rice Canyon. These landslides are outside of the area of proposed development. The landslides have apparently developed on a weak bentonitic clay within the Otay Formation. Based on geomorphological characteristics, these landforms do not exceed approximately 200 feet in width (Figure 2). It is probable that additional small landslides will be encountered during grading.

Alluvium (Qal). Alluvium is typically composed of dense to hard, humid to moist, dark brown, clayey sand to sandy clay that has been deposited near the base of slopes or along canyon bottoms. Stream-deposited alluvial sediments were encountered to depths in excess of 17 feet in the upper reaches of the south leg of Rice Canyon, south of H Street. The alluvial sediments are generally poorly consolidated and susceptible to settlement when subjected to an increase in vertical loads as might result from the placement of fill or structures. Hence, development within areas underlain by alluvial deposits will require remedial grading in the form of removal and recompaction to reduce the potential for settlement.

Topsoil/Colluvium. The majority of the site is overlain by a thin veneer of topsoil/colluvium of generally clayey composition. These deposits consist of highly expansive, potentially compressible, sandy clays that average 2 to 3 feet in thickness. The maximum thickness encountered was 6 feet in Trench Nos. 16 and 19. The topsoil is best developed on the Otay Formation. Due to the compressible nature of these deposits, removal and recompaction is recommended in areas to receive settlement sensitive structures.

Fill Materials (Qudf and Qaf). Fill of different origins are present on the site. Undocumented fill in the form of an earthen embankment is located in the south leg of Rice Canyon, south of H Street. Additionally, localized dumped trash was observed on the site.

Fills associated with the construction of Telegraph Canyon Road, Paseo Ladera, H Street and Bel Air Ridge have been mapped. Boring Nos. 4 and 9 were excavated in a documented offsite canyon fill associated with Bel Air Ridge. Based on the available soil and geologic documentation for the Bel Air Ridge development (see Appendix C, References), limited visual observations and laboratory test results, it is our opinion that this fill has been compacted in substantial conformance with the grading ordinance of the City of Chula Vista.

At the north end of the site, end-dumping of trash and soil was observed in the vicinity of Boring No. 6 and near Exploratory Trench No. 5. These loose soils should be removed prior to grading. The soil may be reused if the deleterious (organic) debris is extracted prior to recompaction.

Geologic Structure

The geologic structure of the site is characterized by a gentle (2 to 3 degrees) westerly dip of the exposed Tertiary formational contacts (Figure 4). The Lindavista Formation overlies the San Diego Formation with a near horizontal contact; while the San Diego/Otay formational contact is slightly angular in nature. Bedding within all formations is typically massive with some local areas of cross-bedding and channel fill.

Geologic Hazards

Faulting and Seismicity. The fault systems with the most significance to site development are the potentially active Rose Canyon and La Nacion Fault Zones, and the active offshore Coronado Banks and onshore San Miguel Fault Zones. A strand of the La Nacion Fault Zone traverses the site (Fault A). Fault Trench No. 4 exposed the San Diego Formation positioned against the Otay Formation along Fault A (Figure 2). Older alluvium has since been deposited over the fault at this location and does not appear to be offset. Trenching performed by others north of H Street indicates the Quaternary-age Lindavista Formation has not been offset by this fault (San Diego Soils - K. Shaw, 1989, personal communication). Based on our field evidence to date and the experience of others immediately to the north of H Street, it is our opinion that Fault A can be considered a potentially active fault which appears to die out to the north, in a series of small folds.

Fault B, located in the proposed Junior High School site, is associated with earlier faulting within the Otay Formation. The fault trenches indicate that a block of the Otay Formation has been rotated such that the sediments dip to the north at an inclination of 60 degrees. This block appears to be located between Fault A and a fault previously mapped to the east in the vicinity of Otay Lakes Road, offsite. Faulting has resulted in rotation of the sediments as well as shearing along the bentonitic clay beds. It appears that the faulting does not extend into the Pliocene San Diego Formation (Trench Nos. 10 and 24; Fault Trench Nos. 8 and 10) and thus can be considered an inactive fault.

The length of the La Nacion Fault Zone is approximately 15 miles (Artim and Pinckney, 1973). Based on the relatively short fault length and lack of fault-related geomorphic features, a maximum probable event along the La Nacion Fault Zone would be expected to be approximately Magnitude 5 to 5.5. The probability of a seismic event of this magnitude occurring on the potentially active La Nacion Fault Zone during the lifetime of the project development is considered low.

The Rose Canyon Fault Zone has been inferred approximately 4 miles west of the site beneath San Diego Bay based upon the results of acoustical profiling (Legg and Kennedy, 1979). Controversy exists among geologists, seismologists, and engineers over the recency of activity of the Rose Canyon Fault Zone and the maximum probable earthquake. There has not been any topographic or geomorphic features identified which suggests Holocene surface rupture along this fault system. Therefore, recurrence interval data are at a minimum and do not permit statistical evaluation for expected future earthquakes along the Rose Canyon Faults zone. Artim (1982) concludes that although the Rose Canyon Fault may be considered by some geologists to be capable of producing a Richter Magnitude earthquake greater than 6.0, the recurrence interval for such an earthquake is probably on the order of 5,000 years, hence, it is unlikely that such an event would occur during the lifetime of the project.

The Coronado Banks Fault Zone and the San Miguel Fault Zone have been mapped approximately 10 and 40 miles south and east of the site, respectively. Based upon the estimated fault lengths reported by Kennedy, et. al. (1975), and the fault rupture length/magnitude relationship suggested by Housner (1969) for the Coronado Banks Fault Zone, the likelihood of a maximum probable event of Magnitude 5.5 to 6.5 occurring within the projected lifetime of project development is very low. A Magnitude 4.6 earthquake occurred on June 29, 1983 approximately 10 miles west of San Diego, which is estimated to be within the Coronado Banks

Fault Zone. This fault zone is considered "active" under criteria set forth by the California Division of Mines and Geology.

The San Miguel Fault Zone consists of four separate en-echelon faults: the Calabasas, Vallecitos, San Miguel, and Tres Hermanos. This zone of faulting occurs approximately 40 miles south of the site and has varying degrees of activity associated with the different fault strands. A magnitude 6.8 earthquake occurred in 1956 along this fault zone. Microseismic studies of Northwestern Baja indicate this is an active area with broadly distributed earthquakes. Peak horizontal bedrock acceleration at the site should the maximum credible earthquake occur on any of the Southern California active faults, is estimated to be between 0.10 to 0.30g (Schnabel and Seed, 1973).

Liquefaction. Based on the density and gradation of soils underlying the project site and the depth to groundwater, it is our opinion that the liquefaction potential of formational material is very low and does not present a significant geologic hazard to the site.

Groundwater. Perched groundwater in the form of seepage was observed in the alluvium of the south leg of Rice Canyon at depths varying from 2 to 10 feet (see Trench Nos. 9, 11, 12, 15 and 21). In addition, each of the geologic units, as well as the surficial deposits observed on the site, have permeability characteristics that are susceptible under certain conditions to water seepage (see Boring Nos. 1 and 5). Perched water conditions are likely to develop during the wet season within the drainage areas. Special consideration to minimize construction difficulties may be required should grading operations extend into these areas. Where major infilling of canyons or ravines are planned, the installation of canyon subdrains (Figure 12) to relieve the potential build-up of hydrostatic pressure is recommended.

CONCLUSIONS AND RECOMMENDATIONS

General

1. No soil or geologic conditions were observed which, in our opinion, would preclude the development of the property as tentatively planned, provided the recommendations presented herein are implemented within design and construction.

2. The site is underlain by surficial soils consisting of documented and undocumented fill, topsoil/colluvium, alluvium, relatively loose landslide deposits, and by four formational units. The surficial deposits are not considered suitable for the support of fill or structural loads in their present condition and will require remedial grading measures as recommended herein.

3. Although some expansive soils may be encountered during grading within the surficial deposits, there should be sufficient quantities of low expansive soils to cap the pad areas. Where highly expansive soils are used as fill soils, these soils should be placed a minimum of 3 feet below finish grade and 15 feet inside of fill slopes. Because of the extremely high expansive nature of bentonite, if used as fill, these soils should be placed a minimum of 10 feet below finish grade and 15 feet inside of fill slopes.

4. Bentonitic clays were observed in the south leg of Rice Canyon at elevations below 375 MSL. Should proposed development encroach in these areas, there is the possibility of bentonite beds daylighting in cut slopes. To reduce the potential for slope instability, drained stability fills (Figure 13) or buttresses may be utilized. In addition, where bentonite beds are located at shallow depths beneath proposed toes of fill slopes, deeper than normal fill keys or shear keys will be required.

5. Cohesionless soils were observed within the San Diego Formation. Where these soils daylight in cut slopes, consideration should be given to placement of stability fills to reduce surficial instability. If these soils are used as fill, mixing with cohesive soils will increase the surficial strength of the cohesionless soils.

6. A strand of the potentially active La Nacion Fault Zone (Fault A) was observed in the western portion of the property along Paseo Ladera. As encountered in Fault Trench No. 4, the strand positions the San Diego Formation against the Otay Formation. However, the overlying younger alluvium does not appear disturbed by faulting. In addition, subsurface investigations to the north indicate that the strand dies out into a series of minor folds. Based on this evidence, it is our opinion that this strand within the La Nacion Fault Zone is potentially active. Therefore, no structural setbacks from this fault strand are necessary. It is possible that grading will reveal other faults associated with the

La Nacion Fault Zone. Unless further evidence is encountered to indicate Holocene (active) faulting, setbacks will not be required from these faults.

7. An east-west trending fault (Fault B) was observed in the vicinity of the proposed Junior High School Site. Based on our subsurface investigation to date, the faulting appears to be restricted to the Otay Foundation, indicating that it is an inactive fault. Based on this evidence, no structural setback is recommended.

8. Documented fill soils were observed and evaluated in the area associated with the Bel Air Ridge subdivision. Based on limited visual and laboratory test results, it is our opinion that these soils may receive improvements, once surficial preparations are complete.

Potential Geologic Hazards

9. No active faults were encountered on the site during the investigation. It is our opinion that the site could be subjected to moderate to severe ground shaking in the event of a major earthquake along any of the active faults in the Southern California area. However, the site is not considered to possess any greater seismic risk than that of the surrounding developments. The effects of seismic shaking can be reduced by adhering to the current Uniform Building Code and the

Recommended Lateral Force Requirements of the Structural Engineer's Association of California.

10. Small landslides were noted in the south leg of Rice Canyon outside of the proposed development. These landslides may represent slope failures within the bentonitic clays of the Otay Formation. Since development is not proposed in this area, landsliding should not be a constraint to development of the site.

11. The liquefaction potential of the site subsoils is considered to be remote for the proposed development.

<u>Groundwater</u>

12. The alluvial and colluvial soils encountered on the site have permeability characteristics and/or associated drainage conditions that could be susceptible under seasonal conditions to water seepage. No major springs, seeps, or groundwater occurrences were encountered within the formational soil units; hence, it is our opinion that the seepage potential for the geologic units is relatively low. It is recommended, however, that periodic on-site observations be made by the soil engineer or engineering geologist during grading and/or construction. If the presence of groundwater is observed, recommendations can be made at that time to address the particular situation. The recommendations that follow provide for the complete removal of alluvial and colluvial deposits and

the placement of a canyon subdrain within the bottom of the removal areas to reduce the potential for groundwater buildup within the proposed deeper canyon fills (see Figure 12; Canyon Subdrain Design).

Excavation Characteristics

13. Based on the results of our field investigation and experience in the area, the soils and formational units on the site can be generally excavated by moderate effort with heavy duty excavation equipment. Locally cemented zones may be encountered in the Lindavista Formation which may generate oversized materials. Recommendations for placing oversize material are presented in our "Recommended Grading Specifications" (Appendix D).

Soil Characteristics

14. The fill soils generated from cuts in the surficial and formational units will primarily be low to moderately expansive sands and clayey sands. The surficial soils (including undocumented soils and landslide debris), may consist of the moderately expansive soils. Where encountered, these soils should be placed a minimum of 3 feet below finish grade and 15 feet (horizontally) inside fill slopes.

The formational soils are generally low to moderately expansive. However, highly expansive bentonitic clays may be encountered in the Otay Formation and sporadically in the San Diego Formation. If these soils are used as fill material, they should be placed a minimum of 10 feet below finish grade and 15 feet (horizontally) inside fill slopes.

15. Based on our field investigation and laboratory test results, the undocumented fill, topsoil/colluvium, alluvium and landslide debris are relatively compressible and may result in settlement if subjected to loads. Where fill slopes, settlement sensitive structures, and streets are planned in areas where these soils occur, we recommend complete removal and recompaction of these soils.

Grading

16. All grading should be performed in accordance with the "Recommended Grading Specifications" contained in Appendix D and applicable ordinances of the governing agencies. Where the recommendations of Appendix D conflict with this section of the report, the recommendations of this section shall take precedence.

17. Site preparation should begin with the removal of all deleterious matter and vegetation. The depth of removal should be such that material to be used in fills is free of organic matter. Material generated during stripping operations and/or site demolition should be exported from the site.

18. In areas to receive fill or settlement sensitive improvements, loose topsoil/colluvium, landslide debris, alluvial deposits, end-dump fills and undocumented fills not removed by planned grading operations should be removed to firm natural ground. The exposed natural ground should be scarified and properly compacted to at least 90 percent relative compaction prior to placing additional fill and/or structures. In general, removals are expected to be on the order of 3 to 5 feet for topsoils and may exceed 20 feet for alluvial removals where development is currently proposed. Deeper than normal benching and/or stripping operations for sloping ground surfaces will be required where thicknesses of potentially compressible surficial deposits are greater than 3 feet. The actual extent of removals will be evaluated in the field by the soil engineer. Once final grading plans are available, supplemental recommendations will be provided.

19. In Telegraph Canyon, it may not be feasible to remove all alluvial soils in areas to be developed because of the presence of Telegraph Canyon Road. Therefore, recommendations for remedial grading will depend on the type of improvement to be located in this area. Once development plans are available, supplemental recommendations will be provided.

20. Following the removal of the alluvial/colluvial soils and undocumented fills, canyon subdrains should be provided where necessary to collect subsurface waters. Figure 12 presents a typical detail of the

subdrain configuration. The actual depth and location of the subdrains, as well as their outlet can be best determined when grading plans are developed.

21. Where additional fill will be placed on the existing documented fill, the surface should be scarified and moisture conditioned prior to placement of the fill. If no additional fill is placed, we recommend finish grade density tests be performed to evaluate compaction of the near surface fill soils.

22. The site should be brought to final subgrade elevations with structural fill compacted in layers. Lifts of fill should be no thicker than will allow for adequate bonding and compaction. Although variable, lift thicknesses should not exceed 6 to 8 inches. Final thicknesses shall be evaluated in the field by the engineer, based on local conditions. All fill (including backfill and scarified ground surfaces) should be compacted to at least 90 percent of maximum dry density at approximately 2 percent over optimum moisture content or above, as determined in accordance with ASTM Test Procedure D1557-78, Method A or C.

23. Grading of the site may produce some oversize rock materials that consist of cemented sandstones and cobble conglomerates. Grading operations on the site should be scheduled so as to place oversize rock and expansive soils in the deeper canyon fills and to utilize granular

materials having a low expansion potential to cap building pads and fill slopes, if possible. To reduce the potential for future problems associated with construction operations, it is recommended that oversize rock not be placed shallower than 5 feet of proposed building pad elevations and at least 10 feet below finish street subgrade or 3 feet below the deepest utilities. For the purpose of this project, oversize rock is defined as rock or cemented fragments greater than 12 inches and less than 4 feet in maximum dimension. Such material should be placed in accordance with the recommendations for oversize material placement contained in the "Recommended Grading Specifications" (Appendix D). No material larger than 6 inches should be placed within 3 feet of finished pad grade.

Alluvial/Colluvial Removals

24. Alluvium removals within the project may range from 10 to 20 feet. In general, we recommend complete removal of the alluvial/colluvial deposits in the canyons adjacent to the proposed toes of fill slopes. Benching associated with the placement of fills in these areas may initiate surficial erosion and instability in colluvial and/or cohesionless sands. Where benching in "structural fill" areas initiates slope instability in any areas on the site, the affected area must be excavated and recompacted to assure proper bonding between the fill-natural contact. The actual extent of removals should be evaluated in the field by the soil engineer during grading. Following removal of the

alluvial or colluvial deposits, a canyon subdrain installation, as depicted in Figure 12, may be required prior to placement of fill.

Transition Lots

25. To reduce the effects of differential settlement, it is recommended that the cut portion of transition lots (cut-fill areas on building pads) be undercut a minimum of 3 feet and replaced by low expansive granular soils compacted to at least 90 percent of the maximum density.

26. The site should be graded such that the soils within 3 feet of finish grade possess an Expansion Index of less than 50.

Slope Stability

27. The stability of proposed cut and fill slopes was analyzed using Taylor's chart and the following effective shear strength parameters:

Properly Compacted Fill	Angle of Internal Friction	Apparent Cohesion
San Diego and Lindavista Formations	27 degrees	350 psf
Otay Formation	30 degrees	200 psf
Cut-Undisturbed Formational Material		
San Diego and Lindavista Formations	30 degrees	200 psf
Otay Formation (granular)	27 degrees	320 psf
Otay - Bentonite (clay)	6 degrees	100 psf

These shear strength parameters are based on the findings of this study and our experience with similar soil and geologic conditions in the area. The results of the analysis indicate that 2:1 (horizontal to vertical) fill slopes composed of properly compacted materials from the San Diego, Lindavista and Otay Formations possess an indicated factor of safety of at least 1.5 for heights of up to 100 feet. Cut slopes in the Lindavista and/or San Diego Formation constructed at an inclination of no greater than 2:1 can be as high as 80 feet. Cut slopes may be designed at a 1.5:1 (horizontal to vertical) inclination up to 5 feet in height. Cut slopes in which bentonite and cohesionless soils layers outcrop may have a factor of safety less than 1.5 and, hence, buttresses or stability fills will be recommended when grading plans are finalized. The attached "Slope Design Charts" (Figures 14 through 17) present the allowable slope height for various slope conditions and assume that a minimum factor of safety of 1.5 is required.

28. Temporary cut slopes up to 10 feet in height in surficial soils without surcharge loads or groundwater seepage during construction should have slope ratios of 1.0:1.0 or flatter. For temporary cut slopes greater than 10 feet in height, the slope ratio for these soils should be no steeper than 1.5:1.0. For temporary slopes in formational soils, we recommend no steeper than 0.75:1.0 for slopes up to 15 feet in height. For heights greater than 15 feet, the slope ratio should be no steeper than 1.0 to 1.0. In all cases, water should not be allowed to flow over

the crests of temporary slopes. All temporary slopes should meet at least the minimum requirements of applicable Health and Safety Codes.

29. It is recommended that all cut slopes and stability fills be observed during grading by an engineering geologist to verify that soil and geologic conditions do not differ significantly from those anticipated.

30. The outer 15 feet (or a distance equal to the height of the slope, whichever is less) of fill slopes should be composed of properly compacted granular soil fill (very low to low expansion potential) to reduce the potential for surficial erosion. Bentonitic clays or highly expansive clays (E.I. greater than 90) should not be placed in the outer 15 feet (horizontal distance) of fill slopes. All fill slopes should be compacted by back-rolling at vertical intervals not to exceed 4 feet and should be track-walked at the completion of each slope such that the fill soils are uniformly compacted to at least 90 percent relative compaction to the face of the completed slope.

31. All slopes should be planted, drained, and properly maintained to reduce erosion.

Foundations

32. The following foundation recommendations for the proposed one- and/or two-story residential structures are separated into categories dependent

on the depth and geometry of underlying fill soils for a particular lot. Determination of final foundation design for specific lots will be made at the completion of grading and will be presented at that time within interim and/or final reports of mass grading operations. It should be noted that the following foundation recommendations pertain to lots excavated in or capped with a minimum of 3 feet of "very low" to "low" expansive soils (Expansion Index of 50 or less). For lots possessing an Expansion Index greater than 50 within 3 feet of finish grade, additional recommendations will be provided.

Category I: Shallow Fill and Cut Pads. In general, the lots within this category include cut lots, undercut and/or transition cut lots with less than 10 feet of fill thickness differential or fill lots underlain by less than approximately 20 feet of fill.

A. It is recommended that foundations within this category have a minimum depth of 12 inches and a minimum width of 12 inches. Foundations so proportioned may be designed for an allowable soil bearing pressure of 2,000 psf (dead plus live load). This bearing pressure may be increased by up to one-third for transient loads such as wind or seismic forces.

B. Continuous footings should be reinforced with two No. 4 reinforcing bars, one placed near the top of the footing and one near the bottom.

C. Concrete slabs-on-grade should have a minimum thickness of 4 inches and should be reinforced with 6x6-10/10 welded wire mesh throughout. It has been our experience that the mesh must be physically pulled up into the slab after the placement of concrete. The mesh should be positioned within the upper one-third of the slab. Proper mesh positioning is critical to future performance of the slabs. The slab should be underlain by at least 4 inches of clean sand and, where moisture sensitive floor coverings are planned, a visqueen moisture barrier covered by at least 1 inch of the sand cushion should also be provided.

Category II: Medium Deep Fill Pads. In general, the lots within this category are underlain by 20 to 50 feet of fill and have a differential thickness of less than 10 feet.

A. It is recommended that foundations within this zone have a minimum depth of 18 inches and a minimum width of 12 inches. Foundations so proportioned may be designed for an allowable soil bearing pressure of 2,000 psf (dead plus live load). This bearing pressure may be increased by up to one-third for transient loads such as wind or seismic forces.

B. Continuous footings should be reinforced with four No. 4 reinforcing bars, two placed near the top of the footing and two near the bottom.

C. Concrete slabs-on-grade should have a minimum thickness of 4 inches and should be reinforced with No. 3 reinforcing bars spaced at 24 inches in both directions. The slab should be underlain by at least 4 inches of clean sand and, where moisture sensitive floor coverings are planned, a visqueen moisture barrier covered by at least 1 inch of sand cushion should also be provided.

Category III: Deep Fill Pads. In general, the lots within this category are underlain by deep fills in excess of approximately 50 feet in depth or are underlain by differential fill thicknesses which vary more than 10 feet.

A. It is recommended that foundations within this category have a minimum depth of 24 inches and a minimum width of 12 inches. Foundations so proportioned may be designed for an allowable soil bearing pressure of 2,000 psf (dead plus live load). This bearing pressure may be increased by up to one-third for transient loads such as wind or seismic forces.

B. Continuous footings should be reinforced with four No. 4 reinforcing bars, two placed near the top of the footing and two near the bottom.

C. Concrete slabs-on-grade should have a minimum thickness of 4 inches and should be reinforced with No. 3 reinforcing bars spaced at 18 inches in both directions. The slab should be underlain by at least 4 inches of clean sand and, where moisture sensitive floor coverings are planned, a visqueen moisture barrier covered by at least 1 inch of the sand cushion should also be provided.

33. Footings located on or near the top of a slope are not recommended. However, where such a condition cannot be avoided, the footing depth should be such that the bottom outside edge of the footing is at least 7 feet from the face of the slope.

34. As an alternative to the foundation recommendations for each category, consideration should be given to the use of post-tensioned concrete slabs and foundation systems for support of the proposed structures. If used, the post-tensioned systems should be designed by a structural engineer experienced with such foundation systems.

35. The recommendations presented herein are intended to reduce the potential for cracking of slabs and foundations as a result of differential settlement of deep fills or fills of varying thicknesses. However, even with the incorporation of the recommendations presented, foundations and slabs-on-grade placed on such conditions may still exhibit some cracking. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, and in particular, where re-entry slab corners occur.

Retaining Walls and Lateral Loads

36. Retaining walls not restrained from movement at the top and having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid weight of 30 pcf. Where the backfill will be inclined at no steeper than 2:1, an active soil pressure of 43 pcf is recommended.

37. Unrestrained walls are defined as those walls that are allowed to rotate more then 0.001H at the top of the wall. Where walls are restrained from movement at the top, an additional uniform horizontal pressure of 7H psf (where H equals the height of the retaining portion of the wall in feet) should be added to the above active soil pressure.

38. All retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and should be waterproofed as required by the Project Architect or Design Engineer. The above recommendations assume a properly compacted granular backfill material with no hydrostatic forces or imposed surcharge loads. If conditions different than those described are anticipated or if specific drainage details are desired, Geocon Incorporated should be contacted for additional recommendations.

39. For resistance to lateral loads, we recommend a passive earth pressure equivalent to a fluid weight of 300 pcf for footings or shear

keys poured neat against undisturbed natural soils or properly compacted granular fill soils. This lateral pressure assumes a horizontal distance for the soil mass extending at least 10 feet or three times the surface generating passive pressure, whichever is greater. The upper 12 inches of material not protected by floor slabs or pavement should not be included in the design for lateral resistance. If friction is to be used for lateral resistance, we recommend using a coefficient of 0.4 between the soil and concrete.

Drainage and Maintenance

40. Good drainage is imperative to reduce the potential for differential soil movement, erosion and subsurface seepage. Positive measures should be taken to finish grade the building pads properly after the structures and other improvements are in place, so that drainage water from the lots and adjacent properties is directed off the lots and to the streets away from foundations and the top of slopes. Experience has shown that even with these provisions, a shallow groundwater or subsurface water condition can and may develop in areas where no such water conditions existed prior to site development; this is particularly true where a substantial increase in surface water infiltration results from an increase in landscape irrigation.

Trench Excavation and Backfill

41. Excavation of trenches in locally cemented zones in formational materials may be difficult and may require the use of heavy-duty trenching equipment. The onsite soils may be utilized for trench backfill provided they are screened of organic material and cobbles greater than 6 inches in dimension. Trench backfill, including all private property utilities, should be tested and compacted in uniform lifts not exceeding 8 inches in compacted thickness by mechanical means to at least 90 percent relative compaction (ASTM D1557-78).

Grading Plan Review

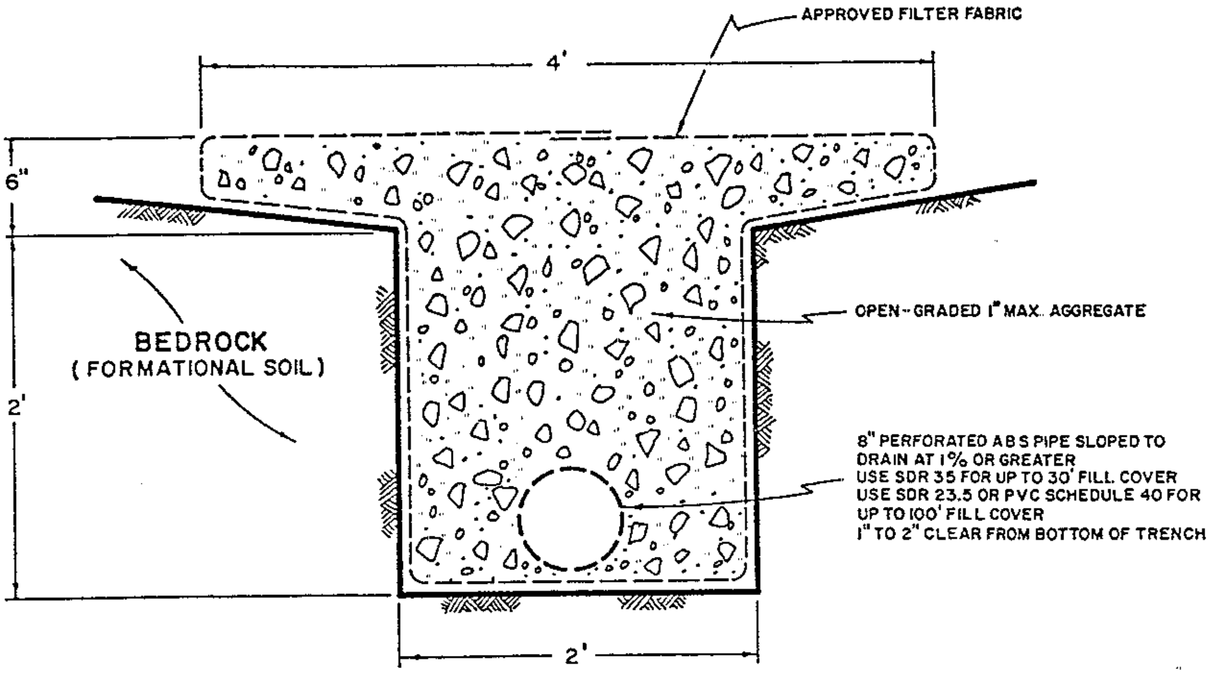
42. The soil engineer and engineering geologist should review the grading plans prior to finalization to verify their compliance with the recommendations of this report and determine the need for additional comments, recommendations and/or analysis. All recommended drained stability fills and subdrains should be shown on the final grading plans.

Construction Observation

43. Since the recommendations presented in this report are interpolated between widely spaced subsurface excavations, we recommend geologic observation during grading. The purpose of this observation will be to confirm soil conditions as anticipated and, if differences are noted, provide modifications to our initial recommendations relative to the geotechnical aspects.

THE FOLLOWING FROM LIMITATIONS AND UNIFORMITY OF CONDITIONS ARE ON FILE AT THE CITY OF CHULA VISTA:

Figures 2 and 3, Geologic Maps
Figures 4, Geologic Cross-Sections
Figures 5 and 6, Fault Trenches 1 - 5 (Pocket)
Figures 7 through 11, Fault Trenches 6 - 10



NO SCALE

NOTES:

1. If Class II permeable material (per Sec. 68-1.025 Caltrans Standard Specifications) is used, the filter fabric may be deleted.

2. Where the subdrain does not connect directly to a storm drain pipe, the subdrain should be nonperforated and should be provided with a 12-inch-thick concrete cut-off wall extending at least 6 inches beyond the subdrain trench sidewalls, bottom and the top of the pipe. The cut-off wall should be located at the connection of the perforated and non-perforated pipes.

3. Where subdrain length is less than 500 feet, the pipe diameter may be reduced to 6 inches.

4. Canyon subdrains outletting into open space areas should be properly protected (ie. concrete, headwalls, rip-rap) to provide free drainage.

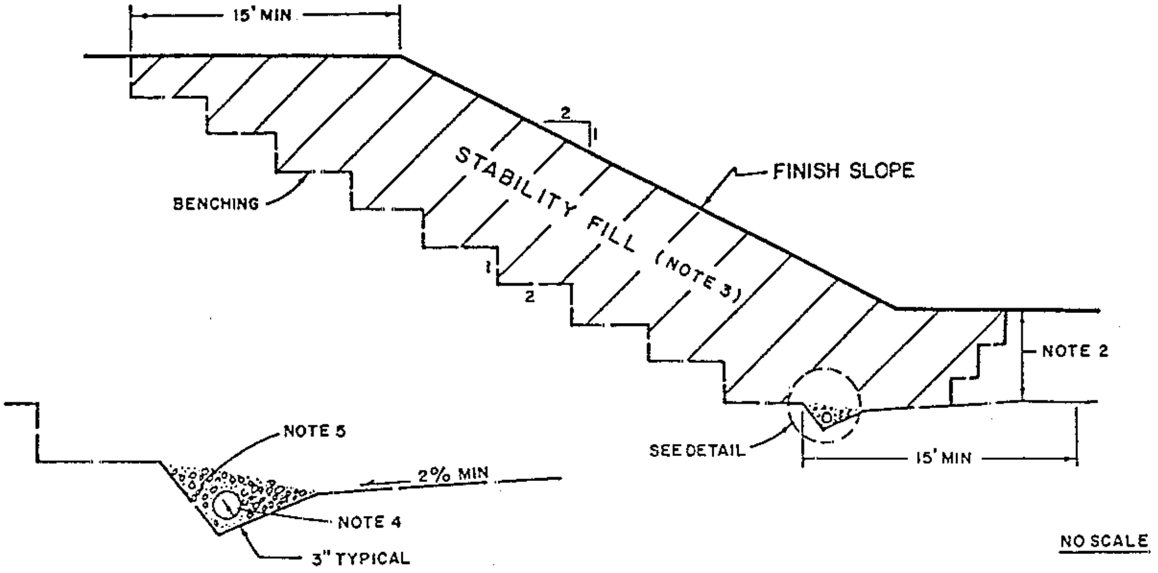
RECOMMENDED CANYON SUBDRAIN DETAIL

RANCHO DEL REY - SPA III

CHULA VISTA, CALIFORNIA

Figure 12

File No. D-4228-M01
March 3, 1989



Notes

1. Excavate backslope at 2.0 to 1.0 inclination beginning 15 feet (minimum) from top of slope.

2. Base of stability fill to be a minimum of 5 feet below pad grade or as evaluated in the field by the project geologist/engineer.

3. Stability fill to be composed of properly compacted granular soil approved by Geocon Incorporated prior to use.

4. Subdrain to be 6-inch minimum diameter, perforated, thickwalled Schedule 40 PVC or ABS SDR 35 sloped to drain at 1 percent minimum and connected to storm drain or canyon subdrain.

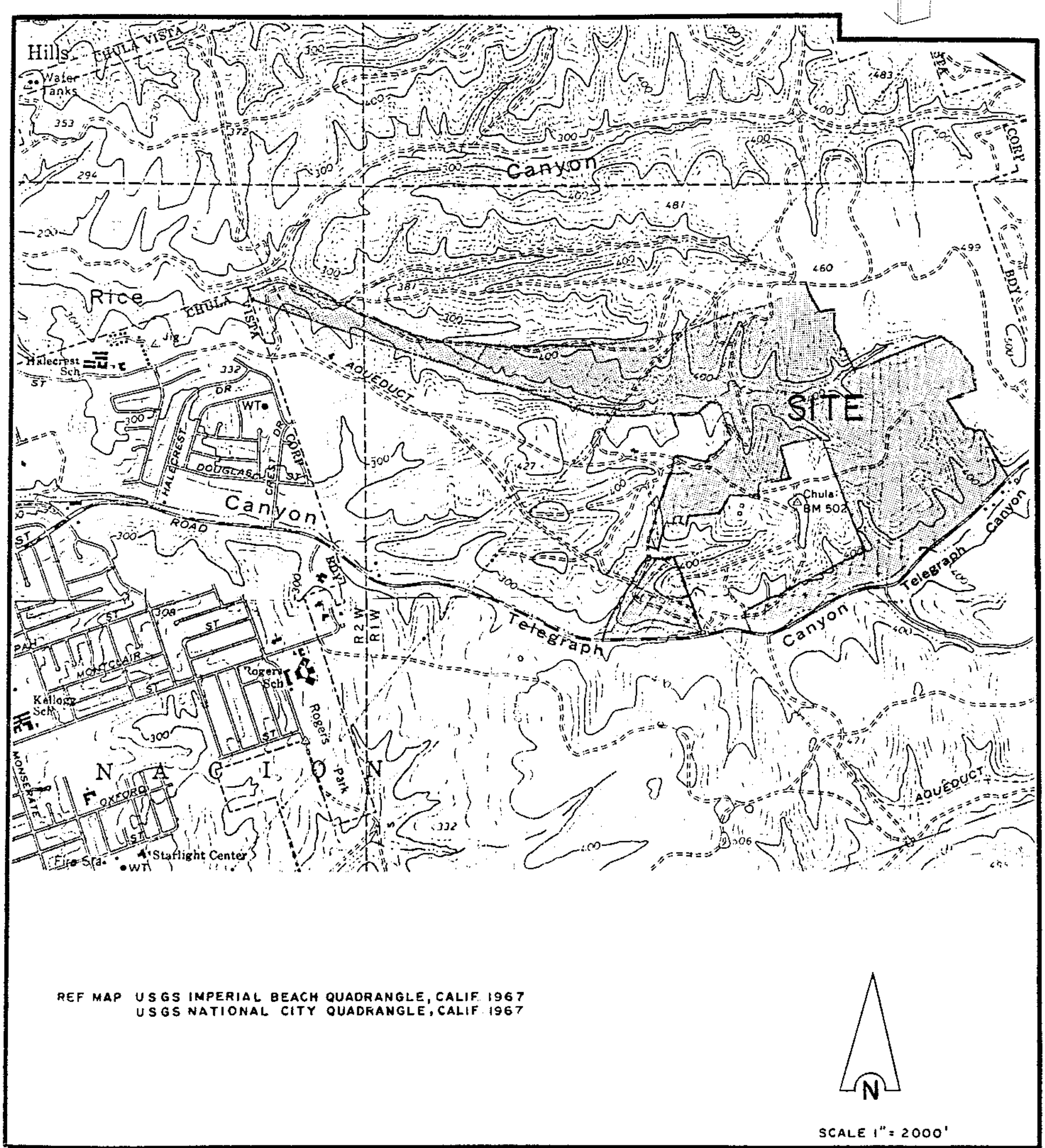
5. Filter material to be either Class II permeable material in accordance with State of California Standard Specifications Section 68-1.025 or 1-inch open graded crushed rock enclosed in Mirafi 140 or equivalent filter fabric. Filter material volume to be 5 cubic feet per foot for Class II or 3 cubic feet per foot for open graded crushed rock.

TYPICAL STABILITY FILL DETAIL

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

Figure 13

File No. D-4228-M01
March 3, 1989



SITE VICINITY MAP

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

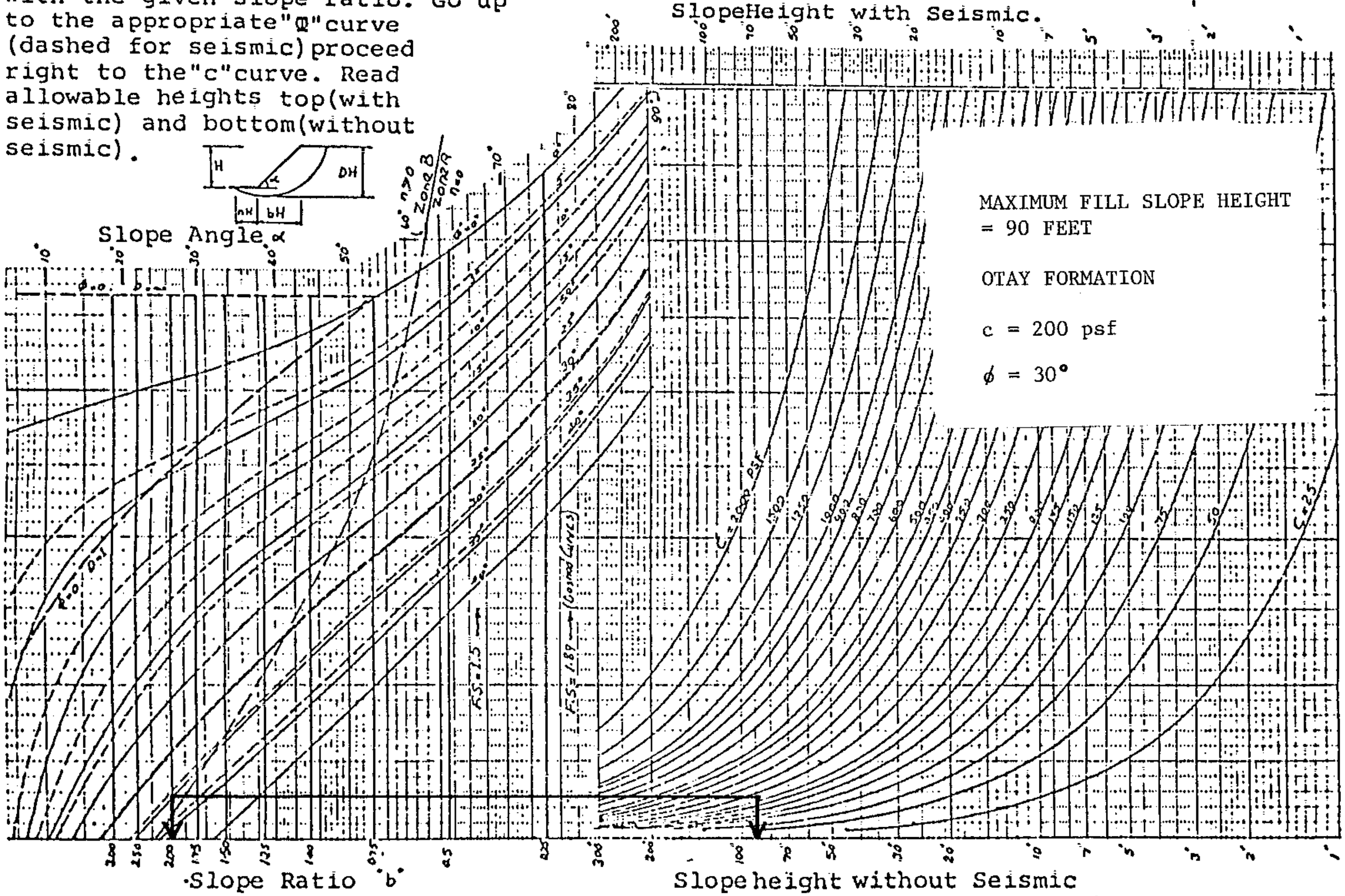
Figure 1

Figure 15

SLOPE 'DESIGN

Statistical analysis of 255 trial circles reveals that use of a factor of safety of 1.89 and Taylor's charts is not significantly different from the use of a factor of safety of 1.5 and a seismic load of 0.1G .The chart below,is based on factors of safety of 1.5 and 1.89 and Taylor's chart.

Enter the chart from the bottom left with the given slope ratio. Go up to the appropriate"Φ"curve (dashed for seismic) proceed right to the"c"curve. Read allowable heights top(with seismic) and bottom(without seismic).



MAXIMUM FILL SLOPE HEIGHT
= 90 FEET

OTAY FORMATION

c = 200 psf

ϕ = 30°

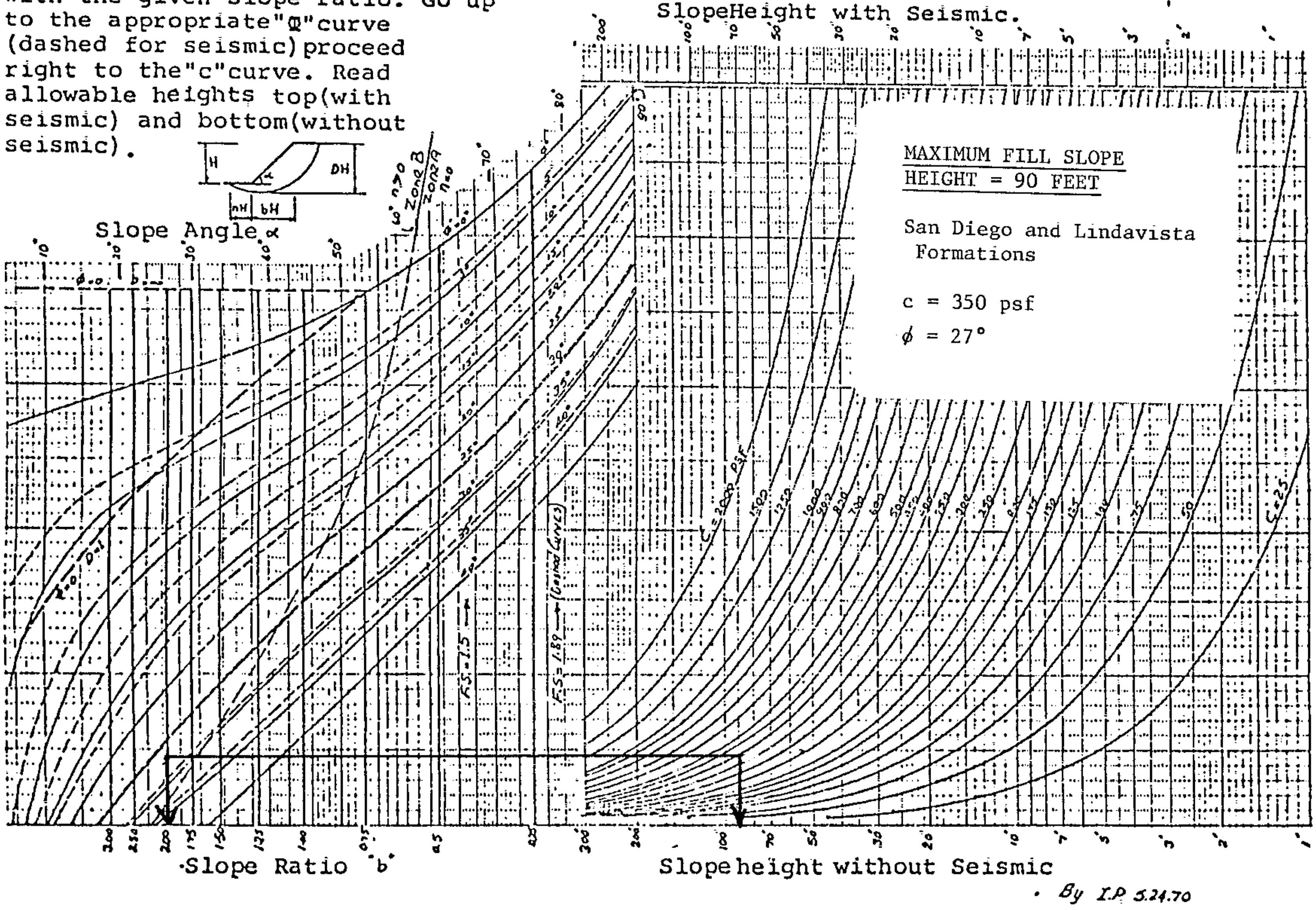
• By I.P. 5.24.70

File No. D-4228-M01
March 3 1989

SLOPE DESIGN

Statistical analysis of 255 trial circles reveals that use of a factor of safety of 1.89 and Taylor's charts is not significantly different from the use of a factor of safety of 1.5 and a seismic load of 0.1G .The chart below,is based on factors of safety of 1.5 and 1.89 and Taylor's chart.

Enter the chart from the bottom left with the given slope ratio. Go up to the appropriate"Ø"curve (dashed for seismic) proceed right to the"c"curve. Read allowable heights top(with seismic) and bottom(without seismic).



MAXIMUM FILL SLOPE
HEIGHT = 90 FEET

San Diego and Lindavista Formations

c = 350 psf

ϕ = 27°

Figure 14

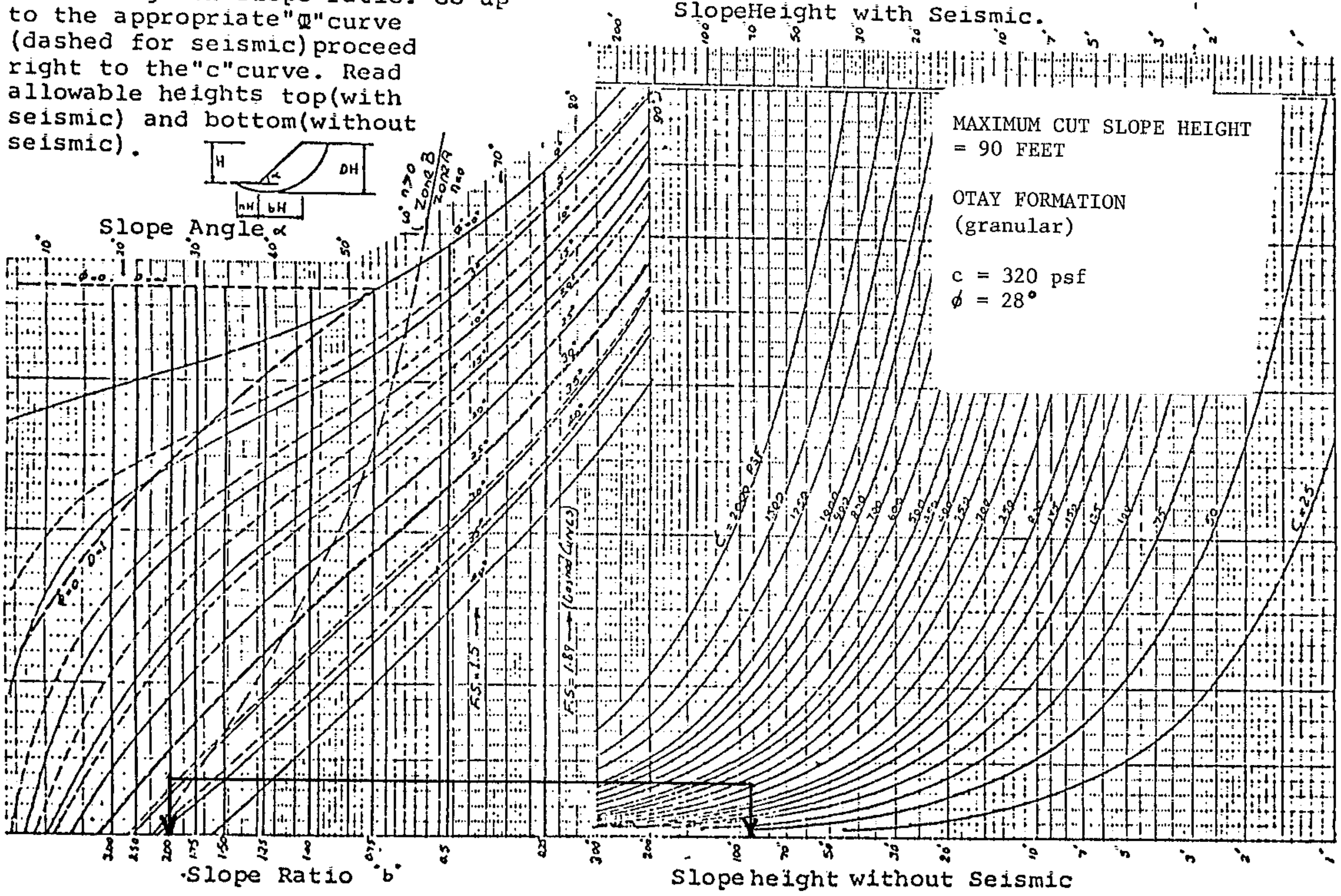
File No. D-4228-M01
March 3, 1989

Figure 17

SLOPE DESIGN

Statistical analysis of 255 trial circles reveals that use of a factor of safety of 1.89 and Taylor's charts is not significantly different from the use of a factor of safety of 1.5 and a seismic load of 0.1G .The chart below,is based on factors of safety of 1.5 and 1.89 and Taylor's chart.

Enter the chart from the bottom left with the given slope ratio. Go up to the appropriate"Φ"curve (dashed for seismic)proceed right to the"c"curve. Read allowable heights top(with seismic) and bottom(without seismic).



MAXIMUM CUT SLOPE HEIGHT
= 90 FEET

OTAY FORMATION
(granular)

c = 320 psf
ϕ = 28°

By I.P 5.24.70

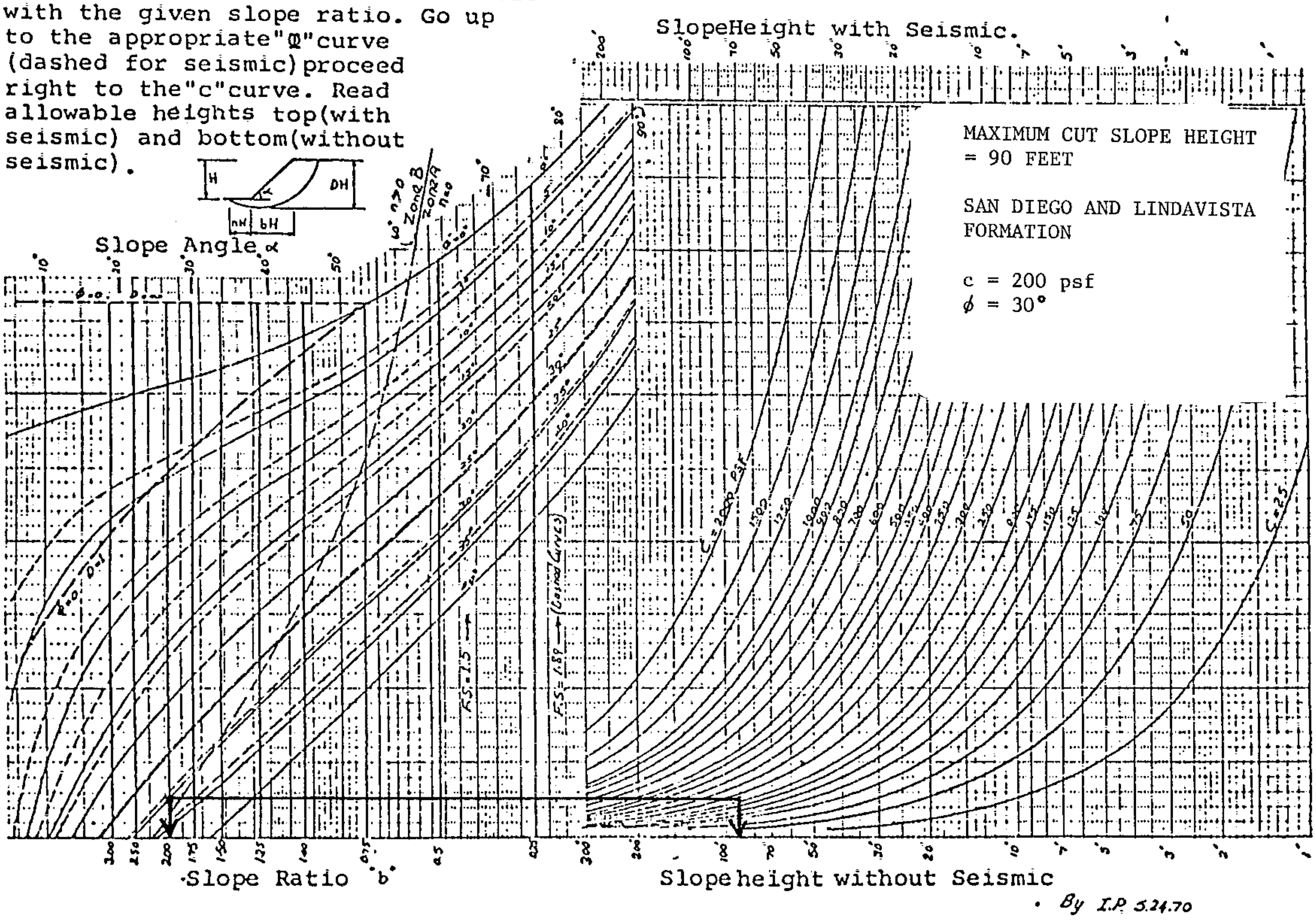
File No. D-4228-M01
March 3, 1989

SLOPE DESIGN

Figure 16

Statistical analysis of 255 trial circles reveals that use of a factor of safety of 1.89 and Taylor's charts is not significantly different from the use of a factor of safety of 1.5 and a seismic load of 0.1G .The chart below, is based on factors of safety of 1.5 and 1.89 and Taylor's chart.

Enter the chart from the bottom left with the given slope ratio. Go up to the appropriate "Ø" curve (dashed for seismic) proceed right to the "c" curve. Read allowable heights top (with seismic) and bottom (without seismic).



MAXIMUM CUT SLOPE HEIGHT
= 90 FEET

SAN DIEGO AND LINDAVISTA
FORMATION

c = 200 psf
ϕ = 30°

By I.P. 5.24.70

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

The field investigation was performed on October 3 through 17, 1988 and January 3 through 5, 1989, consisted of a site reconnaissance by an engineering geologist, the excavation of 9 exploratory borings, and 29 exploratory trenches. In addition, 10 long trenches were excavated to intercept possible fault traces (Figures 5 through 11). The borings were advanced to depths ranging from 26 to 110 feet using a truck-mounted caisson-type drill rig equipped with a 30-inch-wide bucket auger. The approximate locations of the excavations are shown on Figures 2 and 3. The soils encountered were continuously observed, visually classified and logged. Logs of the test borings, trenches and fault trenches are included herein. The logs depict the various soil types encountered and indicate the depths at which samples were obtained.

The exploratory borings were excavated by a Caldweld truck-mounted drill rig equipped with a 30-inch-diameter bucket auger. As drilling proceeded, relatively undisturbed drive samples and disturbed bulk samples were obtained at various depths in the borings and returned to our laboratory for testing. The relatively undisturbed samples were obtained by driving a 3-inch O.D. split-tube sampler into the undisturbed soil mass with blows from the Kelly bar. The exploration trenches and fault trenches were performed by means of a 555 John Deere hydraulic backhoe mounted on a tractor equipped with a 24-inch bucket.

File No. D-4228-M01
March 3, 1989

BORING 1
ELEVATION 455 DATE DRILLED 11/16/88
EQUIPMENT E-100 30" Rotary Bucket

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0								
2				SM/SP	SAN DIEGO FORMATION Dense, moist, light tan-gray, Silty very fine SANDSTONE, micaceous, lenses of friable sandstone			
4								
6								
8								
10	B1-1 ■					5	98.6	7.4
12								
14								
16	B1-2 ☒						BULK SAMPLE	
18					Dense, moist, light orange-brown, Silty very fine SANDSTONE			
20								
22								
24								
26								
28								
30								

Figure A-1, Log of Test Boring 1

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
◧ — STANDARD PENETRATION TEST
■ — DRIVE SAMPLE (UNDISTURBED)
☒ — DISTURBED OR BAG SAMPLE
◪ — CHUNK SAMPLE
▼ — WATER TABLE OR SEEPAGE

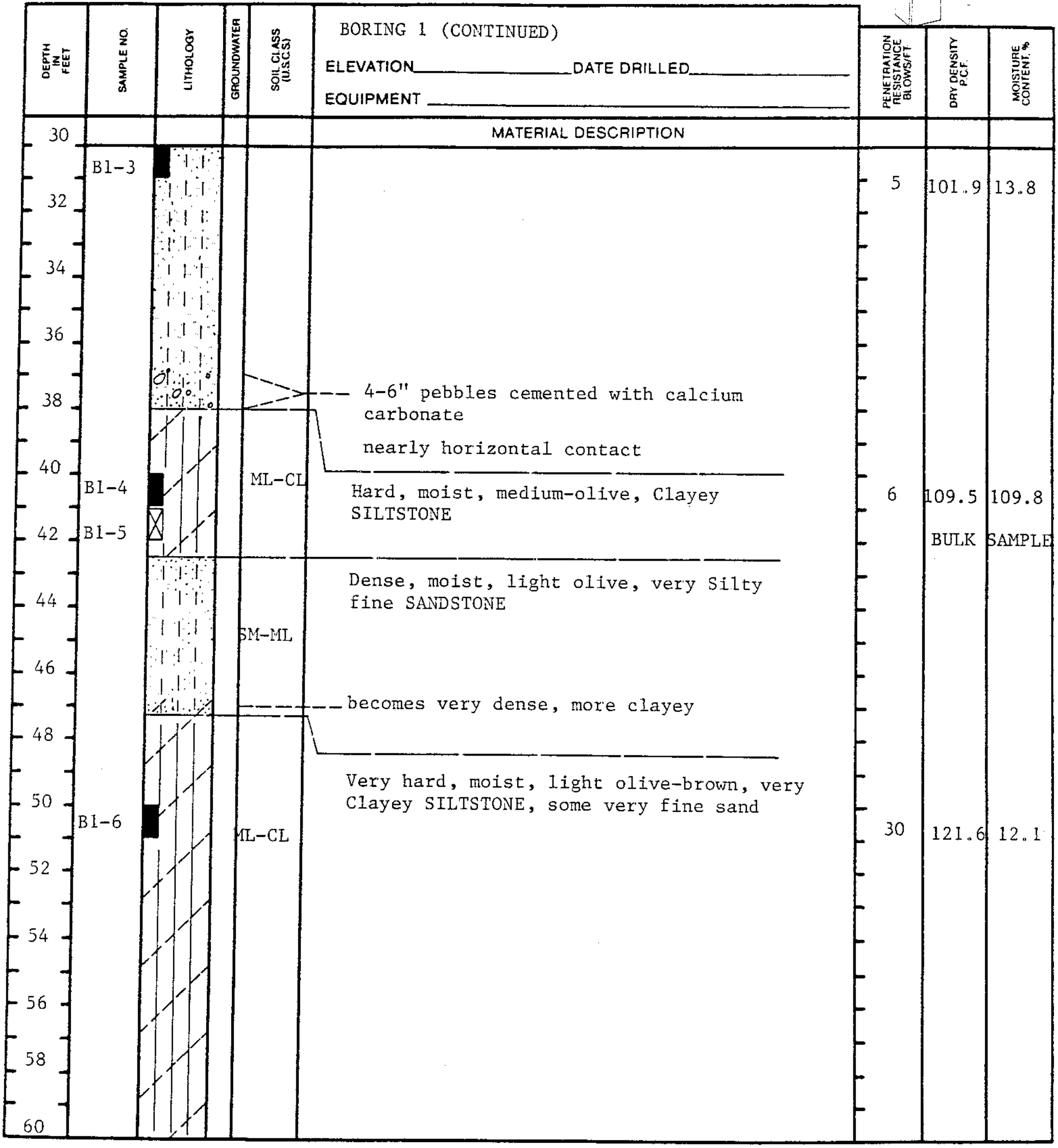
NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 1 (CONTINUED)

ELEVATION ______ DATE DRILLED ______

EQUIPMENT ______



SAMPLE NO.	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
B1-3			5	101.9	13.8
		4-6" pebbles cemented with calcium carbonate			
		nearly horizontal contact			
B1-4	ML-CL	Hard, moist, medium-olive, Clayey SILTSTONE	6	109.5	109.8
B1-5				BULK	SAMPLE
	SM-ML	Dense, moist, light olive, very Silty fine SANDSTONE			
		becomes very dense, more clayey			
B1-6	ML-CL	Very hard, moist, light olive-brown, very Clayey SILTSTONE, some very fine sand	30	121.6	12.1

Figure A-2, Log of Test Boring 1

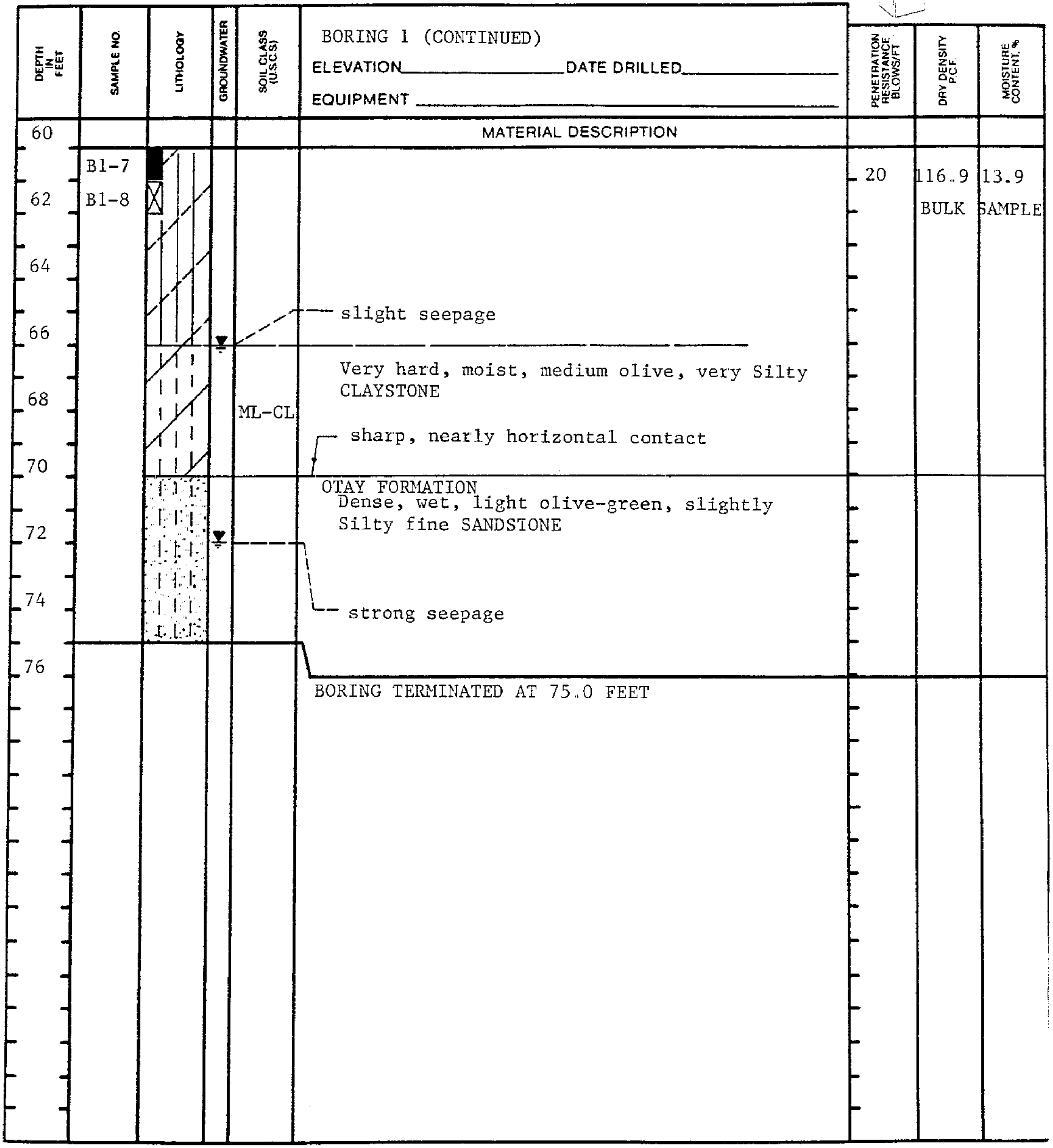
BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989



BORING 1 (CONTINUED)

ELEVATION ____________ DATE DRILLED ____________

EQUIPMENT ____________

MATERIAL DESCRIPTION

slight seepage

Very hard, moist, medium olive, very Silty CLAYSTONE

sharp, nearly horizontal contact

OTAY FORMATION

Dense, wet, light olive-green, slightly Silty fine SANDSTONE

strong seepage

BORING TERMINATED AT 75.0 FEET

Figure A-3, Log of Test Boring 1

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

NOTE. THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 2
ELEVATION 474 DATE DRILLED 11/16/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0				SM	TOPSOIL Medium dense to dense, humid, light orange tan, Silty fine to coarse SAND with some cobbles, little clay			
2								
4				SM	LINDAVISTA FORMATION Dense, humid, orange, Silty fine to coarse SANDSTONE, cemented in layers, with pebbles			
6					cemented			
8					transition zone, undulating contact dipping approximately 7°S			
19	B2-1			SM	SAN DIEGO FORMATION Dense, humid, light gray, Silty fine SANDSTONE, micaceous	5	104.5	8.9
12								
14					pebbles			
16					friable cobble and sand layer			
18					friable cobble and sand layer very micaceous			
20					laminated bedding			
22					cobble layer with biotite rich basal layer			
24					cemented layer with cobbles and sand			
26								
28					cemented sandstone layer			
30								

Figure A-4, Log of Test Boring 2

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

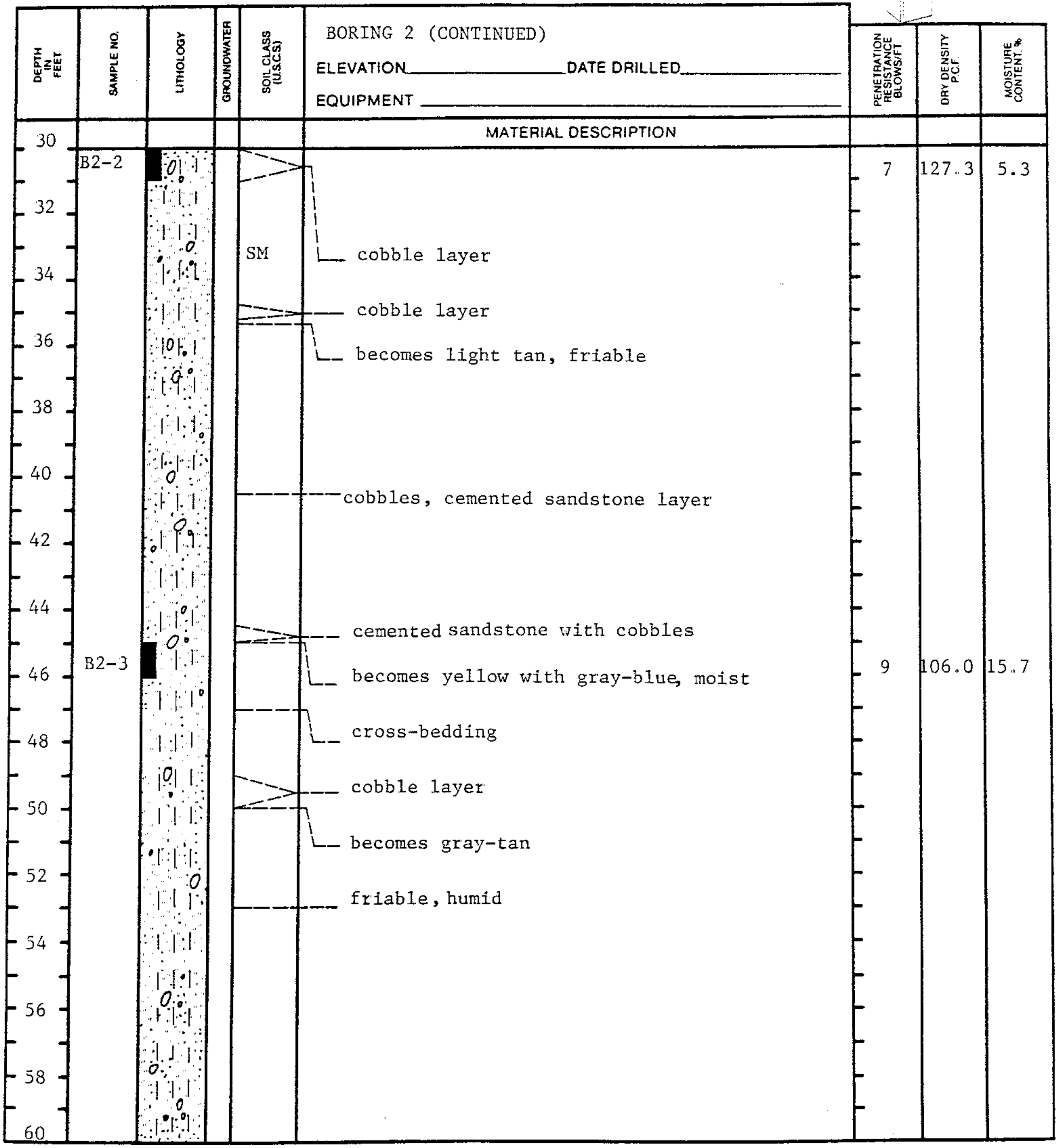
NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 2 (CONTINUED)

ELEVATION ____________ DATE DRILLED ____________

EQUIPMENT ____________



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT %
	B2-2					7	127.3	5.3
				SM	cobble layer			
					cobble layer			
					becomes light tan, friable			
					cobbles, cemented sandstone layer			
					cemented sandstone with cobbles			
	B2-3				becomes yellow with gray-blue, moist	9	106.0	15.7
					cross-bedding			
					cobble layer			
					becomes gray-tan			
					friable, humid			

Figure A-5, Log of Test Boring 2

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

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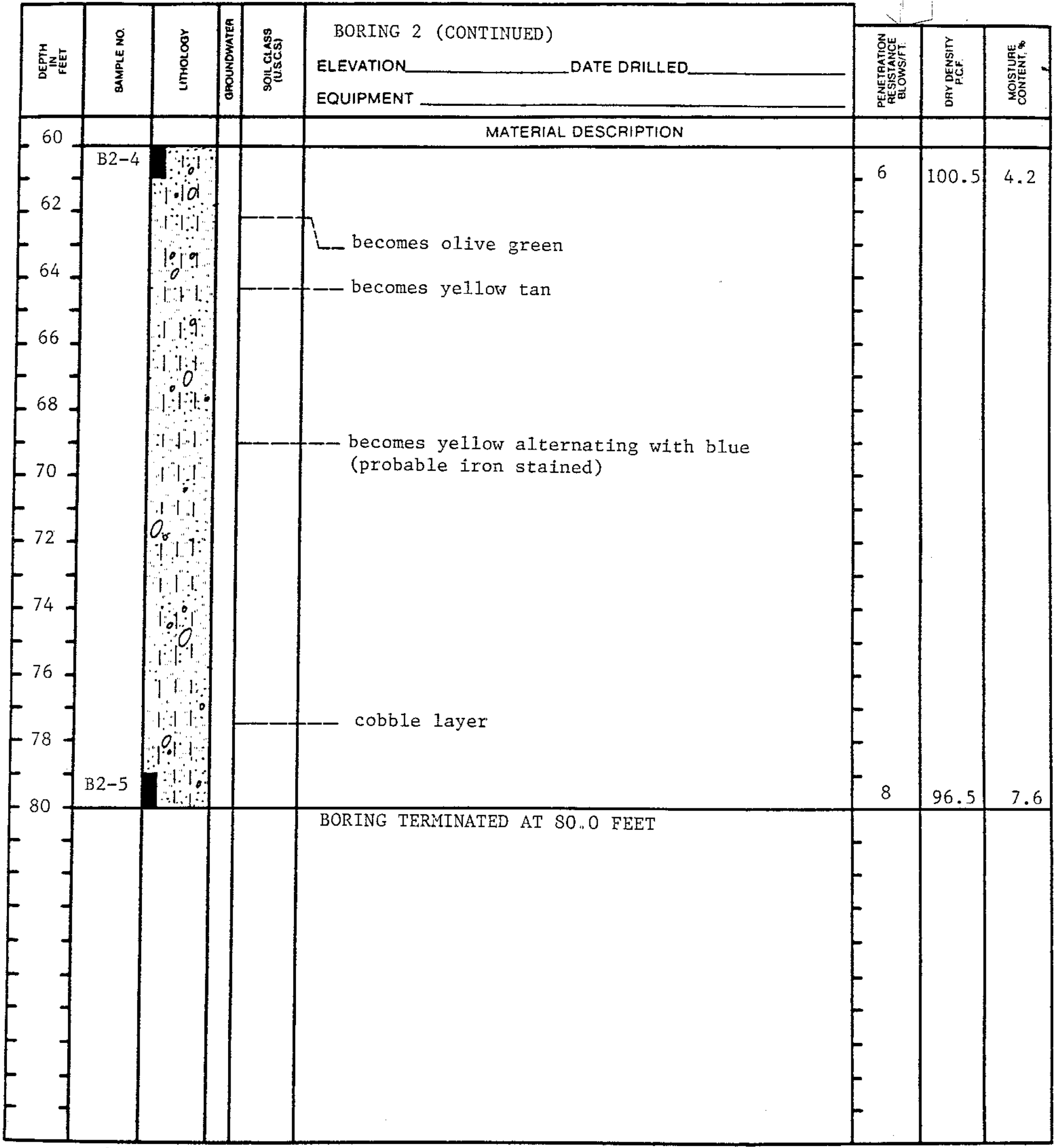
File No. D-4228-M01
March 3, 1989

BORING 2 (CONTINUED)

ELEVATION__________ DATE DRILLED__________

EQUIPMENT__________



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
60	B2-4	■				6	100.5	4.2
62					becomes olive green			
64					becomes yellow tan			
66								
68					becomes yellow alternating with blue (probable iron stained)			
70								
72								
74								
76								
78					cobble layer			
80	B2-5	■				8	96.5	7.6
					BORING TERMINATED AT 80.0 FEET			

Figure A-6, Log of Test Boring 2

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL

☒ — DISTURBED OR BAG SAMPLE

◧ — STANDARD PENETRATION TEST

◩ — CHUNK SAMPLE

■ — DRIVE SAMPLE (UNDISTURBED)

▽ — WATER TABLE OR SEEPAGE

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File No. D-4228-M01
March 3, 1989

BORING 3
ELEVATION 486 DATE DRILLED 11/14/88
EQUIPMENT E-120 30" Rotary Bucket

SAMPLE NO.	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
	CL	COLLUVIUM Hard, moist, dark brown, Gravelly CLAY			
B3-1				BULK SAMPLE	
B3-2	SM	LINDAVISTA FORMATION Medium dense, humid, light brown-orange, Silty Gravelly coarse SANDSTONE	2	108.4	8.5
B3-3				BULK SAMPLE	
	SM-GM	Dense, moist, light tan-orange, Silty fine to coarse very Gravelly SANDSTONE			
		sharp depositional contact - nearly horizontal			
B3-4	SM	SAN DIEGO FORMATION Dense, humid, tan-orange, Silty fine SANDSTONE	4	106.1	5.5
		becomes light gray-brown, micaceous			
		cobble-pebble-gravel layer			
		2-3" calcium carbonate cemented bed (horizontal)			
		becomes light brown with scattered pebble, gravels, cross-bedded.			
B3-5			5	97.3	8.4
B3-6				BULK SAMPLE	
		6" pebbly cemented sandstone bed (horizontal)			

Figure A-7, Log of Test Boring 3

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
≚ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 3 (CONTINUED)

ELEVATION__________ DATE DRILLED__________

EQUIPMENT__________

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
30								
32					6" pebble conglomerate bed (horzontal)			
34					becomes reddish brown-orange, some clay			
36	■ B3-7			SM-SW	Dense, humid, light reddish-brown, Silty medium to coarse SANDSTONE, grit, well-graded between fine and very coarse	7	126.0	3.8
40					12" calcium carbonate cemented and fossil shell layer			
42				SW	Dense, damp to moist, light brown, fine to coarse SANDSTONE, noncohesive, occasional shells, micaceous			
46	■ B3-8					4	111.7	1.7
	☒ B3-9				very coarse sandstone, friable, with fossil shells		BULK SAMPLE	
50				SM	Dense, humid, light brown-tan, Silty fine SANDSTONE, alternating fine-grained, and coarse-grained thin lenticular beds			
56	■ B3-10					3	95.7	5.2
58				SM	Dense, moist, light orange, Silty very fine SANDSTONE			
60								

Figure A-8, Log of Test Boring 3

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS

- ☐ — SAMPLING UNSUCCESSFUL
- ☒ — DISTURBED OR BAG SAMPLE
- ◧ — STANDARD PENETRATION TEST
- ◩ — CHUNK SAMPLE
- ■ — DRIVE SAMPLE (UNDISTURBED)
- ▽ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No D-4228-M01
March 3, 1989

BORING 3 (CONTINUED)

ELEVATION ____________ DATE DRILLED ____________

EQUIPMENT ____________

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT %
60						
64			irregular scour-contact with breccia			
66	B3-11			7	105.3	14.6
		SH-ML ML	OTAY FORMATION Dense, moist, light brown, very Silty, very fine SANDSTONE			
68	B3-12	CH			BULK SAMPLE	
70			2"± clayey-sandy siltstone			
72		SM-ML	1-5" bentonite (white-pink) clay lense bed E-W, 30°N			
74		ML	Hard, moist, light brown, Clayey-Sandy SILTSONTE; slightly micaceous			
76	B3-13			10	122.0	11.4
	B3-14				BULK SAMPLE	
80			fault contact; N75E, 40-60° N, 1/16" to 1/8" slickensided clay gouge oblique striation,steep to E			
84		ML-CL	Hard, moist, light olive-brown, very Silty CLAYSIONE to Clayey SILISTONE			
86	B3-15			10	120.0	13.4
	B3-16				BULK SAMPLE	
90						

Figure A-9, Log of Test Boring 3

BORING CONTINUED NEXT PAGE

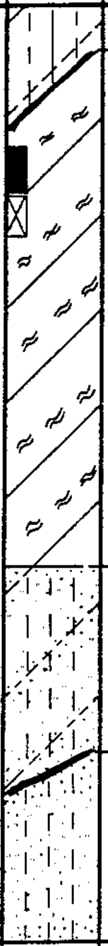
SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▼ — WATER TABLE OR SEEPAGE

File No. D-4228-M01
March 3, 1989

BORING 3 (CONTINUED)

ELEVATION ____________ DATE DRILLED ____________

EQUIPMENT ____________



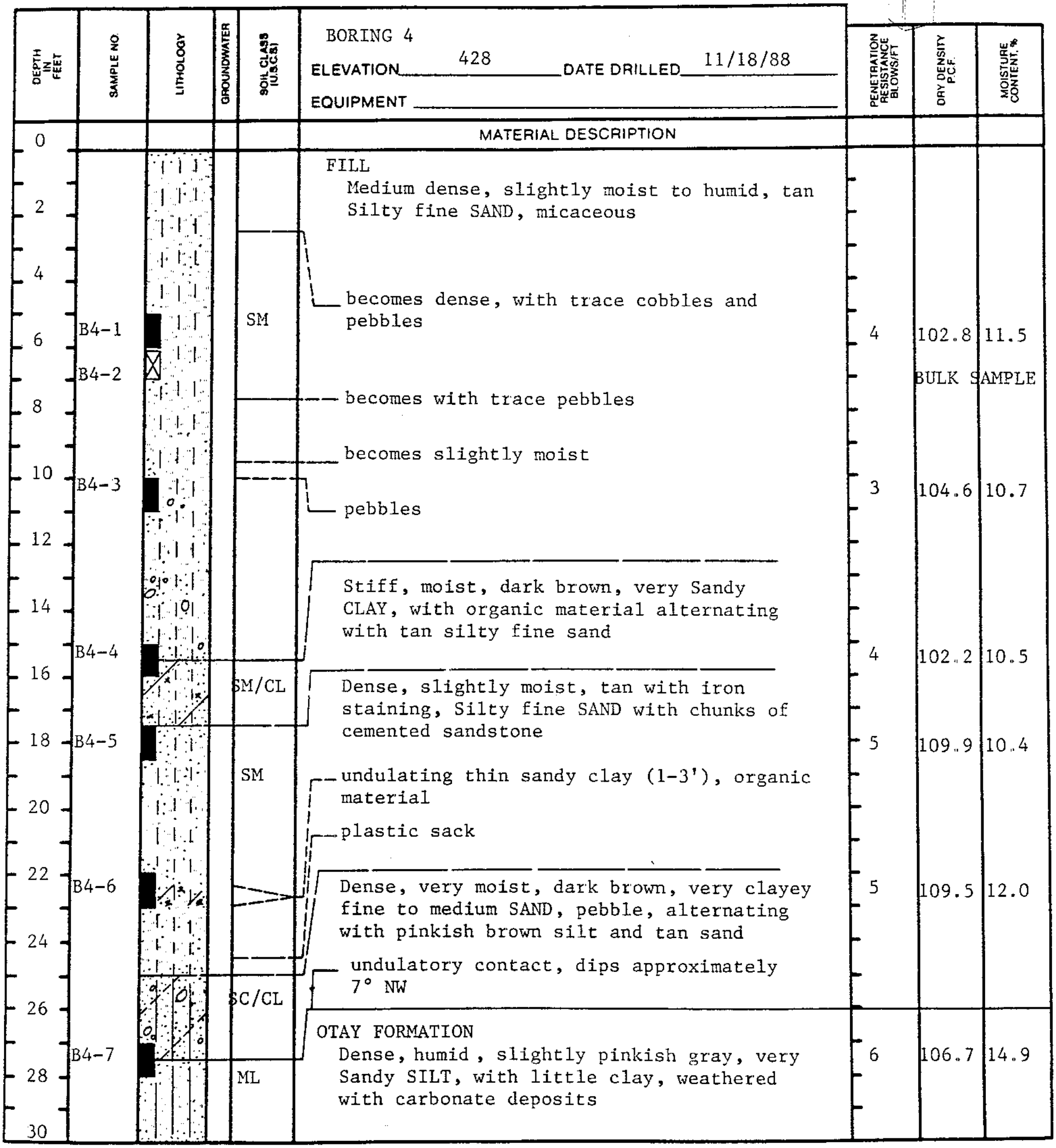
DEPTH IN FEET	SAMPLE NO.	GROUNDWATER	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
90				fault contact; N65E; 1/16-1/8" slickens, clay gouge			
92	B3-17 ■		CL-CH	FAULT ZONE Stiff, wet, medium to light olive, CLAYSTONE random slickensided fractures, remolded zones related to faulting; many shears strike N40-60W, dipping 60-80°NE highly polished	7	89.8	33.2
94	B3-18 ☒					BULK SAMPLE	
98				waxy green-gray bentonite			
102			SM-SC	Dense, humid, tan, Silty fine SANDSTONE, grading into sandy clay at base			
106				fault contact N55E39NW remolded gray bentonitic clay approximately 1" thick			
108			SM	OTAY FORMATION Dense, humid, gray, Silty, fine to medium SANDSTONE, friable, micaceous			
110				BORING TERMINATED AT 110 FEET			

Figure A-10, Log of Test Boring 3

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989



BORING 4
ELEVATION 428 DATE DRILLED 11/18/88
EQUIPMENT

SAMPLE NO.	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
	SM	FILL Medium dense, slightly moist to humid, tan Silty fine SAND, micaceous			
		becomes dense, with trace cobbles and pebbles			
B4-1			4	102.8	11.5
B4-2				BULK SAMPLE	
		becomes with trace pebbles			
		becomes slightly moist			
B4-3		pebbles	3	104.6	10.7
		Stiff, moist, dark brown, very Sandy CLAY, with organic material alternating with tan silty fine sand			
B4-4	SM/CL		4	102.2	10.5
		Dense, slightly moist, tan with iron staining, Silty fine SAND with chunks of cemented sandstone			
B4-5	SM		5	109.9	10.4
		undulating thin sandy clay (1-3'), organic material			
		plastic sack			
B4-6		Dense, very moist, dark brown, very clayey fine to medium SAND, pebble, alternating with pinkish brown silt and tan sand	5	109.5	12.0
		undulatory contact, dips approximately 7° NW			
	SC/CL	OTAY FORMATION Dense, humid, slightly pinkish gray, very Sandy SILT, with little clay, weathered with carbonate deposits			
B4-7	ML		6	106.7	14.9

Figure A-11, Log of Test Boring 4

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
▮ — STANDARD PENETRATION TEST
■ — DRIVE SAMPLE (UNDISTURBED)
☒ — DISTURBED OR BAG SAMPLE
◪ — CHUNK SAMPLE
≚ — WATER TABLE OR SEEPAGE

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File No. D-4228-M01
March 3, 1989

BORING 4 (CONTINUED)
ELEVATION ______ DATE DRILLED ______
EQUIPMENT ______

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT %
30								
32	B4-8	■		SM	Very dense, humid, slightly pinkish brown, Silty, fine to medium SANDSTONE, strongly cemented in places	12/ 6"	110.6	8.4
34					becomes white to tan, fine to coarse			
36				ML	Hard, humid, tan, Sandy SILTSTONE			
38	B4-9	■				10/ 6"	119.3	6.5
	B4-10	☒					BULK SAMPLE	
40					BORING TERMINATED AT 39.0 FEET			

Figure A-12, Log of Test Boring 4

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

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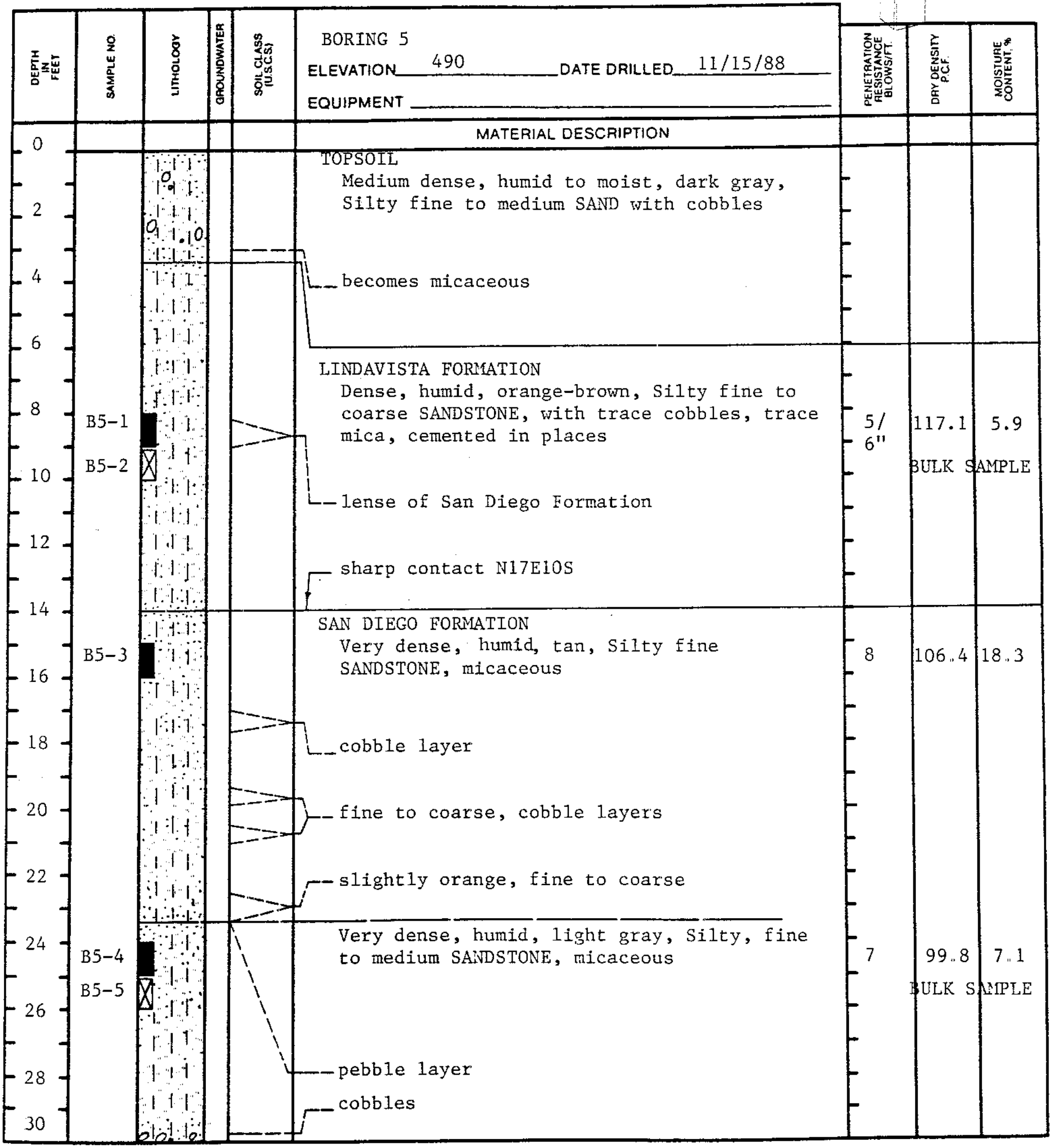
File No. D-4228-M01
March 3, 1989

BORING 5
ELEVATION 490 DATE DRILLED 11/15/88
EQUIPMENT



DEPTH IN FEET	SAMPLE NO.	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0		TOPSOIL Medium dense, humid to moist, dark gray, Silty fine to medium SAND with cobbles			
4		becomes micaceous			
6		LINDAVISTA FORMATION Dense, humid, orange-brown, Silty fine to coarse SANDSTONE, with trace cobbles, trace mica, cemented in places			
8	B5-1		5/ 6"	117.1	5.9
10	B5-2			BULK SAMPLE	
		lense of San Diego Formation			
12		sharp contact N17E10S			
14		SAN DIEGO FORMATION Very dense, humid, tan, Silty fine SANDSTONE, micaceous			
16	B5-3		8	106.4	18.3
18		cobble layer			
20		fine to coarse, cobble layers			
22		slightly orange, fine to coarse			
24	B5-4	Very dense, humid, light gray, Silty, fine to medium SANDSTONE, micaceous	7	99.8	7.1
	B5-5			BULK SAMPLE	
26					
28		pebble layer			
30		cobbles			

Figure A-13, Log of Test Boring 5

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
▮ — STANDARD PENETRATION TEST
■ — DRIVE SAMPLE (UNDISTURBED)
☒ — DISTURBED OR BAG SAMPLE
◪ — CHUNK SAMPLE
▽ — WATER TABLE OR SEEPAGE

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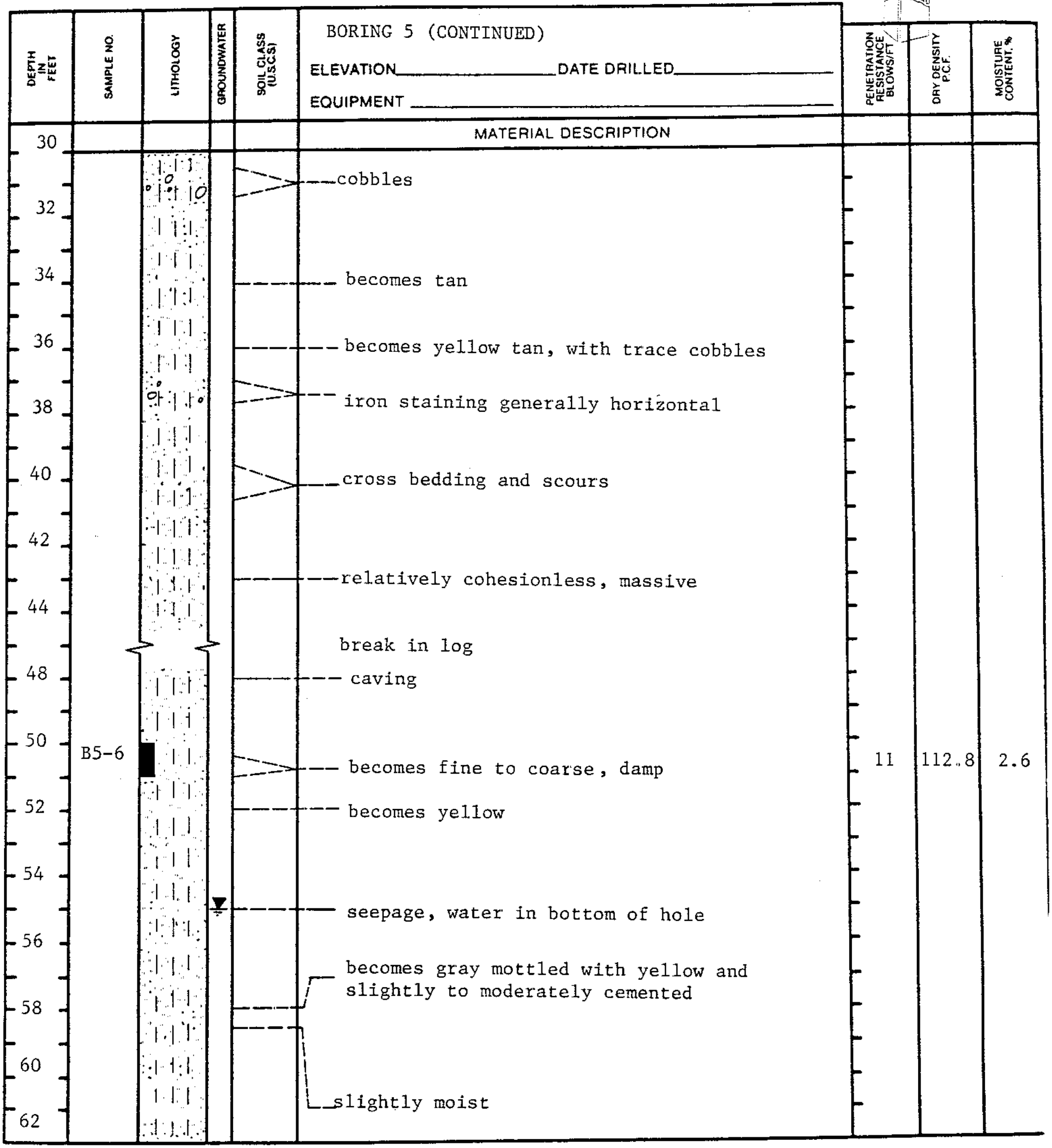
File No. D-4228-M01
March 3, 1989



BORING 5 (CONTINUED)

ELEVATION ______ DATE DRILLED ______

EQUIPMENT ______

cobbles

becomes tan

becomes yellow tan, with trace cobbles

iron staining generally horizontal

cross bedding and scours

relatively cohesionless, massive

break in log

caving

becomes fine to coarse, damp

becomes yellow

seepage, water in bottom of hole

becomes gray mottled with yellow and slightly to moderately cemented

slightly moist

Sample No.	Penetration Resistance Blows/Ft	Dry Density P.C.F.	Moisture Content, %
B5-6	11	112.8	2.6

Figure A-14, Log of Test Boring 5

BORING TERMINATED AT 62.0 FEET

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL

☒ — DISTURBED OR BAG SAMPLE

◧ — STANDARD PENETRATION TEST

◩ — CHUNK SAMPLE

■ — DRIVE SAMPLE (UNDISTURBED)

▼ — WATER TABLE OR SEEPAGE

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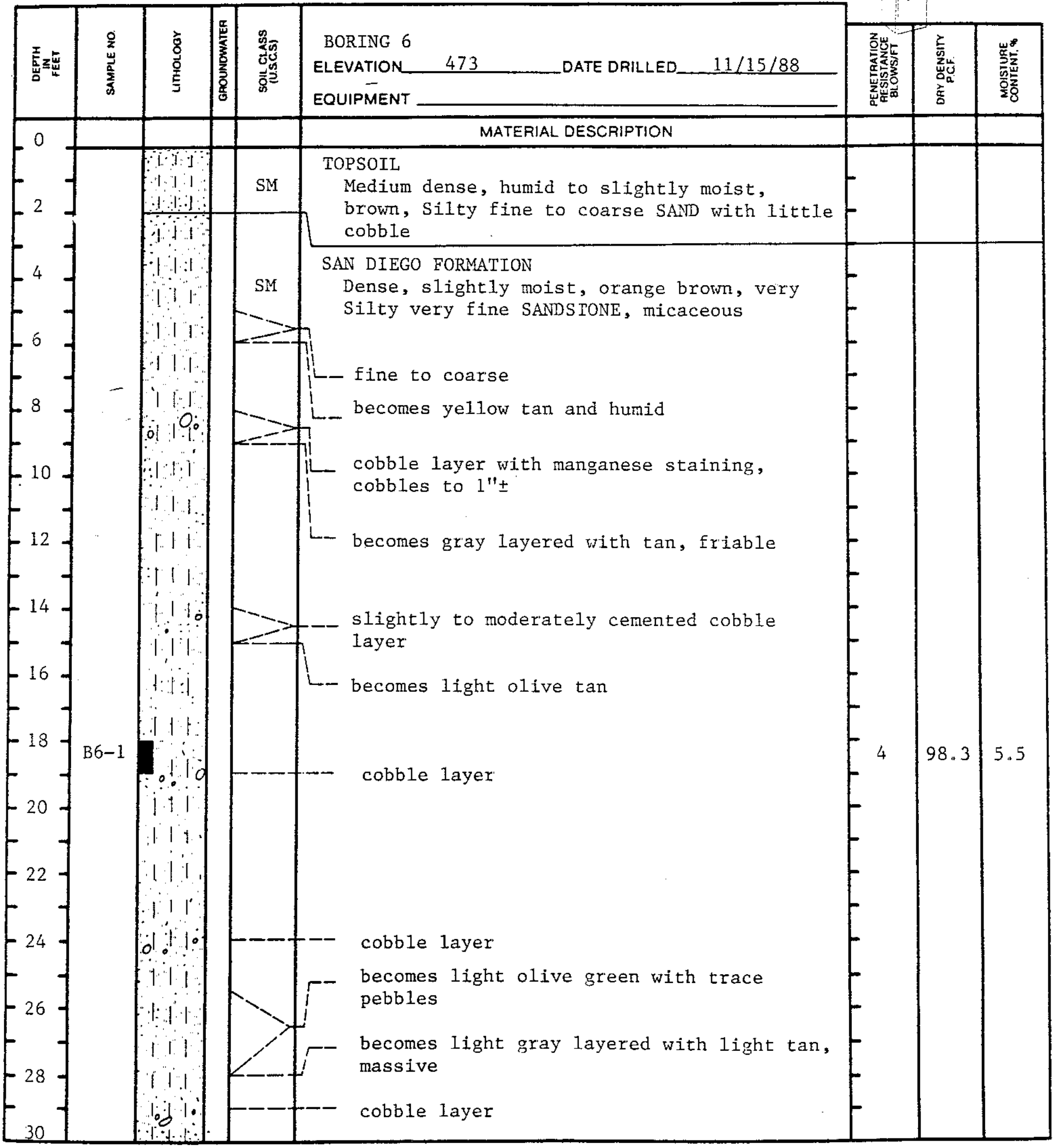
File No. D-4228-M01
March 3, 1989

BORING 6
ELEVATION 473 DATE DRILLED 11/15/88
EQUIPMENT ____



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0				SM	TOPSOIL Medium dense, humid to slightly moist, brown, Silty fine to coarse SAND with little cobble			
2								
4				SM	SAN DIEGO FORMATION Dense, slightly moist, orange brown, very Silty very fine SANDSTONE, micaceous			
6					fine to coarse			
8					becomes yellow tan and humid			
10					cobble layer with manganese staining, cobbles to 1"±			
12					becomes gray layered with tan, friable			
14					slightly to moderately cemented cobble layer			
16					becomes light olive tan			
18	B6-1	■			cobble layer	4	98.3	5.5
20								
22								
24					cobble layer			
26					becomes light olive green with trace pebbles			
28					becomes light gray layered with light tan, massive cobble layer			
30								

Figure A-15, Log of Test Boring 6

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◨ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 6 (CONTINUED)

ELEVATION________ DATE DRILLED________

EQUIPMENT ________

DEPTH IN FEET	SAMPLE NO.	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
30	B6-2	6	101.7	3.7
50	B6-3	10	100.3	6.3

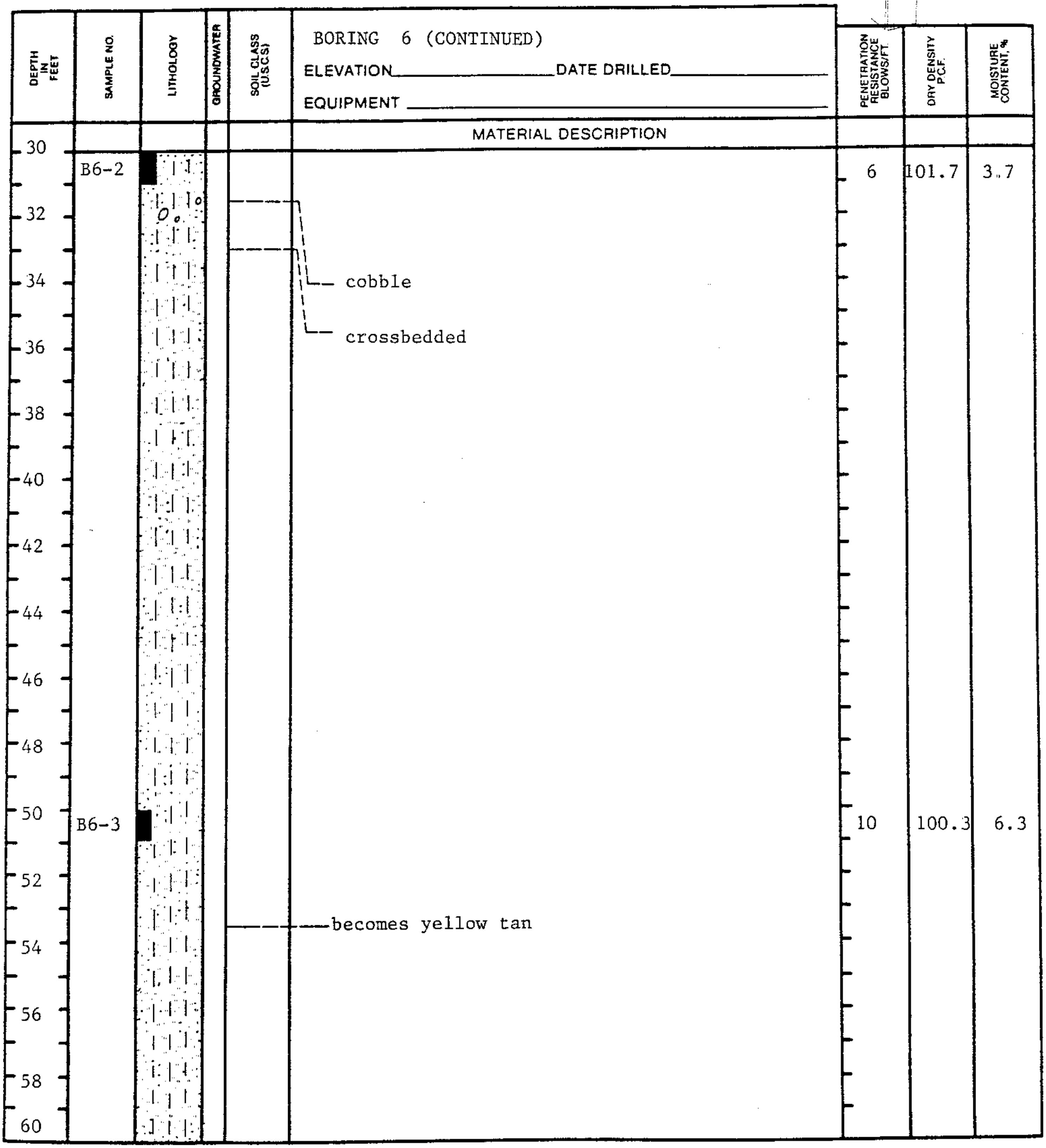


Figure A-16, Log of Test Boring 6

BORING TERMINATED AT 60.0 FEET

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL

◧ — STANDARD PENETRATION TEST

■ — DRIVE SAMPLE (UNDISTURBED)

☒ — DISTURBED OR BAG SAMPLE

◩ — CHUNK SAMPLE

▼ — WATER TABLE OR SEEPAGE

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File No. D-4228-M01
March 3, 1989

BORING 7
ELEVATION 445 DATE DRILLED 11/16/88
EQUIPMENT E-100 30" Rotary Bucket

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0				SM	TOPSOIL Loose, damp, dark brown, Silty fine SAND with gravel			
2								
4				SM-SW	LINDAVISTA FORMATION Dense, moist, medium orange Silty fine to coarse SANDSTONE			
6					cobble gravel layer			
8					gradational contact			
10	B7-1 ■			SM	SAN DIEGO FORMATION Very dense, humid, light brown-tan, Silty very fine SANDSTONE, micaceous	9	110.2	6.6
	B7-3 ☒						BULK	SAMPLE
12								
14					with pebbles and coarse grains			
16					cobble layer			
18					cobble layer			
20	B7-2 ■				becomes light gray	6/ 20"	100.9	9.8
22								
24					calcium-carbonate cemented fossiliferous sandstone layer, with little cobble			
26					BORING TERMINATED AT 26.0 FEET (REFUSAL)			

Figure A-17, Log of Test Boring 7

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▼ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 8
ELEVATION 419 DATE DRILLED 11/16/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT %
0								
2				SM	TOPSOIL Medium dense to dense, humid, orange, Silty fine to medium SAND, with trace roots, micaceous			
4								
6					SAN DIEGO FORMATION Dense, humid, light gray, Silty fine SANDSTONE, micaceous			
8								
					carbonate weathering, cobbles			
10	B8-1	■		SM	with little pebbles	4	99.9	10.4
12					cobbles			
					becomes olive green			
14					cemented fossiliferous sandstone layer with cobbles			
16					sandy lense			
18								
20	B8-2	■		SW	Medium dense, damp, tan, fine to coarse SAND, caving	2	-	1.8
22					becomes slightly silty and light olive green			
24					cemented sandstone lenses			
26								
28				SM	Dense, humid, light gray, Silty fine SANDSTONE			
30								

Figure A-18, Log of Test Boring 8

BORING CONTINUED NEXT PAGE

SAMPLE SYMBOLS			
	☐ — SAMPLING UNSUCCESSFUL	◨ — STANDARD PENETRATION TEST	■ — DRIVE SAMPLE (UNDISTURBED)
	☒ — DISTURBED OR BAG SAMPLE	◩ — CHUNK SAMPLE	≚ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

BORING 8 (CONTINUED)

ELEVATION ______ DATE DRILLED ______

EQUIPMENT ______

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
30								
32					becomes friable			
34					cemented fossiliferous sandstone layer			
36								
38					becomes yellow tan and gray blue, slightly moist, less friable			
40	B8-3	■				3	104.9	8.3
42								
44					becomes gray-tan, very friable			
46				SW SM	Medium dense, damp, gray, fine to coarse SAND, cohesionless			
48								
50					Dense, humid, yellow tan to gray, Silty fine SAND, micaceous, relatively cohesionless			
52	B8-4	■			pebbles	2		
54					pebbles			
56					becomes more cohesive, but still friable			
58								
60								

Figure A-19, Log of Test Boring 8

BORING CONIINUED NEXT PAGE

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▼ — WATER TABLE OR SEEPAGE

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File No. D-4228-M01
March 3, 1989

BORING 8 (CONTINUED)

ELEVATION ____________ DATE DRILLED ____________

EQUIPMENT ____________

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
60								
62	B8-5	■				7	102.3	8.8
64					becomes yellow tan			
66								
68								
70					becomes yellow tan mottled with blue			
72	B8-6	■				5	98.9	8.5
74								
76								
78					becomes light gray blue stained with iron			
80								
82	B8-7	■			cemented sandstone layer	8	103.2	9.1
84								
86					cemented sandstone layer			
					BORING TERMINATED AT 86.0 FEET (REFUSAL)			

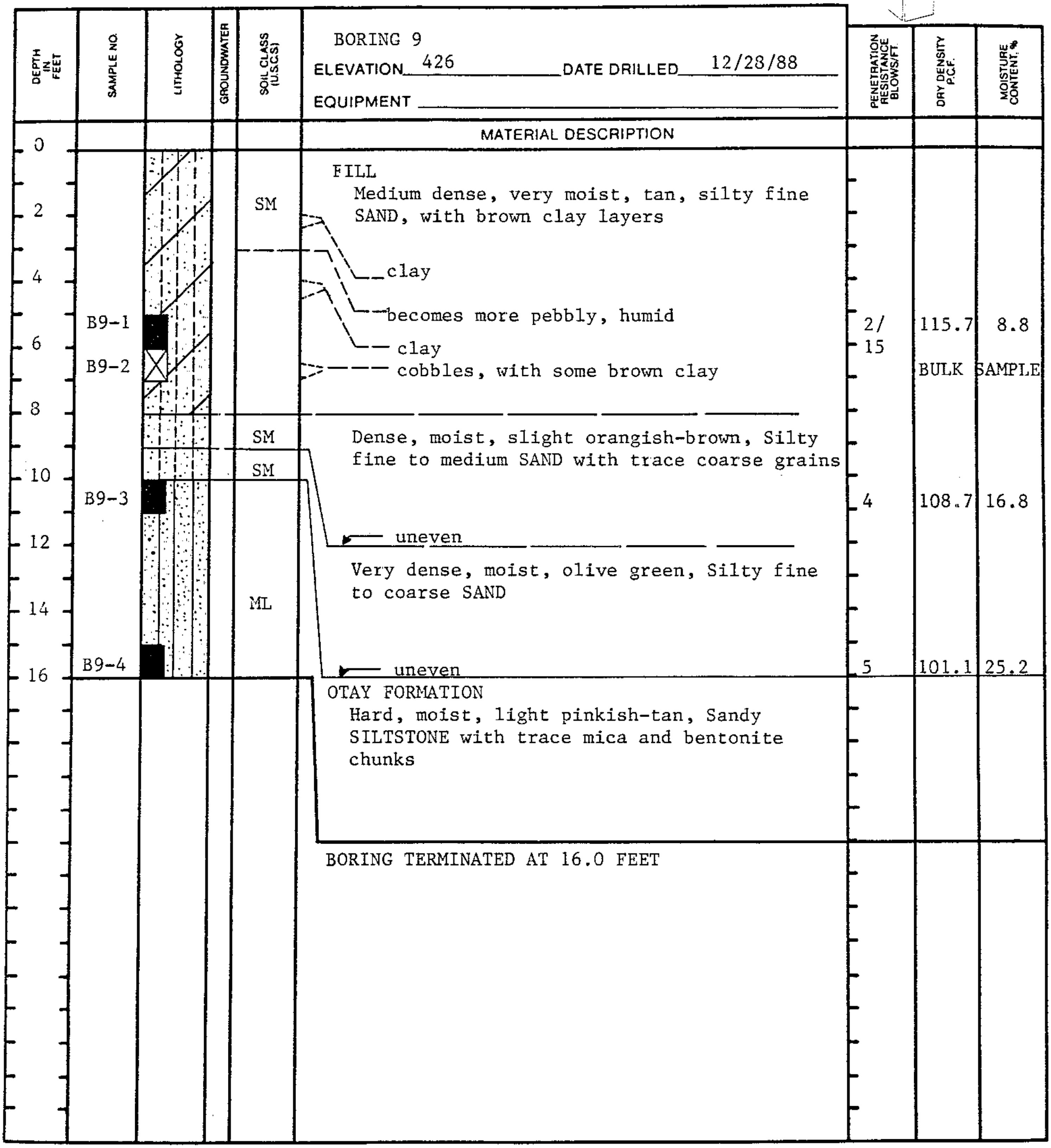
Figure A-20, Log of Test Boring 8

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
◧ — STANDARD PENETRATION TEST
■ — DRIVE SAMPLE (UNDISTURBED)
☒ — DISTURBED OR BAG SAMPLE
◩ — CHUNK SAMPLE
▽ — WATER TABLE OR SEEPAGE

NOTE. THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989



BORING 9
ELEVATION 426 DATE DRILLED 12/28/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0		SM	FILL Medium dense, very moist, tan, silty fine SAND, with brown clay layers			
4			clay becomes more pebbly, humid			
6	B9-1		clay	2/ 15	115.7	8.8
	B9-2		cobbles, with some brown clay		BULK	SAMPLE
8		SM	Dense, moist, slight orangish-brown, Silty fine to medium SAND with trace coarse grains			
10	B9-3	SM		4	108.7	16.8
12		ML	uneven Very dense, moist, olive green, Silty fine to coarse SAND			
16	B9-4		uneven	5	101.1	25.2
			OTAY FORMATION Hard, moist, light pinkish-tan, Sandy SILTSTONE with trace mica and bentonite chunks			

BORING TERMINATED AT 16.0 FEET

Figure A-21, Log of Test Boring 9

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

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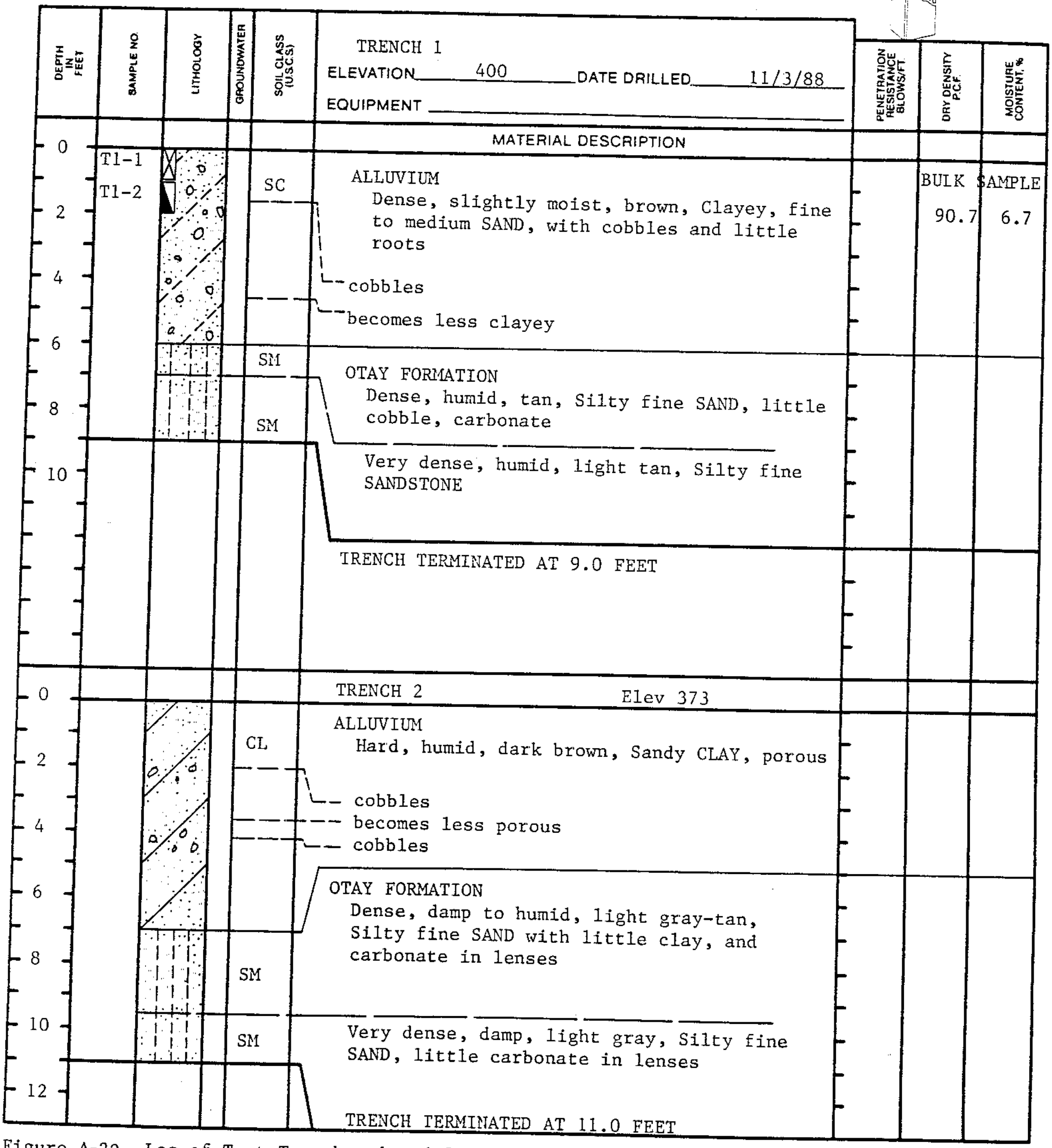
File No. D-4228-M01
March 3, 1989



TRENCH 1
ELEVATION 400 DATE DRILLED 11/3/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0	T1-1 ☒	SC	ALLUVIUM Dense, slightly moist, brown, Clayey, fine to medium SAND, with cobbles and little roots		BULK	SAMPLE
2	T1-2 ◪				90.7	6.7
4			cobbles			
6			becomes less clayey			
		SM	OTAY FORMATION Dense, humid, tan, Silty fine SAND, little cobble, carbonate			
8		SM	Very dense, humid, light tan, Silty fine SANDSTONE			
10			TRENCH TERMINATED AT 9.0 FEET			

TRENCH 2 Elev 373

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0		CL	ALLUVIUM Hard, humid, dark brown, Sandy CLAY, porous			
2			cobbles			
4			becomes less porous			
			cobbles			
6		SM	OTAY FORMATION Dense, damp to humid, light gray-tan, Silty fine SAND with little clay, and carbonate in lenses			
8						
10		SM	Very dense, damp, light gray, Silty fine SAND, little carbonate in lenses			
12			TRENCH TERMINATED AT 11.0 FEET			

Figure A-22, Log of Test Trenches 1 and 2

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

TRENCH 3
ELEVATION 347 DATE DRILLED 11/3/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0								
2	T3-1			CL	ALLUVIUM Hard, humid, dark gray-brown, Sandy CLAY, porous		94.5	4.0
4				SM	Medium dense, humid, dark brown, Silty fine SAND with little clay, moderately porous, carbonate			
6				CL	Very firm, slightly moist, dark brown, Sandy CLAY			
8					cobbles			
10				SM	OTAY FORMATION Medium dense, damp, very Silty, fine to medium SANDSTONE, much carbonate, patches of fine to coarse sand			
					TRENCH TERMINATED AT 10.0 FEET			

Figure A-23, Log of Test Trench 3

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

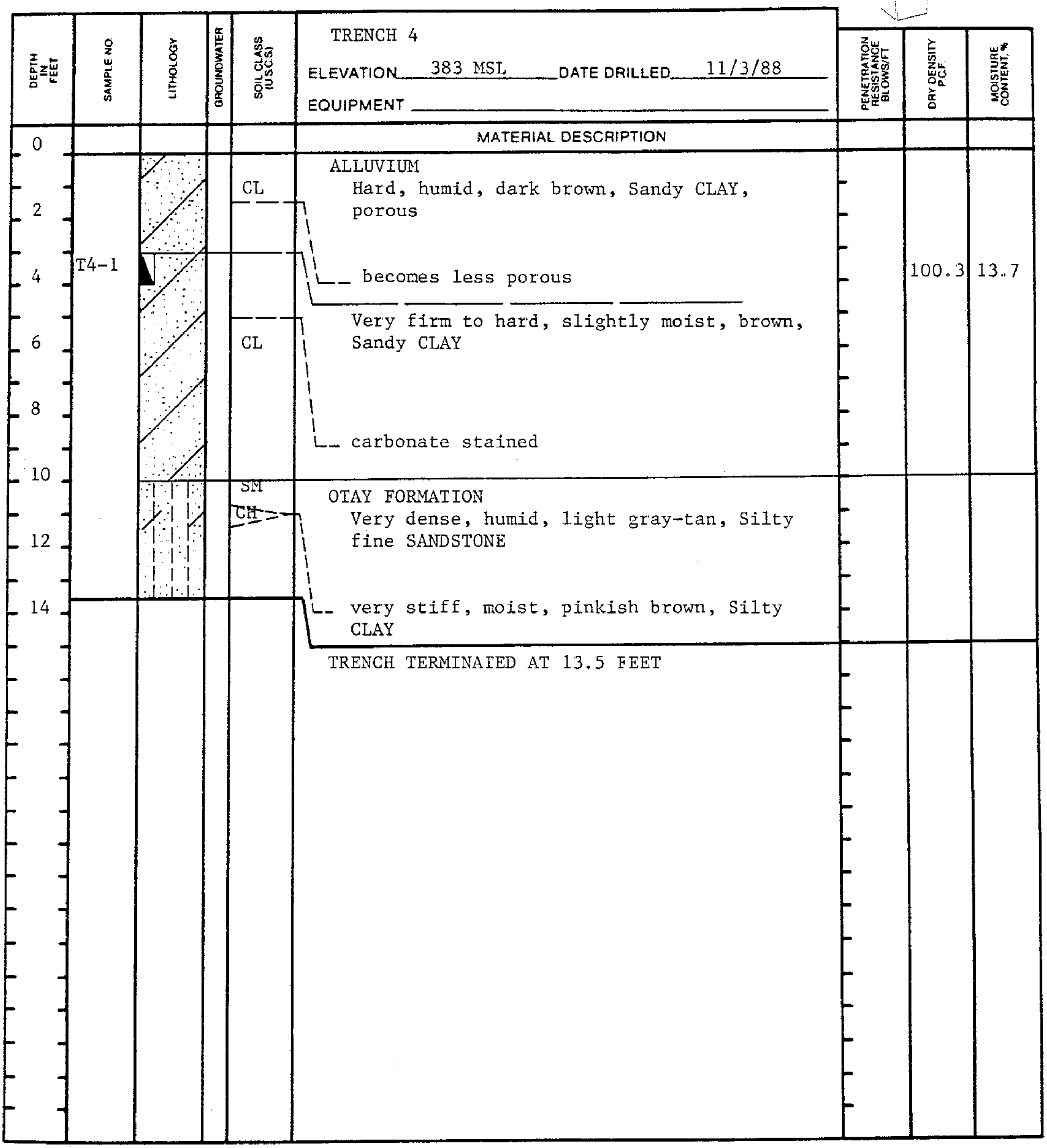
NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-M01
March 3, 1989

TRENCH 4

ELEVATION 383 MSL DATE DRILLED 11/3/88

EQUIPMENT



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0 2				CL	ALLUVIUM Hard, humid, dark brown, Sandy CLAY, porous			
4	T4-1				becomes less porous		100.3	13.7
6				CL	Very firm to hard, slightly moist, brown, Sandy CLAY			
8					carbonate stained			
10 12				SM	OTAY FORMATION Very dense, humid, light gray-tan, Silty fine SANDSTONE			
14				CH	very stiff, moist, pinkish brown, Silty CLAY			

TRENCH TERMINATED AT 13.5 FEET

Figure A-24, Log of Test Trench 4

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◨ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

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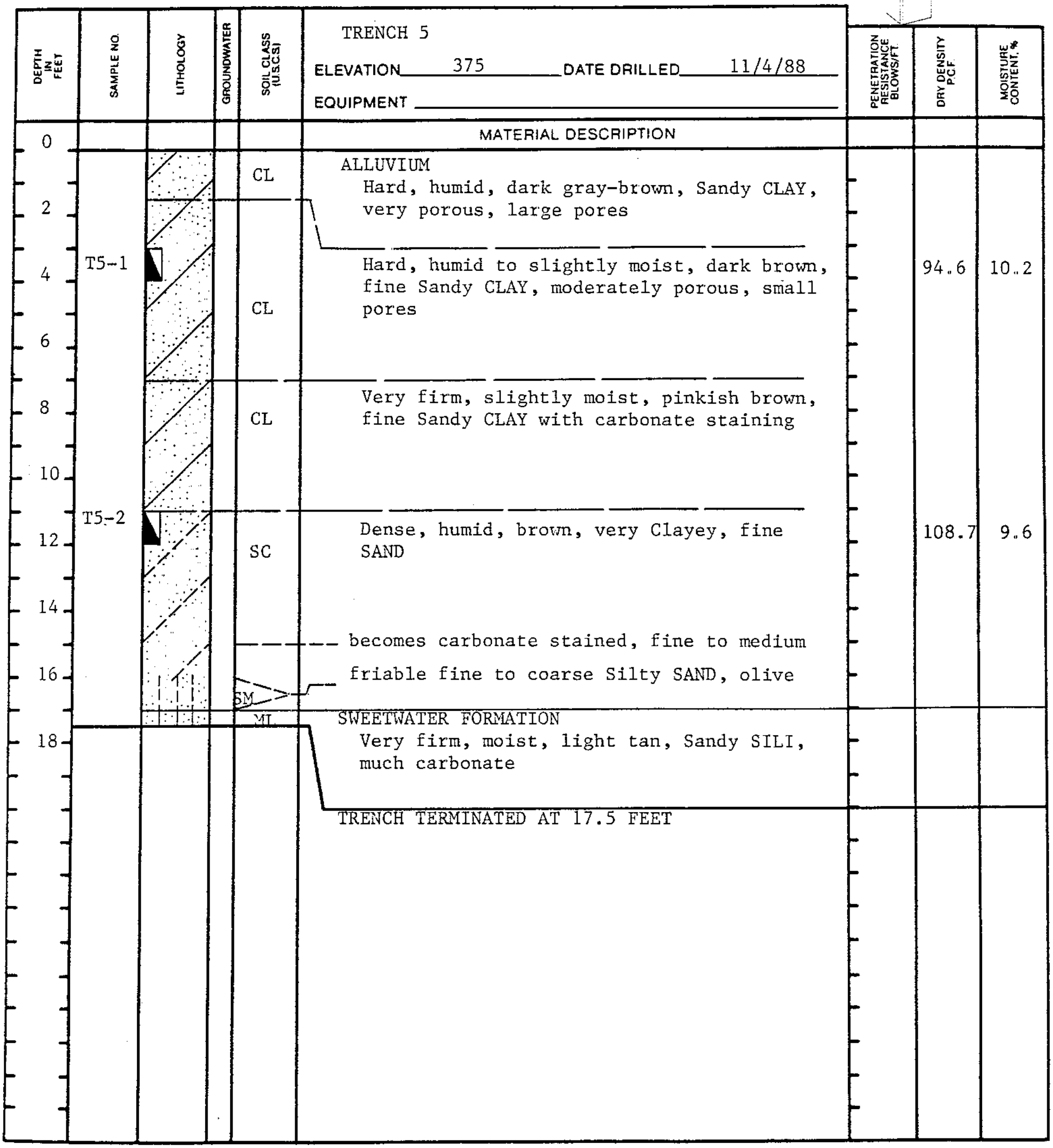
File No. D-4228-M01
March 3, 1989



TRENCH 5

ELEVATION 375 DATE DRILLED 11/4/88

EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %
0				CL	ALLUVIUM Hard, humid, dark gray-brown, Sandy CLAY, very porous, large pores			
4	T5-1			CL	Hard, humid to slightly moist, dark brown, fine Sandy CLAY, moderately porous, small pores		94.6	10.2
8				CL	Very firm, slightly moist, pinkish brown, fine Sandy CLAY with carbonate staining			
12	T5-2			SC	Dense, humid, brown, very Clayey, fine SAND		108.7	9.6
					becomes carbonate stained, fine to medium			
16				SM	friable fine to coarse Silty SAND, olive			
18				ML	SWEETWATER FORMATION Very firm, moist, light tan, Sandy SILT, much carbonate			
					TRENCH TERMINATED AT 17.5 FEET			

Figure A-25, Log of Test Trench 5

SAMPLE SYMBOLS			
	☐ — SAMPLING UNSUCCESSFUL	◧ — STANDARD PENETRATION TEST	■ — DRIVE SAMPLE (UNDISTURBED)
	☒ — DISTURBED OR BAG SAMPLE	◪ — CHUNK SAMPLE	▼ — WATER TABLE OR SEEPAGE

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File No. D-4228-M01
March 3, 1989

TRENCH 6
ELEVATION 377 DATE DRILLED 11/4/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0					ALLUVIUM			
2				CL	Hard, humid, gray-brown, Sandy CLAY, porous			
4					becomes less porous, humid to slightly moist			
6								
8				CL	Very firm, slightly moist to moist, slightly pinkish brown, Silty CLAY			
10					carbonate deposits, becomes slightly porous, carbon flecks			
12					SWEETWATER FORMATION			
14				CL	Very firm, moist, tan, Silty CLAY, weathered topsoil, many pores, carbonate deposits			
16								
18					TRENCH TERMINATED 18.0 FEET			

Figure A-26, Log of Test Trench 6

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◨ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

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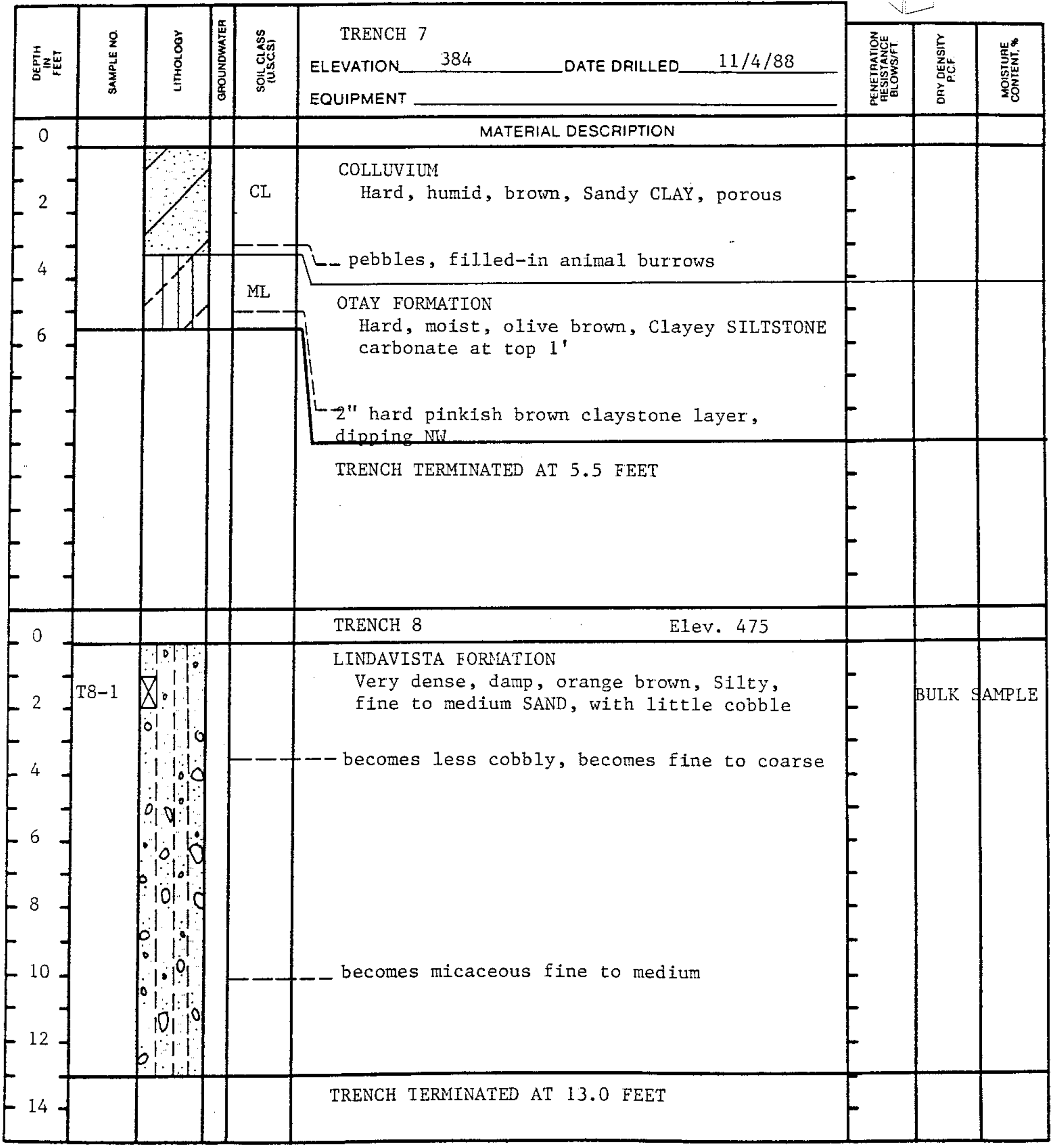
File No. D-4228-M01
March 3, 1989



TRENCH 7

ELEVATION 384 DATE DRILLED 11/4/88

EQUIPMENT

MATERIAL DESCRIPTION

COLLUVIUM
Hard, humid, brown, Sandy CLAY, porous

-- pebbles, filled-in animal burrows

OTAY FORMATION
Hard, moist, olive brown, Clayey SILTSTONE carbonate at top 1'

-- 2" hard pinkish brown claystone layer, dipping NW

TRENCH TERMINATED AT 5.5 FEET

TRENCH 8 Elev. 475

LINDAVISTA FORMATION
Very dense, damp, orange brown, Silty, fine to medium SAND, with little cobble

-- becomes less cobbly, becomes fine to coarse

-- becomes micaceous fine to medium

TRENCH TERMINATED AT 13.0 FEET

Figure A-27, Log of Test Trenches 7 and 8

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▼ — WATER TABLE OR SEEPAGE

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File No. D-4228-M01
March 3, 1989

TRENCH 9
ELEVATION 437 DATE DRILLED 11/4/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT %
0								
					ALLUVIUM			
2				SM	Loose to medium dense, damp, dark brownish gray, Silty, fine to medium SAND, friable with roots at surface			
4								
					becomes dense, moist			
6	◪ T9-1						103.9	15.1
8				SC	Dense, very moist, brown, very Clayey, fine to medium SAND with trace pebbles, carbonate deposits, micaceous			
10			▼					
					seepage, becomes saturated			
12					SAN DIEGO FORMATION			
14				SM	Dense, saturated, bluish-gray with orange stains,Silty, fine to medium SAND with some cobbles			
16					TRENCH TERMINATED AT 15.0 FEET			

Figure A-28 , Log of Test Trench 9

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
◧ — STANDARD PENETRATION TEST
■ — DRIVE SAMPLE (UNDISTURBED)
☒ — DISTURBED OR BAG SAMPLE
◪ — CHUNK SAMPLE
▼ — WATER TABLE OR SEEPAGE

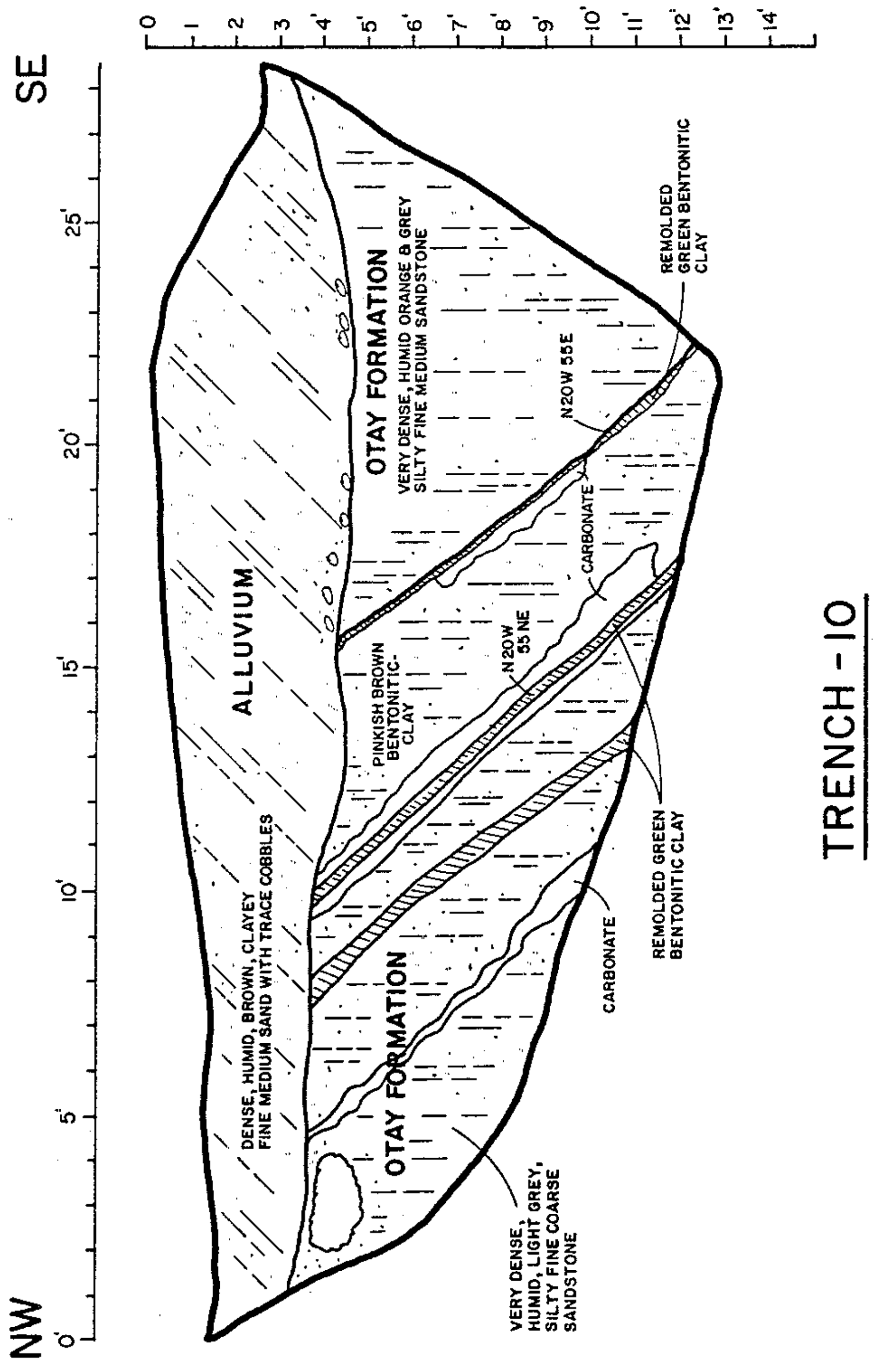
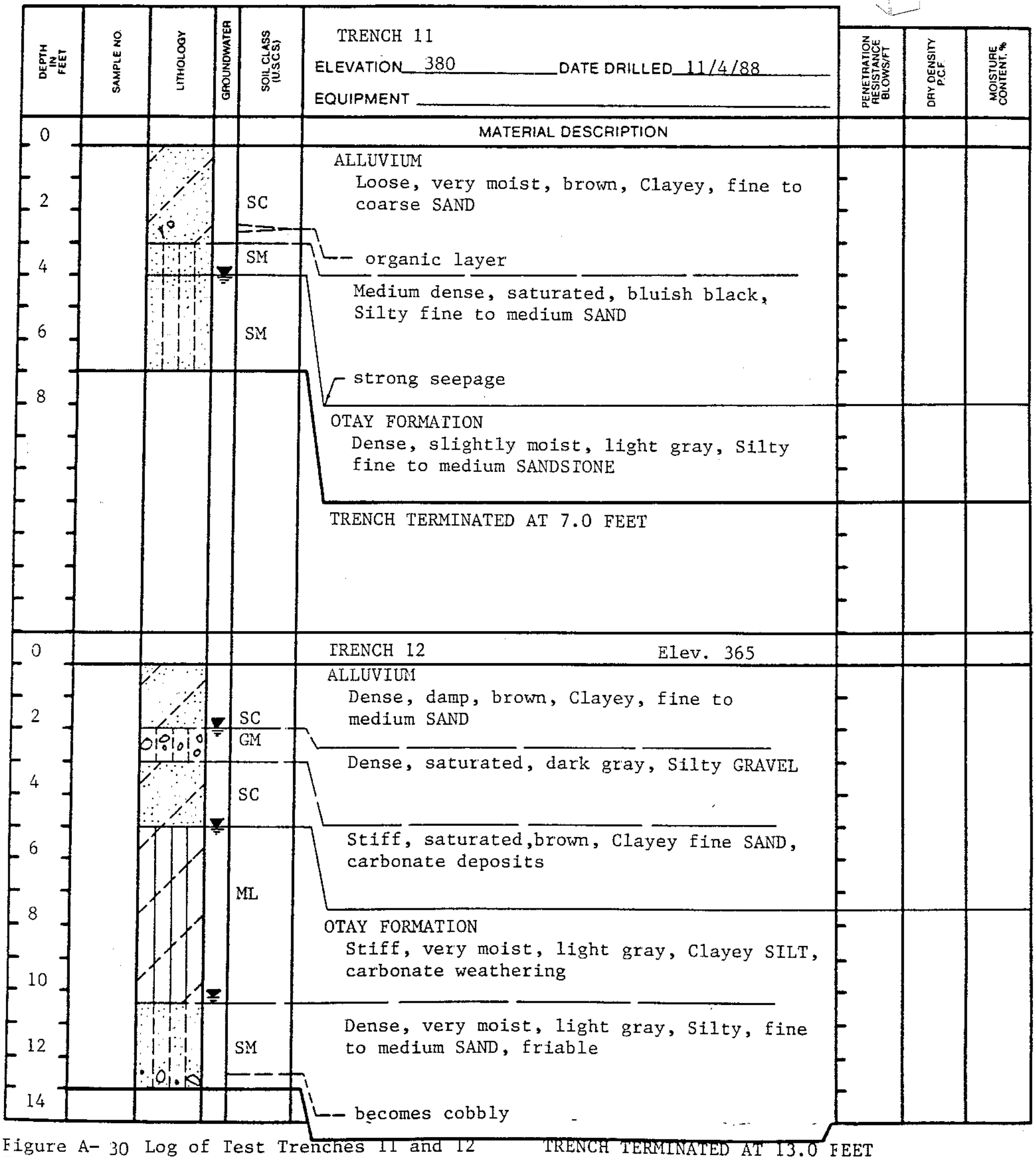


Figure A- 29, Log of Test Trench 10



TRENCH 11

ELEVATION 380 DATE DRILLED 11/4/88

EQUIPMENT

MATERIAL DESCRIPTION

ALLUVIUM

Loose, very moist, brown, Clayey, fine to coarse SAND

organic layer

Medium dense, saturated, bluish black, Silty fine to medium SAND

strong seepage

OTAY FORMATION

Dense, slightly moist, light gray, Silty fine to medium SANDSTONE

TRENCH TERMINATED AT 7.0 FEET

TRENCH 12 Elev. 365

ALLUVIUM

Dense, damp, brown, Clayey, fine to medium SAND

Dense, saturated, dark gray, Silty GRAVEL

Stiff, saturated, brown, Clayey fine SAND, carbonate deposits

OTAY FORMATION

Stiff, very moist, light gray, Clayey SILT, carbonate weathering

Dense, very moist, light gray, Silty, fine to medium SAND, friable

becomes cobbly

TRENCH TERMINATED AT 13.0 FEET

Figure A- 30 Log of Test Trenches 11 and 12

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▼ — WATER TABLE OR SEEPAGE

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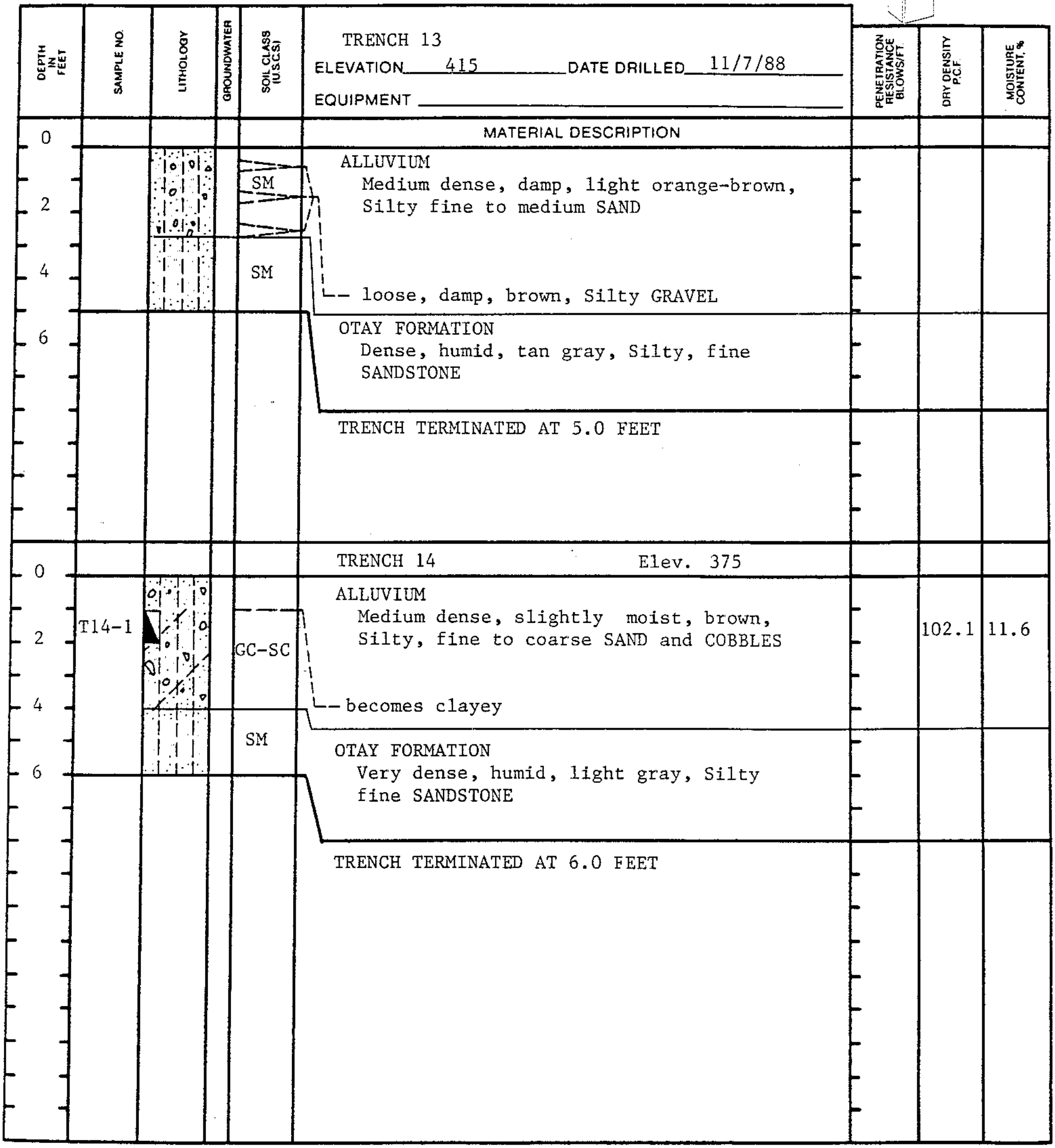
File No. D-4228-M01
March 3, 1989



TRENCH 13
ELEVATION 415 DATE DRILLED 11/7/88
EQUIPMENT

ALLUVIUM
Medium dense, damp, light orange-brown, Silty fine to medium SAND

— loose, damp, brown, Silty GRAVEL

OTAY FORMATION
Dense, humid, tan gray, Silty, fine SANDSTONE

TRENCH TERMINATED AT 5.0 FEET

TRENCH 14 Elev. 375

ALLUVIUM
Medium dense, slightly moist, brown, Silty, fine to coarse SAND and COBBLES

— becomes clayey

OTAY FORMATION
Very dense, humid, light gray, Silty fine SANDSTONE

TRENCH TERMINATED AT 6.0 FEET

Figure A- 31, Log of Test Trench 13 and 14

SAMPLE SYMBOLS	☐ — SAMPLING UNSUCCESSFUL	◧ — STANDARD PENETRATION TEST	■ — DRIVE SAMPLE (UNDISTURBED)
	☒ — DISTURBED OR BAG SAMPLE	◩ — CHUNK SAMPLE	⊻ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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TRENCH 15

ELEVATION 355 DATE DRILLED 11/7/88

EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT %
0 2				SM	ALLUVIUM Dense, damp, brown, Silty, fine to medium SAND, carbonate deposits, friable			
4 6				SC	Stiff, moist, dark brown, Clayey, fine to medium SAND --cobbles			
8	T15-1 ☒						BULK SAMPLE	
	T15-2			SM	Dense, very moist, brown, Silty, fine to medium SAND		101.2	19.9
10 12 14			⊻		water table in trench			
16				SM	OTAY FORMATION Dense, saturated, light gray, Silty fine SANDSTONE			
					TRENCH TERMINATED AT 16.0 FEET			

Figure A- 32, Log of Test Trench 15

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◨ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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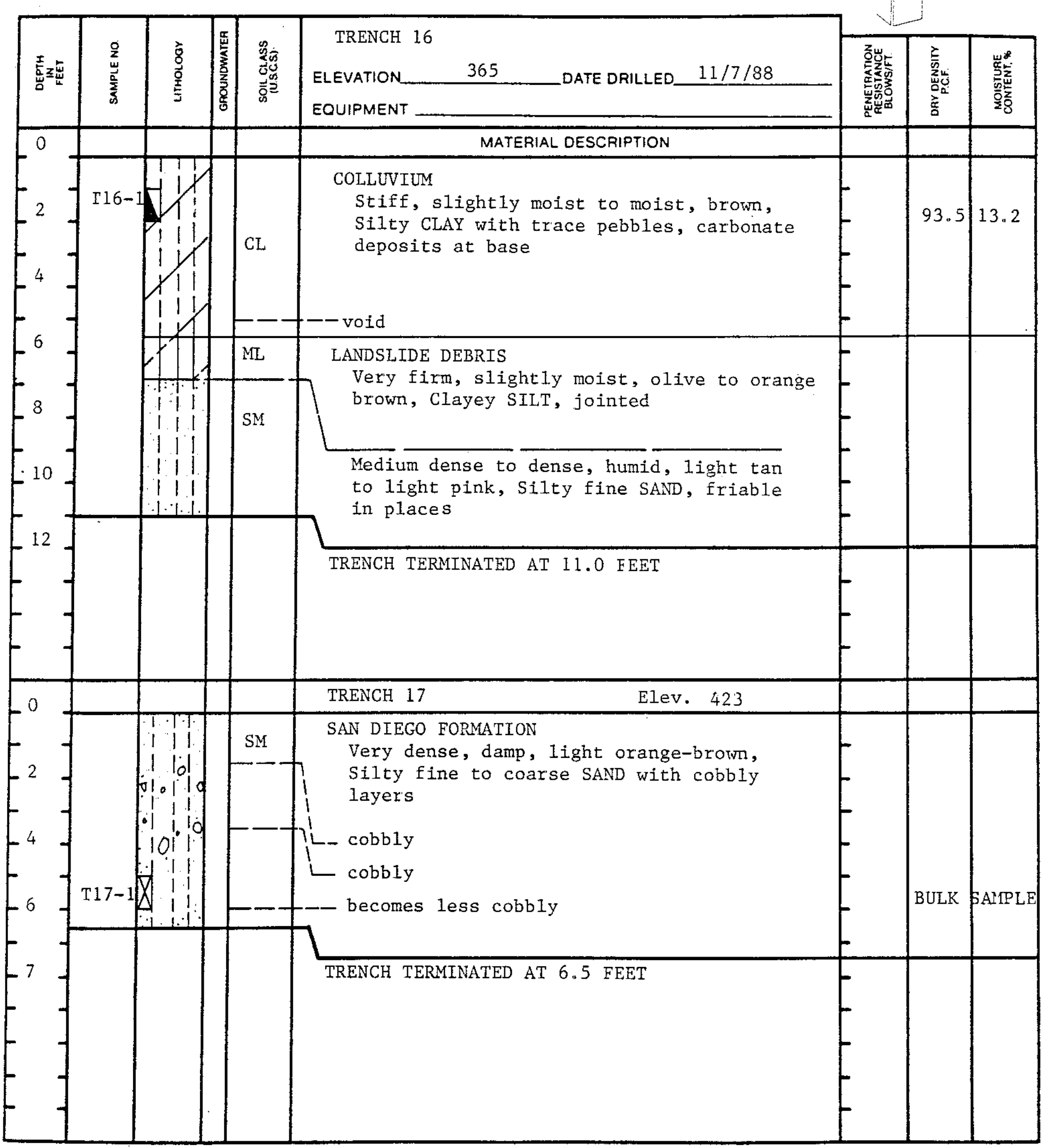
March 3, 1989



TRENCH 16

ELEVATION 365 DATE DRILLED 11/7/88

EQUIPMENT

MATERIAL DESCRIPTION

COLLUVIUM
Stiff, slightly moist to moist, brown, Silty CLAY with trace pebbles, carbonate deposits at base

void

LANDSLIDE DEBRIS
Very firm, slightly moist, olive to orange brown, Clayey SILT, jointed

Medium dense to dense, humid, light tan to light pink, Silty fine SAND, friable in places

TRENCH TERMINATED AT 11.0 FEET

TRENCH 17 Elev. 423

SAN DIEGO FORMATION
Very dense, damp, light orange-brown, Silty fine to coarse SAND with cobbly layers

cobbly

cobbly

becomes less cobbly

TRENCH TERMINATED AT 6.5 FEET

Figure A- 33, Log of Test Trenches 16 and 17

SAMPLE SYMBOLS	☐ — SAMPLING UNSUCCESSFUL	▮ — STANDARD PENETRATION TEST	■ — DRIVE SAMPLE (UNDISTURBED)
	☒ — DISTURBED OR BAG SAMPLE	◩ — CHUNK SAMPLE	⊻ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	TRENCH 18 ELEVATION 443 DATE DRILLED 11/7/88 EQUIPMENT	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0					MATERIAL DESCRIPTION			
				SM	SAN DIEGO FORMATION Very dense, damp, orange-brown, Silty, fine to coarse SAND with little clay			
2								
4					cobble layer			
6				SM	cobble layer			
	T18-1			SM	Very dense, damp, orange-brown, Silty, fine to medium SAND		103.9	5.3
8	T18-2				cobbles		BULK	SAMPLE
					Very dense, damp, light yellow brown, Silty, fine to medium SANDSTONE			
					TRENCH TERMINATED AT 8.0 FEET			
0					TRENCH 19 Elev. 427			
					COLLUVIUM Very dense, humid, dark brown, Clayey, fine to medium SAND, little cobble			
2				SC				
				SM	Very dense, damp, yellow tan, Silty fine SAND, micaceous			
4				GC				
6				CL	Very dense, humid, dark tan, Clayey COBBLES			
				CL	contact dips approximately 45° SW			
8					OTAY FORMATION Very firm, slightly, moist, light tan to pinkish brown, Silty CLAY, bentonitic, carbonate deposits			
					Hard, slightly moist, brown, Silty CLAYSTONE, micaceous, bentontic			

Figure A-34, Log of Test Trenches 18 and19

TRENCH TERMINATED AT 8.0 FEET

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
▯ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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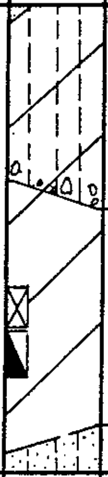
March 3, 1989

TRENCH 20

ELEVATION 367 DATE DRILLED 11/7/88

EQUIPMENT



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0								
2				CL	ALLUVIUM Very firm, humid, brown, Silty CLAY with trace cobbles, porous at top			
4					contact dipping to SW approximately 20°, cobbles on east side			
6	T20-1 ☒				OTAY FORMATION Very stiff, moist, pink, gray and light green BENTONITE, carbonate deposits, general texture dipping E		BULK	SAMPLE
8	T20-2 ◩			CL-CH	contact dipping approximately 40 SE		79.2	28.5
10					Very dense, humid, light gray, Silty, fine SANDSTONE			
					TRENCH TERMINATED AT 10.0 FEET			

Figure A- 35 Log of Test Trench 20

SAMPLE SYMBOLS			
	☐ — SAMPLING UNSUCCESSFUL	◧ — STANDARD PENETRATION TEST	■ — DRIVE SAMPLE (UNDISTURBED)
	☒ — DISTURBED OR BAG SAMPLE	◩ — CHUNK SAMPLE	▽ — WATER TABLE OR SEEPAGE

NOTE. THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

File No. D-4228-MO1
March 3, 1989

TRENCH 21
ELEVATION 355 DATE DRILLED 11/7/88
EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0				CL	ALLUVIUM Hard, slightly moist, dark brown, Sandy CLAY, porous			
2 4				SC	Very dense, humid, dark brown, very clayey, fine SAND, slightly porous			
6 8 10				SM-SC	Dense to very dense, humid, brown Silty fine to coarse SAND, with some clay			
12 14 16				SM	Very dense, humid, brown, Silty, fine to medium, SAND with trace carbonate deposits, tiny pores, trace cobbles			
18					TRENCH TERMINATED AT 17.0 FEET			

Figure A- 36, Log of Test Trench 21

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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March 3, 1989

TRENCH 22

ELEVATION 303 DATE DRILLED 11/8/88

EQUIPMENT

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0				SM	ALLUVIUM Loose to medium dense, dry, brown, Silty fine to medium SAND, porous, friable			
2	T22-1			SM			84.5	5.3
4					Medium dense, damp, light brown, Silty fine to medium SAND, moderately porous, friable			
6	T22-2			SM	cobbles, very irregular contact		87.0	6.0
8					SAN DIEGO FORMATION Medium dense to dense, damp, yellow-brown, Silty fine SAND with carbonate deposits, many filled in animal burrows			
10					becomes dense, but friable, fine to medium			
12				SM	Dense, damp, light gray, Silty fine SANDSTONE, fine to coarse in places, micaceous becomes cemented			
					TRENCH TERMINATED AT 12.0 FEET			

Figure A- 37, Log of Test Trench 22

SAMPLE SYMBOLS

- ☐ — SAMPLING UNSUCCESSFUL
- ☒ — DISTURBED OR BAG SAMPLE
- ◧ — STANDARD PENETRATION TEST
- ◩ — CHUNK SAMPLE
- ■ — DRIVE SAMPLE (UNDISTURBED)
- ⊻ — WATER TABLE OR SEEPAGE

NOTE THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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March 3, 1989

TRENCH 23
ELEVATION 423 DATE DRILLED 12/30/88
EQUIPMENT JD 555

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S.)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0								
		▨		SM	COLLUVIUM Medium dense, humid to slightly moist, dark brown, Silty fine SAND with roots			
2		▨		SM	SAN DIEGO FORMATION Very dense, humid, yellow brown, Silty fine SANDSTONE, micaceous			
		▨			OTAY FORMATION Very dense, humid, light gray, Silty fine to coarse SANDSTONE, joints at top 6 inches trace bentonite chunks			
4					TRENCH TERMINATED AT 4.0 FEET			

Figure A-38, Log of Test Trench 23

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◪ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▼ — WATER TABLE OR SEEPAGE

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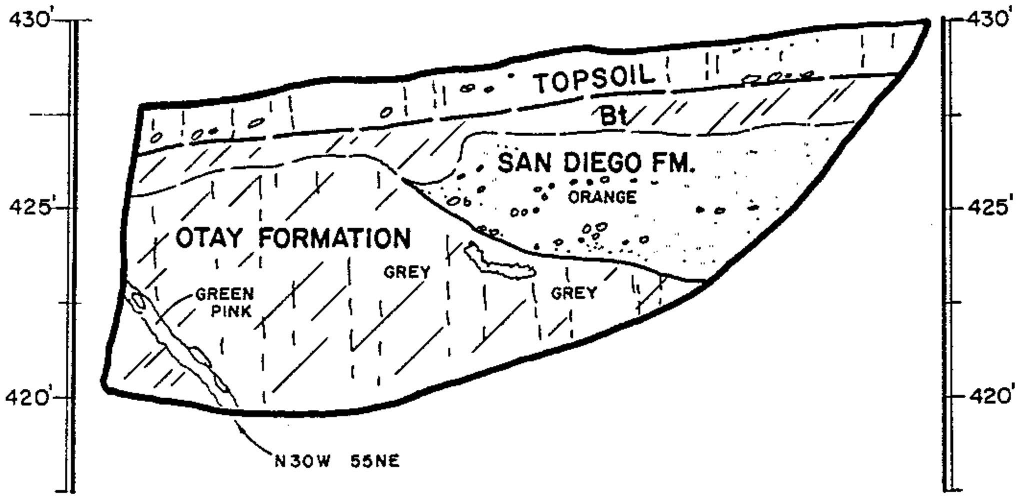

TRENCH - 24

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

Figure A-39, Log of Test Trench 24

APPENDIX B

File No. D-4228-M01
March 3, 1989

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S.)	TRENCH 28 ELEVATION 456 DATE DRILLED 1/6/89 EQUIPMENT	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0					MATERIAL DESCRIPTION			
2 4				SM	TOPSOIL Medium dense, humid to slightly moist, brown, Silty fine SAND with some cobbles and burrows			
6 8				GM-SM	SAN DIEGO FORMATION Dense, humid, tan, Silty fine to coarse SAND and COBBLES with some burrows, friable			
10					TRENCH TERMINATED AT 8.5 FEET			
					TRENCH 29 Elev. 420			
0				GM	COLLUVIUM Loose, moist, brown, Sandy GRAVEL			
2 4				SM SM	SAN DIEGO FORMATION Dense, humid, light yellow, Silty fine SANDSTONE uneven			
6					OTAY FORMATION Very dense, humid to slightly moist, light gray, very Silty fine SANDSTONE, fine to coarse in places, carbonate at top 1 foot			
					TRENCH TERMINATED AT 6.0 FEET			

Figure A-42, Log of Test Irenches 28 and 29

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
◧ — STANDARD PENETRATION TEST
■ — DRIVE SAMPLE (UNDISTURBED)
☒ — DISTURBED OR BAG SAMPLE
◪ — CHUNK SAMPLE
▼ — WATER TABLE OR SEEPAGE

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March 3, 1989

TRENCH 25

ELEVATION 475 DATE DRILLED 12/30/88

EQUIPMENT JD 555

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (U.S.C.S)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE BLOWS/FT.	DRY DENSITY P.C.F.	MOISTURE CONTENT, %
0				ML	TOPSOIL Very stiff, moist, dark brown, Sandy SILT with some cobbles			
2								
4				SM	SAN DIEGO FORMATION Dense to very dense, humid, orange brown, Silty fine SANDSTONE			
6								
8					— cobbles, coarse sand			
10					— becomes gray, trace pebbles at contact			
12					TRENCH TERMINATED AT 12.0 FEET			

Figure A-40, Log of Test Trench 25

SAMPLE SYMBOLS
☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◧ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
▽ — WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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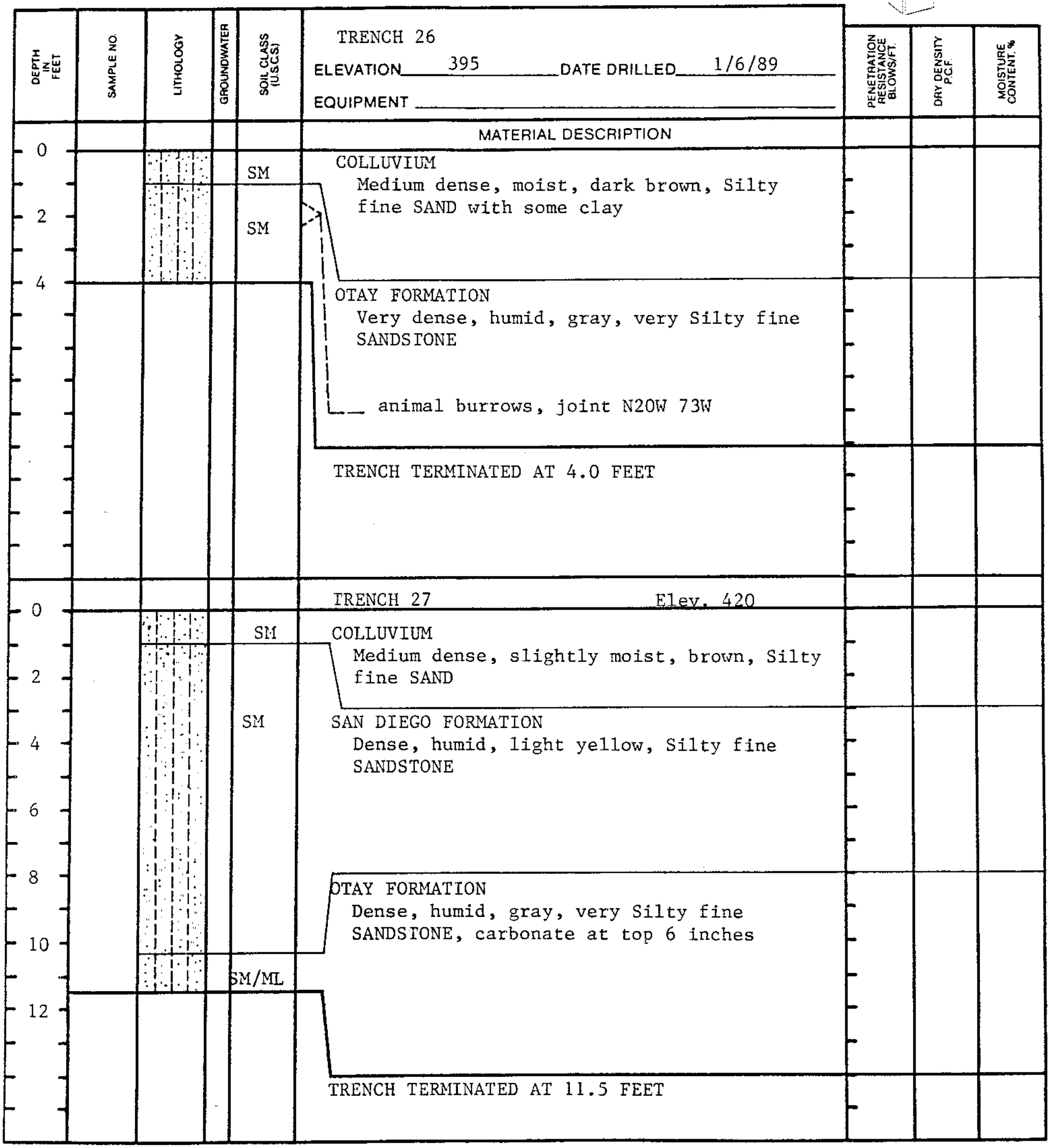

TRENCH 26

ELEVATION 395 DATE DRILLED 1/6/89

EQUIPMENT

COLLUVIUM
Medium dense, moist, dark brown, Silty fine SAND with some clay

OTAY FORMATION
Very dense, humid, gray, very Silty fine SANDSTONE

animal burrows, joint N20W 73W

TRENCH TERMINATED AT 4.0 FEET

TRENCH 27 Elev. 420

COLLUVIUM
Medium dense, slightly moist, brown, Silty fine SAND

SAN DIEGO FORMATION
Dense, humid, light yellow, Silty fine SANDSTONE

OTAY FORMATION
Dense, humid, gray, very Silty fine SANDSTONE, carbonate at top 6 inches

TRENCH TERMINATED AT 11.5 FEET

Figure A-41, Log of Test Trenches 26 and 27

SAMPLE SYMBOLS

☐ — SAMPLING UNSUCCESSFUL
☒ — DISTURBED OR BAG SAMPLE
◨ — STANDARD PENETRATION TEST
◩ — CHUNK SAMPLE
■ — DRIVE SAMPLE (UNDISTURBED)
⊻ — WATER TABLE OR SEEPAGE

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APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures.

Selected relatively undisturbed drive samples were tested for their in-place dry density, moisture content, shear strength, expansion and consolidation potential.

The maximum dry density and optimum moisture content of selected disturbed bulk samples were determined in accordance with ASTM D1557-78, Method C. Portions of selected bulk samples were remolded and subjected to direct shear tests.

The results of our laboratory tests are included in tabular form herewith.

TABLE I

Summary of In-Place Moisture-Density and Direct Shear Test Results

Sample No.	Depth ft.	Dry Density pcf	Moisture Content %	Unit Cohesion psf	Angle of Shear Resistance Degrees	Geologic Unit
*B3-9	46	104.9	11.3	50	31	San Diego
B4-8	32	110.6	8.4	200	40	Otay Sandstone
*B4-10	38	105.9	13.4	320	28	Otay Siltstone
*B5-2	9	106.4	12.5	80	30	Lindavista
B8-4	52	88.8	5.2	100	29	San Diego

* Remolded to 90 percent of maximum density at optimum moisture content.

TABLE II

Summary of Laboratory Compaction Test Results

ASTM D1557-78

Sample No.	Description	Maximum Dry Density pcf	Optimum Moisture % Dry Wt.
B1-8	Light olive-brown, Clayey SILT	116.7	14.7
B3-1	Dark brown, Gravelly CLAY	121.4	11.7
B3-9	Light brown, slightly Silty fine to coarse SAND	116.4	11.7
B4-2	Tan, Silty fine SAND, trace pebbles	106.1	16.8
B4-10	Tan, Sandy SILT	117.7	13.2
B5-2	Orange brown, Silty fine to coarse SAND	118.3	12.6
B9-2	Tan, Silty fine SAND with trace cobbles, clay	122.6	11.8

TABLE III

Summary of Laboratory Expansion Index Test Results

Sample No.	Moisture Content Before Test %	Moisture Content After Test %	Dry Density pcf	Expansion Index
B1-8	10.1	24.2	108.1	18
B3-1	11.8	30.7	103.8	128
B4-2	11.6	25.2	103.0	0
B4-10	11.9	19.2	103.2	5
B5-2	10.1	16.7	108.2	1

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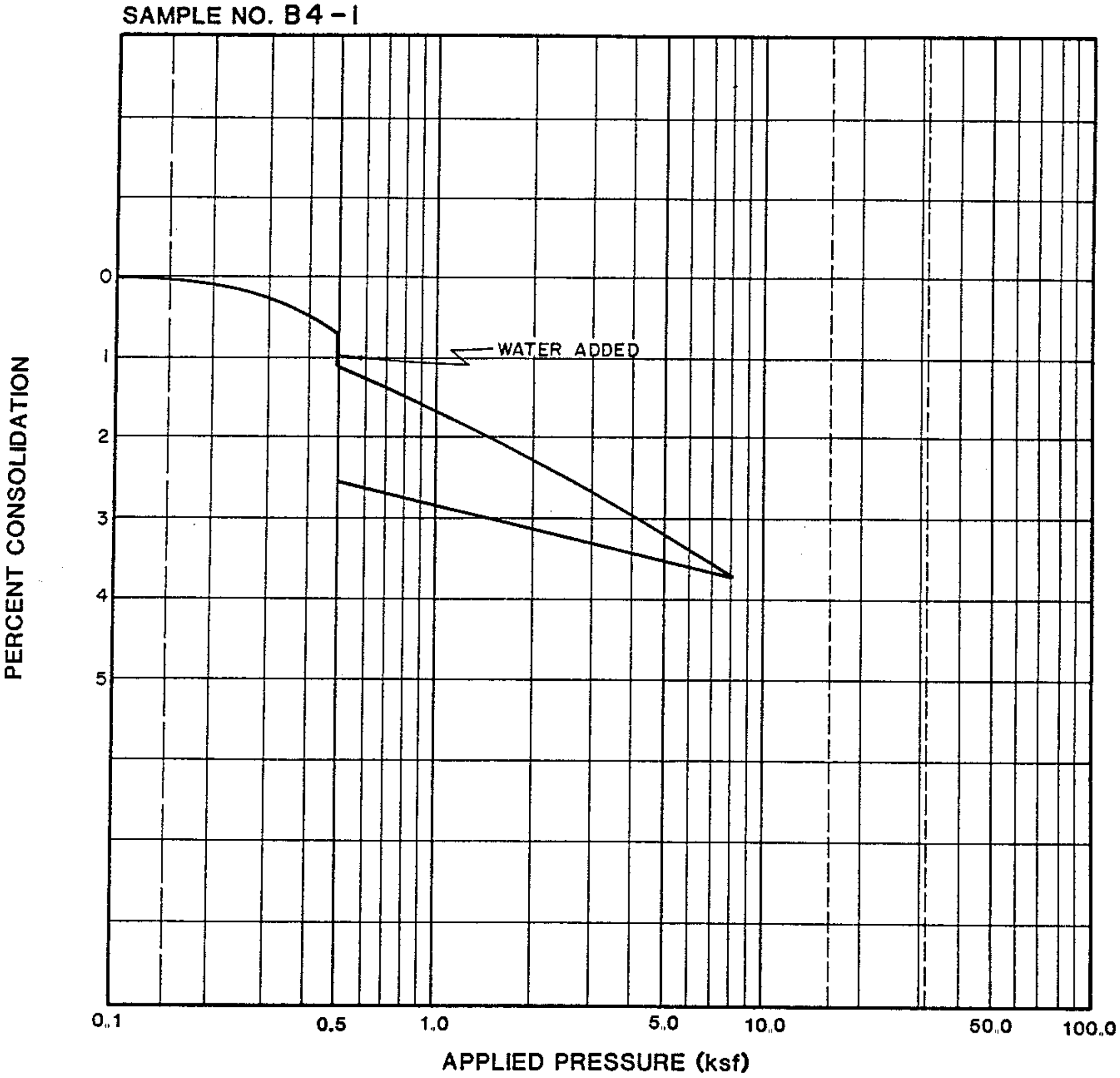


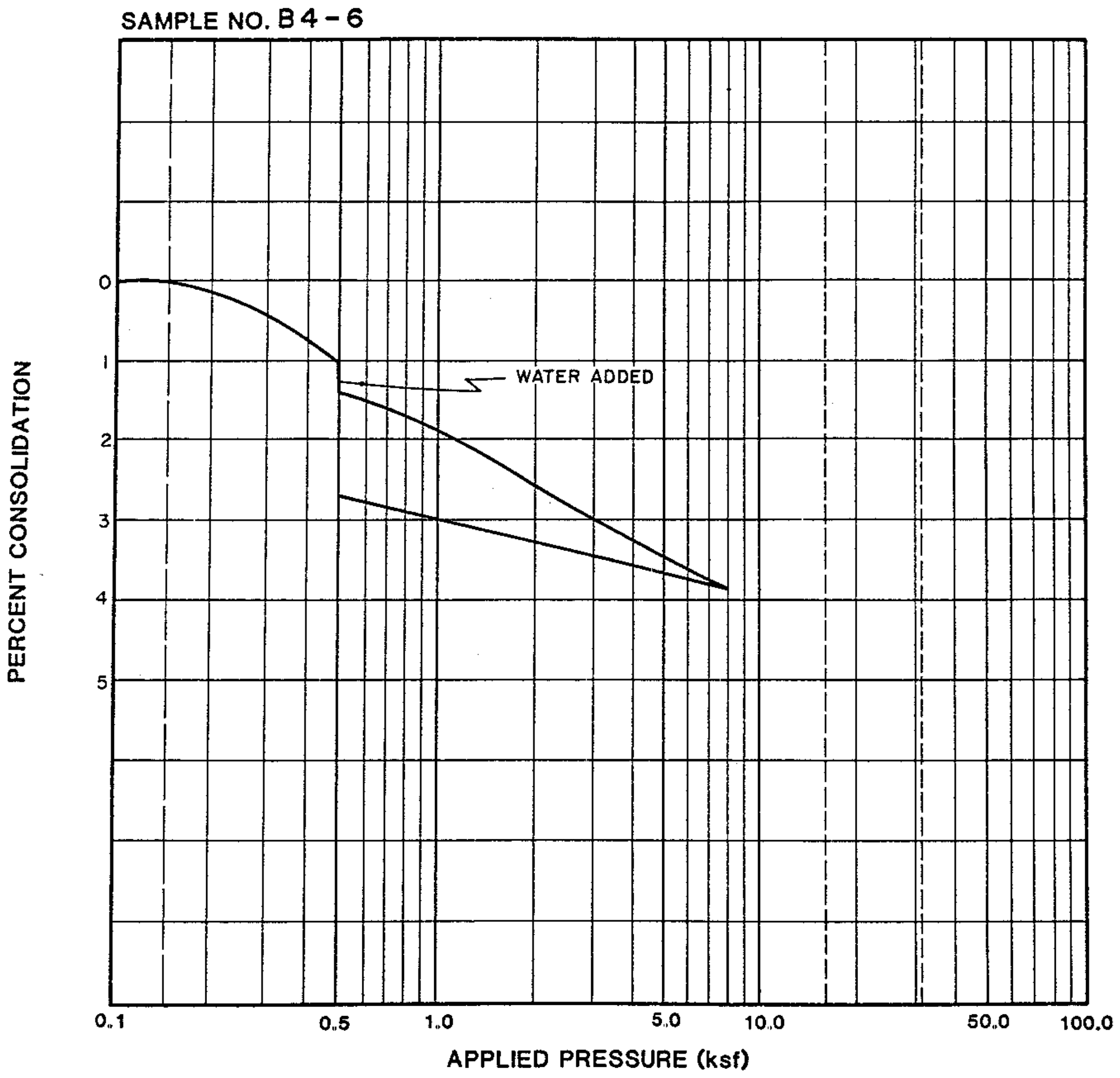
INITIAL DRY DENSITY	102.8 (pcf)	INITIAL SATURATION	52.9 (%)
INITIAL WATER CONTENT	11.5 (%)	SAMPLE SATURATED AT	0.5 (ksf)

CONSOLIDATION CURVE

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

D-103

Figure B-1



INITIAL DRY DENSITY	109.5 (pcf)	INITIAL SATURATION	63.3 (%)
INITIAL WATER CONTENT	12.0 (%)	SAMPLE SATURATED AT	0.5 (ksf)

CONSOLIDATION CURVE

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

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Figure B-2

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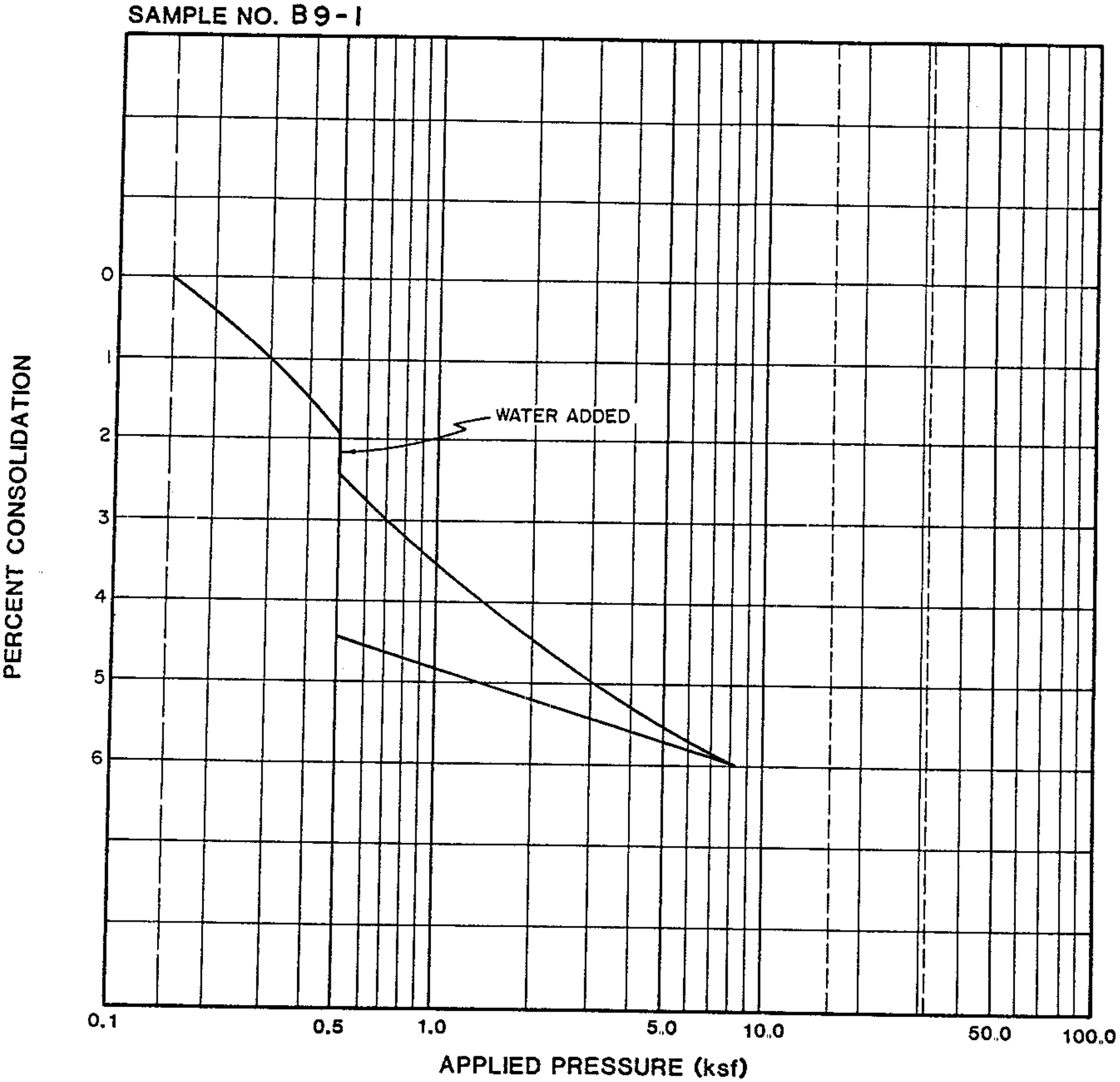


INITIAL DRY DENSITY	115.7 (pcf)	INITIAL SATURATION	50.7 (%)
INITIAL WATER CONTENT	8.8 (%)	SAMPLE SATURATED AT	0.5 (ksf)

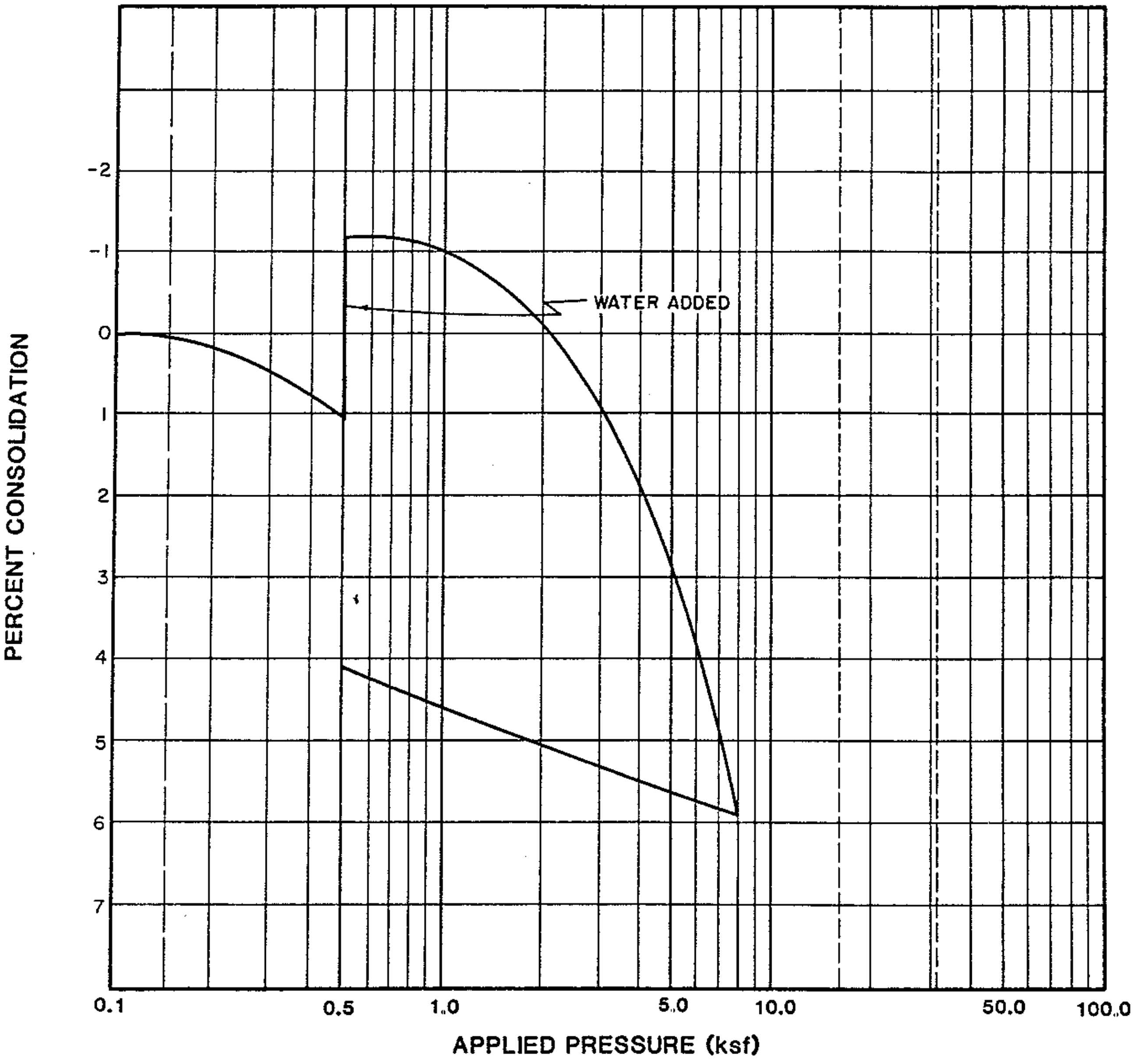
CONSOLIDATION CURVE

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

D-103

Figure B-3

SAMPLE NO. T4-I



INITIAL DRY DENSITY	100.3 (pcf)	INITIAL SATURATION	54.9 (%)
INITIAL WATER CONTENT	13.7 (%)	SAMPLE SATURATED AT	0.5 (ksf)

CONSOLIDATION CURVE

RANCHO DEL REY - SPA III
CHULA VISIA, CALIFORNIA

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Figure B-4

File No. D-4228-M01
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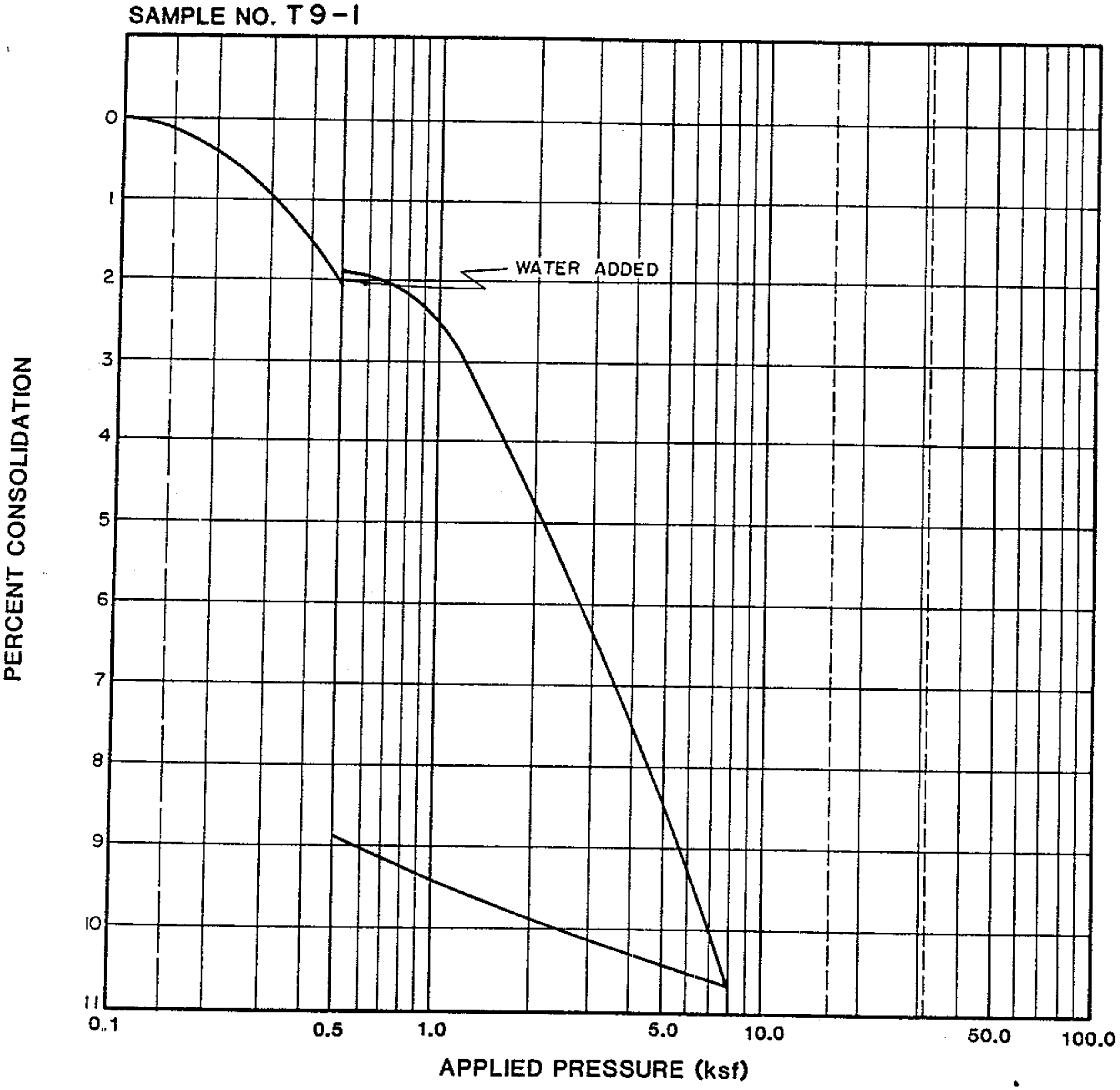

INITIAL DRY DENSITY	103 9 (pcf)	INITIAL SATURATION	64.6 (%)
INITIAL WATER CONTENT	15.1 (%)	SAMPLE SATURATED AT	0.5 (ksf)

CONSOLIDATION CURVE

RANCHO DEL REY - SPA III

CHULA VISTA, CALIFORNIA

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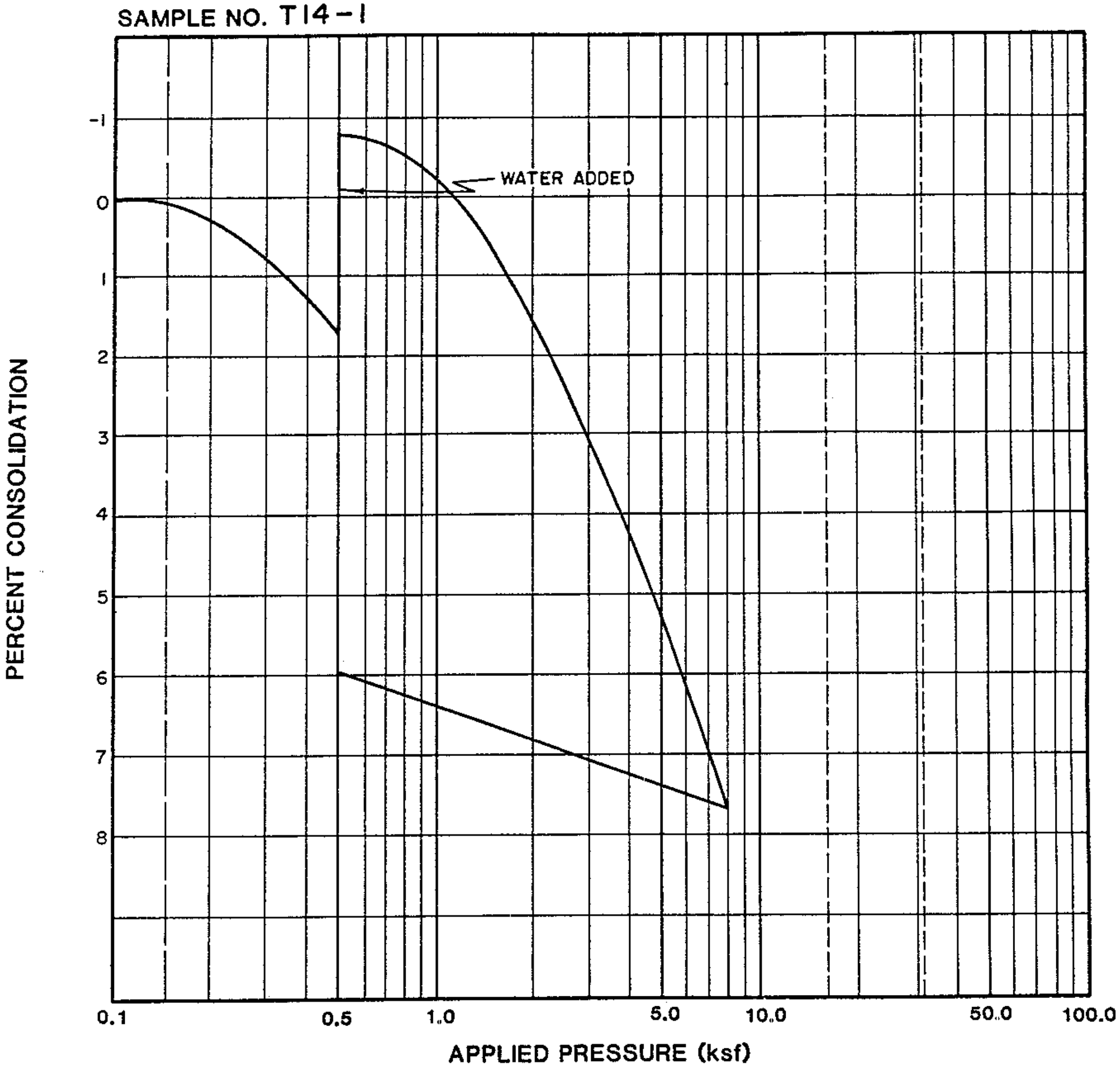
Figure B-5

File No. D-4228-M01
March 3, 1989



INITIAL DRY DENSITY	102.1 (pcf)	INITIAL SATURATION	48.7 (%)
INITIAL WATER CONTENT	11.6 (%)	SAMPLE SATURATED AT	0.5 (ksf)

CONSOLIDATION CURVE

RANCHO DEL REY - SPA III
CHULA VISTA, CALIFORNIA

D-103

Figure B-6

APPENDIX C

APPENDIX C

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"Report of Geotechnical Review, Offsite Fill, Bel Air Ridge, Chula Vista, California", prepared by San Diego Soils Engineering, Inc., dated February, 1988.

APPENDIX C (CONTINUED)

"Final As-Graded Geotechnical Report Bel Air Ridge (Chula Vista Tract No. 87-7) Chula Vista, California", prepared by Leighton and Associates, Inc., dated March 1988.

"As-Graded Geotechnical Report, Mission Village, Chula Vista Tract No. 82-08, Chula Vista, California", prepared by Ninyo and Moore, dated September 1988.

"As-Graded Geotechnical Report East "H" Street Improvements, Chula Vista, California", prepared by San Diego Geotechnical Consultants, Incorporated, dated December 1987.

"Geotechnical Feasibility Investigation, El Rancho del Rey, Chula Vista, California", prepared by San Diego Soils Engineering, Incorporated, dated October 1985.

"Preliminary Geotechnical Investigation, Rancho del Rey, SPA I Area, Chula Vista, California", prepared by San Diego Soils Engineering, Incorporated, dated September 1986.

"Geotechnical Investigation, La Nacion Fault Zone, Proposed Elementary School Site, Rancho del Rey, SPA I, Chula Vista, California", prepared by San Diego Soils Engineering, Incorporated, dated October, 1987.

"Geotechnical Tentative Map Review, Phase 2 Rancho del Rey, SPA I, Chula Vista, California", prepared by San Diego Soils Engineering, Inc., dated January, 1988.

"Preliminary Geotechnical Investigation, Rancho del Rey, SPA II, Chula Vista, California", prepared by San Diego Soils Engineering, Inc., dated August 1988.

"Soil Investigation for the Proposed El Rancho del Rey Unit No. 1, Chula Vista, California", prepared by Woodward-Gizienski and Associates, dated May 1971.

"Fault Investigation for the Proposed El Rancho del Rey - Southwest, Chula Vista, California", prepared by Woodward - Clyde Consultants, dated January 1979.

Base map - undated, untitled topographic and grading map prepared by Project Design Consultants.

APPENDIX D

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon, Incorporated should be notified so that supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

RECOMMENDED GRADING SPECIFICATIONS

1. General

1.1 These specifications have been prepared for grading of Rancho Del Rey, SPA III located in Chula Vista, California. They shall be used in conjunction with the preliminary soil and geologic investigation for the project dated March 3, 1989 prepared by Geocon Incorporated.

1.2 The contractor shall be responsible for placing, spreading, watering, and compacting the fill in strict conformance with these specifications. All excavation and fill placement should be done under the observation of Geocon, Incorporated. Geocon, Incorporated should be consulted if the contractor or owner wishes to deviate from these specifications.

1.3 The grading should consist of clearing, grubbing, and removing from the site all material the Soil Engineer designates as "unsuitable"; preparing areas to be filled; properly placing and compacting fill materials; and all other work necessary to conform with the lines, grades, and slopes shown on the approved plans.

2. Preparation of Areas to be Graded

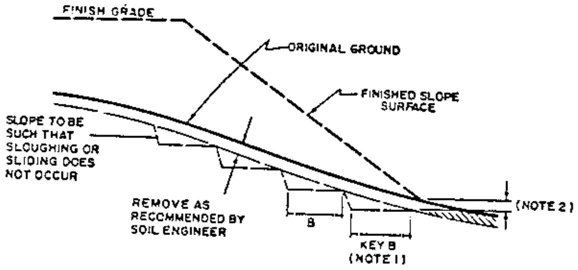
2.1 All trees and shrubs not to be used for landscaping, structures, weeds, and rubbish should be removed from the site prior to commencing any excavating or filling operations.

2.2 All buried structures (such as tanks, leach lines, and pipes) not designated to remain on the site should be removed, and the resulting depressions should be properly backfilled and compacted prior to any grading or filling operations.

2.3 All water wells should be treated in accordance with the requirements of the San Diego County Health Department. The owner shall verify the requirements.

2.4 All vegetation and soil designated as "unsuitable" by the Soil Engineer should be removed under his observation. The exposed surface should then be plowed or scarified to a depth of at least 12 inches until the surface is free from ruts, hummocks, or other uneven features that would prevent uniform compaction by the equipment used.

2.5 Where the slope ratio of the original ground is steeper than 6.0 horizontal to 1.0 vertical, or where recommended by the Soil Engineer, the bank should be benched in accordance with the following illustration.



NOTES

(1) "B" should be 2' wider than the compaction equipment, and should be a minimum of 10' wide.

(2) The outside of the bottom key should be below the topsoil or slopewash and at least 3' into dense formational material.

2.6 After the areas have been plowed or scarified, the surface should be disced or bladed until they are free from large clods; brought to the proper moisture content by adding water or aerating; and compacted as specified in Section 4 of these specifications.

3. Materials Suitable for Use in Compacted Fill

3.1 Material that is perishable, spongy, contains organic matter, or is otherwise unsuitable should not be used in compacted fill. Material used for compacted fill should consist of at least 40 percent fines smaller than 3/4-inch diameter.

3.2 The soil engineer should decide what materials, either imported to the site or excavated from on-site cut areas, are suitable for use in compacted fills; the Soil Engineer should approve any import material before it is delivered to the site. During grading, the contractor may encounter soil types other than those analyzed for the soil investigation. The Soil Engineer should be consulted to evaluate the suitability of such soils.

3.3 Any material containing rocks or hard lumps greater than 6 inches in diameter should be placed in accordance with Section 6 of these specifications.

3.4 The Soil Engineer should perform laboratory tests on representative samples of material to be used in compacted fill. Such tests should be performed to evaluate the maximum dry density and moisture content of the samples. The tests should be performed in accordance with accepted test methods of the American Society of Testing and Materials (ASTM).

4. Placing, Spreading, and Compacting Fill Material

4.1 Unless otherwise specified, fill material should be compacted while at a moisture content near the optimum moisture content and to a relative compaction of at least 90 percent as determined by accepted ASTM test methods.

4.2 Fill materials should be placed in layers that, when compacted, have a relative compaction in conformance with the project specifications. Each layer should be spread evenly and mixed thoroughly to provide uniformity of materials in each layer.

4.3 When the moisture content of the fill material is less than that recommended by the Soil Engineer, water should be added until the moisture content is as recommended. When the moisture content of the fill material is more than that recommended by the Soil Engineer, the fill material should be aerated by blading, mixing, or other methods until the moisture content is as recommended.

4.4 After each layer is placed, mixed, and spread evenly, it should be thoroughly compacted to the recommended minimum relative compaction.

4.5 The fill should be compacted by sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other types of compacting rollers that are capable of compacting the fill at the recommended moisture content. Each layer should be rolled continuously over its entire area until the recommended minimum relative compaction is achieved throughout the fill.

4.6 The fill operation should be continued in layers, as specified above, until the fill has been brought to the finished slopes and grades shown on the approved plans.

4.7 Fill slopes should be compacted by sheepsfoot rollers, by track-walking with a dozer, or by other suitable equipment. Compaction operations should continue until the slopes are properly compacted (that is, in-place density tests indicate a relative compaction of at least 90 percent at a horizontal distance of 2 feet from the slope face).

5. Observation of Grading Operations

5.1 The Soil Engineer should make field observations and perform field and laboratory tests during the filling and compaction operations, so that he can express his opinion whether or not the grading has been performed in substantial compliance with project recommendations.

5.2 The Soil Engineer should perform in-place density tests in accordance with accepted ASTM test methods; such density tests should be made in the compacted materials below the disturbed surface. When results of tests taken within any layer indicate a relative compaction below that recommended, that layer or portion thereof should be reworked until the recommended relative compaction is obtained.

6. Oversize Rock Placement

6.1 "Oversize" rock is defined as material that is greater than 6 inches and less than 4 feet in maximum dimension. Material over 4 feet in maximum dimension should not be used in fills; such material should be exported from the site, broken into acceptably sized pieces, used for landscaping purposes, or placed in areas designated by the Soil Engineer and/or approved by appropriate governing agencies.

6.2 The Soil Engineer should continuously observe the placement of oversize rock.

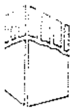
6.3 Oversize rock should be placed in lifts not exceeding the maximum dimension of the rock, and should be placed in a manner that will not result in "nesting" of the rocks. Voids between rocks should be completely filled with properly compacted (minimum relative compaction of 90 percent), fine granular material.

6.4 Oversize rock should not be placed within 5 feet of finish pad grade, within 10 feet of street subgrade, or within 2 feet of the bottom of the proposed utility lines, whichever is deeper.

7. Protection of Work

7.1 During construction, the contractor should grade the site to provide positive drainage away from structures and to prevent water from ponding adjacent to structures. Water should not be allowed to damage adjacent properties or finished work on the site. Positive drainage should be maintained by the contractor until permanent drainage and erosion control facilities are installed in accordance with project plans.

7.2 No additional grading shall be done, except under the observation of the Soil Engineer.



APPENDIX B

DRAINAGE STUDY FOR RANCHO DEL REY SPA III

Project Design Consultants

File: 671.00

April 25, 1989

Mr. Doug Reid
Environmental Review Coordinator
CITY OF CHULA VISTA
Planning Department
276 Fourth Avenue
Chula Vista, CA 92010

SUBJECT: Rancho Del Rey SPA III Drainage Study

Dear Doug:

Enclosed is an updated Drainage Study for the Rancho Del Rey SPA III area. This latest study is intended to update previous reports prepared by Rick Engineering Company entitled, "Drainage Study for Rancho Del Rey Development" dated July 27, 1986, and "Drainage Study for East 'H' Street" dated February 17, 1987. The update is needed to account for the latest planning efforts for the sectional planning area.

Storm water flows were calculated based on the drainage basins delineated from the currently proposed development. Drainage is conveyed by way of internal storm drains to East 'H' Street, South Rice Canyon, or the proposed channel along Telegraph Canyon Road. Based on the calculation methods used, the runoff to East 'H' Street and Telegraph Canyon Road are comparable between the old and new studies. The discharge to the existing 66" RCP draining South Rice Canyon at Paseo Del Rey is slightly reduced from the flow calculated in the February, 1987 study.

Please advise if we can offer supplemental information or meet to explain any of the findings in greater detail.

Very truly yours,

Keith L. Keeter, P.E.
Vice President
RCE 31138; Expires 3/31/92

Richard C. Brasher
Richard C. Brasher, P.E.
Design Engineer

Registered Professional Engineer
Keith L. Keeter
No. 31133
Civil
State of California

KLK:nc

Enclosures

RANCHO DEL REY SPA III
DRAINAGE STUDY
APRIL, 1989

INTRODUCTION

This study has been prepared in accordance with the requirements for the proposed development of Rancho Del Rey S.P.A. III in the City of Chula Vista. This study will address two previously prepared drainage studies and update the results to reflect recent site planning revisions to the S.P.A. III development.

The "Drainage Study for the Rancho Del Rey Development," prepared by Rick Engineering Company and dated July 27, 1986, addressed on-site drainage systems for subareas comprising all of the Rancho Del Rey specific plan area. The "Drainage Study for East 'H' Street," dated February 17, 1987, was also prepared by Rick Engineering Company. This study analyzed the storm drain system for East 'H' Street and the runoff to an existing culvert serving the South Rice Canyon Basin. The areas addressed by these two prior studies are shown in Exhibit "A".

This latest study by Project Design Consultants focuses on S.P.A. III only, being that portion of Rancho Del Rey lying south of East 'H' Street. A storm drainage system has been sized based on projected runoff from areas of proposed development, as shown in Exhibit "D". Also included in this analysis is the capacity of the existing 24" RCP stub at the intersection of Buena Vista Way and East 'J' Street. Larger subbasins were considered in calculating runoff to the existing 66" RCP in South Rice Canyon at Paseo Del Rey. These areas of study are shown in Exhibit "C". The division in drainage areas between the South Rice and Telegraph Canyons subbasins is shown in Exhibit "B".

DRAINAGE CRITERIA AND METHODOLOGY

The modified rational method was used to determine runoff quantities for comparison to both the July, 1986 and February, 1987 studies. This method uses the formula $Q = CIA$, where:

Q is the storm water runoff expressed in cubic feet per second.

C is the coefficient of runoff, which is a function of soil type, topography, ultimate land use and ground cover.

I is the rainfall intensity in inches per hour, which is based on the time of concentration (t_c).

A is the subbasin/drainage area in acres.

COEFFICIENT OF RUNOFF (C)

The predominant C-value used for calculating the runoff from subbasins for sizing the storm drain infrastructure was 0.75. This corresponds to the City's recommended value for dense residential development. Runoff was calculated using other coefficients for areas south of East 'J' Street, which drain to the Telegraph Canyon Road channel, and for areas with more dense proposed development. One such area is designated as a school site which will have large grassy areas for playing fields. A C-value of 0.30 was used for those portions of the school site with the balance estimated at 0.70. There are also significant areas of slope in these subbasins for which a C-value of 0.55 was used to calculate runoff. The existing Mission Verde project at East 'J' Street and Paseo Ranchero and the proposed multi-family tract at East 'J' Street and Buena Vista Way were assumed to have a C-value of 0.85.

In calculating the runoff for the South Rice Canyon Basin draining to the existing 66" RCP, a C-value of 0.65 was used throughout. This particular calculation was performed independently of the calculations to size upstream local drains and was performed primarily to provide a direct comparison to the results of the 1987 Rick Engineering study for this same canyon. The 0.65 C-value corresponds to the value recommended by the City of Chula Vista subdivision manual for single-family residential development. The ultimate developed condition of the basin will be a mix of natural and manmade slopes, single-family residential areas, and multi-family developments. The actual C-values recommended by the City range from 0.50 to 0.60 for the slopes on the site and from 0.65 to 0.75 for the areas devoted to housing. It was determined that a C-value of 0.65 represented a reasonable composite of the proposed land uses and densities for calculations of runoff in the South Rice Canyon Basin and is consistent with the value used in the 1987 Rick Engineering study.

INTENSITY (I)

Rainfall intensity was taken from the City of Chula Vista Design Standard #11 (CVDS 11) for the calculated times of concentration. The initial times of concentration for the overland reaches of the basins were determined by the formula:

$t_c = 60\ (11.9\ L^3/H)^{0.385}$, where

L = Length of overland flow (miles), and

H = Difference in elevation between the furthest point in the subbasin to the desired point of concentration.

The calculated overland t_c was adjusted as follows per the City of Chula Vista subdivision manual:

Calculated t_c	**Add**
Less than 5 minutes	8 minutes
5 - 10 minutes	5 minutes
11 - 15 minutes	3 minutes
Greater than 15 minutes	0 minutes

The travel time for runoff flowing through street gutters was determined by dividing the length of travel by the velocity of flow as given by Appendix X-D of the "San Diego County Flood Control District Design and Procedure Manual." Since the velocity of flow is a function of the discharge (Q), additional runoff was added to the gutter flow from tributary areas not exceeding approximately 500' of gutter length.

The portion of travel time for water flowing through pipes was determined by dividing the length of travel by the velocity of flow, as determined from a calculator program that determines the ratio of depth of flow to pipe diameter.

The computation for the travel time of runoff through South Rice Canyon assumed a natural channel with a trapezoidal cross section measuring 10' wide at the base and having side slopes of 2:1. A high value for the friction factor (n = 0.05) was used in order to more closely approximate the flow through a natural channel.

AREA (A)

The areas of the individual subbasins were planimetered from a 1" = 100' version of the enclosed exhibits. The areas for South Rice Canyon were planimetered off of the 1" = 200' Exhibit "B".

METHOD OF HYDROLOGY

The Modified Rational Method was used in accordance with the methodology of the study prepared by Lawrence, Fogg, Florer and Smith entitled "A Special Study of Storm Drain Facilities," as specified in the "Subdivision Manual" for the City of Chula Vista. In contrast, the July, 1986 and February, 1987 studies utilized a Rational Method computer program. The difference between the two methods is that the Modified Rational Method adjusts the flows of previously calculated upstream basins to compensate for the lengthening time of concentration. This method results in a

slightly reduced estimate of runoff when compared to the Rational Method computer program, although the Modified Method is generally recognized as providing more accurate results for basins of this size.

SUMMARY AND COMPARISON

In both the July, 1986 study and this study, runoff was calculated to size a preliminary storm drain infrastructure. The subbasins from which the runoff was calculated in the current study are different from the previous study. Preliminary storm drain sizes for this study are shown on Exhibit "D".

As part of the storm drain sizing shown by the calculations in Appendix "A" and in Exhibit "D", analysis was performed of the existing 24" RCP stubbed out in East 'J' Street at Buena Vista Way for future connection by S.P.A. III. The minimum slope of the existing pipe was found to be adequate to convey the runoff projected for the tributary area.

A comparison also had to be made between this latest study and the February, 1987 study concerning runoff to the existing 66" RCP at Paseo Del Rey. The main variation in subbasins between the 1987 study and the present analysis is the area of proposed development along the south side of East 'H' Street immediately east of Paseo Del Rey. The previous report assumed that this area would drain north into the East 'H' Street storm drain system. This latest study assumes drainage will be to the south into South Rice Canyon.

As a result of this diversion of tributary area, the East 'H' Street storm drain system is not impacted with increased runoff by the S.P.A. III development; this system will actually experience less flow than originally planned since its tributary area decreases. However, because of the diversion of area from the assumptions made in the previous studies, it was necessary to analyze the capacity of the existing 66" storm drain in South Rice Canyon.

Using the Modified Rational Method, the maximum runoff in South Rice Canyon upstream from Paseo Del Rey is calculated at 430 CFS. In comparison, the February, 1987 study calculated a maximum runoff of 468 CFS by using the Rational Method computer program. The reason for the difference in runoff is due to the diverted area of flow from the East 'H' Street system and the differing methods of hydrology.

The maximum discharge through the existing 66" RCP had been previously calculated as 376 CFS by HEC-1 in the February, 1987 study. The HEC-1 analysis calculated a maximum flow to the inlet of the existing culvert of 474 CFS. The difference between the 474

CFS inflow and the 376 CFS outflow is the result of ponding of 5.5 acre-ft of runoff at the inlet to a depth of 11.4'. The lower runoff amount calculated by this study will result in slightly less ponding at the inlet and slightly less discharge through the 66" RCP.

CONCLUSIONS

Based on the findings of this study, all existing downstream drainage systems which serve S.P.A. III are adequate to serve the project as presently proposed. Specific conclusions are as follows:

1. There is a net divergence from the existing drainage boundary of 0.8 acres from the Telegraph Canyon Basin to the South Rice Canyon Basin; negligible for basins of this size (see Exhibit "B").
2. Flow in the existing East 'H' Street storm drain system will be reduced due to divergence from that system to South Rice Canyon (see Exhibit "C").
3. The area of South Rice Canyon contributing drainage to the 66" culvert is increased but the peak runoff is less due to the diversion of area from East 'H' Street and varying methods of hydrology.
4. The existing 24" culvert in Buena Vista Way has adequate capacity but may experience velocities of 20 FPS in the steeper reaches of the pipe (see Appendix "A", Sheet 3 of 4).

REFERENCES

"Drainage Study for the Rancho Del Rey Development," July 27, 1986, by Rick Engineering Company.

"Drainage Study for East 'H' Street," February 17, 1987, by Rick Engineering Company.

"Design Standards 1986 Construction Standards," City of Chula Vista, Department of Engineering.

"Subdivision Manual (1984)," City of Chula Vista.

"A Special Study of Storm Drain Facilities," October, 1963, by Lawrence, Fogg, Florer and Smith.

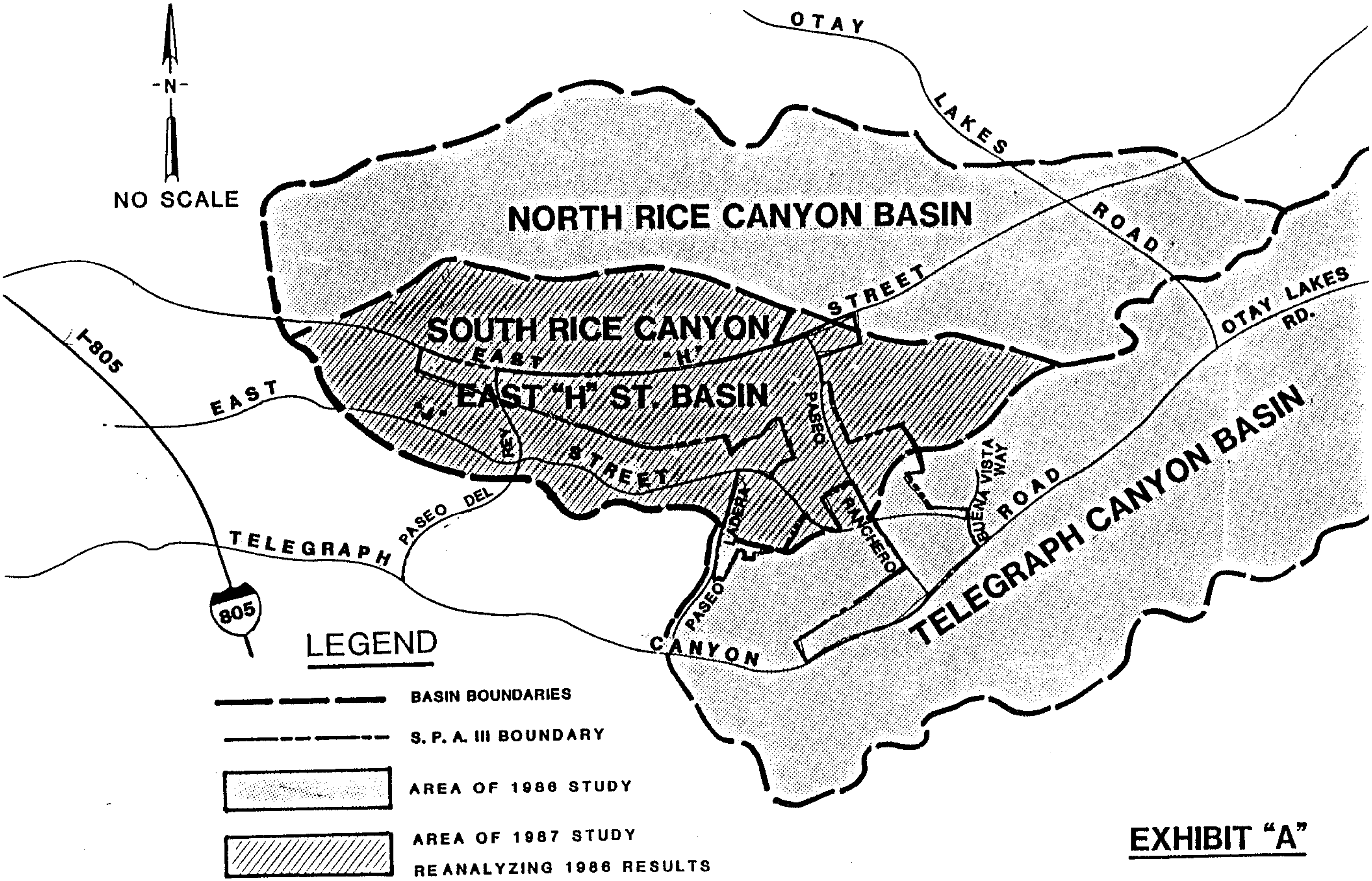


EXHIBIT "A"

BOUNDARIES OF RICK ENGINEERING DRAINAGE STUDIES

Project Design Consultants
Planning and Engineering
1010 Second Avenue, Suite 500, San Diego, CA 92101
619·235·6471 FAX 234·0349

APPENDIX C

BIOLOGICAL IMPACT ANALYSIS

BIOLOGICAL IMPACT ANALYSIS AND MITIGATION PLAN FOR THE SPA-3 DEVELOPMENT UNIT OF THE EL RANCHO DEL REY SPECIFIC PLAN

Prepared for

RANCHO DEL REY PARTNERSHIP
2727 HOOVER AVENUE
NATIONAL CITY, CA 92050

Prepared by

Gerald A. Scheid
GERALD A. SCHEID
ECOLOGIST

RECON
Regional Environmental Consultants
1276 Morena Boulevard San Diego CA 92110-3815 275-3732

RECON NUMBER R-1559E
MARCH 22, 1990

TABLE OF CONTENTS

FIGURE

I. INTRODUCTION

This report is a supplemental biological impact analysis and mitigation plan for the development of the SPA-3 portion of the El Rancho Del Rey Specific Plan. Environmental review documents (EIR-83-2, an Addendum to EIR-83-2, EIR-83-2(B)) have addressed the biological effects of the El Rancho Del Rey Specific Plan. These documents concluded that impacts of the Specific Plan to biological resources (including those within SPA-3) would be considered significant, and mitigation measures were determined to only partially mitigate adverse affects.

The information contained in this analysis briefly reviews the biological resources present on the SPA-3 portion of the Specific Plan. It provides supplemental analyses of impacts to those areas associated with the construction of the specific SPA-3 subdivision, and the potential for impacts to open space areas not anticipated in the specific plan EIR. Mitigation measures for anticipated impacts to biological resources in natural open space areas on SPA-3 are provided.

II. RESOURCES

A. BOTANICAL

The vegetation on the 408.4-acre SPA-3 portion of the Rancho Del Rey development is predominantly (373.8 acres) Diegan coastal sage scrub (Figure 1). Other plant communities occurring are patches of riparian vegetation (1.1 acres) along the bottom of the canyon south of Rice Canyon, two areas of mima mound topography on the top of the disturbed mesa on the eastern portion of the site, and areas of non-native grassland (30.4 acres) along the lower slopes just to the north of Telegraph Canyon Road. Diegan coastal sage scrub and riparian habitats are considered high priority community types by the California Department of Fish and Game (CDFG) (State of California 1989).

The quality of the mima mound topography on-site was assessed and it was determined by field surveys that although the topography for vernal pool habitat exists, no actual pools occur on the site. One tire track depression harbored a single vernal pool taxon, but other potential pool areas had no pool species observed in them.

No state- or federally-listed rare, endangered, or threatened plant species were observed within the SPA-3 project site. Four plant species listed as sensitive by the California Native Plant Society (CNPS) (Smith and Berg 1988) were observed, San Diego barrel cactus (*Ferocactus viridescens*), snake cholla (*Opuntia parryi* var. *serpentina*), golden-spined cereus (*Bergerocactus emoryi*), and ashy-spike moss (*Selaginella cinerascens*).

San Diego barrel cactus was observed on one south-facing slope in the southern portion of the project site (see Figure 1). This cactus species is listed as a Category 2 candidate species by the U.S. Fish and Wildlife Service (USFWS) and it is considered a CNPS List 2 plant. Category 2 is a designation for those species being considered for listing but which lack sufficient scientific information to warrant formal listing at this time. A List 2 CNPS species is a designation referring to plants that are rare, threatened, or endangered in California but which are more common elsewhere. San Diego barrel cactus is

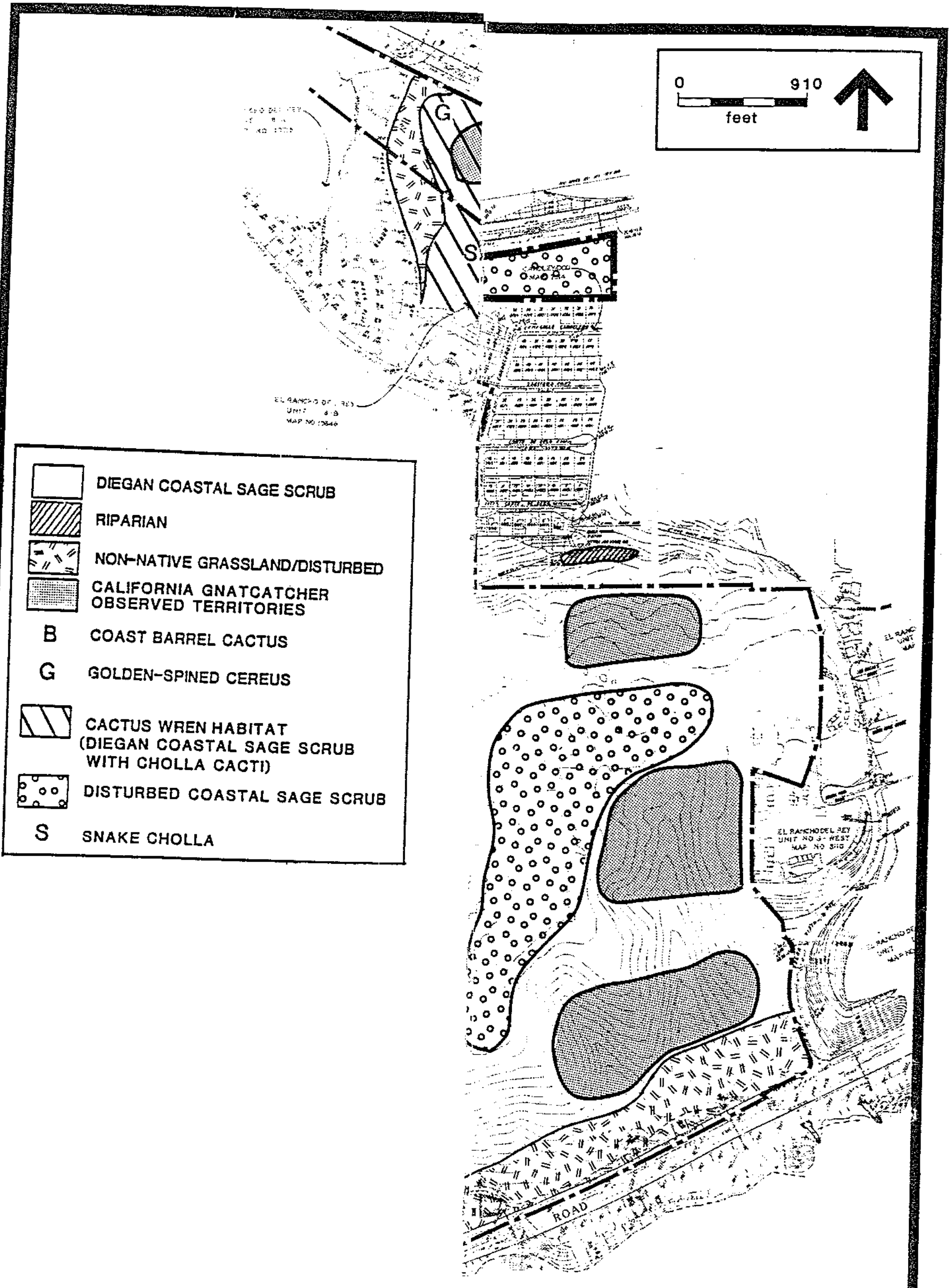


FIGURE 1. EXISTING VEGETATION AND LOC

RECON Regional Environmental Consultants

March 22, 1990

Ms. Betty Dehoney
P & D Technologies
401 West A Street, Suite 2500
San Diego, CA 92101

Regarding: Revisions to the Biological Impacts Analysis and Mitigation Plan for the SPA-3 Development Unit of the El Rancho Del Rey Specific Plan (RECON Number R-1559E)

Dear Ms. Dehoney:

Your most recent comments for the SPA-3 report have been addressed in the revised report provided. Each comment was addressed in the report as follows:

1. The inclusion of the T-intersection into South Rice Canyon was considered in the assessment of the significance of impacts in the second paragraph of section 4B which addresses impacts due to fill, pipelines, etc. An estimate of the acreage of fill to the canyon is provided in the report. No indirect impacts to the riparian vegetation downstream are expected, provided proper slope protection is designed for the manufactured slopes.
2. The loss of high quality coastal sage scrub and habitat for the California gnatcatcher is considered significant on both the local and regional levels. The local significance of the impacts are related to the entire El Rancho Del Rey project and areas of the eastern territories.
3. No specific cactus wren data for SPA-3 are available to our knowledge. It appears that the detailed surveys preformed by RECON involved only the California gnatcatcher. Other biological surveys for the El Rancho Del Rey project area state only that "several" cactus wren nests were observed within cactus thickets in South Rice Canyon (Chambers Consultants and Planners 1983).
4. The non-native grassland community has been added to the description of the area and the loss of a small amount of open space has been brought out as requested.

If you have any further questions, please call.

Sincerely,

Gerry Scheid

Gerry Scheid
Ecologist

GAS:db

Enclosure

Reference Cited

Chambers Consultants and Planners
1983 El Rancho del Rey Reconnaissance and Planning/Design Consideration. April.

1276 Morena Boulevard • San Diego, CA 92110-3815 • (619) 275-3732 • FAX (619) 275-3619

5099 East Grant Road, Suite 301A • Tucson, AZ 85712 • (602) 325-9977 3050 Chicago Avenue • Riverside, CA 92507 • (714) 784-9460

should be conducted for El Rancho del Rey as a whole, not just for SPA-3. The reason for this is that the question to be answered is "How well has the overall contiguous network of open space throughout El Rancho del Rey supported the California gnatcatcher?." The study generally maps the California gnatcatcher habitat coincident with the sage scrub onsite. Since much of the mesa top areas in the northeast and east-central aspect of the property are heavily disturbed, some evaluation of these areas as inappropriate habitat for the gnatcatcher should be made. Thusly, the overall reduction of sage scrub habitat could be reevaluated onsite, especially with regard to the areas of high quality habitat and proposed natural open space.

The biological study shows mapped patches of riparian habitat along the bottom of the South Leg of Rice Canyon. From the mapping it would appear that little, if any, riparian habitat would be lost by the Paseo Ranchero crossing of the canyon. Since riparian habitat is considered very sensitive and the extent of habitat impact could dictate whether notification of the Corps is even necessary (i.e., less than 1 acre of wetland filled), the report should address this in more detail.

The study also indicates that the nonnative grassland along Telegraph Canyon Road would be included in designated open space areas. It would appear from my field reconnaissance that the great majority of this habitat was eliminated by the ongoing expansion of Telegraph Canyon Road. The report should be updated to reflect this fact.

The biological study should be updated to reflect some of the points noted above as well as addressing the appropriate precepts of the recent General Plan Update. The significance of the California gnatcatcher issue and the overall reduction of high quality sage scrub habitat should be discussed with reference to the General Plan Update as well as other major ongoing studies in the Chula Vista Sphere of Influence. Also, additional issues that were addressed in previous studies that are lacking in the biological study are the potential placement of sewer lines, storm drains, power lines, and trails within the natural open space system.

I hope this review is helpful. Please call if you have any questions.

Sincerely,

Stephen B. Lacy

Stephen B. Lacy
Manager, Biological
Resources Group

found on south-facing slopes in the southwestern part of San Diego County, and in similar habitats in northern Baja California.

Snake cholla was observed on the slopes of the canyon in the north portion of the site (see Figure 1). It occurred on both the north- and south-facing slopes in the canyon and the main population occurred over approximately 12.5 acres on-site and 6.2 acres of adjacent off-site area. This cactus is also a federal Category 2 candidate species and it is considered a CNPS List 1B plant. List 1B plants are those considered rare, threatened, or endangered in California and elsewhere. Snake cholla is only found in canyons near the coast of southwestern San Diego County and Northern Baja California.

An individual clump of Golden-spined cactus was observed in one location on the extreme northwest portion of the SPA-3 project site (see Figure 1). This cactus species is a List 2 plant on the CNPS listing. It is known only from a few locations in California.

Ashy-spike moss was observed in openings in the sage scrub throughout the site. This species is considered a List 4 plant by CNPS. List 4 plants are those species suffering declines in population size that warrant monitoring to determine whether it is necessary to move the species to a more sensitive listing. This species is not currently considered to be threatened in San Diego County.

B. WILDLIFE

Sensitive bird species occurring within the SPA-3 area are the California gnatcatcher (formerly the black-tailed gnatcatcher) *(Polioptila californica)* and cactus wren (*Campylorhynchus brunneicapillus*). The California gnatcatcher is a federal Category 2 candidate bird species and is considered a Species of Special Concern by CDFG as listed in their California Natural Diversity Database (State of California 1989). The cactus wren is listed as sensitive in San Diego County due to the continued loss of native cactus populations along the coastal lowlands (Everett 1979). This species was observed in the area of coastal sage scrub habitat which has large concentrations of coast cholla and snake cholla (see Figure 1). In addition to the above bird species, various raptor species would be expected to forage over the property. All raptor species are protected by the State of California.

The San Diego coast horned lizard (*Phrynosoma coronatum blainvillei*) and the orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*) both have the potential for occurrence on the SPA-3 site. The whiptail has been observed, according to information in the EIR 83-2, previously within the El Rancho Del Rey project area; however, exact locations of the observations were not quantified, due to the mobility of this species. Both the orange-throated whiptail and the San Diego horned lizard are known to occur in coastal shrub communities. Both are candidates for federal listing (Category 2) and are considered Species of Special Concern by CDFG and locally endangered by the San Diego Herpetological Society (SDHS).

C. RESULTS OF THE DETAILED CALIFORNIA GNATCATCHER SURVEY

A detailed survey was conducted by Anita Hayworth, consulting zoologist, to determine the number of California gnatcatchers and the approximate areas utilized by the birds on the SPA-3 project site. The survey was conducted on five different days in February of 1989 (February 2, 3, 5, 6, and 7) for a minimum of five hours on the 2nd and 7th, and a maximum of nine hours on the 3rd, 5th, and 6th. The site was thoroughly searched on-foot by using existing dirt roads and animal trails on all the ridges and ravines present within the project area. Sightings and vocalizations were recorded on a topographic map along with an estimate of the boundaries of the area utilized by the birds.

Forty-six California gnatcatchers were observed during the five days of surveying the project site. They were generally observed in both lemonadeberry (*Rhus integrifolia*) and California sage (*Artemisia californica*) shrubs, particularly in the ravines. Of the 46 individuals, 18 birds made up nine pairs where an interaction was observed in the same plant. Some individual birds probably constitute pairs due to their proximity of location but were not observed interacting. Care was taken to avoid duplication in counting the individuals and where there was any question, the lower, more conservative count was used.

Based on this survey, the highest concentration of California gnatcatchers within the SPA-3 project area were observed in two areas, each having 17 individual birds observed (see Figure 1). The first area was south of the proposed East J Street in the deep ravines that run north-south intersecting with Telegraph Canyon Road, and the other area occurred south of East H Street, west of Paseo Ranchero and east of Paseo Del Rey on south-facing slopes of the canyons.

III. IMPACT ANALYSIS

A. SPA-3 DEVELOPMENT

1. Habitat

The implementation of the SPA-3 portion of the El Rancho Del Rey Specific Plan would impact approximately 256 acres of coastal sage scrub vegetation. This would be considered habitat loss for the California gnatcatcher, orange-throated whiptail, and the San Diego horned lizard since all of these species utilize this plant community. Included in the 256 acres of coastal sage scrub impacts is approximately 47 acres of sage scrub containing concentrations of coast cholla and snake cholla cacti. The loss of this 47 acres of sage scrub\cactus vegetation represents habitat loss of the cactus wren.

The riparian and non-native grassland habitats on the site would be included in designated open space areas and including the undisturbed coastal sage scrub, the open space area would amount to about 149.3 acres. Portions of the non-native grassland on the lower slopes adjacent to Telegraph Canyon Road have recently been disturbed due to the widening of the road and the channelization of a drainage. The road widening activities have reduced the total open space area by only a small degree.

2. Botanical

Impacts to the coastal sage scrub community would also include losses of sensitive plant species present on the project site including individuals of San Diego coast barrel cactus, approximately 6.3 acres of sage scrub containing snake cholla, and a large portion of the ashy-spike moss population. The loss of snake cholla and San Diego barrel cactus would be considered to contribute to the cumulative impacts to the populations of these cacti within the entire El Rancho Del Rey project. The golden-spined cereus cactus clump will remain in open space.

3. Wildlife

Impacts to the coastal sage scrub habitat would significantly affect the population of California gnatcatchers on-site. About two-thirds of the population (30 birds) would be disrupted including the high density areas outlined above. The fragmentation of the coastal sage scrub habitat would have detrimental affects on the birds and limit the long-term carrying capacity and habitat viability for California gnatcatchers on-site. It is predicted that the amount of undisturbed coastal sage scrub remaining would support at best only about 12 to 23 individual birds based on a range of territory sizes (5 to 10 acres) estimated by Atwood (1980). The other portion of the population would be lost.

Impacts to the sage scrub community in the northwest portion of the site would include the loss of about 47 acres of sage scrub containing cacti thickets that are preferred habitat of the cactus wren. This loss of habitat would have an adverse affect on the resident population of this species in this area by reducing the area of habitat able to support the species. Losses of sage scrub containing coast cholla populations would be considered to contribute to the cumulative decline of potential cactus wren habitat in southern California.

Loss of coastal sage scrub habitat on-site would also affect potential populations of the orange-throated whiptail and the San Diego horned lizard. Although some loss of individuals would be expected to occur due to impacts from grading, some individuals would be expected to emigrate to undisturbed areas on- or off-site.

B. OPEN SPACE AREAS

1. Impacts to Drainages

The proposed access road (Paseo Ranchero) that connects H Street and Telegraph Canyon Road through the SPA-3 project site would cross a major drainage on the site. This impact would require the notification of the CDFG to secure a Streambed Alteration Agreement as stated under Sections 1601-1603 of the Fish and Game Code. Since the riparian areas and associated wetland vegetation are not to be impacted, notification of the U.S. Army Corps of Engineers (USACE) would not be required.

The area immediately northeast of the Paseo Ranchero crossing of Rice Canyon South is exaggerated by the placement of a t-intersection in the canyon. This intersection increases the fill placed in Rice Canyon South and isolates the eastern portion of the canyon bottom. This reduces the biological value and function of this portion of the canyon.

2. Sewer Laterals and Storm Drains

Sewer laterals and storm drains are proposed through the open space of SPA-3. The majority of the sewer lines for this development are planned to be in future residential access roads throughout the project. One lateral is proposed to cross the open space area in the southwest portion of the property.

Several storm drains would enter the open space areas. Each runs from the top of a particular slope to the bottom of a drainage where they end with an energy dissipater. The City of Chula Vista requires that each storm drain outlet be accessible by a road.

Construction of the storm drains, access roads, and sewer laterals through natural open space areas will impact coastal sage scrub habitat. The locations of the proposed facilities would be in areas where California gnatcatchers occur, and impacts to the coastal sage scrub would cause the loss of habitat for this species, as well as loss of potential habitat for the San Diego horned lizard and the orange-throated whiptail.

3. Fill Slopes

Coastal sage scrub habitat would be impacted by fill slopes extending into natural open space areas. The proposed fill slopes that would encroach into Rice Canyon South on the north portion of the site would effectively narrow the canyon. The total estimated acreage of coastal sage scrub habitat lost from the natural open space area amounts to 18 acres.

4. Sensitive Wildlife: California Gnatcatcher and Cactus Wren

Habitat for the California gnatcatcher will be lost from the encroachment of fill slopes and by the construction of storm drains, sewer laterals, and access roads. Other indirect impacts to the gnatcatcher and other sensitive bird species in the open space areas (e.g. cactus wren) can be attributed to the isolation of habitat and increased predation pressure.

Isolation of portions of habitat in canyons and on slopes of canyons can have detrimental effects on the California gnatcatcher, cactus wren, and other native bird species. Recent studies (Soule et al. 1988) indicate that bird species diversity in isolated canyon habitats in San Diego County decreases over time as the result of local extinctions of species in these canyons. Factors contributing to the increased rate of extinctions in these isolated pockets of habitat include environmental variation, habitat loss, loss of heterozygosity, inbreeding, and predation pressures. Domestic and feral cats are the main cause for the increase in predation pressures. California gnatcatchers nest in low shrubs, and thus, they are especially susceptible to cat predation.

5. Sensitive Plant Species

The proposed open space design will include areas of snake cholla, ashy spike-moss, and the individual clump of golden-spined cereus cactus. Only the small population of San Diego barrel cactus will not be included in open space.

IV. ANALYSIS OF SIGNIFICANCE

A. SPA-3 DEVELOPMENT

Impacts to coastal sage scrub, California gnatcatchers, cactus wrens, and snake cholla identified in the specific plan were considered to be significant in the El Rancho Del Rey EIR (83-2). The impacts to these resources due to the implementation of the SPA-3 development phase would still be considered significant.

Although the loss of high quality coastal sage scrub and habitat for the California gnatcatcher are considered significant not only in reference to this project but also on a regional scale, the local significance of these impacts must be viewed in context with the entire El Rancho Del Rey project. Large contiguous blocks of coastal sage scrub habitat containing California gnatcatchers and other sensitive biological resources already occur in the SPA-1 and SPA-2 areas, which were designed to provide a functional open space system that interconnects with the open space proposed for SPA-3. Other project areas (future and existing) that are part of the eastern territories, including Otay Ranch and Rancho San Diego, have large areas of coastal sage scrub containing California gnatcatchers and other biologically sensitive resources. Some of these resources are either within an existing open space design or will be subject to the implementation of a future open space system which promotes the preservation of the biological resources (Chula Vista General Plan Update 88-2).

B. OPEN SPACE AREAS ON SPA-3

The main focus of the Rancho Del Rey Specific Plan keyed in on a preserve design that established large contiguous open space areas throughout the project area. The proposed SPA-3 plan is consistent with the Specific Plan with the exception of Rice Canyon South. The inclusion of the t-intersection in the canyon to the east off of the proposed Paseo Ranchero crossing results in greater fill of the canyon and the isolation of its eastern portion significantly reducing its biological function. This intersection will deposit an additional five acres of fill to the canyon. No indirect impacts to riparian vegetation is anticipated downstream if proper slope protection is provided.

The encroachment into the natural open space areas from sewer laterals, storm drains, access roads, and fill slopes would have significant adverse affects on approximately 18 acres of coastal sage scrub vegetation and subsequently effect habitat for the California gnatcatcher.

V. MITIGATION

Mitigation measures concerning impacts from the El Rancho Del Rey development adopted with the original environmental documents, amendments, and supplemental documents have been incorporated into the SPA-3 grading and construction plans. Additional mitigation measures to compensate for impacts to open space areas not anticipated in the previous environmental documents are discussed below. Other mitigation measures may be required by the local resource agencies as conditions of permits or agreements required prior to project implementation and issued by these agencies for the specific project (i.e., 1603 Agreements).

1. Impacts to the coastal sage scrub habitat in open space areas should be avoided; however, in areas where fill slopes must encroach, impacts will be minimized by having a qualified biologist monitor the grading of the site. Fire buffers that encroach into open space areas shall be hand cleared instead of using heavy equipment.

2. Manufactured slopes within open space areas will be revegetated with coastal sage scrub species native to the site. The revegetation effort will attempt to re-create the loss of coastal sage scrub habitat and enhance the biological value and function of the open space system.

3. Sewer laterals will be positioned to cause minimum impact to biological resources, especially rare plant populations and sensitive bird habitat. Staging areas for construction will be located to minimize impacts to sensitive biological resources. The installation corridors for sewer laterals must be staked prior to design finalization and then checked by a qualified biologist for potential adjustments to minimize impacts to sensitive resources.

4. Impacted areas along sewer laterals will be revegetated with coastal sage scrub species native to the site.

5. The preservation of coastal sage scrub habitat in open space within the SPA-3 area, plus the additional mitigation of revegetation of fill slopes and sewer laterals with native coastal sage scrub species mitigate the impacts to the California gnatcatcher caused by encroachment into the open space areas.

6. A monitoring program shall be designed and implemented by a qualified biologist to determine the effect of the SPA-3 development on the population of California gnatcatchers. The program shall be conducted for three to five years after the project is completed to assess the recovery of the gnatcatcher population including the number of pairs of birds present and their territories. The purpose of the program would be to provide basic population recovery information on the California gnatcatcher to be used in the design of future preserves for this species. The information of this study would be made available to resource agencies to help develop a regional set of guidelines for California gnatcatcher mitigation. The California gnatcatcher monitoring program shall be a condition for the approval of the SPA-3 development. It is recommended that the monitoring program also incorporate open space areas within the SPA-1 and SPA-2 developments.

7. A project-wide revegetation plan, that includes transplant programs for cacti, shall be designed and incorporated in a project-wide specific plan. This revegetation plan shall be reviewed and implemented by a qualified biologist or horticulturist with experience dealing with native plants. The transplant program would facilitate the introduction of cacti species from impact areas on SPA-3 and other SPA areas into coastal sage revegetation areas in an attempt to re-establish cactus wren habitat. The revegetation plan will include a maintenance and monitoring plan to ensure the success of the revegetation effort.

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5510 Morehouse Drive
San Diego, California 92121
Telephone: 619-458-9044
Fax: 619-458-0943

ERC
Environmental
and Energy
Services Co.

December 22, 1989

Ms. Betty Dehoney
P&D Technologies
401 W. "A" Street, Suite 2500
San Diego, California 92101

Subject: Third-party review of biological impact analysis and mitigation plan for the SPA-3 Development Unit of the El Rancho del Rey Specific Plan

Dear Ms. Dehoney:

I reviewed the draft biological study prepared by RECON (dated May 16, 1989) for SPA-3 in association with assorted background project data provided by P&D and my own file data for El Rancho del Rey. I also made a site visit to overview the project area. The purpose of my review was to evaluate the consistency of the project with the approved Specific Plan and the adequacy of the biological assessment with regard to the analysis of effects on sensitive species and habitats.

The El Rancho del Rey Specific Plan went through an exhaustive environmental planning process. From a biological perspective the focal issue was the configuration of the future natural open space areas. Lacking detailed species-specific data regarding numbers and locations of sensitive plants and animals, the earlier Specific Plan analysis keyed on preserve design and attempted to establish large contiguous natural open space areas. Such areas would hopefully preserve a large diversity of habitats and species and retain a long-term viable open space system. The Specific Plan adopted this concept with the retention of Rice Canyon and other large canyon systems. The present SPA-3 open space plan is consistent with the Specific Plan in all areas with the exception of the area immediately northeast of the Paseo Ranchero crossing of the South Leg of Rice Canyon. The t-intersection from the east causes the canyon road crossing to be much wider than would be attributed to Paseo Ranchero alone and isolates the eastern aspect of the canyon thereby greatly reducing its biological value.

As El Rancho del Rey is processed through the SPA review and development procedure, subsequent biological surveys were to be conducted. Such studies would provide updated species and habitat data which could cause reassessment of the adopted general open space planning program. Adjustments could be made if significant new data warranted. Such adjustments were made in SPA-2 when a population of a highly sensitive plant species was found. The present update study identifies four sensitive plant species, two sensitive animal species, and riparian habitat onsite. This update data are not quantified though, even in a general sense, and it is difficult to assign significance to reductions of these populations without detailed mapping and numerical data. Such data is not necessary for *Selaginella cinerascens*. A detailed survey was conducted for the

California gnatcatcher (syn. black-tailed gnatcatcher) but the informative data are not presented in the biological study. I reviewed these data on large scale (1"=100') maps but the data should be available for public review in the document.

The study concludes that the project would remove all of the *Ferocactus viridescens*, and one-half of the *Opuntia parryi* var. *serpentina* and that these losses are significant. This is not justified without supporting data, especially for *Ferocactus* which is much more common than *Opuntia parryi* var. *serpentina*. Such impacts are not necessarily cumulatively significant on a regional basis if the numbers are very low. *Opuntia parryi* var. *serpentina* is a very rare plant and a large population could warrant recommendations for localized project redesign. It would appear that *Bergerocactus emoryi* is retained in natural open space. This species is only known from a few locations in the U.S. Its retention should be validated in the study.

The biological study identified two concentrated areas of California gnatcatchers onsite, each having 17 individual birds. This is a fairly large number of this sensitive species. When reviewing the distribution of these birds onsite it would appear that about two-thirds of the sightings would be lost including about two-thirds of the presumed pairs. The study discusses the number of birds lost versus the number of territories. Since this species is a resident territorial bird, territorial data is better used to evaluate the potential impacts to the species and the potential carrying capacity of the remaining open space. The reduction of this species onsite at the numbers predicted is clearly a significant impact, but I don't necessarily agree that any loss of gnatcatchers is significant as indicated in the study.

The study indicates that the proposed development would impact cactus thickets which are the preferred breeding habitat of the cactus wren. This cannot be analyzed since cactus thickets (coast cholla and coastal prickly pear cactus) are not mapped. The cactus wren is a very rare bird and its specialized breeding habitat should be mapped. Additionally, no numbers are presented in the study regarding this rare species. While snake cholla (*Opuntia parryi var. serpentina*) is mapped on Figure 1 of the biological study, and it does often occur with coast cholla (*Opuntia prolifera*), which is the species that forms cactus wren habitat, the report appears to imply that the cactus wren and snake cholla are directly related. The transplanting of snake cholla will not conserve habitat for the cactus wren as implied in the study.

I agree with the assessment of vernal pool habitat not being present onsite. While distinctive mima mound topography exists onsite, the mesa top areas are not apparently flat enough to support vernal pools. Vernal pools were not mapped by any of the previous numerous studies for the area.

I also agree with the recommendations to revegetate transition slopes to natural open with native species and to minimize habitat disturbance in creating fuel breaks around the residential-housing interface.

The biological study suggests some measures to reduce impacts to California gnatcatchers such as redesigning the project to retain open space but does not present specific examples of where this would be most productive. It also suggests a monitoring program of this species to ascertain the effects of development on the species three to five years after the project is completed. I would recommend that any monitoring program

APPENDIX D

ARCHAEOLOGICAL TEST EXCAVATIONS REPORT

ARCHAEOLOGICAL TEST EXCAVATIONS
AT SDi-9893
AND EVALUATIONS AT SDi-960/961
RANCHO DEL REY (SPA III)
CHULA VISTA, CALIFORNIA

Prepared for

RANCHO DEL REY PARTNERSHIP
2727 HOOVER AVENUE
NATIONAL CITY, CA 92050-9973

Prepared by

Sue A. Wade

SUE A. WADE
PROJECT ARCHAEOLOGIST

Susan M Hector

SUSAN M. HECTOR, Ph.D
PRINCIPAL INVESTIGATOR

RECON
Regional Environmental Consultants
1276 Morena Boulevard, San Diego, CA 92110-3815 275-3732

RECON NUMBER R-1559I
APRIL 27, 1989

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I. INTRODUCTION

Archaeological investigations were conducted at two sites within Sectional Planning Area (SPA) III of the Rancho del Rey project area. These investigations were necessary to satisfy the requirements of the California Environmental Quality Act (CEQA), Section 21083.2, for the inclusion of information regarding the significance of cultural resources with the environmental review process. In addition to providing these mitigation recommendations as required under CEQA, this report also includes an outline of the compensatory mitigation measures as recommended in the environmental impact report (EIR) for SPA II. This compensatory mitigation was recommended to provide an alternative mitigation for the archaeological site in SPA II which was inadvertently destroyed. The compensatory measures recommended that a heightened level of archaeological investigation be conducted at SDi-9893 (within SPA III) which included extensive regional research and excavation of an increased number of test units. This report includes specific recommendations for the completion of these compensatory mitigation measures.

It was determined that the two sites represent significant resources which can contribute valuable information about the cultural prehistory of San Diego County. The investigations conducted at SDi-960/961 consisted of evaluations by Dr. G. Timothy Gross which resulted in a proposed scope of work for mitigation evaluations. At site SDi-9893, the investigations consisted of excavation of 40 shovel test pits (stp's) and four 1x1-meter test units. These were divided between two areas of the site, western and eastern. No surface collections were accomplished. An impact mitigation program is recommended for SDi-9893.

As a result of the investigations, it was found that site SDi-960/961 contains evidence which can address the question of the presence of early man in San Diego. Broken stones were seen on the surface which possibly exhibit characteristics of human manufacture. These types of materials have been attributed, by virtue of their morphology, to a previously hypothesized early period of San Diego prehistory. A program to evaluate the origins and age of the broken rocks was developed and is presented in this report. The program will involve consultation with previous investigators at the site, analysis of previous collections from the site, controlled surface collections, hand and backhoe excavations, geomorphological evaluations, replicative studies, and lab analyses. Substantive information regarding these types of sites (locations of hypothesized early man artifacts) will result from this investigation.

Site SDi-9893 consists of a surface and subsurface lithic scatter with the potential to yield important information regarding resource exploitation patterns in southern San Diego County. Analysis of the recovered materials revealed that the site probably functioned as a lithic reduction site where food processing also occurred. Some evidence was also found that the site might contain spatial separation of activity areas. Because the site has been undisturbed by agriculture, there is a possibility that features could be discovered which could yield microfaunal and microfloral data as well as material for absolute dating. A program is proposed which will direct excavations towards evaluating these issues. Additional excavation will also be implemented as a part of the compensatory mitigation requirements which will evaluate sampling procedures. This program will involve selection of random test units, a staged excavation program which will involve evaluation of the sampling results at each stage, and preparation of a report contributing information regarding the calculations of sample size.

If the above-described measures are completed, the impacts which will result from development of the proposed project will be mitigated.

II. BACKGROUND

A. ENVIRONMENTAL BACKGROUND

The two archaeological sites investigated exist on mesa lands which lie between Sweetwater Valley approximately two miles to the north and Otay Valley approximately two miles to the south (Figures 1 and 2). The mesa is cut by smaller canyons running to the west: Rice Canyon on the north and Telegraph Canyon to the south. These canyons, in turn, are fed by drainages which run off the mesas to the north and south. Site SDi-9893 lies at the head of one of these tributary drainages which runs south into Telegraph Canyon. Site SDi-960/961 lies on a finger of the mesa overlooking Telegraph Canyon. Both sites afford a wide view of the surrounding mesa tops, coastal foothills, and ocean and bay.

Geologically, the mesas have been formed by alternating marine and riverine deposits laid down during the Eocene age of geologic history and subsequently cut by drainages forming the large valleys and steep canyons. The Eocene deposits are exposed on the surface of the mesas and on the slopes of the canyons and valleys. The exposed cobbles were commonly utilized as sources of raw materials for prehistoric man's production of stone tools. A dense scatter of exposed cobbles is present at site SDi-960/961, while the majority of the rock on the surface of site SDi-9893 is pebble sized.

Another unique natural feature of the project area is the mima mound topography in the location of SDi-960/961. The typical topography is a prominent feature of the landscape. Two basic theories exist for the formation of these natural features: (1) that they were produced by rodent activity and (2) that they have been formed by one of several soil expansion, weathering, or subsidence factors. An important factor in evaluating the effects of these compositional factors on possible associated cultural artifacts is that none of the theories for formation involves depositional processes. Based on these theories, it would not be expected that cultural materials would be found buried in situ in these landforms.

Several vegetation zones are in proximity to the project area. Although the mesa tops have been highly disturbed, remnants of chamise and coastal scrub are present. The vegetation on the slopes is dense and consists of coastal sagebrush, buckwheat, laurel sumac, lemonadeberry, jojoba, snake cholla, prickly pear cactus, and white sage. Seeds, berries, and roots from these plants are known to have been utilized by the Native Americans for food and medicinal purposes (Hedges 1967). The nearby valleys, although now disturbed by development and road placement, would have consisted of riparian habitat and supported large game animals and a stable water source.

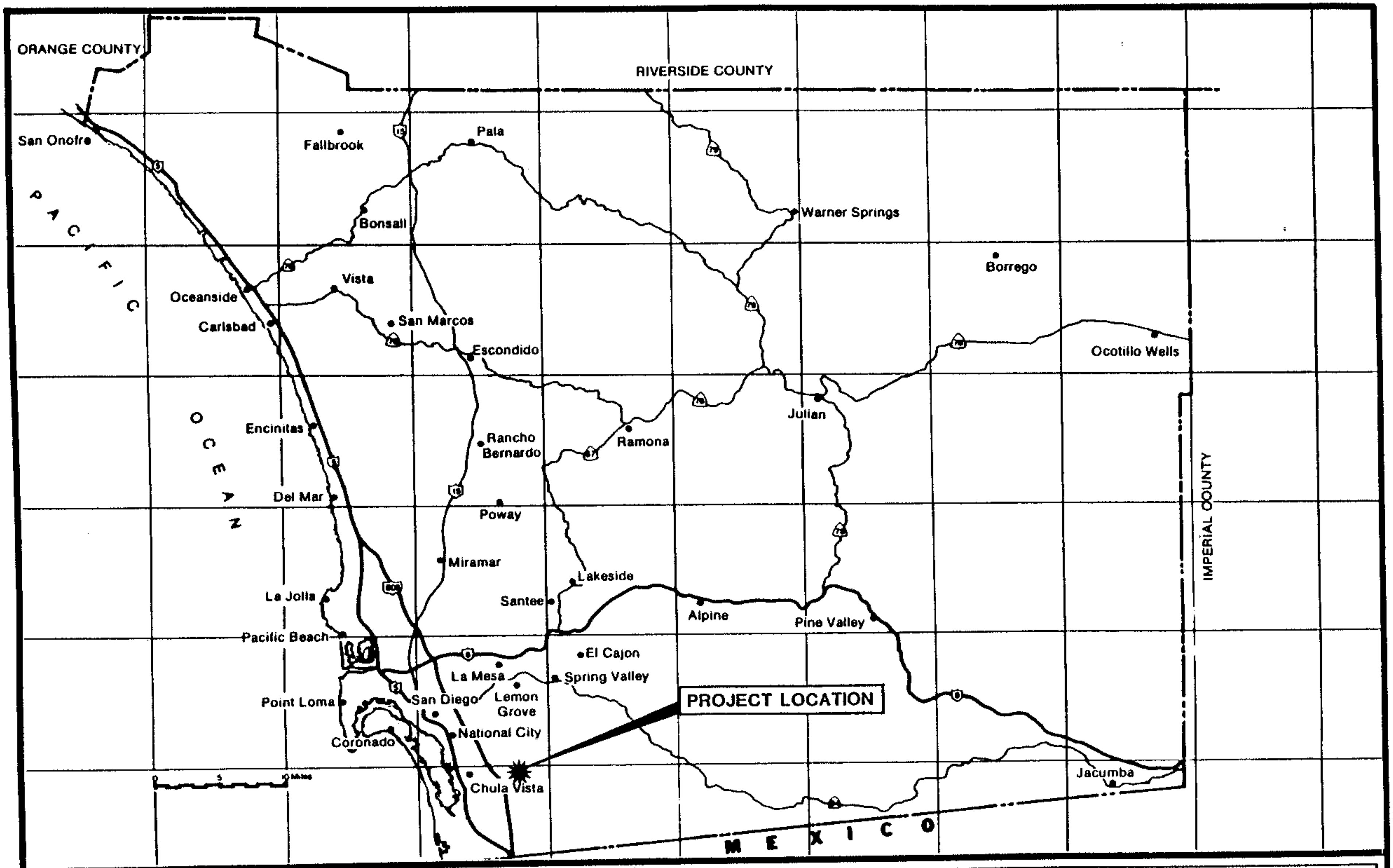

FIGURE 1. THE LOCATION OF THE PROPOSED PROJECT RELATIVE TO THE COUNTY OF SAN DIEGO.

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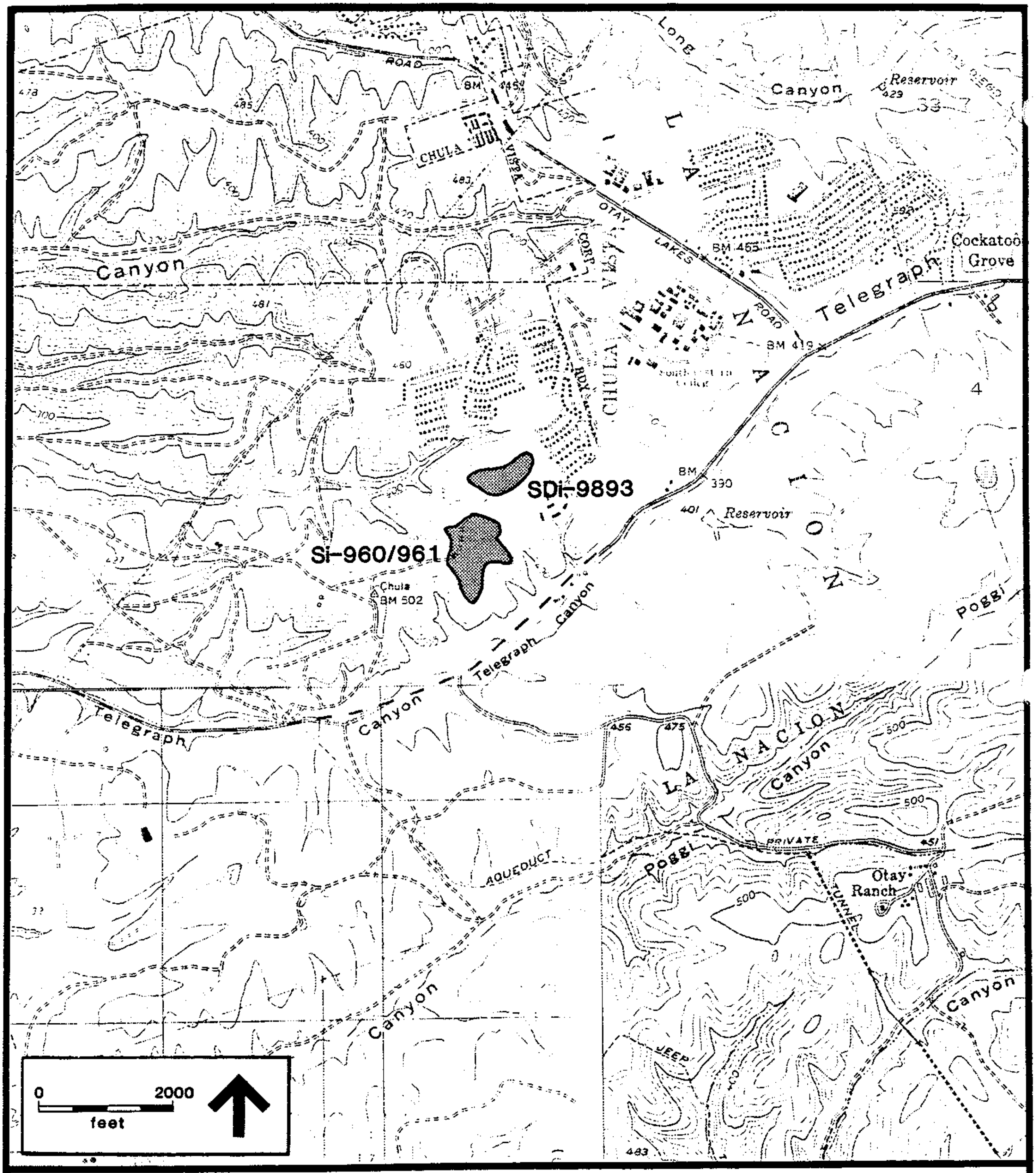


FIGURE 2. ARCHAEOLOGICAL SITE LOCATIONS ON U.S.G.S. 7.5 MINUTE TOPOGRAPHIC MAPS, NATIONAL CITY, JAMUL MOUNTAINS, IMPERIAL BEACH, AND OTAY MESA QUADRANGLES

B. CULTURAL BACKGROUND

Archaeological resources in the south county mesa areas have typically consisted of stone tool and debitage scatters. The majority of artifacts are flaked stone tools, cores, some projectile points or bifaces, and waste debitage associated with the production of these items. Ground stone artifacts are sometimes present, and some faunal remains are also represented, including shell and faunal materials. Sites of this type are present on Otay Mesa to the south and west and the EastLake mesa to the east (Hector 1986; Wade 1986). A few of these sites have exhibited characteristics of habitation (Hector 1988; Kyle 1988). The habitation sites have tended to be located in the ecotone between at least two environmental zones, usually at the head of tributary canyons between the mesa and the adjacent river valleys. In this area of the county, these sites have all tended to have early dates--previous to 2500 B.P.--as determined from shellfish radiocarbon dating. Some have associated projectile point or biface types comparable to those of the Amargosan/Campbell tradition (Cardenas and Van Wormer 1984). Artifacts diagnostic of the Late Prehistoric period (such as ceramics or late projectile point types) are absent from these sites.

It has been proposed that sites in the region were occupied by the same cultural group through time. Hector (1988) has concluded that tool production technology was similar, and tool use and resource exploitation was the same. The variability observed between sites was determined to be due to differences in site function rather than cultural differences (Hector 1988). It was proposed that the sites on Otay Mesa were occupied by groups processing plant resources and practicing secondary reduction of raw material into stone tools.

A comparable situation was found at three sites on the EastLake mesa approximately three miles northeast of the project area (Wade 1988). Three sites shared similar lithic reduction strategies and raw material preferences. However, the sites differed in several ways which were divided along lines defined by ceramic and aceramic aspects. Cultural elements of the preceramic aspect center on site location, ecofacts, and artifacts. A preferred site location consists of high knolls, removed from immediate access to water and containing a view of the surrounding terrain. Ecofacts present include shell and little or no bone. Plants were processed using ground stone manos and metates. Exotic materials were also utilized for tool making, including chert and obsidian. Edge angles on tools varied from obtuse to acute and edge crushing was numerous. For the ceramic aspect, sites are located on low knolls close to water. Characteristics of the ceramic aspect include presence of ceramics and disproportionate amounts of fine-grained porphyritic metavolcanic flakes as compared to the amount of tools of that material and presence of bone and no shell. The study concluded that the occupants of the sites were pursuing very similar tasks in slightly dissimilar ways. These differences could be functional or temporal: it was unclear if the sites represent different activity areas of the same culture or campsites of entirely different cultures and different time periods (Wade 1988).

The sites on the Rancho del Rey property were recorded and evaluated by archaeologists from WESTEC. SDi-960/961 was originally recorded by Carrico and Welch (1976) as a flake and tool scatter of indeterminate age. Subsequently, the site was revisited by Dennis Quillen during his survey of the Rancho del Rey property. His description includes the following:

> . . . surface collection by Dr. Bernard Reeves, University of Calgary, British Columbia, had been undertaken (Cerruti 1983). In-field examination of the site revealed quartzite cores and choppers imbedded in a quartzite cobble matrix, which are exposed between low lying "mima" mounds and depressions caused by roads and off-road vehicle activities. The antiquity of sites like these are the subject of considerable debate among researchers. Some, Dr. Reeves in particular, consider these artifacts to represent a very early occupation in southern California. Many others are skeptical of claims for great antiquity because no unquestionable methods have been developed to date the artifacts. Others suggest the quartzite cobble tools are not man-made artifacts, but were created by natural forces. Therefore, areas containing these materials should not be considered archaeological sites. Artifacts of unquestioned human manufacture were found on the site during the current survey and the site should stand as recorded (Quillen 1984:6, 8).

The value of this resource lies in the information which can contribute to evaluations of the proposed presence of early man in San Diego.

Site SDi-9893 was recorded by Quillen during the survey of Rancho del Rey. It was described as containing extensive flakes, cores, and one portable milling stone (collected by Richard Cerruti). Many of the artifacts were observed to be patinated and a possible association with SDi-9893 was suggested. The presence of subsurface deposits was suggested, and it was noted that the site appeared to be relatively undisturbed.

III. FIELD INVESTIGATIONS

A. SDi-960/961

The site is located on an extended ridge overlooking Telegraph Canyon to the south. The site was visited by archaeologists from RECON: Susan M. Hector, Sue A. Wade, and by G. Timothy Gross. Topography consists of mima mounds and vernal pool depressions. Vegetation is sparsely spread across the surface. An extensive amount of cobbles are located on the surface. Virtually all of the cobble-sized rock is located in the depression areas, giving the appearance of a meandering river bed. Rock located on the mima mounds are pebble sized. Many of the cobbles are fractured and spalled, resulting in many cobbles with very small portions of the surface removed. Some cobbles were observed which were cleaved in half. A very few were seen which had been broken on several surfaces. One broken rock was found which exhibited what resembled three negative flake scar patterns on one edge. This rock was the same material type of which flakes at site SDi-9893 were composed. Several rocks which were cracked but had not yet come apart were observed embedded in the sediments. It is possible that these occurrences can shed light on the natural origins of some of the damage seen on cobbles at the site.

Based on the surface examination, an investigation program was developed by Timothy Gross and will be discussed below.

B. SDi-9893

The site area, as recorded, consists of an elongated artifact scatter at the head of the tributary canyon to Telegraph Canyon. The head of the canyon is an east-west extended flat area which is also just to the south of the head of several north-trending canyons. From the site, one can see San Diego Bay, the coastal mountains, and surrounding mesa lands.

The site area has been artificially bisected by a stockpile of dirt (Figure 3), and possibly some movement of soil has occurred on the area east of the stockpile. No surface evidence of cultural materials could be seen on the eastern portion of the site. The eastern area of the site is separated by approximately 100 meters from the western area of the site where artifacts were observed. In this area, numerous flakes and shatter, some core fragments, and two possible tools were observed on the surface. The artifact density consists of approximately one artifact per square meter.

Twenty shovel test pits were excavated at each of the two site areas. On the eastern portion, these were laid out on a 10x10-meter grid where one stp was excavated at each intersection of the gird lines. The first five were excavated to 40 centimeters through very hard clay soil. The soil was sterile clay and no artifacts were located. The remainder of the pits were excavated to an average of 20 centimeters through very hard clay soil. Several fragments of gravel were located in some of the pits; however, these were attributable to the gravel that is a part of the soil which has been dumped across this area of the site. One flake was found in stp 9. One test excavation (Unit 4) was made in proximity to this stp. Again, some stone fragments were found in the unit. However, these were either clearly created by the excavation tools or consisted of gravel. One felsite flake was found and several pieces of suspicious shatter. The soil in the unit was also very compacted clay and was very difficult to excavate. The unit was excavated to 20 centimeters below the surface. The one felsite flake constituted the only artifact recovered from the eastern area of the site.

On the western site area, 11 stp's were located along a baseline, running at 245 degrees, with an additional nine stp's located on perpendiculars at 55 meters, 70 meters, 80 meters, and 85 meters (see Figure 3). The stp's were excavated to an average of 35 centimeters, the soil being less compact than that on the eastern portion of the site. Clay was encountered at 27 centimeters at stp 19. Flakes and shatter were encountered in all but six stp's. Although a darker soil matrix was observed towards the western portion of this site area, no corresponding considerable increase in cultural materials was noted in this area. One-by-one-meter test units were excavated in the southeastern, southwestern, and northeastern portions of the grid pattern (Units 1-3, respectively). Unit 1 was excavated to 50 centimeters, where sterile soil was encountered. A metate fragment was encountered in the first level at this unit. Unit 2 was excavated to 40 centimeters, where sterile sandy loam and cobbles were encountered. Several pieces of bone were present with flakes and shatter. Unit 3 was excavated to 40 centimeters, where sterile clay was found. This unit produced flakes and shatter. All units contained loosely compacted sandy silt and sandy loam. Some rodent disturbance was also noted by excavators.

IV. ANALYSIS--SDi-9893

The artifacts recovered from site SDi-9893 consisted of 257 flakes and shatter, three flaked stone artifacts, and one ground stone fragment.

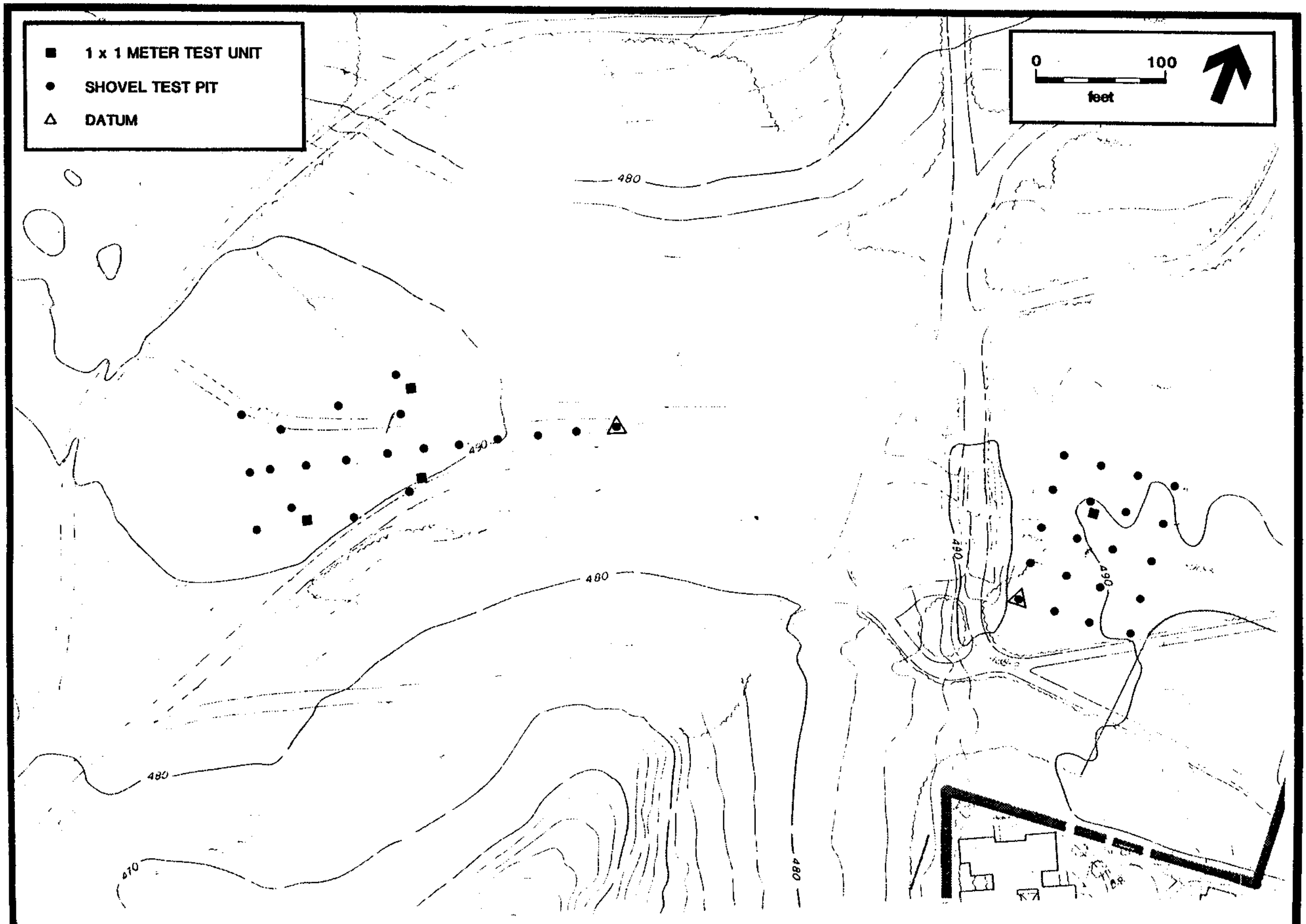


FIGURE 3. SDi-9893 SITE MAP SHOWING SHOVEL TEST PIT AND UNIT LOCATIONS

All artifacts and faunal remains were returned to the RECON archaeological laboratory to be washed and cataloged. After washing, all artifacts and faunal remains were cataloged by unit and level. Debitage and bone were analyzed in bulk by unit and level. Flaked lithic artifacts and ground stone were analyzed individually. The results of the analysis are presented in the computer data printouts presented in Attachment 1. Each artifact category will be discussed separately below.

The debitage was analyzed utilizing a stage of reduction approach based on similar studies by Collins (1975); Norwood, Bull, and Rosenthal (1981); and Hector (1984). This analysis approach focuses on identifying the stage of the reduction sequence and the type of reduction technology, which is represented by a piece of debitage. These determinations are based on attributes of diagnostic flake type, flake size, and amount of cortex present. Stone material type is also recorded. This method of analysis allows the investigator to make inferences regarding site activity (initial quarrying, primary reduction, tool finishing, tool use and maintenance), reduction technology (biface production, blade production), and preferred material types (metavolcanic, quartz, chert).

Nine types of debitage were synthesized to describe the stage of reduction which is represented at the site. A description of the nine types is included in Attachment 1. Type 1 is a blade defined by having a length at least twice as long as its width and parallel sides. No requirement for parallel dorsal scars (indicative of deliberate blade core reduction) is included in the definition. It is recognized that deliberate blade production did not occur in San Diego County; however, opportunistic blades were produced and utilized and their recognization is important to the interpretation of the lithic collection. Type 2 is defined as a biface thinning flake and is indicative of biface production. Types 3-5 represent successive levels of initial reduction. Types 6-7 represent tool finishing and resharpening. Types 8-9 represent cortex and noncortex shatter.

One half of the debitage consisted of types 5 and 6 related to tool finishing and maintenance. One-third of the debitage consisted of noncortex shatter. One biface thinning flake was recovered and small percentages of types 4 (larger reduction flakes) and 7 (cortex tool finishing flakes) were recovered. There were some differences in proportions of flake types present between units. Unit 3 contained a higher percentage of type 5 flakes (47%) related to an earlier stage of reduction. Unit 2 contained a higher proportion of shatter (45%), and Unit 1 contained an even distribution between types 5, 6, and 9 (27%, 28%, and 25% respectively).

Material types were also recorded and the results are presented in Table 1. The majority of debitage consisted of fine-grained nonporphyritic metavolcanic (type 3) (48%), followed by coarse-grained nonporphyritic metavolcanic (type 1) (29%), coarse-grained porphyritic metavolcanic (10%), fine-grained porphyritic metavolcanic (7%), quartzite (6%), and chert (1%). Minor differences were noted in proportions of material types between units. Unit 1 contained the majority of quartzite debitage, Unit 2 contained the only chert, and Unit 3 contained a majority of coarse-grained nonporphyritic stone. In general, the results of the debitage analysis would suggest that there is some spatial variation between areas of the site. These were observed in stage of reduction and material types.

TABLE 1
SUMMARY OF DEBITAGE MATERIAL TYPES

Unit	Material Type*							Totals/
	1	2	3	4	5	6	7	% Total
1	14	5	34	4	8			65
% unit	22	8	52	6	12			31
2	29	13	52	10	4		2	110
% unit	26	12	47	9	4		2	53
3	16	2	14					32
% unit	50	6	44					15
Totals	59	20	100	14	12		2	207
% Total	29	10	48	7	6		1	100

*See Attachment 1 for description of material types.

The flaked stone tools were described using a refinement of an attribute analysis designed to describe the degree of complexity represented by a stone tool. The assumption is that when a particular task is at hand requiring the aid of a stone tool, several steps will be taken by the tool user to complete the "task event." During the completion of the task event, decisions will be made regarding modification, use, and combinations of modification and use. The flow of this process is illustrated in Figure 4. The attempt of stone tool description is to define tool complexity in terms of how many decisions, what kinds of decisions, and what combinations of decisions were made during the task event. If, through this method, we can describe the complexity of the tool, we can come closer to describing the complexity of activities at the site.

The first step in the process is to identify the damaged edges on an artifact; these are described as "noncontiguous, exclusive, damage events" (NEDEs). Each NEDE is then described using several attributes prefaced by whether the NEDE is flaked only, utilized only, or flaked and utilized. The flaking is then categorized according to unifacial or bifacial, and the utilization is described as rounding, nibbling, micro-step flaking, crushing, or battering. At the final step in the description, each NEDE is given a type number that describes the combination of these attributes. The entire flow process, including the resulting type numbers, is illustrated in Figure 5.

Three flaked stone artifacts were recovered from the site: one from Unit 1 and two from Unit 2. Each artifact had only one NEDE. Two were unifacially flaked and utilized and one was a core. The lack of multiple NEDEs and levels of flaking and use indicates a low level of complexity represented by the tools. All flaking was unifacial. The use damage was all related to light-duty tasks: nibbling and micro-step flaking. Tools were composed of nonporphyritic fine- and coarse-grained metavolcanic stone.

The ground stone was analyzed also using an attribute system. Attributes recorded for the tools included presence of shaping (possessing ground shoulders and a tabular appearance), the number of faces, and the stone material type. One ground stone artifact was recovered, a metate fragment composed of granite and ground on one face.

V. CONCLUSIONS--SDi-9893

A modest amount of lithic material was recovered during the investigations at SDi-9893. Although the artifact recovery was not dense, the deposit is spread out over a wide area. In addition, the deposits at the site are relatively intact, rodent disturbance being the only factor noted during the excavations. The materials do not exhibit a variety through artifact class. With one exception, the assemblage consists of flaked stone artifacts and waste debitage only. The one metate fragment (and, it should be noted, the metate fragment previously recovered by Richard Cerruti) indicates that some habitation occurred at the site in addition to the lithic reduction indicated by the remainder of the artifacts. Based on the reduction stage represented at the site (as indicated by the debitage analysis), the site did not function as a quarry location. Secondary reduction was occurring at the site. It is probable that stone materials from a nearby source were being initially reduced before being taken from the site area. This source could consist of site SDi-960/961 located to the southwest. Comparative analysis of the stone materials from each site could shed light on this issue.

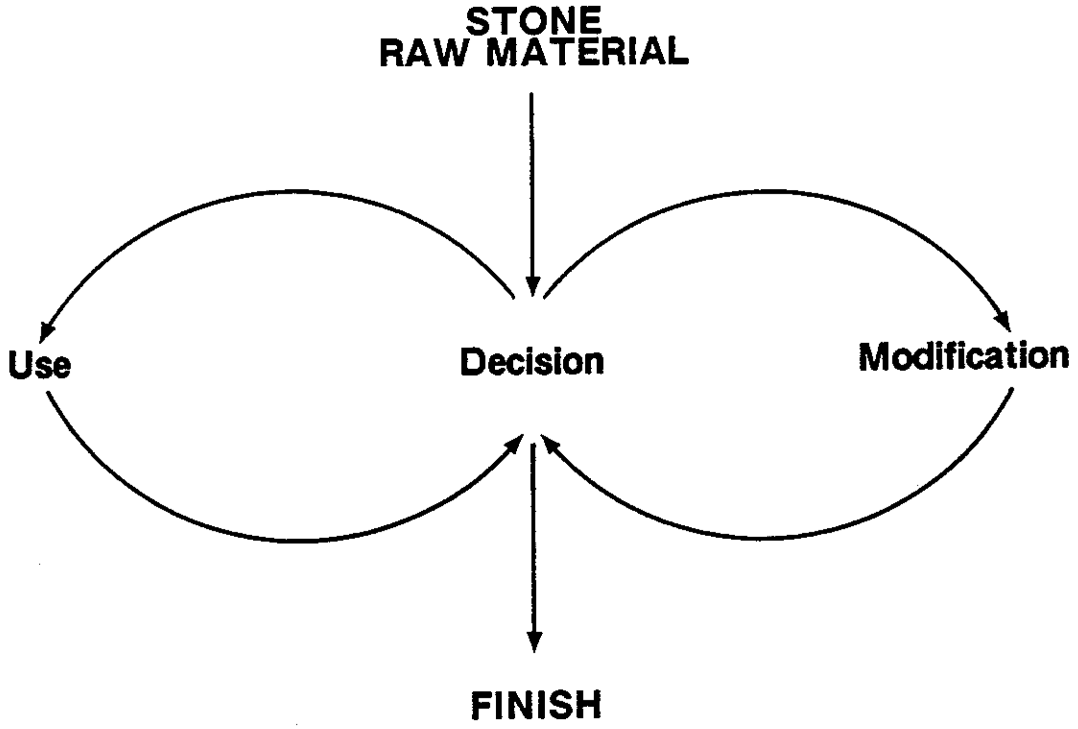
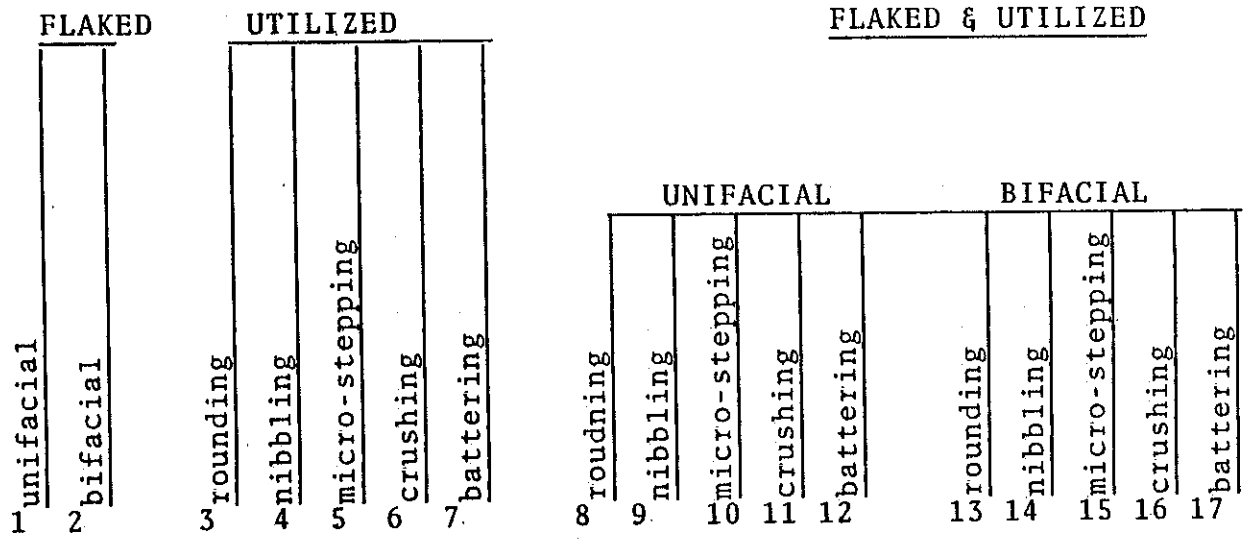


FIGURE 4. TASK EVENT PROCESS

FIGURE 5

IDENTIFICATION OF NON-CONTIGUOUS, EXCLUSIVE, DAMAGE EVENTS

OR 'NEDES'



NOTE: 'Nedes" is:

continuous along a line not broken by an angle less than 90 degrees or undamaged area (non-contiguous)

continuous breakage of the same type (esclusive)

can be interupted by recent breakage and still be interpreted as continuous

does not include platform preparation

Circumference: a circle defined by diameter equaling the maximum length of artifact

Some duration of occupation is indicated by the presence of the metate fragment and the unifacially utilized stone tools. Processing of the food plants in the surrounding areas was a part of the site function. If hearths could be located during future fieldwork at the site, these could be analyzed for microfaunal and floral materials.

There is evidence for intrasite variability based on the variation in proportions of materials recovered from the test units. It is possible that habitation activities were separated from lithic reduction activities. A larger sample of artifacts to be recovered from the site during mitigation excavations could confirm or refute this supposition.

No assumptions are possible at this time regarding the occupation period. Further mitigation excavations could reveal materials suitable for radiocarbon dating or typologically diagnostic artifacts which could shed light on this question.

VI. RECOMMENDATIONS

The sites on the project property have been identified by the City of Chula Vista for special treatment. This is in order to compensate for other sites within earlier phase areas of the Rancho del Rey development which were inadvertently destroyed. Both sites contain the potential to address important research questions in San Diego. Site SDi-960/961 contains information which can address the issue of early man in San Diego. Site SDi-9893 can not only address important questions related to prehistoric culture patterns but also provide a data base against which to test sampling procedures.

A. SDi-960/961

Based on an evaluation prepared by Dr. G. Timothy Gross, a mitigation program is proposed for this site. This program is outlined in detail in Dr. Gross's report attached as Appendix A. This program would address the concept of an early man site on two levels: Are the broken cobbles at the site the product of human manufacture, and if they are of human manufacture, is their context indicative of great age? The mitigation program would include examination of previous collections, surface collection and mapping, examination of mima mounds as providing context for cultural materials, geomorphological examination, excavation of test units, background research, analysis, and report preparation.

B. SDi-9893

The County of San Diego has developed a procedure for evaluating the significance of archaeological sites. This procedure includes identifying research questions to be addressed with data from the site, specifying the data requirements necessary to address the research question, and outlining the data collection methods. The portion of the process which attracts the most debate among archaeologists is determining the data collection methods; that is, how much of the site should be sampled?

In an attempt to clarify this issue, a means of "measuring mitigation" was developed (Bull and Show 1980). The formulas and statistical analyses proposed by the authors as a means of "measuring mitigation" were later amended and adopted by the County of San Diego and incorporated into the Cultural Resource Form requirements.

The formula presented in the County Cultural Resource Form provides a means of setting the desired sample size based on the confidence level and precision level desired and the variance of the sample means. The variance is determined from the initial sample from the site. The confidence and precision requirements can be presented and adjusted by the researcher.

The formula, as presented in Bull and Show (1980), is as follows:

$$n = \frac{Z^2 S^2}{d^2} (1 + 2/n)$$

where

n = needed sample size
Z = appropriate ordinate of standard curve (confidence level desired)
S = standard deviation from mean
d = allowable deviation from sample mean (level of precision desired).

For each artifact class, the standard deviation can be calculated based on the results of the initial sample. The researcher specifies the confidence limits (for this example, 95%) and the level of precision (for this example, 20%). In other words, the sample size will be based on the requirement that the desired sample means will fall within 20 percent of the population means 95 percent of the time.

This formula was modified for use on the County cultural form to determine the number of sample units required. The modification involves the use of a t-distribution (t) rather than the normal distribution (Z) in determining the value of the confidence level. The value of *t* is determined from a table provided on the form.

It is proposed that this sampling formula be tested using excavation of 1x1-meter test units at SDi-9893. Based on excavation of 25 units, means and standard deviations will be calculated for combinations of two units, three units, four units, up to 25 units. As means and standard deviations are calculated for each successive set of units (two, then three, then four, up to 25), it will be possible to determine when the desired precision and confidence level for the sample are reached. The results of this investigation will aid future researchers in objective evaluation of proposed sampling strategies.

If the measures proposed above are completed, the adverse impacts to the archaeological resources in the SPA III project area, as well as previously destroyed resources in earlier phase areas, will be mitigated.

VII. PROJECT STAFF

Susan M. Hector, Ph.D.	Principal Investigator
Sue A. Wade	Project Archaeologist
Mac Davis	Field Archaeologist, Artifact Analysis
Carol Schultze	Field Archaeologist
Karen Knight	Field Archaeologist
Cheryl Bowden	Artifact Analyst
Harry Price	Technical Illustrator
Loretta L. Gross	Production Supervisor
Stacey Tomlinson	Production Typist

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ATTACHMENTS

ATTACHMENT 1

KEY TO FLAKES AND SHATTER

Item	Description
accession number	RECON: R000 WESTEC: W000
catalog number	
site number	00000 for SDi-#s W0000 for SDM-W-#s
locus	
unit	
category	2. debitage
feature	1. hearth 2. burial 3. 4. 5. 6.
level	10, 20, 30, ...
material	1. coarse grained metavolcanic 2. coarse grained porphyritic metavolcanic 3. fine grained metavolcanic 4. fine grained porphyritic metavolcanic 5. quartzite 6. quartz 7. chert/chalcedony 8. obsidian 9. other
flake types	counts of each type within the material type specified; see attached flow diagram

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                 FLAKES AND SHATTER - RAW DATA SUMMARY

 ACC   CAT   SITE LOCUS UNIT FEAT LEVEL MAT TP1 TP2 TP3 TP4 TP5  TP6 TP7 TP8  TP9

* UNIT STP1
R189  1     9893  E     STP1        0     3    0   0   0   1   0    0   0   0    0
** SUBTOTAL **
                                               0   0   0   1   0    0   0   0    0


* UNIT 1
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** SUBTOTAL **
                                               0   0   0   0   1    0   0   0    1


* UNIT STP1
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** SUBTOTAL **
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* UNIT STP3
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** SUBTOTAL **
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* UNIT STP5
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** SUBTOTAL **
                                               0   0   0   0   1    0   0   0    0


* UNIT STP7
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** SUBTOTAL **
                                               0   0   0   0   0    1   1   0    1


* UNIT STP8
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** SUBTOTAL **
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* UNIT STP9
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R189  8     9893  W     STP9        0     3    0   0   0   0   1    3   0   0    2
** SUBTOTAL **
                                               0   0   0   0   2    4   0   0    2
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                FLAKES AND SHATTER - RAW DATA SUMMARY

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                        2
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                        2
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                        2
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* UNIT STP13
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                        3
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                        5
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                        5
** SUBTOTAL **
                                            0   0   0   0   1    2   1   0    3
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                 FLAKES AND SHATTER - RAW DATA SUMMARY

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                        6
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                        6
** SUBTOTAL **
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                        7
** SUBTOTAL **
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** SUBTOTAL **
                                            0   1   0   3  17   19   4   5   16


* UNIT 2
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R189  23    9893  W     2        20    4    0   0   0   0   0    1   0   0    2
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R189  24    9893  W     2        30    2    0   0   0   0   0    0   0   0    3
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04/18/89

                  FLAKES AND SHATTER - RAW DATA SUMMARY

 ACC   CAT   SITE LOCUS UNIT FEAT LEVEL MAT TP1 TP2 TP3 TP4 TP5  TP6 TP7 TP8  TP9

* UNIT 2
R189  24    9893  W     2         30    3    0   0   0   1   1    5   0   1    9
R189  24    9893  W     2         30    5    0   0   0   0   0    0   0   0    1
R189  25    9893  W     2         40    3    0   0   0   0   0    0   0   0    2
R189  25    9893  W     2         40    4    0   0   0   0   1    0   0   0    0
** SUBTOTAL **
                                             0   0   0   3  16   28   0  13   50


* UNIT 3
R189  26    9893  W     3         10    1    0   0   0   0   2    0   0   0    2
R189  26    9893  W     3         10    3    0   0   0   0   0    1   0   0    0
R189  27    9893  W     3         20    1    0   0   0   0   6    0   0   2    1
R189  27    9893  W     3         20    2    0   0   0   0   1    0   0   0    0
R189  27    9893  W     3         20    3    0   0   0   0   5    1   0   1    4
R189  28    9893  W     3         30    1    0   0   0   0   0    2   0   0    1
R189  28    9893  W     3         30    2    0   0   0   1   0    0   0   0    0
R189  28    9893  W     3         30    3    0   0   0   0   1    0   0   0    1
** SUBTOTAL **
                                             0   0   0   1  15    4   0   3    9

** TOTAL **
                                             0   1   1  13  64   63   6  23   86
```

FLAKE LITHIC ARTIFACTS

ITEM	DESCRIPTION	
catalog number		
locus		
unite		
feature	1. hearth	2.burial
level	10, 20, 20, ...	
weight	to the nearest gram	
length	in millimeters	
width	in millimeters	
thickness	in millimeters	
material	1. coarse grained metavolcanic 2. coarse grained porphyritic metavolcanic 3. fine grained metavolcanic 4. fine grained porphyritic metavolcanic	5. quartzite 6. quartz 7. chert/chalcendony 8. obsidian 9. other
label	1. core 2. blades 3. porjectile points 4. knives 5. scrappers-unifacial 6. choppers	7. hammers 8. utilized flakes 9. modified flakes 10. crescentii 11. drills 12. blanks
production base	1. flake 2. core	3. cobble 4. other
condition	1. whole	2. broken
patination	1. present	0. absent
cortex	1. present	0. absent
type	1-14 see chart	
circum.	1. 0-90 2. 0-180	3. 0-270 4. 0-360
angle	1. 0-30 2. 30-60	3. 60-90 4. 90 +

```
PAGE NO. 00001
04/18/89

                FLAKED STONE ARTIFACTS - RAW DATA SUMMARY

 ACC   CAT   SITE LOCUS  UNIT LEVEL MAT   WT  LN  WD  TH LBL  PR  CO  PA  CO TP1 CC1  A1 TP2 CC2  A2 TP3 CC3  A3 TP4 CC4  A4

* UNIT 1
R189  29    9893  W     1     10    1      8  48   5  15 5   2   2   0   0   10  2   1
** SUBTOTAL **
                                           8


* UNIT 2
R189  31    9893  W     2     20    3     40  46  35  25 1   1   1   0   0   9   3   4
R189  32    9893  W     2     20    3     15  31  13  42 9   1   2   0   1   1   2   3
** SUBTOTAL **
                                          55

** TOTAL **
                                          63
```

KEY TO GROUND STONE

Item	Description
accession number	RECON: R000 WESTEC: W000
catalog number	
site number	00000 for SDi-#s W0000 for SDM-W-#s
locus	
unit	
category	5. ground stone
feature	1. hearth 2. burial 3. 4. 5. 6.
level	10, 20, 30, ...
material	1. granite 2. quartzite 3. andesite 4. sandstone 5. other
weight	to the nearest gram
length	in millimeters
width	in millimeters
thickness	in millimeters
condition	1. whole 2. broken
type	1. mano 2. pestle 3. slab 4. basin 5. bowl 6. other
shaped	1. unshaped 2. shaped (shaped manos/pestles are shouldered, bifacial, and have edge treatment to produce a tabular profile)
number of faces	1 face 2 faces 3 faces 4 faces
battering	1. end 2. side 3. both
side 1 (ground surface of metate):	
length / width / depth	in millimeters
side 2 (ground surface of metate):	
length / width / depth	in millimeters

```
PAGE NO. 00001
04/18/89

                    RAW LISTING OF GROUNDSTONE

 ACC   CAT   SITE LOCUS  UNIT LEVEL MAT   WT   LN  WD  TH  CD  TP SHP FCS BAT LN1 WD1 DP1 LN2 WD2 DP2

* UNIT 1
R189  17    SPA-3 WEST  1      10    1   1520 166 133  56 2   3   1   1   0     0   0   0   0   0   0
```

FLAKE TYPOLOGY

Type	Bulb	Platform	Relative Length	Cortex	Dorsal Scars	Other	Collins (1975) Types*	Assumed Process
1	Present	Present	2x W	--	2+	Parallel sides	III	Specialized blade type
2	Present	Present	--	--	--	Diverging, thin	III, IV	Bifacial thinning
3	Present	Present	2+ cm.	80%+	0	--	II, III	Platform creation, cortex removal
4	Present	Present	2+ cm.	30%-80%	0-1	--	II, III	Cortex removal
5	Present	Present	2+ cm.	-30%	1+	--	II	Core reduction, basic shaping
6	Present	Present	-2 cm.	0%	1+	--	IV, V	Finishing, resharpening
7	Present	Present	-2 cm.	Present	1+	--	IV, V	Trimming
8	Absent	Absent	--	Present	--	--	II	Shatter during primary reduction
9	Absent	Absent	--	Absent	--	--	IV	Shatter during secondary reduction
0	Undeterminable							

Source: after Norwood, Bull, and Rosenthal 1981.

*Collins (1975) Stage I (acquisition) present only as unworked raw material.

```
          TABLE FOR C:DE
 CONTROLED FOR VALUE    R189      OF VARIABLE   ACC


     ---------------------------------------------------------------
                  FLAKE TYPES
           1     2     3     4     5     6     7     8     9      TOTAL
     ---------------------------------------------------------------
UNIT
 1         0     1     0     3    18    19     4     5    17        67      26  %GT
           0     1     0     4    27    28     6     7    25                    %RO
           0   100     0    23    28    30    67    22    20                    %CO

 2         0     0     0     3    16    28     0    13    50       110      43  %GT
           0     0     0     3    15    25     0    12    45                    %RO
           0     0     0    23    25    44     0    57    58                    %CO

 3         0     0     0     1    15     4     0     3     9        32      12  %GT
           0     0     0     3    47    13     0     9    28                    %RO
           0     0     0     8    23     6     0    13    10                    %CO

 STP1      0     0     0     1     0     1     0     0     0         2       1  %GT
           0     0     0    50     0    50     0     0     0                    %RO
           0     0     0     8     0     2     0     0     0                    %CO

 STP10     0     0     0     0     1     0     0     0     0         1       0  %GT
           0     0     0     0   100     0     0     0     0                    %RO
           0     0     0     0     2     0     0     0     0                    %CO

 STP11     0     0     1     0     1     1     0     1     0         4       2  %GT
           0     0    25     0    25    25     0    25     0                    %RO
           0     0   100     0     2     2     0     4     0                    %CO

 STP12     0     0     0     4     4     0     0     0     2        10       4  %GT
           0     0     0    40    40     0     0     0    20                    %RO
           0     0     0    31     6     0     0     0     2                    %CO

 STP13     0     0     0     0     0     0     0     0     1         1       0  %GT
           0     0     0     0     0     0     0     0   100                    %RO
           0     0     0     0     0     0     0     0     1                    %CO

 STP14     0     0     0     0     1     0     0     0     0         1       0  %GT
           0     0     0     0   100     0     0     0     0                    %RO
           0     0     0     0     2     0     0     0     0                    %CO

 STP15     0     0     0     0     1     2     1     0     3         7       3  %GT
           0     0     0     0    14    29    14     0    43                    %RO
           0     0     0     0     2     3    17     0     3                    %CO

 STP16     0     0     0     1     1     0     0     0     0         2       1  %GT
           0     0     0    50    50     0     0     0     0                    %RO
           0     0     0     8     2     0     0     0     0                    %CO

 STP17     0     0     0     0     0     1     0     0     0         1       0  %GT
           0     0     0     0     0   100     0     0     0                    %RO
           0     0     0     0     0     2     0     0     0                    %CO

 STP3      0     0     0     0     2     0     0     0     0         2       1  %GT
           0     0     0     0   100     0     0     0     0                    %RO
           0     0     0     0     3     0     0     0     0                    %CO

 STP5      0     0     0     0     1     0     0     0     0         1       0  %GT
           0     0     0     0   100     0     0     0     0                    %RO
           0     0     0     0     2     0     0     0     0                    %CO

 STP7      0     0     0     0     0     1     1     0     1         3       1  %GT
           0     0     0     0     0    33    33     0    33                    %RO
           0     0     0     0     0     2    17     0     1                    %CO

 STP8      0     0     0     0     1     2     0     1     1         5       2  %GT
           0     0     0     0    20    40     0    20    20                    %RO
           0     0     0     0     2     3     0     4     1                    %CO

 STP9      0     0     0     0     2     4     0     0     2         8       3  %GT
           0     0     0     0    25    50     0     0    25                    %RO
           0     0     0     0     3     6     0     0     2                    %CO

TOTS       0     1     1    13    64    63     6    23    86       257
           0     0     0     5    25    25     2     9    33                    %GT
```

ATTACHMENT 2

Affinis

Shadow Valley Center • 839 Jamacha Road • El Cajon, California 92019 • (619) 441-0144

An Archaeological Evaluation of Archaeological Site SDi-W-960/961

21 April 1989

Archaeological site SDi-W-960/961 was recorded by Richard Carrico and Patrick Welch in 1976 and has subsequently surface collected by B. Reeves of the University of Calgary (Quillen 1984) and by Richard Cerruti (Richard Cerruti, personal communication, April, 1989). The occurrence of what have been described as "quartzite cores and choppers imbedded in a quartzite cobble matrix" (Quillen 1984:6) has led Reeves and others to believe that the site is quite old.

I visited archaeological site SDi-W-960/961 with Sue Wade of RECON on 11 April 1989. On that visit we inspected the site surface searching for evidence artifact and features. The area is an area of "mini mound" topography marked by low, circular hummocks of sediment with the areas between the hummocks containing numerous cobbles. Among the cobbles were broken cobbles of quartzites and metavolcanics, a few of which had fractures that resembled that produced by humans.

During the entire course of our examination of the site we did not see any items that were definitely the product of human manufacture. In particular, we did not see any flakes, recognizable cores, or core tools. It may be that earlier surface collections have removed the obvious tools and debitage form the site surface. According to Cerruti, most of his collections and those made by Reeves are in Calgary. I was, therefore, unable to examine them prior to finishing the evaluation of the site. The broken cobbles found on and in the surface of the site appear consistent with the types of material that have been assigned to a possible early occupation of southern California (Carter 1980; Minshall 1976).

Two important research questions are raised by the materials present at the site:

1. Are the broken cobbles found on and in the surface of the site broken as a result of human toolmaking activities?

2. Does the fact that many of these broken cobbles occur imbedded in the surface of the site rather than sitting on it necessarily indicate that those artifacts are old?

Investigations at this site would allow these two issues. The answers to these questions have implications for the understandings of regional prehistory beyond level of a single site, since a number of such sites have been recorded in southern California.

To answer these questions I recommend a seven step program.

1. Examine existing surface collections. Although the Reeves collection is in Calgary, Cerruti tells he also placed some material with WESTEC (now ERC). These collections should be examined and Reeves should be contacted to see if material, notes, catalogs, photographs, or descriptions of the collections in his possession could be made available for study.

2. A detailed, grid-controlled surface collection should also be made of the site to collect any artifacts remaining on the surface of the site. Broken cobbles should also be collected to evaluate whether or not they are the produce of human manufacture. In addition, special watch should be kept for cobbles that are broken or spalled in place such that pieces can be refitted. During the surface collection, crew members should also be alert for any evidence that has a bearing on the nature of the surface sediments and whether or not items are actively being incorporated into that surface. Historic debris such as bricks, glass, and metal objects would be expected to occur only on the surface if incorporation into the surface is a definite sign of antiquity. If such items are found being incorporated into the sediments, it indicates that the soil zone at the site is dynamic and an items being imbedded in that surface in not a sure indicator of antiquity. Surface disturbance should also be recorded. Mapping and photographic documentation should be made at this time.

3. To test whether the occupation predates the formation of the mima mounds, 5 such mounds should be investigated to see whether the artifacts or broken cobbles are incorporated into the mounds, are found on surfaces under the mounds, or are absent form the mounds. Mounds to be investigated should be selected form the site in such a way as to provide good coverage of the area. The excavation procedures should include removing half of each mound with a backhoe to a level approximately 15 cm above the ground surface around the mound. The remaining sediments should be excavated by hand and the material passed through hardware cloth screens. The profile of the remaining half of the mound should be cleaned, drawn, and photographed.

4. A qualified geomorphologist should examine the site and the profiled mounds to evaluate their site setting, age, and stratigraphic integrity.

5. An additional 5 units (1 by 1 m square) should be excavated in areas between mounds to serve as controls and to test for the possibility of subsurface materials. At least two sterile 10 cm levels should be excavated before the units are abandoned.

6. Prior to and concurrent with the field investigations, background research on the site and its setting should be conducted. Such research would include contacting others who have worked at the site.

7. All material collected should be washed, cataloged (unless it is obvious that it is nonartifactual), and analyzed. The analysis should include description of the collections and replication of the materials. the replication should focus on the patterns of breakage found on the broken cobbles to determine the likelihood of some or all of them having been produced by humans. Natural and historic cultural processes that could fracture cobbles in this way should also be evaluated. A report should be prepared detailing the investigations, analyses, and conclusions. Finally, curation should be arranged for the project documentation and any artifacts, as well as the key replicated items, and a sample of the broken cobbles that are determined not to be artifactual (if any).

For such an investigation to be successful and to produce usable results it is important the work be approached with an open mind and the documentation be through.

In summary, this site is one of a series of controversial sites that has been offered as potential evidence of very early occupation in southern California. The investigations outlined above would help to evaluate that evidence and would help move us toward resolution of at least some of the questions that been raised about the reality of such an occupation.

G. Timothy Gross, Ph.D.
Associate Archaeologist

RECON Regional Environmental Consultants

P & D TECHNOLOGIES
MAR 29 1990
RECEIVED

March 2, 1990

Ms. Betty Dehoney
P & D Technologies
4011 Day Street, Suite 2500
San Diego, CA 92101

Reference: Archaeological Mitigation Conditions for Rancho Del Rey SPA II and III (RECON Number R-1559J)

Dear Ms. Dehoney:

As we discussed on the telephone, the City of Chula Vista has confirmed in a letter that the mitigation measures proposed by RECON (Wade and Hector 1989) are acceptable not only as compensatory mitigation for the destruction of an archaeological site within SPA II, but also for the two sites within SPA III. I am enclosing a copy of our archaeological testing report for the two sites within SPA III, which details the recommendations that were accepted. I am also enclosing a copy of the City of Chula Vista's letter which confirms that these recommendations are acceptable.

If you have any questions regarding the mitigation program, please call.

Sincerely,

Sue Wade

Sue A. Wade
Senior Archaeologist

SAW:db

Enclosures

Reference Cited

Wade, Sue A. and Susan M. Hector
1989 Archaeological Test Excavations at SDi-9893 and Evaluations at SDi-960/961 Rancho Del Rey (Spa III) in Chula Vista, California.

1276 Morena Boulevard • San Diego, CA 92110-3815 • (619) 275-3732 • FAX (619) 275-3619

5099 East Grant Road, Suite 301A • Tucson AZ 85712 • (602) 325-9977 3050 Chicago Avenue • Riverside CA 92507 • (714) 784-9460

APPENDIX E

TRAFFIC STUDY

SPA 3 TRAFFIC IMPACT STUDY
CHULA VISTA, CALIFORNIA

JULY 1990

J235-90

BANKSTON/PINE ASSOCIATES, INC.

Transportation Planning and Traffic Engineering

2030 Addison Street, Suite 310
Berkeley, California 94704

415/843-9746

6265 Rose Lake Avenue
San Diego, California 92119

619/465-3720

Prepared for: Rancho Del Rey Partnership
2727 Hoover Avenue
National City, CA 92050

Client Contact: Mr. Craig Fukuyama
619/477-4117

Study Location: Chula Vista, California

Local Agency: City of Chula Vista
Planning Department
276 Fourth Avenue
Chula Vista, CA 92010

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A	Final and Tentative Map Projects Plus Training Center
B	Approved Project Forecast
C	Calculation Sheets
D	Level of Service Criteria Unsignalized Intersections
E	Level of Service Criteria Signalized Intersections
F	Transportation Phasing Plan

1.0 INTRODUCTION

The Rancho Del Rey Partnership retained BANKSTON/PINE ASSOCIATES, INC., to analyze the traffic impacts of their proposed SPA III development. The proposed project is located south of East 'H' Street, west of the planned Paseo Ranchero roadway, and north of Telegraph Canyon Road. (See Figure 1 for site vicinity as it relates to SPA's 1 and 2 of Rancho del Rey and Figure 2 for SPA III location.)

The project is planned for a total of 1,380 residential units plus a junior high school on 25-acres of the site. Phasing in of proposed land use is as follows:

Phase 1.	530 multi-family (retirement) dwelling units.
Phase 2.	245 single family dwelling units.
Phase 3.	365 single family dwelling units. 240 townhouse dwelling units. 1 junior high school on 25 acres.

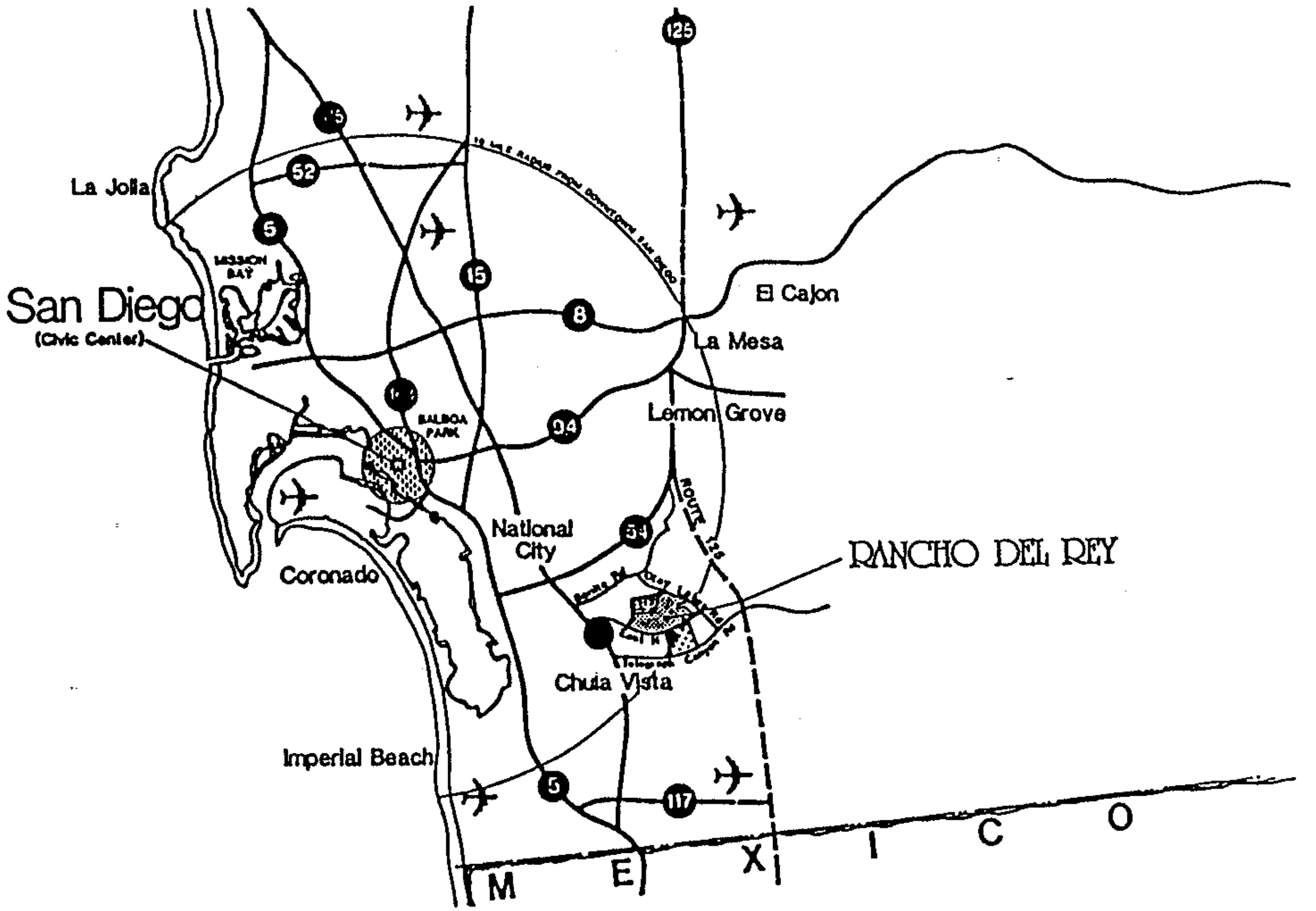
Figure 3 shows the location of SPA3 phases 1, 2, and 3 as they relate to development phasing in SPA's 1 and 2.

The recently implemented process for traffic impact studies required by the City of Chula Vista requires the following:

1. Determine relevant intersections and roadway links adjacent to and within the proposed project. Analyze existing A.M. and P.M. peak hour conditions and determine intersection Level of Service.

2. Estimate peak hour and 24 hour traffic (ADT) traffic gnerated by the proposed project by project phase, distribute, and assign to roadway system.

3. Analyze future conditions without the project based on relevant cumulative projects in the impacted area that have final or tentative map approval (all projects

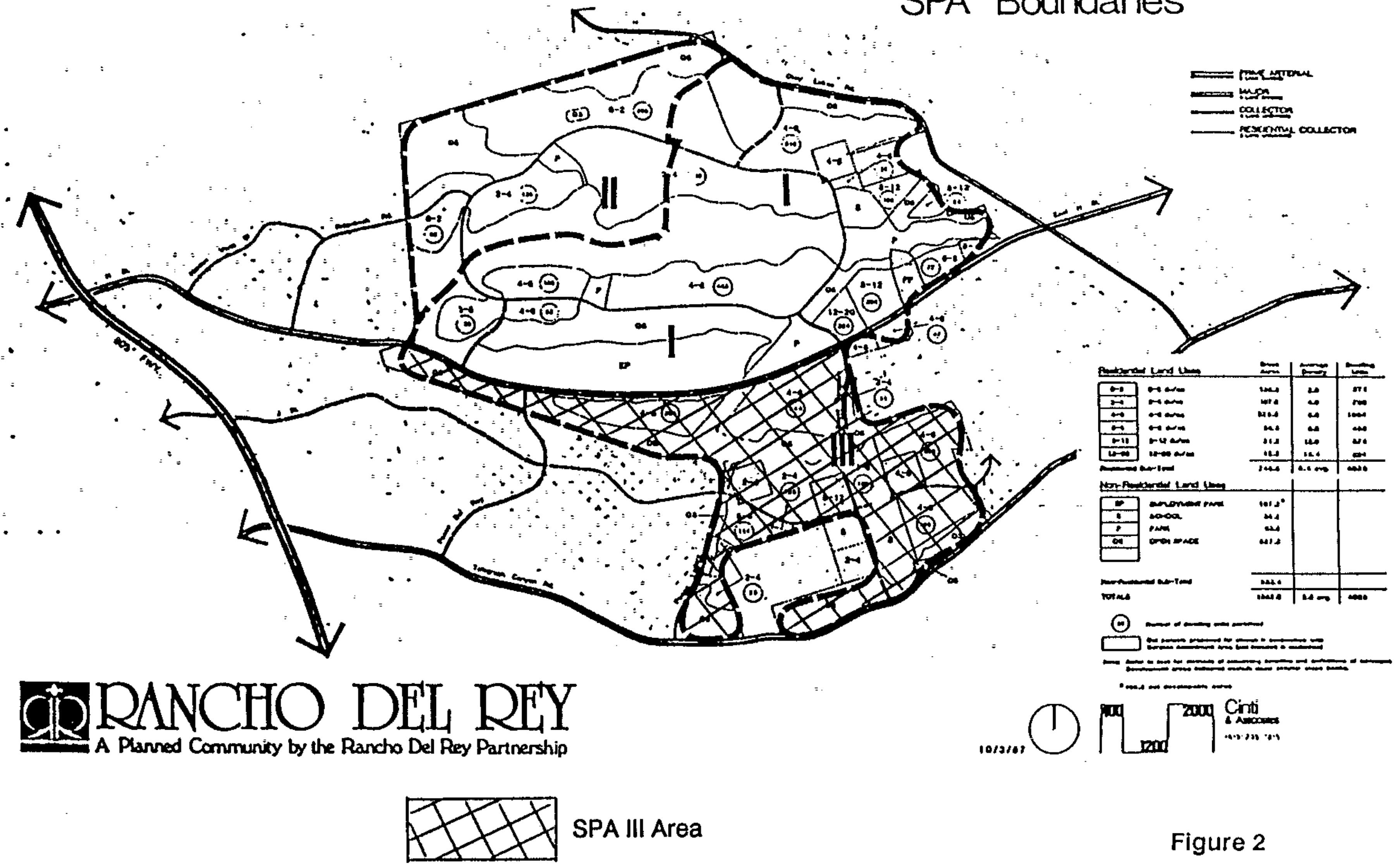


RANCHO DEL REY
A Planned Community by the Rancho Del Rey Partnership

Figure 1

Vicinity Map

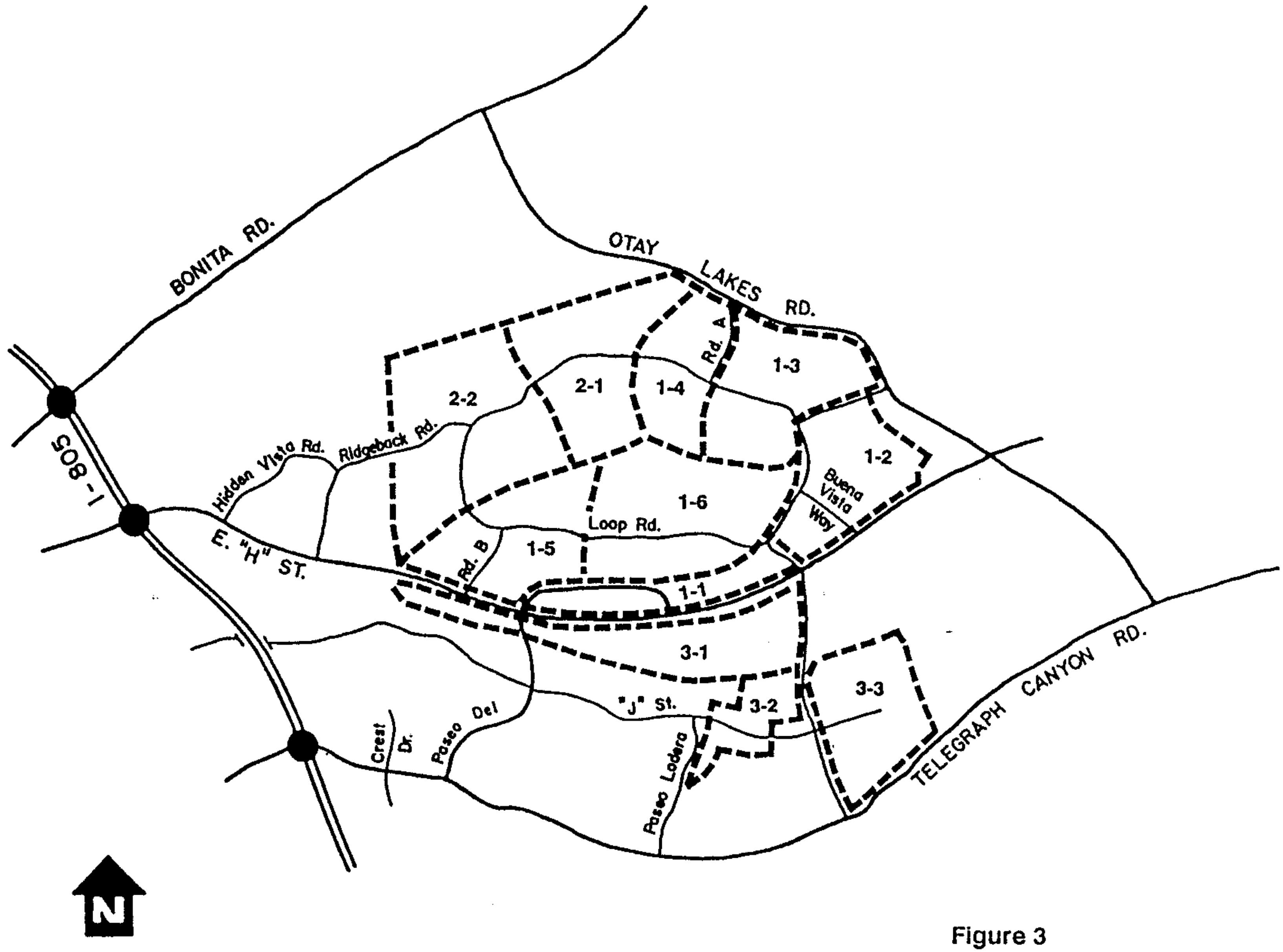
SPA Boundaries



RANCHO DEL REY
A Planned Community by the Rancho Del Rey Partnership

Figure 2

Location Map



00-00: SPA NO.-PHASE NO.

Figure 3

SPA I, SPA II, and SPA III Development Phases with the map approvals plus the 150-acre Olympic Training Center in East Chula Vista in this case). (See Appendix A for a list of included projects.) Estimate future traffic under these conditions with a road network appropriately built up but one which excludes SR 125 using the East Chula Vista Transportation Phasing Plan traffic model. This cumulative scenario sets the stage for estimating the added traffic impacts for approval of a new project (Rancho del Rey SPA 3 in this case).

4. Analyze peak hour traffic impacts under future conditions for each of the phases of the new project by adding traffic generated by each phase cumulatively to that generated by the cumulative projects analysis described in Step 3 above. (For SPA 3, project traffic is added cumulatively for each of the planned phases for peak hour analysis.)

5. Perform a ECVTPP model run to estimate Average Daily Traffic (ADT) with the entire proposed project in place. Differences in the traffic forecast developed in Step 3 and that in Step 5 represents the impacts of the proposed project on the system.

6. The City and developer agree that the currently adopted ECVTPP in force will be the basis for deciding on road system needs.

A primary question is that if traffic resulting from the Step 3 model run can be accommodated by the road system, can each of the added development phases of the proposed project be accommodated within Level of Service (LOS) criteria defined by City policy.

The following scenarios are analyzed for this study based on the steps described above:

1. Existing.
2. Existing plus Cumulative Projects.
3. Existing plus Cumulative Projects plus Phase 1 of SPA 3.
4. Existing plus Cumulative Projects plus Phases 1 and 2 of SPA 3.
5. Existing plus Cumulative Projects plus Phases 1, 2, and 3 of SPA 3.

Mitigations for each scenario are specified based on peak hour analysis, as appropriate.

1.1 Assumptions

Guidelines and assumptions for this analysis include the following:

1. An interim roadway within the State Route 125 corridor in Chula Vista will not be completed within the time frame of this analysis by phase. Phases 1,2, and 3 are shown in Figure 3.

2. Traffic requirements related to City policy on intersection Level of Service are observed and maintained for this analysis. That is, all intersections are mitigated to operate at Policy Threshold Standards set by the City of Chula Vista.

2.0 EXISTING CONDITIONS

2.1 Roadway System

The SPA 3 Project will have primary access via East "H" Street, Paseo Ladera, Paseo RAnchero, and East 'J' Street with secondary access via Paseo Del Rey and Telegraph Canyon Road. (See Figure 4.)

East "H" Street between I-805 and Otay Lakes Road is a 6-lane divided roadway running east/west.

Otay Lakes Road between East "H" Street and Bonita Road is 4 lanes and runs generally north/south.

Telegraph Canyon Road between I-805 and Paseo Ladera is a 4 lane divided east/west roadway. It is 2 lanes between Paseo Ladera and Otay Lakes Road. This roadway link is now being widened to 6 lanes.

I-805 is an 8 lane north/south freeway in the Project vicinity with interchanges at Telegraph Canyon Road, East "H" Street, and Bonita Road; and a separation structure at "J" Street.

2.2 Traffic Volumes

Figure 5 shows existing (1989) average 24 hour weekday traffic levels (ADT).

2.3 Intersection Signalization

Traffic signals exist at the following intersections:

> Telegraph Canyon Road at the I-805 Northbound And Southbound Ramp terminals, Crest Drive, Paseo Del Rey, and at Medical Center Drive.
>
> East "H" Street/ I-805 Northbound Off-ramp.
>
> East "H" Street/ Hidden Vista Road.
>
> East "H" Street/Otay Lakes Road.

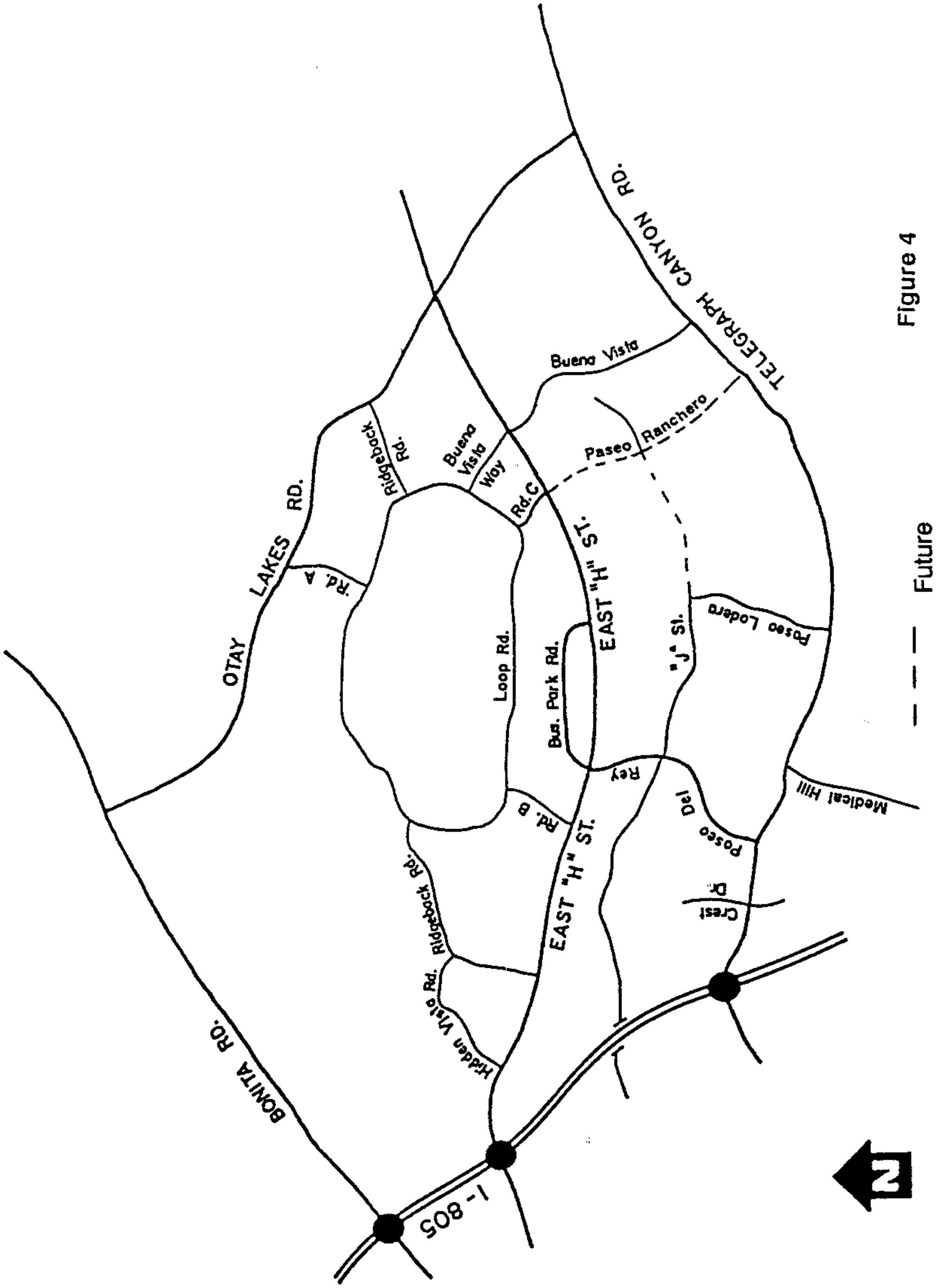


Figure 4
Street Network

Bankston/Pine Associates, Inc.

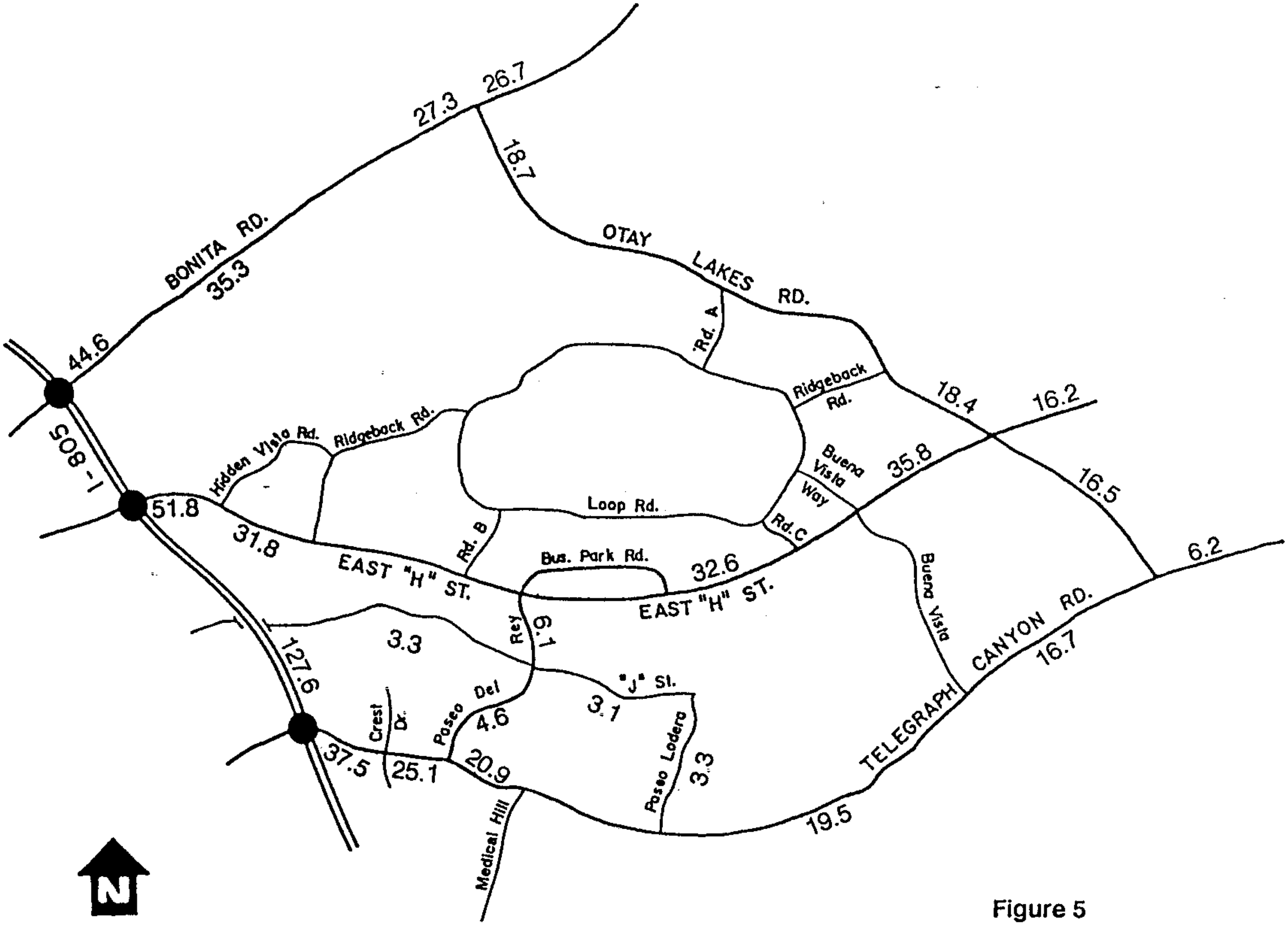


Figure 5

1989 Average Daily Traffic

East "H" Street/Paseo Del Rey.

East "H" Street/Buena Vista Way.

Bonita Road and I-805 Northbound and Southbound Ramp terminals.

Bonita Road/ Otay Lakes Road.

Otay Lakes Road/Ridgeback Road.

Southwestern College Driveway and Shopping Center Entrance.

I-805 Southbound On-ramp.

Paseo Ranchero.

Otay Laks Road/Avenida Del Rey

3.0 THE PROPOSED PROJECT

Project development in three phases is keyed to areas shown on Figure 3. Each phase of land use is described under Section 1.0.

4.0 TRAFFIC IMPACT ANALYSIS

4.1 Trip Generation Rates

Trip generation for project trips except for retirement community are based on The San Diego Association of Governments (SANDAG) trip generation rates. Retirement community trip rates are City of San Diego rates and recommended for use by the City of Chula Vista. Trip generation rates are as follows:

Residential	
Single Family	10 ADT/DU
Townhouses	8 ADT/DU
Retirement	4.5 ADT/DU
Junior High School	40 ADT/Acre

4.2 Trip Generation

Trip generation for the proposed project is shown by phase in Table 1. As shown in Table 1, the proposed project is estimated to generate 11,405 ADT.

4.3 Trip Distribution

Project trip distribution was estimated by separating out SPA 3 assigned ADT from that generated by other sources. This was done by computing the ADT difference for the cumulative future condition without and with SPA 3 as estimated by separate ECTPP model runs. Figure 6 shows the percentage of project trips by direction as distributed by the model.

Table 1

Project Trip Generation

Phase	Land Use	A.M.		P.M.		ADT
		In	Out	In	Out	
1	530 Retirement D.U.'s	38	153	167	72	2385
2	245 S.F.D.U.'s	39	157	172	74	2450
3	240 Townhouse D.U.'s	30	121	133	57	1920
	365 S.F.D.U.'s	59	235	257	110	3650
	25 Acres Jr. High School	97	257	247	130	1000
TOTALS		**263**	**923**	**976**	**443**	**11405**

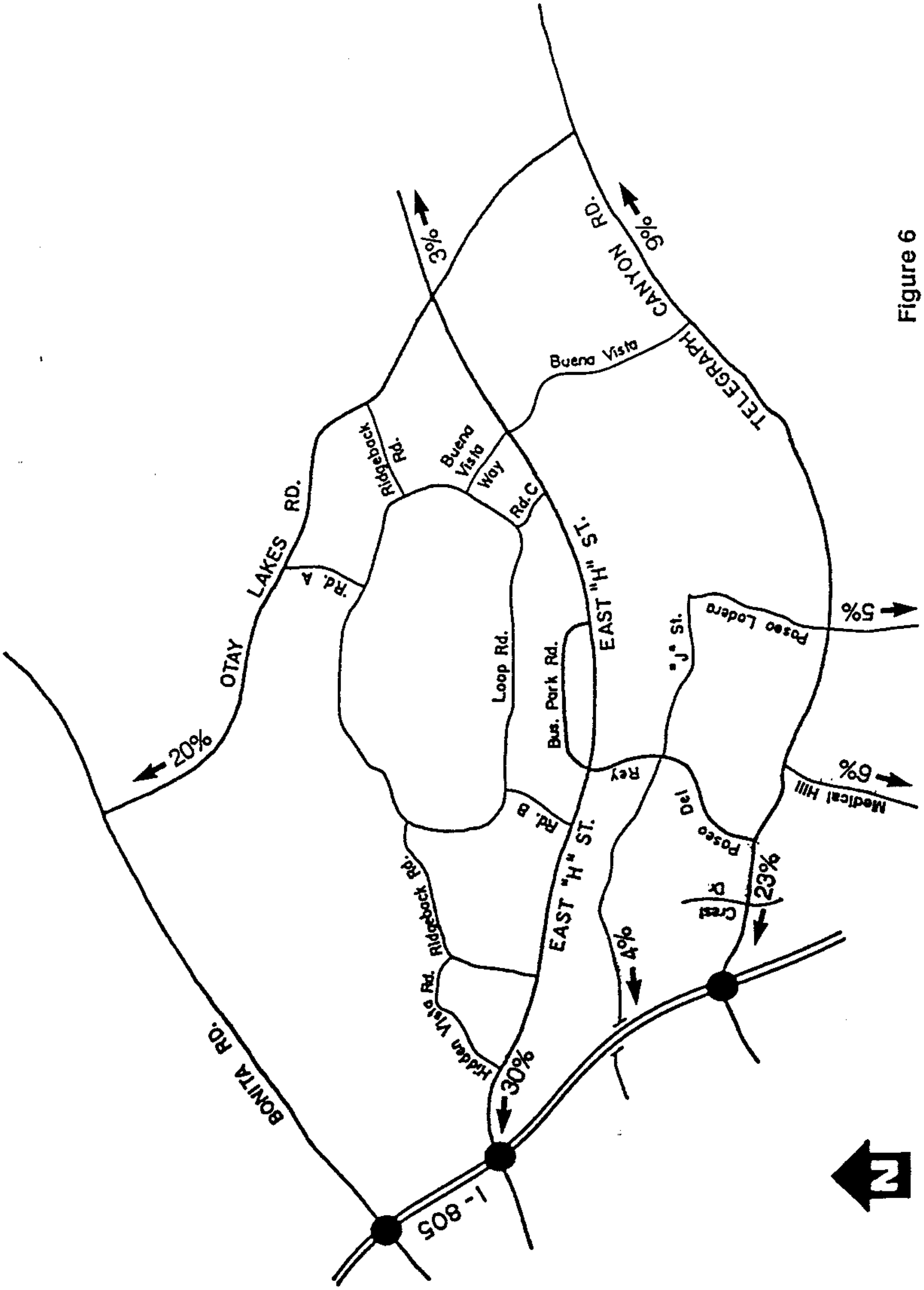


Figure 6
Trip Distribution

Bankston/Pine Associates, Inc.

4.4 Trip Assignment

Using the trip distribution shown in Figure 6, project trips were assigned to the road system. These trips were then added to cumulative traffic volumes on the appropriate road segment. Average Daily Traffic based on ECVTPP model run output for the cumulative future without SPA 3 and with SPA 3 is shown in Figures 7a and 7b, respectively. SPA 3 only ADT is shown in parentheses in Figure 7b.

4.5 Average Daily Traffic Volumes, Project Buildout

The 1989 ADT shown on Figure 5 for East "H"Street between I-805 and Ridgeback Road was counted by City staff during the week of February 6, 1989. These counts were taken at selected locations including East "H" Street and on Telegraph Canyon Road. It is apparent from these counts that approximately 4,000 ADT (Average Daily Traffic) has shifted from Telegraph Canyon Road to East "H" Street. This shift in traffic is believed to be due to the recent opening of the widened East "H" Street and the fact that congestion exists now on Telegraph Canyon Road. The congestion on Telegraph Canyon Road is a temporary condition which will be relieved when the current improvements are completed in 1990. At that time, the 4,000 ADT is expected to shift back to Telegraph Canyon Road from East "H" Street. Accordingly, Figures 7a and 7b reflect this temporary shift from Telegraph Canyon Road to East "H" Street and back again.

4.6 Intersection Level of Service

A.M. and P.M. Peak Hour Level of Service (LOS) analyses were made for existing (1989), where appropriate, and future conditions. Existing conditions are based on current traffic volumes within the roadway facilities now in place. Future analyses assume Project and Cumulative projects build-out along with roadway mitigations (as recommended in Section 5). Figures 8 through 12 show A.M. and P.M. peak hour intersection volumes for each of the 5 scenarios analyzed.

Table 2 shows results from these analyses by Levels of Service based on volume/capacity criteria. Intersection Capacity Utilization (ICU) is the intersection Level of Service method of analysis for signalized intersections adopted by the City of Chula Vista and used in this analysis. LOS levels range on a continuum from LOS 'A' through 'F' with LOS 'A' reflecting optimal conditions with minimal delays and LOS 'F', total breakdown in traffic movement. LOS results based on analysis of signalized intersections indicate the overall level of service at which an intersection operates.

TABLE 2

LEVEL OF SERVICE AT RELEVANT INTERSECTIONS RANCHO DEL REY, SPA 3 DEVELOPMENT

INTERSECTION	E		E+C		E+C+P1		E+C+P1+P2		E+C+P1+P2+P3	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
1. EAST 'H' ST./PASEO DEL REY/ WEST BUSINESS PARK ROAD	A 0.49	B 0.62	B 0.69	C 0.79	B 0.70	C 0.79	B 0.72	D 0.81	C 0.74	D 0.84
2. EAST 'H' ST./ EAST BUSINESS PARK ROAD	---	---	B 0.61	A 0.56	C 0.71	C 0.74	C 0.71	C 0.74	C 0.72	C 0.77
3. EAST 'H' ST./ PASEO RANCHERO	---	---	A 0.58	A 0.57	A 0.58	A 0.58	B 0.68	B 0.70	B 0.70	C 0.72
4. EAST 'J' ST./ PASEO DEL REY	A	A	A	B	A	C	B	C	B	C
5. EAST 'J' ST./ PASEO LANDERA	---	---	---	---	---	---	A	A	A	A
6. EAST 'J' ST./ PASEO RANCHERO	---	---	---	---	---	---	A	A	A-B	A-C
7. TELEGRAPH CANYON RD./ PASEO LADERA	A-E*	A-E*	B 0.61	B 0.70	B 0.61	B 0.70	B 0.61	B 0.70	B 0.64	C 0.73
8. TELEGRAPH CANYON RD./ PASEO RANCHERO	---	---	---	---	---	---	A-E*	A-E*	A 0.51	A 0.49

DEFINITIONS
E - EXISTING
E+C - EXISTING PLUS CUMULATIVE
E+C+P1 - EXISTING PLUS CUMULATIVE PLUS PHASE 1
E+C+P1+P2 - EXISTING PLUS CUMULATIVE PLUS PHASE 1 PLUS PHASE 2
E+C+P1+P2+P3 - EXISTING PLUS CUMULATIVE PLUS PHASE 1 PLUS PHASE 2 PLUS PHASE 3

* STOP SIGN CONTROLS ON MINOR STREET

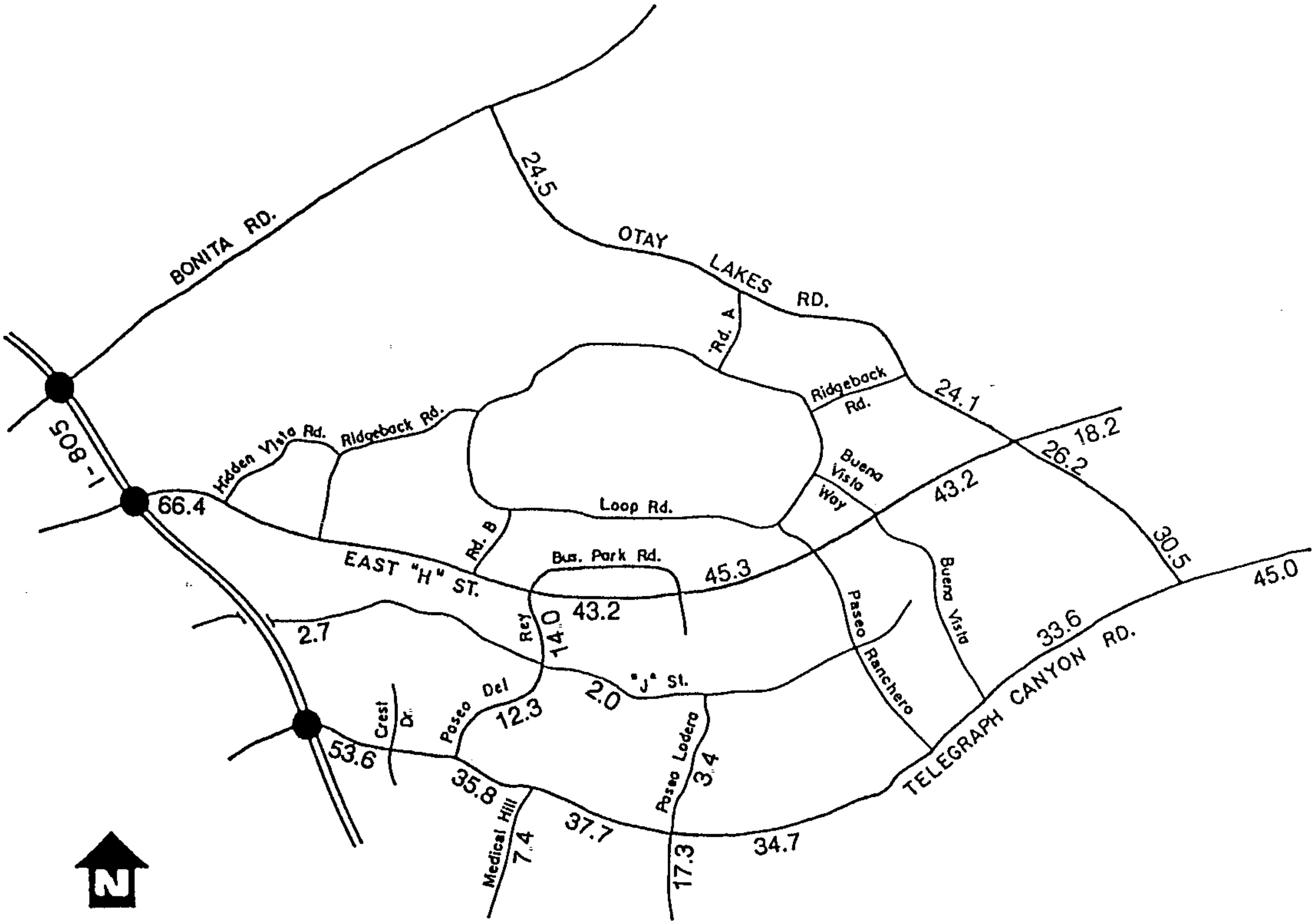
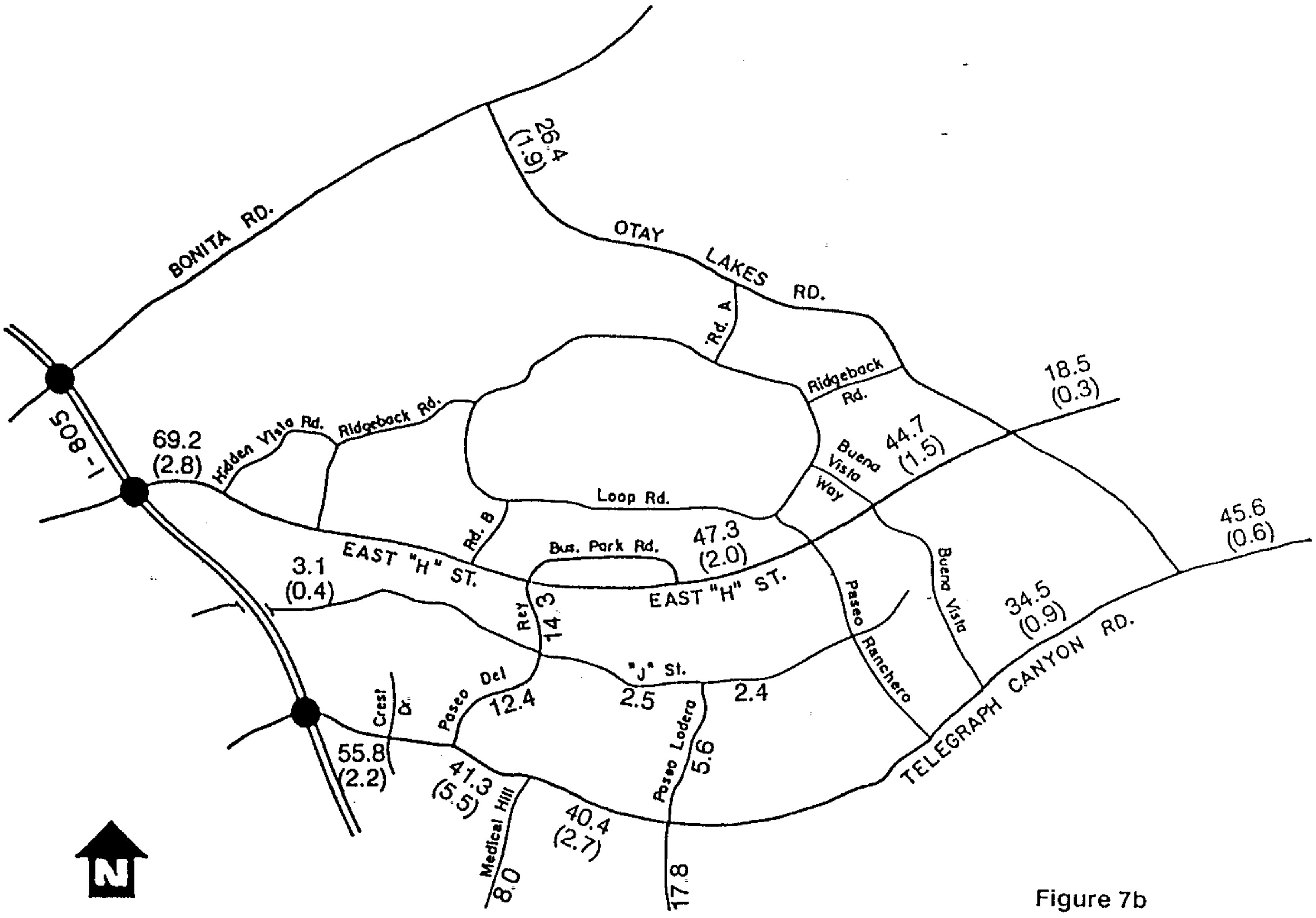


Figure 7a

Average Daily Traffic
Existing + Cumulative

Bankston/Pine Associates, Inc.

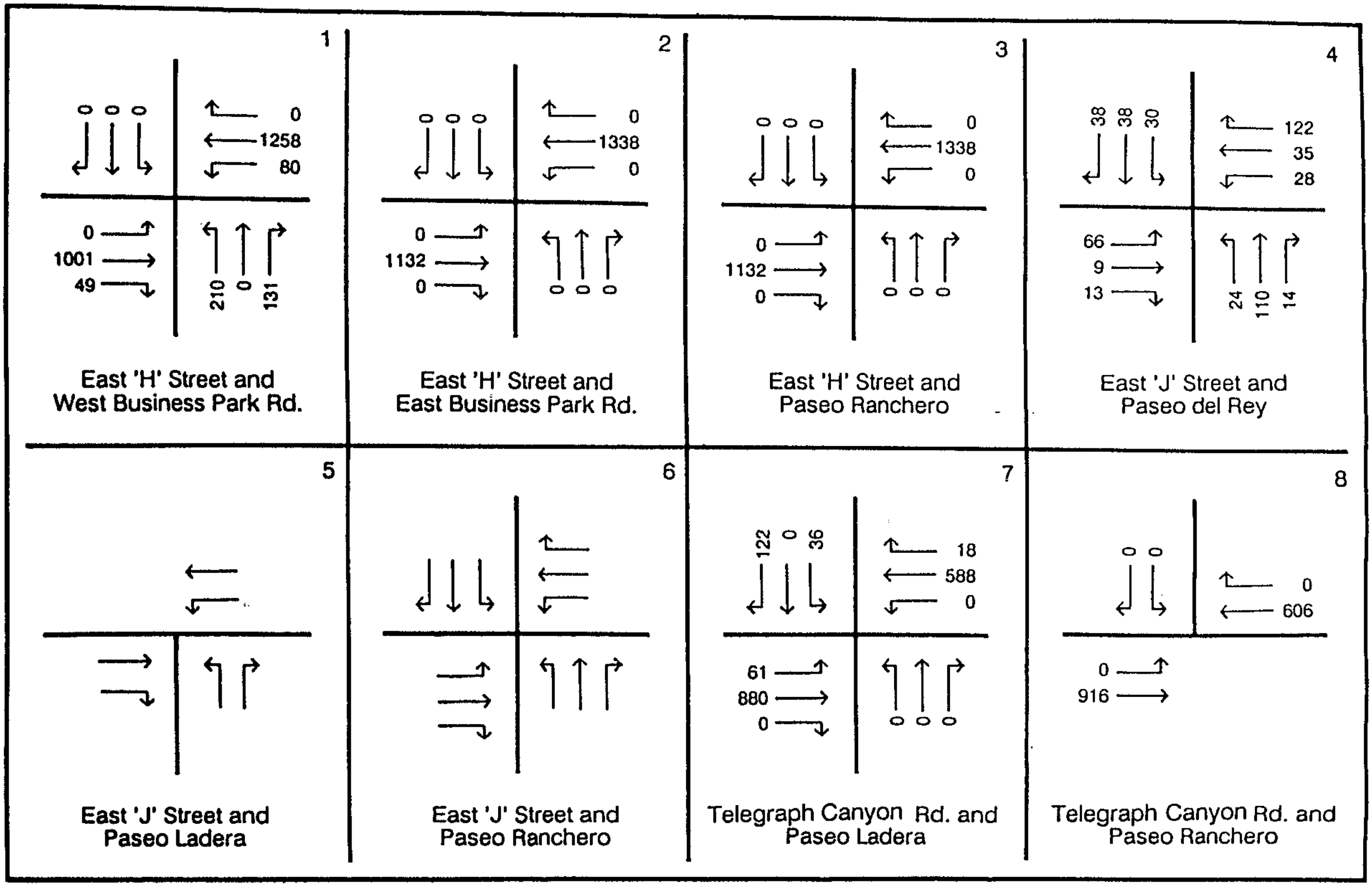


(oo.o) Project Only

Figure 7b

Average Daily Traffic
Existing + Cumulative + Project

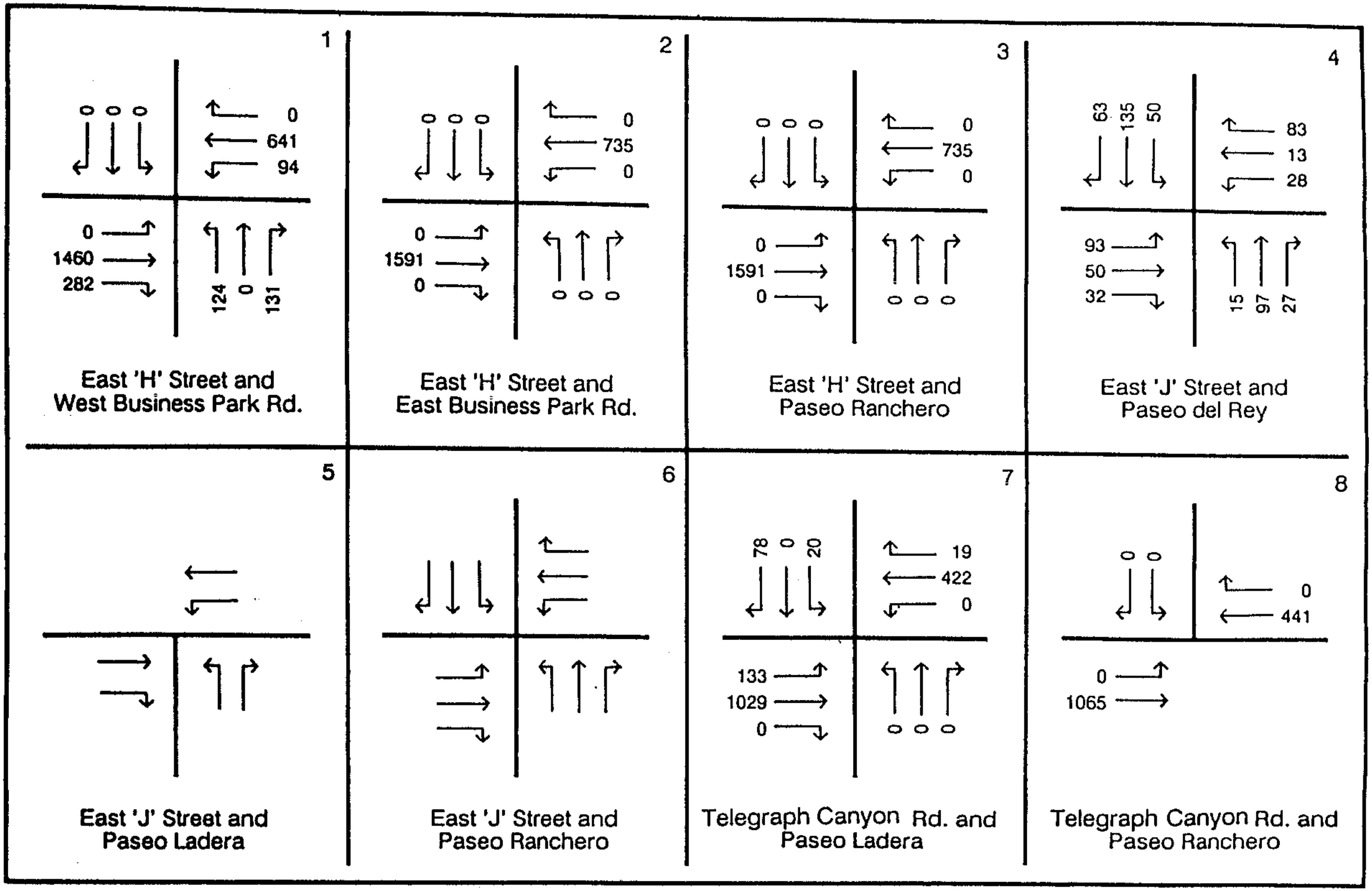
Bankston/Pine Associates, Inc.



BANKSTON/PINE ASSOCIATES

FIGURE 8A

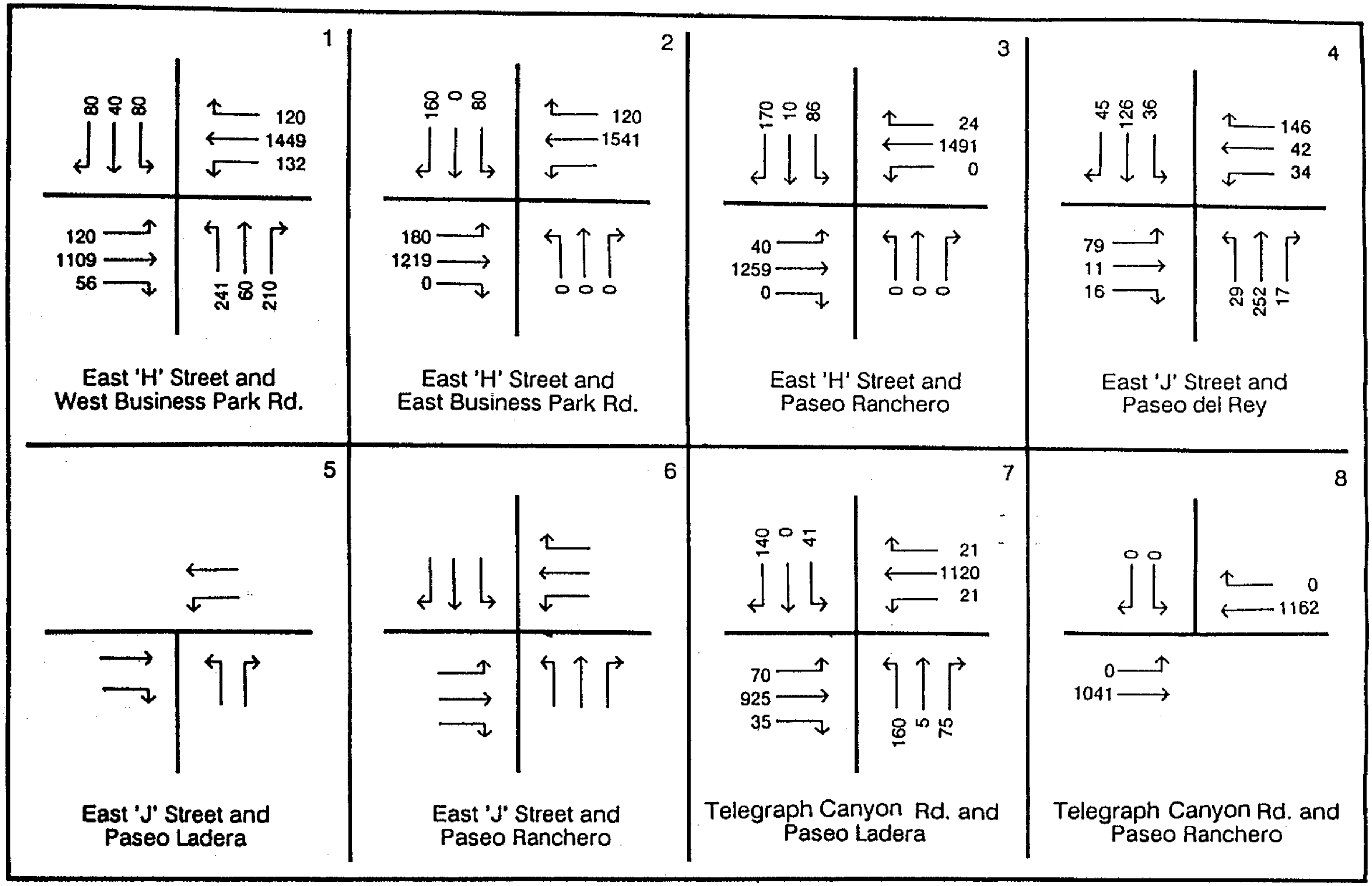
EXISTING INTERSECTION TURN MOVEMENTS
A.M. PEAK HOUR



BANKSTON/PINE ASSOCIATES

FIGURE 8B

EXISTING INTERSECTION TURN MOVEMENTS
P.M. PEAK HOUR



East 'H' Street and West Business Park Rd.

East 'H' Street and East Business Park Rd.

East 'H' Street and Paseo Ranchero

East 'J' Street and Paseo del Rey

East 'J' Street and Paseo Ladera

East 'J' Street and Paseo Ranchero

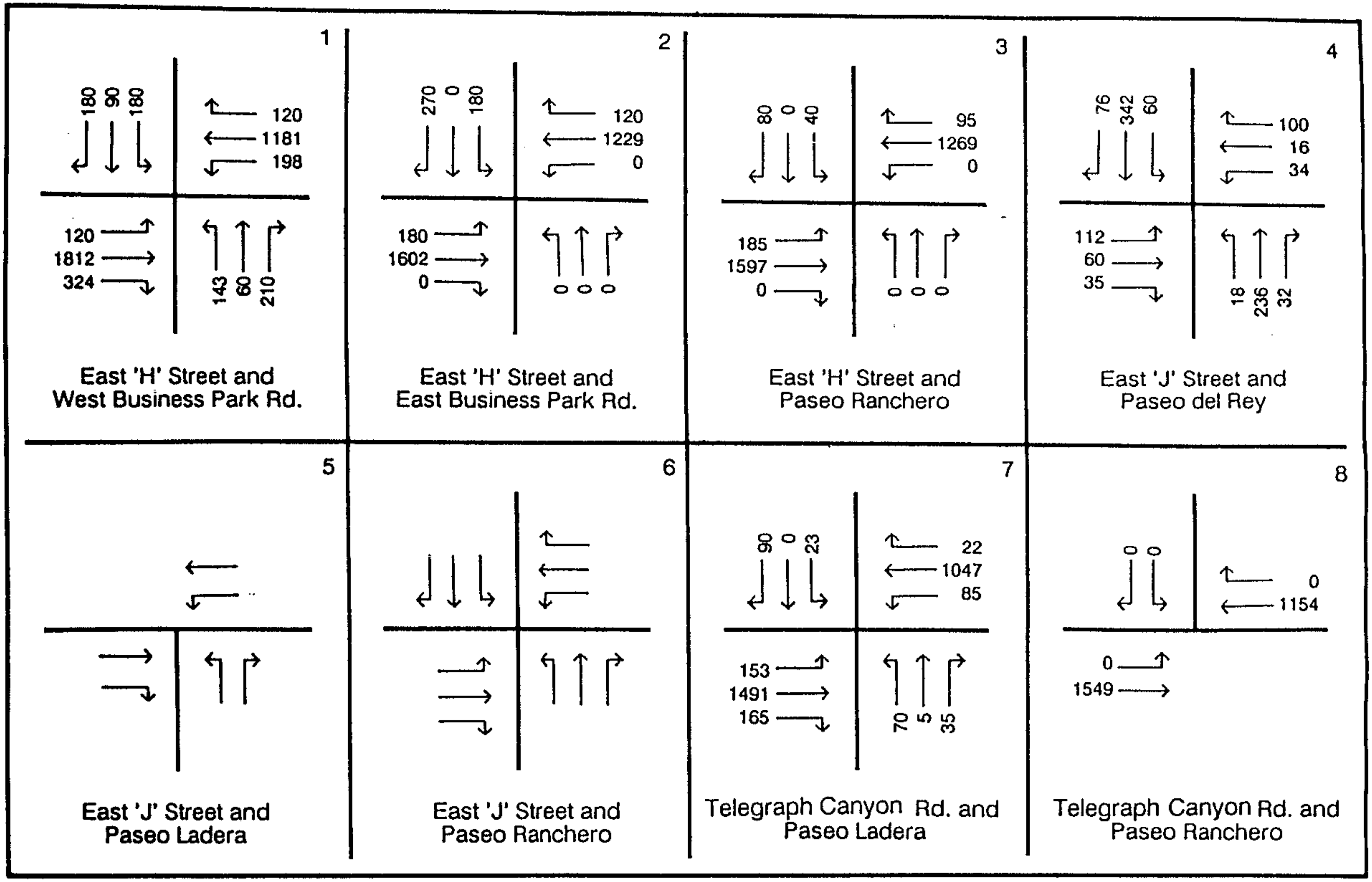
Telegraph Canyon Rd. and Paseo Ladera

Telegraph Canyon Rd. and Paseo Ranchero

BANKSTON/PINE ASSOCIATES

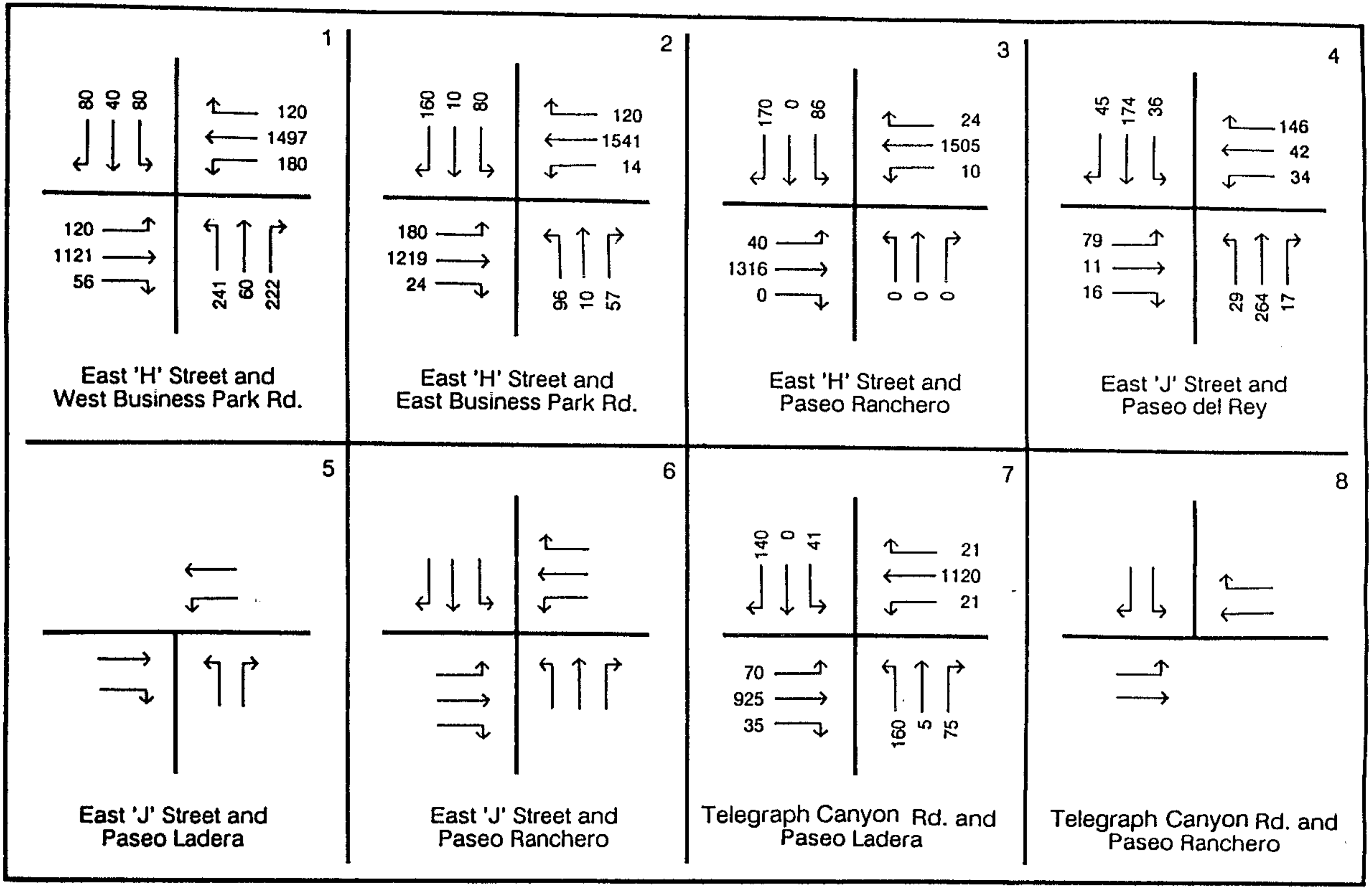
FIGURE 9A

INTERSECTION TURN MOVEMENTS
EXISTING PLUS CUMULATIVE
A.M. PEAK HOUR



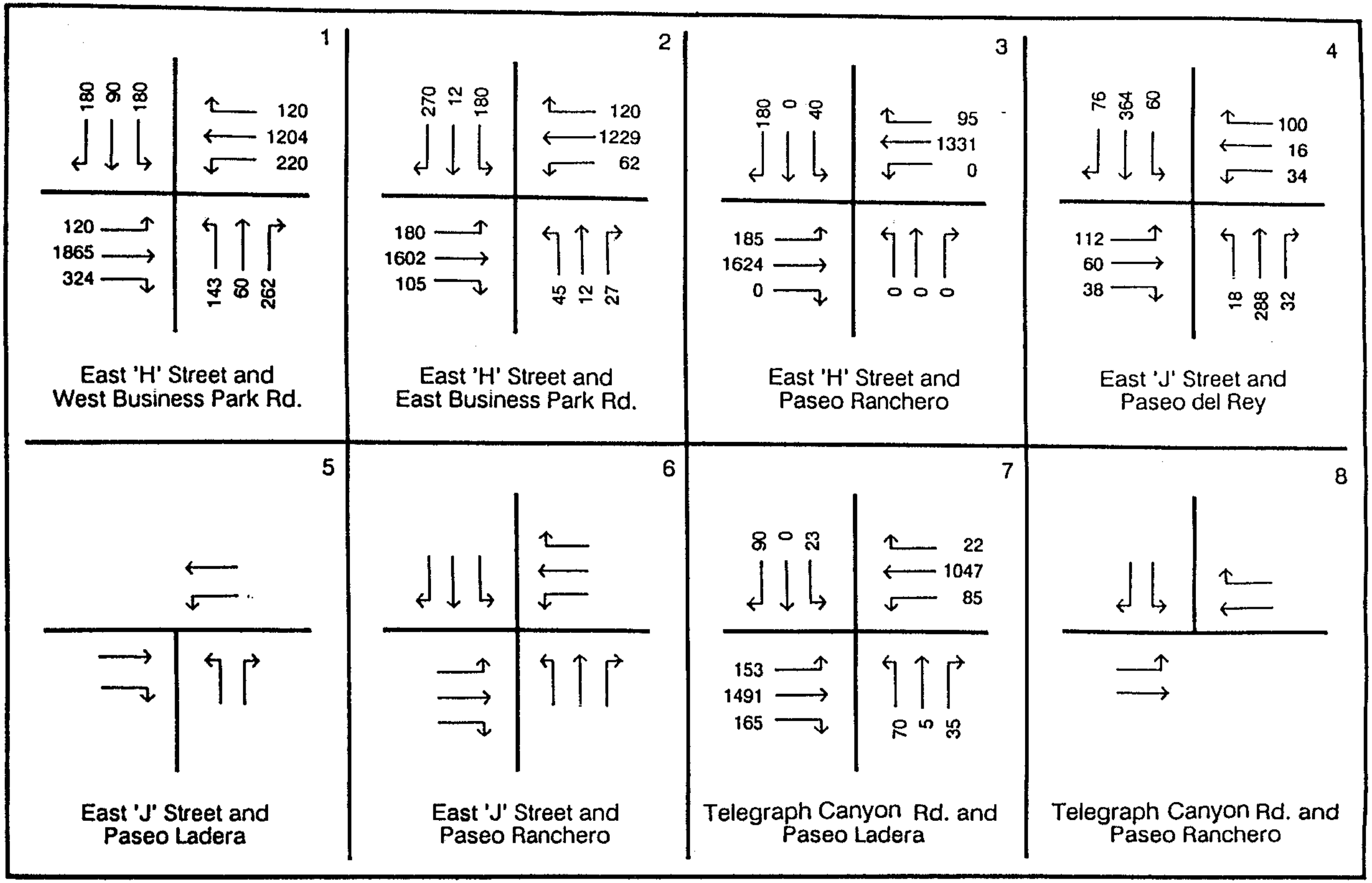
BANKSTON/PINE ASSOCIATES

FIGURE 9B INTERSECTION TURN MOVEMENTS EXISTING PLUS CUMULATIVE P.M. PEAK HOUR



BANKSTON/PINE ASSOCIATES

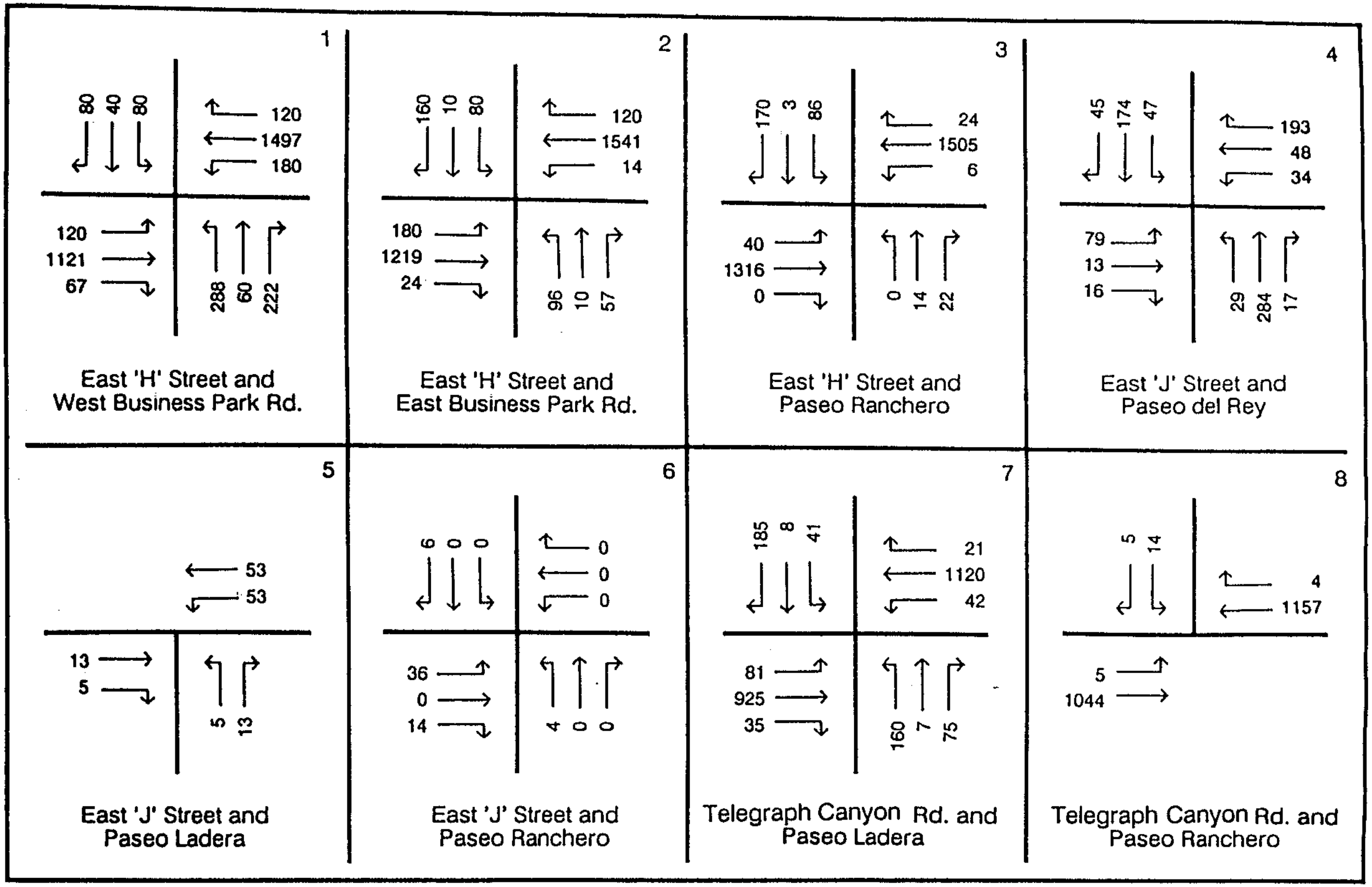
FIGURE 10A INTERSECTION TURN MOVEMENTS
EXISTING PLUS CUMULATIVE PLUS SPA 3 PHASE 1
A.M. PEAK HOUR



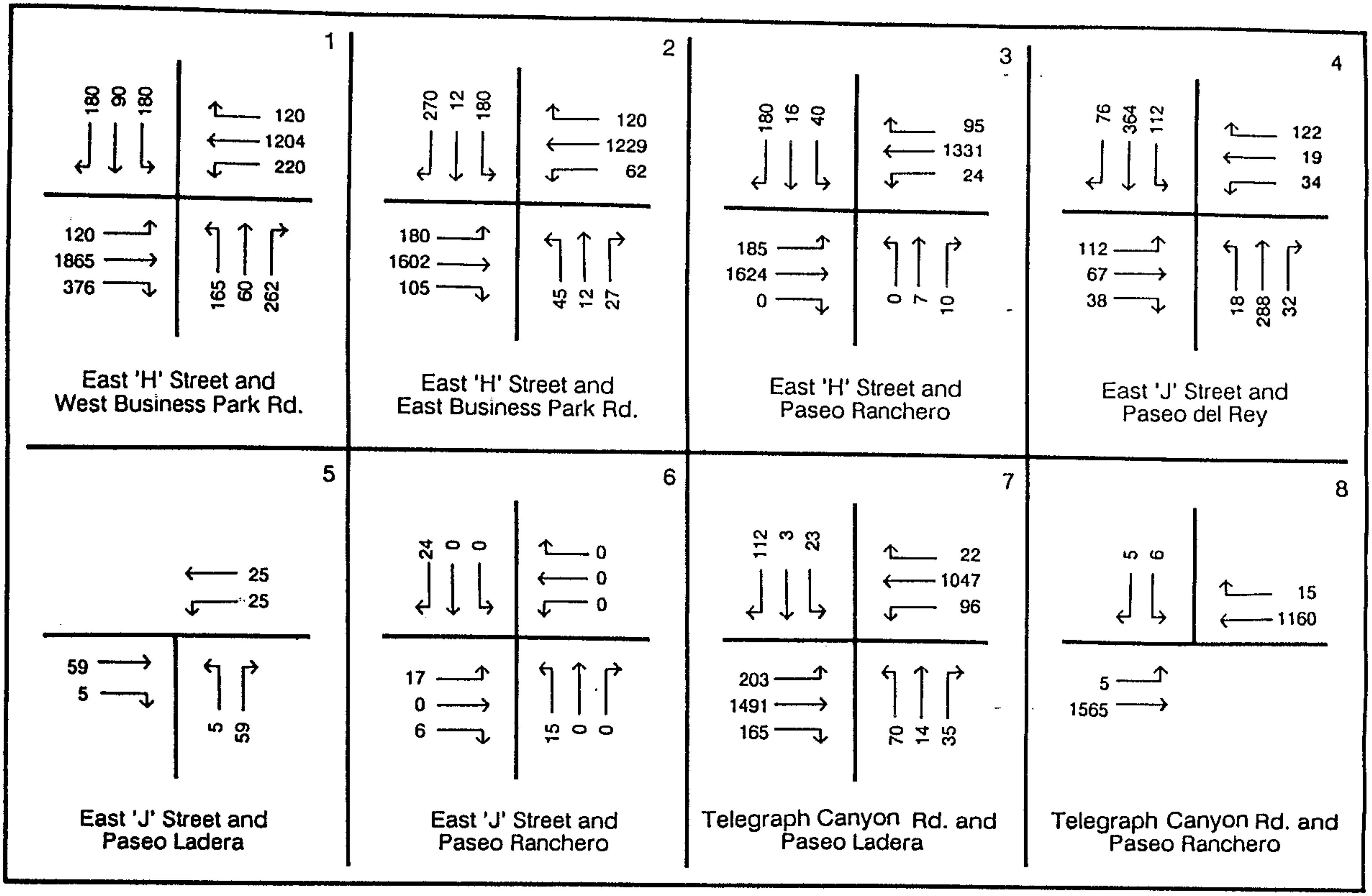
BANKSTON/PINE ASSOCIATES

FIGURE 10B

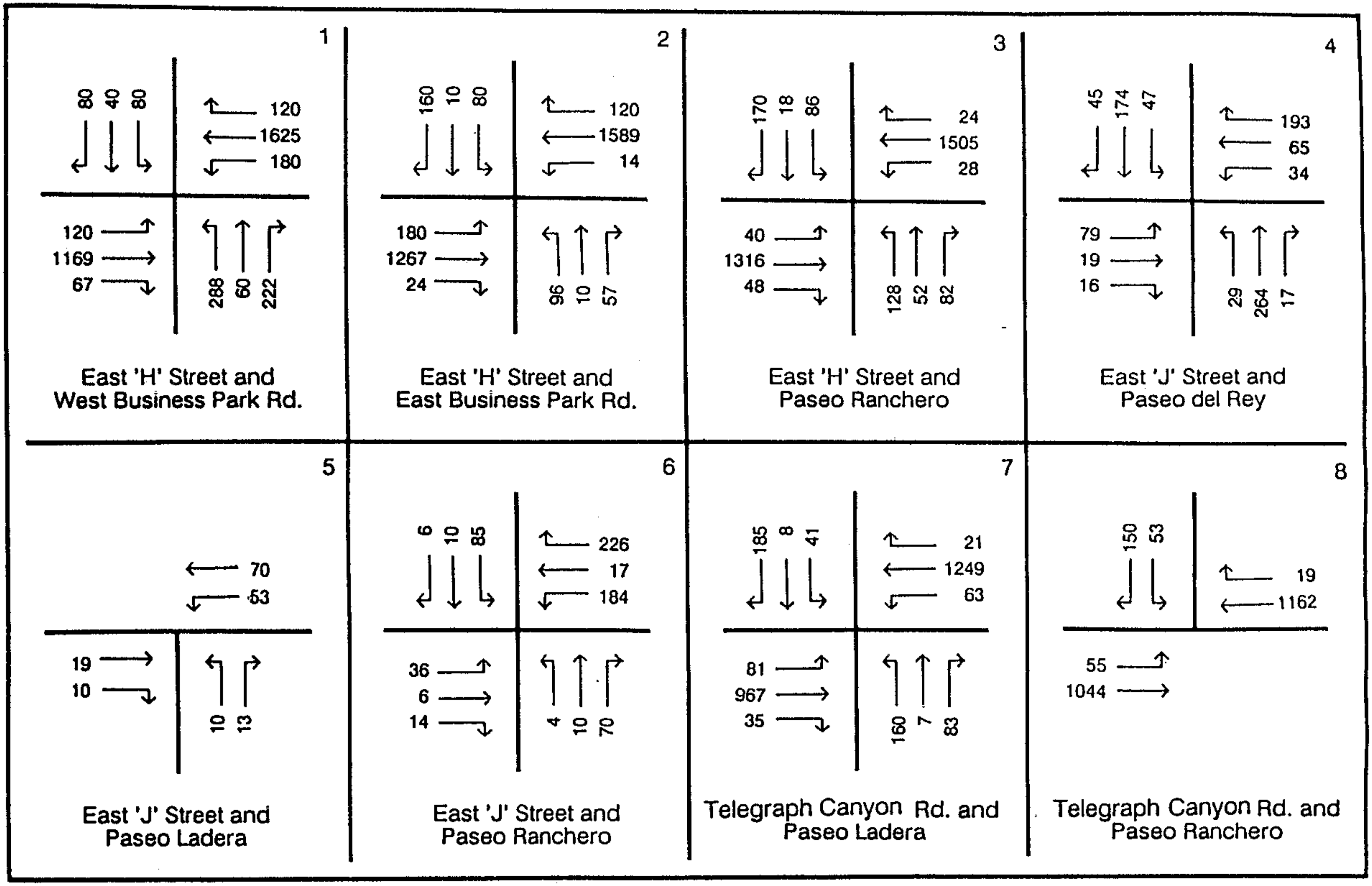
INTERSECTION TURN MOVEMENTS
EXISTING PLUS CUMULATIVE PLUS SPA 3 PHASE 1
P.M. PEAK HOUR



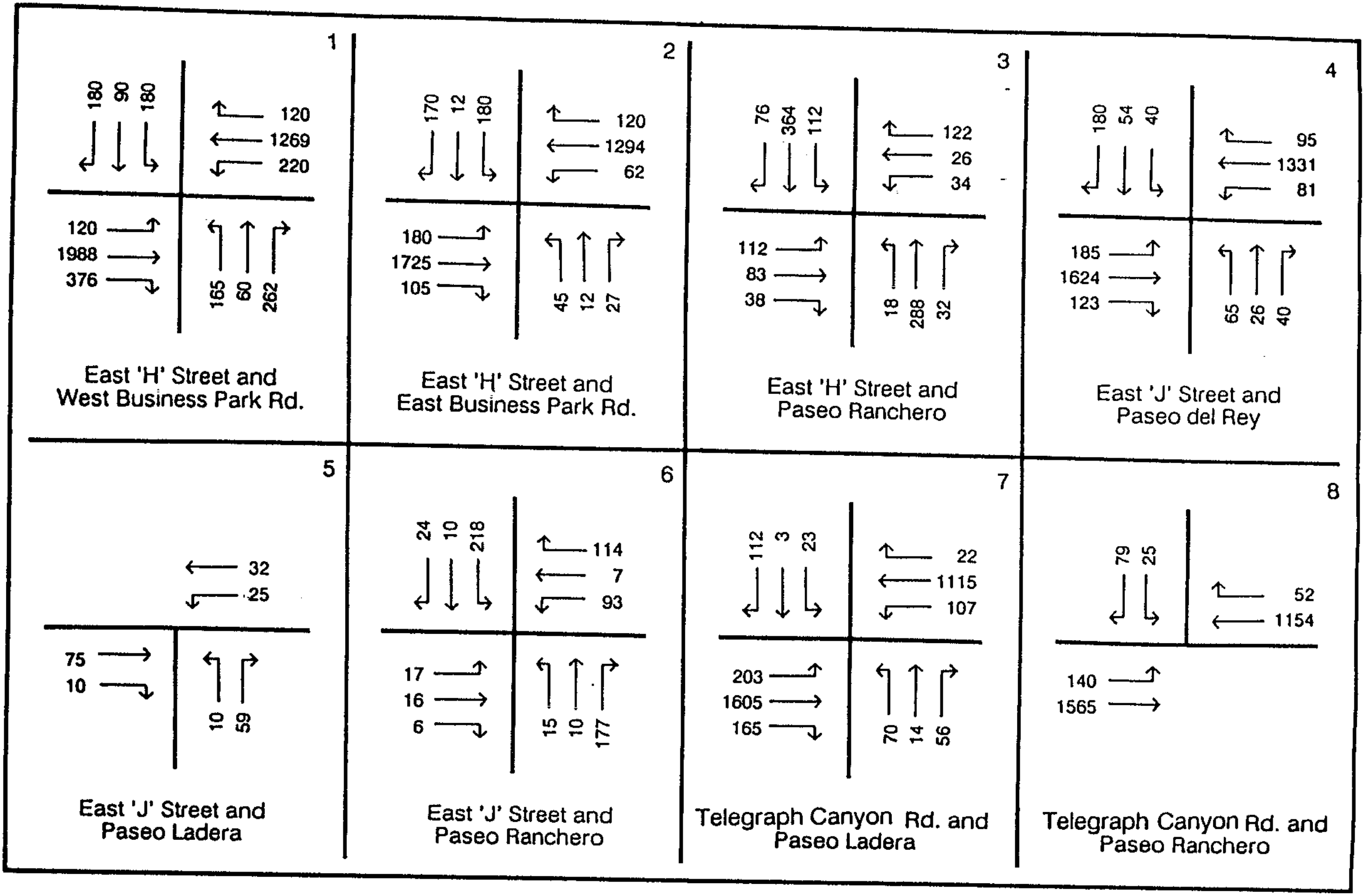
BANKSTON/PINE ASSOCIATES **FIGURE 11A** **INTERSECTION TURN MOVEMENTS EXISTING PLUS CUMULATIVE PLUS SPA 3 PHASES 1 AND 2 A.M. PEAK HOUR**



BANKSTON/PINE ASSOCIATES **FIGURE 11B** **INTERSECTION TURN MOVEMENTS EXISTING PLUS CUMULATIVE PLUS SPA 3 PHASES 1 AND 2 P.M. PEAK HOUR**



BANKSTON/PINE ASSOCIATES **FIGURE 12A** **INTERSECTION TURN MOVEMENTS**
EXISTING PLUS CUMULATIVE PLUS SPA 3 PHASES 1,2, AND 3
A.M. PEAK HOUR



BANKSTON/PINE ASSOCIATES FIGURE 12B INTERSECTION TURN MOVEMENTS EXISTING PLUS CUMULATIVE PLUS SPA 3 PHASES 1,2, AND 3 P.M. PEAK HOUR

ICU signalized intersection results are based upon volumes relative to intersection capacity ratios. Unsignalized intersection analysis results produce operational levels by movement. A range of levels by movement is shown in Table 2 when an intersection is analyzed as unsignalized. For analysis of unsignalized intersections, the method adopted by the Transportation Research Board and put forth in the 1985 Highway Capacity Manual, Report 209 was used.

As Table 2 shows, all intersections relevant to the Project will operate at LOS 'C' or better in the A.M. and P.M. Peak Hours under future conditions with the exception of the East "H" Street/Paseo del Rey intersection and the Telegraph Canyon Road and Paseo Ranchero intersection until it is mitigated by signalization. The East 'H' Street/Paseo del Rey intersection operates at LOS 'D' in the future with SPA 3 in place. According to City policy, LOS 'D' is an acceptable LOS. More specifically, City policy allows intersections to operate at LOS 'D' for up to two hours per day. BPA analysis has determined that in general an intersection which does not exceed LOS 'D' with v/c ratio of 0.87 will operate at LOS 'C' in the third highest hour which complies with City policy.

See Appendices A through D for LOS calculations and Appendices E and F for Level of Service definitions. Intersection lane configuration assumptions are included with the LOS calculation sheets.

To summarize, with the mitigations recommended below along with improvements already under construction or in place, all facilities will operate at an acceptable level of service in accordance with City of Chula Vista Policy Threshold Standards.

4.7 Roadway Segment Level of Service

A review of link ADT's in the study area indicates that LOS 'C' or better is maintained under all conditions analyzed.

5.0 MITIGATION

Analysis indicates that with selected increments of project development, certain mitigations are needed to accommodate Project traffic. Recommendations are made to mitigate study area roadways to acceptable levels of service.

5.1 Existing Conditions

No mitigations are recommended for existing conditions.

As shown on Figure 5, 1989 Average Daily Traffic roadway links in the vicinity of the project are operating at LOS 'C' or better with the Exception of Telephraph Canyon Road between Paseo Ladera and Otay Lakes Road. This section of Telegraph Canyon Road is under construction and being widened from 2 lanes to 6 lanes. These improvements will make this section also operate at an acceptable LOS.

As described earlier and shown in Table 2, the intersection of Telegraph Canyon Road and Paseo Ladera is an unsignalized 'T' intersection with stop sign controls on the Paseo Ladera Approach. LOS results indicate that the left turn from Paseo Ladera operates at LOS 'E', below City guidelines. However, due to the volume of traffic on Paseo Ladera, this intersection does not meet signal warrants so this mitigation is inappropriate.

5.2 Existing Plus Cumulative

- Signalize the intersection of Telegraph Canyon Road and Paseo Ladera.

These intersections will meet signal warrant no. 11 under this condition.

5.3 Existing Plus Cumulative Plus Phase 1 of SPA 3.

Open up the south leg of the East 'H' Street/East Business Park intersection where Phase 1 traffic is assumed to enter and exit. When Phase 1 (now planned as a retirement community of 530 du's) is in final design, there may be a road connection to Paseo Ranchero. However for worst case condition in this analysis, only one connection is assumed. The marginal added impact on Paseo Ranchero if the second connection is made is insignificant.

5.4 Existing Plus Cumulative Plus Phases 1 and 2 of SPA 3

It is assumed that with implementation of SPA 3, Phase 2, that Paseo Ranchero will be constructed between East 'H' Street and Telegraph Canyon Road. In addition, East 'J' Street would be extended to provide a through 2-lane road between Paseo Del Rey and Paseo Ranchero.

The new intersections of East 'J' Street/Paseo Ladera, East 'J' Street and Paseo Ranchero, and Telegraph Canyon Road/Paseo Ranchero would all be stop sign controlled on the minor approach. The minor approaches are on Paseo Ladera at East 'J' Street, East 'J' Street at Paseo Ranchero, and Paseo Ranchero at Telegraph Canyon Road.

The intersection of Telegraph Conyon Road and Paseo Ranchero operates at LOS 'E' for left turns out of Paseo Ranchero. However, since it does not meet signal warrants due to low traffic volumes on minor street, signalization is not recommended for this Scenario.

Mitigate by constructing roads and stop controls as appropriate.

5.5 Existing Plus Cumulative Plus Phases 1, 2, and 3 of SPA 3

Signalize the intersection of Telegraph Canyon Road and Paseo Ranchero.

"As part of Chula Vista's ongoing Traffic Monitoring Program, it should be noted that many of the above mitigations are on streets to be evaluated under the Transportation Phasing Plan and as such, further mitigations on these segments of streets could be required by the Phasing plan to stay in conformance with the City's threshold standards."

Note that project streets will have the following lane segment designations:

'J' Street	- 2 lanes
Paseo Ladera	- 2 lanes
Paseo Ranchero	- 4 lanes

All other project streets will be part of tentative map submittals. Other non-project streets are included in ECTPP.

6.0 REGIONAL BUILDOUT

Regional buildout of Chula Vista (Scenario 4) with 100 percent buildout of Otay Mesa and Year 2010 forecasts by SANDAG for all other areas is shown on Figure 13. The source of these forecasts is the City of Chula Vista. This forecast assumes S.R. 125 is in place.

While significant growth takes place in the study area sub-region, the build-out of S.R. 125 further disperses Project and other nearby traffic; thereby, distributing it more evenly on the adjacent roadways.

As noted above, the controlling policy for all roads in East Chula Vista offsite from SPA3 is keyed to the currently adopted East Chula Vista Phasing Plan (included as Appendix C).

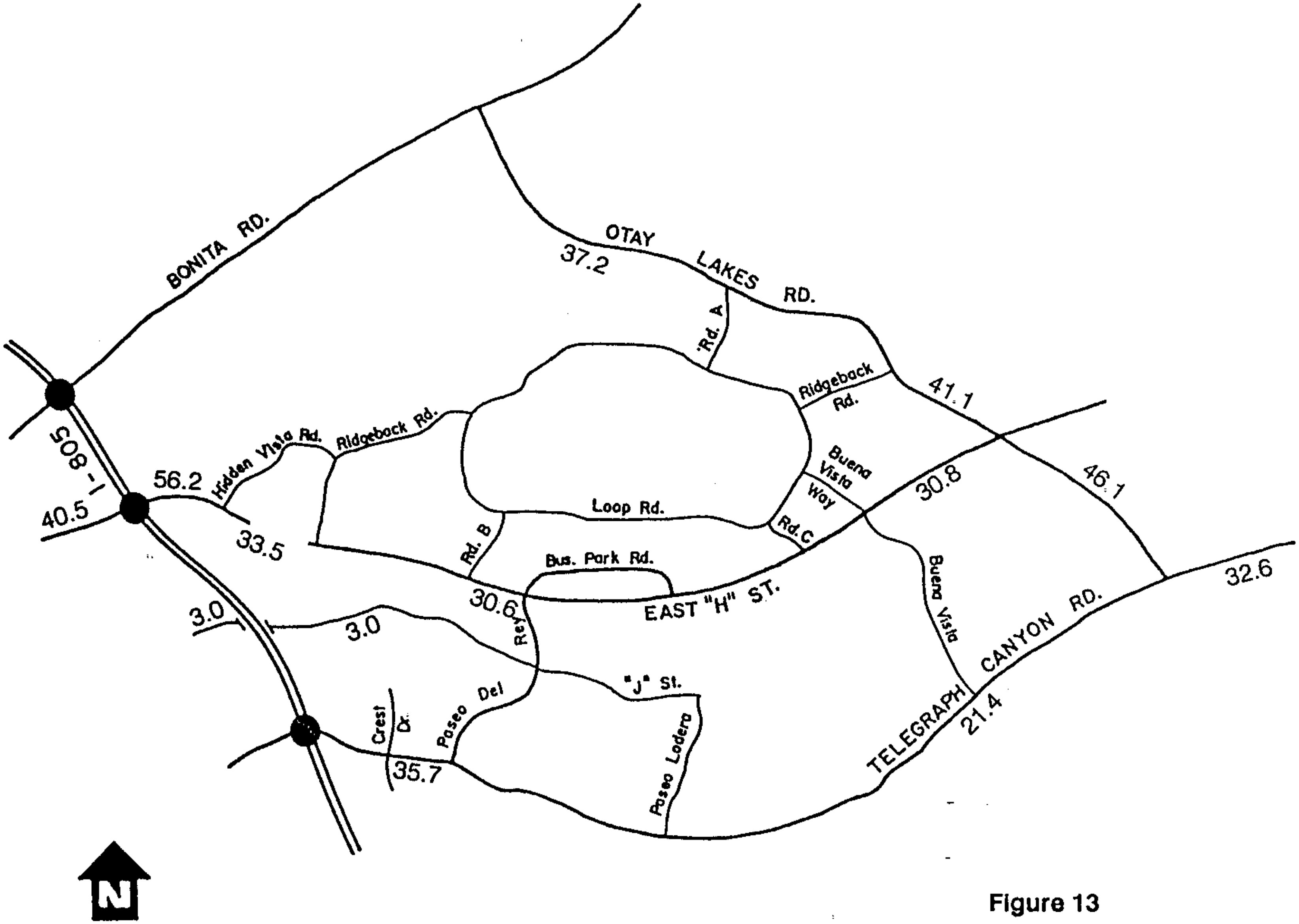


Figure 13

Future Aveage Daily Traffic
Build-out of Chula Vista Scenario 4
with Otay Mesa Build-out

APPENDIX

APPENDIX A

FINAL AND TENTATIVE MAP PROJECTS PLUS APPROVED TRAINING CENTER

APPENDIX A

FINAL AND TENTATIVE MAP PROJECTS PLUS APPROVED TRAINING CENTER

Final Maps	Residential Dwelling Units	Industrial Acres	Commercial Acres
Rancho Del Rey I	1,310	76.2	6.6
EastLake I	172	66.0	34.2
Ladera Villas	29		
Terra Nova	86		
Woodcrest S.W.	54		
Canyon View	40		
Totals	**1,691**	**142.2**	**40.8**
Tentative Maps			
Rancho Del Rey II	567		
Salt Creek I	550		
EastLake Greens	2,774		19.6
Sunbow	1,946	46.0	10.0
Village Center (E.L.I.)	405		
Montillo	353		
Totals	**6,595**	**46.0**	**29.6**

Sectional Planning Area Plan

Olympic Training Center 150 ACRES

APPENDIX B

APPROVED PROJECT FORECAST
WITH RANCHO DEL REY SPA'S I, II AND III

APPENDIX B

Approved Project Forecast with Rancho Del Rey SPA's I, II and III

Rancho Del Rey - 3257 DU, 76 acres industrial, 7 acres commercial, 35 acres schools, 39 acres parks, 19 acres public

TAZ 311	165 SFD (110)
TAZ 316	180 SFD (110), 286 MFD (130)
TAZ 329	518 SFD (110), 7 acres park (765), 11 acres public (720)
TAZ 336	90 SFD (110)
TAZ 353	7 acres public (720), 3 acres park (765)
TAZ 354	513 SFD (110), 81 MFD (130), 6 acres park (765), 10 acres elementary school (684)
TAZ 356	538 SFD (110), 25 acres Jr. High School (683)
TAZ 374	76 acres industrial (211), 7 acres commercial (525)
TAZ 379	623 SFD (110)
TAZ 414	263 FD (110), 2 acres park (765)

Eastlake - 577 DU, 66 acres industrial, 26 acres commercial, 11 acres office

TAZ 313	66 acres industrial (211), 11 acres office (600)
TAZ 317	577 MFD (130), 26 acres commercial (525)

Eastlake Greens 2774 DU, 20 acres commercial, 160 acres golf, 49 acres high school

TAZ 324	754 SFD (110), 699 MFD (130), 80 acres golf course (730), 8 acres parks (765)
TAZ 339	49 acres high school (682), 15 acres commercial (525), 29 acres parks (765), 10 acres elementary school (684)
TAZ 360	503 SFD (110), 818 MFD (130), 80 acre golf course (730), 5 acre church (720)

Olympic Training Center

TAZ 479	150 acre OTC (721)

TAZ = Traffic Analysis Zone (base year)
DU = Dwelling Unit
(XXX) = SANDAG Land Use Code

<u>Sunbow</u> 1946 DU, 10 acres commercial, 10 acres parks, 46 acres industrial

TAZ 435	250 SFD (110)
TAZ 442	200 SFD (110), 798 MFD (130), 10 acres commercial (525), 10 acres parks (765)
TAZ 452	228 SFD (110)
TAZ 475	470 SFD (110)
TAZ 492	46 acres industrial (210)

<u>Salt Creek I</u> 538 DU

TAZ 292	166 SFD (110)
TAZ 301	372 SFD (110)

<u>Montillo</u> 353 DU

TAZ 325	233 SFD (110)
TAZ 503	120 SFD (110)

<u>Canyon View</u> 40 DU

TAZ 288	40 SFD (110)

<u>Woodcrest S.W.</u> 54 DU

TAZ 356	54 SFD (110)

<u>Ladera Villas</u> 29 DU

TAZ 414	29 SFD (110)

Terra Nova 86 DU

TAZ 386 86 SFD (110)

TAZ = Traffic Analysis Zone (base year)
DU = Dwelling Unit
(XXX) = SANDAG Land Use Code

Total:
9654 DU
188 ac ind.
63 ac comm.
11 ac office
150 ac OTC
160 ac golf course
49 ac high school
25 ac jr. high school
20 ac elementary school
19 ac public
65 ac parks

APPENDIX C

CALCULATION SHEETS
WITH RANCHO DEL REY SPA'S I, II AND III

ON THE ACCOMPANYING CALCULATION SHEETS, THE LETTER 'A' AT THE END OF THE FILE NAME IN THE LOWER LEFT HAND CORNER SIGNIFIES A.M. PEAK HOUR CALCULATION; 'P' SIGNIFIES P.M. PEAK HOUR.

√

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: EXISTING (1989)
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	2	3000	210	0.10	Y	0.10
NR	1	1500	131	0.10	N	
NT	0					
SL	0					
SR	0					
ST	0					
EL	0					
ER	ENC W ET					
ET	3	5100	1050	0.21	Y	0.21
WL	1	1500	80	0.10	Y	0.10
WR	0					
WT	3	5100	1258	0.25	N	

N/S COMPONENT	0.10
E/W COMPONENT	0.31
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.49

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:IEA

/

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: EXISTING (1989)

BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	2	3000	124	0.10	Y	0.10
NR	1	1500	131	0.10	N	
NT	0					
SL	0					
SR	0					
ST	0					
EL	0					
ER	ENC W ET					
ET	3	5100	1742	0.34	Y	0.34
WL	1	1500	94	0.10	Y	0.10
WR	0					
WT	3	5100	641	0.13	N	

N/S COMPONENT	0.10
E/W COMPONENT	0.44
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.62

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:IEP

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C
BANKSTON/PINE ASSOCIATES

					CRITICAL MOVEMENT	
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	2	3000	301	0.10	Y	0.10
NR	1	1500	210	0.14	N	
NT	INC W NL					
SL	1 [illegible]	1500	120	0.10	Y	0.10
SR	1	1500	80	0.10	N	
ST	INC W SL					
EL	2	3000	120	0.10	Y	0.10
ER	ENC W ET					
ET	3	5100	1165	0.23	N	
WL	1 [illegible]	1500	132	0.10		
WR	ENC W WT					
WT	3	5100	1569	0.31	Y	0.31

N/S COMPONENT	0.20
E/W COMPONENT	0.41
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.69

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:IECA

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C
BANKSTON/PINE ASSOCIATES

					CRITICAL	MOVEMENT
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	2	3000	203	0.10	Y	0.10
NR	1	1500	210	0.14	N	
NT	INC W NL					
SL	2 An -	3000	270	0.10	Y	0.10
SR	1	1500	180	0.12	N	
ST	INC W SL					
EL	2	3000	120	0.10	N	
ER	ENC W ET					
ET	3	5100	2136	0.42	Y	0.42
WL	2 An -	3000	198	0.10	Y	0.10
WR	ENC W WT					
WT	3	5100	1301	0.26	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.52
RIGHT TURN COMPONENT	
PHASE CHANGE	0.07
ICU TOTAL	0.79

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:IECP

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C+P1

BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	2	3000	301	0.10	Y	0.10
NR	1	1500	222	0.15	N	
NT	INC W NL					
SL	1	1500	120	0.10	Y	0.10
SR	1	1500	80	0.10	N	
ST	INC W SL					
EL	2	3000	120	0.10	Y	0.10
ER	ENC W ET					
ET	3	5100	1177	0.23	N	
WL	2	3000	180	0.10	N	
WR	INC W WT					
WT	3	5100	1617	0.32	Y	0.32

N/S COMPONENT	0.20
E/W COMPONENT	0.42
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.70

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:ECPIA

/

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C+P1

BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	2	3000	203	0.10	Y	0.10
NR	1	1500	262	0.17	N	
NT	INC W NL					
SL	2	3000	270	0.10	Y	0.10
SR	1	1500	180	0.12	N	
ST	INC W SL					
EL	2	3000	120	0.10	N	
ER	ENC W ET					
ET	3	5100	2189	0.42	Y	0.42
WL	2	3000	220	0.10	Y	0.10
WR	INC W WT					
WT	3	5100	1324	0.26	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.52
RIGHT TURN COMPONENT	
PHASE CHANGE	0.07
ICU TOTAL	0.79

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:ECPIP

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	2	3000	348	0.12	Y	0.12
NR	1	1500	222	0.15	N	
NT	INC W NL					
SL	1	1500	120	0.10	Y	0.10
SR	1	1500	80	0.10	N	
ST	INC W SL					
EL	2	3000	120	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1188	0.23	N	
WL	1	1500	180	0.12	N	
WR	INC W WT					
WT	3	5100	1617	0.32	Y	0.32

N/S COMPONENT	0.22
E/W COMPONENT	0.42
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.72

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:1ECP12A

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	2	3000	225	0.10	Y	0.10
NR	1	1500	~~222~~	0.15	N	
NT	INC W NL					
SL	2	3000	270	0.10	Y	0.10
SR	1	1500	80	0.10	N	
ST	INC W SL					
EL	2	3000	120	0.10	N	
ER	INC W ET					
ET	3	5100	2241	0.44	Y	0.44
WL	2	3000	220	0.10	Y	0.10
WR	INC W WT					
WT	3	5100	1617	0.32	~~Y~~ N	~~0.32~~

N/S COMPONENT	0.20
E/W COMPONENT	~~0.86~~ 0.54
RIGHT TURN COMPONENT	
PHASE CHANGE	0.07
ICU TOTAL	~~1.13~~ 0.81

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:1ECP12P

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL Y/N(1)	MOVEMENT V/C
NL(2)	2	3000	225	0.10	Y	0.10
NR	1	1500	262	0.17	N	
NT	INC W NL					
SL	2	3000	270	0.10	Y	0.10
SR	1	1500	180	0.12	N	
ST	INC W SL					
EL	2	3000	120	0.10	~~Y~~	~~0.10~~
ER	ENC W ET					
ET	3	5100	2364	0.46	~~N~~ Y	
WL	2	3000	220	0.10	Y	0.10
WR	INC W WT					
WT	3	5100	1389	0.27	N	

N/S COMPONENT	0.20
E/W COMPONENT	~~0.20~~
RIGHT TURN COMPONENT	
PHASE CHANGE	~~0.07~~ .08
ICU TOTAL	~~0.47~~ [illegible]

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:1ECP123P

INTERSECTION: EAST H STREET/PASEO DEL REY
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	2	3000	348	0.12	Y	0.12
NR	1	1500	222	0.15	N	
NT	INC W NL					
SL	2	3000	120	0.10	Y	0.10
SR	1	1500	80	0.10	N	
ST	INC W SL					
EL	2	3000	120	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1236	0.24	N	
WL	2	3000	180	0.10	N	
WR	INC W WT					
WT	3	5100	1745	0.34	Y	0.34

N/S COMPONENT	0.22
E/W COMPONENT	0.44
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.74

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:1ECP123A

INTERSECTION: EAST H STREET/EAST BUSINESS PARK ROAD
DATE: JULY 1990
CASE: E+C

BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL Y/N(1)	MOVEMENT V/C
NL(2)	0					
NR	0					
NT	INC W NL					
SL	1	1500	80	0.10	Y	0.10
SR	1	1500	160	0.11	N	
ST	INC W SL					
EL	2	3000	180	0.10	Y	0.10
ER	ENC W ET				N	
ET	3	5100	1219	0.24		
WL	0					
WR	ENC W WT				N	
WT	3	5100	1661	0.33	Y	0.33

N/S COMPONENT	0.10
E/W COMPONENT	0.43
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.61

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:2ECA

INTERSECTION: EAST H STREET/E. BUSINESS PK.
DATE: JULY 1990
CASE: E+C
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	0					
NR	0					
NT	INC W NL					
SL	1	1500	180	0.12	Y	0.12
SR	1	1500	270	0.18	N	
ST	INC W SL					
EL	2	3000	180	0.10	Y	0.10
ER	ENC W ET					
ET	3	5100	1602	0.31	N	
WL	0					
WR	INC W WT					
WT	3	5100	1349	0.26	Y	0.26

N/S COMPONENT	0.12
E/W COMPONENT	0.36
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.56

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:2ECP

INTERSECTION: EAST H STREET/E. BUSINESS PK.
DATE: JULY 1990
CASE: E+C+P1
BANKSTON/PINE ASSOCIATES

					CRITICAL MOVEMENT	
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	1	1500	57	0.10	Y	0.10
NR	1	1500	27	0.10	N	
NT	INC W NL					
SL	1	1500	192	0.13	Y	0.13
SR	1	1500	270	0.18	N	
ST	INC W SL					
EL	2	3000	180	0.10	N	
ER	INC W ET					
ET	3	5100	1707	0.33	Y	0.33
WL	1	1500	62	0.10	Y	0.10
WR	INC W WL					
WT	3	5100	1349	0.26	N	

N/S COMPONENT	0.23
E/W COMPONENT	0.43
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.74

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:2ECP1P

INTERSECTION: EAST H STREET/E. BUSINESS PK.
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL Y/N(1)	MOVEMENT V/C
NL(2)	1	1500	106	0.10	Y	0.10
NR	1	1500	57	0.10	N	
NT	INC W NL					
SL	1	1500	90	0.10	Y	0.10
SR	1	1500	160	0.11	N	
ST	INC W SL					
EL	2	3000	180	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1243	0.24	N	
WL	1	1500	14	0.10	N	
WR	INC W WL					
WT	3	5100	1661	0.33	Y	0.33

N/S COMPONENT	0.20
E/W COMPONENT	0.43
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.71

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:2ECP12A

INTERSECTION: EAST H STREET/E. BUSINESS PK.
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	1	1500	106	0.10	Y	0.10
NR	1	1500	57	0.10	N	
NT	INC W NL					
SL	1	1500	90	0.10	Y	0.10
SR	1	1500	160	0.11	N	
ST	INC W SL					
EL	2	3000	180	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1291	0.25	N	
WL	1	1500	14	0.10	N	
WR	INC W WL					
WT	3	5100	1709	0.34	Y	0.34

N/S COMPONENT	0.20
E/W COMPONENT	0.44
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.72

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:2ECP123A

INTERSECTION: EAST H STREET/E. BUSINESS PK.
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	1	1500	57	0.10	Y	0.10
NR	1	1500	27	0.10	N	
NT	INC W NL					
SL	1	1500	192	0.13	Y	0.13
SR	1	1500	170	0.11	N	
ST	INC W SL					
EL	2	3000	180	0.10	N	
ER	ENC W ET					
ET	3	5100	1830	0.36	Y	0.36
WL	1	1500	62	0.10	Y	0.10
WR	ENC W WT					
WT	3	5100	1414	0.28	N	

N/S COMPONENT	0.23
E/W COMPONENT	0.46
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.77

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:2ECP123P

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C

BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL Y/N(1)	MOVEMENT V/C
NL(2)	0					
NR	0					
NT	INC W NL					
SL	1	1500	86	0.10	Y	0.10
SR	1	1500	170	0.11	N	
ST	INC W SL					
EL	1	1500	40	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1259	0.25	N	
WL	0					
WR	INC W WT					
WT	3	5100	1515	0.30	Y	0.30

N/S COMPONENT	0.10
E/W COMPONENT	0.40
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.58

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECA

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	0					
NR	0					
NT	INC W NL					
SL	1	1500	40	0.10	Y	0.10
SR	1	1500	180	0.12	N	
ST	INC W SL					
EL	1	1500	185	0.12	Y	0.12
ER	ENC W ET					
ET	3	5100	1597	0.31	N	
WL	0					
WR	INC W WT					
WT	3	5100	1364	0.27	Y	0.27

N/S COMPONENT	0.10
E/W COMPONENT	0.39
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.57

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1
BANKSTON/PINE ASSOCIATES

					CRITICAL	MOVEMENT
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	0					
NR	0					
NT	INC W NL					
SL	1	1500	86	0.10	Y	0.10
SR	1	1500	170	0.11	N	
ST	INC W SL					
EL	1	1500	40	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1316	0.26	N	
WL	0					
WR	INC W WL					
WT	3	5100	1529	0.30	Y	0.30

N/S COMPONENT	0.10
E/W COMPONENT	0.40
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.58

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP1A

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT	
					Y/N(1)	V/C
NL(2)	0					
NR	0					
NT	INC W NL					
SL	1	1500	40	0.10	Y	0.10
SR	1	1500	180	0.12	N	
ST	INC W SL					
EL	1	1500	185	0.12	Y	0.12
ER	INC W ET					
ET	3	5100	1624	0.32	N	
WL	0					
WR	INC W WL					
WT	3	5100	1426	0.28	Y	0.28

N/S COMPONENT	0.10
E/W COMPONENT	0.40
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.58

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP1P

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

					CRITICAL	MOVEMENT
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)						
NR	1	1500	14	0.10	Y	0.10
NT	1	1500	22	0.10	N	
SL	1	1500	89	0.10	Y	0.10
SR	1	1500	170	0.11	N	
ST	INC W SL					
EL	1	1500	40	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1316	0.26	N	
WL	1	1500	6	0.10	N	
WR	INC W WL					
WT	3	5100	1529	0.30	Y	0.30

N/S COMPONENT	0.20
E/W COMPONENT	0.40
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.68

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP12A

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	0					
NR	1	1500	10	0.10	Y	0.10
NT	1	1500	7	0.10	N	
SL	1	1500	56	0.10	Y	0.10
SR	1	1500	180	0.12	N	
ST	INC W SL					
EL	1	1500	185	0.12	N	
ER	INC W ET					
ET	3	5100	1624	0.32	Y	0.32
WL	1	1500	24	0.10	Y	0.10
WR	INC W WL					
WT	3	5100	1426	0.28	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.42
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.70

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP12P

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	1	1500	180	0.12	Y	0.12
NR	1	1500	82	0.10	N	
NT	INC W NL					
SL	1	1500	104	0.10	Y	0.10
SR	1	1500	170	0.11	N	
ST	INC W SL					
EL	1	1500	40	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1364	0.27	N	
WL	1	1500	28	0.10	N	
WR	INC W WL					
WT	3	5100	1529	0.30	Y	0.30

N/S COMPONENT	0.22
E/W COMPONENT	0.40
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.70

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbo[illegible] left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP123A

INTERSECTION: EAST H STREET/PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

					CRITICAL MOVEMENT	
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	1	1500	91	0.10	Y	0.10
NR	1	1500	40	0.10	N	
NT	INC W NL					
SL	1	1500	94	0.10	Y	0.10
SR	1	1500	170	0.11	N	
ST	INC W SL					
EL	1	1500	185	0.12	N	
ER	INC W ET					
ET	3	5100	1747	0.34	Y	0.34
WL	1	1500	81	0.10	Y	0.10
WR	INC W WL					
WT	3	5100	1426	0.28	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.44
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.72

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:3ECP123P

LOS Calculation
E 'J' St / Paseo Del Rey

4-Way Stop - Capacity 1700 Entering Vehicles Per Hour
2 Lane x 2 Lane

Scenario	Entering Vehicles AM	V/C	LOS	Entering Vehicles PM	V/C	LOS
E	527	0.31	A	786	0.46	A
E + C	833	0.49	A	1124	0.66	B
E + C + P1	983	0.58	A	1198	0.71	C
E + C + P1, P2	1049	0.62	B	1282	0.75	C
E + C + P1, P2, P3	1072	0.63	B	1305	0.77	C

```
LOCATION:E  J' ST/PASEO LADERO          !NAME:FIND LOS ECP12A  F:5P2A
---------------------------------------------------------------------------
HOURLY VOLUMES                          !  VOLUMES IN PCPH
                                     N  !
 Major street:E 'J' ST                  !
========================================!==================================
N= 1                   <---V5---    53  !                     <---V5---
Grade     13---V2--->  v---V4---    53  !        ---V2--->    v---V4---   58
  0%       5---V3---v            N= 1   !        ---V3---v
==================  <!     !>  ==========!================  <!   !> =========
Date of Counts: !     !    !    !       !              !   !   !   !
FUTURE          !    V7   V9   ! X STOP  !              !  V7  V9   !
Time Period:    !     !    !    !  YIELD !              !   !   !   !
AM              !     5    13!           !              !   6    14!
Approach Speed:  Minor Street:   Grade  !
30             PASEO LADERA        0%   !
PHF: .85
Population:
===========================================================================
VOLUME ADJUSTMENTS
---------------------------------------------------------------------------
Movement no.          !   2   !   3   !   4   !   5   !   7   !   9   !
---------------------------------------------------------------------------
Volume (vph)          !   13  !   5   !   53  !   53  !   5   !   13  !
---------------------------------------------------------------------------
Vol(pcph),see Table 10.1!XXXXXXXX!XXXXXXXX!  58  !XXXXXXXX!   6   !   14  !
===========================================================================
STEP 1 : RT From Minor Street           !          /-> V9
===========================================================================
Conflicting Flows, Vc                   ! 1/2 V3+V2= 3 + 13 = 16 vph(Vc9)
Critical Gap, Tc                        ! Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                  ! Cp9= 1000 pcph (Fig.10.3)
Actual Capacity, Cm                     ! Cm9=Cp9= 1000 pcph
===========================================================================
STEP 2 : LT From Major Street           !          v-- V4
===========================================================================
Conflicting Flows, Vc                   ! V3+V2= 5 + 13 = 18 vph(Vc4)
Critical Gap, Tc                        ! Tc=    5 secs (Tab.10.2)
Potential Capacity, Cp                  ! Cp4= 1000 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor   ! (V4/Cp4)x100=  5.8% P4= .97
Actual Capacity, [illegible]     (Fig.10.5)   ! Cm4=Cp4= 1000 pcph
===========================================================================
STEP 3 : LT From Minor Street           !          <-\ V7
===========================================================================
Conflicting Flows, Vc                   ! 1/2 V3+V2+V5+V4=
                                        ! 3 + 13 + 53 + 53 = 122 vph(Vc7)
Critical Gap, Tc                        ! Tc=  6.5 secs (Tab.10.2)
Potential Capacity, Cp                  ! Cp7=  798 pcph (Fig.10.3)
Actual Capacity, Cm                     ! Cm7=Cp7xP4= 798 x .97 = 774 pcph
===========================================================================
SHARED LANE CAPACITY    SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                               CR        CR      LOS   LOS
MOVEMENT    V(PCPH)    CM(PCPH)    CSH(PCPH)  (CM-V)   (CSH-V)    CM    CSH
===========================================================================
    7          6         774                   768                A
    9         14        1000                   986                A
    4         58        1000                   942                A
```

```
LOCATION:E 'J' ST/PASEO LADERO          NAME:FINE LOS ECP:CP    F:5P2P
-------------------------------------------------------------------------------
HOURLY VOLUMES                             | VOLUMES IN PCPH
                                        N  |
 Major street:E 'J' ST                     |
========================================== | ==================================
N= 1                    <---V5--      25   |                   <---V5---
Grade     59---V2--->    v---V4---    25   |       ---V2--->    v---V4---    28
  0%       5---V3---v              N= 1    |       ---V3---v
================  <|     |>  ==========    | ================  <|   |>  =========
Date of Counts: |   |     |   |            |                 |  |    |   |
FUTURE          |   V7    V9  | X STOP     |                 |  V7   V9  |
Time Period:    |   |     |   |   YIELD    |                 |  |    |   |
PM              |    5      59|            |                 |   6     65|
Approach Speed:  Minor Street:   Grade     |
30            PASEO LADERA        0%       |
PHF: .85
Population:
===============================================================================
VOLUME ADJUSTMENTS
-------------------------------------------------------------------------------
Movement no.              |   2   |    3   |    4   |    5   |    7   |    9   |
-------------------------------------------------------------------------------
Volume (vph)              |   59  |     5  |   25   |    25  |     5  |    59  |
-------------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXXX|XXXXXXXX|   28   |XXXXXXXX|     6  |    65  |
===============================================================================
STEP 1 : RT From Minor Street              |          /-> V9
===============================================================================
Conflicting Flows, Vc                      | 1/2 V3+V2= 3 + 59 = 62 vph(Vc9)
Critical Gap, Tc                           | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                     | Cp9= 1000 pcph (Fig.10.3)
Actual Capacity, Cm                        | Cm9=Cp9= 1000 pcph
===============================================================================
STEP 2 : LT From Major Street              |          v-- V4
===============================================================================
Conflicting Flows, Vc                      | V3+V2= 5 + 59 = 64 vph(Vc4)
Critical Gap, Tc                           | Tc=    5 secs (Tab.10.2)
Potential Capacity, Cp                     | Cp4= 1000 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor      | (V4/Cp4)x100=  2.8% P4= .98
Actual Capacity, Cm          (Fig.10.5)    | Cm4=Cp4= 1000 pcph
===============================================================================
STEP 3 : LT From Minor Street              |          <-\ V7
===============================================================================
Conflicting Flows, Vc                      | 1/2 V3+V2+V5+V4=
                                           | 3 + 59 + 25 + 25 = 112 vph(Vc7)
Critical Gap, Tc                           | Tc=  6.5 secs (Tab.10.2)
Potential Capacity, Cp                     | Cp7=  808 pcph (Fig.10.3)
Actual Capacity, Cm                        | Cm7=Cp7xP4= 808 x  98 = 792 pcph
===============================================================================
SHARED LANE CAPACITY    SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                  CR        CR       LOS   LOS
MOVEMENT    V(PCPH)    CM(PCPH)    CSH(PCPH)    (CM-V)    (CSH-V)     CM   CSH
===============================================================================
    7          6         792                     786                  A
    9         65        1000                     935                  A
```

```
LOCATION:E 'J' ST/PASEO LADERA           NAME:FIND LOS EOP123A       F 5P3A
-------------------------------------------------------------------------------
HOURLY VOLUMES   .                            | VOLUMES IN PCPH
                                         N    |
 Major street:E 'J' ST                        |
============================================= | ==========================================
N= 1                        <---V5---    70   |                          <---V5---
Grade     19---V2----       v---V4---    53   |        ---V2--->        ,---V4---    58
  0%      10---V3---v                 N= 1    |        ---V3---v
===============   <|     |>   ==========      | ===============   <|    |>   ========
Date of Counts: |    |     |    |             |                 |    |    |  |
FUTURE          |   V7    V9    | X STOP      |                 |   V7   V9  |
Time Period:    |    |     |    |   YIELD     |                 |    |    |  |
AM              |   10     13|                |                 |   11     14|
Approach Speed:  Minor Street:    Grade       |
30              PASEO LADERA        0%        |
PHF: .85
Population:
==========================================================================================
VOLUME ADJUSTMENTS
------------------------------------------------------------------------------------------
Movement no.            |   2   |   3   |   4   |   5   |   7   |   9   |
------------------------------------------------------------------------------------------
Volume (vph)            |   19  |   10  |   53  |   70  |   10  |   13  |
------------------------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXXX|XXXXXXXX|  58  |XXXXXXXX|  11  |   14  |
==========================================================================================
STEP 1 : RT From Minor Street              |          /-> V9
==========================================================================================
Conflicting Flows, Vc                      | 1/2 V3+V2= 5 + 19 = 24 vph(Vc9)
Critical Gap, Tc                           | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                     | Cp9= 1000 pcph (Fig.10.3)
Actual Capacity, Cm                        | Cm9=Cp9= 1000 pcph
==========================================================================================
STEP 2 : LT From Major Street              |          v-- V4
==========================================================================================
Conflicting Flows, Vc                      | V3+V2= 10 + 19 = 29 vph(Vc4)
Critical Gap, Tc                           | Tc=    5 secs (Tab.10.2)
Potential Capacity, Cp                     | Cp4= 1000 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor      | (V4/Cp4)x100=  5.8% P4= .97
Actual Capacity, Cm         (Fig.10.5)     | Cm4=Cp4= 1000 pcph
==========================================================================================
STEP 3 : LT From Minor Street              |          <-\ V7
==========================================================================================
Conflicting Flows, Vc                      | 1/2 V3+V2+V5+V4=
                                           | 5 + 19 + 70 + 53 = 147 vph(Vc7)
Critical Gap, Tc                           | Tc=  6.5 secs (Tab.10.2)
Potential Capacity, Cp                     | Cp7=  773 pcph (Fig.10.3)
Actual Capacity, Cm                        | Cm7=Cp7xP4= 773 x .97 = 750 pcph
==========================================================================================
SHARED LANE CAPACITY    SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                     CR         CR       LOS    LOS
MOVEMENT     V(PCPH)     CM(PCPH)     CSH(PCPH)    (CM-V)    (CSH-V)     CM     CSH
==========================================================================================
    7          11          750                      739                   A
    9          14         1000                      986                   A
    4          58         1000                      542                   A
```

```
LOCATION:E 'J' ST/PASEO LADERO          :NAME:FIND LOS ECP:C3P    F:5P3P
---------------------------------------------------------------------------------
HOURLY VOLUMES                           : VOLUMES IN PCPH
                                    N    :
 Major street:E 'J' ST                   :
=========================================  =======================================
N= 1                    <---V5---    32 :                          <---V5---
Grade     75---V2--->   v---V4---    25 :          ---V2--->      <---V4---    28
  0%      10---V3---v              N= 1 :          ---V3---v
=================  <|      |>  ========= | ================  <|   |>  ========
Date of Counts: |    |      :    |       :                    |    |   |   |
FUTURE          |   V7     V9   | X STOP :                    |   V7  V9   |
Time Period:    |    |      :    :  YIELD :                    |    |   /   |
PM              |   10      59|          :                    |   11    65|
Approach Speed:  Minor Street:    Grade  :
30              PASEO LADERA        0%   :
PHF: .85
Population:
=================================================================================
VOLUME ADJUSTMENTS
---------------------------------------------------------------------------------
Movement no.            :   2   |   3   |   4   |   5   |   7   |   9   |
---------------------------------------------------------------------------------
Volume (vph)            |   75  |   10  |   25  |   32  |   10  |   55  |
---------------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXX|XXXXXXX|   28  |XXXXXXX|   11  |   65  |
=================================================================================
STEP 1 : RT From Minor Street            |          /-> V9
=================================================================================
Conflicting Flows, Vc                    | 1/2 V3+V2= 5 + 75 = 80 vph(Vc9)
Critical Gap, Tc                         | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                   | Cp9= 1000 pcph (Fig.10.3)
Actual Capacity, Cm                      | Cm9=Cp9= 1000 pcph
=================================================================================
STEP 2 : LT From Major Street            |          v-- V4
=================================================================================
Conflicting Flows, Vc                    | V3+V2= 10 + 75 = 85 vph(Vc4)
Critical Gap, Tc                         | Tc=    5 secs (Tab.10.2)
Potential Capacity, Cp                   | Cp4= 1000 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor    | (V4/Cp4)x100=  2.8% P4= .98
Actual Capacity, Cm          (Fig.10.5)  | Cm4=Cp4= 1000 pcph
=================================================================================
STEP 3 : LT From Minor Street            |          <-\ V7
=================================================================================
Conflicting Flows, Vc                    | 1/2 V3+V2+V5+V4=
                                         | 5 + 75 + 32 + 25 = 137 vph(Vc7)
Critical Gap, Tc                         | Tc=  6.5 secs (Tab.10.2)
Potential Capacity, Cp                   | Cp7=  783 pcph (Fig.10.3)
Actual Capacity, Cm                      | Cm7=Cp7xP4= 783 x .98 = 767 pcph
=================================================================================
SHARED LANE CAPACITY     SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                   CR        CR       LOS   LOS
MOVEMENT    V(PCPH)    CM(PCPH)    CSH(PCPH)     (CM-V)   (CSH-V)     CM    CSH
=================================================================================
   7          11         767                      756                  A
   9          65        1000                      935                  A
```

```
LOCATION:E 'J' ST:PASEO RANCHERO          :NAME:FIND LOS F:GP2A      F: 6 P2A
------------------------------------------------------------------------------
HOURLY VOLUMES                           :  VOLUMES IN PCPH
                                     N   :
 Major street:PASEO RANCHERO             :
======================================== : ===================================
N= 2                  <---V5---    0 :                             <---V5---
Grade      0---V2--->    v---V4---    4 :         ---V2--->        v---V4---     4
  0%       6---V3---\             N= 3 :         ---V3---v
================  <|     |>  ========== : ================  <|    |>  ========
Date of Counts: |   |     |   |         :                 |   |    |   |
FUTURE          |   V7    V9  | X STOP  :                 |   V7   V9 |
Time Period:    |   |     |   |   YIELD :                 |   |    |   |
AM              |   36    14|           :                 |   40     15:
Approach Speed:  Minor Street:   Grade  :
35              E 'J' ST           0%   :
PHF: .85
Population:
==============================================================================
VOLUME ADJUSTMENTS
------------------------------------------------------------------------------
Movement no.         |    2    |    3    |    4    |    5    |    7    |    9    |
------------------------------------------------------------------------------
Volume (vph)         |    0    |    6    |    4    |    0    |   36    |   14    |
------------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXXX|XXXXXXXX|   4    |XXXXXXXX|   40    |   15    |
==============================================================================
STEP 1 : RT From Minor Street             :            /-> V9
==============================================================================
Conflicting Flows, Vc                     : 1/2 V3+V2= 3 + 0 = 3 vph(Vc9)
Critical Gap, Tc                          : Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                    : Cp9= 1000 pcph (Fig.10.3)
Actual Capacity, Cm                       : Cm9=Cp9= 1000 pcph
==============================================================================
STEP 2 : LT From Major Street             :             v-- V4
==============================================================================
Conflicting Flows, Vc                     : V3+V2= 6 + 0 = 6 vph(Vc4)
Critical Gap, Tc                          : Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                    : Cp4= 1000 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor     : (V4/Cp4)x100=   .4% P4=   1
Actual Capacity, Cm          (Fig.10.5)   : Cm4=Cp4= 1000 pcph
==============================================================================
STEP 3 : LT From Minor Street             :             <-\ V7
==============================================================================
Conflicting Flows, Vc                     : 1/2 V3+V2+V5+V4=
                                          : 3 + 0 + 0 + 4 = 7 vph(Vc7)
Critical Gap, Tc                          : Tc=    7 secs (Tab.10.2)
Potential Capacity, Cp                    : Cp7=  848 pcph (Fig.10.3)
Actual Capacity, Cm                       : Cm7=Cp7xP4= 848 x 1 = 848 pcph
==============================================================================
SHARED LANE CAPACITY    SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                   CR        CR       LOS   LOS
MOVEMENT    V(PCPH)    CM(PCPH)    CSH(PCPH)     (CM-V)   (CSH-V)     CM    CSH
==============================================================================
    7          40         848                      808                 A
    9          15        1000                      986                 A
    4           4        1000                      996                 A
```

```
LOCATION:E 'J' ST/PASEO RANCHERO          FNAME:FIND LOS F:6F2P
------------------------------------------------------------------------
HOURLY VOLUMES                          | VOLUMES IN PCPH
                                    N   |
 Major street:PASEO RANCHERO            |
======================================= | ===============================
N= 2                    <---V5---    0  |                       <---V5---
Grade     0---V2--->    v---V4---   15  |       ---V2--->       v---V4---   17
  0%     24---V3---v            N= 3    |       ---V3---v
=================   <|    |>  ========= | ================  <|   |>  ========
Date of Counts: |   |     |   |         |                 |   |    |   |
FUTURE          |   V7    V9  | % STOP  |                 |   V7   V9  |
Time Period:    |   |     |   |   YIELD |                 |   |    |   |
PM              |   17     6|           |                 |   19     7|
Approach Speed:  Minor Street:   Grade  |
35              E 'J' ST           0%   |
PHF: .85
Population:
========================================================================
VOLUME ADJUSTMENTS
------------------------------------------------------------------------
Movement no.            |   2   |   3   |   4   |   5   |   7   |   9   |
------------------------------------------------------------------------
Volume (vph)            |    0  |   24  |   15  |    0  |   17  |    6  |
------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXXX|XXXXXXXX|   17  |XXXXXXXX|  19  |    7  |
========================================================================
STEP 1 : RT From Minor Street           |          /-> V9
========================================================================
Conflicting Flows, Vc                   | 1/2 V3+V2= 12 + 0 = 12 vph(Vc9)
Critical Gap, Tc                        | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                  | Cp9= 1000 pcph (Fig.10.3)
Actual Capacity, Cm                     | Cm9=Cp9= 1000 pcph
========================================================================
STEP 2 : LT From Major Street           |          v-- V4
========================================================================
Conflicting Flows, Vc                   | V3+V2= 24 + 0 = 24 vph(Vc4)
Critical Gap, Tc                        | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                  | Cp4= 1000 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor   | (V4/Cp4)x100=  1.7% P4= .99
Actual Capacity, Cm         (Fig.10.5)  | Cm4=Cp4= 1000 pcph
========================================================================
STEP 3 : LT From Minor Street           |          <-\ V7
========================================================================
Conflicting Flows, Vc                   | 1/2 V3+V2+V5+V4=
                                        | 12 + 0 + 0 + 15 = 27 vph(Vc7)
Critical Gap, Tc                        | Tc=    7 secs (Tab.10.2)
Potential Capacity, Cp                  | Cp7=  828 pcph (Fig.10.3)
Actual Capacity, Cm                     | Cm7=Cp7xP4= 828 x .99 = 820 pcph
========================================================================
SHARED LANE CAPACITY    SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                   CR        CR      LOS   LOS
MOVEMENT    V(PCPH)    CM(PCPH)    CSH(PCPH)     (CM-V)    (CSH-V)    CM   CSH
==============================================================================
    7          19         820                      801                A
    9           7        1000                      993                A
    4          17        1000                      983                A
```

```
LOCATION:E "J" ST/PASEO RANCHERO          NAME:FIND LOS F:6PZA
------------------------------------------------------------------------------
HOURLY VOLUMES                           Grade 0%
                                       !          N = 2       !
                                       !  226                 !
                                       !  V12                 !
                                       !   !    17            !       <N
                                       !   !   V11            !
                                       !   !    !   184       !
       ======================          !   !   V10        ======================
          N= 3                         <!   v    !>       ^-----------V6-- 70
Grade 0%                                                  <-----------V5-- 10   N= 3
         85 --V1--------------^                           v-----------V4-- 4
         10 --V2-------------->                              major road        Grade 0%
          6 --V3--------------v           <!       !>        PASEO RANCHERO
       ======================             V7    !   !     ======================
                                       !  36    !   !     ! STOP xx
                                       !        V8  !     ! YIELD
                                       !  N= 2    6 !     ! Date of Counts:FUTURE
                                       !            V9    ! Time Period:AM
                                       ! minor road  14   ! Prevailing Speed:35
                                       ! E 'J' ST         ! PHF:.85
                                       !   Grade 0 %      ! Population:
==============================================================================
VOLUME ADJUSTMENTS
------------------------------------------------------------------------------
Movement no.        !  1 !  2 !  3 !  4 !  5 !  6 !  7 !  8 !  9 ! 10 ! 11 ! 12 !
------------------------------------------------------------------------------
Volume (vph)        !  85!  10!   6!   4!  10!  70!  36!   6!  14! 184!  17! 226!
------------------------------------------------------------------------------
Vol(pcph),Tab.10.1!  94!XXXX!XXXX!   4!XXXX!XXXX!  40!   7!  15! 202!  19! 249!
==============================================================================

VOLUMES IN PCPH                        !                      !
                                       !  249                 !
                                       !  V12                 !
                                       !   !   19             !
                                       !   !  V11             !
                                       !   !   !  202         !
       ======================          !   !  V10         ======================
                                       <!   v    !>       ^-----------V6-- ==
                                                          <-----------V5-- ==
         94 --V1--------------^                           v-----------V4--    4
         == --V2-------------->
         == --V3--------------v           <!       !>
       ======================             V7    !   !     ======================
                                       !  40    !   !  !
                                       !        V8  !  !
                                       !         7  !  !
                                       !            V9 !
                                       !            15 !
```

```
LOCATION:E 'J' ST/PASEO RANCHERO          NAME:FIND LOS F:6P3A
==========================================================================
STEP 1 : RT From Minor Street !        <-> V9            !        -> V12
==========================================================================
Conflicting Flows, Vc          ! 1/2 V3+V2=Vc9           ! 1/2 V6+V5=Vc12
                               ! 3+ 5= 8 vph             ! 35+ 5= 40 vph
Critical Gap, Tc (Tab.10.2)    ! 5.5 (secs.)             ! 5.5 (secs.)
Potential Capacity,Cp(Fig10.3)! Cp9 = 1000 pcph          ! Cp12 = 1000 pcph
% of Cp utilized               ! (V9/Cp9)x100= 1.5%      ! (V12/Cp12)x100= 24.3%
Impedance Factor, P (Fig.10.5)! P9= .99                  ! P12= .82
Actual Capacity, Cm            ! Cm9=Cp9= 1000 pcph      ! Cm12=Cp12= 1000 pcph

==========================================================================
STEP 2 : LT From Major Street,!        v-- V4            !        --^ V1
==========================================================================
Conflicting Flows, Vc          ! V3+V2=Vc4               ! V6+V5=Vc1
                               ! 5+ 10= 15 vph           ! 70+ 10= 80 vph
Critical Gap, Tc (Tab.10.2)    ! 5.5 (secs.)             ! 5.5 (secs.)
Potential Capacity,Cp(Fig10.3)! Cp4 = 1000 pcph          ! Cp1 = 1000 pcph
% of Cp utilized               ! (V4/Cp4)x100= .4%       ! (V1/Cp1)x100= 9.4%
Impedance Factor, P (Fig.10.5)! P4=  1                   ! P1= .94
Actual Capacity, Cm            ! Cm4=Cp4= 1000 pcph      ! Cm1=Cp1= 1000 pcph

==========================================================================
STEP 3 : TH From Minor Street !         ^  V8            !         v  V11
==========================================================================
Conflicting Flows, Vc          !.5V3+V2+V1+V6+V5+V4=Vc8! .5V6+V5+V4+V3+V2+V1=Vc11
                               ! 3+ 10+ 85+ 70+          ! 35+ 10+ 4+ 6+
                               ! 10+ 4= 182 vph          ! 10+ 85= 150 vph
Critical Gap, Tc (Tab.10.2)    ! 6.5 (secs.)             ! 6.5 (secs.)
Potential Capacity,Cp(Fig10.3)! Cp8 =  738 pcph          ! Cp11 = 770 pcph
% of Cp utilized               ! (V8/Cp8)x100= .8%       ! (V11/Cp11)x100= 2.5%
Impedance Factor, P (Fig.10.5)! P8= .99                  ! P11= .99
Actual Capacity, Cm            ! Cm8=Cp8xP1xP4           ! Cm11=Cp11xP1xP4
                               ! 694= 738x.94x 1pcph     ! 724= 770x.94x 1pcph

==========================================================================
STEP 4 : LT From Minor Street !       <-\ V7             !       \-> V10
==========================================================================
Conflicting Flows, Vc          ! Vc8(step3)+V11+V12=Vc7! Vc11(step3)+V8+V9=Vc10
                               ! 182+ 17+ 226= 425vph    ! 150+ 6+ 14= 170vph
Critical Gap, Tc (Tab.10.2)    ! 7 (secs.)               ! 7 (secs.)
Potential Capacity,Cp(Fig10.3)! Cp7 =  483 pcph          ! Cp10 = 689 pcph
Actual Capacity, Cm            ! Cm7=Cp7xP1xP4xP11xP12   ! Cm10=Cp10xP4xP1xP8xP9
                               ! = 483x.94x 1x.99x.82    ! = 689x 1x.94x.99x.99
                               ! = 369 pcph              ! = 635 pcph

==========================================================================
```

```
LOCATION:E 'J' ST/PASEO RANCHERO          NAME:FINE LOS F:6P3A

                          SHARED LANE CAPACITY
                       APPROACH MOVEMENTS 7,8,9
                                                   CR         CR       LOS   LOS
MOVEMENT     V(PCPH)    CM(PCPH)    CSH(PCPH)    (CM-V)    (CSH-V)     CM    CSH
================================================================================
   7           40         369          397         329        350       B     B
   8            7         594          397         587        350       A     B
   9           15        1000                      985                  A

                       APPROACH MOVEMENTS 10,11,12
                                                   CR         CR       LOS   LOS
MOVEMENT     V(PCPH)    CM(PCPH)    CSH(PCPH)    (CM-V)    (CSH-V)     CM    CSH
================================================================================
  10          102         535          542         433        421       A     A
  11           19         724          542         705        421       A     A
  12          249        1000                      751                  A

                       MAJOR STREET LEFT TURNS 1,4
MOVEMENT     V(PCPH)    CM(PCPH)                 CR(CM-V)              LOS
================================================================================
   1           94        1000                      905                  A
   4            4        1000                      996                  A


 COMMENTS:
```

```
LOCATION:E 'J' ST/PASEO RANCHERO              NAME:FIND LOS P:8F3P
---------------------------------------------------------------------------------
HOURLY VOLUMES                  Grade 0%
                               |         N = 2        |
                               |   114                |
                               |  V12                 |
                               |   |     7            |       <N
                               |   |   V11            |
                               |   |    |    93       |
     =====================     |    |   V10       =====================
         N= 3                  <|     v    |>        ^-----------V6-- 177
Grade 0%                                             <-----------V5-- 10    N= 3
        219 --V1-------------^                       v-----------V4-- 15
         10 --V2------------->                         major road          Grade 0%
         24 --V3------------v        <|          |>    PASEO RANCHERO
     =====================           V7    |     |   =====================
                               |     17    |     |  | STOP xx
                               |          V8     |  | YIELD
                               |  N= 2    16     |  | Data of Counts:FUTURE
                               |                V9  | Time Period:PM
                               | minor road      6  | Prevailing Speed:35
                               | E 'I' ST           | PHF:.85
                               |   Grade 0 %        : Population:
=================================================================================
VOLUME ADJUSTMENTS
---------------------------------------------------------------------------------
Movement no.        |  1 |  2 |  3 |  4 |  5 |  6 |  7 |  8 |  9 | 10 | 11 | 12 |
---------------------------------------------------------------------------------
Volume (vph)        | 219|  10|  24|  15|  10| 177|  17|  16|   6|  93|   7| 114|
---------------------------------------------------------------------------------
Vol(pcph),Tab.10.1| 240|XXXX|XXXX|  17|XXXX|XXXX|  19|  18|   7| 102|   8| 125|
=================================================================================

VOLUMES IN PCPH                |                      |
                               |  125                 |
                               |  V12                 |
                               |   |     8            |
                               |   |   V11            |
                               |   |    |  102        |
     =====================     |   |    |  V10        =====================
                               <|     v    |>        ^-----------V6-- ==
                                                     <-----------V5-- ==
        240 --V1-------------^                       v-----------V4--  17
         == --V2------------->
         == --V3------------v        <|    ^     |>
     =====================           V7    |     |   =====================
                               |     19    |     |  |
                               |          V8     :  |
                               |          18     |  |
                               |                V9  |
                               |                 7  |
```

```
LOCATION:E 'J' ST/PASEO RANCHERO          NAME:FIND LOS F:GP3P
========================================================================
STEP 1 : RT From Minor Street |        --> V9           |      <-- V12
========================================================================
Conflicting Flows, V          | 1/2 V3+V2=Vc9           | 1/2 V6+V5=Vc12
                              | 12+ 5= 17 vph           | 59+ 5= 64 vph
Critical Gap, Tc (Tab.10.2)   | 5.5 (secs.)             | 5.5 (secs.)
Potential Capacity,Cp(Fig10.3 | Cp9 = 1000 pcph         | Cp12 = 1000 pcph
% of Cp utilized              | (V9/Cp9)x100= .7%       | (V12/Cp12)x100= 12.5%
Impedance Factor, P (Fig 10.5)| P9=  1                  | P12=  .92
Actual Capacity, Cm           | Cm9=Cp9= 1000 pcph      | Cm12=Cp12= 1000 pcph

========================================================================
STEP 2 : LT From Major Street |       v-- V4            |       -- V1
========================================================================
Conflicting Flows, Vc         | V3+V2=Vc4               | V6+V5=Vc1
                              | 24+ 10= 34 vph          | 177+ 10= 187 vph
Critical Gap, Tc (Tab.10.2)   | 5.5 (secs.)             | 5.5 (secs.)
Potential Capacity,Cp Fig10.3)| Cp4 = 1000 pcph         | Cp1 = 904 pcph
% of Cp utilized              | (V4/Cp4)x100= 1.7%      | (V1/Cp1)x100= 25.5%
Impedance Factor, P (Fig.10.5)| P4= .99                 | P1= .8
Actual Capacity, Cm           | Cm4=Cp4= 1000 pcph      | Cm1=Cp1= 904 pcph

========================================================================
STEP 3 : TH From Minor Street |          V8             |        v  V11
========================================================================
Conflicting Flows, Vc         |.5V3+V2+V1+V6+V5+V4=Vc8| .5V6+V5+V4+V3+V2+V1=Vc11
                              | 12+ 10+ 218+ 177+       | 89+ 10+ 15+ 24+
                              | 10+ 15= 442 vph         | 10+ 218= 366 vph
Critical Gap, Tc (Tab.10.2)   | 6.5 (secs.)             | 6.5 (secs.)
Potential Capacity,Cp(Fig10.3)| Cp8 =  531 pcph         | Cp11 = 584 pcph
% of Cp utilized              | (V8/Cp8)x100= 3.4%      | (V11/Cp11)x100= 1.4%
Impedance Factor, P (Fig.10.5)| P8= .98                 | P11= .99
Actual Capacity, Cm           | Cm8=Cp8xP1xP4           | Cm11=Cp11xP1xP4
                              | 421= 531x .8x.99pcph    | 463= 584x .8x.99pcph

========================================================================
STEP 4 : LT From Minor Street |       <-\ V7            |       \-> V10
========================================================================
Conflicting Flows, Vc         | Vc8(step3)+V11+V12=Vc7| Vc11(step3)+V8+V9=Vc10
                              | 442+ 7+ 114= 563vph     | 366+ 16+ 6= 388vph
Critical Gap, Tc (Tab.10.2)   | 7 (secs.)               | 7 (secs.)
Potential Capacity,Cp(Fig10.3)| Cp7 =  389 pcph         | Cp10 = 509 pcph
Actual Capacity, Cm           | Cm7=Cp7xP1xP4xP11xP12   | Cm10=Cp10xP4xP1xP8xP9
                              | = 389x .8x.99x.99x.92   | = 509x.99x .8x.98x 1
                              | = 281 pcph              | = 395 pcph

========================================================================
```

```
LOCATION:E 'J' ST/PASEO RANCHERO          NAME:FIND LOS F:SP3P

                              SHARED LANE CAPACITY
                            APPROACH MOVEMENTS 7,8,9
                                                  CR          CR      LOS   LOS
MOVEMENT     V(PCPH)   CM(PCPH)    CSH(PCPH)    (CM-V)    (CSH-V)    CM    CSH
==============================================================================
   7          19         281         335          262        298       C     C
   8          18         421         335          403        299       A     C
   9           7        1000                      993                  A

                            APPROACH MOVEMENTS 10,11,12
                                                  CR          CR      LOS   LOS
MOVEMENT     V(PCPH)   CM(PCPH)    CSH(PCPH)    (CM-V)    (CSH-V)    CM    CSH
==============================================================================
  10         102         395         399          293        289       C     C
  11           8         463         399          455        289       A     C
  12         125        1000                      875                  A

                            MAJOR STREET LEFT TURNS 1,4
MOVEMENT     V(PCPH)   CM(PCPH)                 CR(CM-V)               LOS
==============================================================================
   1         240         904                      664                  A
   4          17        1000                      983                  A

 COMMENTS:
```

INTERSECTION: TELEGRAPH CANYON RD./PASEO LADERA
DATE: JULY 1990
CASE: E+C
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	1	1500	165	0.11	Y	0.11
NR	1	1500	75	0.05	N	
NT	INC W NL					
SL	1	1500	41	0.10	Y	0.10
SR	1	1500	140	0.10	N	
ST	INC W SL					
EL	1	1500	70	0.10	Y	0.10
ER	ENC W ET					
ET	3	5100	960	0.19	N	
WL	1	1500	21	0.02	N	
WR	ENC W WT					
WT	3	5100	1141	0.22	Y	0.22

N/S COMPONENT	0.21
E/W COMPONENT	0.32
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.61

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECA

INTERSECTION: TELEGRAPH CANYON RE./PASEO LADERA
DATE: JULY 1990
CASE: E+C
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL Y/N(1)	MOVEMENT V/C
NL(2)	1	1500	75	0.10	Y	0.10
NR	1	1500	35	0.10	N	
NT	INC W NL					
SL	1	1500	23	0.10	Y	0.10
SR	1	1500	90	0.10	N	
ST	INC W SL					
EL	1	1500	153	0.10	N	
ER	ENC W ET					
ET	3	5100	1656	0.32	Y	0.32
WL	1	1500	85	0.10	Y	0.10
WR	ENC W WT					
WT	3	5100	1069	0.21	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.42
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.70

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP

INTERSECTION: TELEGRAPH CANYON RD./PASEO LADERA
DATE: JULY 1990
CASE: E+C+P1
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	1	1500	165	0.11	Y	0.11
NR	1	1500	75	0.05	N	
NT	INC W NL					
SL	1	1500	41	0.10	Y	0.10
SR	1	1500	140	0.10	N	
ST	INC W SL					
EL	1	1500	70	0.10	Y	0.10
ER	ENC W ET					
ET	3	5100	960	0.19	N	
WL	1	1500	21	0.02	N	
WR	ENC W WT					
WT	3	5100	1141	0.22	Y	0.22

N/S COMPONENT	0.21
E/W COMPONENT	0.32
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.61

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP1A

INTERSECTION: TELEGRAPH CANYON RE./PASEO LADERA
DATE: JULY 1990
CASE: E+C+P1
BANKSTON/PINE ASSOCIATES

					CRITICAL MOVEMENT	
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	1	1500	84	0.10	Y	0.10
NR	1	1500	35	0.10	N	
NT	INC W NL					
SL	1	1500	23	0.10	Y	0.10
SR	1	1500	90	0.10	N	
ST	INC W SL					
EL	1	1500	153	0.10	N	
ER	ENC W ET					
ET	3	5100	1656	0.32	Y	0.32
WL	1	1500	85	0.10	Y	0.10
WR	ENC W WT					
WT	3	5100	1069	0.21	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.42
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.70

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP1P

INTERSECTION: TELEGRAPH CANYON RD./PASEO LADERA
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	1	1500	165	0.11	Y	0.11
NR	1	1500	75	0.05	N	
NT	INC W NL					
SL	1	1500	49	0.10	Y	0.10
SR	1	1500	185	0.12	N	
ST	INC W SL					
EL	1	1500	81	0.10	Y	0.10
ER	ENC W ET					
ET	3	5100	960	0.19	N	
WL	1	1500	42	0.10	N	
WR	ENC W WT					
WT	3	5100	1141	0.22	Y	0.22

N/S COMPONENT	0.21
E/W COMPONENT	0.32
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.61

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP12A

INTERSECTION: TELEGRAPH CANYON RD./PASEO LADERA
DATE: JULY 1990
CASE: E+C+P1,P2
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL	MOVEMENT
					Y/N(1)	V/C
NL(2)	1	1500	84	0.10	Y	0.10
NR	1	1500	35	0.10	N	
NT	INC W NL					
SL	1	1500	26	0.10	Y	0.10
SR	1	1500	112	0.10	N	
ST	INC W SL					
EL	1	1500	203	0.14	N	
ER	INC W ET					
ET	3	5100	1656	0.32	Y	0.32
WL	1	1500	96	0.10	Y	0.10
WR	INC W WT					
WT	3	5100	1069	0.21	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.42
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.70

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP12P

INTERSECTION: TELEGRAPH CANYON RD./PASEO LADERA
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

					CRITICAL MOVEMENT	
MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	Y/N(1)	V/C
NL(2)	1	1500	167	0.11	Y	0.11
NR	1	1500	83	0.10	N	
NT	INC W NL					
SL	1	1500	49	0.10	Y	0.10
SR	1	1500	185	0.12	N	
ST	INC W SL					
EL	1	1500	81	0.10	Y	0.10
ER	INC W ET					
ET	3	5100	1002	0.20	N	
WL	1	1500	63	0.10	N	
WR	ENC W WT					
WT	3	5100	1270	0.25	Y	0.25

N/S COMPONENT	0.21
E/W COMPONENT	0.35
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.64

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP123A

INTERSECTION: TELEGRAPH CANYON RD./PASEO LADERA
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	1	1500	84	0.10	Y	0.10
NR	1	1500	56	0.10	N	
NT	INC W NL					
SL	1	1500	26	0.10	Y	0.10
SR	1	1500	112	0.10	N	
ST	INC W SL					
EL	1	1500	203	0.14	N	
ER	INC W ET					
ET	3	5100	1770	0.35	Y	0.35
WL	1	1500	107	0.10	Y	0.10
WR	INC W WT					
WT	3	6800	1929	0.28	N	

N/S COMPONENT	0.20
E/W COMPONENT	0.45
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.73

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:7ECP123P

```
LOCATION:TELE CYN RD/PASEO RANCHERO      NAME:FIND LOS F:SP2A
------------------------------------------------------------------------------
HOURLY VOLUMES                               |  VOLUMES IN PCPH
                                         N   |
 Major street:TELE CYN RD                .   |
============================================ | ===============================
N= 3                       <---V5--- 1044    |                       <---V5---
Grade  1157---V2--->       <---V4---     5   |         ---V2--->      ---V4---    6
  0%      4---V3---v                  N= 1   |         ---V3---v
=================  <,     |>   ==========    | ================  <|    |>  =========
Date of Counts: |    |     |    |            |                 |    |    |    |
FUTURE          |    V7  + V9   | X STOP     |                 |    V7   V9   |
Time Period:    |    |     |    |  YIELD     |                 |    |    |    |
AM              |    14         5|           |                 |    15       6|
Approach Speed:  Minor Street:   Grade       |
45              PASEO RANCHERO      0%       |
PHF: .85
Population:
==============================================================================
VOLUME ADJUSTMENTS
------------------------------------------------------------------------------
Movement no.          |   2   |    3   |    4   |    5   |    7   |    9   |
------------------------------------------------------------------------------
Volume (vph)          |  1157 |     4  |     5  |  1044  |    14  |     5  |
------------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXXX|XXXXXXXX|   6   |XXXXXXXX|   15   |     6  |
==============================================================================
STEP 1 : RT From Minor Street            |            v-> V9
==============================================================================
Conflicting Flows, Vc                    | 1/2 V3+V2= 2 + 386 = 388 vph(Vc9)
Critical Gap, Tc                         | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                   | Cp9=  568 pcph (Fig.10,3)
Actual Capacity, Cm                      | Cm9=Cp9=  568 pcph
==============================================================================
STEP 2 : LT From Major Street            |            v-- V4
==============================================================================
Conflicting Flows, Vc                    | V3+V2= 4 + 1157 = 1161 vph(Vc4)
Critical Gap, Tc                         | Tc=    6 secs (Tab 10.2)
Potential Capacity, Cp                   | Cp4=  217 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor    | (V4/Cp4)x100=  2.8% P4= .98
Actual Capacity, Cm          (Fig.10.5)  | Cm4=Cp4=  217 pcph
==============================================================================
STEP 3 : LT From Minor Street            |            <-\ V7
==============================================================================
Conflicting Flows, Vc                    | 1/2 V3+V2+V5+V4=
                                         | 2 + 386 + 1044 + 5 = 1437 vph(Vc7)
Critical Gap, Tc                         | Tc=  6.5 secs (Tab 10.2)
Potential Capacity, Cp                   | Cp7=   53 pcph (Fig.10.3)
Actual Capacity, Cm                      | Cm7=Cp7xP4= 53 x .98 = 52 pcph
==============================================================================
SHARED LANE CAPACITY     SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                      CR        CR      LOS   LOS
MOVEMENT     V(PCPH)    CM(PCPH)    CSH(PCPH)      (CM-V)   (CSH-V)     CM    CSH
=================================================================================
    7           15          52                        37                  E
    9            6         568                       562                  A
    4            6         217                       211                  C
```

```
LOCATION:TELE CYN RD-PASEO RANCHERO      NAME:FIND LOS F:SPLP
---------------------------------------------------------------------------
HOURLY VOLUMES                             | VOLUMES IN PCPH
                                        N  |
 Major street:TELE CYN RD               v  |
========================================== | ===============================
N= 3                    <---V5--- 1565 |                      <---V5---
Grade  1160---V2--->    v---V4---    5 |      ---V2--->       v---V4---    6
  0%    15---V3---v              N= 1  |      ---V3---v
=================  <|    |>  ========= | ===============  <|   |>  ========
Date of Counts: |   |    |   |         |                  |   |   |   |
FUTURE          |   V7   V9  | X STOP  |                  |   V7  V9  |
Time Period:    |   |    |   |   YIELD |                  |   |   |   |
PM              |   6     5|           |                  |   7     6|
Approach Speed:  Minor Street:   Grade |
45              PASEO RANCHERO     0%  |
PHF: .85
Population:
===========================================================================
VOLUME ADJUSTMENTS
---------------------------------------------------------------------------
Movement no.              |   2   |   3   |   4   |   5   |   7   |   9   |
---------------------------------------------------------------------------
Volume (vph)              | 1160  |  15   |   5   | 1565  |   6   |   5   |
---------------------------------------------------------------------------
Vol(pcph),see Table 10.1|XXXXXXXX|XXXXXXXX|   6   |XXXXXXXX|   7   |   6   |
===========================================================================
STEP 1 : RT From Minor Street          |           /-> V9
===========================================================================
Conflicting Flows, Vc                  | 1/2 V3+V2= 8 + 387 = 395 vph(Vc9)
Critical Gap, Tc                       | Tc=  5.5 secs (Tab.10.2)
Potential Capacity, Cp                 | Cp9=  564 pcph (Fig.10.3)
Actual Capacity, Cm                    | Cm9=Cp9=  564 pcph
===========================================================================
STEP 2 : LT From Major Street          |           v-- V4
===========================================================================
Conflicting Flows, Vc                  | V3+V2= 15 + 1160 = 1175 vph(Vc4)
Critical Gap, Tc                       | Tc=    6 secs (Tab.10.2)
Potential Capacity, Cp                 | Cp4=  213 pcph (Fig.10.3)
% of Cp utilized and Impedance Factor  | (V4/Cp4)x100=  2.8% P4= .98
Actual Capacity, Cm         (Fig.10.5) | Cm4=Cp4=  213 pcph
===========================================================================
STEP 3 : LT From Minor Street          |           <-\ V7
===========================================================================
Conflicting Flows, Vc                  | 1/2 V3+V2+V5+V4=
                                       | 8 + 387 + 1565 + 5 = 1700 vph(Vc7)
Critical Gap, Tc                       | Tc=  8.5 secs (Tab.10.2)
Potential Capacity, Cp                 | Cp7=   35 pcph (Fig.10.3)
Actual Capacity, Cm                    | Cm7=Cp7xP4= 35 x .98 = 34 pcph
===========================================================================
SHARED LANE CAPACITY    SH = (V7+V9)/((V7/Cm7)+(V9/Cm9)) if lane is shared

                                                    CR        CR     LOS   LOS
MOVEMENT    V(PCPH)    CM(PCPH)    CSH(PCPH)    (CM-V)   (CSH-V)    CM    CSH
==========================================================================
    7          7          34                      27                 E
    9          6         564                     558                 A
    4          6         213                     207                 C
```

INTERSECTION: TELEGRAPH CANYON RD./PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	V/C
NL(2)	0					
NR	0					
NT						
SL	1	1500	25	0.10	Y	0.10
SR	1	1500	79	0.10	N	
ST						
EL	1	1500	140	0.10	N	
ER						
ET	3	5100	1565	0.31	Y	0.31
WL	0					
WR	INC W WT					
WT	3	5100	1206	0.24	N	

N/S COMPONENT	0.10
E/W COMPONENT	0.31
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.49

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F: 8ECP123P

INTERSECTION: TELEGRAPH CANYON RD./PASEO RANCHERO
DATE: JULY 1990
CASE: E+C+P1,P2,P3
BANKSTON/PINE ASSOCIATES

MOVEMENT	#LANES	CAPACITY	VOLUME	V/C	CRITICAL MOVEMENT Y/N(1)	CRITICAL MOVEMENT V/C
NL(2)	0					
NR	0					
NT						
SL	1	1500	53	0.10	Y	0.10
SR	1	1500	150	0.10	N	
ST						
EL	1	1500	55	0.10	Y	0.10
ER						
ET	3	5100	1044	0.21	N	
WL	0					
WR	INC W WT					
WT	3	5100	1181	0.23	Y	0.23

N/S COMPONENT	0.10
E/W COMPONENT	0.33
RIGHT TURN COMPONENT	
PHASE CHANGE	0.08
ICU TOTAL	0.51

DEFINITIONS

(1) Y - Yes. A critical movement
N - No. Not a critical movement
V/C - Volume relative to capacity
(2) NL - Northbound left turn
NR - Northbound right turn
NT - Northbound thru
SL - Southbound left turn
SR - Southbound right turn
ST - Southbound thru
EL - Eastbound left turn
ER - Eastbound right turn
ET - Eastbound thru
WL - Westbound left turn
WR - Westbound right turn
WT - Westbound thru

F:8ECP123A

APPENDIX D

LEVEL OF SERVICE CRITERIA
UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

RESERVE CAPACITY	LEVEL OF SERVICE	EXPECTED DELAY TO MINOR STREET TRAFFIC
≥ 400	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0-99	E	Very long traffic delays
*	F	*

---

* When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement to the intersection.

APPENDIX E

LEVEL OF SERVICE CRITERIA
SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service	Interpretation	V/C Ratio
A,B	Uncongested operations; all queues clear in a single signal cycle.	<.7
C	Light congestion; occasional backups on critical approaches.	.71 - .80
D	Significant congestion on critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long standing queues formed.	.81 - .90
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es).	.91 - 1.0
F	Total breakdown, stop-and-go operation.	>1.0

APPENDIX F

TRANSPORTATION PHASING PLAN

Table 1

ASSUMED LAND USE INCREMENTS PER IDENTIFIED PROPERTY

Developer	Base Year (1/1/89)	Increment 1	Increment 2	Increment 3	Increment 4	Increment 5
EastLake	505 DU 19 Ac. Ind.	962 DU 20 Ac Ind. 10 Ac. Comm.	626 DU 20 Ac. Ind. 21 Ac. Comm.	534 DU 26 Ac. Ind. 18 Ac. Comm.	514 DU 26 Ac. Ind. 7 Ac. Comm.	486 DU 20 Ac. Ind. 14 Ac. Comm.
Rancho del Rey		457 DU 10 Ac. Ind. 1 Ac. Comm.	709 DU 9 Ac. Ind. 2 Ac. Comm.	426 DU 9 Ac. Ind. 2 Ac. Comm.	236 DU 6 Ac. Ind. 2 Ac. Comm.	219 DU
Mission Verde	27 DU	49 DU				
Daly Homes	21 DU					
Ladera Villas		29 DU				
Sunbow	340 DU	145 DU	460 DU 8 Ac. Comm.	440 DU	400 DU	400 DU
Terra Nova		339 DU				
Bonita Long Canyon	279 DU	119 DU				
Salt Creek				300 DU	200 DU	245 DU
Bonita Meadows			205 DU	200 DU		
Rancho San Miguel				100 DU	150 DU	150 DU
Otay Ranch						
Sudberry	10 Ac. Comm.					
Phasing Totals	1,172 DU 19 Ac. Ind. 10 Ac. Comm.	2,100 DU 30 Ac. Ind. 11 Ac. Comm.	2,000 DU 29 Ac. Ind. 31 Ac. Comm.	2,000 DU 35 Ac. Ind. 20 Ac. Comm.	1,500 DU 32 Ac. Ind. 9 Ac. Comm.	1,500 DU 46 Ac. Ind. 14 Ac. Comm.
Cumulative Totals:			4,100 DU 59 Ac. Ind. 42 Ac. Comm.	6,100 DU 94 Ac. Ind. 62 Ac. Comm.	7,600 DU 126 Ac. Ind. 71 Ac. Comm.	9,100 DU 172 Ac. Ind. 85 Ac. Comm.

Table 1 (continued)

ASSUMED LAND USE INCREMENTS PER IDENTIFIED PROPERTY

Developer	Increment 6	Increment 7	Increment 8	Increment 9	Increment 10	Increment 11	Total
EastLake	355 DU 20 Ac. Ind. 14 Ac. Comm	372 DU 20 Ac. Ind.	20 Ac. Ind.	20 Ac. Ind.	20 Ac. Ind.	20 Ac. Ind.	4,354 DU 251 Ac. Ind. 84 Ac. Comm.
Rancho del Rey	551 DU 7 Ac. Ind.	678 DU 10 Ac. Ind.	418 DU 9 Ac. Ind.	334 DU 9 Ac. Ind.	6 Ac. Ind.		4,028 DU 75 Ac. Ind. 7 Ac. Comm.
Mission Verde							76 DU
Daly Homes							21 DU
Ladera Villas							29 DU
Sunbow	184 DU 46 Ac. Ind.						2,369 DU 46 Ac. Ind. 8 Ac. Comm.
Terra Nova							339 DU
Bonita Long Canyon							398 DU
Salt Creek	260 DU	300 DU	300 DU	340 DU	599 DU	290 DU	2,834 DU
Bonita Meadows							405 DU
Rancho San Miguel	150 DU	150 DU	150 DU	250 DU	150 DU		1,250 DU
Otay Ranch			432 DU 5 Ac. Comm.	476 DU 5 Ac. Comm.	751 DU 5 Ac. Comm.	501 DU 5 Ac. Comm.	2,160 DU 20 Ac. Comm.
Sudberry							10 Ac. Comm.
Phasing Totals	1,500 DU 27 Ac. Ind. 14 Ac. Comm.	1,500 DU 30 Ac. Ind.	1,300 DU 29 Ac. Ind. 5 Ac. Comm.	1,400 DU 29 Ac. Ind. 5 Ac. Comm.	1,500 DU 26 Ac. Ind. 5 Ac. Comm.	791 DU 20 Ac. Ind. 5 Ac. Comm.	18,263 DU* 352 Ac. Ind/BP* 129 Ac. Comm.*
Cumulative Totals:	10,600 DU 199 Ac. Ind. 99 Ac. Comm.	12,100 DU 229 Ac. Ind. 99 Ac. Comm.	13,460 DU 258 Ac. Ind. 104 Ac. Comm.	14,800 DU 287 Ac. Ind. 109 Ac. Comm.	16,300 DU 313 Ac. Ind. 114 Ac. Comm.	17,091 DU 333 Ac. Ind. 119 Ac. Comm.	

*Total includes base year.

TABLE 3
TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

		Proposed Circulation	1987 Counts			Base Year (1-1-89)			Increment 1			Increment 2		
	Street Segment	Element Class	Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	Telegraph Canyon Road													
1.	I-805 - Oleander	6P	6P	38.0	B	6P	34.0	A	6P	41.0	B	6P	35.5	A
	Oleander - Paseo del Rey	6P	4M	25.0	B	4M	25.0	B	4M	28.6	C	4M	19.3	A
	Paseo del Rey - Medical Ctr	6P	4M	25.2	B	4M	22.9	B	4M	25.9	B	4M	17.6	A
	Medical Ctr - Paseo Ladera	6P	4M	15.7	A	4M	12.6	A	4M	14.0	A	4M	19.4	A
2.	Paseo Ladera - Buena Vista	6P	2CII	14.2	C*	2CII	11.0	C	4M	12.5	A	4M	17.5	A
	Buena Vista - Otay Lakes Rd	6P	2CII	12.7	C*	2CII	9.4	B	4M	11.4	A	4M	16.3	A
3.	Otay Lakes Rd - Rutgers	6P	2CII	7.4	A	2CII	8.0	A	4M	13.5	A	4M	19.1	A
	Rutgers - EastLake	6P	2CII	6.5	A	2CII	6.8	A	4M	12.3	A	4M	17.9	A
	EastLake - Lane	6P/4M	2CII	4.3	A	2CII	6.6	A	4M	12.1	A	4M	17.7	A
	Lane - East City Limits	4CI	2CII	2.4	A	2CII	2.5	A	2CII	2.5	A	2CII	2.7	A
	Otay Lakes Road													
4.	Bonita Rd - Canyon Dr	6P	4M/2CII	18.2	C	4M/2CII	19.7	C	4M	20.3	A	4M	25.2	B
	Canyon Dr - East "H" St	6P	4M/2CII	16.6	C	4M/2CII	18.9	C	4M	19.4	A	4M	22.3	A
5.	East "H" St - Gotham	6P	4M	12.1	A	4M	15.2	A	4M	18.2	A	4M	23.2	B
	Gotham - Telegraph Canyon Rd	6P	4M	10.7	A	4M	12.9	A	4M	16.5	A	4M	23.3	B
	East "H" Street													
7.	I-805 - Ridgeback	6P	4D	29.6	C	6P	50.0	C	6P	50.0	C	6P	48.0	C
	Ridgeback - Paseo del Rey	6P	2CII	20.1	D*	6P	26.9	A	6P	31.5	A	6P	29.2	A
	Paseo del Rey - Buena Vista	6P	2CII	20.5	D*	6P	30.2	A	6P	32.3	A	6P	32.5	A
	Buena Vista - Otay Lakes Rd	6P	4D	19.7	A	6P	29.0	A	6P	31.3	A	6P	26.9	A
8.	EastLake Pkwy - SR-125	4M	4M	6.8	A	4M	9.6	A	4M	9.2	A	4M	9.0	A

* Capacities tend to by higher on rural roadways. The City's General Plan capacities are for urban conditions and tend to be conservative. Levels of service for rural conditions are estimated based on field observation.

TABLE 3 (continued)

TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

	Street Segment	Proposed Circulation Element Class	1987 Counts			Base Year (1-1-89)			Increment 1			Increment 2		
			Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	San Miguel Road													
9.	Bonita Rd - SR-125	4CI	2CII	4.9	A	2CII	4.9	A	2CII	4.9	A	2CII	5.8	A
	Central Avenue													
10.	Bonita Rd - Frisbie	4CI	4CI	10.0	A	4CI	11.4	A	4CI	13.1	A	4CI	12.5	A
	Frisbie - Corral Canyon	4CI	2CII	8.0	A	2CII	9.4	B	2CII	10.3	B	2CII	10.3	B
	Bonita Road													
11.	Otay Lakes Rd - Acacia	4M	2CII	21.7	E**	2CII	21.7	E**	2CII	21.7	E**	2CII	22.0	E**
	Acacia - Central	4M	2CII	20.1	E**	2CII	20.2	E**	2CII	20.2	E**	2CII	21.0	E**
	Central - San Miguel	4M	2CII	12.2	D**	2CII	13.4	D**	2CII	14.0	E**	2CII	17.2	E**
	San Miguel - Sweetwater	4M	2CII	9.8	B	2CII	10.9	C	2CII	11.6	C	2CII	13.9	D**
	Sweetwater Road													
12.	Bonita Rd - SR-54	4CI	2CII	10.0	B	2CII	11.0	C	2CII	11.6	C	2CII	13.4	D**
	SR-125													
	SR-54 - San Miguel	8 Ln Fwy	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	San Miguel - East "H" St	8 Ln Fwy	"	"	"	"	"	"	"	"	"	"	"	"
	E. "H" St - Telegraph Cyn	8 Ln Fwy	"	"	"	"	"	"	"	"	"	"	"	"
	Telegraph Cyn - E.Palomar	8 Ln Fwy	"	"	"	"	"	"	"	"	"	"	"	"

** Levels of service estimated due to rural conditions. These roadway segments are currently under County jurisdiction and are not significantly impacted by development in early TPP phases.

6P - 6 lane Prime Arterial
4M - 4 lane Major
4CI - 4 lane Class 1 Collector
2CII - 2 lane Class II Collector

TABLE 3 (continued)

TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

	Street Segment	Proposed Circulation Element Class	Increment 3			Increment 4			Increment 5		
			Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	Telegraph Canyon Road										
1.	I-805 - Oleander	6P	6P	37.2	A	6P	39.4	B	6P	35.4	A
	Oleander - Paseo del Rey	6P	4M	21.4	A	4M	23.4	B	4M	20.3	A
	Paseo del Rey - Medical Ctr	6P	4M	19.2	A	4M	21.3	A	4M	19.0	A
	Medical Ctr - Paseo Ladera	6P	4M	26.2	B	4M	28.0	C	4M	25.9	B
2.	Paseo Ladera - Buena Vista	6P	4M	24.3	B	4M	26.2	B	4M	24.4	B
	Buena Vista - Otay Lakes Rd	6P	4M	23.2	B	4M	25.0	B	4M	23.5	B
3.	Otay Lakes Rd - Rutgers	6P	6P	30.9	A	6P	34.0	A	6P	23.7	A
	Rutgers - EastLake	6P	6P	31.6	A	6P	33.9	A	6P	40.3	B
	EastLake - Hunte	6P/4M	4M	23.8	B	4M	25.9	B	4M	28.6	C
	Hunte - East City Limits	4CI	2CII	2.8	A	2CII	2.8	A	2CII	3.0	A
	Otay Lakes Road										
4.	Bonita Rd - Canyon Dr	6P	4M	27.2	C	4M	29.3	C	4M	13.5	A
	Canyon Dr - East "H" St	6P	4M	24.0	B	4M	26.0	B	4M	14.0	A
5.	East "H" St - Gotham	6P	4M	26.2	B	4M	27.5	C	4M	17.0	B
	Gotham - Telegraph Canyon Rd	6P	4M	25.5	B	4M	26.9	C	4M	16.3	A
	East "H" Street										
7.	I-805 - Ridgeback	6P	6P	49.1	C	6P	50.5	C	6P	35.3	A
	Ridgeback - Paseo del Rey	6P	6P	29.2	A	6P	36.8	A	6P	27.6	A
	Paseo del Rey - Buena Vista	6P	6P	32.4	A	6P	34.5	A	6P	24.0	A
	Buena Vista - Otay Lakes Rd	6P	6P	30.7	A	6P	32.4	A	6P	22.3	A
8.	EastLake Pkwy - SR-125	4M	4M	12.3	A	4M	14.9	A	4M	18.0	B

* Capacities tend to by higher on rural roadways. The City's General Plan capacities are for urban conditions and tend to be conservative. Levels of service for rural conditions are estimated based on field observation.

TABLE 3 (continued)

TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

	Street Segment	Proposed Circulation Element Class	Increment 3			Increment 4			Increment 5		
			Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	San Miguel Road										
9.	Bonita Rd - SR-125	4CI	2CII	5.0	A	2CII	5.2	A	4CI	15.2	B
	Central Avenue										
10.	Bonita Rd - Frisbie	4CI	4CI	14.1	A	4CI	14.1	A	4CI	10.4	A
	Frisbie - Corral Canyon	4CI	2CII	13.2	D*	2CII	13.4	D*	2CII	10.2	B
	Bonita Road										
11.	Otay Lakes Rd - Acacia	4M	4M	25.1	B	4M	26.3	B	4M	21.8	A
	Acacia - Central	4M	4M	23.4	B	4M	25.4	B	4M	19.9	A
	Central - San Miguel	4M	2CII	18.0	F*	2CII	19.9	F**	2CII	15.4	E**
	San Miguel - Sweetwater	4M	2CII	14.5	E**	2CII	16.3	F**	2CII	5.8	A
	Sweetwater Road										
12.	Bonita Rd - SR-54	4CI	2CII	14.2	E**	2CII	15.9	F**	2CII	6.8	A
	SR-125										
	SR-54 - San Miguel	8 Ln Fwy	N/A	N/A	N/A	N/A	N/A	N/A	4 Ln Fwy	45.1	-
	San Miguel - East "H" St	8 Ln Fwy	"	"	"	"	"	"	4 Ln Fwy	44.3	-
	E. "H" St - Telegraph Cyn	8 Ln Fwy	"	"	"	"	"	"	4 Ln Fwy	34.5	-
	Telegraph Cyn - E.Palomar	8 Ln Fwy	"	"	"	"	"	"	N/A	N/A	N/A

** Levels of service estimated due to rural conditions. These roadway segments are currently under County jurisdiction and are not significantly impacted by development in early TPP phases.

6P - 6 lane Prime Arterial
4M - 4 lane Major
4CI - 4 lane Class 1 Collector
2CII - 2 lane Class II Collector

TABLE 3 (continued)
TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

	Street Segment	Proposed Circulation Element Class	Increment 6			Increment 7			Increment 8		
			Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	Telegraph Canyon Road										
1.	I-805 - Oleander	6P	6P	33.4	A	6P	34.2	A	6P	36.3	A
	Oleander - Paseo del Rey	6P	4M	20.4	A	4M	21.3	A	4M	23.5	B
	Paseo del Rey - Medical Ctr	6P	4M	19.3	A	4M	20.0	A	4M	22.0	A
	Medical Ctr - Paseo Ladera	6P	4M	25.4	B	4M	26.4	C	4M	29.4	C
2.	Paseo Ladera - Buena Vista	6P	4M	23.1	B	4M	23.9	B	4M	27.5	C
	Buena Vista - Otay Lakes Rd	6P	4M	22.2	A	4M	23.0	B	4M	25.3	B
3.	Otay Lakes Rd - Rutgers	6P	6P	21.9	A	6P	23.2	A	6P	24.7	A
	Rutgers - SR-125	6P	6P	22.1	A	6P	23.4	A	6P	24.9	A
	SR-125 - EastLake	6P	6P	46.3	C	6P	49.4	C	6P	49.7	C
	EastLake - Lane	6P/4M	6P/4M	32.9	A	6P/4M	34.2	A	6P/4M	34.9	A
	Lane - East City Limits	4CI	2CII	3.3	A	2CII	3.3	A	2CII	3.3	A
	Otay Lakes Road										
4.	Bonita Rd - Canyon Dr	6P	4M	14.2	A	4M	14.7	A	4M	15.9	A
	Canyon Dr - East "H" St	6P	4M	15.2	A	4M	15.6	A	4M	15.5	A
5.	East "H" St - Gotham	6P	4M	16.8	A	4M	16.9	A	4M	17.6	A
	Gotham - Telegraph Canyon Rd	6P	4M	16.2	A	4M	16.4	A	4M	17.2	A
	East "H" Street										
7.	I-805 - Ridgeback	6P	6P	33.9	A	6P	35.9	A	6P	37.3	B
	Ridgeback - Paseo del Rey	6P	6P	26.1	A	6P	28.4	A	6P	29.9	A
	Paseo del Rey - Buena Vista	6P	6P	22.0	A	6P	22.9	A	6P	24.1	A
	Buena Vista - Otay Lakes Rd	6P	6P	19.9	A	6P	20.7	A	6P	21.0	A
8.	EastLake Pkwy - SR-125	4M	4M	19.7	A	4M	20.4	A	4M	20.9	A

* Capacities tend to by higher on rural roadways. The City's General Plan capacities are for urban conditions and tend to be conservative. Levels of service for rural conditions are estimated based on field observation.

TABLE 3 (continued)
TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

	Street Segment	Proposed Circulation Element Class	Increment 6			Increment 7			Increment 8		
			Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	San Miguel Road										
9.	Bonita Rd - SR-125	4CI	4CI	12.2	A	4CI	12.4	A	4CI	12.5	A
	Central Avenue										
10.	Bonita Rd - Frisbie	4CI	4CI	10.2	A	4CI	10.3	A	4CI	10.4	A
	Frisbie - Corral Canyon	4CI	2CII	10.0	B	2CII	10.1	B	2CII	10.2	B
	Bonita Road										
11.	Otay Lakes Rd - Acacia	4M	4M	17.8	A	4M	18.1	A	4M	18.3	A
	Acacia - Central	4M	4M	15.1	A	4M	15.7	A	4M	15.9	A
	Central - San Miguel	4M	2CII	9.8	B	2CII	10.1	B	2CII	10.1	B
	San Miguel - Sweetwater	4M	2CII	5.0	A	2CII	5.2	A	2CII	5.2	A
	Sweetwater Road										
12.	Bonita Rd - SR-54	4CI	2CII	5.9	A	2CII	6.0	A	2CII	6.2	A
	SR-125										
	SR-54 - San Miguel	8 Ln Fwy	4 Ln Fwy	53.8	--	4 Ln Fwy	58.1	--	4 Ln Fwy	61.0	-
	San Miguel - East "H" St	8 Ln Fwy	"	50.1	--	"	54.7	--	4 Ln Fwy	58.1	-
	E. "H" St - Telegraph Cyn	8 Ln Fwy	"	38.0	--	"	40.1	--	4 Ln Fwy	40.7	-
	Telegraph Cyn - E.Palomar	8 Ln Fwy	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

** Levels of service estimated due to rural conditions. These roadway segments are currently under County jurisdiction and are not significantly impacted by development in early TPP phases.

6P - 6 lane Prime Arterial
4M - 4 lane Major
4CI - 4 lane Class 1 Collector
2CII - 2 lane Class II Collector

TABLE 3 (continued)

TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

		Proposed Circulation	Increment 9			Increment 10			Increment 11		
	Street Segment	Element Class	Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	Telegraph Canyon Road										
1.	I-805 - Oleander	6P	6P	37.0	A	6P	40.1	B	6P	40.3	B
	Oleander - Paseo del Rey	6P	6P	25.9	A	6P	28.1	A	6P	28.4	A
	Paseo del Rey - Medical Ctr	6P	6P	24.7	A	6P	26.8	A	6P	27.0	A
	Medical Ctr - Paseo Ladera	6P	6P	34.6	A	6P	39.2	B	6P	39.8	B
2.	Paseo Ladera - Buena Vista	6P	4M	30.0	C	6P	35.1	A	6P	37.0	A
	Buena Vista - Otay Lakes Rd	6P	4M	28.5	C	6P	30.8	A	6P	32.5	A
3.	Otay Lakes Rd - Rutgers	6P	6P	26.6	A	6P	28.5	A	6P	30.0	A
	Rutgers - SR 125	6P	6P	26.7	A	6P	28.6	A	6P	30.0	A
	SR 125 - EastLake	6P	6P	49.4	D	6P	49.7	C	6P	50.4	C/D
	EastLake - Hunte Pkwy	6P/4M	6P/4M	36.3	A	6P/4M	36.2	A	6P/4M	36.8	A
	Hunte - East City Limits	4CI	2CI	2.2	A	2CI	3.3	A	2CI	3.2	A
	Otay Lakes Road										
4.	Bonita Rd - Canyon Dr	6P	4M	13.9	A	4M	14.7	A	4M	15.2	A
	Canyon Dr - East "H" St	6P	4M	18.0	A	4M	19.1	A	4M	19.8	A
5.	East "H" St - Gotham	6P	4M	18.5	A	4M	19.9	A	4M	22.4	B
	Gotham - Telegraph Canyon Rd	6P	4M	18.2	A	4M	19.8	A	4M	22.4	B
	East "H" Street										
7.	I-805 - Ridgeback	6P	6P	41.1	B	6P	42.3	B	6P	43.4	C
	Ridgeback - Paseo del Rey	6P	6P	34.2	A	6P	35.5	A	6P	35.6	A
	Paseo del Rey - Buena Vista	6P	6P	19.0	A	6P	20.5	A	6P	21.4	A
	Buena Vista - Otay Lakes Rd	6P	6P	16.9	A	6P	17.8	A	6P	19.0	A
8.	EastLake Pkwy - SR-125	4M	4M	20.5	A	4M	20.7	A	4M	21.1	A
	San Miguel Road										
9.	Bonita Rd - SR-125	4CI	4CI	16.3	A	4CI	16.4	A	4CI	16.8	B
	Central Avenue										
10.	Bonita Rd - Frisbie	4CI	4CI	9.7	A	4CI	9.9	A	4CI	9.9	A
	Frisbie - Corral Canyon	4CI	2CII	9.5	B	2CII	9.7	B	2CII	9.7	B

* Capacities tend to by higher on rural roadways. The City's General Plan capacities are for urban conditions and tend to be conservative. Levels of service for rural conditions are estimated based on field observation.

TABLE 3 (continued)

TRAFFIC VOLUMES AND LOS PER DEVELOPMENT INCREMENT

	Street Segment	Proposed Circulation Element Class	Increment 9			Increment 10			Increment 11		
			Config	Vol	LOS	Config	Vol	LOS	Config	Vol	LOS
	Bonita Road										
11.	Otay Lakes Rd - Acacia	4M	4M	19.0	A	4M	19.4	A	4M	19.3	A
	Acacia - Central	4M	4M	16.3	A	4M	16.7	A	4M	16.6	A
	Central - San Miguel	4M	2C11	12.3	C**	2CII	12.7	C**	2CII	12.8	C**
	San Miguel - Sweetwater	4M	2CII	6.5	A	2CII	5.7	A	2CII	5.9	A
	Sweetwater Road										
12.	Bonita Rd - SR-54	4CI	2CII	6.3	A	2CII	6.6	A	2CII	6.7	A
	SR-125										
	SR-54 - San Miguel	8 Ln Fwy	4 Ln Fwy	64.3	--	4 Ln Fwy	68.0	--	4 Ln Fwy	70.1	--
	San Miguel - East "H" St	8 Ln Fwy	"	69.3	--	"	63.8	--	"	66.2	--
	E. "H" St - Telegraph Cyn	8 Ln Fwy	"	41.9	--	"	43.3	--	"	44.8	--
	Telegraph Cyn - E.Palomar	8 Ln Fwy	4 Ln Fwy	1.5	--	"	1.5	--	"	1.8	--

** Levels of service estimated due to rural conditions. These roadway segments are currently under County jurisdiction and are not significantly impacted by development in early TPP phases.

6P - 6 lane Prime Arterial
4M - 4 lane Major
4CI - 4 lane Class 1 Collector
2CII - 2 lane Class II Collector

Bankston/Pine Associates, Inc.

2030 Addison Street, Suite 310
Berkeley, California 94704
(415) 843-9746

October 19, 1990

Mr. Craig Fukuyama
McMillin Development
2727 Hoover Avenue
National City, CA 92050

Subject: Addendum To Rancho Del Rey-SPA III DEIR Traffic Study

Dear Mr. Fukuyama,

At your request, we are providing additional analysis to supplement the traffic analysis included in the SPA III DEIR dated August, 1990.

Bankston/Pine Associates prepared the base traffic analysis for SPA III DEIR. At the request of City staff, the traffic analysis for the most recent SPA III DEIR was prepared using the then existing ECVTPP to estimate existing plus cumulative and existing plus cumulative plus project (SPA III) traffic forecasts. This work was completed in July, 1990.

Meanwhile, the City's consultant, Willdan Associates, was in the process of completing a revision of the ECVTPP which was made public August, 1990. The difference in the August, 1990 ECVTPP and the previous one is that the land use and cordon trip making for all traffic analysis zones outside of the area was updated from a 1986/1987 base to a 1995 base. This was done to provide a data base outside of East Chula Vista which is more consistent with the future projected by the model. ie., a cumulative future for the ECVTPP area which includes all Approved Projects or projects with Tenative Maps. In addition, the section of East H Street between I-805 and Hidden Vista Drive was upgraded from 6 to 8 lanes as an assumption in the ECVTPP.

The effect of changing the base data outside the ECVTPP area from 1986/1987 to 1995 and increasing the capacity (6 to 8 lanes) of East H Street, was to attract more residential trips outside the ECVTPP area which in turn increased projected ADT on major streets near the boundaries of the area. That is, the projected traffic on East H Street and Telegraph Canyon Road east of I-805 increased to 78,000 and 57,000 ADT respectively with Approved Projects plus SPA III. The previous equivilent projected traffic was 69,200 ADT on East H Street and 55,800 ADT on Telegraph Canyon Road.

The August, 1990 ECVTPP analyzed a future with Approved Projects without and with RDR SPA III. The future with RDR SPA III revealed a potential problem at the intersections of East H Street/Hidden Vista Drive and Telegraph Canyon Road/Crest Drive. This is information not available at the time of preparation of the July, 1990 SPA III Traffic Analysis.

The August ECVTPP identifies the two subject intersections as having potential problems based on a preliminary analysis. Subsequent refinements of their projected traffic volumes lead the City Consultant for the ECVTPP study (Willdan) to conclude that there will not be a problem at one of the intersections. That is, they (Willdan) conclude that the intersection of Telegraph Canyon Road/Crest Drive will operate at acceptable level of service.

Meanwhile, investigation of potential mitigation for these potential problem intersections was undertaken. Since Willdan's conclussions were based on the more generalized ICU method of intersection LOS analysis it was decided that an arterial systems analysis would better simulate future conditions as well as show the relationship of the subject intersections to adjacent intersections as appropriate.

TRANSYT 7-F (T7F) is an arterial analysis program well suited for this analysis since, in addition to measuring intersection LOS, it finds the optimum signal cycle length and phasing and determines the maximum back up of queueing vehicles. The latter is important in determining if spacing between intersections is adequate independent of optimal signal phasing.

The following discussion deals first with the East H Street/Hidden Vista intersection, then with the Telegraph Canyon Road/Crest Drive intersection.

EAST H STREET/HIDDEN VISTA

Figure 1 shows the location of the H Street Corridor and the East H Street/Hidden Vista intersection as it relates to the SPA III project.

T7F was used to simulate the future with the August ECVTPP traffic projections and 4 lanes in each direction on East H Street in the vicinity of Hidden Vista. Scenario 1 assumes existing conditions except for the 4 lanes in each direction on East H Street. Scenario 2 assumes 4 lanes in each direction plus an added full service intersection at the Home Depot driveway immediately east of Hidden Vista. Figure 2 shows an aerial view of the corridor. Figure 3 shows the projected PM Peak Hour traffic for the two scenarios based on 78,000 ADT on East H Street west of Hidden Vista Drive. Figure 4 shows the lane configuration assumptions for each scenario.

The findings of T7F are shown on Table 1. The conclussion is that Scenario 1, with 4 lanes in each direction on East H Street, the East H Street/Hidden Vista intersection will operate at LOS 'C' (See Table 1) with the optimal signal cycle length of 100 seconds and the phasing shown in the T7F results in Appendix A. The LOS determination in T7F is expressed in Average Delay in Seconds/Vehicle. Table 1 indicates that the intersection of East H Street/Hidden Vista will, for Scenario 1, yield an average delay of 30.4 seconds/vehicle which equates to LOS 'C'. Table 2 shows the relation ship between Average Delay and LOS as well as the relationship of this measure to other intersection LOS measures. The other measures are the Highway Capacity Manual-Operations method (Stopped Delay) and Intersection Capacity Utilization (ICU) method (Volume Capacity Ratio V/C).

Scenario 2 asumes that an additional full service intersection is in place at the location of the Home Depot driveway. See Figure 2. The effect of adding another full service intersection is to reduce the overall interuption of heavy east/west movements on East H Street by dividing up and reducing left turn movements into and out of the shopping center. As Table 1 shows, the addition of the second intersection improves conditions by reducing average intersection delay from 30.4 to 22.3 seconds/vehicle. Even though the analysis shows that the second intersection is not needed, its value as a mitigation alternative is obvious.

In addition to the two scenarios discussed above, 4 others were investigated. Scenario 3 was the same as Scenario 2 except that the relative directional split in traffic exiting from the shopping center was changed to reflect potential future conditions. That is, scenarios 1 and 2 assumed that todays split of 75 percent to/from the west would exist in the future. Scenario 3 assumed the split would be more balanced at 50 percent west and 50 percent east. This would be influenced by the projected development to the east.

A second set of 3 scenarios were run with the same traffic assumptions as the first 3 scenarios except the number of through lanes, eastbound and westbound, on East H Street was reduced from 4 to 3. The significant finding here is that if the relative directional flow of traffic out of the shopping center shifts significantly from the west to the east as assumed, then constructing a second intersection will mitigate the LOS at the East H Street intersection to acceptable levels without widening East H Street. See Figure 5, Scenario 3 (3 Lanes).

Another alternative for mitigating Los at the East H Street /Hidden Vista intersection independent of the above, is to widen the northbound approach to provide for 3 left turn lanes.

The conclussion is that there are a number of alternative scenarios for improving or mitigating potential problems at the subject intersection. When SR 125 is in place it is possible that none of the above noted mitigations may be necessary. Therefore, yearly monitoring of conditions at the intersection will provide the best guidance as to when if ever, and what type mitigation is best.

TELEGRAPH CANYON ROAD/CREST DRIVE

In this case, it was decided that optimal timing of the signal at the Telegraph Canyon Road/Crest Drive relative to adjacent intersections should be tested to insure that the Willdan conclusions about the subject intersection can be supported. The location of this study area is shown on Figure 1 as it relates to the East H Street/Hidden Vista intersection and the SPA III project. Figures 6a and 6b show aerial photos of the study corridor.

The T7F analysis includes a comprehenisive look at the 4 existing signalized intersections with Telegraph Canyon Road:

1. NB I-805 Off Ramp
2. Halecrest Drive
3. Crest Drive
4. Paseo Del Rey

The projected 57,000 ADT on Telegraph Canyon Road immediately east of I-805 was converted to AM and PM peak hour traffic which is shown on Figure 7.

The recent traffic studies conducted for the Sunbow development considered and or recommended the following mitigations in the study corridor:

o Westbound Telegraph from SC DW #1 (See Figure 7) to the NB I-805 On Ramp be widened from 3 to 4 throughlanes.

o The SB to EB I-805 Off Ramp be widened to 2 lanes.

o Eastbound Telegraph Canyon Road be widened from 2 to 3 lanes from the SB to EB I-805 Off Ramp to Halecrest Drive.

o The Halecrest Drive intersection be closed for full service ie; no left turns into Halecrest Drive,and that the signal there be relocated east to theexisting fullservice, but unsignalized, intersection at SC DW # 2. The need for consideration of this move is obvious when the existing problems at this intersection are noted. Examination of Figure 6a clearly shows that vehicles from the NB I-805 Off Ramp destined to go north on Halecrest Drive are theoretically if not legally prohibited from doing so by the painted lines.

However, it is also clear that some drivers will not understand this subtle fact and procede to make that unsafe maneuver. It is also clear that the distance between the NB I-805 Off Ramp and Halecrest Drive is now or soon will be too short to accommodate peak hour traffic.

In addition to the widening discussed above, this study assumed 2 lanes for left turns EB to NB at the Paseo Del Rey intersection. See Figure 8 for lane configuration assumptions.

The T7F analysis of the 4 subject intersections revealed the following:

1. Lane widening considered in the Sunbow development studies is needed.

2. Relocation of the signal at Halecrest Drive to the SC DW #2 is needed to provide adequate stacking space for queueing vehicles for both eastbound and westbound Telegraph Canyon Road vehicles.

3. Dual left turn lanes for EB to NB movement at the Telegraph Canyon Road/Paseo Del Rey is needed.

The results of the T7F analysis showed that with the future level of 57,000 ADT on Telegraph Canyon Road immediately east of I-805, the intersection of Telegraph Canyon Road/Crest Drive will operate at LOS 'C' with a 120 second signal cycle and phasing as shown in the T7F results in Appendix B. As Table 3 shows all 4 intersections will operate at LOS 'C' or better with the widening and signal relocation outlined above.

Note that Table 3 reports LOS for the Telegraph Canyon Road/Halecrest Drive intersection. Under the recommended relocation of the signal to the SC DW #2 intersection the LOS of the new signalized intersection would also be 'B'. Traffic from EB Telegraph Canyon Road to NB Halecrest Drive would, under this new condition, procede east to the SC #2 intersection and make a protected u-turn.

Left turning vehicles out of Halecrest Drive are few in number and could be accommodated by an unsignalized median acceleration lane.

Analysis of the aerial photo (Figure 6a) of the corridor indicates that the 4 lane widening recommended for westbound Telegraph Canyon Road is feasible by widening an additional 4 feet on either the north or south side of Telegraph Canyon Road and some redefinition of median channelization.

BANKSTON/PINE ASSOCIATES, INC.,

Kenneth M. Bankston

Kenneth M. Bankston, P.E.
Principal

Attachments

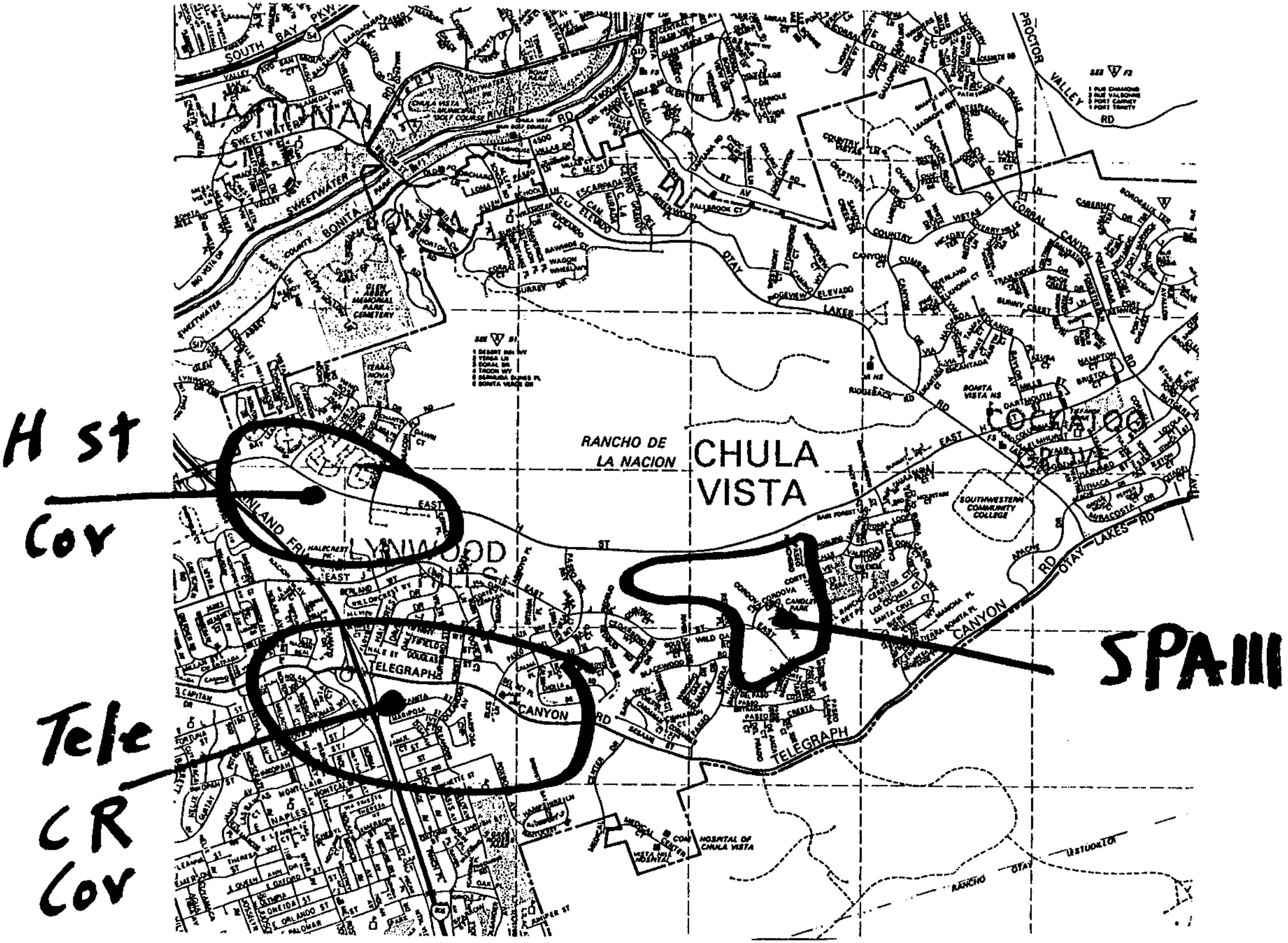


Figure 1
Location Map

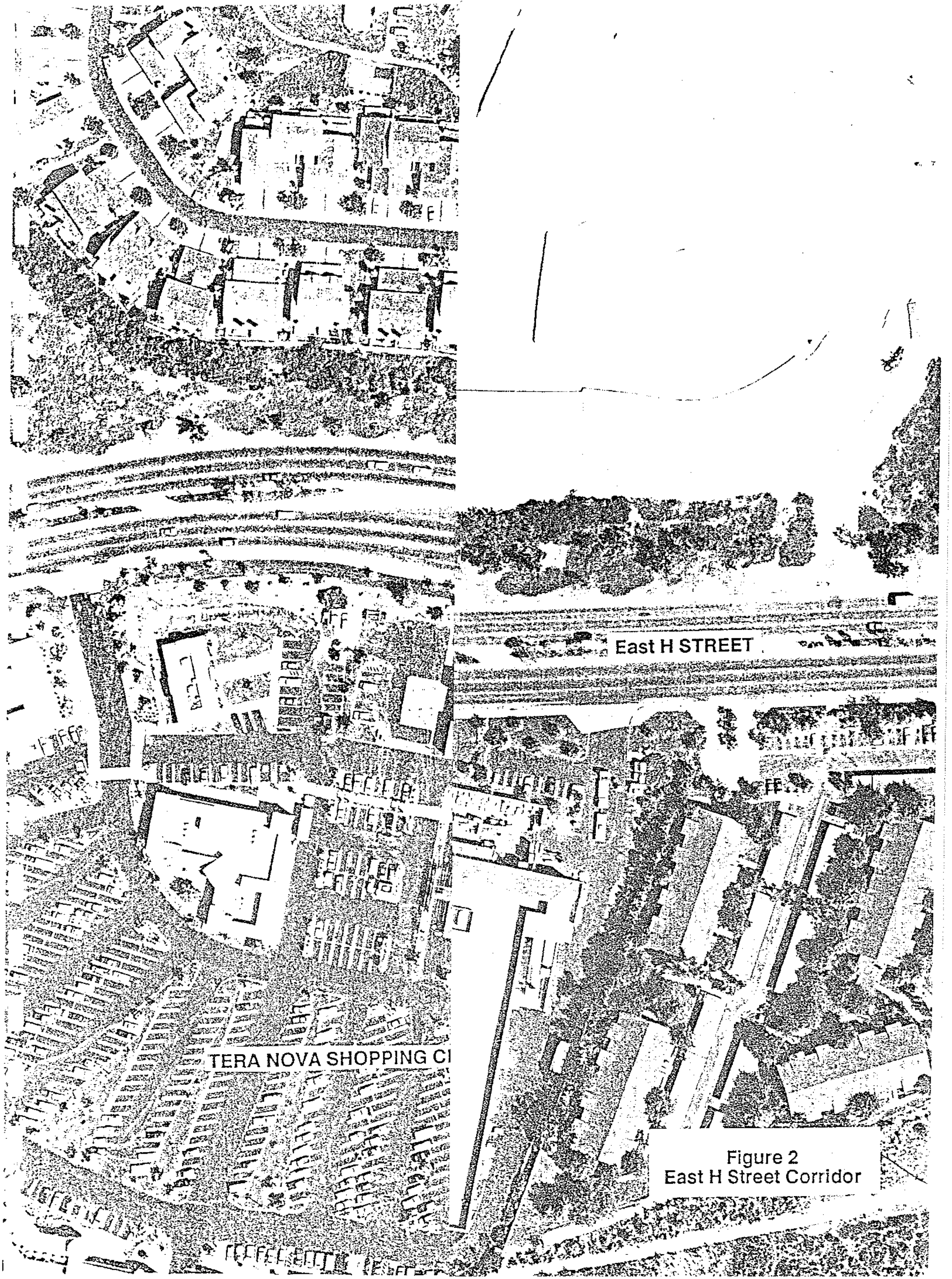


Figure 2
East H Street Corridor

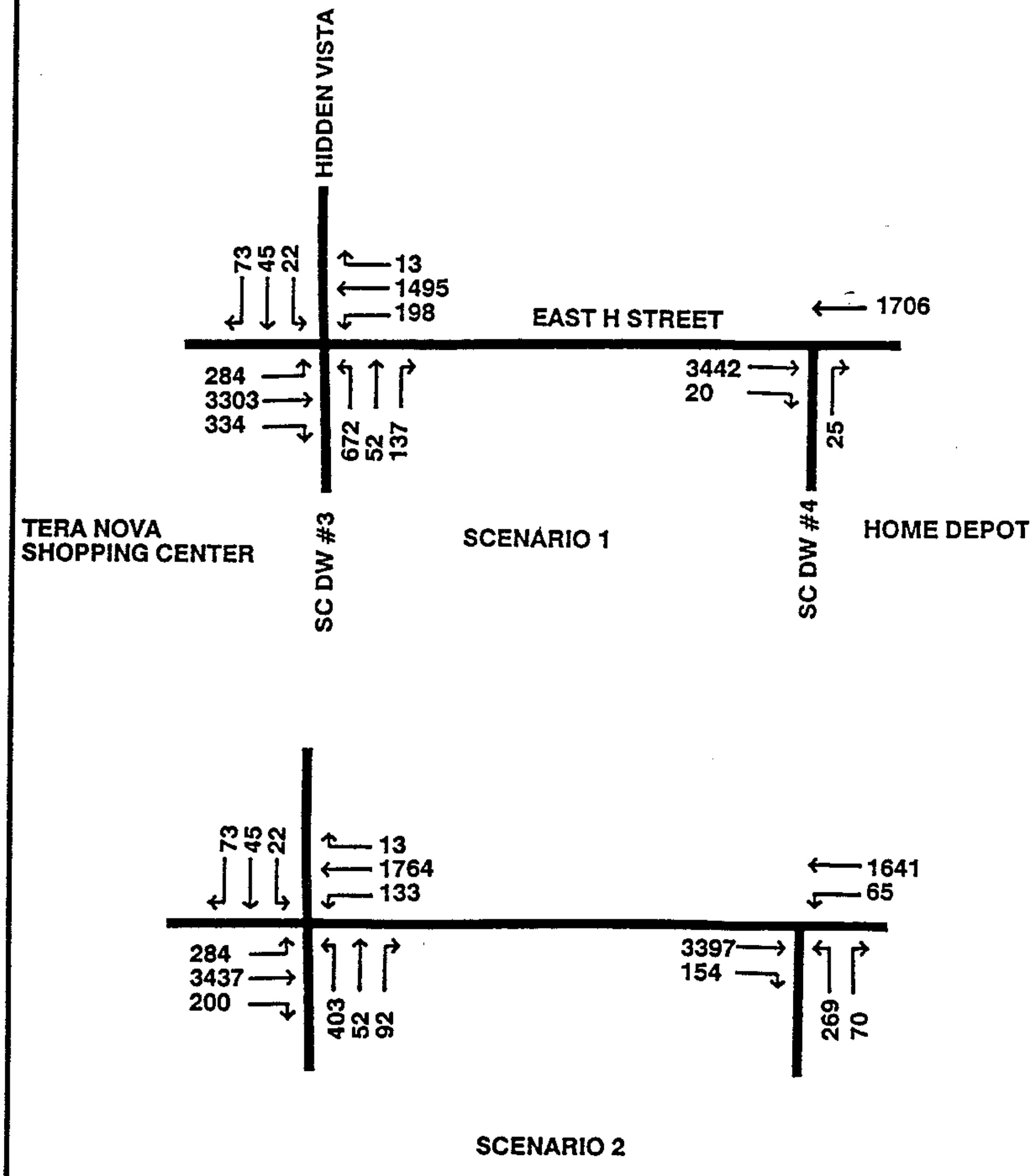


Figure 3
East H Street/Hidden Vista
PM Peak Hour Traffic

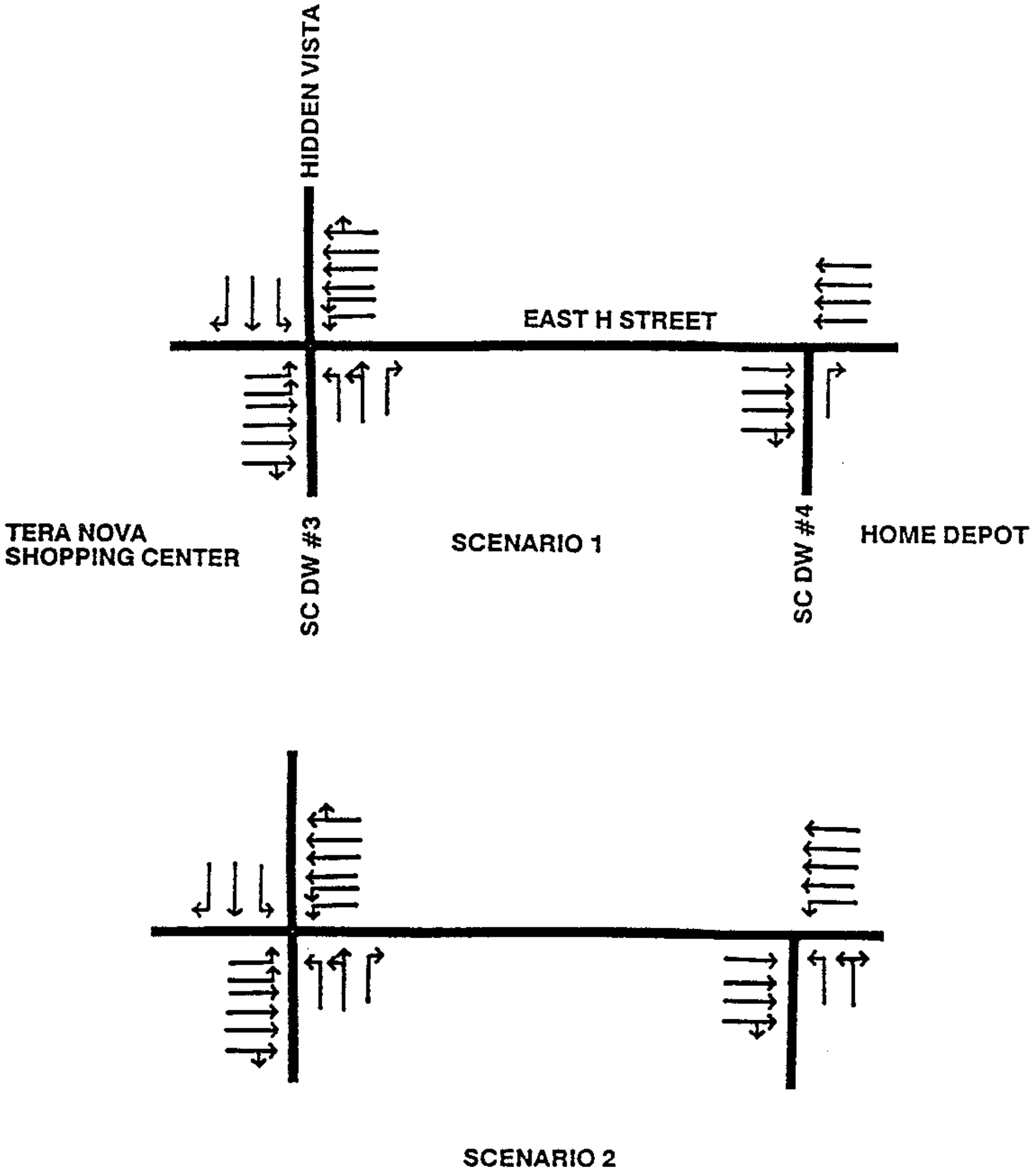


Figure 4
East H Street
Lane Configuration
Assumptions

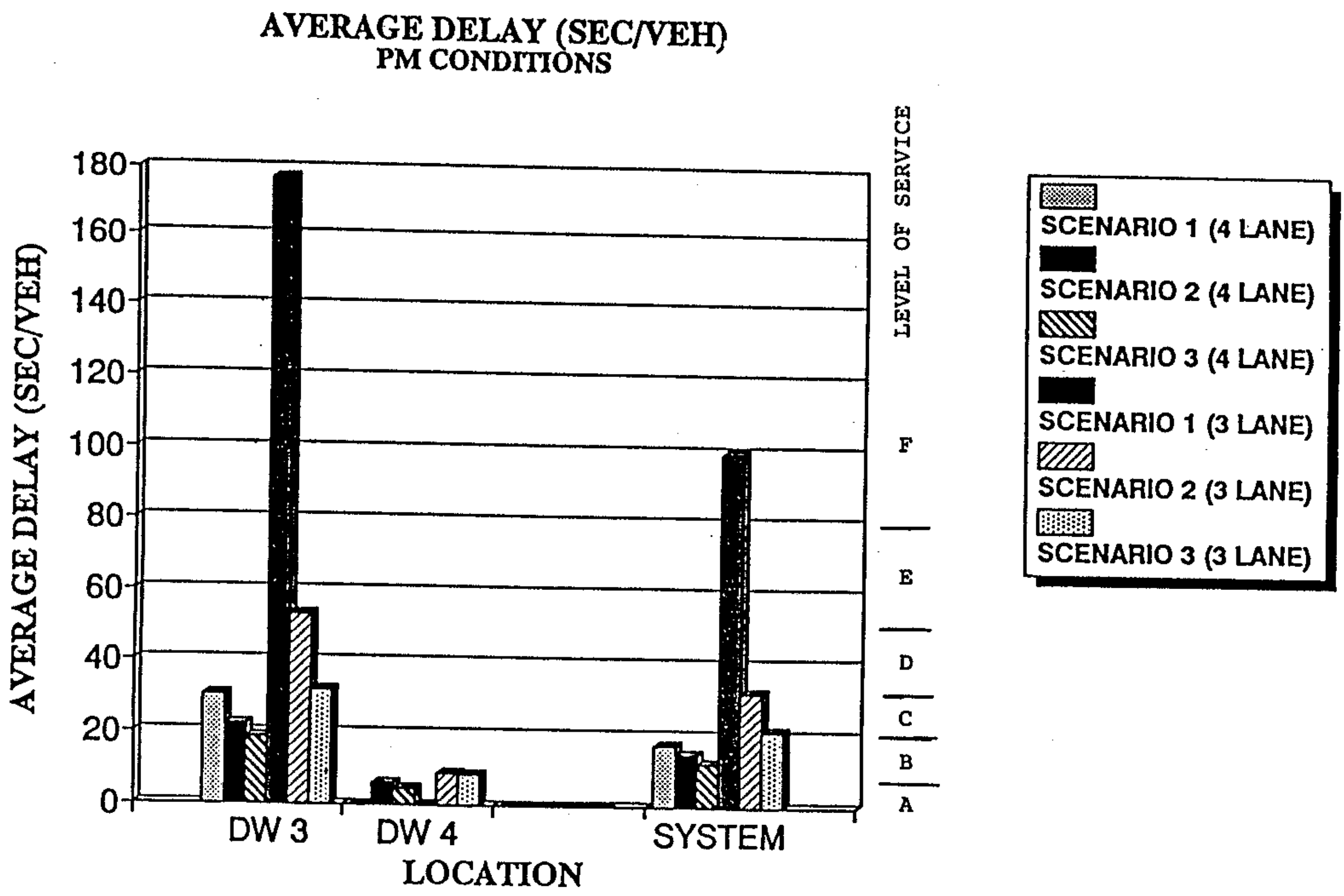


Figure 5
East H Street LOS Comparisons

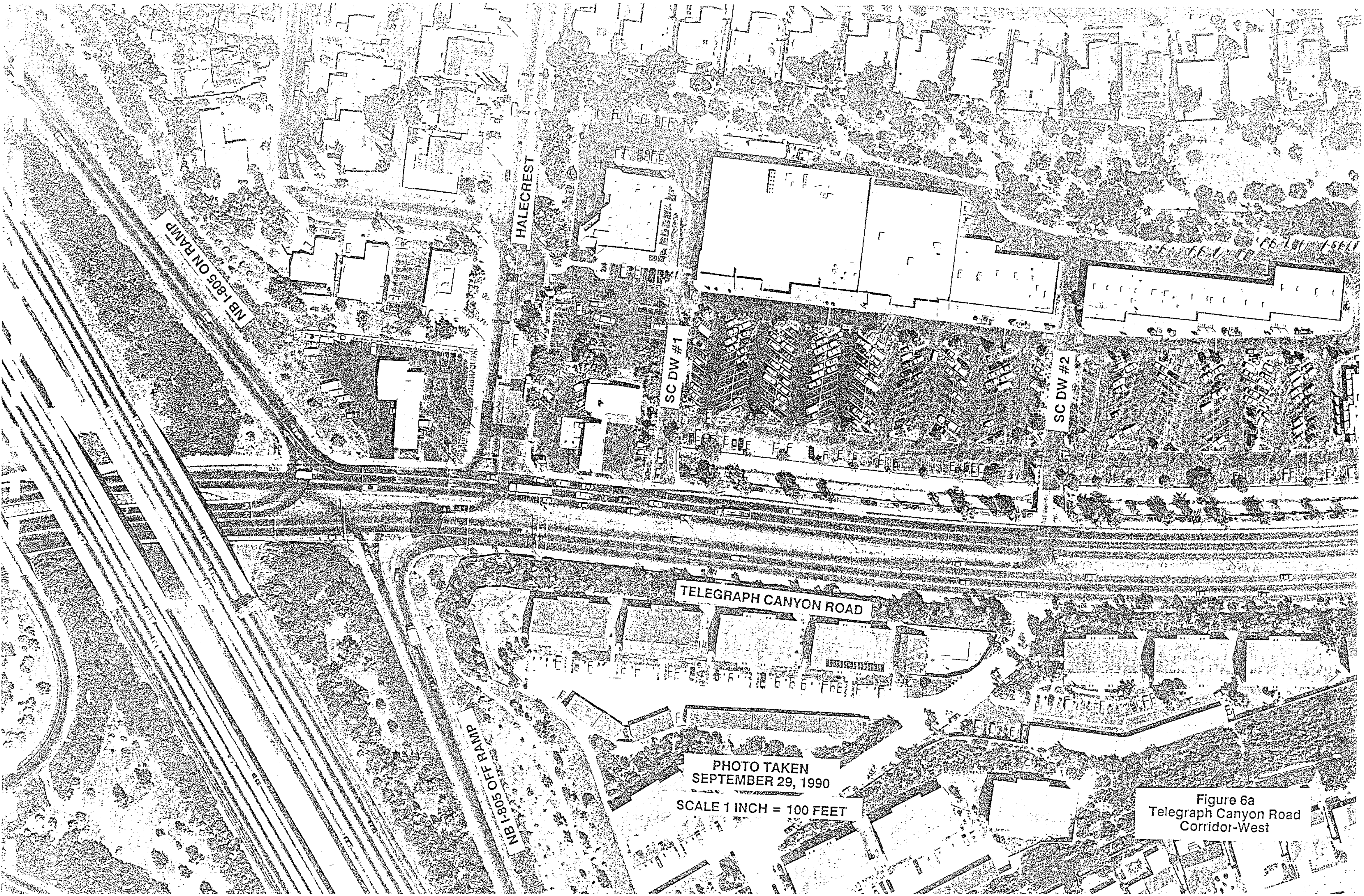


Figure 6a
Telegraph Canyon Road
Corridor-West

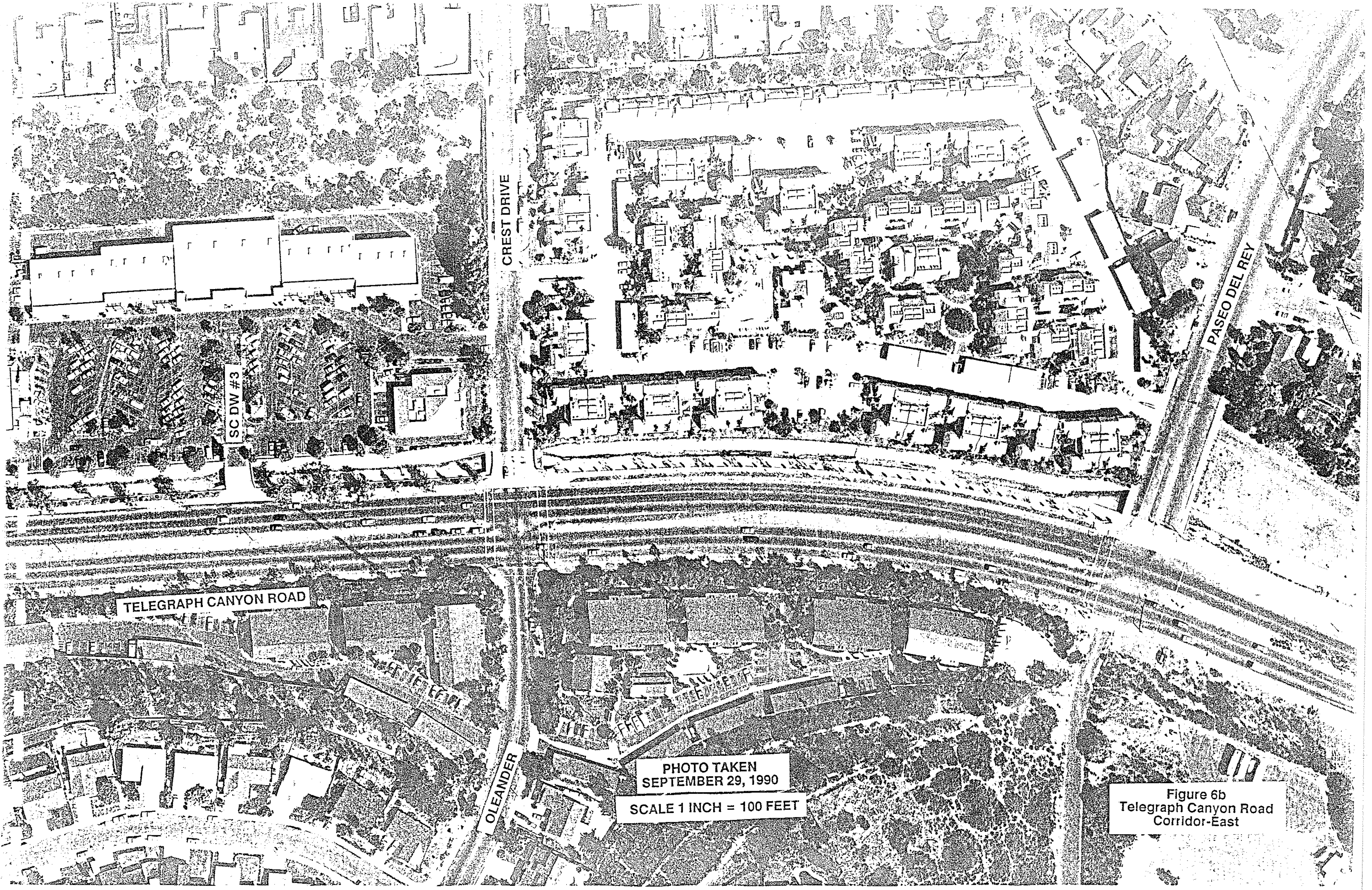


Figure 6b
Telegraph Canyon Road
Corridor-East

Table 2
Level Of Service Definitions

LOS DEFINITIONS FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	INTERPRETATION	STOPPED DELAY (SEC/VEH)	AVERAGE DELAY (SEC/VEH)	INTERSECTION CAPACITY UTILIZATION (ICU) V/C Ratio
A	Very low delay, i.e., less than 5.0 sec per vehicle.	≤ 5.0	≤ 6.5	<.6
B	Good progression with little queuing in a single signal cycle.	5.1 to 15.0	6.6 to 19.6	.61 - .70
C	Light congestion; occasional backups on critical approaches.	15.1 to 25.0	19.7 to 32.5	.71 - .80
D	Significant congestion on critical approaches but intersectional is still functional. Vehicles required to wait through more than one cycle during short peaks. No long standing queues formed.	25.1 to 40.0	32.6 to 52.0	.81 - .90
E	Severe congestion with some long standing queues on critical approaches. Blocking of intersection may occur if traffic signal does not provide for protected turning movements.	40.1 to 60.0	52.1 to 78.0	.91 - 1.0
F	Total breakdown, stop-and-go operation	> 60.0	> 78.0	>1.0

Source: Institute of Transportation Engineers, 1985 HIGHWAY CAPACITY MANUAL.

Table 1
East H Street/Hidden Vista
Level Of Service

EAST H STREET / HIDDEN VISTA

PM PEAK HOUR
WITH APPROVED PROJECTS
WITH RANCHO DEL REY - SPA 3

TRANSYT 7 F ANALYSIS

CONDITIONS AT EAST H ST/HIDDEN VISTA APPROACH	SCENARIO 1 H ST 4 LANES 1 INTERSECTION	SCENARIO 2 H ST 4 LANES 2 INTERSECTIONS
WB - VEH MI	96.30	113.50
WB - TOT TIME - VEH HRS	9.89	9.88
EB - TOT DELAY - VEH HRS	17.58	12.97
WB - TOT DELAY - VEH HRS	6.11	5.43
EB - AVE DELAY - SEC/VEH	23.20	17.10
WB - AVE DELAY - SEC/VEH	19.50	14.70
INTERSECTION - AVE DELAY - SEC/VEH	30.40	22.30
INTERSECTION LOS	C	C

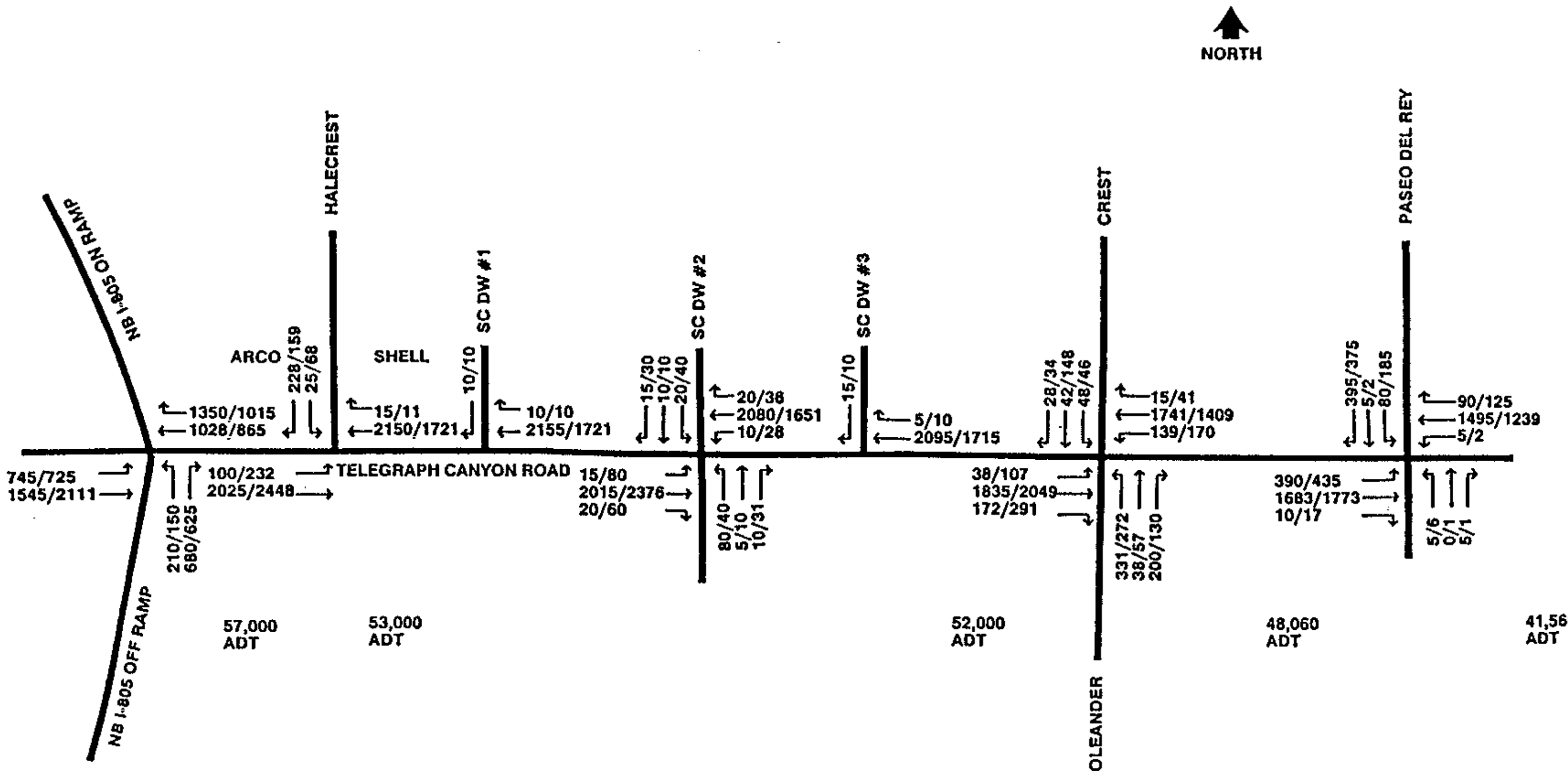


Figure 7
Telegraph Canyon Road Corridor
AM/PM Peak Hour and ADT Traffic

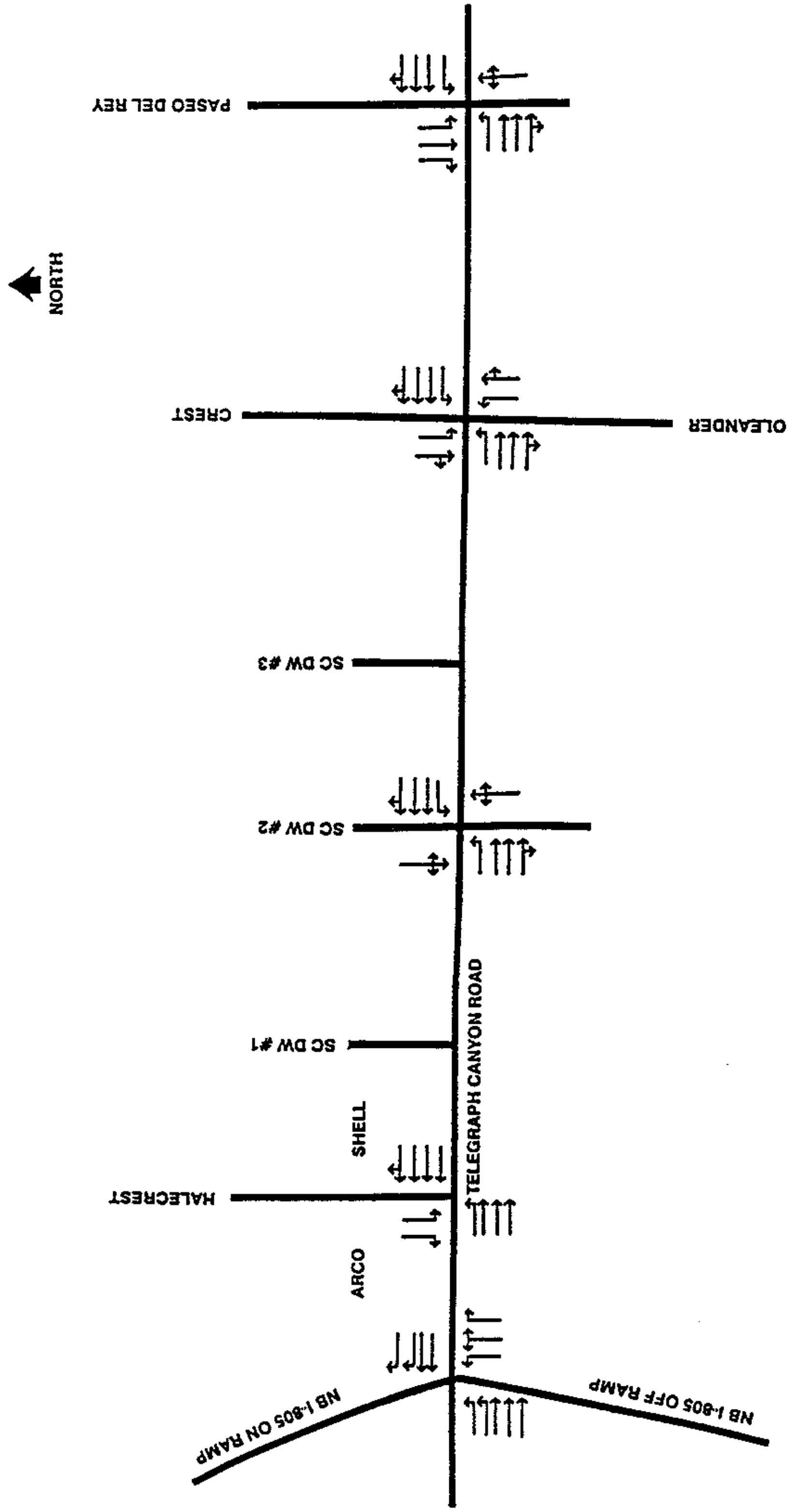


Figure 8
Telegraph Canyon Road
Lane Configuration
Assumptions

Table 3
Telegraph Canyon Road Intersection Level Of Service

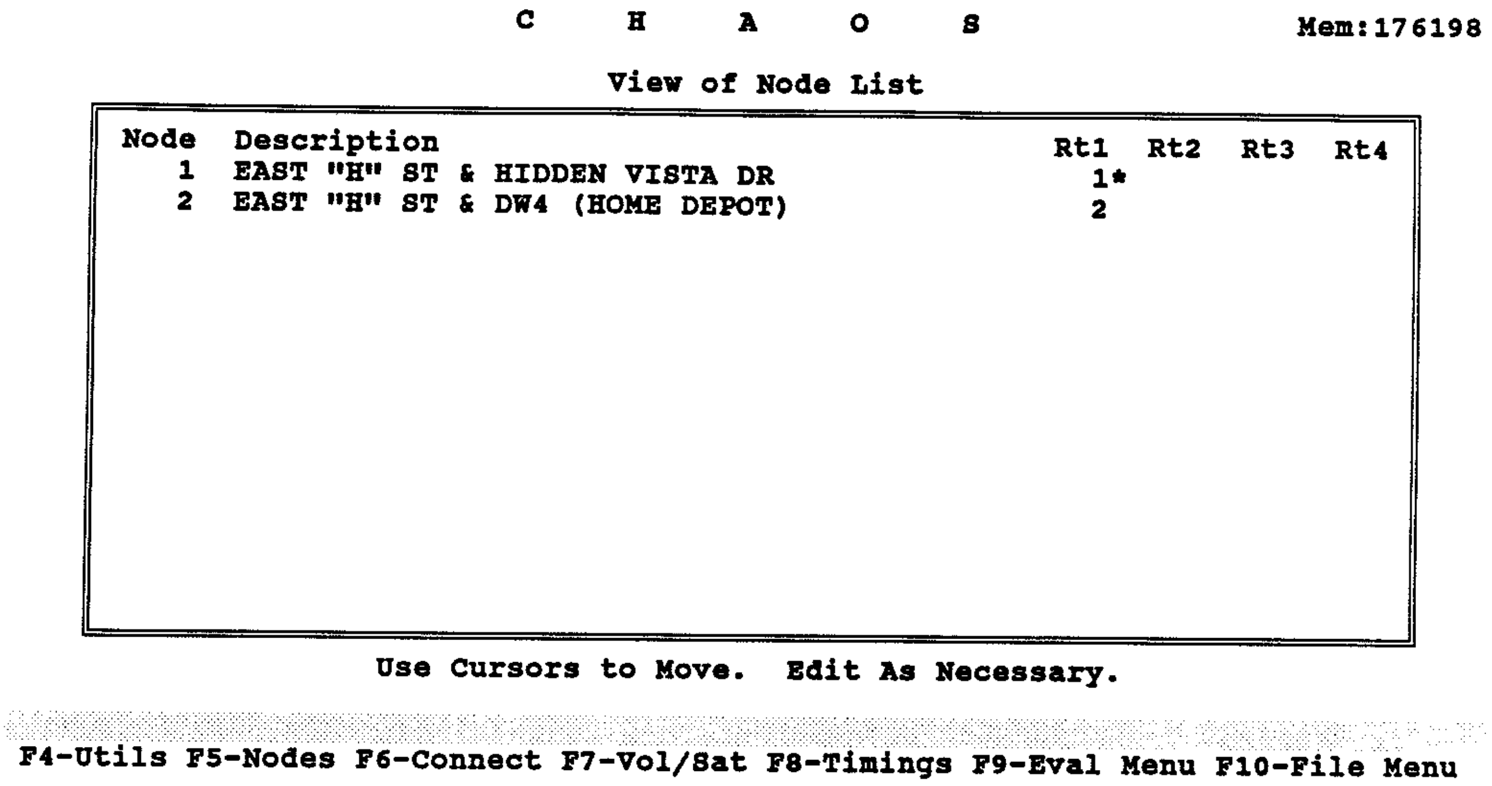
LEVEL OF SERVICE
TELEGRAPH CYN RD CORRIDOR

AM - PM PEAK HOUR
WITH APPROVED PROJECTS
WITH RANCHO DEL REY - SPA 3

TRANSYT 7 F ANALYSIS

INTERSECTION WITH TELEGRAPH	AM PEAK HOUR LEVEL OF SERVICE	PM PEAK HOUR LEVEL OF SERVICE
NB I-805 OFF RAMP	C	B
HALECREST	B	B
CREST	B	C
PASEO DEL REY	B	C

Appendix A
T7F Runs-East H Street



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                    C     H     A     O     S                  Mem:176198
                             View of Node List
  Node  Description                                    Rt1   Rt2   Rt3   Rt4
     1  EAST "H" ST & HIDDEN VISTA DR                   1*
     2  EAST "H" ST & DW4 (HOME DEPOT)                  2

              Use Cursors to Move.  Edit As Necessary.

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu
```

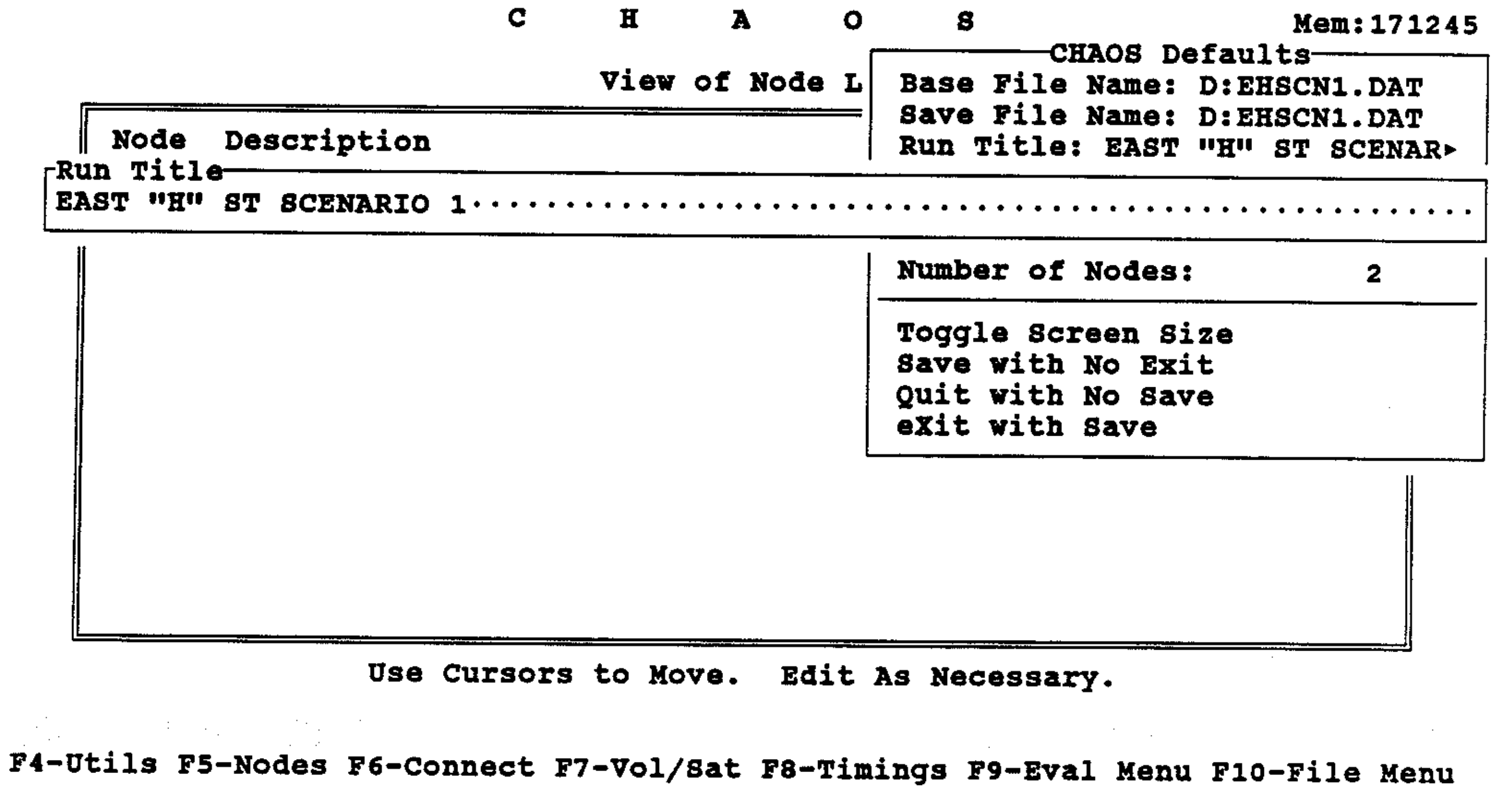

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                    C     H     A     O     S                  Mem:171245
                                        ────────CHAOS Defaults────────
                             View of Node L  Base File Name: D:EHSCN1.DAT
                                             Save File Name: D:EHSCN1.DAT
  Node  Description                          Run Title: EAST "H" ST SCENAR▸
┌Run Title─────────────────────────────────────────────────────────────────
 EAST "H" ST SCENARIO 1·····················································

                                             Number of Nodes:          2
                                             ─────────────────────────────
                                             Toggle Screen Size
                                             Save with No Exit
                                             Quit with No Save
                                             eXit with Save

              Use Cursors to Move.  Edit As Necessary.

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu
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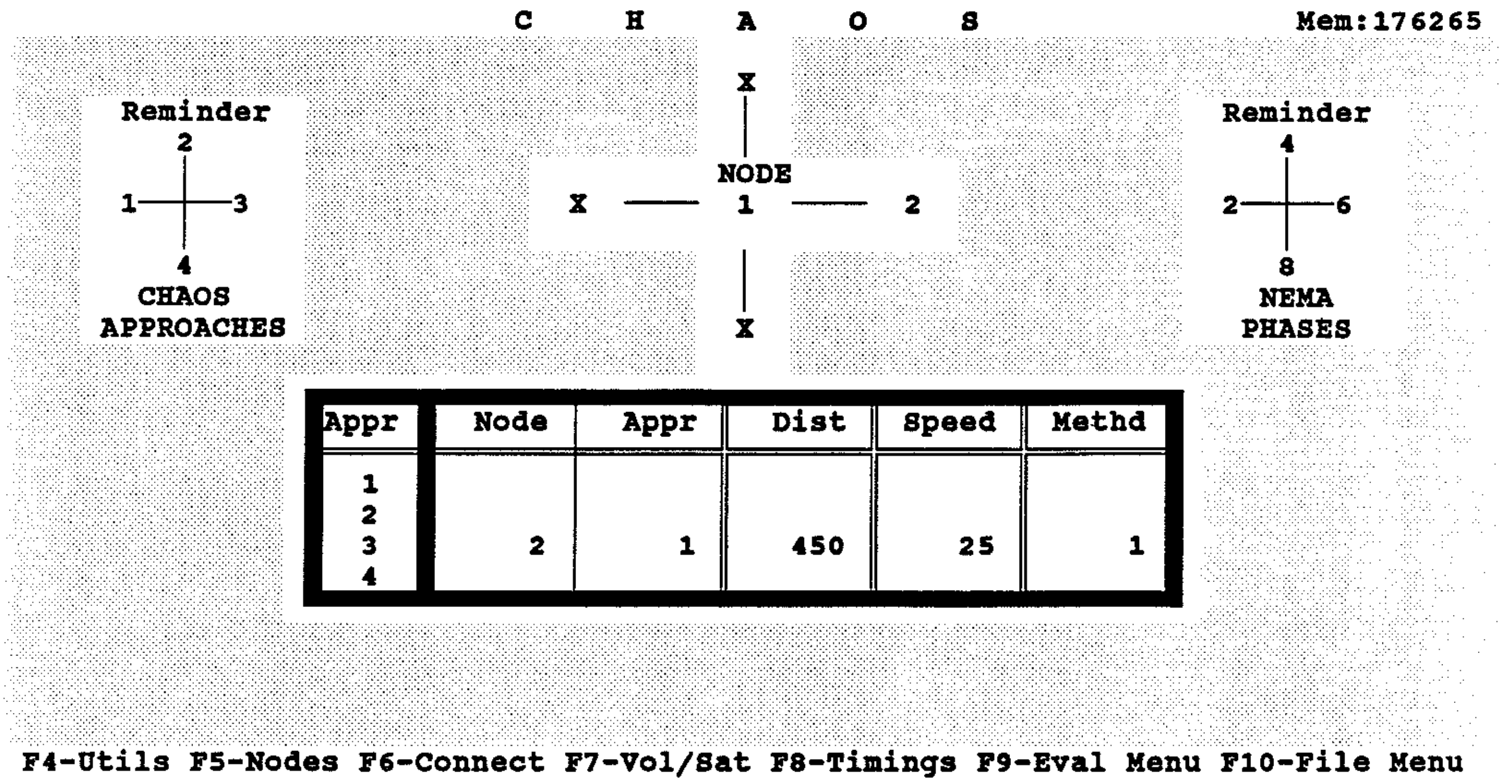
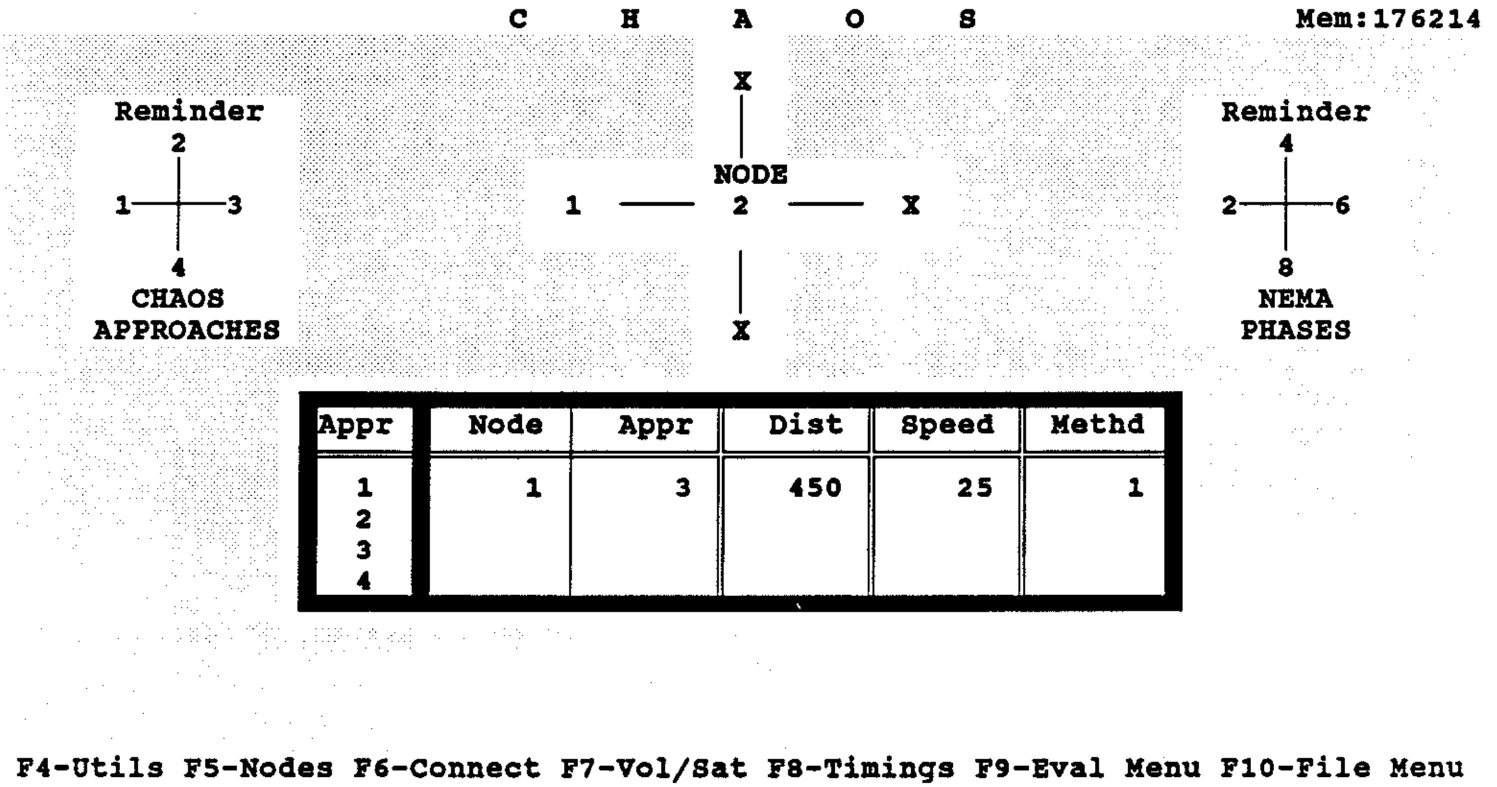


Appr	Node	Appr	Dist	Speed	Methd
1					
2					
3	2	1	450	25	1
4					



Appr	Node	Appr	Dist	Speed	Methd
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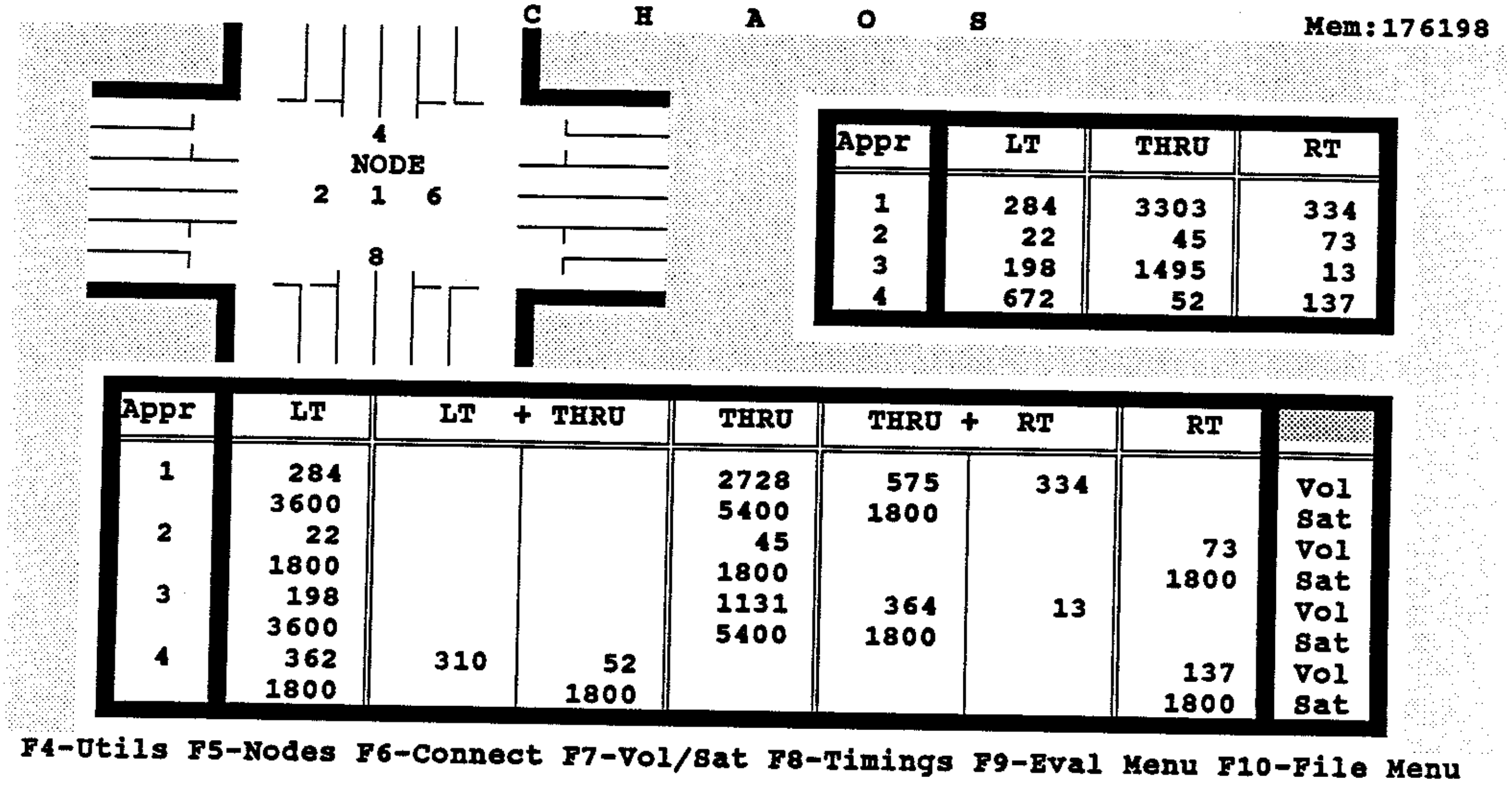
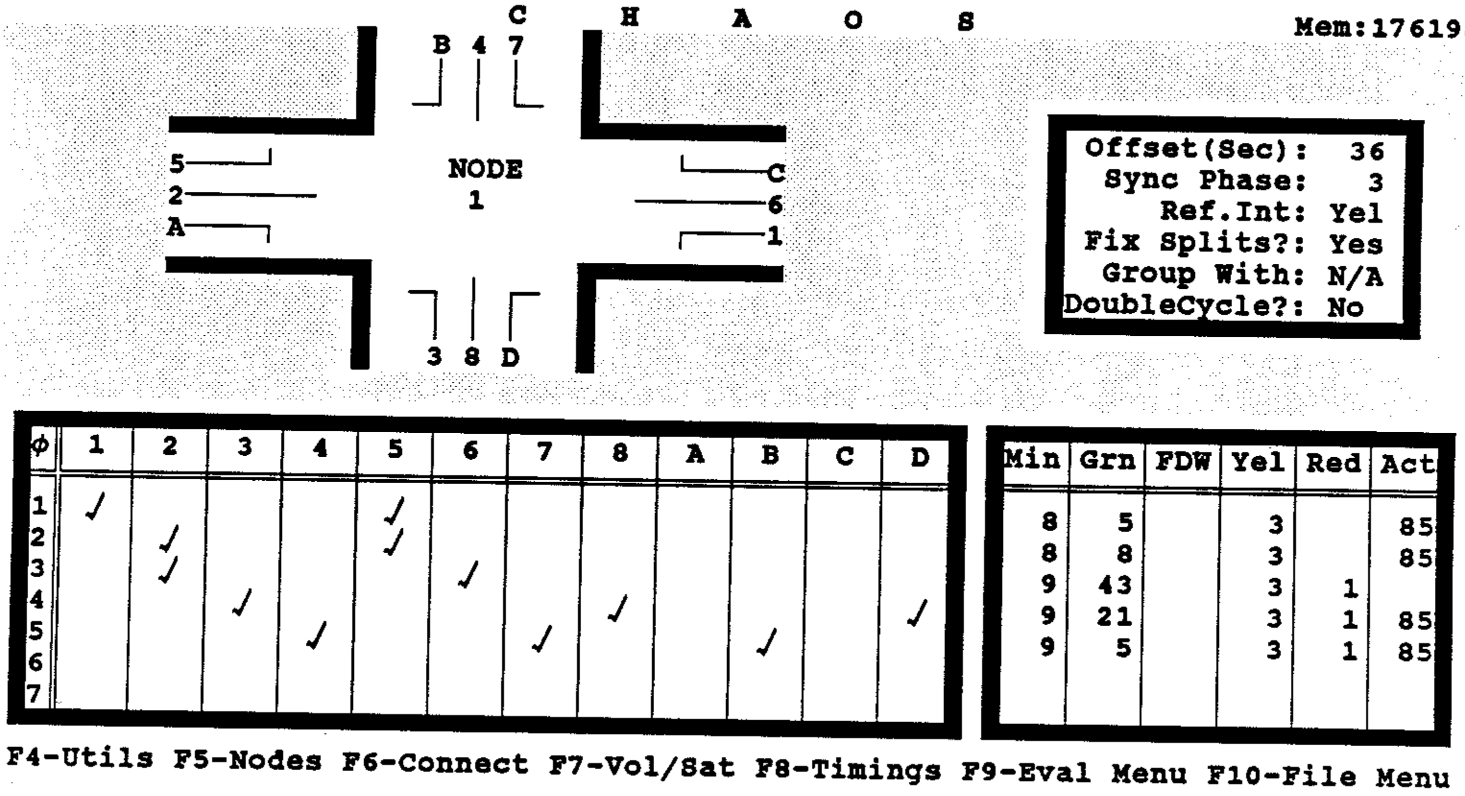
2					
3					
4					



Appr	LT	THRU	RT
1	284	3303	334
2	22	45	73
3	198	1495	13
4	672	52	137

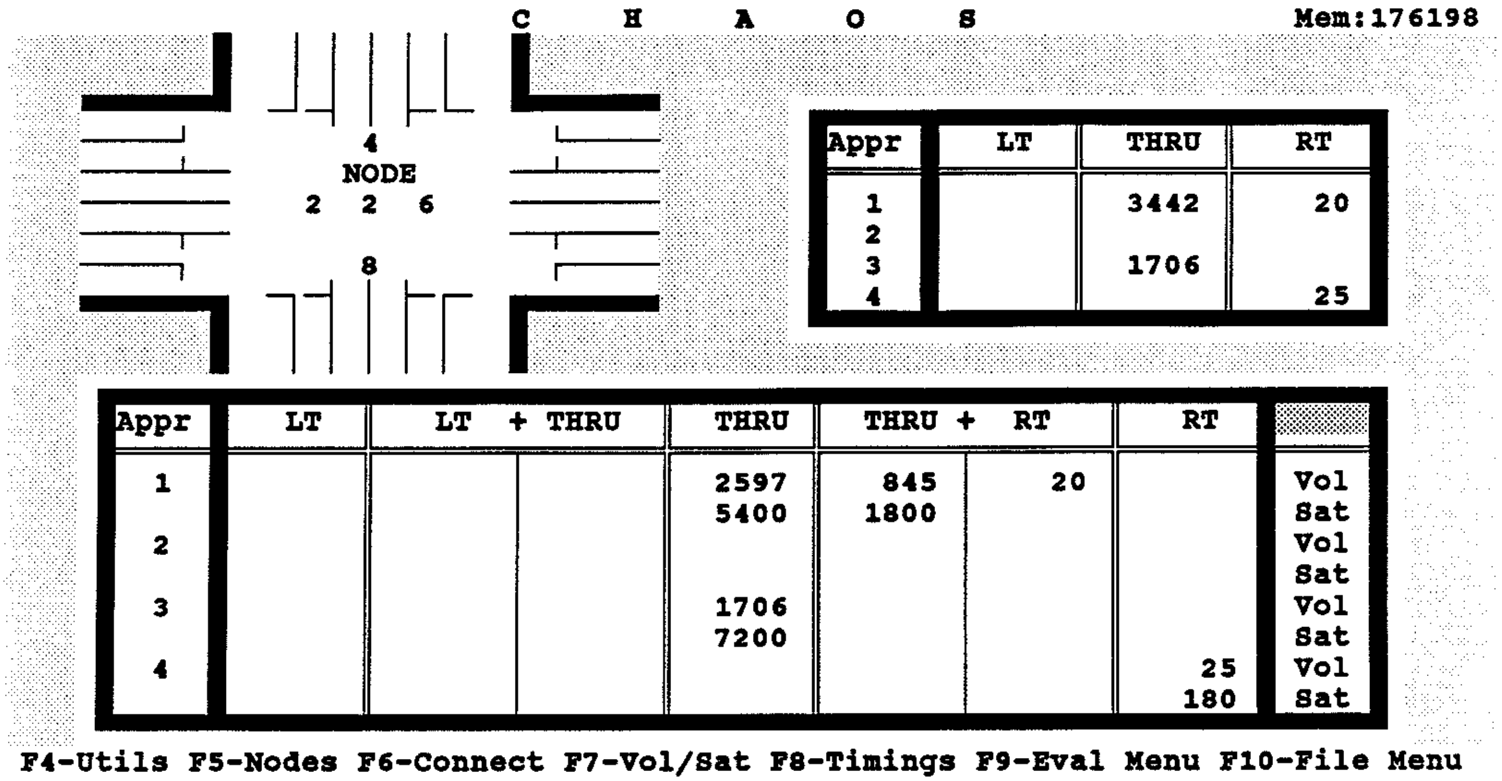
Appr	LT	LT + THRU		THRU	THRU + RT		RT	
1	284			2728	575	334		Vol
	3600			5400	1800			Sat
2	22			45			73	Vol
	1800			1800			1800	Sat
3	198			1131	364	13		Vol
	3600			5400	1800			Sat
4	362	310	52				137	Vol
	1800		1800				1800	Sat



Offset(Sec): 36
Sync Phase: 3
Ref.Int: Yel
Fix Splits?: Yes
Group With: N/A
DoubleCycle?: No

φ	1	2	3	4	5	6	7	8	A	B	C	D
1	✓				✓							
2		✓			✓							
3		✓				✓						
4			✓					✓				✓
5				✓			✓			✓		
6												
7												

Min	Grn	FDW	Yel	Red	Act
8	5		3		85
8	8		3		85
9	43		3	1	
9	21		3	1	85
9	5		3	1	85

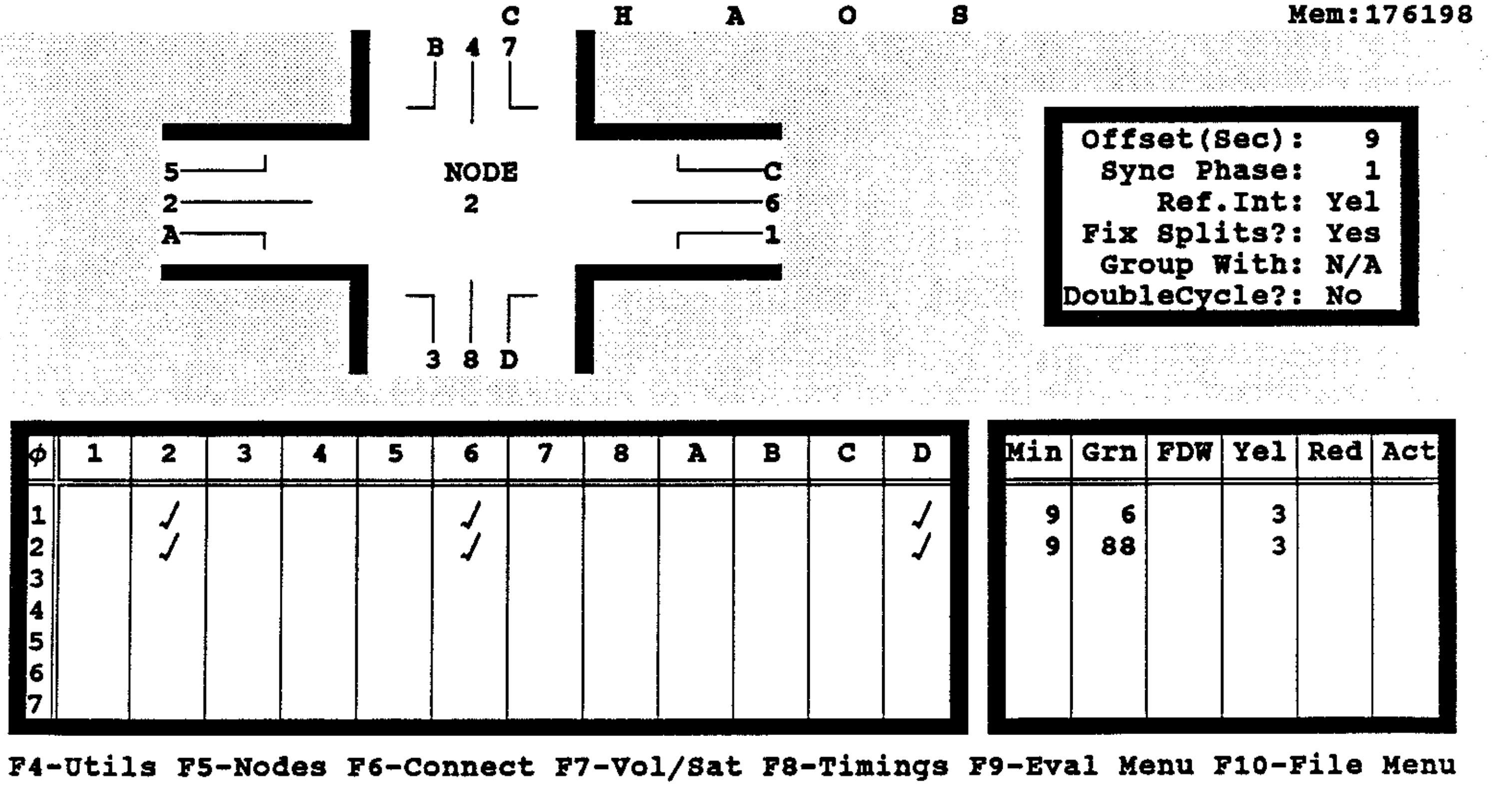


C H A O S Mem:176198

Appr	LT	THRU	RT
1		3442	20
2			
3		1706	
4			25

Appr	LT	LT + THRU		THRU	THRU + RT		RT	▨
1				2597	845	20		Vol
				5400	1800			Sat
2								Vol
								Sat
3				1706				Vol
				7200				Sat
4							25	Vol
							180	Sat

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu



C H A O S Mem:176198

Offset(Sec): 9
Sync Phase: 1
Ref.Int: Yel
Fix Splits?: Yes
Group With: N/A
DoubleCycle?: No

φ	1	2	3	4	5	6	7	8	A	B	C	D
1		✓				✓						✓
2		✓				✓						✓
3												
4												
5												
6												
7												

Min	Grn	FDW	Yel	Red	Act
9	6		3		
9	88		3		

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu

```
 1           T R A N S Y T - 7 F  --  T R A F F I C   S I G N A L   S Y S T E M

  RELEASE 6  OCTOBER 1988

  SPONSORED BY:
  FEDERAL HIGHWAY ADMINISTRATION
  OFFICE OF TRAFFIC OPERATIONS


  DATE OF RUN: 10/ 1/90  START TIME OF RUN:   17:53:47

                                         --------------------------------------------
                                         I N P U T   D A T A   R E P O R T   F O R   R
                                         --------------------------------------------


  FIELDS:  1       2       3       4       5       6       7       8       9
         ----    ----    ----    ----    ----    ----    ----    ----    ----

  LINE                                                            RUN  TITLE  CARD
   NO.      TITLE

    1)      EAST "H" ST SCENARIO 1

                                                     I/O  AND  DEBUG  FLAGS  CARD
  LINE      CARD  PRINT    T-7F     T-7         UNIT NUMBERS         EQUIV  LINES/  P
   NO.      TYPE  FORMAT   DEBUG    DEBUG SCRATCH  PUNCH     DISK     LANE   PAGE   M

    2)        0       0       0       0       0       0       0       0       0
    1   80  120   10    0    0    2    3   -1    1    0    0    0    0    0    1

  +++ 106 +++ WARNING +
 +                      THE SEC/STEPS FACTOR IN FIELD 6 IS TOO SMALL FOR CYCLE
                        LENGTHS ABOVE  60 SECONDS. IT WILL BE INCREASED TO
                        ALLOW A MAXIMUM OF 60 STEPS/CYCLE.

  +++ 107 +++ WARNING +
 +                      A STOP PENALTY OF "-1" WILL RESULT IN AUTOMATIC
                        CALCULATION OF THE PI TO MINIMIZE FUEL CONSUMPTION.
                        LINK SPECIFIC DELAY OR STOP WEIGHTS ON CARD
                        TYPE 37 & 38 WILL STILL BE APPLIED, HOWEVER.

  +++ 114 +++ WARNING +
 +                      INITIAL TIMING FLAG SET TO "1" FOR CYCLE RANGE EVALUATION

  +++ 112 +++ WARNING +
 +                      A VALUE OF 1 IN FIELD 16 CAUSES A DATA FILE WITH
                        THE OPTIMIZED TIMING PLAN TO BE OUTPUT ON UNIT  7.
    2    1    2    0    0    0    0    0    0    0    0    0    0    0    0    0
    7  122  132    0    0    0  126  136    0    0    0  118  113    0    0    0
 1TRANSYT-7F:                                                               PAGE  2

  EAST "H" ST SCENARIO 1

  FIELDS:
    1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16
  --- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
    7  222  232    0    0    0    0    0    0    0    0    0    0    0    0    0
   10    0    3    1    0    0    0    0    0    0    0    0    0    0    0    0
```

```
 EAST "H" ST & HIDDEN VISTA DR

 -----------------
 INTERSECTION     1
 -----------------
 -15     1   86     6     5     3     8     3    43     3     1    21     3     1     5     0
  18     1    3     1     0     0     0     0     0     0     0     0     0     0     0     0
 *** CHAOS DATA; Methods:0010;
  21     1    1     1     2     0     8   105   101     0     0     0     0     0     0    85
  22     1    3     3     4     0     8   105   102   122   132     0     0     0     0    85
  23     1    5     5     6     7     9   102   122   132   106   126   136     0     0     0
  24     1    8     8     9    10     9   103   113   118   148     0     0     0     0    85
  25     1   11    11    12    13     9   107   104   144     0     0     0     0     0    85
 *** Node: 1; Appr:3; Fed By Node: 2; Appr:1; Method: 1; Ratio 1.000
  28   105     0  3600   284     0     0     0     0     0     0     0     0     0     0    20
  28   102     0  5400  2728     0     0     0     0     0     0     0     0     0     0     0
  28   122     0  1800   575     0     0     0     0     0     0     0     0     0     0     0
  28   132     0     0   334     0     0     0     0     0     0     0     0     0     0     0
  28   107     0  1800    22     0     0     0     0     0     0     0     0     0     0     0
  28   104     0  1800    45     0     0     0     0     0     0     0     0     0     0     0
  28   144     0  1800    73     0     0     0     0     0     0     0     0     0     0     0
  28   101   450  3600   198     0   206   198    25     0     0     0     0     0     0    20
  28   106   450  5400  1131     0   206  1131    25     0     0     0     0     0     0     0
  28   126   450  1800   364     0   206   364    25     0     0     0     0     0     0     0
  28   136   450     0    13     0   206    13    25     0     0     0     0     0     0     0
  28   103     0  1800   362     0     0     0     0     0     0     0     0     0     0     0
  28   113     0     0   310     0     0     0     0     0     0     0     0     0     0     0
  28   118     0  1800    52     0     0     0     0     0     0     0     0     0     0     0
  28   148     0  1800   137     0     0     0     0     0     0     0     0     0     0     0
 EAST "H" ST & DW4 (HOME DEPOT)

 -----------------
 INTERSECTION     2
 -----------------
 -12     2    9     2     6     3    88     3     0     0     0     0     0     0     0     0
 *** CHAOS DATA; Methods:1000;
  21     2    1     1     2     0     9   202   222   232   206   248     0     0     0     0
  22     2    3     3     4     0     9   202   222   232   206   248     0     0     0     0
1TRANSYT-7F:                                                                          PAGE   3

 EAST "H" ST SCENARIO 1

 FIELDS:
   1     2     3     4     5     6     7     8     9    10    11    12    13    14    15    16
 --- ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----
 *** Node: 2; Appr:1; Fed By Node: 1; Appr:3; Method: 1; Ratio 1.000
  28   202   450  5400  2597     0   107    17    25   102  2046    25   122   431    25     0
  29   202     0     0     0     0   148   103    25     0     0     0     0     0     0     0
  28   222   450  1800   845     0   107    10    25   102   666    25   122   140    25     0
  29   222     0     0     0     0   148    33    25     0     0     0     0     0     0     0
  28   232   450     0    20     0   107    10    25   102    16    25   122    10    25     0
  29   232     0     0     0     0   148    10    25     0     0     0     0     0     0     0
  28   206     0  7200  1706     0     0     0     0     0     0     0     0     0     0     0
  28   248     0   180    25     0     0     0     0     0     0     0     0     0     0     0

 +++ 138 +++ WARNING +
+                        THE VALUE IN FIELD 4,  180, IS LESS THAN 500,
                         WHICH AS OF RELEASE 4 IS INTERPRETED AS VPHG.
                         IF YOU INTENDED TO SPECIFY EQUIVALENT LANES,
                         YOU MUST NOW CODE A "1" IN FIELD 8 OF CARD TYPE 0.
```

```
                         NOTE: THIS MESSAGE IS ISSUED ONLY ONCE,
                               CHECK YOUR DATA.
                 ....
 *** CHAOS DATA;Route01;Name:EAST "H" STREET
 *** CHAOS DATA;Route01;Data:     0    0    0    0    0    0    0    5  200 T T T
 *** CHAOS DATA;Route01;Node:     1    2;

 --------------------
 PLOT AND OPTION CARDS
 --------------------

  52    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0

 --- PROGRAM NOTE --- A CARD TYPE 52 CAUSES RUN TO BE OPTIMIZED USING THE
                      DEFAULT NORMAL OPTIMIZATION STEP SIZES.
                      IF CARD TYPE 4 WAS INPUT, IT IS IGNORED.

                      THE ABOVE WILL BE PROCESSED AFTER THE "BEST" CYCLE
                      LENGTH HAS BEEN SELECTED.

 --- PROGRAM NOTE --- NO ERRORS DETECTED. TRANSYT-7F PERFORMS FINAL PROCESSING.
                      IF ERRORS ARE DETECTED, FURTHER PROCESSING IS SUSPENDED.

 +++ 163 +++ WARNING +
+                      THE SUM OF UPSTREAM INPUT FLOWS FOR LINK  232 IS  230%
                       OF THE TOTAL NON-MIDBLOCK FLOW.

 --- PROGRAM NOTE --- THERE ARE A TOTAL OF   2 NODES AND  20 LINKS,
                      INCLUDING BOTTLENECKS, IF ANY, IN THIS RUN.

 --- PROGRAM NOTE --- THERE WERE A TOTAL OF   6 WARNING MESSAGES ISSUED
                      IN THE ABOVE REPORT.
1TRANSYT-7F:                                                            PAGE  4

 EAST "H" ST SCENARIO 1


                    ------------------------------------
                    CYCLE EVALUATION SUMMARY PERFORMANCE
                    ------------------------------------

  CYCLE   STEP   AVERAGE  PERCENT     FUEL      PERFORMANCE  NUMBER
 LENGTH   SIZE    DELAY    STOPS   CONSUMPTION     INDEX    SATURATED
  (SEC) (STEPS) (SEC/VEH)   (%)      (GAL/HR)                 LINKS
 ----------------------------------------------------------------------

   80     27     21.76     47        100.8         81.1         6

   90     30     17.19     46         89.2         69.5         6

  100     33     16.47     44         86.6         66.9         0

  110     37     17.26     45         88.7         69.0         0

  120     40     18.00     44         90.3         70.5         0

 ----------------------------------------------------------------------
```

```
     BEST CYCLE LENGTH = 100 SEC.   CYCLE SENSITIVITY =   7.8 %

 --- PROGRAM NOTE --- TRANSYT-7F OPTIMIZES THE SYSTEM USING THE BEST
                      CYCLE LENGTH AND HILL-CLIMB STEP SIZES AS
                      INDICATED BY CARD TYPE 52.

1TRANSYT-7F:                                                   PAGE  5

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS

 <PERFORMANCE WITH OPTIMAL SETTINGS>

 MOVEMENT/        TOTAL  TOTAL  TOTAL   AVG.   UNIFORM    MAX. BACK   FUEL
 NODE NOS.  V/C  TRAVEL   TIME  DELAY  DELAY    STOPS     OF  QUEUE   CONS.
            (%)  (V-MI) (V-HR) (V-HR) (SEC/V)  NO. (%)    NO.  CAP.   (GA)
 ---------------------------------------------------------------------------
    101    : 92   16.86   5.14   4.48   81.4  187.( 95)    5    20     4.78
 EB 102    : 92     .00  17.58  17.58   23.2 2287.( 84)   68>    0    25.52
    103    : 91     .00   5.84   5.84   58.1  336.( 93)   10>    0     6.14
    104    : 42     .00    .64    .64   50.9   42.( 93)    1>    0      .70
    105    : 46     .00   3.02   3.02   38.3  245.( 86)    7    20     3.57
 WB 106    : 48   96.28   9.89   6.11   19.5  745.( 66)   21    54    11.74
    107    : 20     .00    .28    .28   46.5   20.( 91)    1>    0      .32
    113   S: 91     .00   5.01   5.01   58.1  287.( 93)  118   118S    5.25
    118   P: 91     .00    .84    .84   58.1   48.( 93)   10>    0      .88
    122   P: 92     .00   4.69   4.69   29.4  482.( 84)   23>    0     6.10
    126   P: 48   30.99   3.26   2.05   20.3  241.( 66)    7    18     3.84
    132   S: 92     .00   2.73   2.73   29.4  280.( 84)  122   122S    3.54
    136   S: 48    1.11    .12    .08   21.1    9.( 69)  126   126S     .19
    144    : 68     .00   1.27   1.27   62.5   69.( 95)    2>    0     1.31
    148    : 35     .00   1.27   1.27   33.3  109.( 80)    3>    0     1.53

NODE      1: 92  145.23  61.59  55.89   30.4 5388.( 81)                75.41

    202    : 48  221.08   8.68    .00     .0    0.(  0)    0    54     9.85
    206    : 24     .00    .00    .00     .0    0.(  0)    0     0      .00
    222   P: 48   71.93   2.82    .00     .0    0.(  0)    0    18     3.21
    232   S: 48    1.70    .07    .00     .0    0.(  0)  222   222S     .13
    248    : 14     .00    .00    .00     .0    0.(  0)    0     0      .00

NODE      2: 48  294.71  11.57    .00     .0    0.(  0)                13.19
---------------------------------------------------------------------------
1TRANSYT-7F:                                                   PAGE  6

EAST "H" ST SCENARIO 1
CYCLE:  100 SECONDS,   60 STEPS


<SYSTEM WIDE TOTALS INCLUDING ALL LINKS>

PERFORMANCE TOTAL  TOTAL  TOTAL AVG.     UNIFORM     FUEL  SYSTEM TOTAL PERFOR-
MEASURES    TRAVEL TIME   DELAY DELAY     STOPS      CONS. SPEED  COST  MANCE
             V-MI  V-HR   V-HR  SEC/V    NO. (%)      GA    MI/H        INDEX
------------------------------------------------------------------------------

<TOTALS>     440     73     56  17.0    5388( 46)     89   14.7   264    68.9

------------------------------------------------------------------------------
```

```
 NOTE: PERFORMANCE INDEX IS DEFINED AS:

       PI = DELAY + STOPS

 NO. OF SIMULATIONS =  53  NO. OF LINKS = 321  ELAPSED TIME =   622.2 SEC.
1TRANSYT-7F:                                                       PAGE  7

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS

 -------------------------------------
 TRANSYT-7F SIGNAL CONTROLLER SETTINGS
 -------------------------------------



 -------------------------------
 NETWORK-WIDE SIGNAL TIMING DATA
 -------------------------------

 SYSTEM CYCLE LENGTH =  100 SECONDS

 NO MASTER OFFSET REFERENCE CONTROLLER SPECIFIED

 ALL OFFSETS ARE REFERENCED TO AN ARBITRARY TIME BASE.

 NETWORK INCLUDES ACTUATED SIGNAL - GREEN TIMES ARE ESTIMATED.



 --------------------------------
 INTERSECTION CONTROLLER SETTINGS
 --------------------------------



 ----------------------------------------------------
 INTERSECTION     1   ACTUATED - SPLITS ESTIMATED
 ----------------------------------------------------

 INTERVAL  NUMBER :      1   2   3   4   5   6   7   8   9  10  11  12  13

 INTVL LENGTH(SEC):     5M   3   8   3  43   3   1  21   3   1  5M   3   1
 INTVL LENGTH  (%):      5   3   8   3  43   3   1  21   3   1   5   3   1

 PIN SETTINGS  (%): 100/0   5   8  16  19  62  65  66  87  90  91  96  99

 PHASE START (NO.):      1 ACT   2 ACT   3 NAP       4 ACT       5 ACT

 INTERVAL   TYPE  :      V   Y   V   Y   V   Y   R   V   Y   R   V   Y   R

 SPLITS      (SEC):      8      11      47          25          9
 SPLITS        (%):      8      11      47          25          9


 LINKS  MOVING  :      105     105     102         103         107
                       101     102     122         113         104
                               122     132         118         144
```

```
                              132     106         148
                                      126
                                      136

 OFFSET =  36 SEC.  36 %; REFERENCED TO START OF INTERVAL NO.   6

 +++ 195 +++ WARNING +
+                     THE YIELD POINT FALLS WITHIN 1% OF AN INTERVAL
                      CHANGE POINT AT THE START OF INTERVAL NO  7.
1TRANSYT-7F:                                                     PAGE  8

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS



 ------------------------------------------------
 INTERSECTION     2   PRETIMED - SPLITS ARE FIXED
 ------------------------------------------------

 INTERVAL  NUMBER :      1   2   3   4

 INTVL LENGTH(SEC):      6M  3  88   3
 INTVL LENGTH  (%):      6   3  88   3

 PIN SETTINGS  (%): 100/0   6   9  97

 PHASE START (NO.):      1       2

 INTERVAL   TYPE  :      V   Y   V   Y

 SPLITS       (SEC):     9      91
 SPLITS         (%):     9      91


 LINKS  MOVING  :      202     202
                       222     222
                       232     232
                       206     206
                       248     248

 OFFSET =    9 SEC.   9 %; REFERENCED TO START OF INTERVAL NO.   2
1TRANSYT-7F:                                                     PAGE  9

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS


                ----------------------------------
                INPUT DATA REPORT FOR ROUTE NO.  1
                ----------------------------------
  60    1    0    5  200    1    1    0    0    0    0    0    0    0    0    0

 TITLE

 *****EAST "H" STREET*****
  61  102  106  202  206    0    0    0    0    0    0    0    0    0    0    0
1TRANSYT-7F:                                                     PAGE 10

 EAST "H" ST SCENARIO 1
```

```
 CYCLE:  100 SECONDS,   60 STEPS

        < T R A N S Y T - 7 F   T I M E - S P A C E   D I A G R A M >

 ROUTE NO.  1

 ROUTE TITLE: *****EAST "H" STREET*****


 TIME AXIS IS IN: SEC   TIME SCALE =   5 SEC/CHAR,  DIST. SCALE =  200 FT/LINE

                  1         2         3         4         5         6
   NODE  123456789012345678901234567890123456789012345678901234567890 DISTANCE
        :--------------------------------------------------------------------
     1  :        *********+++        *********+++        *********+++     0 FT
        |                   |                   |
     2  :                                                                450 FT
        :--------------------------------------------------------------------
   NODE  123456789012345678901234567890123456789012345678901234567890 DISTANCE
                  1         2         3         4         5         6

        SCALE CONVERSIONS:                            +++ GREEN IN DOWN DIRECTION
        TIME/INCH =  5 * 10 (AT 10 CHAR/INCH)             GREEN IN BOTH DIRECTIONS
        DIST/INCH = 200 * 6 (AT 6 LINES/INCH)         --- GREEN IN UP   DIRECTION
        AVG. TIME DISPLACEMENT =   61.36/SPEED        *** RED IN BOTH DIRECTIONS
1TRANSYT-7F:                                                   PAGE 11

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS

       < T R A N S Y T - 7 F   F L O W   P R O F I L E   D I A G R A M S >


  ROUTE TITLE:
  *****EAST "H" STREET*****


  SYMBOL KEYS:

     FLOW PROFILE SYMBOLS (VERTICAL AXIS IS IN VPH).
         I :  ARRIVALS WHICH QUEUE, NORMALLY ON RED ON UNOPPOSED LINKS OR
              DURING PERIODS OF HEAVY OPPOSING FLOW ON OPPOSED LINKS DURING
              THE PERMITTED PHASE(S).
         S :  DEPARTURES FROM QUEUE, NORMALLY AT THE SATURATION FLOW RATE
              FOR "PROTECTED" LINKS, OR MAXIMUM FLOW RATE FOR PERMITTED,
              OPPOSED LINKS.
         O :  ARRIVALS AND DEPARTURES ON GREEN. WHEN BELOW S'S OR I'S, THESE
              ARRIVALS JOIN THE BACK OF THE QUEUE.


      TIME SCALE (VERTICAL AXIS):
    (BLANK) :  PROTECTED GREEN INTERVALS OR UNOPPOSED MOVEMENTS.
          . :  PERMITTED GREEN INTERVALS WITH OPPOSING TRAFFIC.
          * :  RED INTERVALS.
          N :  THE NUMBERS ACROSS THE BOTTOM ARE A TIME SCALE IN
               UNITS OF STEPS.

 NOTE: THE FLOW PROFILE DIAGRAM SHOWS EFFECTIVE GREEN AND RED, NOT ACTUAL.
```

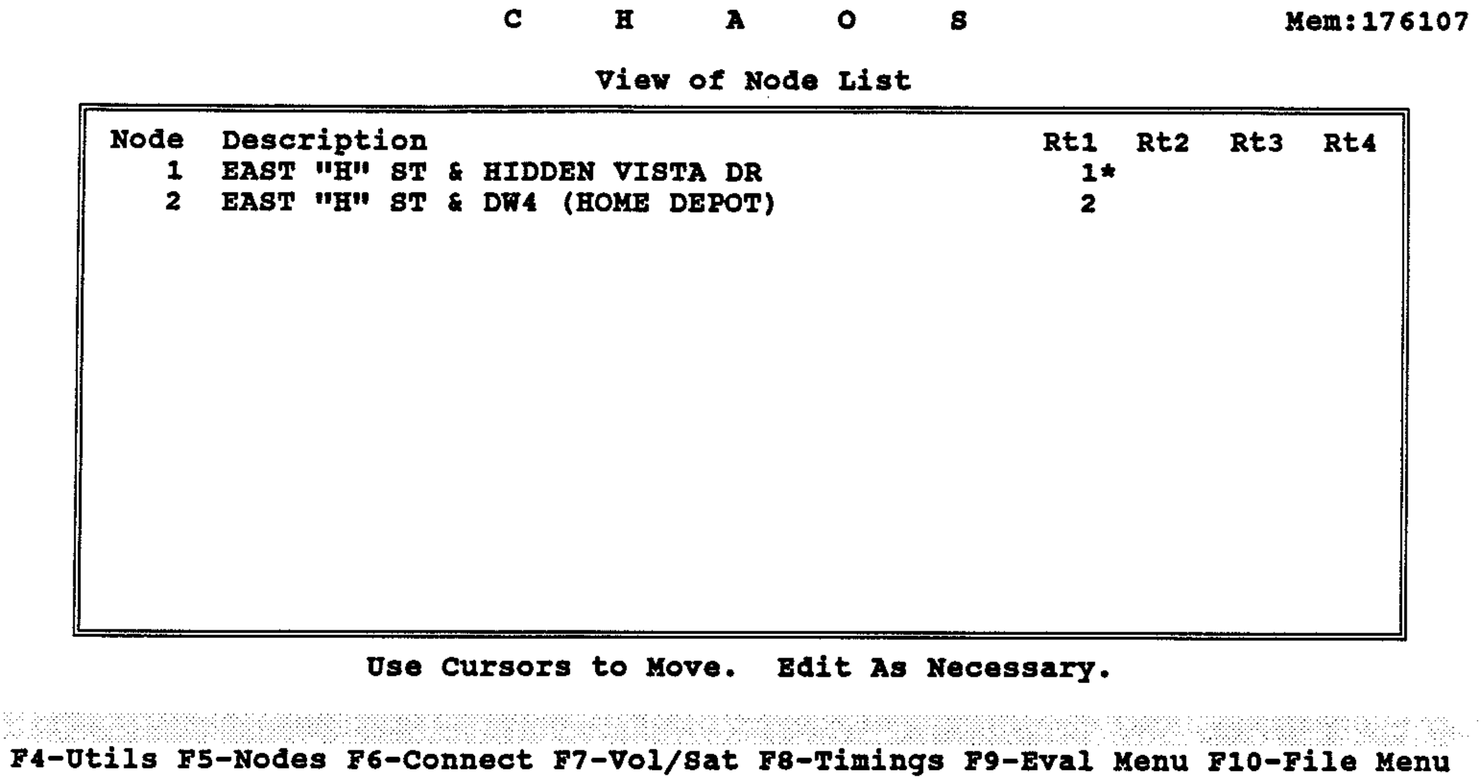
```
       OFFSETS ARE NOT ADJUSTED TO MASTER CONTROLLER IF ANY.

 NOTE: IN THE 80-COLUMN OUTPUT FORMAT, THE "DOWNBOUND" LINKS ARE PLOTTED
       CONTINUOUSLY FIRST, THEN THE "UPBOUND" LINKS ARE PLOTTED CONTINUOUSLY.
```

```
 *****EAST "H" STREET*****
 CYCLE:  100 SECONDS,   60 STEPS

    LINK   102    MAX FLOW  5400 VEH/H     PLT. INDEX  .00

 6000+
     :
     :SSSSSSSSSSSSSSSSS                                  SSSSSSSSS
     :SSSSSSSSSSSSSSSSS                                  SSSSSSSSS
     :SSSSSSSSSSSSSSSSS                                  SSSSSSSSS
     :SSSSSSSSSSSSSSSSS                                  SSSSSSSSS
 4500+SSSSSSSSSSSSSSSSS                                  SSSSSSSSS
     :SSSSSSSSSSSSSSSSSS                                 SSSSSSSSS
     :SSSSSSSSSSSSSSSSSS                                 SSSSSSSSS
     :SSSSSSSSSSSSSSSSSS                                 SSSSSSSSS
     :SSSSSSSSSSSSSSSSSS                                 SSSSSSSSS
     :SSSSSSSSSSSSSSSSSS                                SSSSSSSSSS
 3000+SSSSSSSSSSSSSSSSSS                                SSSSSSSSSS
     :OOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
 1500+OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIOOOOOOOOOO
                             **************************
      123456789012345678901234567890123456789012345678901234567890

    LINK   202    MAX FLOW  4907 VEH/H     PLT. INDEX  .74

 5000+            OOOOOOOOOOO
     :    OOOOOOOOOOOOOOOOOOO
     :  OOOOOOOOOOOOOOOOOOOOOO
     : OOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOO
 3750+OOOOOOOOOOOOOOOOOOOOOOOOO                                  O
     :OOOOOOOOOOOOOOOOOOOOOOOOO                                  O
     :OOOOOOOOOOOOOOOOOOOOOOOOOO                                 O
     :OOOOOOOOOOOOOOOOOOOOOOOOOOO                               OO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOO                              OO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOO                             OO
 2500+OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                            OO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                           OOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                           OOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                           OOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                          OOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                      OOO
 1250+OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                      OOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                    OOOO
```

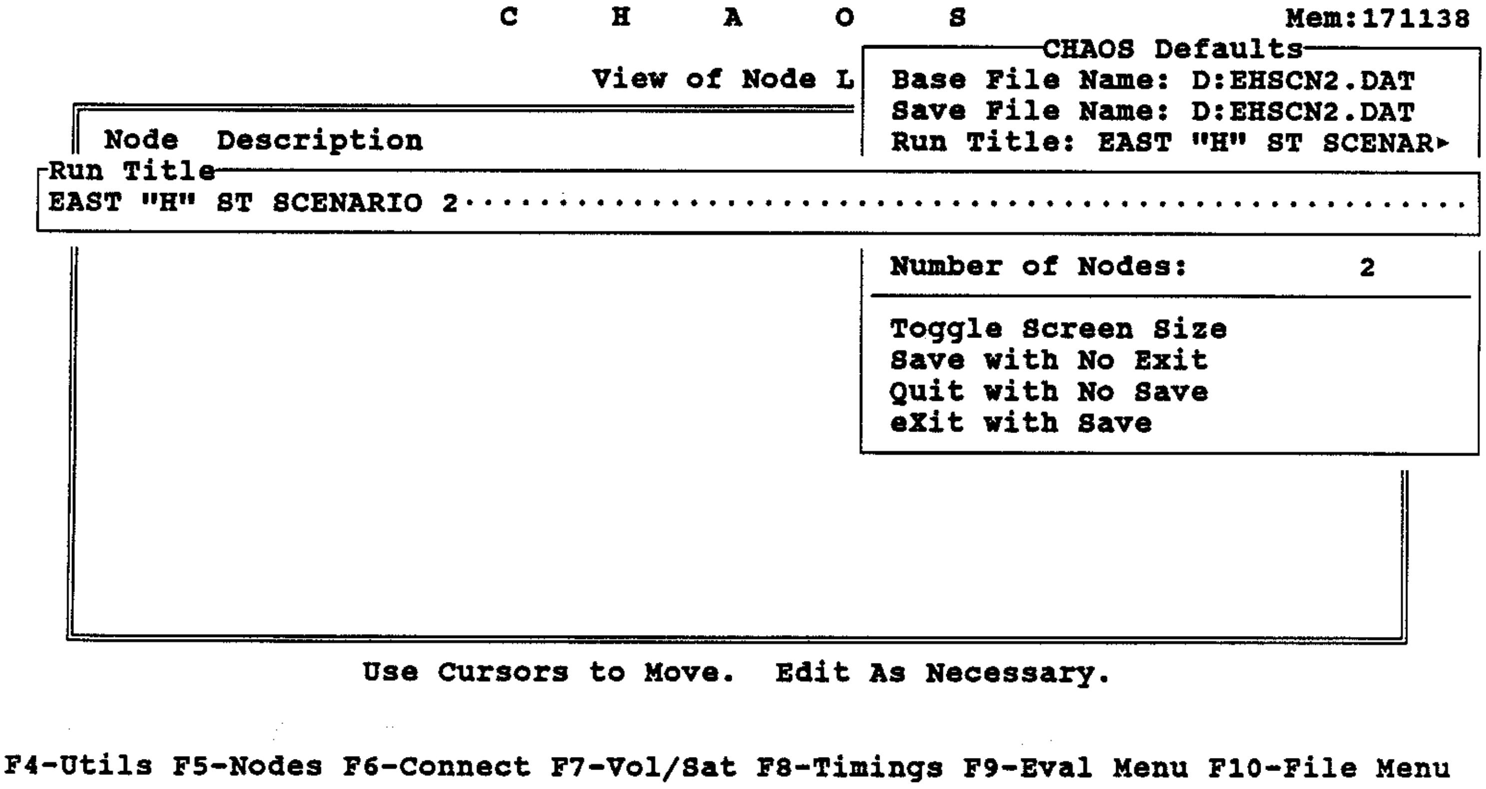
```
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                    OOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO                   OOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO       O         OOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO OOOO      OOOO

      123456789012345678901234567890123456789012345678901234567890
1TRANSYT-7F:                                                          PAGE 13

 *****EAST "H" STREET*****
 CYCLE:  100 SECONDS,   60 STEPS

    LINK   106     MAX FLOW  5400 VEH/H     PLT. INDEX  .00

 6000+
     :
     :SSSSS                                                    SSS
     :SSSSS                                                    SSS
     :SSSSS                                                    SSS
     :SSSSS                                                    SSS
 4500+SSSSS                                                    SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
 3000+SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
     :SSSSSS                                                   SSS
 1500+SSSSSS                                                   SSS
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIOOO
                              ********************************
      123456789012345678901234567890123456789012345678901234567890

    LINK   206     MAX FLOW  1706 VEH/H     PLT. INDEX  .00

 2000+
     :
     :
     :
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
 1500+OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
 1000+OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
```

```
   500+OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
       :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
       :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
       :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
       :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
       :OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

        123456789012345678901234567890123456789012345678901234567890
1TRANSYT-7F:                                                           PAGE 14

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS


  SYMBOL KEYS:

     FLOW PROFILE SYMBOLS (VERTICAL AXIS IS IN VPH).
         I :  ARRIVALS WHICH QUEUE, NORMALLY ON RED ON UNOPPOSED LINKS OR
              DURING PERIODS OF HEAVY OPPOSING FLOW ON OPPOSED LINKS DURING
              THE PERMITTED PHASE(S).
         S :  DEPARTURES FROM QUEUE, NORMALLY AT THE SATURATION FLOW RATE
              FOR "PROTECTED" LINKS, OR MAXIMUM FLOW RATE FOR PERMITTED,
              OPPOSED LINKS.
         O :  ARRIVALS AND DEPARTURES ON GREEN. WHEN BELOW S'S OR I'S, THESE
              ARRIVALS JOIN THE BACK OF THE QUEUE.


      TIME SCALE (VERTICAL AXIS):
   (BLANK) :  PROTECTED GREEN INTERVALS OR UNOPPOSED MOVEMENTS.
         . :  PERMITTED GREEN INTERVALS WITH OPPOSING TRAFFIC.
         * :  RED INTERVALS.
         N :  THE NUMBERS ACROSS THE BOTTOM ARE A TIME SCALE IN
              UNITS OF STEPS.

 NOTE: THE FLOW PROFILE DIAGRAM SHOWS EFFECTIVE GREEN AND RED, NOT ACTUAL.
       OFFSETS ARE NOT ADJUSTED TO MASTER CONTROLLER IF ANY.
1TRANSYT-7F:                                                           PAGE 15

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,   60 STEPS

 <ROUTE SUMMARY REPORT>
 *****EAST "H" STREET*****

 MOVEMENT/          TOTAL  TOTAL  TOTAL    AVG.   UNIFORM     MAX. BACK    FUEL
 NODE NOS.   V/C   TRAVEL   TIME  DELAY   DELAY    STOPS      OF  QUEUE   CONS.
             (%)   (V-MI) (V-HR) (V-HR) (SEC/V)  NO.  (%)     NO.  CAP.    (GA)
 ----------------------------------------------------------------------------
    102     : 92      .00  17.58  17.58    23.2 2287.( 84)    68 >   0   25.52
    202     : 48   221.08   8.68    .00      .0    0.(  0)     0    54    9.85

     DOWN   : 92   221.08  26.26  17.58    11.9 2287.( 43)                35.38

    106     : 48    96.28   9.89   6.11    19.5  745.( 66)    21    54   11.74
    206     : 24      .00    .00    .00      .0    0.(  0)     0     0     .00

     UP     : 48    96.28   9.89   6.11     7.8  745.( 26)                11.74

1TRANSYT-7F:                                                           PAGE 16
```

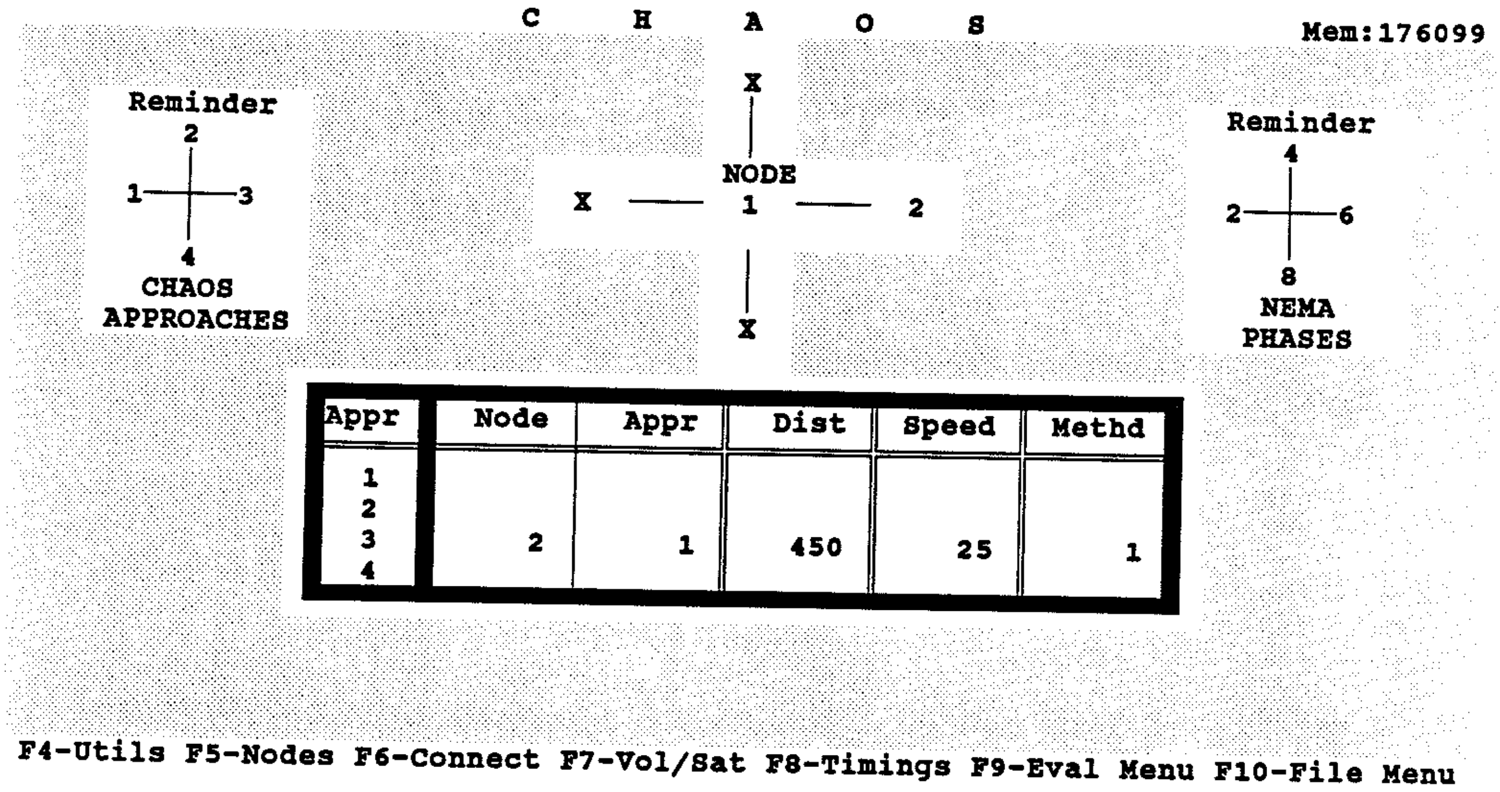
```
 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,    60 STEPS


 <ROUTE TOTALS>

 PERFORMANCE TOTAL  TOTAL TOTAL AVG.      UNIFORM    FUEL  TOTAL SYSTEM PERFOR-
 MEASURES    TRAVEL TIME  DELAY DELAY      STOPS     CONS. COST  SPEED   MANCE
              V-MI  V-HR  V-HR  SEC/V     NO. (%)     GA          MI/H   INDEX
 ------------------------------------------------------------------------------

 <TOTALS>     317    36    24  10.5     3032( 37)     47   100    17.1    33.0

 ------------------------------------------------------------------------------

 NOTE: PERFORMANCE INDEX IS DEFINED AS:

       PI = DELAY + STOPS

 NO. OF SIMULATIONS =  53  NO. OF LINKS = 321  ELAPSED TIME =   624.6 SEC.
1TRANSYT-7F:                                                       PAGE 17

 EAST "H" ST SCENARIO 1
 CYCLE:  100 SECONDS,    60 STEPS

  TERMINATION CARD

  90    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0

 --- PROGRAM NOTE --- END OF JOB!
1
```



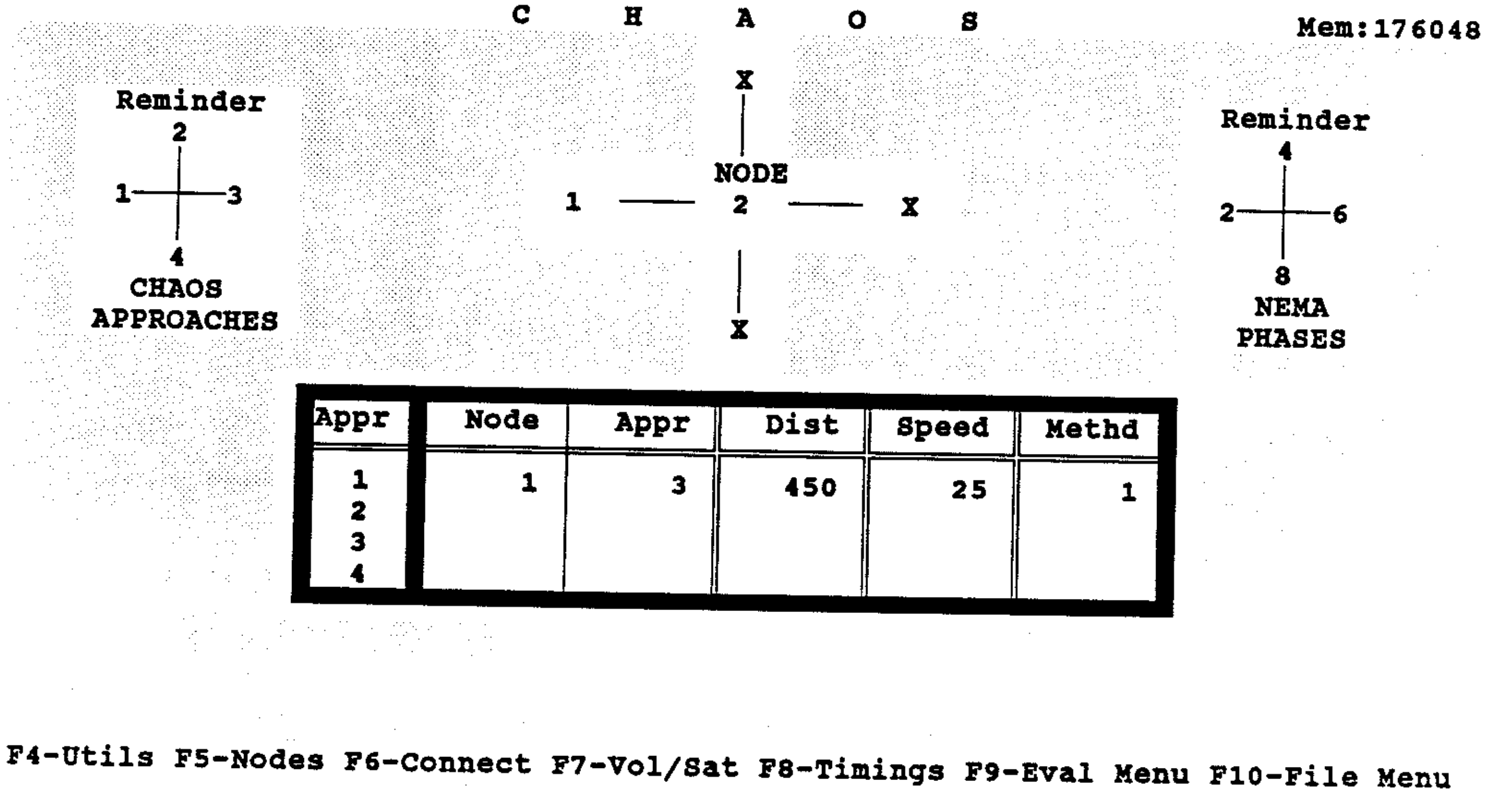
```
                    C     H     A     O     S                    Mem:176107

                              View of Node List
 ╔══════════════════════════════════════════════════════════════════════╗
 ║ Node  Description                                Rt1  Rt2  Rt3  Rt4  ║
 ║    1  EAST "H" ST & HIDDEN VISTA DR               1*                 ║
 ║    2  EAST "H" ST & DW4 (HOME DEPOT)              2                  ║
 ║                                                                      ║
 ╚══════════════════════════════════════════════════════════════════════╝
                   Use Cursors to Move.  Edit As Necessary.

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu
```



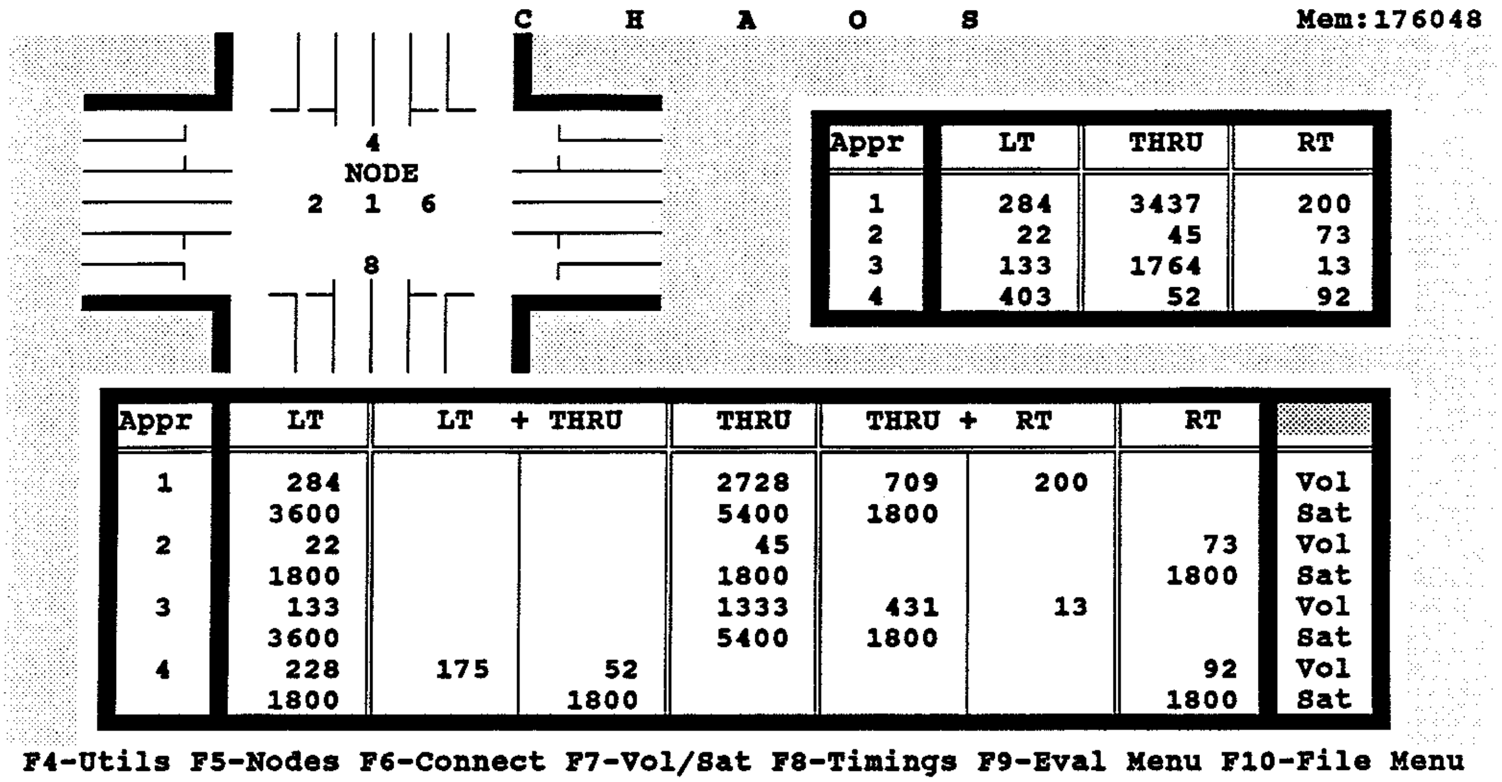
```
                    C     H     A     O     S                    Mem:171138
                                          ┌──────────CHAOS Defaults──────┐
                              View of Node L│ Base File Name: D:EHSCN2.DAT │
 ╔══════════════════════════════════════════│ Save File Name: D:EHSCN2.DAT │
 ║ Node  Description                        │ Run Title: EAST "H" ST SCENAR▸
┌Run Title──────────────────────────────────────────────────────────────────┐
│EAST "H" ST SCENARIO 2·······················································│
└───────────────────────────────────────────────────────────────────────────┘
 ║                                        │ Number of Nodes:           2  │
 ║                                        │ ──────────────────────────────│
 ║                                        │ Toggle Screen Size            │
 ║                                        │ Save with No Exit             │
 ║                                        │ Quit with No Save             │
 ║                                        │ eXit with Save                │
 ║                                        └───────────────────────────────┘
 ║                                                                      ║
 ╚══════════════════════════════════════════════════════════════════════╝
                   Use Cursors to Move.  Edit As Necessary.

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu
```



Appr	Node	Appr	Dist	Speed	Methd
1					
2					
3	2	1	450	25	1
4					

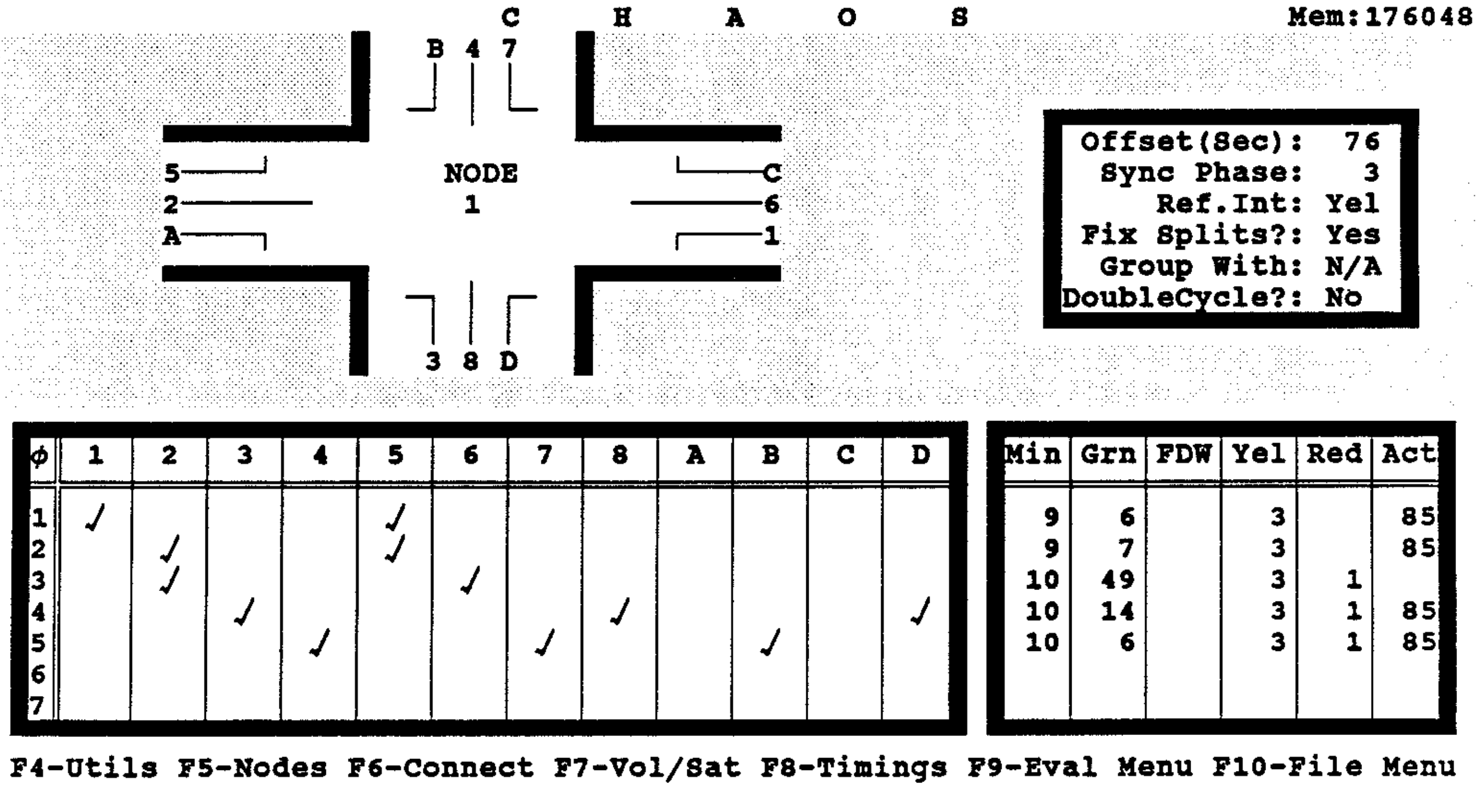


Appr	Node	Appr	Dist	Speed	Methd
1	1	3	450	25	1
2					
3					
4					



Appr	LT	THRU	RT
1	284	3437	200
2	22	45	73
3	133	1764	13
4	403	52	92

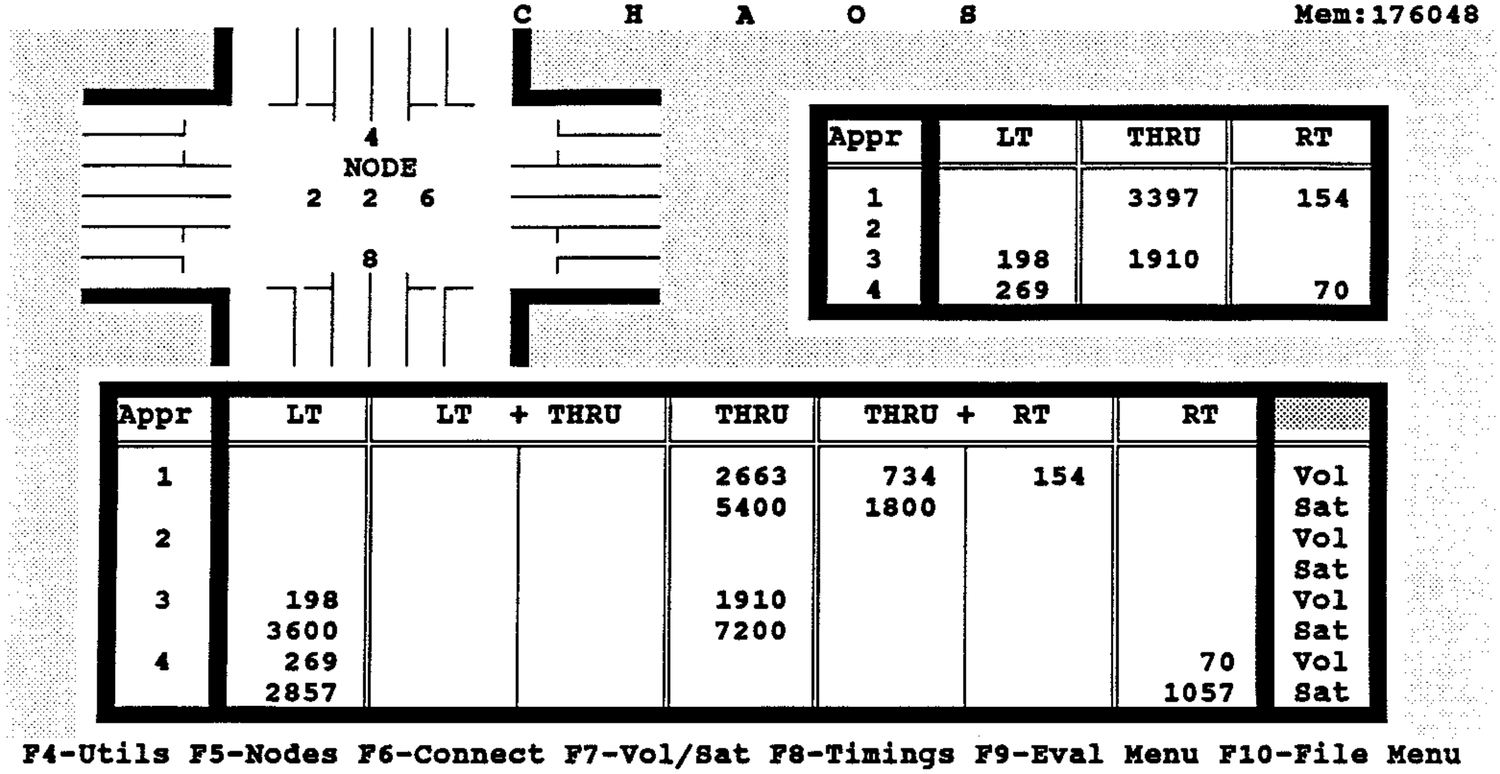
Appr	LT	LT + THRU		THRU	THRU + RT		RT	▨
1	284			2728	709	200		Vol
	3600			5400	1800			Sat
2	22			45			73	Vol
	1800			1800			1800	Sat
3	133			1333	431	13		Vol
	3600			5400	1800			Sat
4	228	175	52				92	Vol
	1800		1800				1800	Sat



Offset(Sec): 76
Sync Phase: 3
Ref.Int: Yel
Fix Splits?: Yes
Group With: N/A
DoubleCycle?: No

ϕ	1	2	3	4	5	6	7	8	A	B	C	D
1	✓				✓							
2		✓			✓							
3		✓				✓						
4			✓					✓				✓
5				✓			✓			✓		
6												
7												

Min	Grn	FDW	Yel	Red	Act
9	6		3		85
9	7		3		85
10	49		3	1	
10	14		3	1	85
10	6		3	1	85



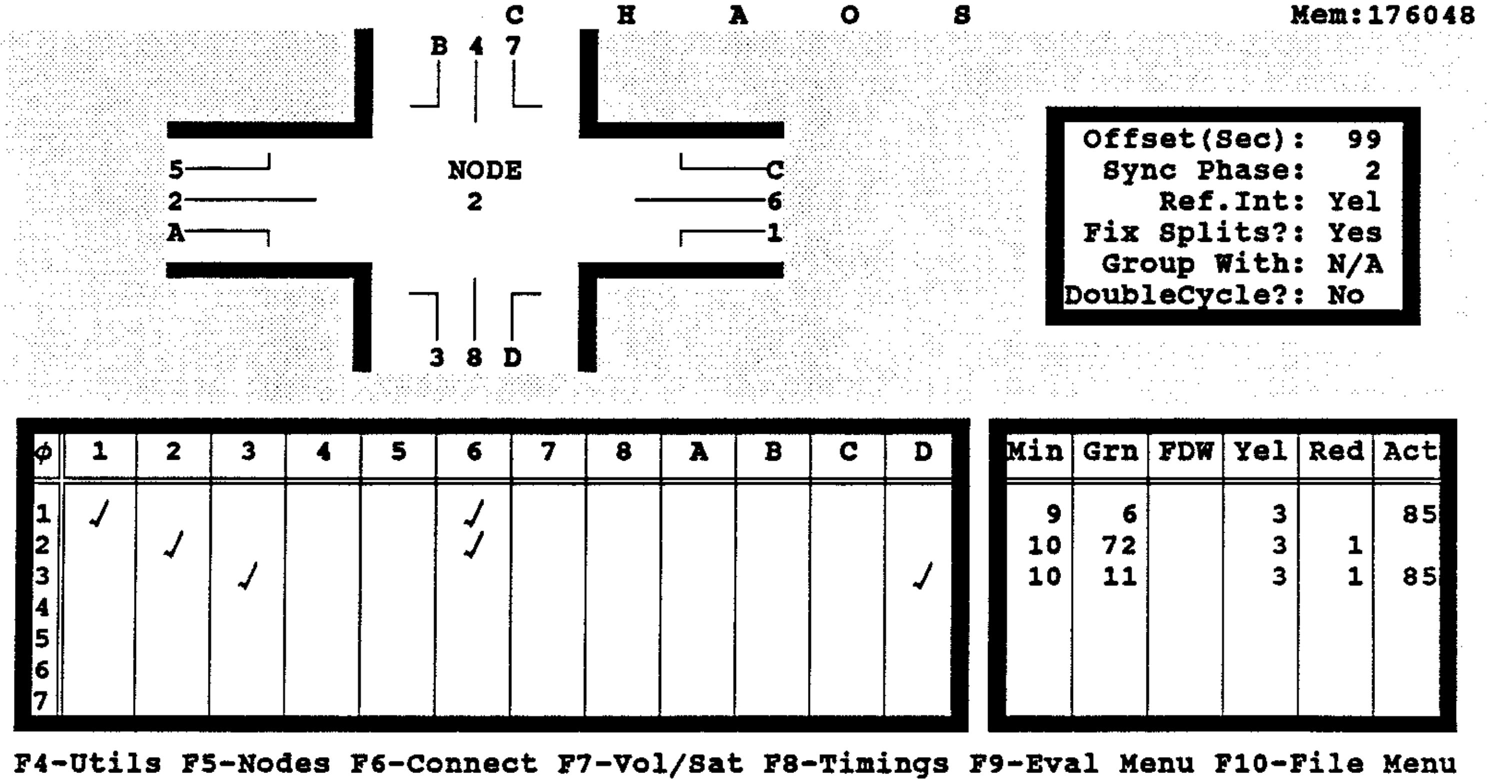
C H A O S

Mem:176048

Appr	LT	THRU	RT
1		3397	154
2			
3	198	1910	
4	269		70

Appr	LT	LT + THRU		THRU	THRU + RT		RT	▨
1				2663	734	154		Vol
				5400	1800			Sat
2								Vol
								Sat
3	198			1910				Vol
	3600			7200				Sat
4	269						70	Vol
	2857						1057	Sat

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu



C H A O S

Mem:176048

Offset(Sec): 99
Sync Phase: 2
Ref.Int: Yel
Fix Splits?: Yes
Group With: N/A
DoubleCycle?: No

φ	1	2	3	4	5	6	7	8	A	B	C	D
1	✓					✓						
2		✓				✓						
3			✓									✓
4												
5												
6												
7												

Min	Grn	FDW	Yel	Red	Act
9	6		3		85
10	72		3	1	
10	11		3	1	85

F4-Utils F5-Nodes F6-Connect F7-Vol/Sat F8-Timings F9-Eval Menu F10-File Menu

```
 --------------------
 PLOT AND OPTION CARDS
 --------------------

  52    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0

 --- PROGRAM NOTE --- A CARD TYPE 52 CAUSES RUN TO BE OPTIMIZED USING THE
                      DEFAULT NORMAL OPTIMIZATION STEP SIZES.
                      IF CARD TYPE 4 WAS INPUT, IT IS IGNORED.

                      THE ABOVE WILL BE PROCESSED AFTER THE "BEST" CYCLE
                      LENGTH HAS BEEN SELECTED.

 --- PROGRAM NOTE --- NO ERRORS DETECTED. TRANSYT-7F PERFORMS FINAL PROCESSING.
                      IF ERRORS ARE DETECTED, FURTHER PROCESSING IS SUSPENDED.

 --- PROGRAM NOTE --- THERE ARE A TOTAL OF   2 NODES AND  22 LINKS,
                      INCLUDING BOTTLENECKS, IF ANY, IN THIS RUN.

 --- PROGRAM NOTE --- THERE WERE A TOTAL OF   4 WARNING MESSAGES ISSUED
                      IN THE ABOVE REPORT.
1TRANSYT-7F:                                                          PAGE  4

 EAST "H" ST SCENARIO 2


                    ------------------------------------
                    CYCLE EVALUATION SUMMARY PERFORMANCE
                    ------------------------------------

  CYCLE    STEP   AVERAGE  PERCENT       FUEL      PERFORMANCE  NUMBER
 LENGTH    SIZE    DELAY    STOPS     CONSUMPTION     INDEX    SATURATED
  (SEC)  (STEPS) (SEC/VEH)   (%)        (GAL/HR)                 LINKS
 ---------------------------------------------------------------------

    80      27     14.89     49          90.6          69.8        0

    90      30     14.18     47          87.0          66.3        0

   100      33     14.38     46          86.9          66.2        0

   110      37     15.06     44          87.3          66.5        0

   120      40     15.56     43          88.3          67.5        0

 ---------------------------------------------------------------------


     BEST CYCLE LENGTH = 100 SEC.   CYCLE SENSITIVITY =   2.3 %

 --- PROGRAM NOTE --- TRANSYT-7F OPTIMIZES THE SYSTEM USING THE BEST
                      CYCLE LENGTH AND HILL-CLIMB STEP SIZES AS
                      INDICATED BY CARD TYPE 52.
1TRANSYT-7F:                                                   PAGE  5

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS
```

```
 <PERFORMANCE WITH OPTIMAL SETTINGS>

 MOVEMENT/          TOTAL   TOTAL   TOTAL    AVG.    UNIFORM     MAX.  BACK    FUEL
 NODE NOS.  V/C    TRAVEL   TIME    DELAY   DELAY     STOPS      OF   QUEUE   CONS.
            (%)    (V-MI)  (V-HR)  (V-HR)  (SEC/V)   NO. (%)     NO.   CAP.    (GA)
 ------------------------------------------------------------------------------------
    101    : 53    11.32    2.39    1.94    52.6   127.( 96)     4     20      2.43
 EB 102    : 84      .00   12.97   12.97    17.1  2012.( 74)    61>     0     20.62
    103    : 84      .00    3.61    3.61    57.0   211.( 93)     6>     0      3.81
    104    : 36      .00     .59     .59    47.2    41.( 91)     1>     0       .66
    105    : 46      .00    2.96    2.96    37.5   244.( 86)     7     20      3.51
 WB 106    : 49   113.48    9.88    5.43    14.7   861.( 65)    25     54     12.47
    107    : 17      .00     .27     .27    44.3    20.( 90)     1>     0       .31
    113   S: 84      .00    2.75    2.75    56.5   162.( 93)   118    118S     2.91
    118   P: 84      .00     .82     .82    56.5    48.( 93)     6>     0       .86
    122   P: 84      .00    3.94    3.94    20.0   523.( 74)    20>     0      5.77
    126   P: 49    36.69    3.28    1.84    15.3   279.( 65)     9     18      4.09
    132   S: 84      .00    1.11    1.11    20.0   147.( 74)   122    122S     1.63
    136   S: 49     1.11     .10     .06    16.9    11.( 84)   126    126S      .19
    144    : 58      .00    1.09    1.09    53.5    68.( 93)     2>     0      1.17
    148    : 34      .00     .99     .99    38.6    78.( 85)     2>     0      1.15

 NODE     1: 84   162.59   46.73   40.35    22.3  4832.( 74)                  61.59

    201    : 79      .00    3.14    3.14    57.1   187.( 94)     5     20      3.33
    202    : 68   226.70    9.40     .50      .7    30.(  1)     1     54     10.59
    203    : 78      .00    3.79    3.79    50.8   250.( 93)     7>     0      4.16
    206    : 32      .00    1.10    1.10     2.1   371.( 19)    12>     0      2.85
    222   P: 68    62.48    2.81     .36     1.8    15.(  2)     1     18      3.11
    232   S: 68    13.11     .62     .11     2.6    11.(  7)   222    222S      .71
    248    : 55      .00     .95     .95    48.9    63.( 90)     2>     0      1.04

 NODE     2: 79   302.29   21.82    9.95     6.0   926.( 15)                  25.80
 ------------------------------------------------------------------------------------

1TRANSYT-7F:
                                                                          PAGE  6

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS


 <SYSTEM WIDE TOTALS INCLUDING ALL LINKS>

 PERFORMANCE TOTAL  TOTAL TOTAL AVG.     UNIFORM      FUEL  SYSTEM TOTAL PERFOR-
 MEASURES    TRAVEL TIME  DELAY DELAY     STOPS       CONS. SPEED  COST  MANCE
             V-MI   V-HR  V-HR  SEC/V    NO. (%)       GA   MI/H         INDEX
 -------------------------------------------------------------------------------

 <TOTALS>     465     69    50  14.5    5758( 46)      87   16.3   266    66.6

 -------------------------------------------------------------------------------

 NOTE: PERFORMANCE INDEX IS DEFINED AS:

       PI = DELAY + STOPS

 NO. OF SIMULATIONS =    5  NO. OF LINKS =  91  ELAPSED TIME =   232.3 SEC.
1TRANSYT-7F:
                                                                         PAGE  7

 EAST "H" ST SCENARIO 2
```

```
 CYCLE:  100 SECONDS,   60 STEPS

 ------------------------------------
 TRANSYT-7F SIGNAL CONTROLLER SETTINGS
 ------------------------------------



 ------------------------------
 NETWORK-WIDE SIGNAL TIMING DATA
 ------------------------------

 SYSTEM CYCLE LENGTH =  100 SECONDS

 NO MASTER OFFSET REFERENCE CONTROLLER SPECIFIED

 ALL OFFSETS ARE REFERENCED TO AN ARBITRARY TIME BASE.

 NETWORK INCLUDES ACTUATED SIGNAL - GREEN TIMES ARE ESTIMATED.


 ------------------------------
 INTERSECTION CONTROLLER SETTINGS
 ------------------------------


 ----------------------------------------------
 INTERSECTION     1   ACTUATED - SPLITS ESTIMATED
 ----------------------------------------------

 INTERVAL  NUMBER :      1   2   3   4   5   6   7   8   9  10  11  12  13

 INTVL LENGTH(SEC):     6M   3   7   3  49   3   1  14   3   1  6M   3   1
 INTVL LENGTH  (%):      6   3   7   3  49   3   1  14   3   1   6   3   1

 PIN SETTINGS  (%): 100/0   6   9  16  19  68  71  72  86  89  90  96  99

 PHASE START (NO.):      1 ACT   2 ACT   3 NAP      4 ACT       5 ACT

 INTERVAL   TYPE  :      V   Y   V   Y   V   Y   R   V   Y   R   V   Y   R

 SPLITS      (SEC):      9      10      53          18          10
 SPLITS        (%):      9      10      53          18          10


 LINKS  MOVING   :     105     105     102         103         107
                       101     102     122         113         104
                               122     132         118         144
                               132     106         148
                                       126
                                       136

 OFFSET =  76 SEC.  76 %; REFERENCED TO START OF INTERVAL NO.   6
1TRANSYT-7F:                                                      PAGE  8

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS
```

```
 ------------------------------------------------
 INTERSECTION     2   ACTUATED - SPLITS ESTIMATED
 ------------------------------------------------

 INTERVAL  NUMBER :      1   2   3   4   5   6   7   8

 INTVL LENGTH(SEC):      6   3  72   3   1  11   3   1
 INTVL LENGTH  (%):      6   3  72   3   1  11   3   1

 PIN SETTINGS  (%): 100/0   6   9  81  84  85  96  99

 PHASE START (NO.):      1 ACT   2 NAP      3 ACT

 INTERVAL   TYPE  :      V   Y   V   Y   R   V   Y   R

 SPLITS      (SEC):      9      76          15
 SPLITS        (%):      9      76          15


 LINKS  MOVING  :      201     202         203
                       206     222         248
                               232
                               206

 OFFSET =  99 SEC.  99 %; REFERENCED TO START OF INTERVAL NO.   4

 +++ 195 +++ WARNING +
+                      THE YIELD POINT FALLS WITHIN 1% OF AN INTERVAL
                       CHANGE POINT AT THE START OF INTERVAL NO  1.
1TRANSYT-7F:                                                     PAGE  9

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS


                  ----------------------------------
                  INPUT DATA REPORT FOR ROUTE NO.  1
                  ----------------------------------
  60    1    0    5  200    1    1    0    0    0    0    0    0    0    0    0

 TITLE

 *****EAST "H" STREET*****
  61  102  106  202  206    0    0    0    0    0    0    0    0    0    0    0
1TRANSYT-7F:                                                     PAGE 10

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS

        < T R A N S Y T - 7 F   T I M E - S P A C E   D I A G R A M >

 ROUTE NO.  1

 ROUTE TITLE: *****EAST "H" STREET*****


 TIME AXIS IS IN: SEC   TIME SCALE =   5 SEC/CHAR,  DIST. SCALE =  200 FT/LINE
```

```
                   1         2         3         4         5         6
    NODE  123456789012345678901234567890123456789012345678901234567890 DISTANCE
         :-----------------------------------------------------------
       1 :***++           *******++           *******++           ****    0 FT
         |                   |                   |
       2 : ***-                ***-                ***-                  450 FT
         :-----------------------------------------------------------
    NODE  123456789012345678901234567890123456789012345678901234567890 DISTANCE
                   1         2         3         4         5         6

          SCALE CONVERSIONS:                       +++ GREEN IN DOWN DIRECTION
          TIME/INCH =  5 * 10 (AT 10 CHAR/INCH)        GREEN IN BOTH DIRECTIONS
          DIST/INCH = 200 * 6 (AT 6 LINES/INCH)    --- GREEN IN UP   DIRECTION
          AVG. TIME DISPLACEMENT =   61.36/SPEED   *** RED IN BOTH DIRECTIONS
 1TRANSYT-7F:                                                     PAGE 11

  EAST "H" ST SCENARIO 2
  CYCLE:  100 SECONDS,   60 STEPS

         < T R A N S Y T - 7 F   F L O W   P R O F I L E   D I A G R A M S >


   ROUTE TITLE:
   *****EAST "H" STREET*****



   SYMBOL KEYS:

      FLOW PROFILE SYMBOLS (VERTICAL AXIS IS IN VPH).
          I :  ARRIVALS WHICH QUEUE, NORMALLY ON RED ON UNOPPOSED LINKS OR
               DURING PERIODS OF HEAVY OPPOSING FLOW ON OPPOSED LINKS DURING
               THE PERMITTED PHASE(S).
          S :  DEPARTURES FROM QUEUE, NORMALLY AT THE SATURATION FLOW RATE
               FOR "PROTECTED" LINKS, OR MAXIMUM FLOW RATE FOR PERMITTED,
               OPPOSED LINKS.
          O :  ARRIVALS AND DEPARTURES ON GREEN. WHEN BELOW S'S OR I'S, THESE
               ARRIVALS JOIN THE BACK OF THE QUEUE.


       TIME SCALE (VERTICAL AXIS):
    (BLANK) :  PROTECTED GREEN INTERVALS OR UNOPPOSED MOVEMENTS.
          . :  PERMITTED GREEN INTERVALS WITH OPPOSING TRAFFIC.
          * :  RED INTERVALS.
          N :  THE NUMBERS ACROSS THE BOTTOM ARE A TIME SCALE IN
               UNITS OF STEPS.

  NOTE: THE FLOW PROFILE DIAGRAM SHOWS EFFECTIVE GREEN AND RED, NOT ACTUAL.
        OFFSETS ARE NOT ADJUSTED TO MASTER CONTROLLER IF ANY.

  NOTE: IN THE 80-COLUMN OUTPUT FORMAT, THE "DOWNBOUND" LINKS ARE PLOTTED
        CONTINUOUSLY FIRST, THEN THE "UPBOUND" LINKS ARE PLOTTED CONTINUOUSLY.
1TRANSYT-7F:                                                      PAGE 12

 *****EAST "H" STREET*****
 CYCLE:  100 SECONDS,   60 STEPS

     LINK   102    MAX FLOW  5400 VEH/H     PLT. INDEX  .00
```

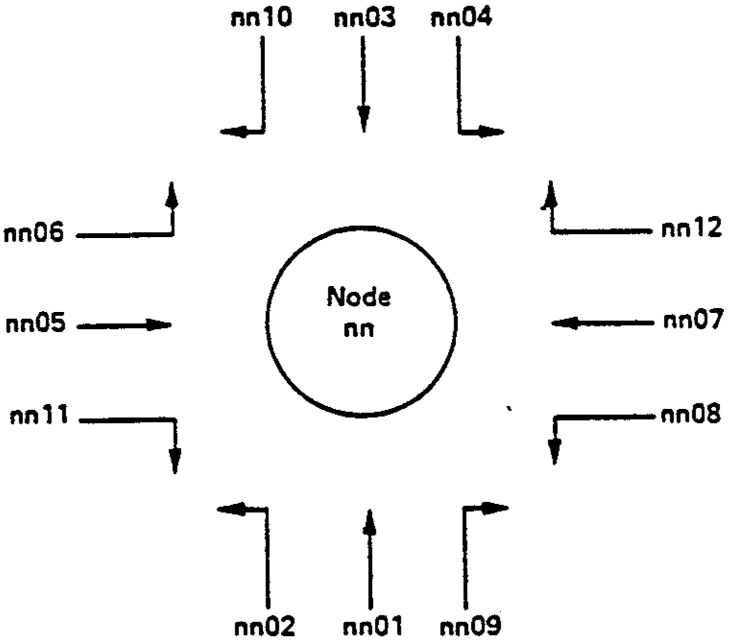
```
6000+
    :
    :            SSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSS
4500+            SSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSSS
    :            SSSSSSSSSSSSSSSSSSSSSSSS
    :           SSSSSSSSSSSSSSSSSSSSSSSSS
3000+           SSSSSSSSSSSSSSSSSSSSSSSSS
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
1500+IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
    :IIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
     ***********OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
                                                     ************
     123456789012345678901234567890123456789012345678901234567890

    LINK   202     MAX FLOW  5103 VEH/H      PLT. INDEX  .67
6000+
    :
    :
    :
    :                         OOOOOOOOOOOOOOOO
    :                       OOOOOOOOOOOOOOOOOOO
4500+                      OOOOOOOOOOOOOOOOOOOO
    :                     OOOOOOOOOOOOOOOOOOOOO
    :                    OOOOOOOOOOOOOOOOOOOOOOO
    :                    OOOOOOOOOOOOOOOOOOOOOOO
    :                    OOOOOOOOOOOOOOOOOOOOOOOO
    :                   OOOOOOOOOOOOOOOOOOOOOOOOOO
3000+                   OOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 S OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 S OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
1500+                 SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :                 OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :O                OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
    :OOIII III        OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
       ***************
     123456789012345678901234567890123456789012345678901234567890
```

```
     LINK   106    MAX FLOW  5400 VEH/H     PLT. INDEX  .23

 6000+
     :
     :                  SSSSSSSSS
     :                  SSSSSSSSS
     :                  SSSSSSSSS
     :                  SSSSSSSSS
 4500+                  SSSSSSSSSS
     :                  SSSSSSSSSS
     :                  SSSSSSSSSS
     :                  SSSSSSSSSS
     :                  SSSSSSSSSS
     :                 SSSOOSSSSSS
 3000+                 SSSOOSSSSSS
     :                 SSOOOSSSSSS
     :                 SSOOOOSSSSS
     :                 SSOOOOSSSSS
     :                 SSOOOOOSSSS
     :                 SOOOOOOOSSS
 1500+           III   SOOOOOOOOOS
     :IIIIIII   IIIII  SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
     :IIIIIIII IIIIIII SOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
     :IIIIIIIIIIIIIIIIISOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
     :IIIIIIIIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
     :IIIIIIIIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOIIIIIIIIIIII
      *****************                               ************
      123456789012345678901234567890123456789012345678901234567890

     LINK   206    MAX FLOW  7200 VEH/H     PLT. INDEX  .00

 8000+
     :
     :            SSS
     :            SSS
     :            SSS
     :            SSS
 6000+            SSS
     :            SSSS
     :            SSSS
     :            SSSS
     :            SSSS
     :            SSSS
 4000+            SSSS
     :            SSSS
     :            SSSS
     :            SSSS
     :            SSSS
     :            SSSS
 2000+OIIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OIIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
     :OOIIIIIIIIIIOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
        *********
      123456789012345678901234567890123456789012345678901234567890
```

```
 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS


  SYMBOL KEYS:

     FLOW PROFILE SYMBOLS (VERTICAL AXIS IS IN VPH).
         I :  ARRIVALS WHICH QUEUE, NORMALLY ON RED ON UNOPPOSED LINKS OR
              DURING PERIODS OF HEAVY OPPOSING FLOW ON OPPOSED LINKS DURING
              THE PERMITTED PHASE(S).
         S :  DEPARTURES FROM QUEUE, NORMALLY AT THE SATURATION FLOW RATE
              FOR "PROTECTED" LINKS, OR MAXIMUM FLOW RATE FOR PERMITTED,
              OPPOSED LINKS.
         O :  ARRIVALS AND DEPARTURES ON GREEN. WHEN BELOW S'S OR I'S, THESE
              ARRIVALS JOIN THE BACK OF THE QUEUE.


      TIME SCALE (VERTICAL AXIS):
   (BLANK) :  PROTECTED GREEN INTERVALS OR UNOPPOSED MOVEMENTS.
         . :  PERMITTED GREEN INTERVALS WITH OPPOSING TRAFFIC.
         * :  RED INTERVALS.
         N :  THE NUMBERS ACROSS THE BOTTOM ARE A TIME SCALE IN
              UNITS OF STEPS.

 NOTE: THE FLOW PROFILE DIAGRAM SHOWS EFFECTIVE GREEN AND RED, NOT ACTUAL.
       OFFSETS ARE NOT ADJUSTED TO MASTER CONTROLLER IF ANY.
1TRANSYT-7F:
                                                                  PAGE 15

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS

 <ROUTE SUMMARY REPORT>
 *****EAST "H" STREET*****

 MOVEMENT/          TOTAL   TOTAL   TOTAL    AVG.    UNIFORM    MAX. BACK     FUEL
 NODE NOS.   V/C   TRAVEL    TIME   DELAY   DELAY     STOPS     OF  QUEUE    CONS.
             (%)   (V-MI)  (V-HR)  (V-HR)  (SEC/V)  NO.  (%)   NO.  CAP.     (GA)
 -------------------------------------------------------------------------------
    102     : 84      .00   12.97   12.97    17.1 2012.( 74)    61 >   0    20.62
    202     : 68   226.70    9.40     .50      .7   30.(  1)     1    54    10.59

     DOWN   : 84   226.70   22.37   13.47     9.0 2042.( 38)                31.21

    106     : 49   113.48    9.88    5.43    14.7  861.( 65)    25    54    12.47
    206     : 32      .00    1.10    1.10     2.1  371.( 19)    12 >   0     2.85

     UP     : 49   113.48   10.98    6.53     7.2 1231.( 38)                15.32

1TRANSYT-7F:
                                                                  PAGE 16

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS


 <ROUTE TOTALS>

 PERFORMANCE TOTAL  TOTAL TOTAL AVG.      UNIFORM     FUEL  TOTAL SYSTEM PERFOR-
 MEASURES    TRAVEL TIME  DELAY DELAY      STOPS      CONS. COST  SPEED    MANCE
              V-MI  V-HR  V-HR  SEC/V    NO. (%)       GA          MI/H    INDEX
```

```
 -----------------------------------------------------------------------------

 <TOTALS>      340      33     20   8.3     3273( 38)     47     99     17.6     31.4

 -----------------------------------------------------------------------------

 NOTE: PERFORMANCE INDEX IS DEFINED AS:

       PI = DELAY + STOPS

 NO. OF SIMULATIONS =   5  NO. OF LINKS =  91  ELAPSED TIME =   234.6 SEC.
1TRANSYT-7F:                                                       PAGE 17

 EAST "H" ST SCENARIO 2
 CYCLE:  100 SECONDS,   60 STEPS

  TERMINATION CARD

  90    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0

 --- PROGRAM NOTE --- END OF JOB!
1
```

Appendix B
T7F Runs-Telegraph Canyon Road



Notes: 1. 'nn' is the node number.

2. Other special links will be numbered nnxx, where xx >12, and must be user-assigned. This applies to bus links, shared stopline links or diagonal links.

FIGURE 4.4 RECOMMENDED NODE/LINK IDENTIFICATION SCHEME

Intersection Node Numbers

1. Telegraph Canyon Road/NB I-805 Off Ramp
2. Telegraph Canyon Road/Halecrest
3. Telegraph Canyon Road/Crest
4. Telegraph Canyon Road/Paseo Del Rey

```
         T R A N S Y T - 7 F -- T R A F F I C   S I G N A L   S Y S T E M   O P T I M I Z A T I O N   P R O G R A M

 RELEASE 5  OCTOBER 1988                                                                                 VERSION 2.0

 SPONSORED BY:                                                                                        DEVELOPED BY:
 FEDERAL HIGHWAY ADMINISTRATION                                                   TRANSPORT AND ROAD RESEARCH LABORATORY
 OFFICE OF TRAFFIC OPERATIONS                                                                     UNITED KINGDOM AND
                                                                                        TRANSPORTATION RESEARCH CENTER
                                                                                                UNIVERSITY OF FLORIDA

 DATE OF RUN: 10/19/90  START TIME OF RUN:   13:57:27

                              ----------------------------------------------
                              I N P U T   D A T A   R E P O R T   F O R   R U N   1
                              ----------------------------------------------
```

AM
100 Sec Cycle

```
 FIELDS:  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16
         ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----

 LINE                                              RUN  TITLE  CARD
  NO.    TITLE

   1)    TELEGRAPH CANYON RD AM PEAK  BASE OPTIMIZATION

                                            NETWORK  CONTROL  CARD
                                    SEC/   SEC/
 LINE   CARD    MIN    MAX   CYCLE  STEP   STEP    LOST   GREEN   STOP  OUTPUT INITIAL PERIOD SEC(0) SPD(0) ENGL(0) PNCH
  NO.   TYPE   CYCLE  CYCLE  INCR.  CYCLE NORMAL   TIME   EXTEN. PENALTY LEVEL TIMINGS LENGTH PERC(1) TIME(1) METR(1) DECK

   2)    1      70     110     5      3      1      2      2      -1      0      1      60      0      0      0      0

 +++ 106 +++ WARNING + THE SEC/STEPS FACTOR IN FIELD 6 IS TOO SMALL FOR CYCLE
                       LENGTHS ABOVE  60 SECONDS. IT WILL BE INCREASED TO
                       ALLOW A MAXIMUM OF 60 STEPS/CYCLE.

 +++ 107 +++ WARNING + A STOP PENALTY OF "-1" WILL RESULT IN AUTOMATIC
                       CALCULATION OF THE PI TO MINIMIZE FUEL CONSUMPTION.
                       LINK SPECIFIC DELAY OR STOP WEIGHTS ON CARD
                       TYPE 37 & 38 WILL STILL BE APPLIED, HOWEVER.

   3) * COMMENT:----- OPTIMIZATION NODE LIST -----

 LINE   CARD                                    LIST  OF  NODES  TO  BE  OPTIMIZED
  NO.   TYPE

   4)    2      1      2      3      4      0      0      0      0      0      0      0      0      0      0      0

   5) * COMMENT:----- NETWORK MASTER -----

                                               SYSTEM  MASTER  DATA
 LINE   CARD  MASTER  SYSTEM DEFAULTS SYSTEM EXTERNAL SYSTEM  FUEL   VEHICLE ORIEN- DESIRED % OF SAT  MBQ   INFLAT  FUEL VEHICLE
  NO.   TYPE   NODE   YELLOW ALL-RED SATFLOW  SPEED    PDF   FACTOR  LENGTH TATION  SPLITS  2-CYC  WEIGHT  RATE   COST   OCC.

   6)    10      1      4      1     1700     30      35     100      25      0      85      25      40     100    125    120
```

```
FIELDS:  1      2      3      4      5      6      7      8      9      10     11     12     13     14     15     16
        ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----

   7) * COMMENT:***************** INTERSECTION 1  ****************

   8) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION    1
------------------
```

NB OFF RAMP

```
                                                 CONTROLLER  TIMING  DATA
LINE    CARD    NODE  OFFSET/             INTERVAL DURATIONS (SECS. OR PERCENT) ........................................ DOUBLE
 NO.    TYPE     NO.  YLD.PT.  REF INT  INT1    INT2    INT3    INT4    INT5    INT6    INT7    INT8    INT9   INT10   INT11  CYCLE

  9)     13       1      0       1       0       4       1       0       4       1       0       4       1       0       0      0

                                                   PHASE  TIMING  DATA
LINE    CARD    NODE     START  VARIAB. YELLOW  ALL-RED  MINIM.                                                            PHASE
 NO.    TYPE     NO.     INTVL   INTVL   INTVL   INTVL   SECS.   LINKS MOVING IN THIS PHASE ..............................  TYPE

 10)     21       1        1       1       2       3      10      105     106      0       0       0       0       0       0      0
 11)     22       1        4       4       5       6      10      112     107    105       0       0       0       0       0      0
 12)     23       1        7       7       8       9      10      102     109      0       0       0       0       0       0      0

  13) * COMMENT:----- LINK DATA -----

                                                        LINK  DATA
LINE    CARD    LINK   LINK     SAT.    TOTAL   MID-BLK. FIRST  INPUT LINK....    SECOND INPUT LINK....   THIRD INPUT LINK....  QUEUE
 NO.    TYPE     NO.  LENGTH    FLOW     VOL.     VOL.    NO.     VOL.   SPD/TT     NO.     VOL.  SPD/TT     NO.     VOL.  SPD/TT  CAP.

 14)     28     102     400     3400     210       0       0       0      30        0       0       0       0       0       0      0
 15)     28     105     400     5400    1545       0       0       0      30        0       0       0       0       0       0      0
 16)     28     106     400     3400     745       0       0       0      30        0       0       0       0       0       0      0
 17)     28     107     140     3600    1028       0     207     975      25      210      53      25       0       0       0      0
 18)     28     109     400     3400     680       0       0       0      30        0       0       0       0       0       0      0
 19)     28     112     140     3400    1350       0     207    1175      25      210     175      25       0       0       0      0

  20) * COMMENT:***************** INTERSECTION 2  ****************

  21) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION    2
------------------
```

HALECREST

```
                                                 CONTROLLER  TIMING  DATA
LINE    CARD    NODE  OFFSET/             INTERVAL DURATIONS (SECS. OR PERCENT) ........................................ DOUBLE
 NO.    TYPE     NO.  YLD.PT.  REF INT  INT1    INT2    INT3    INT4    INT5    INT6    INT7    INT8    INT9   INT10   INT11  CYCLE

 22)     13       2      0       1       0       4       1       0       4       1       0       4       1       0       0      0

                                                   PHASE  TIMING  DATA
LINE    CARD    NODE     START  VARIAB. YELLOW  ALL-RED  MINIM.                                                            PHASE
 NO.    TYPE     NO.     INTVL   INTVL   INTVL   INTVL   SECS.   LINKS MOVING IN THIS PHASE ..............................  TYPE
```

```
 FIELDS:  1       2       3       4       5       6       7       8       9      10      11      12      13      14      15      16
         ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----
  23)     21      2       1       1       2       3      10     205     206       0       0       0       0       0       0       0
  24)     22      2       4       4       5       6      10     205     207       0       0       0       0       0       0       0
  25)     23      2       7       7       8       9      10     204     210       0       0       0       0       0       0       0

  26) * COMMENT:----- LINK DATA -----

                                                                LINK  DATA
 LINE    CARD     LINK   LINK     SAT.   TOTAL   MID-BLK. FIRST INPUT LINK....     SECOND INPUT LINK....     THIRD INPUT LINK....  QUEUE
  NO.    TYPE      NO.  LENGTH    FLOW    VOL.    VOL.     NO.    VOL.    SPD/TT    NO.    VOL.    SPD/TT    NO.    VOL.   SPD/TT  CAP.

  27)     28      204    250     1700     25       0        0       0       0        0       0       0        0       0       0       0
  28)     28      205    130     5400   2025       0      105    1475      25      109     650      20        0       0       0       0
  29)     28      206    130     1700    100       0      105      70      25      109      30      20        0       0       0       0
  30)     28      207    600     7200   2165       0      307    1795      30      310      40      30      302     330      30       0
  31)     28      210    250     1700    228       0        0       0       0        0       0       0        0       0       0       0

  32) * COMMENT:***************** INTERSECTION 3  ****************

  33) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION     3
```

CREST

```
------------------
                                                     CONTROLLER  TIMING  DATA
LINE     CARD     NODE   OFFSET/          INTERVAL DURATIONS (SECS. OR PERCENT) ............................................ DOUBLE
NO.      TYPE      NO.   YLD.PT.   REF INT  INT1     INT2     INT3     INT4     INT5     INT6     INT7     INT8     INT9    INT10    INT11   CYCLE

 34)      15        3       0         1       0        4        1        0        4        1        0        4        1        0        4       0

                                                CONTROLLER  TIMING  DATA  (CONTINUED)
LINE     CARD     NODE     INTERVAL DURATIONS (SECS. OR PERCENT) ...................................................................
NO.      TYPE      NO.     INT12    INT13    INT14    INT15    INT16    INT17    INT18    INT19    INT20    INT21    INT22    INT23    INT24   INT25

 35)      18        3        1        0        4        1        0        0        0        0        0        0        0        0        0       0

                                                         PHASE  TIMING  DATA
LINE     CARD     NODE     START   VARIAB.  YELLOW   ALL-RED  MINIM.                                                                    PHASE
NO.      TYPE      NO.     INTVL    INTVL    INTVL    INTVL   SECS.    LINKS MOVING IN THIS PHASE .................................      TYPE

 36)      21        3        1        1        2        3       10     306      308       0        0        0        0        0        0       0
 37)      22        3        4        4        5        6        6     308      307       0        0        0        0        0        0       0
 38)      23        3        7        7        8        9       10     305      307       0        0        0        0        0        0       0
 39)      24        3       10       10       11       12       10     304      310       0        0        0        0        0        0       0
 40)      25        3       13       13       14       15       10     302        0       0        0        0        0        0        0       0

 41) * COMMENT:---- LINK DATA -----

                                                                LINK  DATA
LINE     CARD     LINK   LINK     SAT.   TOTAL   MID-BLK. FIRST INPUT LINK....     SECOND INPUT LINK....     THIRD INPUT LINK....  QUEUE
 NO.     TYPE      NO.  LENGTH    FLOW    VOL.    VOL.     NO.    VOL.    SPD/TT    NO.    VOL.    SPD/TT    NO.    VOL.   SPD/TT  CAP.
```

```
FIELDS:  1       2       3       4       5       6       7       8       9      10      11      12      13      14      15      16
        ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----    ----
 42)     28     302     200    3600     569       0       0       0       0       0       0       0       0       0       0       0
 43)     28     304     200    1700      48       0       0       0       0       0       0       0       0       0       0       0
 44)     28     305     900    5400    2007       0     205    1997      35     204      20      35       0       0       0       0
 45)     28     306     220    1700      38       0     205      32      35     204      10      35       0       0       0       0
 46)     28     307     700    5400    1756       0     407    1381      35     410     375      35       0       0       0       0
 47)     28     308     220    1700     139       0     407     114      35     410      25      35       0       0       0       0
 48)     28     310     200    1700      70       0       0       0       0       0       0       0       0       0       0       0

 49) * COMMENT:***************** INTERSECTION 4  ****************

 50) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION    4
------------------
```

PASEO DEL REY

```
                                                      CONTROLLER  TIMING  DATA
LINE   CARD    NODE  OFFSET/                INTERVAL DURATIONS (SECS. OR PERCENT) ........................................ DOUBLE
 NO.   TYPE     NO.  YLD.PT.   REF INT  INT1     INT2     INT3     INT4     INT5     INT6     INT7     INT8     INT9   INT10   INT11  CYCLE

 51)    14       4      0        1        0        4        1        0        4        1        0        4        1       0       4      0

                                                 CONTROLLER  TIMING  DATA  (CONTINUED)
LINE   CARD    NODE    INTERVAL DURATIONS (SECS. OR PERCENT) ..........................................................................
 NO.   TYPE     NO.    INT12    INT13    INT14    INT15    INT16    INT17    INT18    INT19    INT20    INT21    INT22    INT23    INT24  INT25

 52)    18       4       1        0        0        0        0        0        0        0        0        0        0        0        0      0

                                                     PHASE  TIMING  DATA
LINE   CARD    NODE    START   VARIAB.  YELLOW  ALL-RED  MINIM.                                                                         PHASE
 NO.   TYPE     NO.    INTVL    INTVL    INTVL    INTVL   SECS.   LINKS MOVING IN THIS PHASE ..................................        TYPE

 53)    21       4       1        1        2        3       6     406     410     408       0       0       0       0       0       0
 54)    22       4       4        4        5        6      10     410     406     405       0       0       0       0       0       0
 55)    23       4       7        7        8        9      10     405     407       0       0       0       0       0       0       0
 56)    24       4      10       10       11       12       6     410     403     404     401       0       0       0       0       0

 57) * COMMENT:----- LINK DATA -----

                                                         LINK  DATA
LINE   CARD    LINK   LINK     SAT.   TOTAL   MID-BLK. FIRST INPUT LINK....     SECOND INPUT LINK....     THIRD INPUT LINK....  QUEUE
 NO.   TYPE     NO.  LENGTH    FLOW    VOL.     VOL.    NO.     VOL.   SPD/TT     NO.     VOL.   SPD/TT     NO.     VOL.  SPD/TT   CAP.

 58)    28     401    100     1800      10       0       0       0       0        0       0       0        0       0       0       0
 59)    28     403    300     1800      10       0       0       0       0        0       0       0        0       0       0       0
 60)    28     404    300     1700      80       0       0       0       0        0       0       0        0       0       0       0
 61)    28     405    670     5400    1693       0     305    1535      35      302     130      35      304      20      35       0
 62)    28     406    220     3400     390       0     305     300      35      302      70      35      304      20      35       0
 63)    28     407    700     5400    1585       0       0       0       0        0       0       0        0       0       0       0
 64)    28     408    100     1700      10       0       0       0       0        0       0       0        0       0       0       0
 65)    28     410    300     1700     395       0       0       0       0        0       0       0        0       0       0       0
```

```
FIELDS:  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16
        ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----

  66) * COMMENT:----- FLOW PROFILE REQUESTS -----

  67) * COMMENT:----- RUN SPECIFICATIONS -----

                                                   RUN  CARD
LINE   CARD   PI
 NO.   TYPE   TYPE

 68)    52     0      0      0      0      0      0      0      0      0      0      0      0      0      0      0

--- PROGRAM NOTE --- A CARD TYPE 52 CAUSES RUN TO BE OPTIMIZED USING THE
                     DEFAULT NORMAL OPTIMIZATION STEP SIZES.
                     IF CARD TYPE 4 WAS INPUT, IT IS IGNORED.

                     THE ABOVE WILL BE PROCESSED AFTER THE "BEST" CYCLE
                     LENGTH HAS BEEN SELECTED.

--- PROGRAM NOTE --- NO ERRORS DETECTED. TRANSYT-7F PERFORMS FINAL PROCESSING.
                     IF ERRORS ARE DETECTED, FURTHER PROCESSING IS SUSPENDED.

--- PROGRAM NOTE --- THERE ARE A TOTAL OF   4 NODES AND  26 LINKS,
                     INCLUDING BOTTLENECKS, IF ANY, IN THIS RUN.

--- PROGRAM NOTE --- THERE WERE A TOTAL OF   2 WARNING MESSAGES ISSUED
                     IN THE ABOVE REPORT.
```

```
                    ------------------------------------
                    CYCLE EVALUATION SUMMARY PERFORMANCE
                    ------------------------------------

  CYCLE   STEP   AVERAGE  PERCENT      FUEL      PERFORMANCE  NUMBER
 LENGTH   SIZE    DELAY    STOPS   CONSUMPTION     INDEX     SATURATED
  (SEC) (STEPS) (SEC/VEH)   (%)      (GAL/HR)                  LINKS
 ---------------------------------------------------------------------

    70     23     47.28     58        312.7        245.2         5

    75     25     31.47     58        251.5        183.9         5

    80     27     22.59     55        213.4        145.9         5

    85     28     20.20     52        199.1        131.6         3

    90     30     19.06     54        196.0        128.4         3

    95     32     18.91     52        194.2        126.6         3

   100     33     18.54     51        191.8        124.3         3

   105     35     18.83     51        192.3        124.7         3

   110     37     19.19     52        195.1        127.5         2

 ---------------------------------------------------------------------

    BEST CYCLE LENGTH = 100 SEC.   CYCLE SENSITIVITY =  27.5 %

--- PROGRAM NOTE --- TRANSYT-7F OPTIMIZES THE SYSTEM USING THE BEST
                     CYCLE LENGTH AND HILL-CLIMB STEP SIZES AS
                     INDICATED BY CARD TYPE 52.
```

```
TELEGRAPH CANYON RD AM PEAK  BASE OPTIMIZATION                                CYCLE:  100 SECONDS,   60 STEPS   PAGE  7

(PERFORMANCE WITH OPTIMAL SETTINGS)

 NODE LINK   FLOW   SAT  DEGREE  TOTAL     TOTAL  -------- DELAY -------- AVERAGE   UNIFORM  MAX BACK  QUEUE    FUEL  PHASE  LINK
  NO.  NO.          FLOW  OF SAT  TRAVEL     TIME  UNIFORM  RANDOM    TOTAL  DELAY     STOPS   OF QUEUE CAPACITY CONSUM LENGTH  NO.
          (VEH/H)(VEH/H) (%)  (VEH-MI/H)(VEH-H/H)       (VEH-H/H)        (SEC/VEH) (VEH/H;%) (VEH/LK)(VEH/LK)  (GA/H) (SEC)

   1  102    210  3400    29     15.92      2.44     1.89     .03     1.92   32.9   167.3( 80%)   5        32    3.01    26    102
   1  105   1545  5400    41    117.12      6.74     2.82     .07     2.90    6.8   602.2( 39%)  18        48   10.34    74    105
   1  106    745  3400    95*    56.48     13.35     7.61    3.88    11.50   55.6   695.7( 93%)  20        32   14.69    28    106
   1  107   1028  3600    70     27.47      6.41     4.93     .40     5.33   18.7   951.9( 93%)  27  >    11C    8.92    46    107
   1  109    680  3400    95*    51.55     12.68     7.18    3.80    10.99   58.2   640.0( 94%)  18        32   13.80    26    109
   1  112   1350  3400    97*    36.07     15.98     8.78    5.78    14.56   38.8  1283.3( 95%)  36  >    11C   17.39    46    112

   1 :          5558   MAX =  97*   304.60     57.60    33.22   13.97    47.19   30.6  4340.3( 78%)                 68.14 PI =   55.5

   2  204     25  1700     6      1.18       .24      .20     .00      .20   28.5    18.2( 73%)   1        10     .33    30    204
   2  205   2025  5400    58     50.33      6.45     4.13     .20     4.33    7.7   973.2( 48%)  38  >    16C    8.85    70    205
   2  206    100  1700    74      2.49      1.89     1.30     .49     1.78   64.2    92.9( 93%)   3         5    1.74    13    206
   2  207   2165  7200    58    246.18     11.83     3.55     .20     3.75    6.2   557.6( 26%)  22        96   15.98    57    207
   2  210    228  1700    54     10.77      2.55     2.04     .15     2.19   34.6   189.0( 83%)   5        10    3.08    30    210

   2 :          4543   MAX =  74    310.95     22.96    11.21    1.04    12.25    9.7  1831.0( 40%)                 29.99 PI =   17.0

   3  302    569  3600    83     21.57      7.68     5.96    1.00     6.96   44.0   518.8( 91%)  15        16    8.82    24    302
   3  304     48  1700    56      1.82       .86      .62     .18      .79   59.6    45.4( 95%)   1         8     .97    10    304
   3  305   2007  5400    83    341.70     15.85     5.23     .97     6.20   11.1   538.3( 27%)  23       108   21.64    50    305
   3  306     38  1700    45      1.58       .72      .58     .09      .67   63.6    36.9( 97%)   1         9     .81    10    306
   3  307   1756  5400    64    232.41     12.26     5.41     .28     5.69   11.7   674.4( 38%)  20        84   18.17    56    307
   3  308    139  1700    74      5.79      2.93     2.25     .52     2.77   71.7   138.2( 99%)   4         9    3.31    16    308
   3  310     70  1700    82      2.65      1.82      .91     .83     1.73   89.2    67.4( 96%)   2         8    1.84    10    310

   3 :          4627   MAX =  83    607.52     42.12    20.95    3.87    24.82   19.3  2019.4( 44%)                 55.57 PI =   32.3

   4  401     10  1800     9       .19       .13      .12     .00      .12   43.6     9.0( 90%)   0         4     .15    11    401
   4  403     10  1800     9       .57       .14      .12     .00      .12   43.6     9.0( 90%)   0        12     .18    11    403
   4  404     80  1700    78      4.52      1.80     1.00     .65     1.65   74.4    75.7( 95%)   2        12    1.81    11    404
   4  405   1693  5400    41    214.60      6.70      .57     .07      .64    1.4   133.0(  8%)   4        80    9.63    82    405
   4  406    390  3400    55     16.24      5.04     4.42     .16     4.58   42.3   376.1( 96%)  11        18    6.87    26    406
   4  407   1585  5400    51    209.78     12.48     5.32     .13     5.45   12.4   861.9( 54%)  26        84   17.36    63    407
   4  408     10  1700    29       .19       .17      .13     .03      .16   58.4     9.5( 95%)   0         4     .19     7    408
   4  410    395  1700    73     22.34      4.50     3.27     .48     3.75   34.2   333.2( 84%)  10        12    5.49    37    410

   4 :          4173   MAX =  78    468.42     30.96    14.95    1.53    16.48   14.2  1807.2( 43%)                 41.67 PI =   23.1
```

```
                                  <SYSTEM WIDE TOTALS INCLUDING ALL LINKS>


   TOTAL        TOTAL     TOTAL     TOTAL     TOTAL    AVERAGE     TOTAL      TOTAL
 DISTANCE      TRAVEL    UNIFORM   RANDOM     DELAY     DELAY     UNIFORM      FUEL   OPERATING PERFORMANCE  SPEED
 TRAVELED       TIME      DELAY     DELAY                          STOPS      CONSUM    COST      INDEX
(VEH-MI/H) (VEH-H/H) (VEH-H/H) (VEH-H/H) (VEH-H/H) (SEC/VEH)   (VEH/H-%)    (GA/H)                         (MI/H)

 1691.49     153.64     80.34     20.40    100.74     19.19   9997.9( 53%)  195.37    627.39    127.82     11.01 <TOTALS>
NOTE: PERFORMANCE INDEX IS DEFINED AS:

      PI = DELAY + STOPS

NO. OF SIMULATIONS =   9  NO. OF LINKS = 135  ELAPSED TIME =   154.8 SEC.




  69) * COMMENT:----- TSD REQUESTS -----
```

```
--- PROGRAM NOTE ---INPUT DATA REPORT FOR ROUTE REQUEST NO.   1

                                                                    ROUTE  SUMMARY  DATA
LINE     CARD     TSD      TIME     TIME     DIST.     PPD    ROUTE    PPD      GDF                                                      ROUTE
 NO.     TYPE     FLAG     FLAG     SCALE    SCALE     FLAG  SUMMARY  FLAG     FLAG                                                     ORIENT.

 70)      60        1        1        3       50        0       0       0        0        0        0        0        0        0        0        0

LINE
 NO.      TITLE                                                    ROUTE  TITLE  CARD

  71)      TSD NO. 1

                                                                   ROUTE  LINK  LIST
LINE     CARD     LINK PAIRS ALTERNATING BY DIRECTION
 NO.     TYPE     DOWN AND UP       DOWN AND UP       DOWN AND UP       DOWN AND UP       DOWN AND UP       DOWN AND UP       DOWN AND UP

 72)      61      105      107      205      207      305      307      405      407        0        0        0        0        0        0        0

  73) * COMMENT:----- TERMINATION -----
```

```
                                < T R A N S Y T - 7 F   T I M E - S P A C E   D I A G R A M >

                  ROUTE NO.  1  ROUTE TITLE:  TSD NO. 1

                  TIME AXIS IS IN: SEC          TIME SCALE =  3 SEC/CHAR,  DIST. SCALE =  50 FT/LINE

               1         2         3         4         5         6         7         8         9        10        11
NODE  12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890  DISTANCE
     :------------------------------------------------------------------------------------------------------------------------
   1 :+++++++++               *********+++++++++               *********+++++++++                *********+++++++++      0 FT
     !                                !                                !                                 !
   2 :+                 ***********++++                  ***********++++                  ***********+++++             130 FT
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
   3 :               -***************--                ***************--                ****************--            1030 FT
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
     !                                !                                !                                 !
   4 :                  ******+++++++                    ******+++++++                      ******++++++              1700 FT
     :------------------------------------------------------------------------------------------------------------------------
NODE  12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890  DISTANCE
               1         2         3         4         5         6         7         8         9        10        11

     SCALE CONVERSIONS:                                 +++ GREEN IN DOWN DIRECTION                   AVG. TIME DISPLACEMENT:
     TIME/INCH =  3 * 10 (AT 10 CHAR/INCH)                  GREEN IN BOTH DIRECTIONS                    386.35 / SPEED
     DIST/INCH =  50 * 6 (AT 6 LINES/INCH)              --- GREEN IN UP   DIRECTION
                                                        *** RED   IN BOTH DIRECTIONS
```

```
LINE   CARD                                       TERMINATION CARD
 NO.   TYPE

 74)    90     0      0      0      0      0      0      0      0      0      0      0      0      0      0      0

--- PROGRAM NOTE --- END OF JOB!
```

```
             T R A N S Y T - 7 F -- T R A F F I C   S I G N A L   S Y S T E M   O P T I M I Z A T I O N   P R O G R A M

        RELEASE 5  OCTOBER 1988                                                                                  VERSION 2.0

        SPONSORED BY:                                                                                           DEVELOPED BY:
        FEDERAL HIGHWAY ADMINISTRATION                                                    TRANSPORT AND ROAD RESEARCH LABORATORY
        OFFICE OF TRAFFIC OPERATIONS                                                                         UNITED KINGDOM AND
                                                                                                 TRANSPORTATION RESEARCH CENTER
                                                                                                          UNIVERSITY OF FLORIDA

        DATE OF RUN: 10/19/90  START TIME OF RUN:   16: 2:51

                                      ----------------------------------------------------
                                      I N P U T   D A T A   R E P O R T   F O R   R U N   1
                                      ----------------------------------------------------


        FIELDS: 1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16
               ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----
```

PM
120 Sec Cycle

```
        LINE                                         RUN  TITLE  CARD
        NO.    TITLE

         1)    TELEGRAPH CANYON RD PM PEAK  BASE OPTIMIZATION

                                                NETWORK  CONTROL  CARD
                                         SEC/   SEC/
        LINE   CARD    MIN    MAX   CYCLE   STEP   STEP   LOST   GREEN   STOP  OUTPUT INITIAL PERIOD SEC(0) SPD(0) ENGL(0) PNCH
        NO.    TYPE   CYCLE  CYCLE  INCR.  CYCLE  NORMAL  TIME  EXTEN. PENALTY LEVEL  TIMINGS LENGTH PERC(1) TIME(1) METR(1) DECK

         2)     1      90     120     5      3      1      2      2     -1      0      1     60      0      0      0      0

        +++ 106 +++ WARNING + THE SEC/STEPS FACTOR IN FIELD 6 IS TOO SMALL FOR CYCLE
                              LENGTHS ABOVE  60 SECONDS. IT WILL BE INCREASED TO
                              ALLOW A MAXIMUM OF 60 STEPS/CYCLE.

        +++ 107 +++ WARNING + A STOP PENALTY OF "-1" WILL RESULT IN AUTOMATIC
                              CALCULATION OF THE PI TO MINIMIZE FUEL CONSUMPTION.
                              LINK SPECIFIC DELAY OR STOP WEIGHTS ON CARD
                              TYPE 37 & 38 WILL STILL BE APPLIED, HOWEVER.

         3) * COMMENT:----- OPTIMIZATION NODE LIST -----

        LINE   CARD                                 LIST  OF  NODES  TO  BE  OPTIMIZED
        NO.    TYPE

         4)     2      1      2      3      4      0      0      0      0      0      0      0      0      0      0      0

         5) * COMMENT:----- NETWORK MASTER -----

                                                 SYSTEM  MASTER  DATA
        LINE   CARD  MASTER  SYSTEM DEFAULTS SYSTEM  EXTERNAL SYSTEM  FUEL   VEHICLE ORIEN- DESIRED % OF SAT  MBQ    INFLAT  FUEL VEHICLE
        NO.    TYPE   NODE   YELLOW ALL-RED SATFLOW  SPEED    PDF   FACTOR  LENGTH TATION  SPLITS  2-CYC  WEIGHT  RATE   COST   OCC.

         6)     10      1      4      1     1700     30      35     100      25      0      85      25     40     100    125    120
```

```
FIELDS:  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16
        ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----

   7) * COMMENT:***************** INTERSECTION 1  ****************

   8) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION     1          NB OFF-RAMP
------------------
                                                  CONTROLLER  TIMING  DATA
LINE    CARD    NODE  OFFSET/           INTERVAL DURATIONS (SECS. OR PERCENT) ........................................... DOUBLE
 NO.    TYPE     NO.  YLD.PT.  REF INT  INT1    INT2    INT3    INT4    INT5    INT6    INT7    INT8    INT9   INT10   INT11  CYCLE

  9)     13       1      0        1      0       4       1       0       4       1       0       4       1       0       0      0

                                                      PHASE  TIMING  DATA
LINE    CARD    NODE    START  VARIAB. YELLOW  ALL-RED  MINIM.                                                               PHASE
 NO.    TYPE     NO.    INTVL   INTVL   INTVL   INTVL   SECS.   LINKS MOVING IN THIS PHASE ..............................    TYPE

 10)     21       1       1       1       2       3      10      105     106      0       0       0       0       0       0      0
 11)     22       1       4       4       5       6      10      112     107     105      0       0       0       0       0      0
 12)     23       1       7       7       8       9      10      102     109      0       0       0       0       0       0      0

 13) * COMMENT:----- LINK DATA -----

                                                         LINK  DATA
LINE    CARD    LINK   LINK    SAT.    TOTAL   MID-BLK. FIRST INPUT LINK....      SECOND INPUT LINK....     THIRD INPUT LINK....  QUEUE
 NO.    TYPE     NO.  LENGTH   FLOW     VOL.     VOL.     NO.    VOL.    SPD/TT    NO.    VOL.    SPD/TT    NO.    VOL.   SPD/TT  CAP.

 14)     28     102    400     3400     150       0        0       0      30        0       0       0        0       0       0      0
 15)     28     105    400     5400    2111       0        0       0      30        0       0       0        0       0       0      0
 16)     28     106    400     3400     725       0        0       0      30        0       0       0        0       0       0      0
 17)     28     107    140     3600     865       0      207     835      25      210      30      25        0       0       0      0
 18)     28     109    400     3400     625       0        0       0      30        0       0       0        0       0       0      0
 19)     28     112    140     3400    1015       0      207     886      25      210     129      25        0       0       0      0

 20) * COMMENT:***************** INTERSECTION 2  ****************

 21) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION     2        HALECREST
------------------
                                                  CONTROLLER  TIMING  DATA
LINE    CARD    NODE  OFFSET/           INTERVAL DURATIONS (SECS. OR PERCENT) ........................................... DOUBLE
 NO.    TYPE     NO.  YLD.PT.  REF INT  INT1    INT2    INT3    INT4    INT5    INT6    INT7    INT8    INT9   INT10   INT11  CYCLE

 22)     13       2      0        1      0       4       1       0       4       1       0       4       1       0       0      0

                                                      PHASE  TIMING  DATA
LINE    CARD    NODE    START  VARIAB. YELLOW  ALL-RED  MINIM.                                                               PHASE
 NO.    TYPE     NO.    INTVL   INTVL   INTVL   INTVL   SECS.   LINKS MOVING IN THIS PHASE ..............................    TYPE
```

```
FIELDS:  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16
        ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----
 23)     21     2      1      1      2      3     10    205    206      0      0      0      0      0      0      0
 24)     22     2      4      4      5      6     10    205    207      0      0      0      0      0      0      0
 25)     23     2      7      7      8      9     10    204    210      0      0      0      0      0      0      0

 26) * COMMENT:----- LINK DATA -----

                                                                 LINK  DATA
LINE    CARD    LINK   LINK    SAT.   TOTAL   MID-BLK. FIRST INPUT LINK....     SECOND INPUT LINK....   THIRD INPUT LINK....  QUEUE
 NO.    TYPE     NO.  LENGTH   FLOW    VOL.     VOL.     NO.    VOL.   SPD/TT    NO.    VOL.   SPD/TT    NO.    VOL.  SPD/TT  CAP.

 27)     28     204    250    1700      68       0        0       0       0       0       0       0       0       0       0      0
 28)     28     205    130    5400    2448       0      105    1788      25     109     660      20       0       0       0      0
 29)     28     206    130    1700     232       0      105     167      25     109      65      20       0       0       0      0
 30)     28     207    600    7200    1732       0      307    1426      30     310      34      30     302     272      30      0
 31)     28     210    250    1700     159       0        0       0       0       0       0       0       0       0       0      0

  32) * COMMENT:***************** INTERSECTION 3  ****************

  33) * COMMENT:----- SIGNAL TIMING -----

------------------
INTERSECTION    3
------------------
```

CREST

```
                                                    CONTROLLER  TIMING  DATA
LINE    CARD    NODE  OFFSET/           INTERVAL DURATIONS (SECS. OR PERCENT) ..........................................  DOUBLE
 NO.    TYPE     NO.  YLD.PT.  REF INT  INT1     INT2     INT3     INT4     INT5     INT6     INT7     INT8     INT9    INT10    INT11  CYCLE

 34)     15      3       0        1       0        4        1        0        4        1        0        4        1        0        4      0

                                               CONTROLLER  TIMING  DATA  (CONTINUED)
LINE    CARD    NODE    INTERVAL DURATIONS (SECS. OR PERCENT) ...............................................................
 NO.    TYPE     NO.    INT12    INT13    INT14    INT15    INT16    INT17    INT18    INT19    INT20    INT21    INT22    INT23    INT24  INT25

 35)     18      3        1        0        4        1        0        0        0        0        0        0        0        0        0      0

                                                         PHASE  TIMING  DATA
LINE    CARD    NODE    START  VARIAB. YELLOW  ALL-RED  MINIM.                                                                      PHASE
 NO.    TYPE     NO.    INTVL   INTVL   INTVL   INTVL    SECS.   LINKS MOVING IN THIS PHASE ................................     TYPE

 36)     21      3        1       1       2       3       10     306      308       0        0        0        0        0        0      0
 37)     22      3        4       4       5       6        6     308      307       0        0        0        0        0        0      0
 38)     23      3        7       7       8       9       10     305      307       0        0        0        0        0        0      0
 39)     24      3       10      10      11      12       10     304      310       0        0        0        0        0        0      0
 40)     25      3       13      13      14      15       10     302        0       0        0        0        0        0        0      0

  41) * COMMENT:---- LINK DATA -----

                                                                 LINK  DATA
LINE    CARD    LINK   LINK    SAT.   TOTAL   MID-BLK. FIRST INPUT LINK....     SECOND INPUT LINK....   THIRD INPUT LINK....  QUEUE
 NO.    TYPE     NO.  LENGTH   FLOW    VOL.     VOL.     NO.    VOL.   SPD/TT    NO.    VOL.   SPD/TT    NO.    VOL.  SPD/TT  CAP.
```

```
FIELDS:  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15     16
        ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----   ----
  42)    28    302    200   3600    459      0      0      0      0      0      0      0      0      0      0      0
  43)    28    304    200   1700     46      0      0      0      0      0      0      0      0      0      0      0
  44)    28    305    900   5400   2340      0    205   2320     35    204     20     35      0      0      0      0
  45)    28    306    220   1700    107      0    205     67     35    204     40     35      0      0      0      0
  46)    28    307    700   5400   1450      0    407   1100     35    410    350     35      0      0      0      0
  47)    28    308    220   1700    170      0    407    145     35    410     25     35      0      0      0      0
  48)    28    310    200   1700    182      0      0      0      0      0      0      0      0      0      0      0

  49) * COMMENT:***************** INTERSECTION 4  ****************

  50) * COMMENT:----- SIGNAL TIMING -----

 ------------------
 INTERSECTION    4        PASEO DEL REY
 ------------------

                                                CONTROLLER  TIMING  DATA
 LINE    CARD    NODE  OFFSET/           INTERVAL DURATIONS (SECS. OR PERCENT) .......................................... DOUBLE
  NO.    TYPE     NO.  YLD.PT.  REF INT  INT1    INT2    INT3    INT4    INT5    INT6    INT7    INT8    INT9   INT10   INT11  CYCLE

  51)     14       4      0        1      0       4       1       0       4       1       0       4       1       0       4      0

                                           CONTROLLER  TIMING  DATA  (CONTINUED)
 LINE    CARD    NODE    INTERVAL DURATIONS (SECS. OR PERCENT) .........................................................
  NO.    TYPE     NO.    INT12   INT13   INT14   INT15   INT16   INT17   INT18   INT19   INT20   INT21   INT22   INT23   INT24  INT25

  52)     18       4       1       0       0       0       0       0       0       0       0       0       0       0       0      0

                                                    PHASE  TIMING  DATA
 LINE    CARD    NODE    START  VARIAB. YELLOW  ALL-RED  MINIM.                                                          PHASE
  NO.    TYPE     NO.    INTVL   INTVL   INTVL   INTVL   SECS.   LINKS MOVING IN THIS PHASE ..............................  TYPE

  53)     21       4       1       1       2       3       6     406     410     408       0       0       0       0       0      0
  54)     22       4       4       4       5       6      10     410     406     405       0       0       0       0       0      0
  55)     23       4       7       7       8       9      10     405     407       0       0       0       0       0       0      0
  56)     24       4      10      10      11      12       6     410     403     404     401       0       0       0       0      0

  57) * COMMENT:----- LINK DATA -----

                                                      LINK  DATA
 LINE    CARD    LINK   LINK     SAT.   TOTAL   MID-BLK. FIRST INPUT LINK....    SECOND INPUT LINK....    THIRD INPUT LINK....  QUEUE
  NO.    TYPE     NO. LENGTH    FLOW     VOL.    VOL.     NO.     VOL.  SPD/TT     NO.     VOL.  SPD/TT     NO.     VOL.  SPD/TT  CAP.

  58)     28     401    100     1800     10      0       0       0       0       0       0       0       0       0       0      0
  59)     28     403    300     1800     10      0       0       0       0       0       0       0       0       0       0      0
  60)     28     404    300     1700    185      0       0       0       0       0       0       0       0       0       0      0
  61)     28     405    570     5400   1790      0     305    1726      35     302     900      35     304      26      35      0
  62)     28     406    220     3400    435      0     305     395      35     302      40      35     304      20      35      0
  63)     28     407    700     5400   1364      0       0       0       0       0       0       0       0       0       0      0
  64)     28     408    100     1700     10      0       0       0       0       0       0       0       0       0       0      0
  65)     28     410    300     1700    375      0       0       0       0       0       0       0       0       0       0      0
```

```
FIELDS:  1     2     3     4     5     6     7     8     9    10    11    12    13    14    15    16
        ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----

  66) * COMMENT:----- FLOW PROFILE REQUESTS -----

  67) * COMMENT:----- RUN SPECIFICATIONS -----

                                              RUN  CARD
LINE    CARD    PI
 NO.    TYPE   TYPE

 68)     52     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0

--- PROGRAM NOTE --- A CARD TYPE 52 CAUSES RUN TO BE OPTIMIZED USING THE
                     DEFAULT NORMAL OPTIMIZATION STEP SIZES.
                     IF CARD TYPE 4 WAS INPUT, IT IS IGNORED.

                     THE ABOVE WILL BE PROCESSED AFTER THE "BEST" CYCLE
                     LENGTH HAS BEEN SELECTED.

--- PROGRAM NOTE --- NO ERRORS DETECTED. TRANSYT-7F PERFORMS FINAL PROCESSING.
                     IF ERRORS ARE DETECTED, FURTHER PROCESSING IS SUSPENDED.

--- PROGRAM NOTE --- THERE ARE A TOTAL OF   4 NODES AND  26 LINKS,
                     INCLUDING BOTTLENECKS, IF ANY, IN THIS RUN.

--- PROGRAM NOTE --- THERE WERE A TOTAL OF   2 WARNING MESSAGES ISSUED
                     IN THE ABOVE REPORT.
```

```
                  ------------------------------------
                  CYCLE EVALUATION SUMMARY PERFORMANCE
                  ------------------------------------

 CYCLE   STEP   AVERAGE  PERCENT     FUEL     PERFORMANCE  NUMBER
LENGTH   SIZE    DELAY    STOPS   CONSUMPTION    INDEX    SATURATED
 (SEC) (STEPS) (SEC/VEH)   (%)      (GAL/HR)                LINKS
--------------------------------------------------------------------


   90     30     25.38     55        227.0       160.0         3

   95     32     24.70     54        222.3       155.3         3

  100     33     23.94     55        220.0       153.0         2

  105     35     23.15     54        216.1       149.1         2

  110     37     21.79     56        212.8       145.8         2

  115     38     21.85     57        214.9       147.8         2

  120     40     22.00     54        211.7       144.6         1

--------------------------------------------------------------------


    BEST CYCLE LENGTH = 120 SEC.   CYCLE SENSITIVITY =   3.7 %

--- PROGRAM NOTE --- TRANSYT-7F OPTIMIZES THE SYSTEM USING THE BEST
                     CYCLE LENGTH AND HILL-CLIMB STEP SIZES AS
                     INDICATED BY CARD TYPE 52.
```

```
TELEGRAPH CANYON RD PM PEAK  BASE OPTIMIZATION                                   CYCLE:  120 SECONDS,   60 STEPS   PAGE  7

<PERFORMANCE WITH OPTIMAL SETTINGS>

   NODE LINK   FLOW   SAT  DEGREE  TOTAL     TOTAL   -------- DELAY -------- AVERAGE   UNIFORM  MAX BACK  QUEUE    FUEL  PHASE  LINK
    NO.  NO.          FLOW OF SAT  TRAVEL    TIME   UNIFORM  RANDOM   TOTAL   DELAY     STOPS   OF QUEUE CAPACITY CONSUM LENGTH  NO.
              (VEH/H)(VEH/H) (%)  (VEH-MI/H)(VEH-H/H)      (VEH-H/H)       (SEC/VEH) (VEH/H;%) (VEH/LK)(VEH/LK)  (GA/H) (SEC)

     1  102    150  3400    20     11.37     1.99     1.61     .01    1.62   38.9   120.0( 80%)    4         32    2.33     31   102
     1  105   2111  5400    56    160.03    10.34     4.91     .18    5.09    8.7   930.0( 44%)   33         48   15.56     89   105
     1  106    725  3400    85     54.96    11.46     8.45    1.21    9.65   47.9   662.9( 91%)   23         32   13.09     35   106
     1  107    865  3600    59     23.11     2.06      .95     .21    1.16    4.8    63.5(  7%)    2         11    2.13     54   107
     1  109    625  3400    85     47.38    10.55     7.83    1.15    8.99   51.8   582.5( 93%)   20         32   11.84     31   109
     1  112   1015  3400    73     27.12     4.01     2.45     .49    2.94   10.4   283.2( 28%)   29  >     11C    4.49     54   112

     1 :       5491   MAX =  85    323.97    40.41    26.19    3.25   29.45   19.3  2642.1( 48%)                   49.44 PI =   36.0

     2  204     68  1700    32      3.21     1.05      .90     .04     .94   49.8    60.2( 88%)    2         10    1.15     20   204
     2  205   2448  5400    57     60.84     8.11     5.38     .19    5.57    8.2  1461.4( 60%)   53  >     16C   12.00    100   205
     2  206    232  1700    53      5.77     2.27     1.88     .15    2.03   31.5   163.1( 70%)    6  >      5C    2.32     36   206
     2  207   1732  7200    49    196.95    15.45     8.86     .12    8.98   18.7  1095.2( 63%)   42         96   20.86     64   207
     2  210    159  1700    75      7.51     3.03     2.24     .54    2.77   62.8   148.6( 93%)    5         10    3.15     20   210

     2 :       4639   MAX =  75    274.28    29.91    19.27    1.03   20.30   15.8  2928.5( 63%)                   39.49 PI =   27.9

     3  302    459  3600    90     17.40     8.90     6.46    1.86    8.31   65.2   437.4( 95%)   15         16    9.20     22   302
     3  304     46  1700    23      1.74      .69      .62     .02     .63   49.6    40.7( 88%)    1          8     .82     19   304
     3  305   2340  5400    95*   398.40    25.75    10.65    3.85   14.50   22.3   992.4( 42%)   45        108   33.36     60   305
     3  306    107  1700    94      4.45     3.73     1.42    2.18    3.60  121.1    86.4( 81%)    3          9    3.47     13   306
     3  307   1450  5400    53    191.91    11.20     5.63     .15    5.78   14.4   581.2( 40%)   20         84   15.98     66   307
     3  308    170  1700    86      7.08     4.19     2.84    1.16    3.99   84.6   168.1( 99%)    6          9    4.49     19   308
     3  310    182  1700    92      6.90     4.85     2.65    1.97    4.62   91.4   175.8( 97%)    6          8    4.63     19   310

     3 :       4754   MAX =  95*   627.88    59.31    30.27   11.18   41.44   31.4  2482.1( 52%)                   71.95 PI =   48.0

     4  401     10  1800     4       .19      .12      .12     .00     .12   42.6     8.2( 82%)    0          4     .15     24   401
     4  403     10  1800     4       .57      .14      .12     .00     .12   42.6     8.2( 82%)    0         12     .17     24   403
     4  404    185  1700    69     10.46     3.17     2.45     .37    2.82   54.9   169.9( 92%)    6         12    3.43     24   404
     4  405   1790  5400    47    226.90     9.31     2.79     .11    2.90    5.8   628.5( 35%)   21         80   15.56     89   405
     4  406    435  3400    48     18.11     7.24     6.62     .11    6.73   55.7   371.8( 85%)   12         18    8.48     37   406
     4  407   1364  5400    56    180.53    15.44     9.20     .18    9.38   24.8   959.9( 70%)   33         84   19.57     59   407
     4  408     10  1700    35       .19      .21      .16     .05     .21   73.9     9.5( 95%)    0          4     .22      7   408
     4  410    375  1700    47     21.20     3.03     2.21     .11    2.32   22.2   241.9( 65%)    8         12    3.89     61   410

     4 :       4179   MAX =  69    458.14    38.66    23.67     .92   24.59   21.2  2397.9( 57%)                   51.47 PI =   33.4
```

```
                                        <SYSTEM WIDE TOTALS INCLUDING ALL LINKS>



   TOTAL       TOTAL    TOTAL     TOTAL     TOTAL    AVERAGE      TOTAL       TOTAL
  DISTANCE     TRAVEL   UNIFORM   RANDOM    DELAY     DELAY      UNIFORM       FUEL   OPERATING PERFORMANCE  SPEED
  TRAVELED     TIME     DELAY     DELAY                          STOPS       CONSUM     COST      INDEX
 (VEH-MI/H) (VEH-H/H) (VEH-H/H) (VEH-H/H) (VEH-H/H) (SEC/VEH)   (VEH/H-%)    (GA/H)                          (MI/H)


   1684.27    168.29     99.40     16.38    115.78      21.86  10450.6( 55%)  212.35     677.13     145.32     10.01 <TOTALS>

NOTE: PERFORMANCE INDEX IS DEFINED AS:

      PI = DELAY + STOPS

NO. OF SIMULATIONS =   9  NO. OF LINKS = 135  ELAPSED TIME =   149.7 SEC.




  69) * COMMENT:----- TSD REQUESTS -----
```

```
--- PROGRAM NOTE ---INPUT DATA REPORT FOR ROUTE REQUEST NO.  1

                                                      ROUTE  SUMMARY  DATA
LINE   CARD   TSD    TIME   TIME   DIST.   FPD   ROUTE   PPD    GDF                                                         ROUTE
 NO.   TYPE   FLAG   FLAG   SCALE  SCALE   FLAG  SUMMARY FLAG   FLAG                                                        ORIENT.

 70)    60     1      1      3      50      0      0      0      0      0      0      0      0      0      0      0

LINE
 NO.    TITLE                                           ROUTE  TITLE  CARD

  71)    TSD NO. 1

                                                      ROUTE  LINK  LIST
LINE   CARD   LINK PAIRS ALTERNATING BY DIRECTION
 NO.   TYPE   DOWN AND UP    DOWN AND UP    DOWN AND UP    DOWN AND UP    DOWN AND UP    DOWN AND UP    DOWN AND UP

 72)    61    105    107     205    207     305    307     405    407      0      0      0      0      0      0      0

 73) * COMMENT:----- TERMINATION -----
```

```
                         < T R A N S Y T - 7 F   T I M E - S P A C E   D I A G R A M >

                   ROUTE NO.  1  ROUTE TITLE:  TSD NO. 1

                   TIME AXIS IS IN: SEC          TIME SCALE =   3 SEC/CHAR,  DIST. SCALE =   50 FT/LINE

              1         2         3         4         5         6         7         8         9        10        11
NODE 12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890  DISTANCE
    :----------------------------------------------------------------------------------------------------------------------
  1 :++++++++++++                  **********++++++++++++                  **********++++++++++++                      0 FT
    |                                       |                                       |
  2 :++++++++++++                     *******++++++++++++                     *******++++++++++++                    130 FT
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
  3 :                   -******************--                   *******************--                   *********** 1030 FT
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
    |                                       |                                       |
  4 :++++++                   **********++++++++++                    **********++++++++++                     **** 1700 FT
    :----------------------------------------------------------------------------------------------------------------------
NODE 12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890  DISTANCE
              1         2         3         4         5         6         7         8         9        10        11

    SCALE CONVERSIONS:                                  +++ GREEN IN DOWN DIRECTION                 AVG. TIME DISPLACEMENT:
    TIME/INCH =  3 * 10 (AT 10 CHAR/INCH)                   GREEN IN BOTH DIRECTIONS                 386.35 / SPEED
    DIST/INCH =  50 * 6 (AT 6 LINES/INCH)               --- GREEN IN UP   DIRECTION
                                                        *** RED   IN BOTH DIRECTIONS
```

```
LINE   CARD                                     TERMINATION CARD
 NO.   TYPE

 74)    90     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0

--- PROGRAM NOTE --- END OF JOB!
```

APPENDIX F

RANCHO DEL REY SPA III FISCAL IMPACT ANALYSIS

CITY OF CHULA VISTA
RANCHO DEL REY SPA III
FISCAL IMPACT ANALYSIS

APRIL 1989

Prepared for:

RANCHO DEL REY PARTNERSHIP
a joint venture of

McMillin Communities
2727 Hoover Avenue
National City, California 92050

and

Home Capital Development Group
a subsidiary of Home Federal Savings & Loan Association
707 Broadway, Suite 1017
San Diego, California 92101

Prepared by:

JOHN McTIGHE & ASSOCIATES
3160 Camino Del Rio South, Suite 205
San Diego, California 92108
(619) 281-772

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CHAPTER I

INTRODUCTION AND SUMMARY

SCOPE OF REPORT

John McTighe & Associates (formerly Public Affairs Consultants, Inc.) was retained by the Rancho del Rey Partnership to prepare an analysis of the fiscal impact on the City of Chula Vista of the proposed Sectional Planning Area (SPA) III of the Rancho del Rey Specific Plan. SPA III is the third of three sectional planning areas contained within the El Rancho Del Rey Specific Plan area as amended in 1985.

Public Affairs Consultants prepared the fiscal impact analysis for SPA I in April 1987. That analysis projected an annual positive fiscal impact from the development of the first approximately 2,200 dwelling units and 89 acres of commercial & industrial development contained within the SPA plan amounting to $147,195 (1987 $) at buildout. The analysis for SPA II prepared by Public Affairs Consultants in September 1988 projected that SPA II would result in a net annual surplus for the City of Chula Vista at buildout of $32,076 (1988 $).

This analysis has considered all known non-enterprise fund operating costs and revenues that might be attributable to the development of SPA III.

City operating costs were projected based on a computer model that took into consideration the fiscal year 1988-89 budget of the City and input received from the various City operating departments. The model includes an allocation of indirect and overhead costs to direct service activities of the City. In this manner the projections of added costs attributed to SPA III will in fact reflect the full costs to the City of accommodating this addition to the City.

City revenue projections were based on the existing revenue sources of the City. Computer modelling of the relationship of individual revenue accounts to population, land use and other factors was developed by John McTighe & Associates to simulate the changes in revenue that could be expected over the development of this project. A separate model of assessed valuation/property tax changes was developed to project the effect on City property tax revenues based on the developer's projection of buildout rate and product pricing.

While every attempt has been made to assure accuracy in the projections given the assumptions incorporated in the analysis, unforseen changes in State law, City Council policy, the general economy or the rate and type of development could result in differences from the projected outcomes.

The principal value of this type of analysis lies in being able to compare land use decisions with the present circumstance and with one another. When these comparisons are combined with the ecological, economical, social and political considerations and placed in context with other fiscal factors affecting the City, a reasoned judgement about a project's relative effect on the City's fiscal position can be made.

CHARACTERISTICS OF THE PLAN

The land use plan analyzed in this study is based on the statistical summary of the Site Utilization Plan for Rancho del Rey SPA III dated March 31, 1989. Table I-1 shows the land uses contained in the SPA I and SPA II Fiscal Impact Analyses as well as the SPA III land uses at buildout per the March 31, 1989 Site Utilization Plan.

Table I-1
Rancho del Rey SPAs I, II & III
Land Use Plan

Land Use	SPA I Acres	SPA A I I Acres	SPA III Acres	Total Acres
Residential	306.3	192.1	217.8	716.2
Employment Park	84.4	0.0	0.0	84.4
Community Facilities	11.7	6.8	0.0	18.5
Schools	10.7	0.0	22.5	33.2
Public Park	41.7	7.0	2.0	50.7
Open Space	281.3	151.2	149.3	581.8
Circulation	72.5	13.8	16.8	103.1
Total	808.6	370.9	408.4	1,587.9
Dwelling Units	2,201	567	1,380	4,146
Population	5,781	1,825	3,691	11,297

Table I-2 shows the assumed rate of buildout for the residential dwelling units. Table I-3 shows the assumed rate of residential land absorption based on the average density per residential product type. Table I-4 shows the assumed non-residential rate of development. These rates of development were based upon information provided by the Rancho del Rey Partnership.

Table I-2
Rancho del Rey SPA III
Residential Building Projection
Dwelling Units Occupied per Fiscal Year

	Fiscal Year						
Product Type	89-90	90-91	91-92	92-93	93-94	94-95	Total
Retirement							
Stacked Townhouses		30	60	60	60	11	221
Cluster Townhomes		36	72	72	52		232
Patio Homes		24	48	5			77
3,520 s.f. pad			75				75
3,600 s.f pad				96	19		115
4,180 s.f. pad				96	4		100
5,000 s.f. pad			72	131	72	6	281
6,000 s.f. pad			27				27
Townhomes				96	96	60	252
Total	0	90	354	556	303	77	1,380
Cumulative Total	0	90	444	1,000	1,303	1,380	

Table I-3
Rancho del Rey SPA III
Residential Acres Absorbed per Fiscal Year

		----------Fiscal		Year-----------				
Product Type	Ac./DU	89-90	90-91	91-92	92-93	93-94	94-95	TOTAL
Retirement								
Stacked Townhouses	0.16	0.0	4.8	9.5	9.5	9.5	1.7	35.0
Cluster Townhomes	0.16	0.0	5.7	11.4	11.4	8.2	0.0	36.8
Patio Homes	0.16	0.0	3.8	7.6	0.8	0.0	0.0	12.2
3,520 s.f. pad	0.18	0.0	0.0	13.4	0.0	0.0	0.0	13.4
3,600 s.f pad	0.15	0.0	0.0	0.0	14.4	2.8	0.0	17.2
4,180 s.f. pad	0.16	0.0	0.0	0.0	15.1	0.6	0.0	15.7
5,000 s.f. pad	0.21	0.0	0.0	14.8	26.9	14.8	1.2	57.7
6,000 s.f. pad	0.27	0.0	0.0	7.2	0.0	0.0	0.0	7.2
Townhomes	0.09	0.0	0.0	0.0	8.5	8.5	5.3	22.4
Total		0.0	14.3	63.9	86.6	44.5	8.3	217.8
Cumulative Total		0.0	14.3	78.2	164.8	209.3	217.8	

Table I-4
Rancho del Rey SPA III
Non-Residential Acres Absorbed per Fiscal Year

	-------------Fiscal			Year--------------			
Land Use	89-90	90-91	91-92	92-93	93-94	94-95	Total
Community Facilities							
Junior High School	0.0	0.0	22.5	0.0	0.0	0.0	22.5
Public Park	0.0	2.0	0.0	0.0	0.0	0.0	2.0
Open Space	0.0	86.0	41.4	21.9	0.0	0.0	149.3
Major Circulation	0.0	1.1	6.0	6.0	3.1	0.6	16.8
Annual Totals	0.0	89.1	69.9	27.9	3.1	0.6	190.6
Cumulative Total	0.0	89.1	159.0	186.9	190.0	190.6	

Figure I-1 graphically illustrates the rate of residential buildout through Fiscal Year 1995, while Figure I-2 shows the projected population based upon a factors of 2.000 persons per dwelling unit in the retirement community, 3.219 persons per dwelling unit for the single family detached units and 2.801 persons per dwelling unit for the townhomes included within SPA III.

Figure I-1
Rancho del Rey SPA III
Occupied Dwelling Units

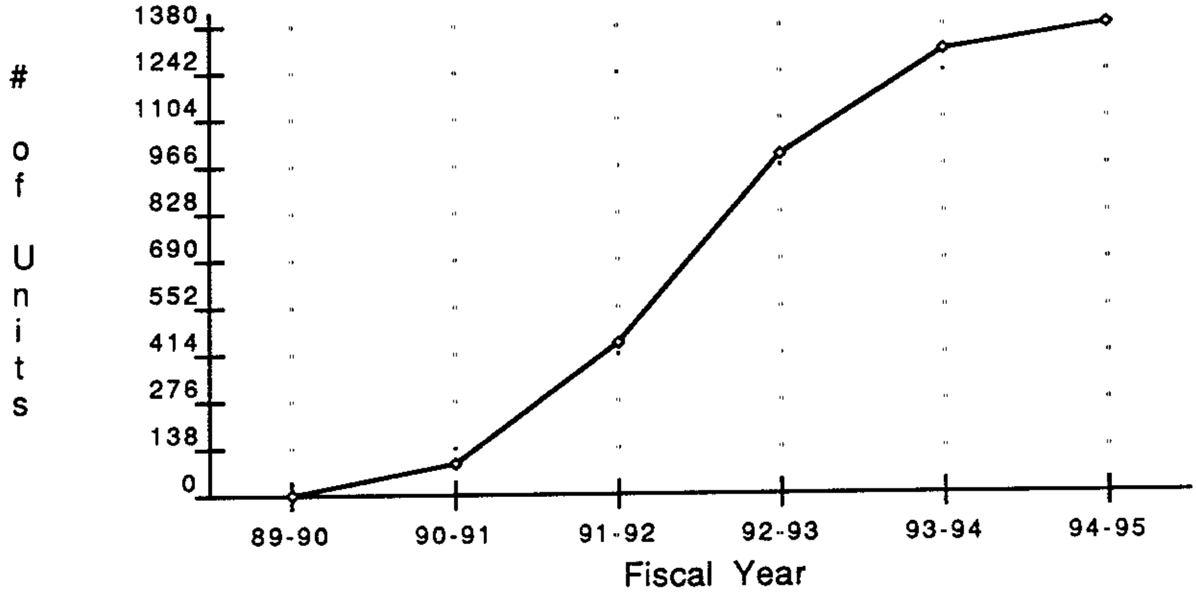
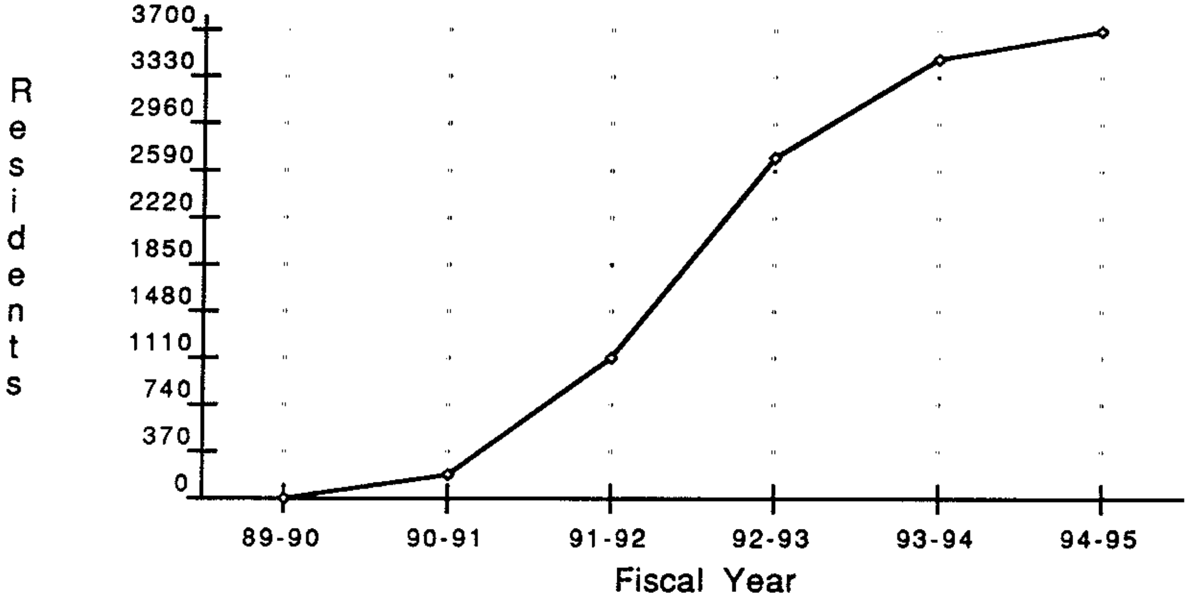


Figure I-2
Rancho del Rey SPA III
Resident Population



SUMMARY OF ANALYSIS

The development of Rancho del Rey SPA III is projected to have an overall positive fiscal impact on the City of Chula Vista. In other words, cumulative operating revenues are projected to exceed cumulative operating costs over the nine year period of time analyzed in this study. SPA III's annual impact after buildout is projected to be a positive $64,877 per year in current dollars.

It is important to consider that SPA III is just one part of a three part development. The fiscal analysis of SPA I prepared in 1987 showed an annual positive fiscal impact amounting to $147,195 at buildout. It is reasonable to expect that the recent significant increases in housing values would result in an even greater positive fiscal impact if prepared today.

The Rancho del Rey SPA III development is expected to have a neutral effect on the City's capital expenditures and revenues, in that the development will provide public facilities financed either from the developer of the property or from the property itself through the use of public debt mechanisms tied to the property (i.e. 1913 Act assessment districts). A separate Public Facilities Financing Plan is being prepared for Rancho del Rey SPA III that will detail the methods to be used to finance the affected public facilities.

The following tables and figures reflect the projections of operating cost and revenue by fund as fully discussed in Chapters II and III.

Table I-6 shows the projected combined operating funds costs and revenues over the buildout period and for five years beyond. The funds included in this grouping are the General Fund, Special Gas Tax, Traffic Safety Fund and State Library Act Fund.

Table I-6
Projected Annual Operating Revenues and Costs
(in constant 1989 $)

Fiscal Year	Revenue*	Cost**	Annual Net Impact	Cumulative Net Impact	Revenue/ Cost Ratio
1990	$9,035	$0	$9,035	$9,035	n/a
1991	$58,765	$51,035	$7,730	$16,765	1.15
1992	$315,478	$275,311	$40,167	$56,931	1.15
1993	$685,210	$589,280	$95,930	$152,861	1.16
1994	$836,397	$747,107	$89,290	$242,151	1.12
1995	$856,986	$785,033	$71,953	$314,104	1.09
1996	$849,910	$785,033	$64,877	$378,981	1.08
1997	$849,910	$785,033	$64,877	$443,858	1.08
1998	$849,910	$785,033	$64,877	$508,735	1.08
1999	$849,910	$785,033	$64,877	$573,611	1.08
2000	$849,910	$785,033	$64,877	$638,488	1.08

* see Table III-1

** see Table II-3

Figure I-3 shows the relationship between the costs and revenues on an annual basis for each of the first eleven years of development.

CHAPTER II

OPERATING EXPENDITURE ANALYSIS

The analysis of municipal operating expenditures has been prepared based on information gathered from a review of the City of Chula Vista's 1988-89 operating budget and discussions and/or correspondence with various city departments.

To determine the full costs of providing city services, John McTighe & Associates prepared a cost allocation of the indirect and overhead costs contained in the City's budget. These costs have been allocated to eighteen "direct service" activities. The eighteen activities and their associated 1988-89 direct service budgeted expenditures are listed on Table II-1 below. Appendix A shows the costs that were allocated to each of these activities based on the City's previously developed allocation methodology.

Table II-1
City of Chula Vista
1988-89 General Fund Direct Service Activities' Full Cost

Activity/Department	1988-89 Full Cost
General Government and Non-Departmental	$1,105,712
Planning	1,086,301
Community Development	747,544
Police/Animal Regulation	13,460,289
Fire Protection	5,559,51
Building & Housing	781,854
Public Works/Engineering	
Engineering	
Design & Construction	1,181,280
Land Development	712,458
Traffic Engineering	445,852
Public Works	
Street Maintenance	1,368,221
Street Sweeping	253,700
Street Tree Maintenance	569,816
Traffic Operations	374,823
Traffic Signal & Street Light Maintenance	1,088,293
Sewer Systems Maintenance	894,800
Pump Station Maintenance	167,922
Parks & Recreation	3,509,232
Library	2,439,583
Total	$35,747,192

Source: City of Chula Vista 1988-89 Adopted Budget;
John McTighe & Associates

When all indirect and overhead costs were allocated, the resulting eighteen activities were reviewed to determine which ones would be impacted as a result of the proposed development of Rancho del Rey SPA III as illustrated in the conceptual development plan in Chapter I. Table II-2 lists the type of impact anticipated on each of the activities.

Table II-2
Effect of Rancho del Rey SPA III Development on City Operating Expenditure Activities

No Impact	One-Time Impact	On-Going Impact
Legislative & Administrative*	Planning	Park & Recreation
Community Development	Building Inspection	Public Works
	Engineering	Operations
	Fire Prevention	Police
		Library Operations
		Fire Suppression

*Approximately $3,802,920 of Legislative & Administrative costs have been allocated as overhead to other activities.

Source: John McTighe & Associates

The following discussion assesses the impact of the proposed land uses on those activities shown as impacted on Table II-2.

ONE TIME IMPACT

Planning

Planning will experience a one-time, impact as the plans for the development of the Rancho del Rey SPA III area are formalized and processed. Since the buildout of this project is anticipated to extend over a three year period, this impact should not have a significant impact at any particular point in time. It is not now possible to quantify the cost of this impact on the current planning activity. However, Chula Vista's planning fees have been established at a level intended to recover the full cost of the Planning Department's processing resulting in no net cost to the City.

Building Inspection

The Building inspection activity provides structural plan check and field inspection services on all new construction within the City. This activity will experience a one-time impact as the construction on the site takes place. However, neither the magnitude nor the cost of this activity can be estimated without specific construction plans for the site. The full costs for these services are recovered through the levying of fees upon the subject construction. As a result, no net costs are assumed to be incurred by the City for the services of the Building Inspection activity during the buildout of Rancho del Rey SPA III.

Engineering

There would be a one-time impact upon engineering services during the development of the property. Due to the lack of specific plans for development, it is not possible to project the cost of this impact at this time. However, the City's engineering fees have been established on a full cost recovery basis thereby assuring that the costs to be incurred by the City for engineering services will be fully offset by the imposition of fees upon the development requiring the expenditures to be made.

Fire Prevention

Fire prevention would experience one-time costs for review of the building plans for all structures proposed for the property. The costs for these services cannot be estimated at this time due to the lack of specific building plans for the property.

ON-GOING IMPACT

Table II-3 summarizes the projected annual on-going costs for each of the first nine years of buildout. The bases for the projections are discussed in the following paragraphs.

Table II-3
Summary of On-going Annual City Cost Increments resulting from Development of Rancho del Rey SPA III
(in constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	51,035
1992	275,311
1993	589,280
1994	747,107
1995	785,033
1996	785,033
1997	785,033
1998	785,033
1999	785,033
2000	785,033

PUBLIC WORKS OPERATIONS

This activity consists of a variety of maintenance functions, primarily street maintenance & repair.

Street Maintenance

Street maintenance costs were estimated using a combination of the projected number of miles of public streets and the projected average daily traffic trips.

One-half of the cost of street maintenance was projected on the basis of the current annual cost per mile of maintaining the 250 miles of streets in the City's maintained system ($2,736.44). This was multiplied by the estimated number of miles of public streets to arrive at half of the annual costs of street maintenance.

The other half of the cost of street maintenance was projected on the basis of the projected number of average daily traffic trips to be generated within the project area as found on Table II-5. These were estimated using traffic generation factors of 10 average daily trips (ADT) for single family residential dwelling units, 4.5 ADTs per retirement housing unit, 8.0 ADTs per townhome Unit, 60 ADTs per acre of junior high school use and 50 ADTs per acre for the neighborhood park. The City is currently projected to have 738,186 ADTs. One-half of the estimated 88-89 cost of street maintenance divided by the estimated current ADTs yields an average annual maintenance cost per ADT of $.93. This factor of $.93 was applied to the estimated annual ADTs to arrive at the portion of the street maintenance costs attributable to actual travel trips.

Table II-4, below shows the total number of street miles projected per year that were used as the basis for the cost projections.

Table II-4
Rancho del Rey SPA III
Number of Miles of City Maintained Streets

Fiscal Year	Miles
1990	0.0
1991	1.5
1992	3.5
1993	5.2
1994	5.9
1995	6.0
1996	6.0
1997	6.0
1998	6.0
1999	6.0
2000	6.0

Table II-5 shows the average daily traffic trips that were projected by John McTighe & Associates for use in this analysis.

Table II-5
Average Daily Traffic Trips

Residential	ADTs/	Fiscal Year						
Product Type	DU	89-90	90-91	91-92	92-93	93-94	94-95	TOTAL
Retirement								
Stacked Townhouses	4.5	0	135	270	270	270	50	995
Cluster Townhomes	4.5	0	162	324	324	234	0	1,044
Patio Homes	4.5	0	108	216	22	0	0	346
3,520 s.f. pad	10.0	0	0	750	0	0	0	750
3,600 s.f pad	10.0	0	0	0	960	190	0	1,150
4,180 s.f. pad	10.0	0	0	0	960	40	0	1,000
5,000 s.f. pad	10.0	0	0	720	1,310	720	60	2,810
6,000 s.f. pad	10.0	0	0	270	0	0	0	270
Townhomes	8.0	0	0	0	768	768	480	2,016
Total Residential		0	405	2,550	4,614	2,222	590	10,381
Cumulative Residential		0	405	2,955	7,569	9,791	10,381	

Non-Residential Land Use	ADTs/ Ac.	89-90	90-91	91-92	92-93	93-94	94-95	TOTAL
Community Facilities								
Junior High School	60	0	0	1,350	0	0	0	1,350
Public Park	50	0	100	0	0	0	0	100
Total Non-Residential		0	100	1,350	0	0	0	1,450
Cumulative Non-Residential		0	100	1,450	1,450	1,450	1,450	
Annual Grand Total		0	505	3,900	4,614	2,222	590	11,831
Cumulative Grand Total		0	505	4,405	9,019	11,241	11,831	

Table II-6

Street Maintenance Cost Projections

(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	4,627
1992	13,623
1993	22,504
1994	26,479
1995	27,383
1996	27,383
1997	27,383
1998	27,383
1999	27,383
2000	27,383

Street Sweeping

The cost of street sweeping shown on the following table has been projected on the basis of $503 per mile of street. This is the current contract cost the City pays for street sweeping. As these contract costs fluctuate, the overall cost may differentiate from that shown here.

Table II-7
Street Sweeping Cost Projections
(In Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	764
1992	1,754
1993	2,600
1994	2,952
1995	3,018
1996	3,018
1997	3,018
1998	3,018
1999	3,018
2000	3,018

Street Tree Maintenance

Street tree maintenance was projected on the basis of the current average annual cost per mile of public streets in the city in 1988-89 of $2,279. This was derived by dividing the full cost of this activity ($569,816) by the 250 miles of streets estimated in the City's maintained system in 1988-89. This cost per mile of $2,279 was applied to the estimated number of miles of public streets to arrive at the estimate of annual costs for street tree maintenance in

Rancho del Rey SPA III. It should be noted, however, that this cost estimate is probably high in the first few years, since the maintenance of young trees is not as labor intensive as for more mature trees. However, over the long term the average maintenance costs would be applicable.

Table II-8
Street Tree Maintenance Cost Projections
(In Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	3,464
1992	7,947
1993	11,783
1994	13,378
1995	13,676
1996	13,676
1997	13,676
1998	13,676
1999	13,676
2000	13,676

Traffic Signal and Street Light Maintenance

Traffic signal and street light maintenance costs were calculated on the basis of the number of miles of public streets based on the 1988-89 budget for an annual cost of $4,353 per mile.

Table II-9
Traffic Signal and Street Light Maintenance Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	6,616
1992	15,178
1993	22,503
1994	25,551
1995	26,119
1996	26,119
1997	26,119
1998	26,119
1999	26,119
2000	26,119

Traffic Operations

The traffic operations costs were projected on the same basis as street operations. That is, one half of the current year's cost was calculated on a per mile of public street basis of $749.65 and the other half was equated to be approximately $.25 per average daily traffic trip (ADT). These factors were then applied to the projected increases in miles of public streets and ADTs to arrive at the projections shown.

Table II-10
Traffic Operations Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	1,267
1992	3,732
1993	6,165
1994	7,254
1995	7,502
1996	7,502
1997	7,502
1998	7,502
1999	7,502

PARKS AND RECREATION

Recreation Services

It is anticipated that further demand for recreation services will exist in proportion to the increase in resident population from within Rancho del Rey SPA III. The City's current cost for recreation services is estimated to be $11.82 per capita. If the recreation service activities increase in proportion to the increased population, the increases shown on the following table would be expected to occur:

Table II-11
Recreation Services Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1992	2,128
1993	13,007
1994	31,725
1995	41,173
1996	43,645
1997	43,645
1998	43,645
1999	43,645
2000	43,645

Park Maintenance

Park maintenance costs are expected to increase with the addition of park acreage in the area. The present per acre cost of park maintenance within the City of Chula Vista is $6,100. The Rancho del Rey SPA III SPA Plan provides for the addition of a 2.0 acre neighborhood park in the second year of development of the SPA. The following park maintenance costs are therefore projected.

Table II-12
Park Maintenance Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	0
1992	12,201
1993	12,201
1994	12,201
1995	12,201
1996	12,201
1997	12,201
1998	12,201
1999	12,201
2000	12,201

Open Space

The Rancho del Rey SPA III land use plans designate 149.3 acres as open space land. For purposes of this analysis, it has been assumed that the open space lands would be dedicated to an open space maintenance district in an amount proportionate to the percent of all land uses absorbed in each year of development. Therefore, based on the City's present estimated cost of $215.42 per acre for the administration of open space maintenance, the costs shown on the following table are projected. These costs will be offset by revenues to be received from an open space maintenance district covering Rancho del Rey. There will be additional direct costs for the actual maintenance of the open space charged against the open space maintenance district. Those costs, however, cannot be estimated at this time, but because they will be charged against the district, there will be no net cost incurred by the City.

Table II-13
Open Space Maintenance Administration
Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	0
1992	18,526
1993	27,445
1994	32,162
1995	32,162
1996	32,162
1997	32,162
1998	32,162
1999	32,162
2000	32,162

POLICE AND ANIMAL REGULATION

Based on the 1988-89 City Police full cost allocation budget, the per capita cost of police and animal control services is $111.90. Applying this ratio to the projected population for Rancho del Rey SPA III results in the projected cost of police services shown below.

Table II-14
Police and Animal Regulation Cost Projections
(in Constant 1989$)

Fiscal Year	Cost
1990	$ 0
1991	20,142
1992	123,091
1993	300,229
1994	389,638
1995	413,025
1996	413,025
1997	413,025
1998	413,025
1999	413,025
2000	413,025

FIRE

Fire services costs were allocated to Rancho del Rey SPA III based on a methodology developed for allocation of fire services costs to the updated EastLake I fiscal impact analysis in February 1988. Briefly, an equivalent dwelling unit for fire services purposes was derived based on projections of city-wide growth of dwelling units, commercial acres and industrial acres. The SANDAG Series 7 growth rates were applied to the 1987 base number of dwelling units

(45,101), commercial acres (786.7) and industrial acres (562.03) to project the future number of city-wide fire equivalent dwelling units. The cost of providing fire protection services was kept constant through 1992 and then increased by the cost of one additional engine company. The cost per equivalent dwelling unit was determined by dividing this annual cost by the number of EDUs in any particular year. The resulting cost per EDU was then applied to the number of fire EDUs that were projected to exist in Rancho del Rey SPA III in that particular year based on the earlier described buildout scenario.

Table II-15
Fire Services Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	8,376
1992	43,943
1993	97,710
1994	125,700
1995	131,445
1996	131,445
1997	131,445
1998	131,445
1999	131,445
2000	131,445

LIBRARY OPERATIONS

Library operations costs were projected on the basis of current per capita costs of $20.28. The following are the projected added library operations costs.

Table II-16
Library Operations Cost Projections
(in Constant 1989 $)

Fiscal Year	Cost
1990	$ 0
1991	3,651
1992	22,309
1993	54,414
1994	70,619
1995	74,858
1996	74,858
1997	74,858
1998	74,858
1999	74,858
2000	74,858

CHAPTER III

OPERATING REVENUE ANALYSIS

ONE TIME IMPACT

The City receives one-time revenues associated with the processing of land development projects. Fees for building, plumbing, electrical, housing and sewer connection permits along with charges for environmental reviews, plan checks, zoning and engineering fees, etc., have been established by the City to recover costs incurred for these activities. The one-time revenues from these sources are expected to offset the City's expenditures resulting in no net cost to the City.

ON-GOING IMPACT

Figure III-1 shows the total on-going revenue per year projected through fiscal year 1999-2000. Table III-1 shows the revenues projected during the first nine years. The following paragraphs describe how the revenues for each source were projected.

Figure III-1

Operating Revenue

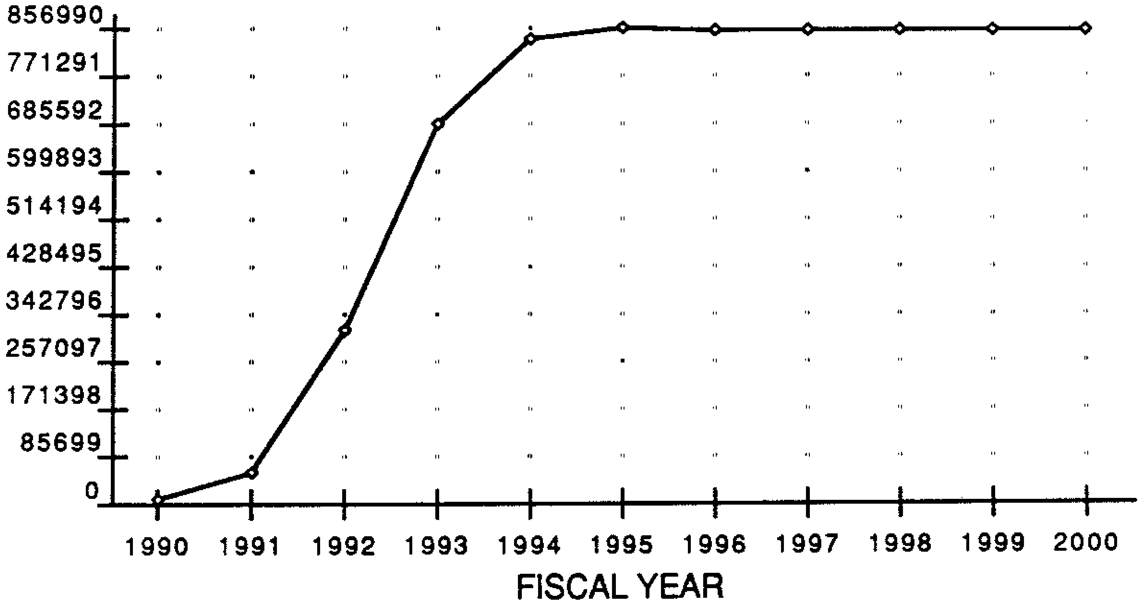


Table III-1

Summary of Annual Revenue Increments Resulting from Development of Rancho del Rey SPA III

(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 9,035
1991	58,765
1992	315,478
1993	685,210
1994	836,397
1995	856,986
1996	849,910
1997	849,910
1998	849,910
1999	849,910
2000	849,910

PROPERTY TAX

Property taxes for general government purposes are limited to a total of 1% of the assessed market value. The taxes collected are apportioned among several different local government agencies in whose jurisdiction the property lies. The basis for apportionment of taxes has been established by formula for each tax rate area (TRA) based on the pre-1978 ratio of taxes within that TRA.

All of this property has been previously annexed to the City and has therefore been subjected to the property tax allocation agreement then in place between the City and County of San Diego. As a consequence, the City of Chula Vista will receive approximately 14.05% of the 1% property tax collected on all of the property contained within the boundaries of Rancho del Rey SPA III. This figure represents the projected average distribution from all tax rate areas covering Rancho del Rey SPA III.

The property taxes have been projected based on a combination of discussions with representatives of the Rancho del Rey Partnership and assumptions developed by John McTighe & Associates. Because the property tax yield to the City is dependent on the assessed value of the property, a series of computer models was developed which projected assessed value and property tax based on various assumptions. Table III-2 shows the projected new residential market values used to project assessed valuation. Table III-3 then shows the secured property tax revenue from Rancho del Rey SPA III based on the models. The details of the projections and models are displayed in Appendix D. The discussion which follows Table III-3 summarizes the projections and the key assumptions.

Table III-2

Projected New Residential Market Valuations

(in 1,000s of Constant 1989 dollars)

Product Type	1989 Market Value (in dollars)	89-90	90-91	91-92	92-93	93-94	94-95	Total
Retirement								
Stacked Townhouses	$148,930	$0	$4,468	$8,936	$8,936	$8,936	$1,638	$32,914
Cluster Townhomes	$149,900	$0	$5,396	$10,793	$10,793	$7,795	$0	$34,777
Patio Homes	$191,220	$0	$4,589	$9,179	$956	$0	$0	$14,724
3,520 s.f. pads	$193,450	$0	$0	$14,509	$0	$0	$0	$14,509
3,600 s.f pad	$171,470	$0	$0	$0	$16,461	$3,258	$0	$19,719
4,180 s.f. pad	$206,500	$0	$0	$0	$19,824	$826	$0	$20,650
5,000 s.f. pad	$244,050	$0	$0	$17,572	$31,971	$17,572	$1,464	$68,578
6,000 s.f. pad	$258,100	$0	$0	$6,969	$0	$0	$0	$6,969
Townhomes	$158,750	$0	$0	$0	$15,240	$15,240	$9,525	$40,005
Totals		$0	$14,454	$67,956	$104,180	$53,62	$12,628	$252,844

Table III-3
Property Tax Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 8,079
1991	26,731
1992	119,742
1993	263,713
1994	337,848
1995	355,369
1996	355,369
1997	355,369
1998	355,369
1999	355,369
2000	355,369

Three major variables that affect the assessed value projections (and consequently, property taxes) are rate of buildout, rate of property appreciation and rate of turnover.

Buildout Rate

The assumptions regarding rate of buildout were based on the Rancho del Rey Partnership's forecasts. The previous Table I-1 found on page 2 shows the number of residential units by density per year that were used in the projections. Table I-2 on page 3 shows the number of gross acres of non-residential development per year in each category that were assumed to be developed.

Appreciation

The rate of property appreciation is significant in as much as it affects both the initial assessed valuation and the reevaluation that is placed on property when it changes ownership. Property values, particularly housing values, have historically appreciated at a faster rate than the underlying rate of inflation. Consequently, unless an assumption is made concerning the difference between the rate of property appreciation and underlying inflation, the property tax revenue projections may be understated. This is particularly true when the effect of Proposition 13's provisions relating to the limitation of annual assessed value increases is taken into consideration. Property upon resale is going to reflect the then-current market value and will be subject to reassessment and consequently taxed at the higher value. However, to be conservative, the total revenues shown here have not included an adjustment in either annual inflation or appreciation. Hence, this property tax projection is most likely understated.

Turnover

The rate of turnover would be significant because of its impact on reassessments where appreciation is greater than 2% annually. Under the present system of property assessment, annual increases in assessed value are limited to a maximum of 2% unless property changes ownership. When changes of ownership take place, the assessed value is adjusted to reflect the actual market value of the property. However, in this analysis no adjustment has been made for either the 2% annual inflation or for appreciation.

For purposes of this analysis, annual turnover rates of 10% for residential property and 5% for non-residential property have been assumed. In other words, it has been assumed that the ownership of residential property will change on the average once every ten years and the ownership of industrial, retail and office property will change on the average once every twenty years.

SALES AND USE TAXES

Sales Tax revenues for SPA III are projected based on an estimate of per capita spending. It has been assumed that fifty percent of the sales tax generated within the City of Chula Vista is attributed to the fact that the people reside within the City (per capita), while the other fifty percent is attributed to the location of commercial and industrial businesses within the City.

The City's estimated 1988-89 sales tax revenues total $9,773,690. Fifty percent of this is $4,886,845 which amounts to $40.63 per capita. This amount was multiplied by the estimated resident population in each year to arrive at the sales tax projection.

Since no commercial or industrial land uses are included within the SPA III boundaries, no allocation of sales tax revenue has been attributed from those uses. However, the following describes the methodology which would have been used to attribute sales tax to non-residential uses had they existed. This discussion is included since other SPAs of Rancho del Rey do in fact include such uses are therefore credited with additional sales tax revenue in accordance with this methodology.

While no precise studies exist to verify the amount of retail sales attributed to industrial land use, a conservative amount of $10 per square foot of industrial space per year has been assumed. Assuming an average of thirty percent lot coverage for industrial uses, this translates to taxable sales of $130,680 per year per acre.

The commercial sales tax per acre is estimated by deducting the total attributed to industrial uses from the other 50% of the City's total sales tax revenue in the base year. The remainder is then divided by the estimated number of acres of commercial land use within the City in 1988 to arrive at an annual commercial per acre sales tax revenue of $5,278.23.

Table III-4

Sales & Use Tax Revenue Projection

(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	7,313
1992	44,689
1993	109,000
1994	141,460
1995	149,951
1996	149,951
1997	149,951
1998	149,951
1999	149,951
2000	149,951

FRANCHISE TAXES

This revenue is derived from taxes placed on cable television, sanitary and gas & electric services provided within the City. The estimated city-wide revenue for 1988-89 from this source is $1,418,790.

The projections for this revenue source were based on a breakdown of the current charges for each of the three utilities among residential and non-residential users and then on the average per dwelling unit and/or developed non-residential uses. The following table shows the comparison of this revenue source projection.

Table III-5
Franchise Tax Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	1,948
1992	9,612
1993	21,648
1994	28,207
1995	29,874
1996	29,874
1997	29,874
1998	29,874
1999	29,874
2000	29,874

PROPERTY TRANSFER TAXES

Property transfer tax revenue is based on a rate of $.55 for each $1,000 of unencumbered real property value transferred. To be conservative, the projections have been based on 50% of the projected value of turnover property transactions and 100% of new property transactions. The resulting projection of revenue is as follows:

Table III-6
Property Transfer Tax Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	7,949
1992	37,773
1993	59,545
1994	34,626
1995	13,536
1996	6,953
1997	6,953
1998	6,953
1999	6,953
2000	6,953

UTILITY USERS TAX

The City levies taxes on the consumption of natural gas and electricity and on the gross revenue for telephone billings within the City. The current rates of these taxes are $0.0025 per kilowatt hour (KWH) of electricity, $0.00919 per therm of gas and 5% of the gross telephone revenues.

The average electrical consumption per residential unit is estimated by San Diego Gas and Electric Company to be 425 KWH per month, or 5,100 KWH per year. At $0.0025 per KWH, this equates to $12.75 in utility users tax per year per dwelling unit for electricity.

The average gas consumption per dwelling unit is estimated by SDG&E as 50 therms per month, or 600 therms per year. At $0.00919 per therm this equates to $5.514 per dwelling unit per year in utility users tax for natural gas.

Assuming the average residential phone bill is $20.00 per month, the annual utility users tax for phone services per dwelling unit is projected to be $12.00 per year.

Altogether, the utility users tax revenue was projected using composite annual figures of $30.26 per dwelling unit. The total projections of revenue from the utility users tax are as follows:

Table III-7
Utility Users Tax Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	2,724
1992	13,437
1993	30,264
1994	39,434
1995	41,764
1996	41,764
1997	41,764
1998	41,764
1999	41,764
2000	41,764

BICYCLE LICENSES

Bicycle licenses are calculated on a per capita basis. Using the estimated 1988-89 revenue from this category of $4,100 divided by the total population of Chula Vista (120,288) giving a $.03 per capita amount. This figure was then multiplied by the population to yield the following projections.

Table III-8
Bicycle License Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	6
1992	37
1993	91
1994	119
1995	126
1996	126
1997	126
1998	126
1999	126
2000	126

ANIMAL LICENSES

Animal licenses are calculated in the same manner as bicycle licenses. The estimated 1988-89 revenue from animal licenses is $46,000 divided by the population of Chula Vista (120,288) for a $.38 per capita amount. The results of this figure multiplied by the total population are as follows.

Table III-9
Animal Licenses Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	69
1992	421
1993	1,026
1994	1,332
1995	1,411
1996	1,411
1997	1,411
1998	1,411
1999	1,411
2000	1,411

OTHER TAXES

This category includes unsecured and delinquent property taxes and the Homeowner Property Tax Relief revenue from the state. The amounts projected in this category were based on the current year's percentage that those revenues represent of property tax revenue. The following table shows the annual revenue.

Table III-10
Other Taxes Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 325
1991	1,076
1992	4,819
1993	10,612
1994	13,595
1995	14,300
1996	14,300
1997	14,300
1998	14,300
1999	14,300
2000	14,300

MOTOR VEHICLE IN-LIEU

The City estimates $4,168,140 in revenues from the State for Motor Vehicle In-Lieu taxes in 1988-89. The formula used by the State allocates these revenues on a per capita basis. Therefore, the per capita amount was calculated as $4,168,140 divided by 120,288 = $34.65. The annual revenue projected is as follows:

Table III-11
Motor Vehicle In-Lieu Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	6,237
1992	38,116
1993	92,970
1994	120,656
1995	127,898
1996	127,898
1997	127,898
1998	127,898
1999	127,898
2000	127,898

FINES, FORFEITURES AND PENALTIES

The revenue in this category is derived from a combination of fines for ordinance violations and library fines. Approximately 49% is from ordinance violations and 51% from library fines. Both of these revenues are expected to increase proportionate to population and have therefore been projected on the basis of $1.35 per capita. The projections are as follows:

Table III-13
Fines, Forfeitures and Penalties Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	243
1992	1,485
1993	3,621
1994	4,699
1995	4,981
1996	4,981
1997	4,981
1998	4,981
1999	4,981
2000	4,981

SWIMMING POOLS

The City estimates revenues totalling $85,000 from fees for use of municipal swimming pools in 1988-89. This amounts to approximately $.71 per capita. This revenue is assumed to increase proportionate to population. The resulting projections are shown below:

Table III-14
Swimming Pools Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	127
1992	777
1993	1,896
1994	2,461
1995	2,608
1996	2,608
1997	2,608
1998	2,608
1999	2,608
2000	2,608

RECREATION PROGRAM AND OTHER CHARGES

The charges for the various City-sponsored recreation programs and reservation of park facilities are estimated to amount to a total of $70,350 in 1988-89, for a per capita amount of about $.58. The following shows the projections of the estimated revenue from these fees and charges.

Table III-15

Recreation Program and Other Fee Revenue Projection

(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	58
1992	354
1993	864
1994	1,122
1995	1,189
1996	1,189
1997	1,189
1998	1,189
1999	1,189
2000	1,189

INVESTMENT EARNINGS

The City places its idle funds in interest bearing investments. Generally, as a City's total revenue increases, the amount of money available for investment also increases. This analysis, however, has assumed that only the net positive difference between annual revenue and expenditures will be available to earn interest. A rate of 7.5% has been assumed on this balance. Therefore, the following projections of interest earnings attributed to Rancho del Rey SPA III represent 7.5% of the difference between the amount of total revenue and the amount of total costs in any one year.

Table III-16
Investment Earnings Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 630
1991	539
1992	2,802
1993	6,693
1994	6,230
1995	5,020
1996	4,526
1997	4,526
1998	4,526
1999	4,526
2000	4,526

TRAFFIC SAFETY FUND

This fund receives its revenue from fines for violations of the Vehicle Code within the City. For purposes of this analysis it has been assumed that these revenues will increase in proportion to increases in population. Therefore, the estimated $385,000 revenue for 1988-89 was converted to $3.20 per capita and applied to the population assumptions to arrive at the following projections:

Table III-17
Traffic Safety Fund Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	576
1992	3,521
1993	8,587
1994	11,145
1996	11,814
1997	11,814
1998	11,814
1999	11,814
2000	11,814

STATE LIBRARY ACT FUND

The state provides a foundation program for library funding for all libraries in the state whose expenditures meet or exceed a fixed per capita amount. The City estimates receiving $136,000 in fiscal year 1988-89 which equates to $1.13 per capita. Assuming the City's library will continue its eligibility to receive these funds, the following projections of revenue from this source are projected:

Table III-18
State Library Act Revenue Projection
(In constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	204
1992	1,244
1993	3,033
1994	3,937
1995	4,173
1996	4,173
1997	4,173
1998	4,173
1999	4,173
2000	4,173

SPECIAL GAS TAX FUND

Gasoline tax is distributed by the State according to a complicated set of formulas that take into consideration the population of counties compared to the state total, the population of cities to total county population and the assessed value of cities compared to total assessed value within the county. Since the number of variables within these formulas make it impossible to project future gas tax revenue with any certainty, this analysis has assumed that gas tax revenue to Chula Vista will increase in proportion to population increases.

Table III-19
Gasoline Tax Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	2,511
1992	15,346
1993	37,431
1994	48,577
1995	51,493
1996	51,493
1997	51,493
1998	51,493
1999	51,493
2000	51,493

OPEN SPACE MAINTENANCE FUND

An open space maintenance district will be formed to provide the funding for the costs of maintaining the dedicated open space areas contained within SPA III. This district will levy an annual assessment on property owners to cover the costs of maintenance and administration. The costs of maintenance have not been projected in this analysis since the type and frequency of that maintenance has not yet been defined. However, this analysis has projected costs for open space administration based on the City's current experience. Therefore, the revenue shown on the following table reflects the offset to the costs shown on Table II-13 for the administration of the open space maintenance program.

Table III-20
Open Space Maintenance District Revenue Projection
(in constant 1989 $)

Fiscal Year	Revenue
1990	$ 0
1991	0
1992	18,526
1993	27,445
1994	32,162
1995	32,162
1996	32,162
1997	32,162
1998	32,162
1999	32,162
2000	32,162

APPENDIX A

INDIRECT COST ALLOCATION

CITY OF CHULA VISTA COST ALLOCATION
1988-89 Adopted Budget

Department/Activity	Employee Services	Other Services	Capital Outlay	1988-89 Total	Indirect Costs to be Allocated	Direct Cost Base	Indirect Cost Allocation	Grand Total
-------------------	----------	----------	---------	----------	----------	----------	----------	----------
Building & Equipment								
GENERAL GOVERNMENT & NON DEPARTMENTAL								
City Council	$125,190	$55,790		$180,980	$0	$125,190	$25,095	$206,075
Boards & Commissions	$5,970	$23,200		$29,170	$0	$5,970	$1,197	$30,367
Community Promotions		$19,130		$19,130	$0	$0	$0	$19,130
City Attorney	$310,230	$42,950		$353,180	$0	$310,230	$62,187	$415,367
City Clerk/Elections	$158,770	$48,900		$207,670	$0	$158,770	$31,826	$239,496
Administration	$545,650	$46,750	$6,270	$598,670	($484,400)	$61,250	$12,278	$120,278
Management Services	$679,570	$291,520	$20,490	$991,580	($971,090)	$0	$0	$0
Personnel/Volunteers	$457,030	$98,390	$11,310	$566,730	($555,420)	$0	$0	$0
Finance/Purchasing	$733,000	$139,600	$15,800	$888,400	($797,600)	$0	$0	$75,000
Insurance		$792,100		$792,100	($792,100)	$0	$0	$0
Non-Departmental	($19,770)	$222,080		$202,310	($202,310)	$0	$0	$0
	----------	---------	--------	---------	----------	---------	--------	----------
SUB-TOTAL GENL. GOV'T. & NON-DEPARTMENTAL...........	$2,995,640	$1,780,410	$53,870	$4,829,920	($3,802,920)	$661,410	$132,582	$1,105,712
PLANNING	$853,870	$61,270	$5,950	$921,090	$0	$853,870	$171,161	$1,086,301
COMMUNITY DEVELOPMENT	$574,620	$57,740	$2,300	$634,660	$0	$574,620	$115,184	$747,544
POLICE/ANIMAL REGULATION	$9,987,210	$1,471,110	$33,840	$11,492,160	$0	$9,987,210	$2,001,969	$13,460,289
FIRE PROTECTION	$4,338,220	$351,680	$22,490	$4,712,390	$0	$4,338,220	$869,611	$5,559,511
BUILDING & HOUSING								
Administration	$105,030	$12,010	$750	$117,790	($117,040)	$0	$0	$0
Communications	$113,910	$17,890		$131,800	($133,994)	$0	$0	$0
Building Inspection	$604,300	$42,450	$8,000	$654,750	$11,637	$615,937	$123,467	$781,854
	----------	---------	--------	---------	---------	---------	--------	----------
SUB-TOTAL	$823,240	$72,350	$8,750	$904,340	($133,994)	$615,937	$123,467	$781,854

April 26, 1989

CITY OF CHULA VISTA COST ALLOCATION
1988-89 Adopted Budget

Department/Activity	Employee Services	Other Services	Capital Outlay	1988-89 Total	Indirect Costs to be Allocated	Direct Cost Base	Indirect Cost Allocation	Grand Total
PUBLIC WORKS/ENGINEERING								
Administration	$221,430	$27,650	$3,600	$252,680	($249,080)	$0	$0	$0
Operations Adminstration	$243,360	$50,480	$5,000	$298,840	($293,840)	$0	$0	$0
Design & Construction	$884,530	$56,250	$7,030	$947,810	$52,641	$937,171	$187,859	$1,181,280
Land Development	$547,370	$16,260	$4,040	$567,670	$32,576	$579,946	$116,252	$712,458
Traffic Engieering	$342,380	$10,380		$352,760	$20,376	$362,756	$72,716	$445,852
Street Maintenance	$632,580	$456,690	$1,050	$1,090,320	$126,743	$759,323	$152,209	$1,368,221
Street Sweeping	$0	$253,700		$253,700	$0	$0	$0	$253,700
Street Tree Maintenance	$253,090	$205,120		$458,210	$50,709	$303,799	$60,897	$569,816
Traffic Operations	$165,730	$136,010		$301,740	$33,205	$198,935	$39,877	$374,823
Traffic Sig./St. Lt. Maint.	$132,690	$897,090		$1,029,780	$26,586	$159,276	$31,927	$1,088,293
Sewer System Maintenance	$502,410	$170,840	$5,050	$678,300	$100,662	$603,072	$120,888	$894,800
Pump Station Maintenance	$97,970	$26,750		$124,720	$19,629	$117,599	$23,573	$167,922
Bldg. Maint. & Repair	$301,790	$129,670	$4,290	$435,750	($491,926)	$0	$0	$0
Custodial Maintenance	$324,760	$134,480		$459,240	($524,308)	$0	$0	$0
SUB-TOTAL	$4,650,090	$2,571,370	$30,060	$7,251,520	($1,016,235)	$4,021,876	$806,198	$7,057,165
PARKS & RECREATION								
Administration	$437,070	$54,730	$750	$492,550	($491,800)	$0	$0	$0
Park Maintenance	$769,900	$485,650	$9,980	$1,265,530	$217,963	$987,863	$198,020	$1,671,534
Recreation	$743,220	$277,570	$15,000	$1,035,790	$210,410	$953,630	$191,158	$1,422,358
Open Space Administration	$40,580	$24,740	$540	$65,860	$11,488	$52,068	$10,437	$87,246
Maintenance "J" St. Marina	$112,950	$36,280	$22,500	$171,730	$31,977	$144,927	$29,051	$210,258
Senior Information Center	$70,510	$9,230		$79,740	$19,962	$90,472	$18,135	$117,837
SUB-TOTAL PARKS & REC.	$2,174,230	$888,200	$48,770	$3,111,200	$0	$2,228,960	$446,802	$3,509,232
LIBRARY	$1,427,630	$725,780	$11,210	$2,164,620	$0	$1,427,630	$286,173	$2,439,583
TOTAL GENERAL FUND............	$27,824,750	$7,979,910	$217,240	$36,021,900	($4,953,148)	$24,709,734	$4,953,148	$35,747,192

April 26, 1989

CITY OF CHULA VISTA COST ALLOCATION

1988-89 Allocaton Factors

ASSUMPTIONS:

1988 Population	120,288
Base # of ADTs	738,186
Miles of Street	250
MGDs of Sewage	11.12
Acs. of park land	274
Acs. of Open Space	405

DEPARTMENT/FUNCTIOI	ALLOCATION BASIS	AMOUNT	
General Government	Constant Cost		
Planning	One Time		
Community Developmen	Constant Cost		
Police/Animal Contr	Per Capita	$111.90	/Capita
Fire Protection	Constant Cost		
Building & Housing	One Time		
Public Works			
Street Maintenance	50%/Mile of Stree	$2,736.44	/Mi. of Street
	50% per ADT	$0.93	/ADT
Street Sweeping	Per mile of Street	$503.00	/Mi. of Street
Street Tree Maintenance	Per mile of Street	$2,279.26	/Mi. of Street
Traffic Operations	50%/Mile of street &	$749.65	/Mi. of Street
	50% per ADT	$0.25	/ADT
T.S./St. Lt. Maintenanc	Per mile of Street	$4,353.17	/Mi. of Street
Sewer System Maint.	Per MGD of Sewer Flow	$80,467.61	/MGD
Pump Station Maintenance	Per MGD of Sewer Flow	$15,100.92	/MGD
Enginnering	One Time		
Parks & Recreation			
Recreation	Per Capita	$11.82	/Capita
Park Maintenance	Per Acre of Park Land	$6,100.49	/Ac. of Park Land
Open Space Administration	Per Acre of Open Space	$215.42	/Ac. of Open Space
Library	Per Capita	$20.28	/Capita
METROPOLITAN SEWER CHARGES	Per MG of Annual discharge	$646.00	/MG/Yr.

Source: City of Chula Vista 1988-89 Budget; John McTighe & Assocaites' Cost Allocation Model

April 26, 1989

APPENDIX B

EXPENDITURE PROJECTIONS BY YEAR

City of Chula Vista
Rancho del Rey SPA III
Fiscal Impact Analysis

Summary of Projected Operating Expenditures

Page 1 of 2

DEPARTMENT/ACTIVITY	Fiscal Year					
	1990	1991	1992	1993	1994	1995
PUBLIC WORKS						
Street Maintenance	$0	$4,627	$13,623	$22,504	$26,479	$27,383
Street Sweeping	$0	$764	$1,754	$2,600	$2,952	$3,018
Street Tree Maintenance	$0	$3,464	$7,947	$11,783	$13,378	$13,676
T.S./St. Lt. Maintenance	$0	$6,616	$15,178	$22,503	$25,551	$26,119
Traffic Operations	$0	$1,267	$3,732	$6,165	$7,254	$7,502
SUB-TOTAL PUBLIC WORKS	$0	$16,738	$42,235	$65,555	$75,614	$77,697
PARKS & RECREATION						
Recreation Division	$0	$2,128	$13,007	$31,725	$41,173	$43,645
Parks Division	$0	$0	$12,201	$12,201	$12,201	$12,201
Open Space Maintenance	$0	$0	$18,526	$27,445	$32,162	$32,162
SUB-TOTAL PARKS & RECREATION	$0	$2,128	$43,734	$71,371	$85,537	$88,008
POLICE AND ANIMAL CONTROL	$0	$20,142	$123,091	$300,229	$389,638	$413,025
FIRE	$0	$8,376	$43,943	$97,710	$125,700	$131,445
LIBRARY OPERATIONS	$0	$3,651	$22,309	$54,414	$70,619	$74,858
TOTAL	$0	$51,035	$275,311	$589,280	$747,107	$785,033
CUMULATIVE TOTAL	$0	$51,035	$326,347	$915,627	$1,662,734	$2,447,767

April 26, 1989

City of Chula Vista
Rancho del Rey SPA III
Fiscal Impact Analysis

Summary of Projected Operating Expenditures

	Fiscal Year				
DEPARTMENT/ACTIVITY	1996	1997	1998	1999	2000
PUBLIC WORKS					
Street Maintenance	$27,383	$27,383	$27,383	$27,383	$27,383
Street Sweeping	$3,018	$3,018	$3,018	$3,018	$3,018
Street Tree Maintenance	$13,676	$13,676	$13,676	$13,676	$13,676
T.S./St. Lt. Maintenance	$26,119	$26,119	$26,119	$26,119	$26,119
Traffic Operations	$7,502	$7,502	$7,502	$7,502	$7,502
SUB-TOTAL PUBLIC WORKS	$77,697	$77,697	$77,697	$77,697	$77,697
PARKS & RECREATION					
Recreation Division	$43,645	$43,645	$43,645	$43,645	$43,645
Parks Division	$12,201	$12,201	$12,201	$12,201	$12,201
Open Space Maintenance	$32,162	$32,162	$32,162	$32,162	$32,162
SUB-TOTAL PARKS & RECREATION	$88,008	$88,008	$88,008	$88,008	$88,008
POLICE AND ANIMAL CONTROL	$413,025	$413,025	$413,025	$413,025	$413,025
FIRE	$131,445	$131,445	$131,445	$131,445	$131,445
LIBRARY OPERATIONS	$74,858	$74,858	$74,858	$74,858	$74,858
TOTAL	$785,033	$785,033	$785,033	$785,033	$785,033
CUMULATIVE TOTAL	$3,232,800	$4,017,832	$4,802,865	$5,587,898	$6,372,931

April 26, 1989

APPENDIX C

REVENUE PROJECTIONS BY YEAR

City of Chula Vista
Rancho del Rey SPA III
Fiscal Impact Analysis

Summary of Projected City Operating Revenue

Revenue Source	1990	1991	1992	1993	1994	1995
GENERAL FUND						
Property Taxes	$8,079	$26,731	$119,742	$263,713	$337,848	$355,369
Sales & Use	$0	$7,313	$44,689	$109,000	$141,460	$149,951
Franchise Taxe:	$0	$1,948	$9,612	$21,648	$28,207	$29,874
Property Transfer	$0	$7,949	$37,773	$59,545	$34,626	$13,536
Utility Users	$0	$2,724	$13,437	$30,264	$39,434	$41,764
Business Licenses	$0	$0	$0	$0	$0	$0
Bicycle License	$0	$6	$37	$91	$119	$126
Animal License:	$0	$69	$421	$1,026	$1,332	$1,411
Delinquent Taxes	$325	$1,076	$4,819	$10,612	$13,595	$14,300
Motor Vehicle In-lieu	$0	$6,237	$38,116	$92,970	$120,656	$127,898
Cigarette Taxes	$0	$407	$2,487	$6,066	$7,873	$8,345
Fines, Forfeitures & Penalties	$0	$243	$1,485	$3,621	$4,699	$4,981
Swimming Pool	$0	$127	$777	$1,896	$2,461	$2,608
Recreation Programs	$0	$58	$354	$864	$1,122	$1,189
Other Income	$0	$47	$289	$705	$915	$970
Investment Earnings	$630	$539	$2,802	$6,693	$6,230	$5,020
GENERAL FUND TOTAL	$9,035	$55,474	$276,841	$608,714	$740,576	$757,344
SPECIAL FUNDS						
SPECIAL GAS TAX FUND	$0	$2,511	$15,346	$37,431	$48,577	$51,493
TRAFFIC SAFETY FUND	$0	$576	$3,521	$8,587	$11,145	$11,814
STATE LIBRARY ACT FUND	$0	$204	$1,244	$3,033	$3,937	$4,173
OPEN SPACE MAINTENANCE	$0	$0	$18,526	$27,445	$32,162	$32,162
TOTAL SPECIAL FUNDS	$0	$3,291	$38,637	$76,496	$95,821	$99,642
GRAND TOTAL ALL FUNDS	$9,035	$58,765	$315,478	$685,210	$836,397	$856,986
CUMULATIVE -OPERATING	$9,035	$67,800	$383,278	$1,068,488	$1,904,885	$2,761,871

City of Chula Vista
Rancho del Rey SPA III
Fiscal Impact Analysis

Summary of Projected City Operating Revenue

Revenue Source	1996	1997	1998	1999	2000
GENERAL FUND	----	----	----	----	----
Property Taxes	$355,369	$355,369	$355,369	$355,369	$355,369
Sales & Use	$149,951	$149,951	$149,951	$149,951	$149,951
Franchise Taxe:	$29,874	$29,874	$29,874	$29,874	$29,874
Property Transfer	$6,953	$6,953	$6,953	$6,953	$6,953
Utility Users	$41,764	$41,764	$41,764	$41,764	$41,764
Business Licenses	$0	$0	$0	$0	$0
Bicycle License	$126	$126	$126	$126	$126
Animal License:	$1,411	$1,411	$1,411	$1,411	$1,411
Delinquent Taxes	$14,300	$14,300	$14,300	$14,300	$14,300
Motor Vehicle In-lieu	$127,898	$127,898	$127,898	$127,898	$127,898
Cigarette Taxes	$8,345	$8,345	$8,345	$8,345	$8,345
Fines, Forfeitures & Penalties	$4,981	$4,981	$4,981	$4,981	$4,981
Swimming Pool	$2,608	$2,608	$2,608	$2,608	$2,608
Recreation Programs	$1,189	$1,189	$1,189	$1,189	$1,189
Other Income	$970	$970	$970	$970	$970
Investment Earnings	$4,526	$4,526	$4,526	$4,526	$4,526
	==========	==========	==========	==========	==========
GENERAL FUND TOTAL	$750,267	$750,267	$750,267	$750,267	$750,267
SPECIAL FUNDS					
SPECIAL GAS TAX FUND	$51,493	$51,493	$51,493	$51,493	$51,493
TRAFFIC SAFETY FUND	$11,814	$11,814	$11,814	$11,814	$11,814
STATE LIBRARY ACT FUND	$4,173	$4,173	$4,173	$4,173	$4,173
OPEN SPACE MAINTENANCE	$32,162	$32,162	$32,162	$32,162	$32,162
	==========	==========	==========	==========	==========
TOTAL SPECIAL FUNDS	$99,642	$99,642	$99,642	$99,642	$99,642
GRAND TOTAL ALL FUNDS	$849,910	$849,910	$849,910	$849,910	$849,910
CUMULATIVE -OPERATING	$3,611,780	$4,461,690	$5,311,600	$6,161,509	$7,011,419

APPENDIX D

PROPERTY TAX PROJECTIONS

Rancho del Rey SPA III
Residential Assessed Valuations

Assumptions:

	Assumed Appreciation Rate:	0.00%
	Assumed Turnover Rate:	10.00%
1989	Base A.V. per Acre:	18,727.20

YEAR.......	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	----	----	----	----	----	----	----	----	----	----	----
New Market Values in 1989 Dollars	0	14,453,580	67,956,210	104,180,370	53,626,130	12,627,530	0	0	0	0	0
Appreciated New Value	0	14,453,580	67,956,210	104,180,370	53,626,130	12,627,530	0	0	0	0	0
Cumulative Number of Dwelling Units	0	90	444	1,000	1,303	1,380	1,380	1,380	1,380	1,380	1,380
Number of Resales	0	0	9	44	100	130	138	138	138	138	138
Average Value per New Unit	0	160,595	185,608	186,590	184,356	183,220	183,220	183,220	183,220	183,220	183,220
Residential Acres Absorbed per Year	0.00	14.26	63.93	86.58	44.53	8.31	0.00	0.00	0.00	0.00	0.00
Base Land Value	4,240,033	4,240,033	3,962,113	2,716,522	1,029,584	161,879	0	0	0	0	0
Less Absorbed Land	0	-277,920	-1,245,591	-1,686,938	-867,705	-161,879	0	0	0	0	0
Remaining Base	4,240,033	3,962,113	2,716,522	1,029,584	161,879	0	0	0	0	0	0
Base Inflation Adj.	0	0	0	0	0	0	0	0	0	0	0
New Base Valuation	4,240,033	3,962,113	2,716,522	1,029,584	161,879	0	0	0	0	0	0
Cum. New Value	0	0	14,453,580	82,409,790	186,590,160	240,216,290	252,843,820	252,843,820	252,843,820	252,843,820	252,843,820
Less Turnover Value	0	0	-1,445,358	-8,166,736	-18,659,016	-23,966,322	-25,284,382	-25,284,382	-25,284,382	-25,284,382	-25,284,382
Adj. Cumulative Value	0	0	13,008,222	74,243,054	167,931,144	216,249,968	227,559,438	227,559,438	227,559,438	227,559,438	227,559,438
Inflation Adjustment	0	0	0	0	0	0	0	0	0	0	0
Annual New Value	0	14,453,580	67,956,210	104,180,370	53,626,130	12,627,530	0	0	0	0	0
New Turnover Value	0	0	1,445,358	8,166,736	18,659,016	23,966,322	25,284,382	25,284,382	25,284,382	25,284,382	25,284,382
New Cumulative Value	0	14,453,580	82,409,790	186,590,160	240,216,290	252,843,820	252,843,820	252,843,820	252,843,820	252,843,820	252,843,820
Total Valuation	4,240,033	18,415,693	85,126,312	187,619,744	240,378,169	252,843,820	252,843,820	252,843,820	252,843,820	252,843,820	252,843,820

April 26, 1989

Rancho del Rey SPA III
Non-Residential Assessed Valuation

Assumptions

Appreciation Rate:	0.00%
Turnover Rate:	5.00%
1988 A.V./Ac.	$18,727.20

YEAR.......	1990	1991	1992	1993	1994	1995	1996	Total
Community Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Public Park	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Open Space	86.00	41.40	21.90	0.00	0.00	0.00	0.00	149.30
Major Circulation	1.13	5.99	6.00	3.09	0.58	0.00	0.00	16.79
Annual Total	89.13	47.39	27.90	3.09	0.58	0.00	0.00	168.09
Cumulative Acres	89.13	136.52	164.42	167.51	168.09	168.09	168.09	

April 26, 1989

Rancho del Rey SPA III
Non-Residential Assessed Valuation

Assumptions:

	Appreciation Rate:	0.00%
	Turnover Rate:	5.00%
1989	Base A.V. per Acre:	$18,727.20

YEAR.......	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	----	----	----	----	----	----	----	----	----	----	----
Base Land Value	3,210,763	1,508,269	602,987	69,987	11,004	0	0	0	0	0	0
Less Absorbed Land	-1,702,494	-905,282	-533,000	-58,983	-11,004	0	0	0	0	0	0
Remaining Base	1,508,269	602,987	69,987	11,004	0	0	0	0	0	0	0
Base Inflation Adj.	0	0	0	0	0	0	0	0	0	0	0
New Base Valuation	1,508,269	602,987	69,987	11,004	0	0	0	0	0	0	0
Cum. New Value	0	0	0	0	0	0	0	0	0	0	0
Less Turnover Value	0	0	0	0	0	0	0	0	0	0	0
Adj. Cumulative Value	0	0	0	0	0	0	0	0	0	0	0
Inflation Adjustment	0	0	0	0	0	0	0	0	0	0	0
Annual New Value	0	0	0	0	0	0	0	0	0	0	0
New Turnover Value	0	0	0	0	0	0	0	0	0	0	0
New Cumulative Value	0	0	0	0	0	0	0	0	0	0	0
Total Valuation	1,508,269	602,987	69,987	11,004	0	0	0	0	0	0	0

April 26, 1989

Rancho del Rey SPA III
City Property Tax Projections
0.00% Appreciation Rat
Existing City Tax Rate: 0.1405487

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Secured Assessed Value	(in $1,000)										
Residential	$4,240.0	$18,415.7	$85,126.3	$187,619.7	$240,378.2	$252,843.8	$252,843.8	$252,843.8	$252,843.8	$252,843.8	$252,843.8
Non-Residential	$1,508.3	$603.0	$70.0	$11.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total Assessed Value	$5,748.3	$19,018.7	$85,196.3	$187,630.7	$240,378.2	$252,843.8	$252,843.8	$252,843.8	$252,843.8	$252,843.8	$252,843.8
		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Unsecured Assessed Value (in $1,000)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
City Property Tax	$8,079	$26,731	$119,742	$263,713	$337,848	$355,369	$355,369	$355,369	$355,369	$355,369	$355,369
Residential											
Annual New Value	$0	$14,453,580	$67,956,210	$104,180,370	$53,626,130	$12,627,530	$0	$0	$0	$0	$0
New Turnover Value	$0	$0	$1,445,358	$8,166,736	$18,659,016	$23,966,322	$25,284,382	$25,284,382	$25,284,382	$25,284,382	$25,284,382
Non-Residential											
Annual New Value	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Turnover Value	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Values											
Residential	$0	$14,453,580	$67,956,210	$104,180,370	$53,626,130	$12,627,530	$0	$0	$0	$0	$0
Non-Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$14,453,580	$67,956,210	$104,180,370	$53,626,130	$12,627,530	$0	$0	$0	$0	$0
Turnover Values											
Residential	$0	$0	$1,445,358	$8,166,736	$18,659,016	$23,966,322	$25,284,382	$25,284,382	$25,284,382	$25,284,382	$25,284,382
Non-Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$1,445,358	$8,166,736	$18,659,016	$23,966,322	$25,284,382	$25,284,382	$25,284,382	$25,284,382	$25,284,382
Base for Property Trar	r Tax										
Residential	$0	$14,453,580	$68,678,889	$108,263,738	$62,955,638	$24,610,691	$12,642,191	$12,642,191	$12,642,191	$12,642,191	$12,642,191
Non-Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$14,453,580	$68,678,889	$108,263,738	$62,955,638	$24,610,691	$12,642,191	$12,642,191	$12,642,191	$12,642,191	$12,642,191

April 26, 1989

APPENDIX E

PERSONS CONTACTED

APPENDIX E - PERSONS CONTACTED

Person	Agency/Position
Christopher, Lyman	City of Chula Vista, Finance Director
Gray, Bud	City of Chula Vista, Planning Consultant
Kniep, Jay	Cinti and Associates, Associate
Lane, Rosemary	City of Chula Vista, Library Director
Lee, Ken	City of Chula Vista, Planner
Lippitt, John	City of Chula Vista, City Engineer
Mollinedo, Manuel A.	City of Chula Vista, Director of Parks and Recreation
Reid, Douglas	City of Chula Vista, Environmental Review Coordinator
Stokes, Shauna	City of Chula Vista, Parks and Recreation Department
Winters, William J.	City of Chula Vista, Director of Public Safety

APPENDIX F

REFERENCES

APPENDIX F - REFERENCES

Burchell, Robert W. and David Listokin; **THE FISCAL IMPACT HANDBOOK**; The Center for Urban Policy Research, New Brunswick; 1978.

Chula Vista, City of; **1988-89 PROPOSED BUDGET**.

Chula Vista, City of; "MASTER FEE SCHEDULE"; November 9, 1982.

Chula Vista, City of; **MUNICIPAL CODE**.

San Diego County Assessor; "1988-89 SECURED PROPERTY ASSESSED VALUATIONS."

San Diego County Auditor and Controller; "1988-89 PROPORTIONATE INCREASE BY FUND".

APPENDIX G

SERVICE LETTERS

RECEIVED
JUL 1 9 1989
P & D TECHNOLOGIES

OTAY WATER DISTRICT
...Dedicated to Community Service
10595 JAMACHA BOULEVARD SPRING VALLEY, CALIFORNIA 92078
TELEPHONE: 670-2222 AREA CODE 619

July 18, 1989

Mr. Serge Dedina
Environmental Analyst
P & D Technologies
401 W. "A" Street, Suite 2500
San Diego, CA 92101

Subject: Rancho del Rey SPA III Plan Area EIR (W.O. 1729)

Dear Mr. Dedina:

Rancho del Rey SPA I, II and III were included in a study that was performed by the Otay Water District staff, entitled "Central Area Water Master Plan Update, January 1987". The District, in conjunction with the developer, has followed the recommendations of this study to provide the required infrastructure to serve Rancho del Rey. More specifically, Rancho del Rey III lies mostly within the 710 pressure zone. A 10-inch water main has already been installed in "H" Street to be looped at a future date with facilities to be built in Rancho del Rey SPA III per the master plan.

In general, water supply to the District has been limited to 38 cfs during high peak demand by the County Water Authority (CWA). This has made the District study the impact of growth vs. the limited water supply. As a result, the District Board of Directors approved a water allocation plan which will allow the District to provide service to future development conditional on the construction of terminal reservoirs and limited to a maximum of 1900 Equivalent Dwelling Units (EDUs) per year. This water allocation plan will be in effect until the District can build adequate terminal storage, find additional sources of water supply or have the CWA lift the limitation of 38 cfs.

In summary, the infrastructure to serve Rancho del Rey SPA III has either been identified in a master plan or has already been constructed. Water supply will eventually be resolved to provide service to future development without any limitations. In the meantime, future development will be subject to the conditions of the water allocation report.

If you have any other questions, please call me at 670-2238.

Very truly yours,

Manuel Arroyo

Manuel Arroyo
District Planning Engineer

MA:cp

CITY OF
CHULA VISTA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

RECEIVED
JUL 25 1989
P & D TECHNOLOGIES

July 21, 1989
File # YE-001

P&D Technologies
401 "A" Street, Suite 2500
San Diego, CA 92101

Attention: Serge Dedina

EIR, RANCHO DEL REY SPA III

This is in response to your letter dated June 27, 1989 in which you request that the City provide a service availability letter for the subject project.

The City currently has adequate reserve capacity with Metro to allow for treatment of sewage generated by the subject project. Whether the Point Loma treatment plant has the ability to treat the sewage is a matter that should be discussed with the operators of the plant.

There are several large developments in varying stages of planning that propose to utilize the Telegraph Canyon Trunk sewer. Considering the cumulative effect of these developments, there is some uncertainty as to how much remaining capacity would be available in that line to serve the subject project.

The City is currently working with all of the developers involved to establish a program of monitoring and improvement of the system to serve all of the proposed development.

If you have any further questions regarding this matter, please contact Steve Thomas, Associate Civil Engineer.

Roger L Daoust

ROGER L. DAOUST
SENIOR CIVIL ENGINEER

CST:llb

(A\LETTERS\SDEDINA.DOC)

276 FOURTH AVENUE/CHULA VISTA CALIFORNIA 92010/(619) 691-5021

SDG&E San Diego Gas & Electric
P.O. BOX 1831 • SAN DIEGO, CA 92112 • 619/696-2000

January 16, 1990

FILE NO

Mr. Serge Dedina
P&D Technologies
401 West "A" Street
Suite 2500
San Diego, CA 92101

SUBJECT: RANCHO DEL REY SPECIFIC PLAN AREA III

Serge:

Please see my notes on the attached map you provided for the subject specific plan area. SDG&E recently acquired approximately five acres for a future substation that will serve the area. The site is indicated on said map. Also, indicated is our existing transmission right of way.

The existing right of way now contains a double circuit 138kV tower line. The width of the right of way would allow for two more similar tower lines and possibly four 69kV wood pole lines. Future energy needs would most likely dictate that additional facilities be located within this right of way.

Adequate distribution facilities are currently located within the area. The new substation would further reinforce these so that there is no problem serving Plan Area III. Gas facilities are also available to serve the area.

If you have any questions regarding this letter or wish to discuss the project in general, please give me a call 696-2409.

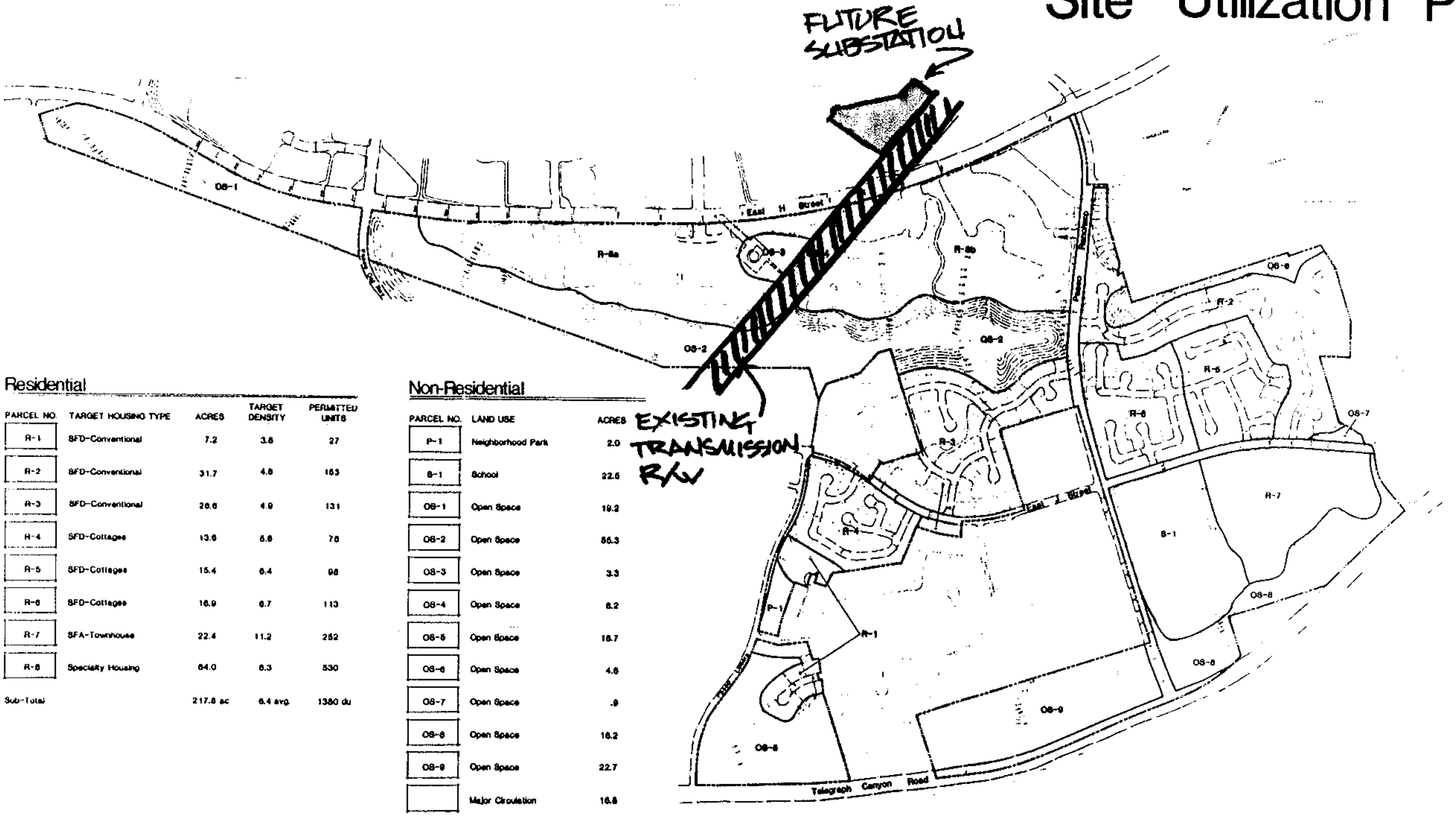
Sincerely,

Don L Rose

Don L. Rose
Senior Land Planner

DLR:kms

Site Utilization Plan



Residential

PARCEL NO.	TARGET HOUSING TYPE	ACRES	TARGET DENSITY	PERMITTED UNITS
R-1	SFD-Conventional	7.2	3.8	27
R-2	SFD-Conventional	31.7	4.8	153
R-3	SFD-Conventional	26.6	4.9	131
R-4	SFD-Cottages	13.6	5.8	78
R-5	SFD-Cottages	15.4	6.4	98
R-6	SFD-Cottages	16.9	6.7	113
R-7	SFA-Townhouse	22.4	11.2	252
R-8	Specialty Housing	84.0	6.3	530
Sub-Total		217.8 ac	6.4 avg.	1380 du

Non-Residential

PARCEL NO.	LAND USE	ACRES
P-1	Neighborhood Park	2.0
S-1	School	22.5
OS-1	Open Space	19.2
OS-2	Open Space	56.3
OS-3	Open Space	3.3
OS-4	Open Space	6.2
OS-5	Open Space	18.7
OS-6	Open Space	4.6
OS-7	Open Space	.9
OS-8	Open Space	16.2
OS-9	Open Space	22.7
	Major Circulation	16.8
Sub-Total		190.6 ac
PROJECT TOTAL		408.4 ac

RANCHO DEL REY

A Planned Community by the Rancho Del Rey Partnership

7/6/89

Cinti & Associates
(619) 239-1615

DEPARTMENTAL CORRESPONDENCE

JUL 10 1989

DATE: July 6, 1989

TO: P & D Technologies

FROM: Captain Hawkins, Chula Vista Police Department

SUBJECT: EIR - Rancho del Rey Area III

This project appears to call for 1,380 single family residential units averaging 3.28 persons per unit, or an approximate population increase of 4,526 people.

The City adopted a thresholds/standards policy in 1987. The Police Department is currently maintaining an acceptable level of service based on those requirements. Over the past twenty to twenty-five years, the City has ascribed to a 1.2 officer per 1,000 population ratio. We would therefore require approximately 5.4 personnel added to current staff levels to maintain our current level of service for calls for service generated by this addition to the City.

The proposed project does fall within beat 32. Our long-range plan will be to divide the developing areas from the current 2 beats (28 and 32) into 3 separate beats.

Additionally, the threshold for police services has been modified as follows:

1) Respond to 84% of Priority I calls within 7 minutes and maintain an average response time to all Priority I emergency calls of 4.5 minutes or less.

2) Respond to 62.10% of Priority II calls within 7 minutes and maintain an average response time to all Priority II calls of 7 minutes or less.

KH/amh

CITY OF
CHULA VISTA
MANAGEMENT SERVICES DEPARTMENT

SEP 29 1989
P & D TECH. [illegible]

September 28, 1989

Brian Biamonte
P & D Technologies
401 W "A" Street
Suite 2500
San Diego, Ca 92101

RE: Rancho del Rey SPA III

The City's overall threshold for fire services is to "respond to 85% of all emergency calls within 7 minutes". To insure that the citywide threshold is maintained, the City has established fire coverage guidelines for individual development projects. These guidelines require that:

A. Residential Projects

--85% of residential units be within a 5.7 minute travel time from an existing or planned fire station; 100% within 8.7 minutes.

B. Special Risk Commercial/Industrial Sites

For sites designated as special risks by the City's Fire Prevention Bureau, the guidelines target:

--a 2.7 minute travel time to the site from the first-in fire station and an 8.7 minute travel time from the second-in fire station if the site is not sprinklered;

--a 5.7 minute travel time to the site from the first-in fire station and an 8.7 minute travel time from the second-in fire station, if the site is sprinklered.

Currently, fire coverage for the Rancho del Rey development is provided by the City's fire station #4, located on Otay Lakes Road near "H" Street. As part of the City's Fire Station Master Plan, it is planned to close fire station #4 in conjunction with the construction of new fire stations in the Rancho del Rey and Salt Creek developments. These new stations are planned for operation when targeted buildout levels are reached, currently expected to occur by FY 1992-93 or before. Long term coverage for the Rancho del Rey

276 FOURTH AVENUE/CHULA VISTA CALIFORNIA 92010/(619) 691-5296

development will be provided by the planned Rancho del Rey fire station to be located proximate to "H" Street and Paseo Ranchero. Based on the fire station network detailed in the City's Fire Station Master Plan, the Rancho del Rey development, including SPA III, will meet or exceed the City's specific project guidelines relating to fire-related services.

Please contact me If you require any further information.

Sincerely,

Marty Chase

Marty Chase
Assistant Director

cc: Carol Gove

Sweetwater Union High School District

ADMINISTRATION CENTER
1130 FIFTH AVENUE
CHULA VISTA CALIFORNIA 92011
(619) 691-5553

PLANNING DEPARTMENT

COPY

RECEIVED
JUL 27 1989
P & D TECHNOLOGIES

July 13, 1989

Mr. Serge Dedina
P&D Techologies
401 West "A" Street
Suite 2500
San Diego, CA 92101

Dear Mr. Dedina:

Re: Rancho del Rey/SPA III Development

This correspondence is sent in response to your June 27, 1989, letter requesting district information relative to the proposed Rancho del Rey SPA III Development. A project of this scope would generate approximately 262 junior high school students and 138 high school students.* At the present time, this project is located in the ~~Hilltop~~ Bonita Junior and ~~Hilltop~~ Bonita High Schools attendance areas; these schools are currently operating at 99 percent and 106 percent permanent capacity. Temporary facilities, i.e., trailers and relocatable classrooms have been leased to house the additional students. As you can see on the enclosed table, the district is operating at 118 percent of its permanent capacity.

Because of the size and scope of the Rancho del Rey Development project, in November 1988 a community facilities district (CFD #3) was established to fund mitigation measures and reduce the project's impact to school facilities. The most significant mitigation measure proposed by the McMillin Development Company is the identification of a junior high school site in the lower southeastern portion of SPA III.

The district staff and architect have been working with McMillin in the design of an adequate circulation access plan for the school, the provision of sufficient acreage for the school, and the conceptual design of the school so that it may be compatible with adjacent proposed land uses. If

If you require additional information, please do not hesitate to call me at 691-5553.

Respectfully,

Thomas Silva

Thomas Silva
Director of Planning

TS/sf

*Change in school designation from Hilltop to Bonita per phone conversation with Tom Silva
7/28/89

CBEDS ENROLLMENT
REVISED 11/02/88

SCHOOL	SCHOOL CAPACITY				CBEDS ENROLLMENT October 1988	UNHOUSED STUDENTS
	Trailer	Relo's	Permanent	Total		
BVJHS		240	1284	1524	1525	241
BVHS *		300	1632	1932	1740	108
CPMS			1456	1456	1103	(353)
CPHS		240	1568	1808	1930	362
CVJHS	360		1070	1430	1338	268
CVHS		480	1356	1836	1874	518
GJHS			1096	1096	987	(109)
HJHS		120	1386	1506	1378	(8)
HHS		120	1388	1508	1478	90
MVMS			1246	1246	1224	(22)
MVHS	120	120	1300	1540	1842	542
MoJHS			1674	1674	1392	(282)
MoHS	240	180	1270	1690	2055	785
NCJHS	60		922	982	1029	107
SoWJHS	60	300	828	1188	1181	~~350~~ 7
SoWHS	180	480	1214	1874	2146	932
SUHS		300	1958	2258	2029	71
DRC			N/A		60	
SPECIAL ED.			N/A		173	N/A
PHS			N/A		361	N/A
TOTAL		2880	22648	26548	26845	3663*

NOTE: Permanamt Capacity - CBED enrollments (excluding DRC and Special Ed.)

* 187 SAC students housed in Bonita Vista High School