# FINAL

# ENVIRONMENTAL IMPACT REPORT

# OTAY RIO BUSINESS PARK

# CHULA VISTA

**Prepared for:**

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

**Prepared by:**

Keller Environmental
Associates, Inc.
964 Fifth Avenue, Suite 535
San Diego, CA 92101
619/544 - 1414

June 24, 1987

## INSTRUCTION SHEET

This report is a Final Environmental Impact Report for the proposed Otay Rio Business Park Development in the City of Chula Vista. The Draft Environmental Impact Report was submitted by the City of Chula Vista for public review on April 24, 1987. Comments received as a result of that circulation are included in the beginning of this report, and responses to these comments follow each comment. Additionally, changes have been made to the text in response to these comments. The Draft Environmental Impact Report, the comments and responses, and text changes constitute the Final Environmental Impact Report.

## COMMENTS AND RESPONSES

The following comments were received after circulation of the Draft EIR for public review, and during the City of Chula Vista Planning Commission hearing on the project June 10, 1987. The format for the Comments and Responses is that the Comment will be presented in its original form, and the Response for that Comment will follow immediately. Additionally, the text has been revised throughout in response to comments. Where revisions occur in the text, the type style for the new language is in an italic print. Where text has been eliminated, lines are drawn through the narrative to indicate exactly which language was deleted.

COMMENT 1

STATE OF CALIFORNIA—RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF WATER RESOURCES
P.O. Box 6598
LOS ANGELES
90055

MAY 28 1987

City of Chula Vista
P. O. Box 1087
Chula Vista, CA 92010

Attention: Environmental Review Coordinator

Reference: Notice of Preparation of DEIR for Case EIR-87-2, located west of Otay Road, dated April 23, 1987

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

The Department recommends that you 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

cc: Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

## Department of Water Resources Recommendations for Water Conservation and Water Reclamation

To reduce water demand, the water conservation measures described here should be implemented.

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.

- o Health and Safety Code Section 4047 prohibits installation of residential water softening or conditioning appliances unless certain conditions are satisfied. Included is the requirement that, in most instances, the installation of the appliance must be accompanied by water conservation devices on fixtures using softened or conditioned water.

o Government Code Section 7800 specifies that lavatories in all public facilities constructed after January 1, 1985, be equipped with self-closing faucets that limit flow of hot water.

Recommendations to be implemented where applicable

Interior:

1. Supply line pressure: Water pressure greater than 50 pounds per square inch (psi) be reduced to 50 psi or less by means of a pressure-reducing valve.

2. Drinking fountains: Drinking fountains be equipped with self-closing valves.

3. Hotel rooms: Conservation reminders be posted in rooms and restrooms.* Thermostatically controlled mixing valve be installed for bath/shower.

4. Laundry facilities: Water-conserving models of washers be used.

5. Restaurants: Water-conserving models of dishwashers be used or spray emitters that have been retrofitted for reduced flow. Drinking water be served upon request only.*

6. Ultra-low-flush toilets: 1 1/2 gallon per flush toilets be installed in all new construction.

Exterior:*

1. Landscape with low water-using plants wherever feasible.

2. Minimize use of lawn by limiting it to lawn-dependent uses, such as playing fields. When lawn is used, require warm season grasses.

3. Group plants of similar water use to reduce overirrigation of low-water-using plants.

4. Provide information to occupants regarding benefits of low-water-using landscaping and sources of additional assistance.

5. Use mulch extensively in all landscaped areas. Mulch applied on top of soil will improve the water-holding capacity of the soil by reducing evaporation and soil compaction.

6. Preserve and protect existing trees and shrubs. Established plants are often adapted to low-water-using conditions and their use saves water needed to establish replacement vegetation.

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*The Department of Water Resources or local water district may aid in developing these materials or providing other information.

7. Install efficient irrigation systems that minimize runoff and evaporation and maximize the water that will reach the plant roots. Drip irrigation, soil moisture sensors, and automatic irrigation systems are a few methods of increasing irrigation efficiency.

8. Use pervious paving material whenever feasible to reduce surface water runoff and aid in ground water recharge.

9. Grade slopes so that runoff of surface water is minimized.

10. Investigate the feasibility of utilizing reclaimed waste water, stored rainwater, or grey water for irrigation.

11. Encourage cluster development, which can reduce the amount of land being converted to urban use. This will reduce the amount of impervious paving created and thereby aid in ground water recharge.

12. Preserve existing natural drainage areas and encourage the incorporation of natural drainage systems in new developments. This aids ground water recharge.

13. To aid in ground water recharge, preserve flood plains and aquifer recharge areas as open space.

Department of Water Resources Recommendations for Flood Damage Prevention

In flood-prone areas, flood damage prevention measures required to protect a proposed development should be based on the following guidelines:

1. It is the State's policy to conserve water; any potential loss to ground water should be mitigated.

2. All building structures should be protected against a 100-year flood.

3. In those areas not covered by a Flood Insurance Rate Map or Flood Boundary and Floodway Map, issued by the Federal Emergency Management Agency, the 100-year flood elevation and boundary should be shown in the Environmental Impact Report.

4. At least one route of ingress and egress to the development should be available during a 100-year flood.

5. The slope and foundation designs for all structures should be based on detailed soils and engineering studies, especially for hillside developments.

6. Revegetation of disturbed or newly constructed slopes should be done as soon as possible (utilizing native or low-water-using plant material).

7. The potential damage to the proposed development by mudflow should be assessed and mitigated as required.

8. Grading should be limited to dry months to minimize problems associated with sediment transport during construction.

COMMENT 1

Mr. Charles R. White, Chief of the Planning Branch, Southern District, of the State Department of Water Resources recommends that the City implement a comprehensive program to use reclaimed water for irrigation purposes. Additionally, Mr. White enclosed a list of required and recommended water conservation measures.

RESPONSE

The City will consider such a program, and, upon examination of the amount and type of landscaping and irrigation contained in the Precise Plan, will decide whether or not such a program would be warranted for this development.

COMMENT 2

*THE CITY OF*

# SAN DIEGO

*EXECUTIVE COMPLEX • 1010 SECOND AVENUE • SUITE 600 • SAN DIEGO, CA 92101*

ENVIRONMENTAL
QUALITY DIVISION
PLANNING
DEPARTMENT
236-5775

RECEIVED

BY

JUN 5 19

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

June 2, 1987

Mr. Douglas Reid, Environmental Review Coordinator
City of Chula Vista
P.O. Box 1087
Chula Vista, CA 92012

Dear Mr. Reid:

SUBJECT: OTAY RIO BUSINESS PARK DRAFT ENVIRONMENTAL IMPACT REPORT

The City of San Diego Planning and Engineering and Development Departments have reviewed the Draft Environmental Impact Report for the proposed Otay Rio Business Park. We offer the following comments regarding the content of the EIR.

Section 2.2 Project Characteristics

2A Page 7, paragraph 2 - This paragraph should be expanded to state that approval of Robinhood Ridge is uncertain as there are significant unmitigable impacts and planning concerns associated with that project.

Section 2.4 Related Projects

2B Table 2-1, Page 2 - As currently planned, Robinhood Ridge proposes the development of 992 residential units with a potential for 86 additional units from undeveloped properties. This table should be revised to reflect the new numbers.

Section 3.5 Air Quality

2C Pages 36 and 37, Mitigation - This section should clearly state whether the Mitigation Measures are required and how their implementation can be assured.

Section 3.6 Noise

2D Page 42, paragraph 2 - The discussion of Brown Field noise should be augmented to describe the effect of future aircraft operations on proposed land uses under the existing Brown Field Master Plan or future revisions.

2E Page 43, Mitigation - This section should state who will be responsible for mitigation and how it will be ensured.

Section 3. 9 Land Use/General Plan Elements/Zoning

2F It would be helpful to have a figure of existing General Plan designations and zoning as well as proposed designations and zoning somewhere in the text to facilitate a comparison.

2G Page 70 - The Community Plans for South San Diego and the San Diego Progress Guide and General Plan identify the Otay River Valley and the southern slopes of the Otay Valley as a regional open space resource. The proposed project conflicts with these designations and thus represents an adverse environmental effect. The impact discussion should address the significance of converting designated Parks and Public Open Space to urban use. Quantification of the acreage of existing and proposed land use designations should be provided.

2H Page 70, paragraph 3 - This paragraph states that Research and Limited Industrial land uses are proposed "over the flat portion of the site." Review of the topographic map (Figure 3-3) indicates that research and limited industrial land uses would encroach into hillside areas above the 200 foot contour.

2I Page 71, last paragraph - This paragraph should reiterate that development of residential uses in the southern site limit is dependent on the development of the proposed Robinhood Ridge PRD to the south for access and facilities. In addition, it should also be stated that approval of the Robinhood Ridge development has not occurred.

2J Page 73, first full paragraph - It is true that "the City presently has no plans to change these land use designations as a result of the extension of noise contours." However, the City is considering changing the land use designations and revising the Brown Field Master Plan. The City Council may approve revisions to the adopted noise contours and commence a master plan revision as early as June 9, 1987. The EIR should state that City of San Diego land use designations may be revised in the future.

2K Page 74, first full paragraph - This paragraph states that intensive buffering will be required between proposed industrial uses and lands within the City of San Diego. However, the EIR does not state how implementation of buffering will be ensured. What implementation mechanism(s) will be employed to ensure mitigation?

Section 3.10 Aesthetics

2L Pages 76 and 77 (Impacts) - More detail should be provided regarding how the site will appear following development. What will industrial, residential, commercial and open space land uses look like? How will this differ from the visual character of development under existing designations? What areas will have views of the site? Will any sensitive areas be impacted? Finally, has the visual character of any noise walls been considered?

2M Page 76, bottom of page - Again, development of Robinhood Ridge is not assured. The Otay Mesa Community Plan designates portions of the Robinhood Ridge project site for open space where development is being proposed. Thus, the visual compatibility of land uses could be affected.

2N Page 77, top of page - This paragraph should restate that proposed industrial uses would differ in character from planned very low density residential land uses to the west. The need for buffering should be stated and the visual character of buffering described. Also, how will buffering be assured?

2O Page 77, Mitigation - The mechanism to ensure implementation of these measures should be stated. Is review by the City's Design Review Committee assured?

2P Page 85, paragraph 4 - The Robinhood Ridge Precise Plan proposes 992 dwelling units with a potential for 86 additional units from undeveloped properties. The 1046 dwelling units cited in the EIR should be revised.

Section 3.19 Transportation/Access

2Q A multi-jurisdictional (San Diego County, San Diego City, Chula Vista) traffic and land use study is currently being prepared by SANDAG. Early results of this study indicate that all major routes into and out of Otay Mesa will experience traffic congestion upon buildout. Until this study is complete the Planning Department cannot support this or other proposals which could aggravate traffic congestion in Otay Mesa.

2R The City of San Diego Engineering and Development Department is concerned that the traffic study and EIR do not adequately address potential long-range traffic impacts resulting from development of the proposed project. The traffic study indicates that the project would generate 9000 ADT more than General Plan land uses on Otay Valley Road east of Interstate 805. This would result in a volume of approximately 56,000 ADT on Otay Valley Road at buildout which exceeds the City of San Diego's recommended maximum desirable ADT of 40,000 ADT for six lane major streets. The traffic study should be updated to include intersection capacity utilization analyses for the I-805 ramp intersections with Otay Valley Road and for the intersection of Heritage Road and Otay Valley Road to ensure that these intersections would operate at acceptable levels of service at buildout. Street improvements beyond those currently envisioned could be required as a result of the proposed project.

2S The near-term traffic analysis considered only existing-plus-project traffic to determine the limit of Phase 1 development based on the existing capacity of Otay Valley Road. Many other projects in the area, as shown on Figure 2-5 of the EIR, could contribute to traffic increases on Otay Valley Road in the near-term. Some phasing of these projects should be assumed in the traffic study to ensure that Otay Valley Road would be adequate to accommodate future traffic volumes at each stage of development. Please contact Kristi Berg at 236-5307 if you have any questions regarding our comments on traffic.

Section 3.20 Risk of Upset/Health Hazard

2T This section should be revised to address potential safety hazards related to aircraft operations at Brown Field.

Section 4.0 Alternatives

2U Page 118 - As stated in Section 3.4, the project would result in an incremental loss of agricultural land which, on a cumulative basis, is considered significant. As such, an alternative retaining and maximizing the agricultural potential of the property should be included in the analysis.

General

2V Overall the mitigation measures outlined in the EIR should be much more detailed in regard to how each measure will be assured, implemented and when, who is responsible, and whether each measure is required to mitigate effects to insignificant levels.

Thank you for the opportunity to review this report. If we can be further assistance please feel free to contact Mary Wright of this office at 696-3681.

Sincerely,

David A. Potter

David A. Potter, Acting Deputy Director
City Planning Department

DAP:MW:csn

cc: Mike Stang
Allen Holden

COMMENT 2

Mr. David A. Potter, Deputy Director of the City of San Diego Planning Department, submitted a series of comments, and rather that restate each comment, the reader is referred to that letter. A response to each comment is included below.

RESPONSE

2A. This new information is acknowledged, and the text changed as requested.

2B. These new numbers are acknowledged, and the text changed as requested on Table 2-1, following page 8.

2C. The implementation of these mitigation measures is further clarified on page 37.

2D. Page 39 describes typical daily noise impacts from Brown Field. Because the Brown Field Master Plan is undergoing revision, and new contours are anticipated, an analysis of the existing Plan was not conducted. Once the new Plan is approved, supplemental noise studies could be performed for this project. Additionally, City staff is not recommending approval of the residential portion of the project at this time.

2E. The text has been expanded on page 44 to clarify the responsibility and the ensurance of these mitigation measures.

2F. Figures 2-2 and 2-3 following page 3 have been modified to include the existing zones and General Plan.

2G. The Community Plans for South San Diego and the San Diego Progress Guide and General Plan are City of San Diego plans. This project is located within the boundaries of the City of Chula Vista, and is thus analyzed with respect to City of Chula Vista plans.

The City of Chula Vista's Park and Public Open Space designation occurs over the steep and hilly southern portion of the site and along the floodplain, as described on page 69. The significance of the proposed residential development in this area is described in relation to the Open Space Element on page 89. Otherwise, no development is proposed within this existing designation.

The existing land uses are described and acreage quantified where appropriate in paragraph 2, page 68. The acreage of proposed land uses is quantified on Figure 2-4, Tentative Map, following page 6. The Tentative Map originally did not include quantification of acreage for the residential units; that is now also included on this Figure.

2H. In order to clarify topographical interpretations, "flat" has been revised to "previously farmed and graded".

2I. The text has been expanded as requested at the end of this paragraph, at the bottom of page 72.

2J. This new information is acknowledged, and the text expanded as requested.

2K. Clarification of the implementing mechanism is included at the end of this paragraph.

2L. Elaboration of the visual impacts of the development is included on pages 77 and 78. Also, to answer the question of what industrial, residential, commercial, and open space land uses look like, it is suggested that the commentor examine existing similar land uses to obtain an idea of how these uses can appear. Because the individual development proposals have not been submitted yet, the specific design of the Otay Rio Business Park uses is not yet known. The nature of industrial and commercial land uses, however, would indicate that such development would look quite different than that of low density residential development, the existing designation. The City's Design Review Committee would examine the Precise Plan (including the noise berm/wall) and individual proposals to ensure conformance with design goals and standards.

2M. See the addition to the text on pages 77 and 78. Additionally, it is the City of San Diego's responsibility to analyze conformance of development within their plan area. Also, the residential portion of the Otay Rio Business Park project, which is adjacent to the Robinhood Ridge proposed development, is not being recommended for approval by City of Chula Vista staff at this time.

2N. The text has been expanded on page 78 as requested.

2O. See response 2N. Also, "should" has been changed to "will" in the second sentence of the second full paragraph to show that review by the City's Design Review Committee will be ensured.

2P. This paragraph has been revised as requested.

2Q. The City of San Diego Engineering and Development Department has correctly calculated that based on the directional distribution of trips in the traffic study the proposed project would place approximately 9,000 daily vehicular trips more on Otay Valley Road east of I-805, compared to General Plan land uses. However, the directional distribution of trips in the traffic study is based on the assumption of today's land use patterns and today's street system. As land uses and the street systems in Otay Mesa develop, trip-making would be expected to be oriented less to I-805 (as is the case now) and more oriented to the east via Otay Valley Road and Heritage Road. Therefore, the 9,000 daily trips cannot be added directly to the long-term SANDAG Alternative #5 projections to arrive at the total of 56,000 vehicles per day (VPD). Accordingly, a comparison of the traffic volume of 56,000 VPD to desirable maximum levels, of traffic would not be appropriate.

Intersection capacity utilization (ICU) analyses at the I-805 ramp intersections with Otay Valley Road have not been performed because of the distance of the project site from that intersection. ICU analyses for Heritage Road and Otay Valley Road have not been performed because of uncertainty about both the location of the facilities and the land uses that will ultimately evolve in the area.

2R. See Response 2Q.

2S. On the basis to today's travel patterns, traffic to and from the projects indicated in Figure 2-5 of the EIR would be expected to be oriented primarily to and from the west. Accordingly, traffic associated with those projects on the Otay Valley Road bridge and in the vicinity of the project would be very small. The comment would be applicable to Otay Valley Road in the area west of the projects indicated in Figure 2-5 of the EIR.

2T. The text has been expanded on page 118 in response to this comment.

2U. A new alternative analysis, Retention of Agricultural Use, is included in the text on page 122.

2V. This comment is acknowledged, and, in addition to the text changes indicated above, the text has been expanded on pages 54, 55, 65, 74, 92, and 104.

COMMENT 3

STATE OF CALIFORNIA—OFFICE OF THE GOVERNOR

GEORGE DEUKMEJIAN, *Governor*

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

Douglas D. Reid
City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 92010

June 10, 1987

Subject: Otay Rio Business Park - SCH# 86112607

Dear Mr. Reid:

The State Clearinghouse submitted the above named draft Environmental Impact Report (EIR) to selected state agencies for review. The review period is closed and the comments of the individual agency(ies) is(are) enclosed. Also, on the enclosed Notice of Completion, the Clearinghouse has checked which agencies have commented. Please review the Notice of Completion to ensure that your comment package is complete. If the package is not in order, please notify the State Clearinghouse immediately. Your eight digit State Clearinghouse number should be used so that we may reply promptly.

Please note that recent legislation requires that a responsible agency or other public agency shall only make substantive comments on a project which are within the area of the agency's expertise or which relate to activities which that agency must carry out or approve. (AB 2583, Ch. 1514, Stats. 1984.)

These comments are forwarded for your use in preparing your final EIR. If you need more information or clarification, we suggest you contact the commenting agency at your earliest convenience.

Please contact Glenn Stober at 916/445-0613 if you have any questions regarding the environmental review process.

Sincerely,

David C. Nunenkamp
Chief
Office of Permit Assistance

Enclosures

cc: Resources Agency

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BY

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PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

COMMENT 3

Mr. David C. Nunenkamp, Chief, Office of Permit Assistance of the State Office of Planning and Research commented that the State Clearinghouse had circulated the EIR to selected state agencies and that the review period was closed. He forwarded four additional comments with his letter from various state departments.

RESPONSE

Mr. Nunenkamp's letter is acknowledged. The additional comments follow as comments 4 through 7.

COMMENT 4

State Clearinghouse
Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

June 8, 1987

Attention Glenn Stober

The City of Chula Vista's DEIR for the Otay Rio Business Park; SCH# 86112607

The Department of Transportation, Division of Aeronautics, has reviewed the above-referenced document pursuant to CEQA and we offer the following comments for your consideration.

The project which consists of industrial, commercial, residential and open space is to be located approximately 3/4 mile northwest of Brown Field Airport. Portions of the site are beneath the downwind and base legs for the airport's northern traffic pattern.

As the DEIR states on page 39, "Specific noise events noted during a one-hour midafternoon observation period included ...Eight (8) helicopter overflights from Brown Field air traffic; Numerous civil aviation aircraft takeoffs from Brown Field; High level jet climbout noise, probably from Lindbergh Field..." The report further states on page 40 that "the single-event intrusive nature of one source like a helicopter briefly overflying a neighborhood that may increase the probability of future conflicts and noise complaints as residential development moves closer to Brown Field." The Division concurs with this statement. In addition, there is a study under way on expanding airport usage to include heavy jet aircraft.

The mitigation measures do not adequately address the airport-related noise impacts. We suggest that all prospective homeowners and tenants be notified of the close proximity of Brown Field Airport and subsequent aircraft overflights from Brown Field and Lindbergh Field. We also suggest that consideration be given to whether noise and avigation easements should be required.

Thank you for the opportunity to review and comment on this proposal.

JACK D. KEMMERLY, Chief
Division of Aeronautics

Sandy Hesnard
Environmental Planner

cc: Brown Field Airport
SANDAG

bcc: F. Darrell Husum - DOTP
Mr. Carl West, Deputy - 11

COMMENT 4

Mr. Jack D. Kemmerly, Chief of the Division of Aeronautics, concurs with the EIR's analysis of airport-related noise. He states that the mitigation measures do not adequately address the noise impacts, and suggests that all prospective homeowners and tenants be notified of the close proximity of Brown Field and its associated overflights. He also suggests that consideration be given to requiring noise and aviation easements.

RESPONSE

Page 44 of the text has been expanded to recommend the notification to prospective tenants and homebuyers of the Brown Field proximity and associated noise impacts, however, it should be noted that City staff is not recommending approval of the residential portion of the project at this time. Also, once the Brown Field Master Plan revision has been approved, the City could consider noise and aviation easements.

COMMENT 5

State of California                                                                 The Resources Agency

# Memorandum

To : 1. Projects Coordinator
Resources Agency

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

Date : June 3, 1987

From : **Department of Fish and Game**

Subject : Draft EIR: Otay Rio Business Park, San Diego County - SCH No. 86112607

We have reviewed the Draft EIR for the Otay Rio Business Park, a proposed industrial and residential development located on 210 acres on the southeasterly boundary of Chula Vista. We have the following comments:

The loss of 0.92 acre of wetland habitat (referred to as "riparian woodland" on page 53) is unacceptable to the Department of Fish and Game. It is our position that there should be no net loss of either wetland acreage or values due to development, and we prefer features that will increase the amount of wetlands available for wildlife use. We recommend that the 0.92 acre of wetland habitat be retained in natural open space and that any degraded wetlands be enhanced to provide better biological habitat. However, if it is demonstrated to be infeasible to preserve this habitat, replacement habitat of sufficient size and quality to assure no net loss of either wetland acreage or wetland habitat value would be acceptable. A revegetation plan should be provided for Department approval and should include a performance bond which guarantees the success of the revegetation plan.

Also, the proposed 20-25 foot buffer surrounding wetland habitat is insufficient to protect biological resources. We recommend that this buffer area be at least 100 feet wide and landscaped with native wetland vegetation such as willows and sycamores. However, if new biological surveys determine that the least Bell's vireo, a state- and federally-listed endangered species, is present on the area, the Department and the U. S. Fish and Wildlife Service shall in consultation with the project sponsor recommend a requisite buffer width and design sufficient to eliminate potential adverse impacts to this endangered species. All mitigation measures as described on page 54 of the Draft EIR should be implemented.

Please advise us whether the preceding measures will be [illegible] incorporated into the project design. We also [illegible] of the Final EIR be provided to us for review [illegible] completion.

STATE CLEARINGHOUSE
JUN 04 1987

Thank you for the opportunity to review and comment on this project. If you have any questions, please contact Fred Worthley, Regional Manager of Region 5, at 245 W. Broadway, Suite 350, Long Beach, CA 90802-4467 or by telephone at (213) 590-5113.

Pete Bontadelli
Director

COMMENT 5

Mr. Peter Bartadelt of the State Department of Fish and Game states:

5A) That the loss of 0.92 acre of wetland habitat is unacceptable and should be retained in natural open space;

5B) That the 20-25 foot buffer surrounding the wetland habitat should be increased to 100 feet;

5C) That if the least Bell's vireo is present onsite, that the U.S. Fish and Wildlife service would recommend a buffer; and

5D) That all mitigation measures for Biology should be implemented.

RESPONSE

5A,5B.

Mr. Keith Merkel of Pacific Southwest Biological Services, the biological consultant for this project, spoke with Mr. Chris Lal, the Environmental Services Supervisor of the Long Beach office of the Department of Fish and Game, regarding these comments. After Mr. Merkel described the nature of the onsite riparian vegetation, Mr. Lal said that Fish and Game has not visited the site, and that there had been a misunderstanding of the type and quality of vegetation present. He said Fish and Game would not be concerned with the loss of the 0.92 acre of habitat discussed in the letter. However, Mr. Lal said Fish and Game would like specimen riparian canopy species such as sycamores, to be planted within the Open Space Park area. Mr. Lal indicated the Department would not have objections to the project if such measures were implemented to offset the minor loss of habitat. Also Mr. Lal said a follow-up review of the site would be made, and a new letter drafted at that time. The recommended Condition of Approval by City staff for the Tentative Subdivision Map requires retention of Lot 2 as an active use park, however, the riparian habitat in this area could be retained on a 100 foot buffer incorporated into the surrounds of the habitat area. Thus, if Fish and Game does require a 100 foot buffer in the future, this area will be available for that buffer. Additionally, to fullfill these requirements, proposed 2:1 slopes separating Lots 1 and 2 will be eliminated and replaced with a more gradual incline into the flood plane.

5C. The extensive biological surveys recently (April, May 1987) conducted by the City in the Otay Rio floodplain and associated wetland habitat did not find the least Bell's vireo present on this project site.

5D. All mitigation measures described on pages 54 and 55 will be implemented as Conditions of Approval on the Tentative Map.

COMMENT 6

State of California

THE RESOURCES AGENCY OF CALIFORNIA

# Memorandum

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

Douglas D. Reid
City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 92010

Date : MAY 2 7 1987

Subject: Otay Rio
Business Park
DEIR SCH
#86112607

From : Department of Conservation—Office of the Director

The Department of Conservation's Division of Mines and Geology has reviewed the Draft Environmental Impact Report for the Otay Rio Business Park. The Division has special expertise in evaluating geologic and seismic hazards, as well as mineral resource issues. We have the following comments on mineral resources and seismicity.

Under the authority of the State Surface Mining and Reclamation Act of 1975 (SMARA), the Department of Conservation is authorized, among other responsibilities, to classify specified lands of the State according to the presence of significant mineral deposits. This mineral-land classification activity provides local governments, local property owners, and the mining industry with scientific information regarding the nature, occurrence, and distribution of mineral deposits. This information is intended for use by local government in land-use planning and mineral conservation.

The Division of Mines and Geology has classified land in a portion of the Project area as MRZ-2. This is an area where adequate information indicates that there are economic mineral resources that are regionally significant. While the DEIR acknowledges the SMARA designation, it suggests the resource is not regionally significant. The DEIR states that the material underlying the site is not suitable for the quarrying of aggregate for Portland Cement Concrete (Page 12, DEIR). There are, however, operating aggregate areas both upstream and downstream of the site. Aggregate resources can have varying quality and may require different forms of processing, but their profitability and significance are largely determined by their proximity to a consumption area.

Based on the operating deposits upstream and downstream, the close proximity to the consumption region, and the ability to process gravels at depth to meet specific engineering requirements, we disagree with the conclusions in the DEIR and maintain the relevance of including this area in an MRZ-2

We recommend that the impacts of the proposed development on the local and regional aggregate resource supplies be evaluated and mitigations included in the Final EIR.

Seismicity is likewise an important consideration at this site. We recommend strict adherence to the Uniform Building Code be stressed in the Final EIR.

If you have any questions regarding these comments, please contact Zoe McCrea, Division of Mines and Geology Environmental Review Officer, at (916) 322-3202.

Original signed by

Dennis J. O'Bryant
Environmental Program Coordinator

cc: Zoe McCrea, Division of Mines and Geology
Richard B. Saul, Division of Mines and Geology

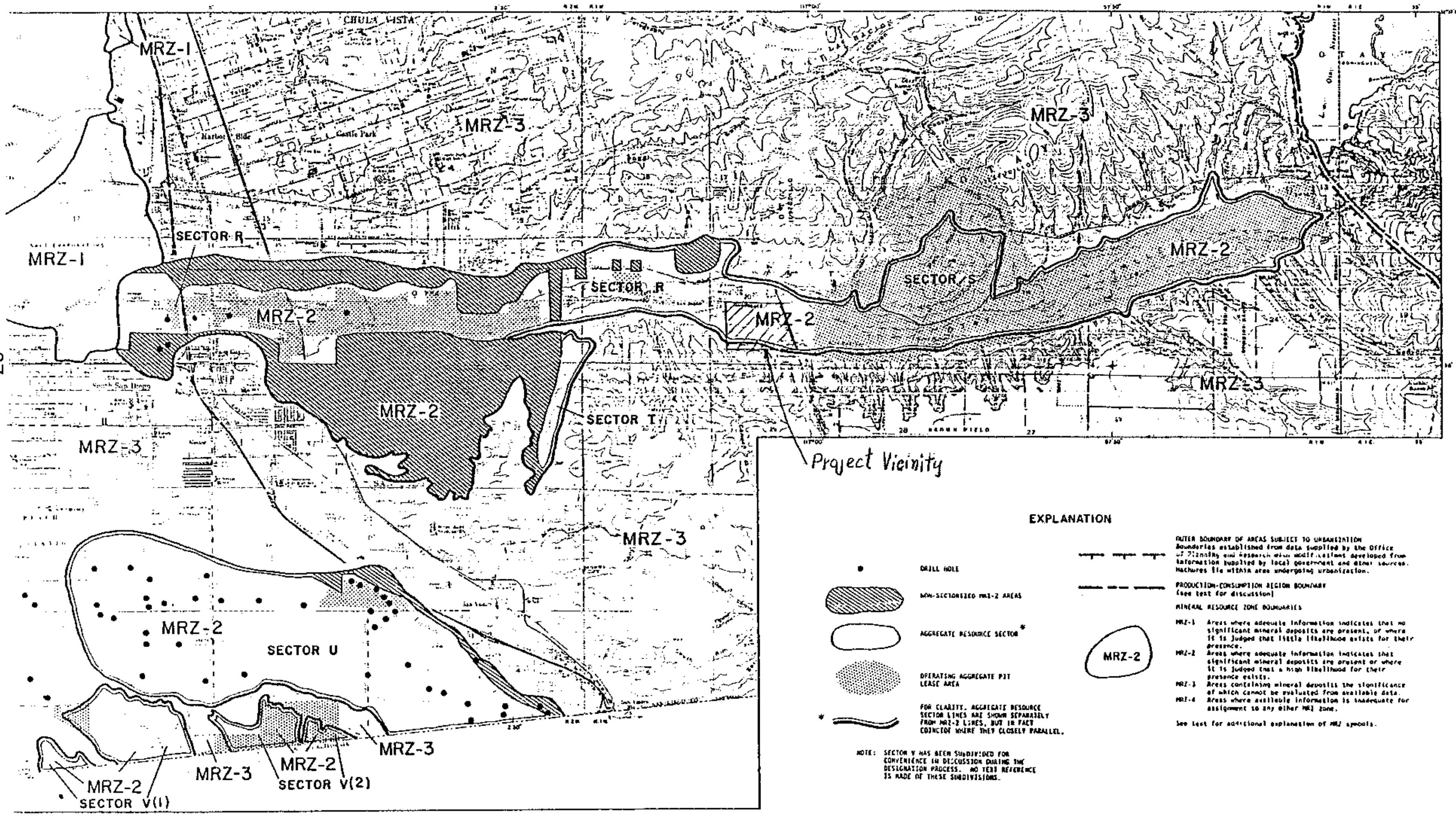
Enclosure

0293H
DJO:ZM:dlw

Reference:

Kohler, S. L. and Miller, R. V., 1982, Mineral Land Classification; Aggregate Materials in Western San Diego County Production-Consumption Region: Division of Mines and Geology Special Report 153 (note plate 36).

-proc. 12, 153




TOPOGRAPHIC BASE MAP BY U.S. GEOLOGICAL SURVEY
Reduced from 1:24,000

# MINERAL LAND CLASSIFICATION OF THE WESTERN SAN DIEGO COUNTY PRODUCTION-CONSUMPTION REGION

## OTAY VALLEY, TIJUANA RIVER, AND BORDER HIGHLANDS RESOURCE AREAS

AGGREGATE RESOURCE SECTORS R-V

COMMENT 6

Mr. Dennis J. O'Bryant, Environmental Program Coordinator for the Department of Conservation, states:

6A) That based on the proximity of operating aggregate desposits upstream and downstream from the project sets, and the ability to process gravel at depth to meet specific engineering requirements, that the Department disagrees with the conclusions in the DEIR, and that they maintain the relevance of including this area in the MRZ-2 classification.

6B) Also, Mr. O'Bryant states that due to seismicity hazards, strict adherence to the Uniform Buliding Code should be stressed in the final EIR.

RESPONSE

6A. As described on page 12 of the DEIR, recent (March, 1987) studies were performed for the sole purpose of determining the suitability of site soils as an aggregate resource. This recent, site specific study found that the soils did not meet criteria for fine aggragate. Even though the site is in close proximity to a consumption area, and mining is occurring upstream and downstream from the site, the unsuitability of the soils for aggregate render the mining of the area infeasible. It should also be noted that the site is located on a terrace above the river valley.

6B. Page 15 of the text has been expanded to stress strict adherence to the Uniform Building Code.

COMMENT 7

...te of California

Business, Transportation and Housing Agency

# ...emorandum

: STATE CLEARINGHOUSE

ATTENTION GLENN STOBER

Date : June 2, 1987

File No.: 11-SD-805
3.7

District 11
...om : DEPARTMENT OF TRANSPORTATION

...bject: Otay Rio Business Park, SCH 86112607

Caltrans District 11 comments on the DEIR are as follows:

7A 1. This document recommends the establishment of a Transportation System Management (TSM) strategy for air quality impact mitigations (pages 36, 37). Funding sources to establish and maintain the recommended measures should be identified.

7B 2. It is recommended that consideration be given to the adoption of an ordinance similar to that adopted by the City of Pleasanton, Calif. That ordinance requires employers to implement a broad range of TSM measures, establishes goals and provides for reporting procedures. The City of San Marcos is in the process of establishing a similar ordinance.

Our contact person for TSM information is Manuel Demetre, Chief, Ridesharing Branch, (619) 237-6977.

James T Cheshire

JAMES T. CHESHIRE, Chief
Environmental Planning Branch

MO:ec

RECEIVED
JUN 03 1987
STATE CLEARINGHOUSE

COMMENT 7

Mr. James T. Cheshire, Chief of the State Department of Transportation District 11 Environmental Planning Branch recommends:

7A) The establishment of a TSM strategy for project-related air quality impacts, and requests that funding sources of such a strategy be identified; and

7B) That the city consider adopting an ordinance that requires employers to implement a broad range of TSM measures.

RESPONSE

7A. It is beyond the scope of the developer's responsibility for this project to establish a TSM program; such a program should be developed at the City level, with subsequent cooperation from developers in such a program. The city does not have a TSM program at this time.

7B. This comment is acknowledged.

EXTRACT OF THE PUBLIC HEARING ON THE DRAFT EIR-87-2 - OTAY RIO BUSINESS PARK - HELD ON JUNE 10, 1987

Chairman Shipe: The Public Hearing is open. Does anyone wish to address the Commission on this item?

Tony Ambrose: (4877 Viewridge AVe., 92123 - from HCH Repr Chilingworth Corp)

Thank you. Mr. Chairman and Members of the Commission, my name is Tony Ambrose and I'm a planner with HCH and Assoc., address of 4877 Viewridge Avenue. We are the planning firm that is involved in this project, Chillingworth Corporation. We think the EIR is a fairly thorough document and it is a good one overall. We share your concerns about the traffic. Unit I was designed with maximum capacity that we could put onto Otay Valley Road. As you can see, there is a little dash line around the commercial area which was deleted from Unit I so there would be a reduction of potential traffic generation. This project has been planned with the idea in mind that ultimately we would be able to virtually self-contain this project by having commerical uses in here -- ultimately provide the banking, the lunch time food services and that kind of activity to minimize the number of trips -- and that is why we have also included a park area around the riparian area to the northwest. I think the staff has done a good job and we concur with their findings. Mr. Gill is also in the audience as well as Mr. Bob McCrary from Chillingworth Corporation and they will be happy to answer any of your questions, if you have any.

C/man Shipe: The next individual to request time to speak is Mr. Peter Watry. Mr. Watry. Good morning, Mr. Watry.

Peter Watry: Good evening. My name is Peter Watry and I live at 81 Second Avenue. I have a question concerning what you were just talking about -- that road. The EIR says that they are going to build Phase I with Otay Valley Road being a two-lane road and Phase II won't be done until it is widened. Then, later on in the EIR it says that Phase I is expected to generate 5,700 vehicles, and that is right around or a little bit past the limit. My question really was -- with that threshold, is the threshold going to be the line on the map or the threshold going to be the actual count. I thought I heard Mr. Reid say, a while ago, that it's going to be the actual count.

ERC Reid: Mr. Chairman, there are actually two thresholds here. We would probably entertain the approval of Phase I of the Industrial Project, however, any issuance of building permits for construction within that Unit I will be keyed to an on-going monitoring of the traffic on Otay Valley Road. Once that reaches a certain threshold, then no more building permits would be issued.

P. Watry: Even Phase I?

ERC Reid: Correct.

P. Watry: The number you used a while ago is 7,500 and I quarrel with that. I think that is the proper way to go -- use the actual count, not the estimate. Use the actual count. Thank you.

C/man Shipe: Thank you Mr. Watry. Does anyone else wish to address the Commission on this item? If not, I'll close the Public Hearing.

Is there a motion:

MS (Cannon/Fuller) to continue this to June 24th for consideration of the final EIR.

C/Cannon: I have one more comment I would like to make on this. This EIR appears to be prepared better than most of them we have seen recently. I would like to compliment Keller Environmental on that. Certainly there are some things that need to be covered in it; with regard to traffic, I would like to see more of an analysis of -- well, not necessarily an analysis -- but a specific set-up as to when these roads are planned on being done. I see we are going to shut it down after a threshold level of something, apparently. But, I would like to see from a planning standpoint and an environmental review standpoint -- when are we going to get these roads built out there so that we can go ahead with these phases. What are we doing, shooting in the dark. I would like to see something a little more concrete -- maybe these roads will be built 10 years from now, 5 years from now, 3 years from now, whenever it's going to be -- and at what levels. Is it going to be a four-lane road, is it going to be a six-lane road. I would like to see an anticipation on those things.

C/man Shipe: Did you second that, Mr. Cannon? *(Ed: Tugenberg)*

C/Fuller: I did.

C/man Shipe: Okay. Is there other discussion? Will you vote please. THE MOTION IS CARRIED.

NOTE: THE VOTE WAS UNANIMOUS.

**OTAY RIO BUSINESS PARK EIR**

**TABLE OF CONTENTS**

OTAY RIO BUSINESS PARK

TABLE OF CONTENTS (Cont.)

## APPENDICES

(Separate Volume on file and available for review at the City of Chula Vista Planning Department)

A. NOTICE OF PREPARATION AND RESPONSES

B. BIOLOGICAL SURVEY REPORT

C. ARCHAEOLOGICAL SURVEY REPORT

D. PALEONTOLOGICAL SURVEY REPORT

E. TRANSPORTATION/ACCESS

F. AIR QUALITY COMPUTER RESULTS

## LIST OF FIGURES

## LIST OF FIGURES (Cont.)

## LIST OF TABLES

# 1.0 INTRODUCTION

## 1.1 PURPOSE

This document is an Environmental Impact Report (EIR) which addresses a development project known as Otay Rio Business Park, proposed by The Chillingsworth Corporation (Chillingsworth). The applicant and property owner, Chillingsworth, proposes to subdivide a 210-acre site with 79 lots for light industrial development, 49 lots for single-family residential development, 1 lot for a park and natural riparian open space, and 1 lot for open space. The site is located on the southeasterly boundary of the City of Chula Vista, on property annexed in 1986 by the City of Chula Vista from the City of San Diego. An aerial photograph of the project site is shown on Figure 1-1.

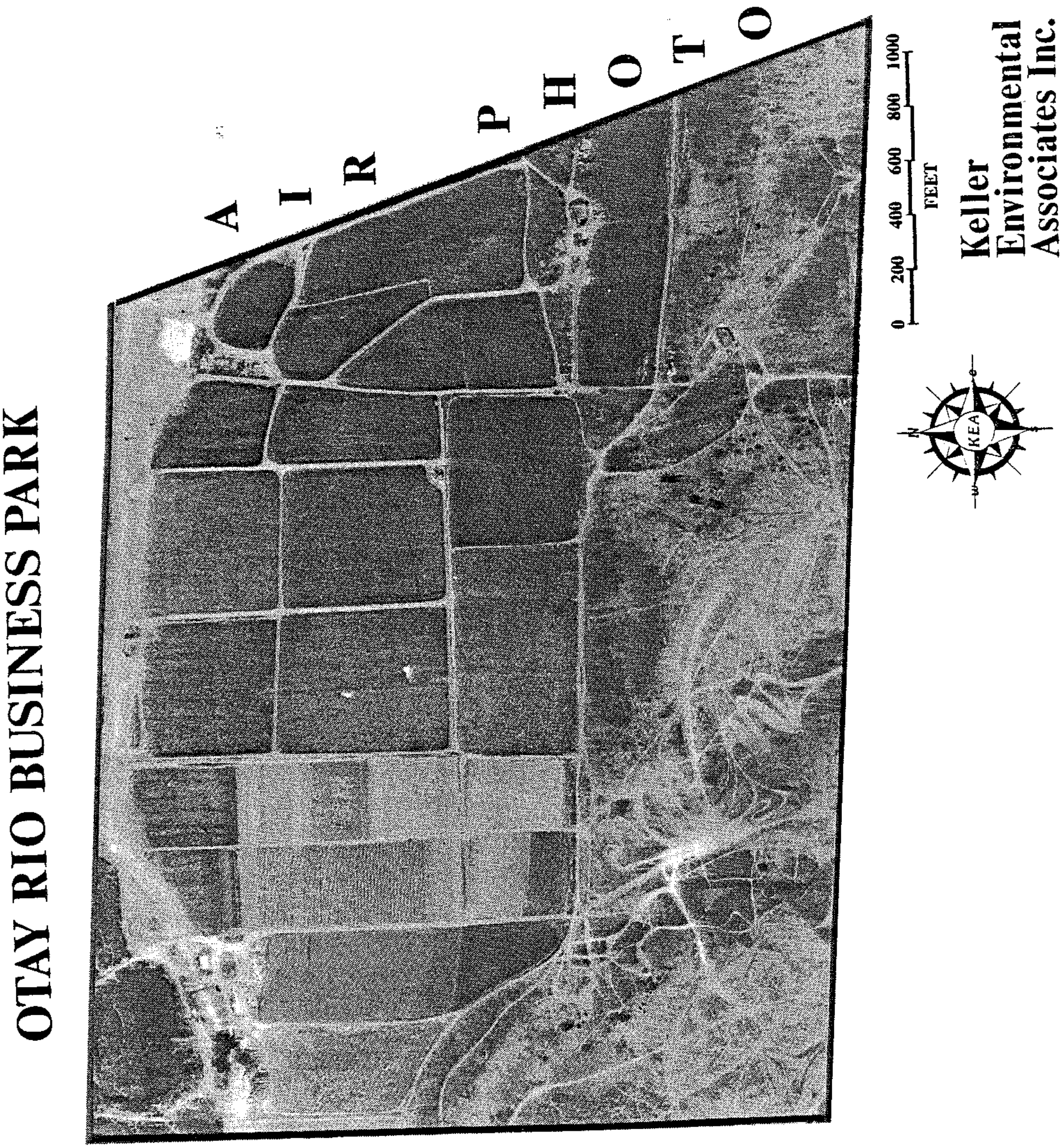
Implementation of the proposed development project would require approval of the following discretionary actions:

- o General Plan Amendment;
- o Zone Change; and
- o Tentative Subdivision Map.

The purpose of this EIR is to analyze the environmental and social consequences from development of this proposed plan, including approvals of the above-listed discretionary actions. This EIR has been prepared in accordance with the criteria, standards, and procedures of:

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

The lead agency preparing this EIR is the City of Chula Vista in accord 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." No Initial Study has been prepared for this project. The necessity to prepare an EIR and the scope of the



OTAY RIO BUSINESS PARK
AIR PHOTO
0 200 400 600 800 1000
FEET
KEA
Keller
Environmental
Associates Inc.


Figure 1-1

analysis was determined by the City of Chula Vista's Environmental Review Coordinator. The environmental consultant to the City is Keller Environmental Associates, Inc., of San Diego, California. Preparers of and contributors to this report are listed in Section 9.0. Key contact persons are:

| | |
|---|---|
| City of Chula Vista | Mr. Doug Reid<br>Environmental Review Coordinator<br>Planning Department<br>276 Fourth Avenue<br>Chula Vista, CA 92010<br>(619) 691-5101 |
| Environmental Consultant | Ms. Diana Gauss Richardson<br>Keller Environmental Associates, Inc.<br>964 Fifth Avenue, Suite 535<br>San Diego, CA 92101<br>(619) 544-1414 |
| Applicant/Property Owner | Mr. Robert McCrary<br>The Chillingsworth Corporation<br>251 South Lake Avenue, No. 612<br>Pasadena, CA 91101 |

An effort has been made during the preparation of the EIR 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 to those agencies or persons contacted or who responded to the Notice of Preparation, all interested agencies and persons will have the opportunity to comment on the project during the circulation of the Draft EIR. Comments received by the City of Chula Vista, together with responses to such comments, will be included in the Final EIR.

## 1.2 EXECUTIVE SUMMARY

The remainder of this section summarizes in Table 1-1 the significant and adverse impacts cited to occur as a result of approval of the proposed General Plan Amendment, Zone Change, Tentative Subdivision Map, and the subsequent construction and operation of the Otay Rio Business Park development. Listed for each category of analysis are the environmental impacts and the mitigation measures recommended to reduce or eliminate the impacts. This summary ends with the list of alternative developments analyzed and their comparative merits.

**TABLE 1-1**

**EXECUTIVE SUMMARY**

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
|---|---|---|---|
| Geology/Soils/Minerals | Geo/Soils-Impacts could occur from development on unstable, compressible, and expansive deposits and formations | Need further detailed subsurface soil and engineering geology investigations to determine exact remedial grading, foundation, and contstruction recommendations | With mitigation, no significant impacts expected |
| | Minerals-No significant or adverse impacts from construction of incompatible uses in the MRZ-2 area due to findings of a recent subsurface soils study | No mitigation necessary | |
| Drainage/Groundwater/ Water Quality | Drainage-Site drainage characteristics would change significantly with development | Drainage plans would be reviewed by the City's Engineering Division. Recommendations would be made as Conditions of Approval on the Tentative Map | No significant impacts are anticipated for Drainage/Groundwater/Water Quality |
| | Groundwater-The loss to the basin is considered an incremental amount | No mitigation necessary | |
| | Water Quality-Surface runoff contaminants would change from agriculture-related pesticides/fertilizers, and sediment, to vehicle-related contaminants. Incremental increase expected | No mitigation necessary | |

TABLE 1-1 (Cont.)

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
|---|---|---|---|
| Water Quality (cont.) | Also, future industrial uses need to be reviewed for wastewater discharges | The City and the RWQCB would review industrial wastewater discharge plans for compliance | |
| Landform | No significant impacts as grading would largely follow existing contours of the land | No mitigation necessary | No significant impacts |
| Agricultural Resources | Incremental loss of area-wide agricultural resource | No mitigation necessary | No significant impacts |
| Air Quality | Project-level emissions increases are considered significant | A Transportation System Management program should be established to implement all available transportation control measures (TCM) | With implementation of TCMs, the significant impacts could be reduced to a level of insignificance |
| Noise | Where industrial development is planned within the 70 CNEL contour, significant impacts to the City's designated noise standards would occur | Implementation of a 6-foot high wall/berm in impacted areas (along Otay Valley Road) would reduce levels levels below the 70 CNEL limit | With mitigation, no significant impacts |
| Biology | No significant impacts as .92 acres of Riparian area would be lost to development (less than 1.0 acre acceptable to federal agencies) | Include a buffer of 20 to 25 feet consisting of densely planted Riparian vegetation | With mitigation, no significant impacts |
| | Incremental loss of raptor foraging land, Ferrocactus, Dichondra, and Viguiera laciniata | No mitigation necessary | |

**TABLE 1-1 (Cont.)**

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
|---|---|---|---|
| Archaeology/History/ Paleontology | Archaeology-The project would grade and build upon nearly all of the area of W-386, which represents a direct impact to the site. However, as the site no longer retains any research potential, subsurface deposits, or major features, the impacts to the site from development are not considered adverse or significant | No measures are necessary; no further studies or excavations are recommended prior to grading | No significant impacts |
| | Paleontology-Potential impacts to significant resources; can be determined when grading activities occur | A qualified paleontologist should be involved during pre-grading and grading activities; should be allowed to recover fossils in a timely manner | With mitigation, no significant impacts expected |
| | History-The redwood structure is minimally significant; impacts from demolition are not considered significant | Grading should be monitored at the trash dump in order to salvage any historic artifacts | With mitigation, no significant impacts expected |
| Land Use/General Plan Elements/Zoning | Inconsistent land uses would occur on the project's western boundary, with industrial uses abutting City of San Diego's Very Low Density (0-5 du/ac) residential uses | Intensive boundary buffering with both vegetation and barriers. Also, industrial street traffic should be routed east from the project site, away from the future residential uses | With mitigation, no significant impacts expected |

TABLE 1-1 (Cont.)

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
| --- | --- | --- | --- |
| Aesthetics | Development of the proposed project would significantly change views into the site. Proposed land uses will be consistent with existing and proposed area development. Visual quality of the actual buildings cannot be determined until plans are submitted | The City's Design Review Committee should review the Precise Plan when submitted and future development plans to ensure that design requirements are met. Other measures are available to visually enhance the site | With mitigation, no significant impacts are expected |
| | Short-term construction-related impacts | A temporary wall or mesh fence should be placed along the eastern site boundary adajcent to Otay Valley Road | |
| Community Social Factor | The proposed project would incrementally and beneficially contribute to the City's housing and employment base | No mitigation necessary | No significant impacts |
| Community Tax Structure | Future assessed market value will rise due to project improvements, resulting in an increase to the tax base | No mitigation necessary | No significant impacts |
| Schools | The proposed project could generate 20 elementary and 20 secondary school children to the system, which is already over capacity, resulting in significant impacts to the system | The developer(s) would be required to pay school fees which would mitigate their responsibility | With mitigation, no significant impacts expected |

TABLE 1-1 (Cont.)

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
| --- | --- | --- | --- |
| Parks, Recreation, Open Space | Impacts to the Park and Recreation system would occur due to the absence of dedicated park and recreation facilities in the project design | The developer is required to pay fees under the Park Land Dedication Ordinance | With mitigation, no significant impacts are expected |
| | No significant conflicts with the Open Space Element would occur | No mitigation necessary | |
| Fire and Police Protection | Fire-Street width and turning radius just meet requirements, with no room for on-street parking. Also, a 12-minute response time is considered excessive<br><br>Police-Incremental impacts to increased service | Enlarge the cul-de-sac and/or clearly mark parking prohibited curbs. A cooperative agreement could be set up between the area developers and the City to contribute fees toward the purchase of necessary facilities | With mitigation, no significant impacts are expected |
| Waste Disposal | Incremental impacts to the life of the Otay Landfill | No mitigation necessary | No significant impacts |
| Utility Service/ Energy Conservation | Incremental impacts to the existing available circuits. SDGandE may need to rearrange the existing network | The developer would be required to pay fees as required by SDGandE. Implementation of gas is recommended by SDGandE | No significant impacts |

TABLE 1-1 (Cont.)

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
|---|---|---|---|
| Water and Sewer Service | Water-Service can be provided by the Otay Municipal Water District. Incremental impacts to the southern California lack of water situation | The developer would have to annex into the District, pay pay annexation fees, extend water lines. The Metropolitan Water District could require annexation into that system, though, at this time it does not appear that they will require this. Installation of building water-saving devices, and landscaping with native vegetation would conserve water, aiding in mitigation for incremental impacts | With mitigation, no significant impacts would remain |
| | Sewer-The City of San Diego would allow project-generated sewage into their trunk line with payment based on the amount generated | The City of Chula Vista would have to install a metering station to assess the amount of project-related sewage, and pay San Diego for their portion into San Diego's system | |
| Transportation/ Access | The two-lane segment of Otay Valley Road would be significantly impacted by the project as well as the surrounding developing area | The project could be phased to allow traffic levels within the desired capacity of the two lane road. When the road is widened, (as planned by the City), the remainder of the project could be developed | Accomplishment of the recommended mitigation would reduce and eliminate significant impacts. The project's residential traffic is dependent upon access through the future Robinhood Ridge development |

TABLE 1-1 (Cont.)

| Issue | Impacts | Mitigation Measures | Analysis of Significance (Residual Impacts) |
|---|---|---|---|
| Transportation/ Access (cont.) | Project-related traffic volume would exceed the design standards at the southerly site entrance | Special treatment at this intersection, such as additional width for turn lanes, would need to be accomplished | |
| | The 1,000-foot straight-away segment of "C" and "E" Streets could cause speed enforcement problems | This portion of "C" Street may require speed enforcement if problems occur | |
| Risk of Upset/ Health Hazard | Fire and Geologic hazards are discussed in their respective sections. Otherwise, no significant impacts are expected | No mitigation necessary, other than that called for in the Fire Protection and Geology sections | With mitigation, no significant impacts are expected |

## 2.0 PROJECT DESCRIPTION AND SETTING

## 2.1 LOCATION

The Chula Vista central city core is located in San Diego County, approximately 8 miles south of the City of San Diego downtown core, and about the same distance north of the Mexican border (see Figure 2-1, Vicinity Map). Major access to the City of Chula Vista is provided by Interstates 5 and 805. The 210-acre project site is located in the extreme southeast corner of the City, approximately 3 miles north of the border, adjacent to the County of San Diego to the east, and the City of San Diego to the south and west. Otay Valley Road bounds the project area on the east side.

## 2.2 PROJECT CHARACTERISTICS

### A. Requested Actions

The applicant is requesting a General Plan Amendment (GPA), a Zone Change, and Tentative Subdivision Map approval. The requested GPA and Zone Change are shown on Figures 2-2 and 2-3.

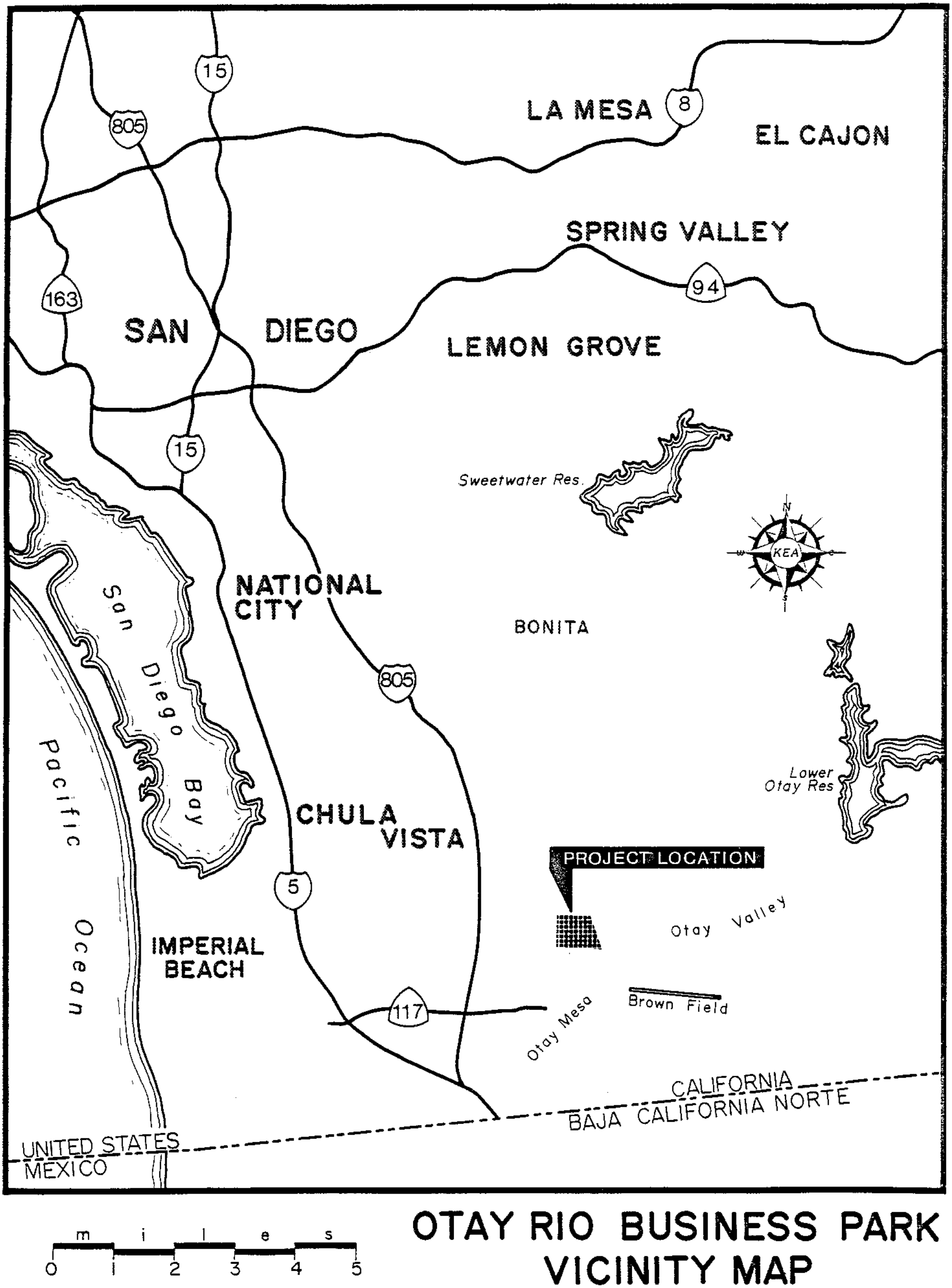
#### 1. General Plan Amendment

The existing General Plan designation for the site is Low Density Residential and Parks and Public Open Space. Low Density Residential allows 1 to 3 dwelling units per acre. The proposed GPA is Research and Limited Industrial, Medium Density Residential, and Open Space.

No General Plan designation exists for the Research and Limited Industrial classification. However, the General Plan does state regarding Industrial Development Principles, and Industrial Locations and Uses:

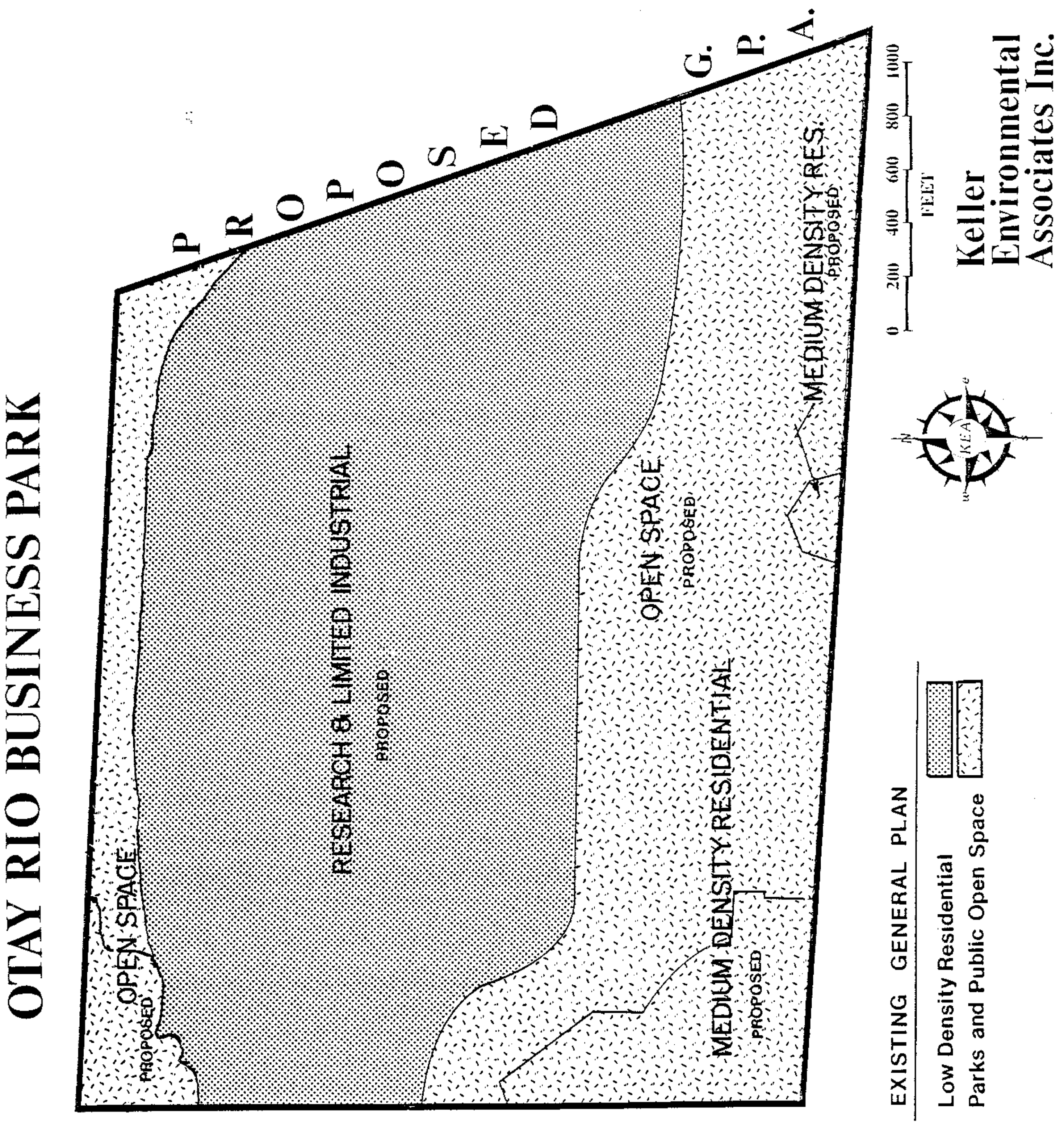
Industrial Development Principles

1. Reserve an adequate supply of land for industrial development which is properly located in relation to other land uses in Chula Vista.
2. Encourage industrial park development in appropriate locations.




**OTAY RIO BUSINESS PARK**
**VICINITY MAP**

Figure 2-1


OTAY RIO BUSINESS PARK
OPEN SPACE
PROPOSED
RESEARCH & LIMITED INDUSTRIAL
PROPOSED
OPEN SPACE
PROPOSED
MEDIUM DENSITY RESIDENTIAL
PROPOSED
MEDIUM DENSITY RES.
PROPOSED
PROPOSED G. P. A.
EXISTING GENERAL PLAN
Low Density Residential
Parks and Public Open Space
0 200 400 600 800 1000
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KEA
Keller Environmental Associates Inc.

Figure 2-2

## OTAY RIO BUSINESS PARK

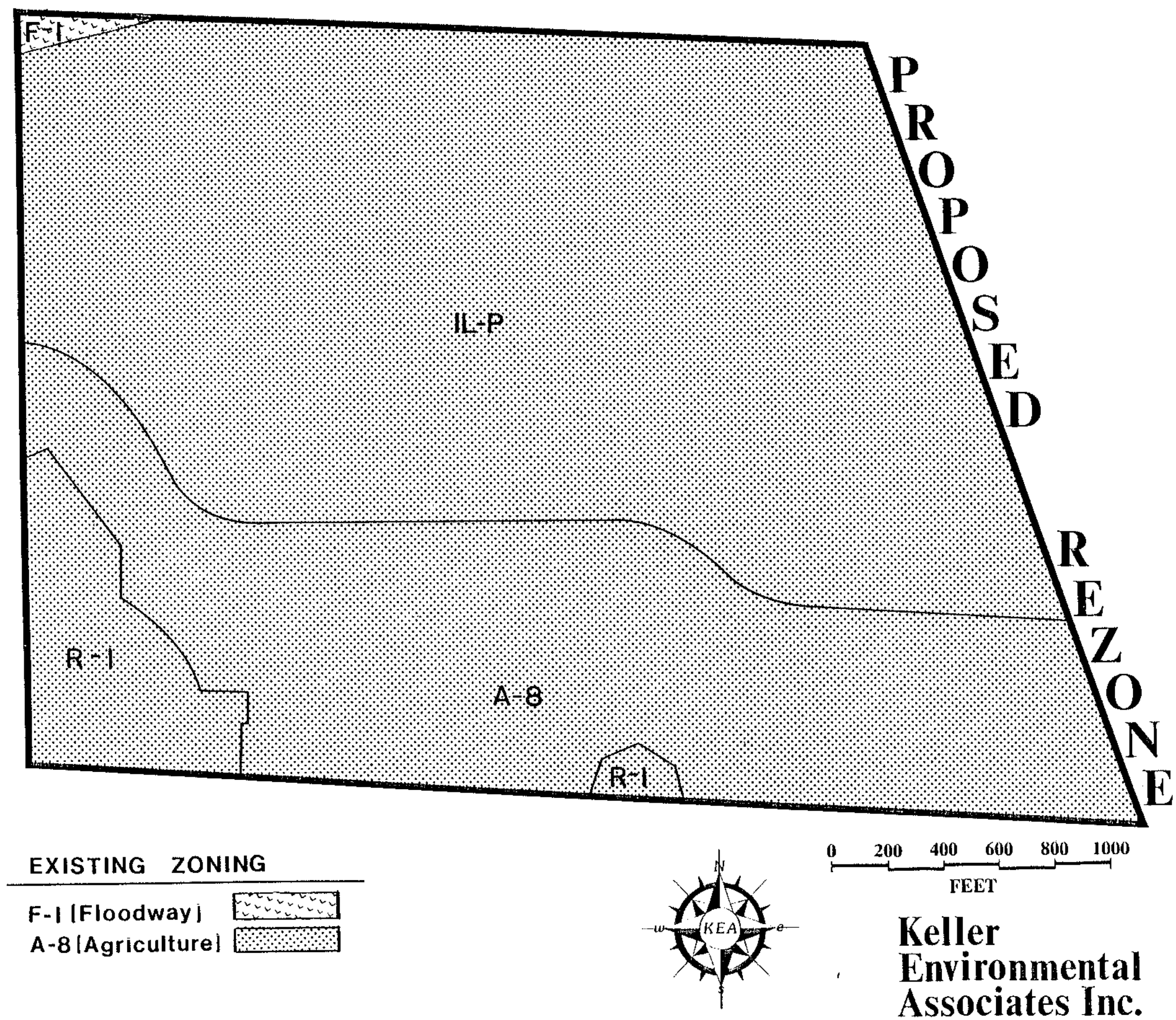



Figure 2-3

3. Schedule development of industrial land, insofar as possible to assure compact and orderly use of industrial districts in accordance with the absorption rate of the industrial land market.

4. Establish industrial classifications based upon performance standards.

5. Locate the most compatible industrial uses close to residential areas and less compatible ones away from residential areas.

Industrial Locations and Uses

> The area proposed for industrial development in Chula Vista is located in the crescent shaped belt along the western, northern, and southern sides of the Planning Area. This belt includes portions of the Sweetwater and Otay Valleys, the Tidelands, and selected areas east of the Tidelands and west of Broadway. Proposed industrial development is divided into two classes: 1) general industry and 2) limited and research industry.

With a Master Conditional Use Permit (CUP), commercial uses could be allowed in the Industrial area. Lot 11, in the northeast corner of the site, is planned for commercial uses under such a Master CUP. Commercial uses allowed would be subject to the overall Precise Plan, and are expected to include service-related businesses such as restaurants, banks, day care centers, dry cleaners, and other businesses which would serve the needs of the Business Park employees.

Medium Density Residential allows 4-12 dwelling units per acre, and combines single-family dwellings with limited numbers of duplex dwellings and small apartments.

2. Zone Change

The site is presently zoned A-8 (Agricultural) and F-1 (Floodway). As stated in the City's Zoning Ordinance, the purpose of the Agricultural Zone is to "provide a zone with appropriate uses for areas rural in character, which are undeveloped and not yet ready for urbanization. The zone is intended to preserve in agricultural use land which may be suited for eventual development in urban uses, and which will encourage proper timing for the economical provision of utilities, major streets, and other facilities, so that orderly development will occur."

The Floodway zone is established to protect the floodway from obstructions or diversions in order that the natural channel may carry abnormal flows of water in times of flood.

The proposed zones include IL-P, R-1, F-1 and A-8, which are described below.

The proposed IL-P (Limited Industrial, Precise Plan) designation permits the following uses:

A. Manufacturing, printing, assembling, processing, repairing, bottling, or packaging of products from previously prepared materials, not including any prohibited use in this zone;

B. Manufacturing of electrical and electronic instruments, devices and components;

C. Wholesale businesses, storage and warehousing;

D. Laboratories: research, experimental, film, electronic and testing;

E. Truck, trailer, mobile home, boat and farm implement sales establishments;

F. Public and private building material sales yards, service yards, storage yards, and equipment rental;

G. Minor auto repair;

H. Laundries, laundry service, dyeing and cleaning plants, except large scale operations;

I. Car washing establishments subject to the provisions of Section 19.58.060 of the Code;

J. Plumbing and heating shops;

K. Exterminating services;

L. Animal hospitals and veterinarians, subject to the provisions of Section 19.58.050 of the Code;

M. The manufacture of food products, drugs, pharmaceuticals and the like, excluding those in Section 19.44.050 of the Code;

N. Electrical substations and gas regulator stations, subject to the provisions of Section 19.58.140 of the Code;

O. Temporary tract signs, subject to the provisions of Section 19.58.320 and Section 19.60.470 of the Code (this section amended to conform with provisions of Ord. 1575, 1974);

P. Any other limited manufactured use which is determined by the commission to be of the same general character as the above uses;

Q. Agricultural uses as provided in Section 19.16.030 of the Code.

With a Master Conditional Use Permit over the northeast corner, the applicant could develop service-related commercial uses in the IL-P zone. These uses would be subject to conditions and limitations of the Precise Plan.

The "P" designates a Precise Plan Modifying District which modifies the underlying [IL] zone to allow "diversification in the spatial relationship of land uses, density, buildings, structures, landscaping and open spaces...." The P designation may be applied when the property requires special handling of the development due to unique environmental or planning characteristics which would allow the City appropriate control over the detailed development plans. In order to implement this District, the developer must submit a Precise Plan to the City for their approval, and which will specify uses allowed and design standards required for development within the district. In this case, because the proposed project is a subdivision of land, rather than actual development of buildings or structures, the P designation would require that when individual purchasers and developers of each lot or lots plan for development, their plans would be submitted to the City for verification of consistency with the Precise Plan before approval could be granted. This would assure control over the design and use proposed.

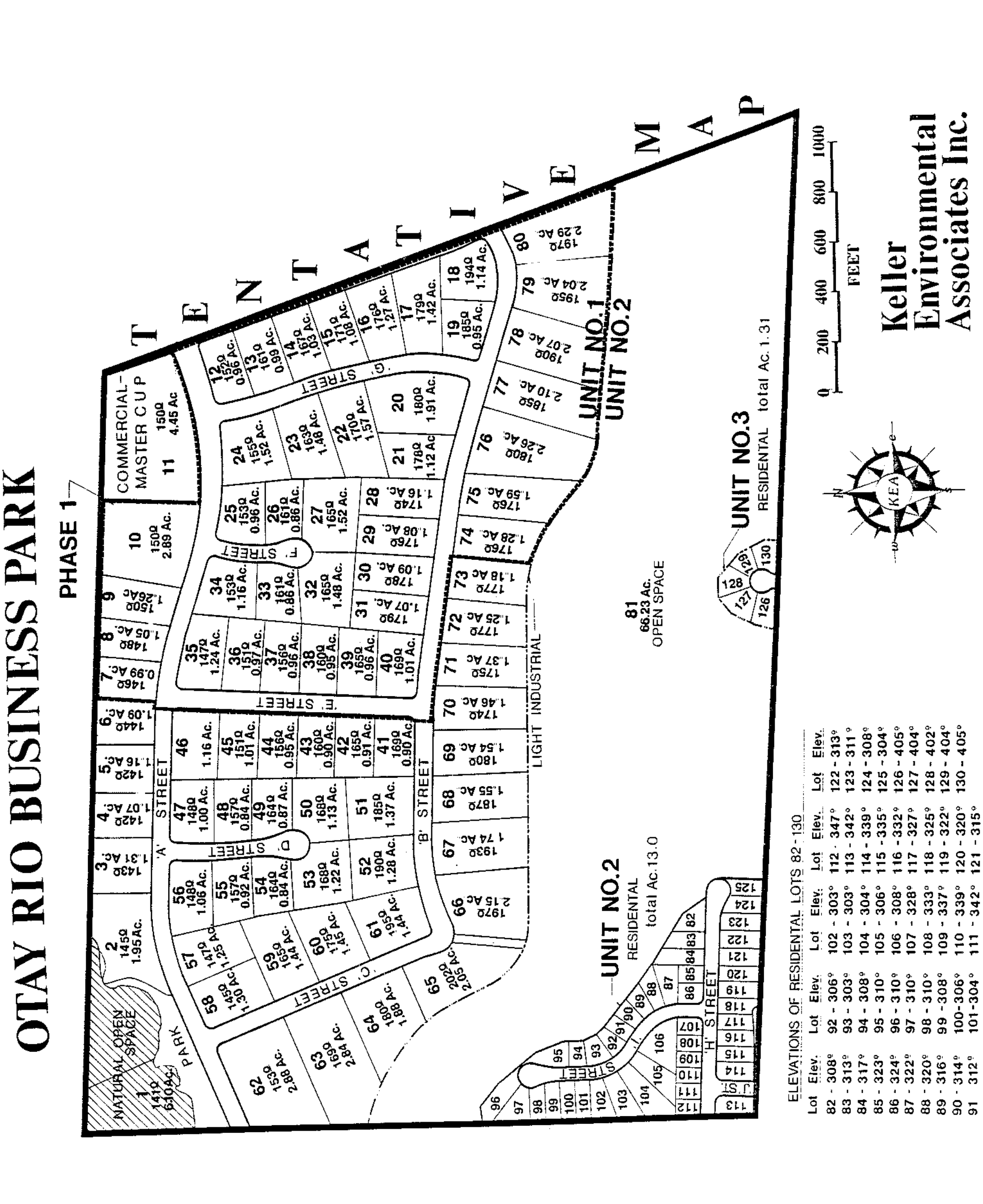
The R-1 zone allows single-family detached dwellings.

The F-1 zone is located in the northwest corner where the Floodway crosses the site, and is applied to property which either has a history of flood inundation, or the potential for such. No buildings are permitted in a designated floodway zone.

As stated earlier, the A-8 (Agriculture) zone is intended to preserve in agricultural use land which may be suited for eventual development in urban uses. There are presently no plans to develop this area, rather, the intent is to provide open space. However, establishment of an A-8 zone leaves open the possibility for future development. If plans were submitted in the future for development, those plans would be subject to environmental review.

3. <u>Tentative Subdivision Map</u>

The Tentative Subdivision Map is shown on Figure 2-4.



OTAY RIO BUSINESS PARK
PHASE 1
TENTATIVE MAP
COMMERCIAL-MASTER C U P
NATURAL OPEN SPACE
PARK
'A' STREET
'B' STREET
'C' STREET
'D' STREET
'E' STREET
'F' STREET
'G' STREET
'H' STREET
'I' STREET
'J' ST.
LIGHT INDUSTRIAL
81
66.23 Ac.
OPEN SPACE
UNIT NO.1
UNIT NO.2
UNIT NO.2
RESIDENTAL
total Ac.13.0
UNIT NO.3
RESIDENTAL
total Ac. 1.31
KEA
0 200 400 600 800 1000
FEET
Keller Environmental Associates Inc.
ELEVATIONS OF RESIDENTAL LOTS 82 - 130
Lot Elev. Lot Elev. Lot Elev. Lot Elev. Lot Elev.
82 - 308° 92 - 306° 102 - 303° 112 - 347° 122 - 313°
83 - 313° 93 - 303° 103 - 303° 113 - 342° 123 - 311°
84 - 317° 94 - 308° 104 - 304° 114 - 339° 124 - 308°
85 - 323° 95 - 310° 105 - 306° 115 - 335° 125 - 304°
86 - 324° 96 - 310° 106 - 308° 116 - 332° 126 - 405°
87 - 322° 97 - 310° 107 - 328° 117 - 327° 127 - 404°
88 - 320° 98 - 310° 108 - 333° 118 - 325° 128 - 402°
89 - 316° 99 - 308° 109 - 337° 119 - 322° 129 - 404°
90 - 314° 100-306° 110 - 339° 120 - 320° 130 - 405°
91 312° 101-304° 111 - 342° 121 - 315°


Figure 2-4

B. Proposed Improvements

The proposed improvements are shown on the Tentative Subdivision Map, Figure 2-4. Generally, the applicant proposes to subdivide the site into 130 lots. Lots 2 through 10 and 12 through 80 would be designated industrial; lot 11 would be designated industrial, but would have commercial uses under the provisions of a Master CUP; lots 82 through 130 would be designated single family residential; lot 1 would be designated park land though the majority would remain in natural open space; and lot 81 would be agricultural (open space). The site is divided into 3 units, with Unit 1 including the industrial, commercial and park land lots; Unit 2 would include the agricultural (open space) area and residential lots in the southwest corner, and Unit 3 would include the 5 residential lots along the south central border.

Units 2 and 3, being separate from the rest of the project, may be developed at a later time when adjacent residential development, and associated streets development, occur. Units 2 and 3 are dependent upon the development of the property to the South ~~(Robinhood Ridge and the associated streets)~~. *currently known as Robinhood Ridge. Approval of Robinhood Ridge by the City of San Diego is uncertain at this time, however, as the City of San Diego has found significant unmitigable impacts associated with project development, and has additional planning concerns associated with the project.* The proposed improvements are discussed in detail in Section 3.0.

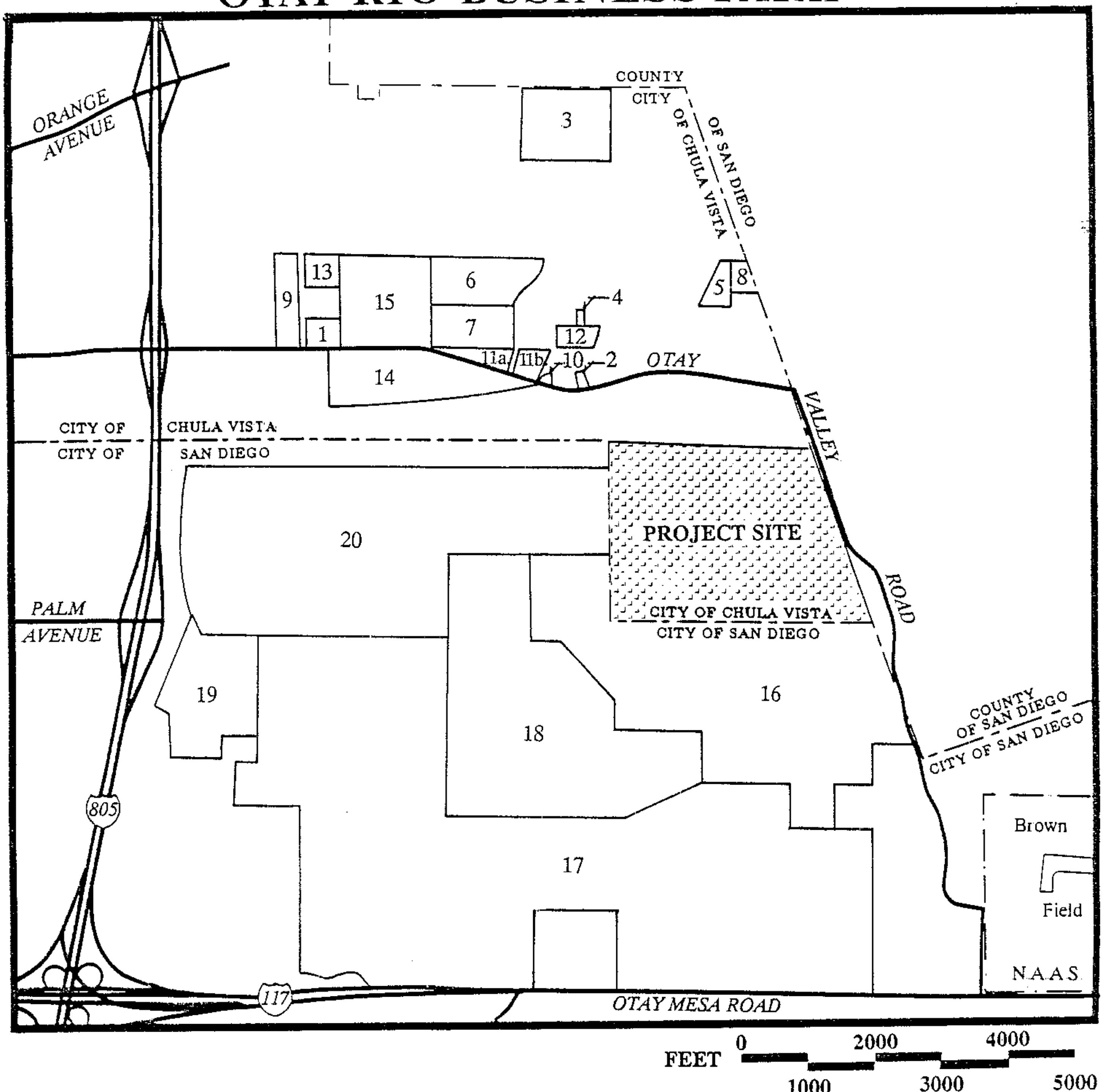
## 2.3 PROJECT PHASING

The proposed plan includes two phases, shown on Figure 2-4. The first phase includes industrial use lots 7 through 10, 12 through 40, and 74 through 80, totalling 53.5 acres. The second phase includes the remainder of the site. However, Phase 2 may be broken out into more phases as project-related constraints, such as access considerations, become apparent. The first phase would occur before widening of Otay Valley Road, whereas the second phase is dependent upon widening of that road for traffic reasons, and would occur after completion of the widening.

## 2.4 RELATED PROJECTS

The City of Chula Vista, City of San Diego, and County of San Diego Planning Departments were contacted to obtain data on projects which are either under construction, approved, or proposed in the general study area. The cumulative impacts assessments are based on these projects, which are termed related projects. Figure 2-5 shows the area and the projects included in this analysis. Table 2-1 includes a brief project description and status for these projects, and identifies the projects included in the cumulative impacts analysis.

# OTAY RIO BUSINESS PARK




# PROJECT VICINITY
# PLANNED DEVELOPMENTS

Keller
Environmental
Associates Inc.

Figure 2-5

TABLE 2-1

RELATED PROJECTS

| | Jurisdiction | Project Name | Project Description | Status |
|---|---|---|---|---|
| 1. | City of Chula Vista | Hy Span Precision Products | 50,000 sf industrial plant | Approved for all City Discretionary Actions; anticipate bldg. early 1987 |
| 2. | City of Chula Vista | The Chillingsworth Corporation | 13,000 sf industrial bldg. | Approved Discretionary Actions |
| 3. | City of Chula Vista | Pacific Lighting Energy Systems | Methane Gas Conversion to Electric Energy Plant | Just completed construction |
| 4. | City of Chula Vista | Bradford Metals | 11,000 sf industrial bldg. | Planned |
| 5. | City of Chula Vista | Consolidated Freightways | 6,700 sf distribution warehouse | Just completed construction |
| 6. | City of Chula Vista | SDG&E | 47,000 sf South Bay Subregional Headquarters | Planned |
| 7. | City of Chula Vista | Greenwald McDonald | 170,000 sf industrial bldg. | Under construction |
| 8. | City of Chula Vista | Chula Vista Sanitary Service | 17,000 sf bldg. plus truck parking and maintenance | Under construction |
| 9. | City of Chula Vista | Werdin Development Co. | 170,000 sf industrial bldg. | Beginning construction |
| 10. | City of Chula Vista | Gold Coast Engineering | 14,000 sf industrial bldg. | Under construction |
| 11. | City of Chula Vista | Girard Financial Corp. | a) 20,000 sf industrial bldg.; b) unknown sf industrial bldg. | Approved plans Plans being submitted |
| 12. | City of Chula Vista | Peninsula Vegetable Exchange | 20,000 sf warehouse/ distribution | Plans approved |

TABLE 2-1 (Cont.)

| | Jurisdiction | Project Name | Project Description | Status |
|---|---|---|---|---|
| 13. | City of Chula Vista | Werdin/Darnell Companies | 90,000 sf distribution/ warehouse | Plans submitted |
| 14. | City of Chula Vista | Walker Scott | Major industrial area; expecting 200,000 sf industrial space | Plans pending |
| 15. | City of Chula Vista | Otay Industrial Park (previous Omar Rendering Plant) | Subdivision of 40 acres | Final Map in for subdivision |
| 16. | City of San Diego | Robinhood Ridge Precise Plan | 996 residential units<br>86 additional units (potential)* | Precise Plan submitted |
| 17. | City of San Diego | California Terraces Precise Plan | 4,756 residential units | Precise Plan submitted |
| 18. | City of San Diego | Riverview Precise Plan | Residential; number of units unknown at this time | Planned |
| 19. | City of San Diego | Palm Vistas Precise Plan | Mobile Homes; number of units unknown at this time | Planned |
| 20. | City of San Diego | Walker Scott/Palm Precise Plan | Residential; number of units unknown at this time | Planned |

Source: City of Chula Vista: Fred Kassman, Community Development Department
City of San Diego: Michael Stang, Planning Department

*New residential counts in response to comments (D. Potter June 2, 1987)

## 3.0 ENVIRONMENTAL ANALYSIS

## 3.1 GEOLOGY/SOILS/MINERAL RESOURCES

Geology, soils and seismicity information is largely extracted from a preliminary geologic reconnaissance of the project site by GEOCON, Inc., performed in August, 1984.

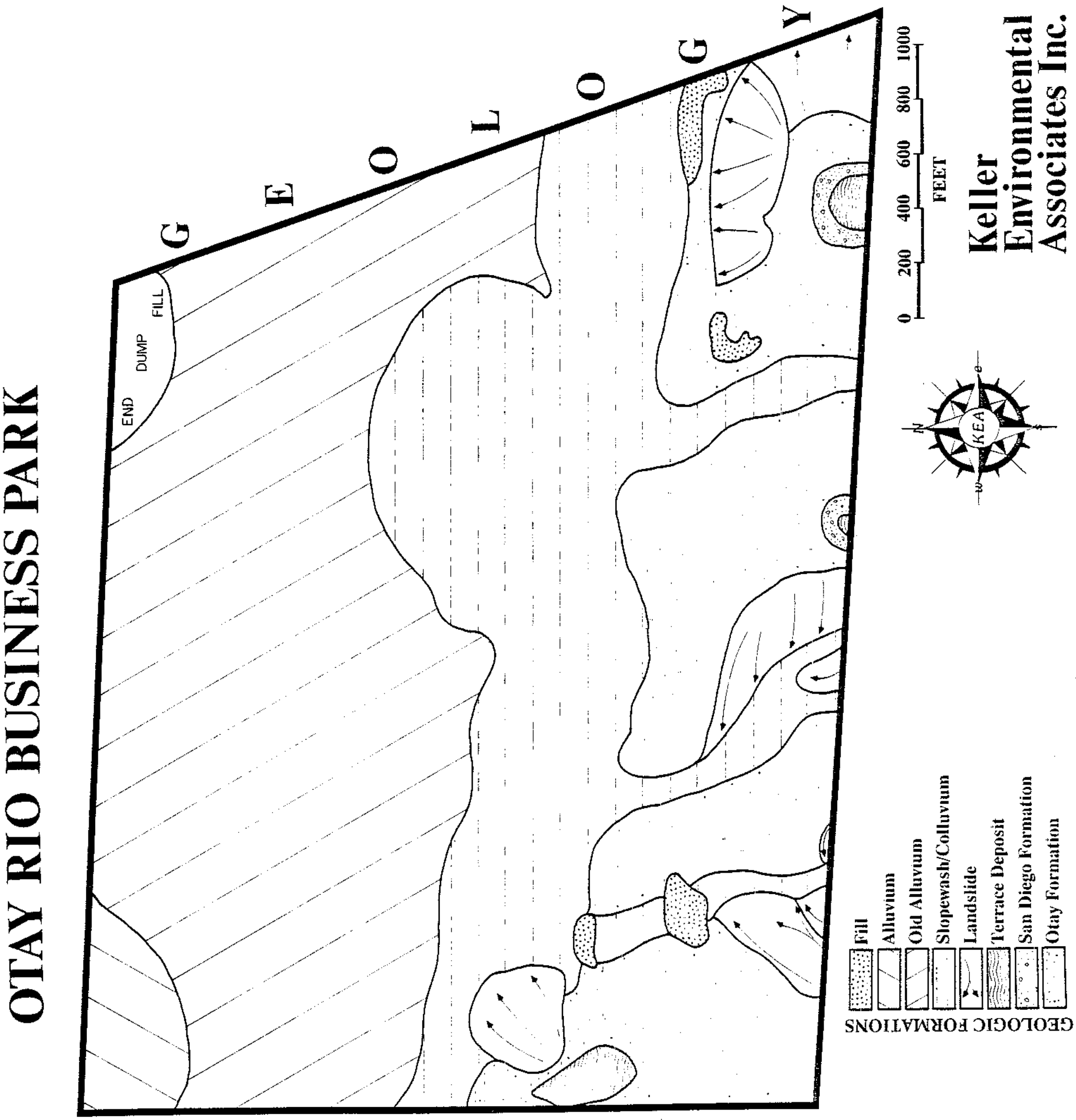
### A. Project Setting

#### 1. Geology and Soils

The geologic materials which underlie the property consist of several types of surficial deposits consisting of topsoils, alluvium developed in the floodway of the Otay River, older alluvium occupying an elevated river terrace where farming is presently occurring, and an extensive deposit of slopewash and colluvial soils present along the southerly side of the valley near the base of the hills. Underlying the surficial materials is an older rock unit, the Otay Formation. Superimposed on the Otay Formation, and, to some extent, over the colluvial and slopewash deposits, are several small to moderately-sized ancient landslides. These landslides probably occurred as a result of the presence of bentonite clay layers. Figure 3-1 shows surficial deposits and formations. Also shown on the figure are two man-made earthen dams in the western portion of the site.

Project area soils consist of Salinas Clay Loam, Riverwash, Stockpen Gravelly Clay Loam, Diablo Clay, Linnes Clay Loam, and recent alluvial sediments. Generally, the Salinas Clay Loams are found in the areas which are being farmed, with slopes of 2-9 percent; the Diablo and Linnes Clays are on the steep slopes; and the Stockpen Clays are in the drainages. The Riverwash is located in the floodway and floodplain.

The Otay Formation consists primarily of silty, fine, light gray sandstones that are moderately to poorly cemented. Also interbedded with the sandstones are occasional siltstone beds and the bentonite clay deposits that are two to three feet thick. Two additional units, the San Diego Formation and Quaternary Terrace



OTAY RIO BUSINESS PARK
GEOLOGY
END DUMP FILL
GEOLOGIC FORMATIONS
Fill
Alluvium
Old Alluvium
Slopewash/Colluvium
Landslide
Terrace Deposit
San Diego Formation
Otay Formation
0 200 400 600 800 1000
FEET
KEA
N
Keller Environmental Associates Inc.


Figure 3-1

Deposits, were observed onsite, however, they have limited areal extent over the site.

The modern alluvium located in the floodway of the Otay River could not be directly observed, however, based on GEOCON's previous experience, those deposits consist primarily of loose, medium-grained, clean sands. A large deposit of end-dumped fill and rubble apparently being imported from other construction projects is also located in the area of the floodway.

The older alluvium mapped in the area that is presently being used for agricultural purposes is capped by a relatively clayey topsoil over moderately dense to loose silts and clays. Slopewash and colluvial materials found primarily near the base of the steeper slopes along the southerly portion of the project area consist almost entirely of highly expansive clays. These materials may also be compressible.

2. <u>Seismicity</u>

A review of published geologic maps of the area (Kuper, 1977) indicates that the property lies approximately 7,000 feet east of the La Nacion Fault Zone.

The La Nacion Fault and related faults within this zone are presently considered to be potentially active. Geologic evidence exists for movement along faults within this system during the Pleistocene (2 million to 11,000 years before present), but not during the Holocene or the last 11,000 years. Moore and Kennedy (1975) estimate that a magnitude 6.5 earthquake could occur on the average of every 300 years in the San Diego Metropolitan area.

The closest known active faults to the site are the Elsinore and San Miguel Faults located approximately 40 miles to the northeast and southeast, respectively. These faults are considered to be the most likely source of seismic shaking to the site. In the event of a major earthquake (Magnitude 6.0 or greater) on either the Elsinore, San Miguel, La Nacion or other related faults in the Southern California area, the site could be subjected to severe seismic shaking, however, the seismic risk at the site is not significantly greater than that of the surrounding developments.

### 3. Minerals

The State Department of Conservation, under the direction of the State Mining and Geology Board, has designated certain areas in San Diego as "regionally significant construction aggregate resource areas." In order to meet the high demand in San Diego County for construction quality aggregate, these areas with known or likely significant deposits of this mineral resource have been identified and mapped by these departments. A substantial amount of this resource is available in the County, yet, urban expansion has been a major cause of a decline in the availability of the resource. Sand and gravel resources constitute Chula Vista's most important mineral resource, both in terms of quantity and economic value.

The Surface Mining and Reclamation Act of 1975 (SMARA) requires that "a lead agency's land use decisions involving designated areas are in accordance with its mineral resource management policies." Also, "a lead agency, in determining land use in aggregate-designated areas, must balance mineral value against alternative land uses and consider the importance of the designated mineral resources to their market region as a whole, and not just their importance to the lead agency's area of jurisdiction." (Department of Conservation, 1985). The City of Chula Vista's Conservation Element includes the following policy regarding aggregate resources: "To protect and manage sand and gravel resources for the benefit of the general public."

The State Mining and Geology Board has adopted mineral resource goals and policies to guide local government in the use of SMARA's process. One goal relevant to this proposed project is:

> Mineral lands classified MRZ-2 or designated as areas of regional significance should be protected from preclusive and incompatible land uses so that the mineral resources within these lands and areas are available when needed.

Incompatible land uses are defined as:

> Land uses inherently incompatible with mining and/or that require a high public or private investment in structures, land improvements, and landscaping and that would prevent mining because of the higher economic value of the land and its improvements.

Approximately 60 percent of the project area is covered by Mineral Resource Zone-2 (MRZ-2) classification (Figure 3-2), which is defined as

> areas where adequate information indicates that significant mineral deposits are present or where it is judged that there is a high likelihood for their presence exists. This zone shall be applied to known mineral deposits or where well-developed lines of reasoning, based upon economic geologic principles and adequate data, demonstrates that the likelihood for occurrence of significant mineral deposits is high.

The Otay River Valley and adjacent mesa deposits are one of 22 resource sectors in San Diego County that contain aggregate resources that remain available from a general land use perspective, and are the areas the State Mining and Geology Board consider as being of regional significance. This Otay Valley sector (Sector R) encompasses approximately 2,780 acres and is estimated to contain approximately 10 million short tons resources, including reserves. Approximately 129 acres of the project site are within this sector, constituting approximately 4.6 percent of the entire sector.

Studies were completed by GEOCON, Inc. in March, 1987, to determine whether site soils were suitable for use in the manufacture of hydraulic concrete. The study included 5 borings to depths ranging from 11 to 33 feet, and found the first 5 feet of subsoils to be clayey to very clayey sand and sandy silty clay. This mantle is underlain by silty, clayey sands with abundant subrounded gravels and cobbles which increase in dimension with depth. Relatively large amounts of cobbles and boulders with dimensions of approximately 24 to 30 inches were encountered near the contact with the formational soils of the Sweetwater Formation. The formational soils were characterized as dense to very dense, very moist, fine to medium grained clayey sands.

Because the top 5 feet of subsoils possess considerable amount of clays and silts, and because the percentage of gravels, cobbles and boulders is much greater than would be acceptable for mining operations, it is GEOCON's opinion that mining of the onsite sand is not feasible for manufacturing hydraulic concrete. Furthermore, GEOCON compared the grain size of the site soils with the grain size requirements of "Standard Specifications for Fine Aggregate for Portland Cement Concrete," and found that the soils did not meet the criteria for fine aggregate.

# OTAY RIO BUSINESS PARK

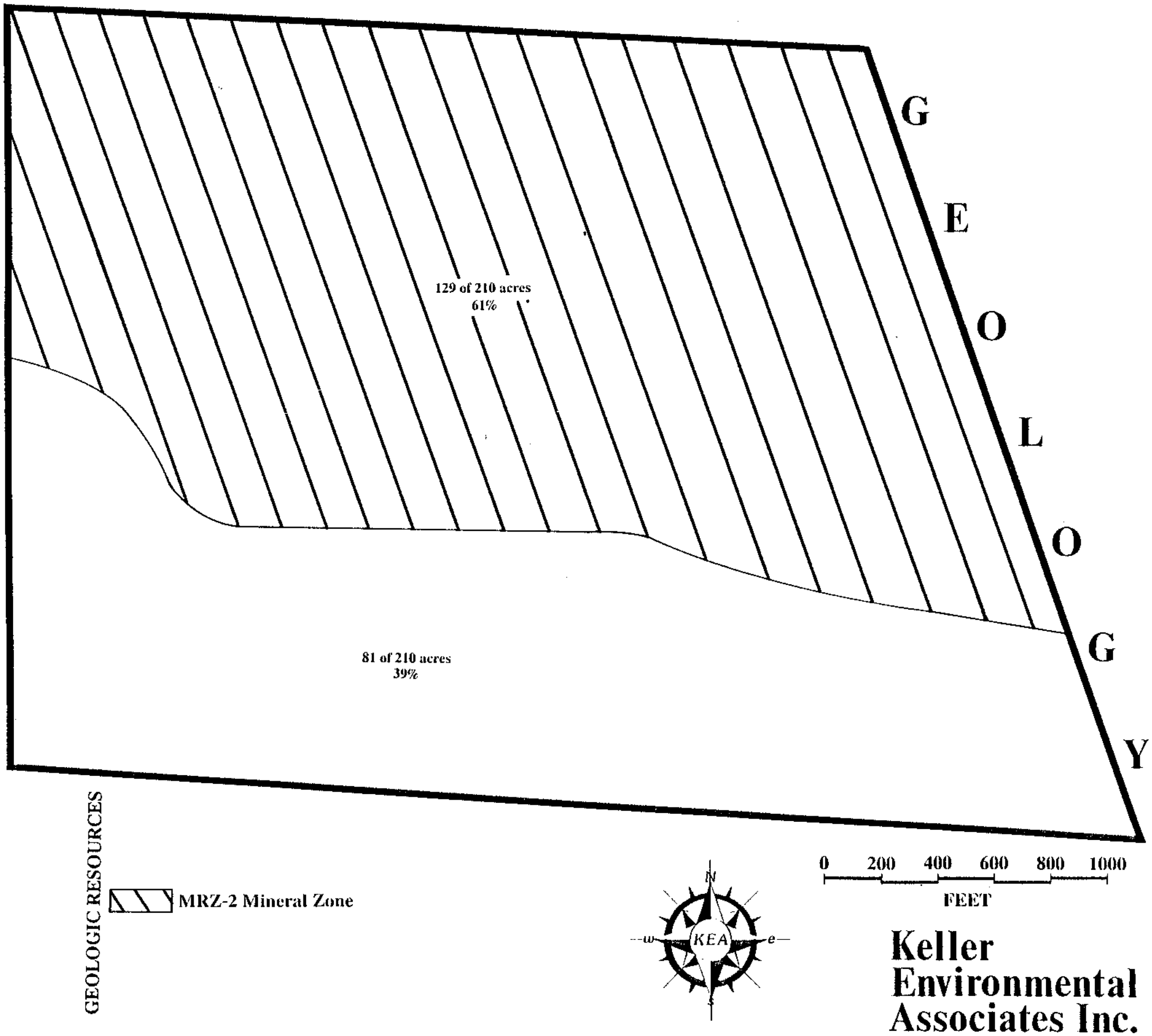



Figure 3-2

B. Impacts

1. Geology and Soils

The proposed project would entail grading of the site in preparation for structural development. Maximum slopes proposed are a ratio of 2.0 horizontal to 1.0 vertical. The industrial use lots would require 600,000 cubic yards of cut and the same amount of fill; the residential lots would require 300,000 cubic yards of cut and the same amount of fill.

Once structures are developed, impacts could occur from the unstable, compressible, and expansive deposits and formations found on the site. The problem deposits and formations are the alluvium, colluvium/slopewash, bentonite clay layers, landslides, and dams. Because the applicant is preparing the site for future development, he would be responsible for the remedial grading which is necessary to stabilize the soils and landslides before development can occur. Further detailed subsurface soil and engineering geology investigations would determine the type and locations of remedial grading necessary, as well as foundation and construction recommendations.

2. Seismicity

No significant impacts are expected due to grading and eventual development of the site. Standard building practices require earth stabilization in soils which tend to shift about during groundshaking. The only portion of the site where there is a potential for seismically induced soil liquefaction is where the recent alluvium in the floodplain may occur in association with high groundwater conditions for short periods of time; the probability of this occurrence would be very slight. A major earthquake could cause significant damage to structures on the site, as well as potentially threaten lives, however, as stated earlier, the risk is no greater at this site than that of surrounding developments.

3. Minerals

The proposed project would grade the site into pads in anticipation of structural development. The land uses expected are both light industrial/research and residential, and are deemed incompatible (as defined by the State Mining and Geology Board) with mining. The State Mining and Geology Board (Department of Conservation) would normally cite development of incompatible land use a significant unmitigable impact (O'Bryant, 1986). Their recommendation would be to extract the resource before development of incompatible uses. However, based on the recent GEOCON study performed to determine the suitability of subsurface soils for resource extraction, it was found that these soils do not possess qualities desirable for mining, and it is found that no significant or adverse impacts to this resource would occur from project development.

## C. Mitigation

### 1. Geology and Soils

A detailed subsurface soil and engineering geology investigation ~~should~~ *will* be conducted *by the developer* to provide remedial grading, foundation and construction recommendations prior to the final project design. Following the recommendations of the investigation would avoid significant impacts. *Conditions of approval on the Tentative Map would outline the data to be included in this investigation.* This investigation should include the following:

- o Drilling, logging, and sampling of drill holes to evaluate the bedrock composition and structure;
- o Excavation, logging, and sampling of test pits and trenches in areas of suspected landslides or fault traces;
- o In situ and laboratory testing of soils to establish engineering characteristics;
- o Preparation of grading specifications and foundation design criteria.
- o Definition of areas where slope buttressing may be required and provide buttress designs.
- o Determination of the relevancy of groundwater conditions in relation to grading and slope stability and provide subdrain requirements;
- o Definition of areas requiring soil removal and recompaction; and
- o Recommendations for seismic design parameters.

The design and construction of buildings in conformance with the State 1976 Uniform Building Code would effectively minimize the hazards on ground-shaking on the site. The potential for liquefaction or differential compaction during seismic events which may be found in the floodplain along the northern boundary can be mitigated or eliminated by following recommendations provided by the recommended geotechnical investigation.

Additionally, remedial grading known to be necessary at this time in order to develop the site includes the following:

a. Removal and recompaction of alluvium, older alluvium and colluvium/slopewash will be required in the central and northerly portions of the site and in the valley bottoms in the extreme southerly portion of the site. The depth of removal and recompaction is estimated to vary from approximately 5 to 10 feet depending on the conditions of the soils in these areas.

b. Complete removal or buttressing of landslides and clay seams will be required where encountered in cut slopes within the Otay Formation. In general, cut and fill slopes should not exceed an inclination of 2.0 horizontal to 1.0 vertical.

c. Because of the extensive clays (highly expansive soils) located throughout most of the central portion of the site, some construction will be necessary on highly expansive lots, or these lots must be capped with nonexpansive materials derived from the Otay Formation. For preliminary planning purposes, it may be assumed that approximately 2.5 feet of nonexpansive soils will be necessary to properly cap lots containing expansive materials.

d. It is recommended that the earthen dams be removed during any grading of the site or studied to determine whether or not they possess sufficient stability to be left in place.

The developer would accomplish appropriate remedial grading techniques as recommended by the geotechnical investigation.

2. <u>Seismicity</u>

Recommendations of the geotechnical investigation would ensure appropriate ground stabilization and building design to protect against seismic occurrences. *Also, adherence to the Uniform Building Code will be required.*

3. <u>Minerals</u>

No mitigation measures are necessary, as there would be no significant or adverse impacts to mineral resource extraction.

D. Analysis of Significance

A detailed subsurface soil and engineering geology investigation is necessary to determine specific geotechnical and seismic constraints. Significant impacts would be avoided by following the recommendations of this investigation.

A subsurface soils study to determine the adequacy of site soils for sand and gravel mineral resource potential found the soils to possess qualities which do not meet criteria for fine aggregate, and thus, no significant or adverse impacts to mineral resources would occur from project development.

## 3.2 DRAINAGE/GROUNDWATER/WATER QUALITY

A. Project Setting

The San Diego coastal province is approximately 3,900 square miles and includes all hydrographic basins which drain into the Pacific Ocean between the Mexican border and Laguna Beach. The elevations range from sea level to 6,000+ feet, and, due to the seasonal rainfall pattern, most San Diego streams are of an ephemeral type.

Eleven major hydrographic units, which are the entire watershed of one or more streams, make up the coastal province. These units are further divided into subunits, which are major tributaries or groundwater basins within the unit. The project site lies within the Otay subunit, which encompasses 65 square miles. The Otay subunit is part of the Otay unit, which encompasses 160 square miles.

1. <u>Drainage</u>

The Otay subunit is drained by the Otay River, which originates near the eastern boundary of the Otay unit, northeast of the Lower Otay Reservoir (the Reservoir is the terminus of the San Diego Aqueduct). The Otay River floodway is approximately 600 feet wide adjacent to the north end of the site and crosses the site at the northwest corner. The 100-year floodplain line also crosses the site in this area, as well as a small portion in the northeast corner. The broad, flat nature of this segment of the river adjacent to the site, combined with the amount of vegetation in the floodway, serves to spread sediment from the river out over the floodway when the river overflows its channels. This aggrading action is an important process in maintaining a balanced stream profile. The Otay River eventually discharges into the south end of the San Diego Bay. Site drainage characteristics and topography are shown on Figure 3-3.

The project site naturally drains in a northerly direction toward the river. Three major drainages traverse the south side of the project site as shown in Figure 3-3. Also, one drainage crosses the southwest corner of the property. Drainage in the western portion of the site is presently controlled by two dams, shown on Figure 3-3. Also, a drainage channel is located north of the dams to channel excess runoff to Otay River. These improvements were constructed to protect the agricultural fields from inundation. Presently, the total amount of runoff (based on precipitation levels for a ten-year storm) from the project site is approximately 175 cubic feet per second (cfs). The northwestern edge of the site, which lies in the Otay River floodplain, has a history of flooding, otherwise, the remainder of the site has not been known to experience flooding. Downstream from the site, flooding hazards occur to development within the floodplain, which is largely agricultural. Additionally, illegal dumping occurs in the floodplain.

The San Diego Regional Water Quality Control Board (RWQCB) lists beneficial uses for surface water in the Otay subunit; these include agricultural supply, non-contact water recreation such as picnicking and sunbathing, potential industrial service supply, and habitat for wildlife, including rare and endangered species. At the project location, the Otay River is not presently used for agricultural supply, industrial service supply, or for recreation.

2. Groundwater

Groundwater occurs in the Otay unit, and, in the general project area, is typically deeper than 100 feet below the surface (DWR, 1967). This is confirmed by a depth test run by the State of California Department of Water Resources in October,

# OTAY RIO BUSINESS PARK

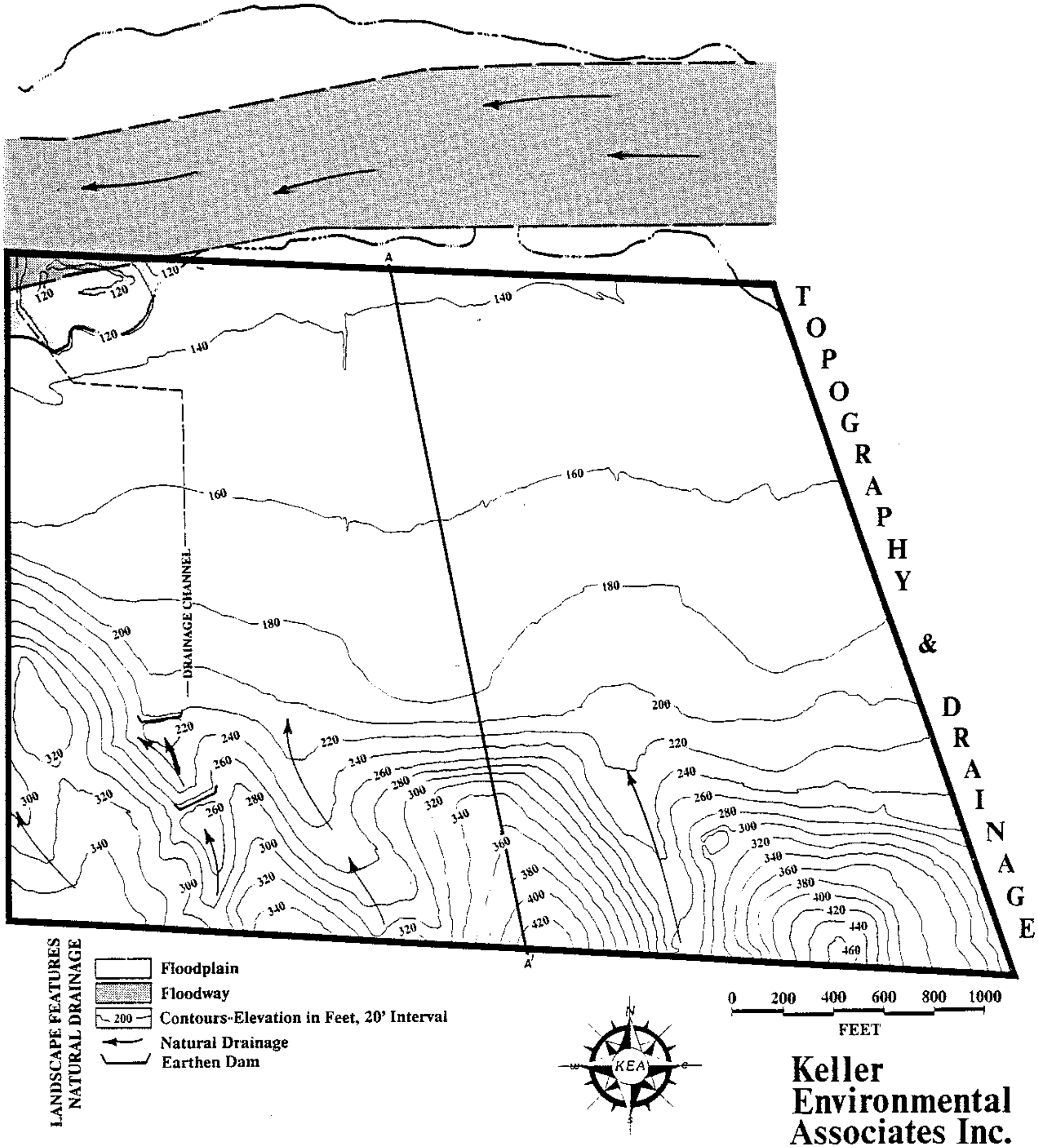



Figure 3-3

1985. The test was run at a well located at the existing onsite residence adjacent to Otay Valley Road. The depth to groundwater at this well, which is no longer used, was 109.9 feet. Also, the recent (March, 1987) study performed by GEOCON for subsurface soils encountered the most shallow depth of groundwater at 22 feet.

Historically, groundwater was used for agricultural and drinking water purposes in the project region, however, due to the poor water quality, and the accessibility of imported water, groundwater is no longer used. No seawater intrusion problems occur in the project vicinity.

The RWQCB also lists beneficial uses for groundwater in the Otay subunit. These uses include industrial service supply and potential groundwater recharge. Neither use presently occurs, except whatever groundwater recharge occurs naturally.

### 3. Water Quality

The RWQCB is responsible for regulating point sources of water pollutants. The Otay River watershed is largely unmonitored and data on water quality and water level are sparse.

The existing water quality in the river is variable, ranging from good to poor depending on rainfall and runoff volumes. Groundwater in this area typically has high amounts of total dissolved solids and is characterized by high sodium and chloride counts. This chemical character is directly related to the mineral composition of the granodiorites and gabbros which occur in the watershed. Because of the high amounts of chloride in this water, it is rated to be inferior for irrigation purposes (DWR, 1967).

Surface water quality measurements along the Otay River have been taken by the RWQCB in 1984 and 1985 at various times of the year. The two locations measured are: a) just east of the 805 freeway, and b) just east of the I-5 freeway. The a) location, closest to the project site, is approximately 1.5 miles downriver from the site. Within this distance are located many farming and industrial land uses which contribute to surface runoff into Otay River. Generally, the amount of total dissolved solids exceeded the RWQCB's objectives for this area. The project site, which is presently being farmed, is irrigated, with surface runoff also entering the river. No point source measurements at the project site have been taken.

Groundwater quality measurements were taken at various locations throughout Otay Valley by the California Department of Water Resources in October, 1985. The two wells tested which are closest to the project are located approximately 2.5 miles from the site. Generally, groundwater quality was fair to good, with only one well slightly exceeding RWQCB objectives for total dissolved solids, chloride, and sodium.

Additionally, groundwater measures were taken by the RWQCB in November, 1985 at a well in front of the Otay landfill, approximately 0.75 mile downriver from the project site. Generally, water quality was less than fair, with total dissolved solids and other constituents exceeding RWQCB objectives. The County's Solid Waste Division also conducts water quality testing at wells both on the landfill and toward the river from the landfill. Their tests also show levels of total dissolved solids, chloride, and other constituents generally exceeding the RWQCB objectives.

Surface water runoff and groundwater from the project site specifically have never been tested. However, due to its use historically for farming, water runoff is expected to have contained various pesticides and fertilizers used for crop fertility and maintenance.

## B. Impacts

### 1. Drainage

At ultimate buildout, the proposed project would grade for development approximately 64 percent of the site, or about 135 acres. Most of this area will eventually be covered with surfaces (roads, rooftops, parking lots, etc.) which are impervious to surface-to-groundwater drainage. Considering the amount of anticipated surface coverage, the surface water runoff (based on precipitation levels of a ten-year storm) would total about 248 cfs, or an increase from current runoff levels of about 40 percent. The increases in runoff would not be accompanied by increased sediment loads because of the change in land use from open space and agriculture to urban uses.

Because the project site represents a very small percentage of the Otay River watershed, the increase in peak runoff from the site would represent only an incremental increase to the existing flood discharges from the rest of the watershed. However, as development continues in the watershed, the increase could be considered cumulatively significant because of existing downstream moderate flooding problems in the floodplain. The proposed natural open space/riparian area in Lot 1 is located within the 100-year floodplain. As no use is proposed for this area, no impacts would occur.

The project proposes a drainage system, as shown on Figure 3-4. This system generally follows the natural course of drainage, and will be sized to accommodate surface flows. As shown on the Figure, surface drainage will flow both along street gutters and in storm drains. The storm drains eventually empty out into the Otay River floodplain. The drainage system will be examined for approval by the City of Chula Vista's Engineering Department, and the developer would accomplish any conditions of approval placed by Engineering on the drainage system. During construction, the developer would implement erosion and sedimentation control measures, such as sandbagging, and temporary desiltation basins. The location of these control measures will not be known until final grading plans are submitted.

2. <u>Groundwater</u>

Buildout of the proposed project will eliminate surface-to-groundwater (leaching) drainage over approximately two-thirds of the site, thus decreasing the amount of water naturally added during storms to the groundwater basin. This loss is not considered significant for two reasons. First, the naturally occurring topsoils on the property are largely clay loams, which naturally drain very slowly. Thus, the amount of water available from the project site by leaching is an incremental amount of the basin, and therefore the site is not an important recharge watershed area. Secondly, groundwater in the general project area is high in its total dissolved solids levels, and naturally high in sodium and chloride, which has already precluded its suitability for agricultural and potable uses.

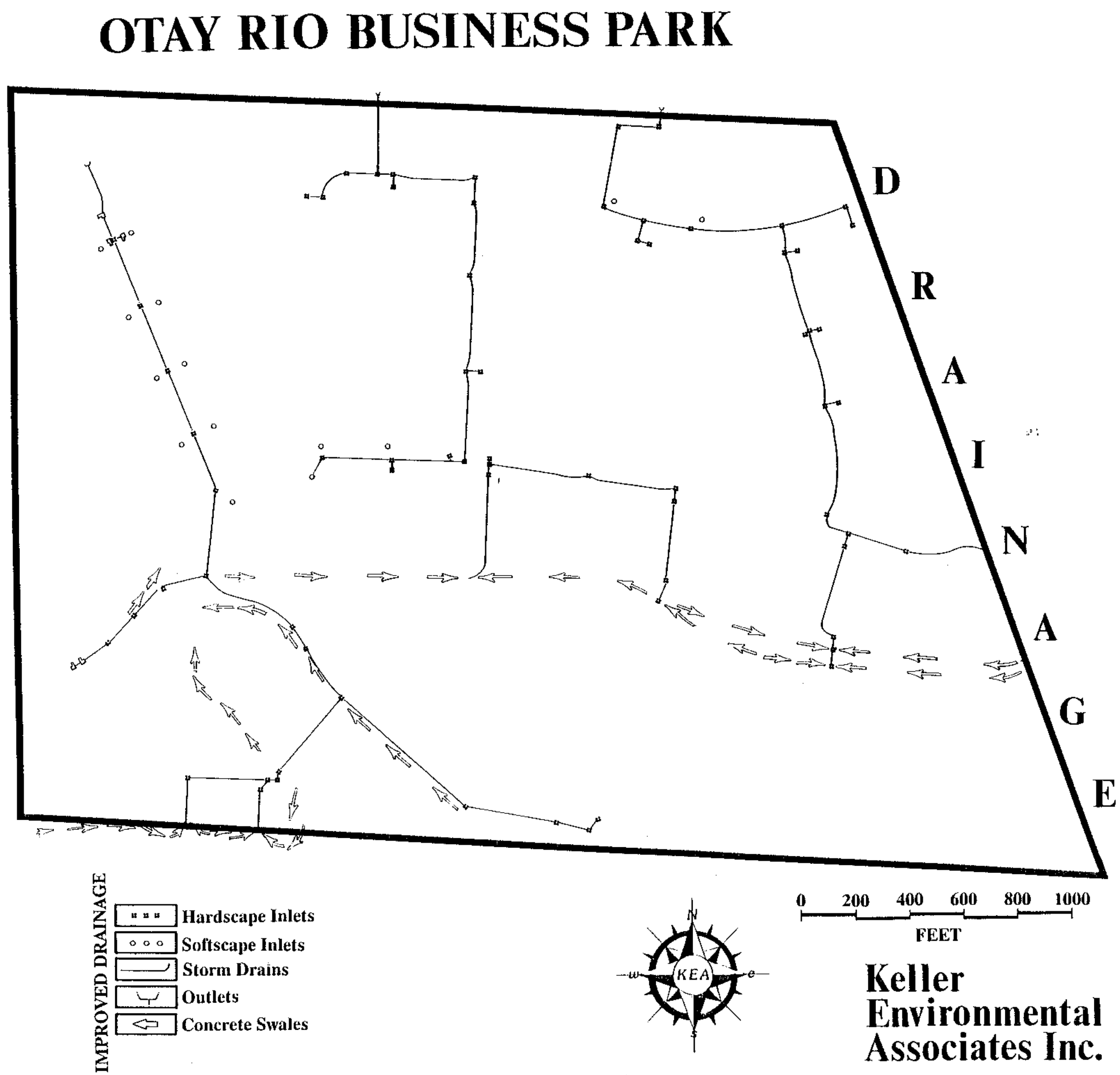

OTAY RIO BUSINESS PARK
D R A I N A G E
IMPROVED DRAINAGE
Hardscape Inlets
Softscape Inlets
Storm Drains
Outlets
Concrete Swales
KEA
0 200 400 600 800 1000
FEET
Keller
Environmental
Associates Inc.

Figure 3-4

Thus, the amount of water potentially lost to the groundwater basin from project development is not considered to be significantly great to constitute an adverse impact to the basin.

3. Water Quality

Project development would result in a change in the type of contaminants contained in surface runoff. Dissolved solids associated with agricultural use, such as nutrients, would decrease almost entirely, and contaminants from automotive sources, such as oil, grease, and heavy metals, would increase. Sediment loads in surface runoff would decrease. Water quality in the Otay River, and eventually, San Diego Bay, would not be measurably degraded by runoff contaminants from the site, rather, these contaminants would represent only a slight incremental contribution of the total contaminant load carried by Otay River and into the Bay.

If any of the future industrial development will use water, and then discharge the wasted water into percolation or sedimentation ponds, then the RWQCB would require a Waste Discharge Requirements Permit from that industry. If any of the industrial developments discharge wasted water into the sewage system, then the development would fall under the City of San Diego's Industrial Pre-treatment Program. These requirements will be determined when actual development plans are submitted.

C. Mitigation

1. Drainage

At this time, no mitigation is necessary. However, the City of Chula Vista Engineering Department will determine the adequacy of proposed site drainage once plans are submitted. The developer would accomplish any conditions of approval required by the Engineering Department.

2. Groundwater

No mitigation measures are necessary.

3. <u>Water Quality</u>

No mitigation measures are necessary, other than future industrial uses will need to submit plans to the City for their review and RWQCB's review to ensure compliance with their requirements.

D. Analysis of Significance

No significant impacts are anticipated at this time. Once final development plans are submitted to the City, recommendations can be made on site drainage, and any water quality requirements.

3.3 LANDFORM

A. Project Setting

The project site is situated adjacent to the Otay River and its associated wetland environment. The river floodplain crosses the northwest and northeast corners of the site. Elevations range from 120 feet at the northern boundary to 180 feet approximately two-thirds of the way across the site to the south. Steep bluffs begin at this point, with a sharp increase in elevation from 180 feet to over 400 feet at the northcentral and northeastern boundary. This elevation increase constitutes an approximate 25 percent slope. However, this steepest portion of the bluffs have a slope of approximately 50 percent. Site topography is shown on Figures 3-3 and 3-5. Figure 3-5 shows three observations: View A is from the north to south; View B is from the northeast to southwest; View C is from the west to southeast.

The flatter, lower elevations have been historically used for farming, with the exception of an approximate 5-acre portion of land in the northwestern corner of the site which is in the floodway and contains wetland vegetation. Otherwise, the site topography has not been altered.

B. Impacts

The proposed project would grade, by the end of the last phase of development, approximately 900,000 cubic yards of balanced cut and fill. The proposed elevations

# OTAY RIO BUSINESS PARK

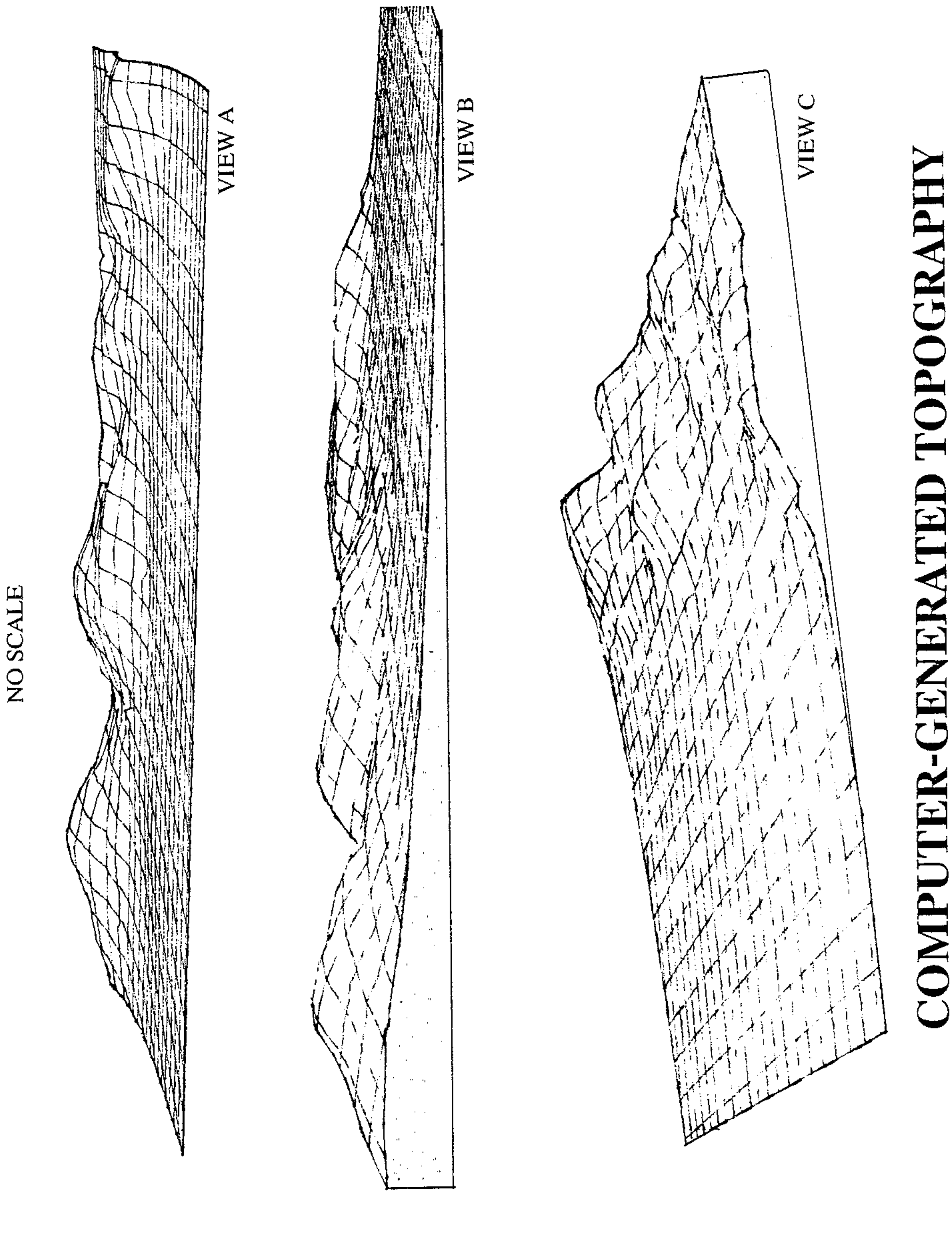



Figure 3-5

are shown on the Tentative Subdivision Map, Figure 2-4. As shown on the Figure, most of the grading would occur in the southwesterly portion of the site. Site elevations in this area would be altered in most lots approximately 5 to 15 feet, with some lots cut by 30 to 40 feet (east end of "H" Street and adjacent lots). The gradually sloping portion of the site in the north would be leveled slightly, with site elevations changing from about 3 to 10 feet. However, the southeast lots (77-80) of the level portion would be cut from 25 to 30 feet. Figure 3-6 shows the existing site elevations from north to south (A-A') as compared with the proposed elevations.

The steepest slopes proposed are at a ratio of two horizontal to one vertical (2:1), which is the maximum slope allowed by the City as well as by standard grading practices. The steepest natural slopes would remain natural, as would the entire southeast corner. In most areas, the site topography would not change significantly with project development, but rather would be cut and filled along natural lines to create level pads.

C. Mitigation

No mitigation is required as there are no significant impacts anticipated.

D. Analysis of Significance

The project would grade the site for future development, and grading would conform with City-accepted standards. Landform alteration would not change the topography significantly from present site configuration.

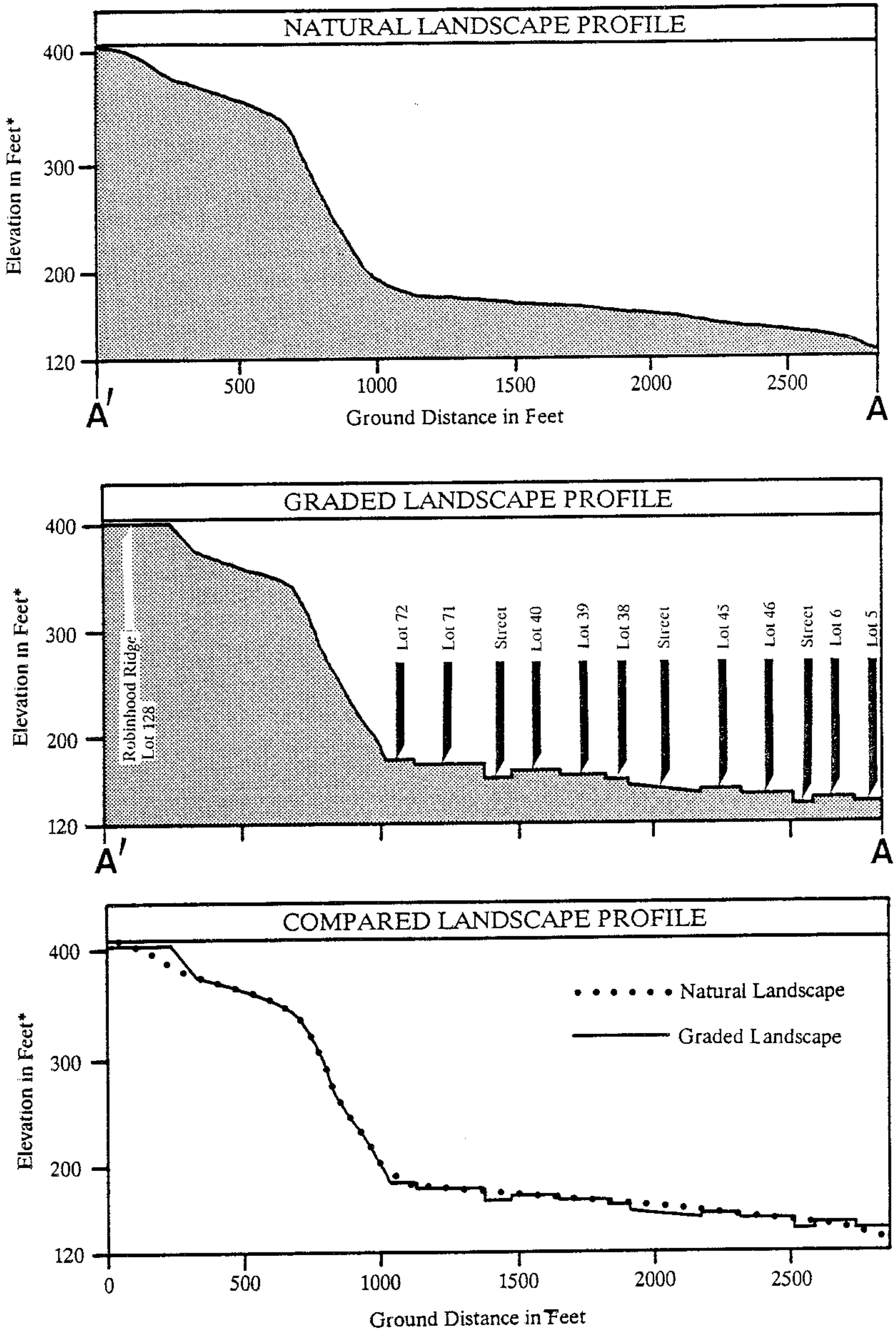
## 3.4 AGRICULTURAL RESOURCES

A. Project Setting

San Diego County lands under cultivation in 1985 totaled approximately 75,000 acres (County Annual Crop Report 1985). Land under cultivation was less than that in 1984 (by approximately 2,600 acres), but the overall gross crop value was approximately $45 million higher. Of the total County lands under cultivation, approximately 9,000 acres of vegetable crops were harvested for a value of $49 million. Approximately 13 percent fewer acres were used for vegetable crops in

# OTAY RIO BUSINESS PARK

## CROSS-SECTIONAL PROFILES




*Vertical Exaggeration 5:1

**Keller Environmental Associates Inc.**

Figure 3-6

1985 than in 1984, but the difference in value was almost 30 percent higher ($49 million in 1985 versus $71 million in 1984). Three of the County's largest income crops (cucumbers, squash, tomatoes) have been produced in the past on the subject property.

The proposed Otay Rio Business Park locale is in an area favorable to crop production. The study area is within the boundaries of the coastal area climate, which is suited to the production of coastal dependent vegetables and such items as tomatoes and decorative potted plants or flowers.

Soils on the property are also conducive to agriculture. The U.S. Department of Agriculture Soil Conservation Service (SCS) has developed a ranking system for soil agricultural suitability based on such criteria as slope, soil depth and erosion hazards. This system ranks soils on a scale of I to VIII, with Class I lands being those most favorable to crop production. Approximately half of the proposed project area consists of two types of Salinas Clay loams (SbA and SbC), which are considered Class I and II soils, respectively. Both of these soil types are considered Prime farmlands by the SCS, and are rated as being Good for tomatoes and Fair for citrus, truck crops and flowers. Another project soil type (Diablo Clay - DaD), is listed as Fair for tomato production, and is therefore considered agricultural land by the SCS, but is not considered Prime farmland.

While the City desires that "highly productive agricultural lands" should be retained (Open Space Element of the Chula Vista General Plan, 1973:7), it is also recognized by the City that agriculture cannot compete with urban uses and that "at best, activities in the vicinity of urban areas must be viewed as interim uses" (Conservation Element of the Chula Vista General Plan (1973:Section I). The project area is largely zoned for agriculture by the City, yet the General Plan designation is Low Density Residential along the gentle slopes and Open Space in the steeper hills on the southern portion of the property.

Agricultural use of the project area began in 1920 when Mr. K. Takashima began farming there. From 1920 to 1983, Mr. Takashima produced tomatoes and cucumbers on a January-June and July-December schedule, using approximately 50-60 acres of his property. Chillingsworth Corporation purchased the property in 1983, and for the past two years has leased 42 acres to Mr. D. Hafen. Mr. Hafen has cultivated approximately 20 acres in each growing season, concentrating on cucumbers, squash, green beans, herbs and some tomatoes. At present, because of uncertain lease availability, only four acres are in crops. All of these are fava beans, although some of the earlier grown herb groups (particularly thyme) are flourishing in non-maintained areas. These will be removed by Mr. Hafen when his lease expires.

B. Impacts

The proposed business park would remove all arable project lands from production, as construction is proposed for the entire area appropriate for cultivation. At present, only four acres are in production. If the full 42 acres subject to lease were in use, this property would account for 0.005 percent of County lands in vegetable crops as of 1985. While this is a relatively insignificant amount, it is part of a trend in loss of croplands in the coastal area due mainly to urban and related growth. These losses may eventually result in reduction of the ability to produce state (and nationally) consumed off-season vegetables. Therefore, loss of the project lands will contribute to a County-wide trend which is cumulatively significant. Reviewed independently, however, this project will not result in any significant loss.

C. Mitigation

Due to the conflicting nature of the project and current land uses, no mitigative actions are proposed.

D. Analysis of Significance

The loss of the project agricultural lands will indeed result in relatively significant impacts on a cumulative (County-wide) level. The surrounding project area is not primarily agriculturally oriented, however, and the business park will not increase industry in an area previously given to cultivation. Though rural in nature, the prevailing uses are planned residential developments to the south of the project area and other industrial uses to the north. Reviewed independently, therefore, loss of this acreage will not create a project-significant impact.

## 3.5 AIR QUALITY

### A. Project Setting

#### 1. Regional and Local Meteorology/Climate

The climate of Chula Vista, as with all of Southern California, is largely controlled by the strength and position of the semi-permanent high pressure center over the Pacific Ocean. The high pressure ridge over the West Coast creates a repetitive pattern of frequent early morning cloudiness, hazy afternoon sunshine, clean daytime onshore breezes and little temperature change throughout the year. Limited rainfall occurs in winter when the high center is weakest and farthest south when the fringes of mid-latitude storms occasionally move through the area. Summers are often completely dry with an average of 10 inches of rain falling each year from November to early April.

Unfortunately, the same atmospheric conditions that create a desirable living climate combine to limit the ability of the atmosphere to disperse the air pollution generated by the large population attracted to San Diego County in part by the climate. The onshore winds across the coastline diminish quickly when they reach the foothill communities east of San Diego, and the sinking air within the offshore high pressure system forms a massive temperature inversion that traps all air pollutants near the ground. The resulting horizontal and vertical stagnation, in conjunction with ample sunshine, cause a number of reactive pollutants to undergo photochemical reactions and form smog that degrades visibility and irritates tear ducts and nasal membranes. Because coastal areas are well-ventilated by fresh breezes during the daytime, they generally do not experience the same air pollution problems found in some areas east of San Diego. Unhealthful air quality within the San Diego Air Basin's coastal communities such as Chula Vista may occur at times in summer during limited localized stagnation, but occurs mainly in conjunction with the occasional intrusion of polluted air from the Los Angeles Basin into the County, especially North County. Localized elevated pollution levels may also occur in winter during calm, stable conditions near freeways, shopping centers or other major traffic sources, but such clean air violations are highly localized in space and time. Except for this occasional interbasin transport and possible localized air pollution "hot spots," coastal community air quality is generally quite good.

Local meteorological conditions typically conform well to the regional pattern of strong onshore winds by day, especially in summer, and weak offshore winds at night, especially in winter. Local wind patterns are driven by the temperature differences between the normally cool ocean and the warm interior and steered by the Otay River topography. In summer, moderate breezes of 8-12 mph blow onshore by day, and may continue all night as a light onshore breeze as the land remains warmer than the ocean. In winter, the onshore flow is weaker, and reverses in the evening as the land becomes cooler than the ocean. While daytime winds are mainly off the ocean from the W-NW, winds do, at times, shift into the WSW or even SW where air pollution emissions from Mexico are carried across the border. Given the scope of development and the lack of pollution controls across the border, international transport is an important air pollution concern. Such cross-border emissions do not generally affect the Chula Vista area because it takes several hours of transport for such pollutants to react and become photochemical smog, but, like the pollution recirculation from the Los Angeles Basin, it means that no matter what pollution controls are implemented within the County, there may still be smog from other sources beyond the County's control.

Both the onshore flow of marine air and the nocturnal drainage winds are accompanied by two characteristic temperature inversion conditions that further control the rate of air pollution dispersal throughout the air basin. The daytime cool onshore flow is capped by a deep layer of warm, sinking air. Along the coastline, the marine air layer is deep enough to accommodate any locally generated emissions. However, as the layer moves inland, pollution sources (especially automobiles) add pollutants from below without any dilution from above. When this progressively polluted layer approaches foothill communities east of coastal developments, it becomes shallower and exposes residents in those areas to the reacted byproducts of coastal area sources. The slow drainage or stagnation of cool air at night creates localized cold "pools" while the air above the surface remains warm. Such radiation inversions occur throughout the San Diego area, but are strongest within low, channelized areas such as the Otay River Valley. They may trap vehicular exhaust pollutants such as carbon monoxide (CO) near their source until these inversions are destroyed by surface warming the next morning. Any such CO "hot spots" are highly localized in space and time (if they occur at all), but occasionally stagnant dispersion conditions are certainly an important air quality concern relative to continued intensive development of the Chula Vista area.

2. Air Quality

In order to gauge the significance of the air quality impacts of the proposed commercial, light industrial and residential development projects comprising the Otay Rio Business Park, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

National Ambient Air Quality Standards (AAQS) were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 has since been extended to 1987 for national AAQS, and may require further extension in air quality problem areas like Southern California. Because California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 3-1.

There are no routine measurements of air quality distributions made near the Otay Rio Business Park project site by the San Diego County Air Pollution Control District (APCD), the agency responsible for air quality planning, monitoring and enforcement in the San Diego Air Basin (SDAB). The nearest air quality monitoring station is in downtown Chula Vista, but air quality patterns should be sufficiently homogeneous such that monitoring results from this station should be well representative of the project site. Some ambient air quality monitoring had been conducted at Brown Field until about mid-1978 which is far more

TABLE 3-1

## AMBIENT AIR QUALITY STANDARDS

| Pollutant | Averaging Time | California Standards | | National Standards | | |
|---|---|---|---|---|---|---|
| | | Concentration | Method | Primary | Secondary | Method |
| Oxidant | 1 hour | 0.10 ppm (200 ug/m$^3$) | Ultraviolet Photometry | – | – | – |
| Ozone | 1 hour | – | – | 0.12 ppm (235 ug/m$^3$) | Same as Primary Standard | Ethylene Chemiluminescence |
| Carbon Monoxide | 8 hour | 9 0 ppm (10 mg/m$^3$) | Non-Dispersive Infrared Spectroscopy (NDIR) | 9 0 ppm (10 mg/m$^3$) | Same as Primary Standards | Non-Dispersive Infrared Spectroscopy (NDIR) |
| | 1 hour | 20 ppm (23 mg/m$^3$) | | 35 ppm (40 mg/m$^3$) | | |
| Nitrogen Dioxide | Annual Average | – | Gas Phase Chemiluminescence | 100 ug/m$^3$ (0.05 ppm) | Same as Primary Standard | Gas Phase Chemiluminescence |
| | 1 hour | 0.25 ppm (470 ug/m$^3$) | | – | | |
| Sulfur Dioxide | Annual Average | – | Ultraviolet Fluorescence | 80 ug/m$^3$ (0 03 ppm) | – | Pararosaniline |
| | 24 hour | 0.05 ppm (131 ug/m$^3$) | | 365 ug/m$^3$ (0 14 ppm) | – | |
| | 3 hour | – | | – | 1300 ug/m$^3$ (0.5 ppm) | |
| | 1 hour | 0.25 ppm (655 ug/m$^3$) | | – | – | |
| Suspended Particulate Matter ($PM_{10}$) | Annual Geometric Mean | 30 ug/m$^3$ | $PM_{10}$ | – | – | – |
| | 24 hour | 50 ug/m$^3$ | | – | – | |
| Suspended Particulate Matter | Annual Geometric Mean | – | – | 75 ug/m$^3$ | 60 ug/m$^3$ | High Volume Sampling |
| | 24 hour | – | | 260 ug/m$^3$ | 150 ug/m$^3$ | |
| Sulfates | 24 hour | 25 ug/m$^3$ | Turbidimetric Barium Sulfate | – | – | – |
| Lead | 30 day Average | 1 5 ug/m$^3$ | Atomic Absorption | – | – | – |
| | Calendar Quarter | – | – | 1 5 ug/m$^3$ | Same as Primary Standard | Atomic Absorption |
| Hydrogen Sulfide | 1 hour | 0.03 ppm (42 ug/m$^3$) | Cadmium Hydroxide STRactan | – | – | – |
| Vinyl Chloride (Chloroethene) | 24 hour | 0.010 ppm 26 ug/m$^3$) | Tedlar Bag Collection, Gas Chromatography | – | – | – |
| Visibility Reducing Particles | 1 observation | In sufficient amount to reduce the prevailing visibility to less than 10 miles when the relative humidity is less than 70% | | – | – | – |
| **APPLICABLE ONLY IN THE LAKE TAHOE AIR BASIN:** | | | | | | |
| Carbon Monoxide | 8 hour | 6 ppm (7 mg/m$^3$) | NDIR | – | – | – |
| Visibility Reducing Particles | 1 observation | In sufficient amount to reduce the prevailing visibility to less than 30 miles when the relative humidity is less than 70% | | – | – | – |

representative of the project site, but the data from that site was sufficiently similar to the downtown Chula Vista station to justify discontinuing monitoring at Brown Field. Table 3-2 summarizes the last five complete years of monitoring data from the Chula Vista (80 E. J. St.) station. Progress toward cleaner air is seen in almost every pollution category. The only national standard that was exceeded throughout the 5-year monitoring period was the hourly ozone standard which was exceeded an average of 5 times per year (once per year is allowable). In preliminary data from 1986, Chula Vista only exceeded the federal ozone standard on two occasions, or only once more than allowable under federal guidelines. The more stringent state standards for ozone and total suspended particulates (dust) were exceeded on a somewhat higher frequency, but overall air quality in Chula Vista, and by inference at the project site, is nevertheless very good in comparison to other areas of the San Diego Air Basin (SDAB).

The continued violations of national AAQS in the SDAB, particularly those for ozone in inland foothill areas, requires that a plan be developed outlining the stationary and mobile source pollution controls that will be undertaken to improve air quality. In San Diego County, this attainment planning process is embodied in a regional air quality management plan developed jointly by the APCD and SANDAG with input from other planning agencies. This plan, originally called RAQS (Regional Air Quality Strategies), is now called the 1982 State Implementation Plan Revisions (1982 SIP Revisions). The underlying premise of this plan is that the County can have continued economic and population growth and still achieve basinwide clean air. The plan outlines the analysis methodology and charts the necessary steps to reduce the current excess emissions burden plus offset the air pollutants associated with continued growth. The 1982 SIP Revisions recognize that there are meteorological patterns under which county emissions are uniquely responsible for ozone violations, and there are also conditions where interbasin transport is a major factor in observed air quality. The basic conclusion of the 1982 SIP is that emissions will have been sufficiently reduced by the end of 1987 such that all county-related ozone violations will have been eliminated, but that violations due to transport from the Los Angeles Basin will continue as long as that basin continues to experience very unhealthful ozone levels.

The proposed Otay Rio Business Park relates to the SIP Revisions through incorporation of sub-regional development plans into regional growth estimates. If

TABLE 3-2

CHULA VISTA AREA AIR QUALITY MONITORING SUMMARY, 1981-85
(Days standards were exceeded, and maxima for periods indicated)

| Pollutant/Standard | YEAR 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|
| Ozone: | | | | | |
| 1-HR > 0.10 ppm | 21 | 23 | 20 | 18 | 28 |
| 1-HR > 0.12 ppm | 3 | 5 | 6 | 4 | 4 |
| 1-HR > 0.20 ppm | 0 | 1 | 1 | 0 | 1 |
| Max. 1-HR (ppm) | 0.17 | 0.20 | 0.21 | 0.15 | 0.20 |
| Carbon Monoxide: | | | | | |
| 1-HR > 20 ppm | 0 | 0 | 0 | 0 | 0 |
| 8-HR > 9 ppm | 0 | 0 | 0 | 0 | 0 |
| Max. 1-HR (ppm) | 8. | 9. | 13. | 7. | 7. |
| Max. 8-HR (ppm) | 4.5 | 4.1 | 4.4 | 4.6 | 3.9 |
| Nitrogen Dioxide: | | | | | |
| 1-HR > 0.25 ppm | 0 | 0 | 0 | 0 | 0 |
| Max. 1-HR (ppm) | 0.15 | 0.18 | 0.18 | 0.20 | 0.16 |
| Sulfur Dioxide: | | | | | |
| 1-HR > 0.25 ppm | 0 | 0 | 0 | 0 | 0 |
| 24-HR > 0.05 ppm | 0 | 0 | 0 | 0 | 0 |
| Max. 1-HR (ppm) | 0.12 | 0.13 | 0.07 | 0.07 | 0.08 |
| Max. 24-HR (ppm) | 0.028 | 0.039 | 0.021 | 0.021 | 0.015 |
| Total Suspended Particulates: | | | | | |
| 24-HR > 100 ug/m3 | 5/59 | 3/61 | 1/60 | 0/61 | 0/61 |
| 24-HR > 260 ug/m3 | 0/59 | 0/61 | 0/60 | 0/61 | 0/61 |
| Max. 24-HR (ug/m3) | 160. | 112. | 103. | 88. | 96. |
| Lead Particulates: | | | | | |
| 1-MO > 1.5 ug/m3 | 0/12 | 0/12 | 0/12 | 0/12 | 0/12 |
| Max. 1-MO (ug/m3) | 1.17 | 1.00 | 0.82 | 0.60 | 0.38 |
| Sulfate Particulates: | | | | | |
| 24-HR > 25 ug/m3 | 0/57 | 0/62 | 1/58 | 0/61 | 0/54 |
| Max. 24-HR (ug/m3) | 23.7 | 16.9 | 25.8 | 18.0 | 15.4 |

Source: California Air Resources Board
Summary of Air Quality Data, 1981-85
Chula Vista Monitoring Station Except for Lead and Sulfate Particles which are from San Diego APCD Island Avenue Station.

the project has been correctly anticipated in the SANDAG Series V growth forecasts (the basis for SIP transportation emissions forecasts), then it will not cause any unanticipated regional air quality impacts. If, however, the proposed development exceeds the intensity of development or occurs sooner than predicted by regional growth forecasts, it will be inconsistent with the SIP Revisions until growth forecasts are updated and those updates are incorporated into the next cycle of regional air quality planning (1987).

B. Impacts

A business park and residential use complex will impact air quality primarily through transportation related air pollutant emissions. The mobile nature of these sources is such that they usually do not of themselves cause clean air standards to be exceeded. Rather, the emissions from this project will mix with those from hundreds of similar traffic intensive developments. The regional impact from any one project is incrementally small, but the cumulative impact of all such growth creates a large part of the region's air quality problems. Light industrial uses such as those proposed within the project may also contribute emissions from industrial chemicals, paints and coatings, materials processing, etc. Such activities vary markedly from one facility to another. Such emissions are generally under the strict control of the San Diego County APCD, such that such light industrial or R&D sources are considered "clean" land uses in terms of air pollution potential.

There are a number of secondary sources of air emissions from a development such as the proposed Otay Rio Business Park project, but they are usually less significant in quantity or duration than the vehicular sources. They include temporary emissions during construction, increased electrical power demand from regional generating stations, on-site combustion of natural gas for space and water heating, and various small population-related sources such as gas stations serving project traffic, landscaping equipment, or asphalt paving. These sources are small, even on a total project basis, and are thus much less of a concern than the increased vehicular source emissions.

### 1. Construction-Related Impacts

The demolition of any existing agricultural site uses, excavation of utility access, preparation of foundations and footings, and building assembly will create temporary emissions of dusts, fumes, equipment exhaust and other air contaminants during the project construction period. In general, the most significant source of air pollution from project construction will probably be the dust generated during demolition, grading, excavation and site preparation. Typical dust lofting rates from construction activities are usually assumed to average 1.2 tons of dust per month per acre disturbed. For the approximately 125 acres comprising the developable land portion of the Otay Rio Business Park project site and an 11-month construction cycle per industrial or commercial site structure, and a 6-month residential building cycle, this generation rate translates into a potential total of almost 1,600 tons of dust released into the local airshed during the project buildout period if no dust control procedures are implemented.

Dust control through regular watering and other fugitive dust abatement measures required by the San Diego County APCD can reduce dust emission levels from 50 to 75 percent. Total dust lofting until project completion will thus range from 400 to 800 tons. Dust emissions rates depend on the development rate and the care with which dust abatement procedures are implemented. Phasing plans have not yet been completed, but such dust emissions would probably be spread out over a considerable period of time. It should be noted that much of this dust is comprised of large particles that are easily filtered by human breathing passages, and settles out rapidly on parked cars and other nearby horizontal surfaces. It thus comprises more of a soiling nuisance rather than any potentially unhealthful air quality impact. With prevailing west to east daytime winds, the maximum soiling potential will generally be on the east side of any development except during Santa Ana wind conditions. In order to minimize the dust nuisance potential, it would therefore be beneficial to build out the project site before development occurs directly east of Otay Valley Road so that downwind receptors are not exposed to heavy upwind dust emissions. It should also be noted that the construction dust is the same dust as that currently generated by agricultural activities. The construction dust lofting will be more intense than from current tilling and unpaved surface equipment travel, but construction is basically a one-time source whereas agricultural activities are a long-term, chronic fugitive dust generator.

Equipment exhaust will also be released during temporary construction activities, particularly from mobile sources during the redistribution of graded material, and from off-site equipment hauling concrete and other building materials during actual construction. Low-rise land use development typically entails from 250,000 to 300,000 Brake-Horsepower-Hours (BHP-HR) of off-site truck and on-site equipment operations. If all such equipment is assumed diesel-powered, the following air pollution emissions will be released from construction activity combustion emissions:

| | | | |
|---|---|---|---|
| Reactive Organic Gases | (ROG) | - | 37.9 tons |
| Carbon Monoxide | (CO) | - | 98.8 tons |
| Nitrogen Oxides | (NOx) | - | 363.3 tons |
| Total Particulates | (TSP) | - | 31.3 tons |
| Sulfur Dioxide | (SO2) | - | 30.5 tons |

Although the construction activity emission rates are substantial (especially NOx from diesel-fueled trucks and on-site vehicles), they will be widely dispersed in space and time by the mobile nature of much of the equipment itself. Furthermore, daytime ventilation during much of the year in the Otay Valley area is usually more than adequate to disperse any local pollution accumulations near the project site. Any perceptible impacts from construction activity exhaust will therefore be confined to an occasional "whiff" of characteristic diesel exhaust odor, but not in sufficient concentration to expose any nearby receptors to air pollution levels above acceptable standards. By routing construction traffic away from any nearby sensitive receptor sites as much as possible, the potential for any noticeable construction activity combustion emissions exposure will be negligible.

### 2. Long Term Vehicular Emissions Impacts

By far, the most significant potential impact derives from the the 15,200+ daily vehicle trips that will be generated at project completion. For typical San Diego area employee residential, commuting and business activity trips, the project will generate about 114,500 vehicle miles traveled (VMT) each workday. Compared to the approximately 40 to 50 million miles traveled each day in and around San Diego, the project contribution is small, but certainly not insignificant. VMT alone is not a complete indicator of project-induced air pollution emissions because vehicular emission characteristics per mile of travel are much different for short trips with a cold engine versus long trips with a well-warmed engine, but the Otay Rio Business Park will definitely create a substantive increase to regional on-road transportation emissions.

Project-related vehicular air pollution emissions can be readily calculated using a computer program developed by the California Air Resources Board (ARB) that calculates emissions as a function of land use called URBEMIS#1. Mobile source emissions calculations for the proposed business/residential park project were made for the proposed project, and for comparison, a calculation was made for site development under the existing general plan. The results of the various model runs are attached in the Appendix. Table 3-3 summarizes calculated project emissions for the three main vehicular emission species (CO, RHC and NOx) as a function of project build-out year. Total annual project emissions for the Otay Rio Business Park total about 500 tons for CO and around 30 to 50 tons each for RHC and NOx. These estimates do not take into account the mandatory inspection and maintenance program begun in 1984, and are thus somewhat conservative (over-predictive). Table 3-3 also compares emissions from the proposed site uses with traffic emissions from existing or currently planned single family use at 3 DU/acre. These data show that the proposed business park will generate more than 3 times the traffic, and correspondingly about 3 times the emissions, compared to the project site built out to its current general plan designation. Because the residential uses specified in the existing general plan create emissions 7 days per week while much of the business park use is mainly 5 days per week, annual emissions are not strictly in direct proportion to daily trip generation. Even with this small difference taken into account, the proposed site uses are still seen to generate a substantial emissions increase compared to what is currently anticipated from the site if it were built out according to the current general plan.

Since on a regional scale it is not the total emissions that are significant, but rather whether the project has been properly anticipated within the regional air quality planning framework, the proposed project may have a significant basinwide air quality impact. Table 3-3 shows that such an impact will diminish slightly with time as continued emissions reductions from older cars will off-set some project traffic intensification, but the cumulative impact of such traffic growth is certainly non-

TABLE 3-3

PROJECT-RELATED REGIONAL VEHICULAR AIR POLLUTION EMISSIONS

| Scenario/Year | Daily Trips | Daily VMT | Annual Emissions (tons/year) CO | RHC | NOx |
|---|---|---|---|---|---|
| Project - 1990 | 19045 | 141963 | 658.1 | 62.3 | 44.3 |
| Project - 1995 | 19045 | 141963 | 586.7 | 54.8 | 37.9 |
| Project - 2000 | 19045 | 141963 | 530.1 | 50.1 | 36.2 |
| Ex. G.P. - 2000 | 4240 | 25095 | 148.7 | 12.7 | 9.2 |
| Increase - 2000 | +349% | +466% | +256% | +294% | +293% |
| San Diego Air Basin Daily Emissions: | | | 1021.4 | 253.5 | 154.5 |
| Project Only (2000) Daily Emissions: | | | 2.20 | 0.21 | 0.15 |
| Project Share of Daily Basinwide Total: | | 0.22% | 0.08% | 0.10% | |

Source: URBEMIS#1 Computer Model and 1982 SIP Revisions.

Key: CO = Carbon Monoxide; RHC = Reactive Hydrocarbons; NOx = Nitrogen Oxides negligible. There are no established standards for regional air quality impact significance, but if the vehicular business park emissions sources were a stationary source (such as a smokestack), it would require complicated air quality impact reviews and special permits. The net regional emissions increase (in tons/day, TPD) from project implementation can almost completely off-set some other transportation emissions decreases anticipated in the SIP Revisions. The air pollution impact from Otay Rio Business Park traffic sources, while small on a regional scale, may therefore be considered individually and cumulatively significant to the extent that project emissions far exceed the levels anticipated from the project site based on the site's current general plan designation, and, secondly, that they can totally negate one or more of the transportation control measures (TCMs) to reduce vehicular emissions. Weighing against a finding of significance is that the proposed business park uses normally do not of themselves generate a demand for development space, but rather that they accommodate an existing demand. Construction of major light industrial buildings and residences will not occur unless there already is a market for such facilities. It should further be noted that if a demand for such space is not met at Otay Rio Business Park, it may be met elsewhere in San Diego County with essentially the same set of air emissions. Freeway access via I-805 to the project site during non-stagnation traffic periods creates a very pollution efficient driving mode, and the project area may accommodate growth that might otherwise be diverted into areas of San Diego where roadway capacity is more severely constrained than in the Otay Mesa area. It has also been legally found that development non-conformity with growth projections is not of itself a "fatal flaw," but rather that the growth forecasts simply did not anticipate future changes in development patterns. (See, e.g., Del Mar vs. San Diego, re: North City West.) The above discussion therefore suggests that, while the emissions increases from project traffic intensification are indeed substantial, the cumulative project impact on a regional scale is not necessarily significant.

While regional pollution generation is incrementally small, the concentration of additional traffic on local roadways might produce microscale violations of air quality standards. To test for this possibility, maximum traffic levels were combined with minimum dispersion conditions into a worst-case microscale air quality impact assessment. These parameters were combined into the California line source air pollution model CALINE3 with CO used as the indicator pollutant for any "hot spot" potential. A receptor location of 25 feet from any area roadway was chosen since if it can be shown that no unhealthful air quality exists that close to the edge of the road, then typical receptor exposure much farther from the roadway will be even lower. Table 3-4 summarizes the results of this analysis. Hourly and 8-hour CO concentrations from local traffic contributions are seen to be below the applicable standard for each exposure period, and the project traffic contribution is less than 2 ppm for one hour and less than 1 ppm for an 8-hour period. Despite the considerable planned growth and associated traffic in eastern Chula Vista, microscale air quality is forecast to remain healthful even under worst-case traffic and dispersion assumptions as long as the levels of service on the area roadways remain within an acceptable Level of Service (LOS) of "D" used as the basis for the microscale analysis. If roadway system growth were not to keep pace with land use growth, then air quality degradation from traffic stagnation could result with the attendant formation of very localized areas of unhealthful air quality. Traffic impact mitigation and air quality therefore are directly coupled in preserving a healthful air quality environment in the Otay Valley.

### 3. Miscellaneous Impacts

Project-related energy demand that is met by burning fossil fuels and a variety of small growth-related sources will contribute additional air pollutant emissions to the basin burden. On an annual basis, energy sources, particularly the reactive hydrocarbons that participate in the regional smog formation process, are much less than the project-related vehicular sources.

Proposed Otay Rio Business Park uses will also add a variety of other small emissions to the total project contribution. These sources include:

- Petroleum product storage and dispensing (especially gasoline);
- Paints, thinners and solvents used in construction and maintenance;
- Asphalt and roofing tar emissions;
- Sand and gravel, aggregates and concrete for building materials;
- Utility equipment used in landscape maintenance;
- Increased business travel at area airports; and

TABLE 3-4

PROJECT-RELATED MICROSCALE AIR QUALITY IMPACT ANALYSIS

(CO Concentration in ppm at 25 feet from edge of each indicated roadway)

Hourly CO Concentrations, Standard = 20 ppm, Includes 7 ppm Background Level:

| Receptor Location: | Existing Traffic | Future No Proj. | Future With Proj. | Future With Sec.[1] |
|---|---|---|---|---|
| Otay Valley Rd/Heritage | 7.0 | 12.8 | 14.7 | 14.4 |
| Otay Valley Rd/"A" St. | 7.1 | 11.6 | 13.1 | 13.0 |
| Otay Valley Rd/"B" St. | 7.1 | 11.6 | 12.3 | 12.3 |
| Industrial Area Interior | 7.0 | 7.0 | 8.0 | 7.9 |
| Residential Area Interior | 7.0 | 7.0 | 7.2 | 7.2 |

8-Hour CO Concentrations, Standard = 9 ppm, Includes 3.9 ppm Background Level:

| Receptor Location: | Existing Traffic | Future No Proj. | Future With Proj. | Future With Sec. |
|---|---|---|---|---|
| Otay Valley Rd/Heritage | 3.9 | 6.8 | 7.8 | 7.6 |
| Otay Valley Rd/"A" St. | 4.0 | 6.2 | 7.0 | 6.9 |
| Otay Valley Rd/"B" St. | 4.0 | 6.2 | 6.6 | 6.6 |
| Industrial Area Interior | 3.9 | 3.9 | 4.4 | 4.4 |
| Residential Area Interior | 3.9 | 3.9 | 4.0 | 4.0 |

Source: CALINE3 Roadway Computer Model and SANDAG Alternative #5 Traffic.

[1]"With Sec" = With Project and Secondary Site Access.

Assumptions: Speed = 25 mph, Year = 1995, CO = 17.16 gram/mile

- o Industrial activity emissions up to the levels regulated by stationary source air pollution rules of the San Diego County APCD.

Most of these sources are too small to be easily quantified, even on a cumulative project basis, but they all are evidence of the fact that increased growth means increased air pollution from a variety of small sources.

## C. Mitigation

Because much of the project impact derives from transportation sources, there is only a limited potential for effective impact mitigation. The fact that the proposed project represents a higher than anticipated level of development places an extra burden on the project applicant to mitigate the impact of such an intensification as much as possible. In order to achieve any substantial transportation emissions reduction, all available Transporation Control Measures (TCMs) must be implemented where possible. The adoption of such TCMs may not eliminate the basic dependence on the single passenger automobile as the primary means of transportation, but their adoption recognizes the continuing need of both responsible agencies and project proponents to minimize transportation emissions impacts as much as possible consistent with the aims of the regional air quality plan.

In order to maximize the effectiveness of a collection of TCMs, a Transportation System Management (TSM) approach to reducing traffic and attendant air emissions is typically the optimum strategy for air quality impact mitigation. A TSM program can integrate a variety of tactics and coordinate the participation of not just one single project such as the Otay Rio Business Park, but of the entire Otay Mesa Community Plan area. The community plan elements and objectives of such a program should include the following:

| | | |
|---|---|---|
| Transit Alternatives | - | The preferred mitigation for project traffic impacts should be transit alternatives and not simply roadway improvements that encourage greater numbers of automobiles into the community. |
| Transit Accessibility | - | Bus stops or turnouts to be constructed along all major area roadways. |

| | | |
|---|---|---|
| Project Integration | - | Allow greater development density for those projects that demonstrate the greatest mode shift from low passenger automobiles to higher occupancy transit alternatives. |
| Transit Center | - | Develop a transit center within the community and structure transit routes to optimize transit center access and utilization. |
| Transit Loop | - | A transit loop and tram shuttle system should be developed within the community to link major trip generators and attractors. Development approvals should be contingent upon developer participation through land dedication or other development agreements, including possible financial participation. |
| Park-and-Ride | - | A park-and-ride facility should be developed near I-805. |

Implementation of these objectives will help to reduce the impact of transportation emissions sources, and therefore mitigate the air quality impacts of any potential SIP inconsistency. On an individual project basis such as the Otay Rio Business Park, the effectiveness of TSM participation is limited because the size of the participant pool, especially from the residential element, is limited. On the Community Plan level, however, such a program could play a significant role in off-setting some of the growth-related transportation air pollutant emissions. *The developer should participate in an area-wide TSM program, however, it is beyond the scope of this developer's responsibility to develop such a program, and at this time, the City does not have a TSM program. It is recommended that when such a program is developed, the Cities of Chula Vista and San Diego and the County, should participate jointly because of the close proximity of jurisdictional boundaries.*

## 3.6 NOISE

### A. Project Setting

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound or noise can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," written as dB(A).

Time variations in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called Leq), or, alternately, as a statistical description of what sound level is exceeded over some fraction (10, 50 or 90 percent - called L10, L50 and L90, respectively) of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). An interior CNEL of 45 dB(A) is mandated for multiple family dwellings, and is considered a desirable noise exposure for single family dwelling units as well. Since typical noise attenuation within residential structures with closed windows is about 20 dB, an exterior noise exposure of 65 dB CNEL is thus typically the design exterior noise exposure for new residential dwellings in California. Because commercial or industrial uses are not occupied on a 24-hour basis, the same exterior noise exposure standard generally does not apply for such less noise sensitive land uses.

These guidelines form the basis for the Noise Element of the City of Chula Vista's General Plan which suggests a desirable exterior noise exposure of 65 dB(A) for residential and other noise sensitive uses. The City's noise policy states as its first objective that every citizen has a right to live in an environment where noise is not detrimental to his or her life, health, and enjoyment of property. Within the policy's implementation provisions, there is a mandate for the City to consider the effects of noise, especially from transportation sources, in its land use decisions in order to realize the above objective.

Existing noise levels within the Otay Rio Business Park project area derive from both surface vehicular sources on Otay Valley Road as well as from aircraft activity at Brown Field. Occasional noise intrusions from recreational off-road vehicles on undeveloped mesa slopes, from industrial sources, and from agricultural activities may also occur. In order to characterize current noise levels in and around the planning area, a brief on-site noise survey was conducted on January 22, 1987. Hourly noise levels adjacent to Otay Valley Road were monitored using standard CalTrans roadway noise monitoring protocols. Monitoring was conducted using a B&K Model 2230 Sound Level Meter operating in the A-weighted Leq monitoring mode. Noise levels at the periphery of the proposed project were 56.1 dB, during average afternoon traffic conditions. This noise exposure is comprised of short periods of a typically rural noise environment around 40 dB(A) interspersed with frequent noise intrusions from various sources associated with the increasing urbanization of the eastern Chula Vista area. Specific noise events noted during a one-hour mid-afternoon observation period included the following:

- o Eight (8) helicopter overflights from Brown Field air traffic;
- o Numerous civil aviation aircraft takeoffs from Brown Field;
- o Several ORV motorcycles on the mesa southwest of the project site;
- o Gunshots from a person engaged in target practice;
- o Backup warning horns on quarry equipment at the rock plant;
- o High level jet climbout noise, probably from Lindbergh Field;
- o A farm tractor using Otay Valley Road at a moderate speed;
- o Two heavy wrecker trucks hauling cars to the Heritage wrecking yards;
- o Numerous smaller wreckers and wreck hauling flatbeds; and
- o One hundred thirty-two (132) passenger cars and small trucks.

Other major noise sources such as the nearby Otay Valley Skeet & Gun Club (across Otay Valley Road to the east), or the occasionally very loud Rohr jet engine test stand at Brown Field, were not in operation, or there would have been even more pronounced noise intrusions. Even cumulatively, all the above noise sources are still well within desirable noise exposure guidelines. The undesirable aspect of such sources, however, is that they are sporadically superimposed upon an otherwise very quiet background. Each intrusion, which often exceeds the background by 20-

30 dB, is thus immediately obvious to the small receptor population living near the project site. As traffic volumes on Otay Valley Road continue to grow, the cumulative noise exposure in the area will slowly increase. It may not, however, necessarily seem that much noisier because traffic sources are a more continuous and steady-state noise generator than the peaks and valleys now experienced. Many of the background noise sources now audible above the rural background may thus be masked by the gradual increase of roadway noise "hum."

The Otay Valley Road readings, in conjunction with concurrent traffic counts and speed checks, were used to calibrate the federal highway traffic noise prediction model (FHWA-RD-77-108) initialized with the latest California vehicle noise (Calveno) emissions data. The initial calibration run showed that ambient noise levels exceeded model predictions by 2.3 dB(A). The aircraft, guns, ORV cycles and other non-local traffic contributions thus added a substantial excess noise level to the local exposure. As long as such extraneous noise sources continue to be present in the Otay Valley, then they will create an additional noise penalty to future local noise exposure from traffic and other development-related noise emissions sources. Since Brown Field activities are responsible for much of the observed excess, continued encroachment by noise sensitive uses such as residential development into what is now mainly an open space buffer may create future land use conflicts due to noise. As observed in the current site noise characterization, the cumulative effect of airport activity noise sources at the project site is not significant (a 2.3 dB "excess" noise difference is barely perceptible within the range of normal hearing), but it is the single-event intrusive nature of one source like a helicopter briefly overflying a neighborhood that may increase the probability of future conflicts and noise complaints as residential development moves closer to Brown Field.

## B. Impacts

Two characteristic noise sources are typically identified with urbanizing development. Construction activities, especially heavy equipment, will create short-term noise increases near the project site. Upon completion, vehicular traffic on streets within the surrounding community may create a higher noise exposure to area residents beyond the noise levels currently experienced.

### 1. Construction-related Impacts

Temporary construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated initially by large earth-moving sources, then by foundation and roadway construction, and finally by finish construction. The earth-moving sources are the noisiest, with equipment noise ranging from 73 to 95 dB(A) at 50 feet from the source. Point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance. The quieter noise sources will thus drop to a 65 dB exterior/45 dB interior noise level by about 200 feet from the source while the loudest will require 5 distance doublings (to 1,600 feet from the source) to reduce the 95 dB(A) source strength to an acceptable 65 dB(A) exterior exposure level. Construction noise sources are not strictly relatable to a noise standard because they occur only during selected times and the source strength varies sharply with time, but it does point out the advisability of maintaining a suitable distance buffer or erecting a temporary noise barrier between the loudest noise sources and nearby occupied dwellings during certain construction activities. The penalty associated with noise disturbance during quiet hours and the nuisance factor accompanying such disturbance usually leads to time limits on construction activities imposed as conditions on construction and use permits. The hours from 7 AM to 7 PM are typically the allowed times for construction activities if there are occupied dwellings within a reasonable exposure zone surrounding the construction site.

Materials handling and small stationery noise sources have lower initial noise levels, and their corresponding noise impact zones during later phases of construction are therefore much smaller.

### 2. Long Term Vehicular Noise Impacts

Long term noise concerns from the increased urbanization of the project area center primarily on mobile sources on the major roadways surrounding the project site. These concerns were addressed using the FHWA Model in the same manner as the existing noise environmental characterization. The model calculates the Leq noise level for a particular reference set of input conditions, and then makes a series of adjustments for site-specific traffic volumes, distances, speeds, or noise barriers.

Table 3-5 summarizes the calculated CNEL at 50 feet from the roadway centerline for four traffic scenarios with and without Otay Rio Business Park secondary access. The Table also shows the corresponding distance from the centerline to the 65 CNEL for each scenario. By way of reference, a 1 dB increase in noise level is considered a marginally perceptible increase under very quiet conditions while a 2 to 3 dB increase becomes noticeable when the sound is superimposed upon typical interior noise levels in a house. Any increase above 5 dB is immediately perceptible.

Along Otay Valley Road between the project and I-805, a significant noise impact will occur because of the substantial traffic increase associated with the proposed project. Near I-805, the noise level due to project traffic increases by 3+ dB, and becomes a 10+ dB increase close to the Otay Rio Business Park project site. The 70 CNEL contour expands by 50 feet from project-related traffic noise sources. The noise increase if the project site were built out to the existing General Plan designation would be much less, but would still be in excess of the 5 dB significance threshold close to the project site. Secondary access has little effect on noise distributions with only a minor increase along Palm and a small decrease along Otay Valley Road if secondary access is constructed. The data in Table 3-5 also show that the traffic from the proposed project (and its associated noise generation), is only a small part of the overall cumulative growth of southeastern Chula Vista. The proposed business park will create an expansion of acceptable noise exposure levels out to 80-120 feet from the roadway centerline. With nominal noise control measures such as perimeter block walls near any potential residential development along Otay Valley Road, the City's exterior noise standard can be easily met. For future cumulative growth, however, the 65 CNEL for the unabated case extends from 165-185 feet from the roadway. Such an expansion will require somewhat more aggressive noise control measures (higher walls or berms) if noise sensitive land uses, such as residential uses, are developed within the roadway noise impact zone.

*Though City staff is not recommending residential at this time,* residential areas within the project site itself, by virtue of their considerable distance from nearby major traffic sources, will be little affected by roadway traffic noise. These areas will be far more sensitive to single-event phenomena such as Brown Field aircraft and helicopter overflights which will disturb the normally quiet noise environment.

## TABLE 3-5

## OTAY RIO BUSINESS PARK TRAFFIC NOISE CALCULATIONS

**(CNEL Levels at 50 feet from Indicated Roadway, and Distance from Roadway Centerline to Various CNEL Levels)**

| Roadway Location: | Existing Traffic | Future No Proj. | Future With Proj. | Future With Sec.[1] |
|---|---|---|---|---|
| Otay Valley Rd/Heritage North of "A" St. | 58.9 | 74.1 | 75.5 | 75.3 |
| Otay Valley Road/Heritage Betw. "A" & "B" Sts. | 58.9 | 74.1 | 75.0 | 74.9 |
| Otay Valley Road South of "B" St. | 58.9 | 74.1 | 74.2 | 74.2 |
| Industrial Area "A" St. near OVR | --- | --- | 65.0 | 64.8 |
| Residential Area "H" St. near Lot 131 | --- | --- | 57.1 | 56.8 |
| **Distance to 65 CNEL Contour:** | | | | |
| OVR North of "A" | <50 ft. | 135 ft. | 168 ft. | 163 ft. |
| OVR Betw. "A" & "B" | <50 ft. | 135 ft. | 155 ft. | 153 ft. |
| OVR South of "B" | <50 ft. | 135 ft. | 138 ft. | 138 ft. |
| "A" St. near OVR | --- | --- | <50 ft. | <50 ft. |
| "H" St. near Lot 131 | --- | --- | <50 ft. | <50 ft. |
| **Distance to 60 CNEL Contour:** | | | | |
| OVR North of "A" | <50 ft. | 213 ft. | 266 ft. | 259 ft. |
| OVR Betw. "A" & "B" | <50 ft. | 213 ft. | 246 ft. | 242 ft. |
| OVR South of "B" | <50 ft. | 213 ft. | 219 ft. | 219 ft. |
| "A" St. near OVR | --- | --- | 72 ft. | 71 ft. |
| "H" St. near Lot 131 | --- | --- | <50 ft. | <50 ft. |
| **Distance to 55 CNEL Contour:** | | | | |
| OVR North of "A" | 89 ft. | 338 ft. | 421 ft. | 410 ft. |
| OVR Betw. "A" & "B" | 89 ft. | 338 ft. | 390 ft. | 384 ft. |
| OVR South of "B" | 89 ft. | 338 ft. | 348 ft. | 347 ft. |
| "A" St. near OVR | --- | --- | 115 ft. | 111 ft. |
| "H" St. near Lot 131 | --- | --- | 68 ft. | 65 ft. |

Source: FHWA Traffic Noise Impact Model Adjusted for Structural Screening and Roadway Curvature (Line-of-Sight Adjustment)

[1] "With Sec" = With Project and Secondary Site Access.

Even though the integrated noise exposure from these single events is well within acceptable limits, the perception among residents will be one of undesirable noise intrusion. Noise conflicts will obviously not be unique to the residential component of this project, but will occur with all residential development in eastern Chula Vista and surrounding areas. Some of those inevitable noise problems may be minimized, however, if flight paths, particularly for helicopters, are coordinated between responsible agencies and the City before extensive development occurs rather than later in response to complaints and conflicts.

Industrial uses are proposed along Otay Valley Road where noise levels from traffic would be highest. Whereas 65 CNEL is the acceptable limit for residential uses, 70 CNEL is the acceptable limit (Noise Ordinance) for industrial development. The 70 CNEL contour occurs approximately 100 feet from the Otay Valley Road centerline. Beyond that distance, noise impacts would occur, and measures to reduce noise would be necessary.

C. Mitigation

Noise mitigation design features that should be considered to reduce noise increases above 70 dB CNEL include:

- o Build a six-foot high wall/berm along the perimeter of the site along Otay Valley Road. Six feet total height of any berm/wall in areas of flat terrain will generally reduce ground level roadway noise exposure by 10 dB such that any ground-story receptors on parcels backing up to the roadway behind such a shield will be exposed to ambient noise levels below the desired 70 dB cut-off.

- o Locate taller structures close to the roadway to create a substantial "sound shadow" behind such buildings, and thus shield other on-site receptors on the parcel farther from the roadway centerline.

- o Locate developments with outdoor storage yard requirements with the yards backing up to Otay Village/Heritage and having the office close to "G" Street to use the storage yard as a noise spreading distance buffer.

The implementation of these mitigation measures can be further enhanced by site planning decisions that optimize the noise attenuation capabilities of any physical noise mitigation measures.

*The developer will be required as a condition on the Tentative Subdivision Map to place a six-foot high wall or berm on the east side of lots 11 through 18 and lot 80 to reduce the noise impacts to an acceptable level.*

*Also, although City staff is not recommending residential at this time, prospective tenants and homeowners should be notified by the developer of the proximity of Brown Field and its existing and future potential noise impacts. Implementation of this notification could be achieved as a Condition of Approval on the project.*

D. Analysis of Significance

Noise level increases of more than 10 dB CNEL and a substantial expansion of the 65 CNEL contour (the City of Chula Vista exterior noise exposure standard for residential uses) along Otay Valley Road north of the project site would constitute a significant noise impact to residential uses. Also, increases above the 70 CNEL contour along the proposed industrial uses on Otay Valley Road (beyond 100 feet from the centerline) would constitute a significant noise impact. Development according to the existing General Plan designation for the project site will also create a perceptible traffic noise level increase along Otay Valley Road, but less so than for the proposed project. The project-related noise increase is part of an overall traffic noise increase associated with cumulative growth of southeastern Chula Vista. Mitigation measures and development planning for minimizing noise exposure can be implemented to abate any significant or adverse project-related noise impacts.

## 3.7 BIOLOGY

The Biological Report, included as Appendix B, and survey were performed by Pacific Southwest Biological Services (PSBS). Both the botanical and zoological portions of the survey were performed in late November, 1986. The property, with the exception of the agricultural fields, was surveyed on foot. A checklist of plant taxa observed is included in the Appendix, and sensitive plants observed and vegetation communities are shown on Figure 3-7. Wetlands were mapped using the U.S. Fish and Wildlife Service wetlands plants list as a guide.

The following section is a condensed version of the report.

A. Project Setting

1. Botany

a. Vegetation

Four major vegetation communities are present on the project site. These include Riparian Woodland, Freshwater Marsh, Disturbed Inland Sage Scrub, and Fallow Agricultural Fields. A small Eucalyptus grove is present in the northwestern portion of the site and represents a very minor vegetation community (Figure 3-7).

Riparian Woodland. Riparian Woodland is found in two locations on the site. In the northwestern corner of the property, Riparian Woodland supported by the Otay River occurs over 2.6 acres. The woodland in this wetland area is dominated by willows (Salix sp.). Additional understory species such as Mulefat (Baccharis glutinosa). Leafy Burrobush (Hymenoclea monogyra), Elderberry (Sambucus mexicana), and Goldenbush (Isocoma veneta) are common.

Within the wetland, on an island, upland species such as Broom Baccharis (Baccharis sarothroides) and California Sagebrush (Artemisia californica) occur, illustrating the ecotonal (transitional) nature of the wetland.

The second area in which Riparian Woodland occurs is in a small side canyon behind a man-made earthen dam. This site is highly disturbed and is dominated by the early successional plant Mulefat (Baccharis glutinosa), and the non-native, invasive Tamarisk (Tamarix sp.). The wetland acreage at this site is 0.1 acres.

Freshwater Marsh. Freshwater Marsh occurs within the Riparian Woodland in the northwest corner of the property. This marsh occupies 2.0 acres and is typified by open water and emergent vegetation such as Bulrush (Scirpus americanus) and

# OTAY RIO BUSINESS PARK

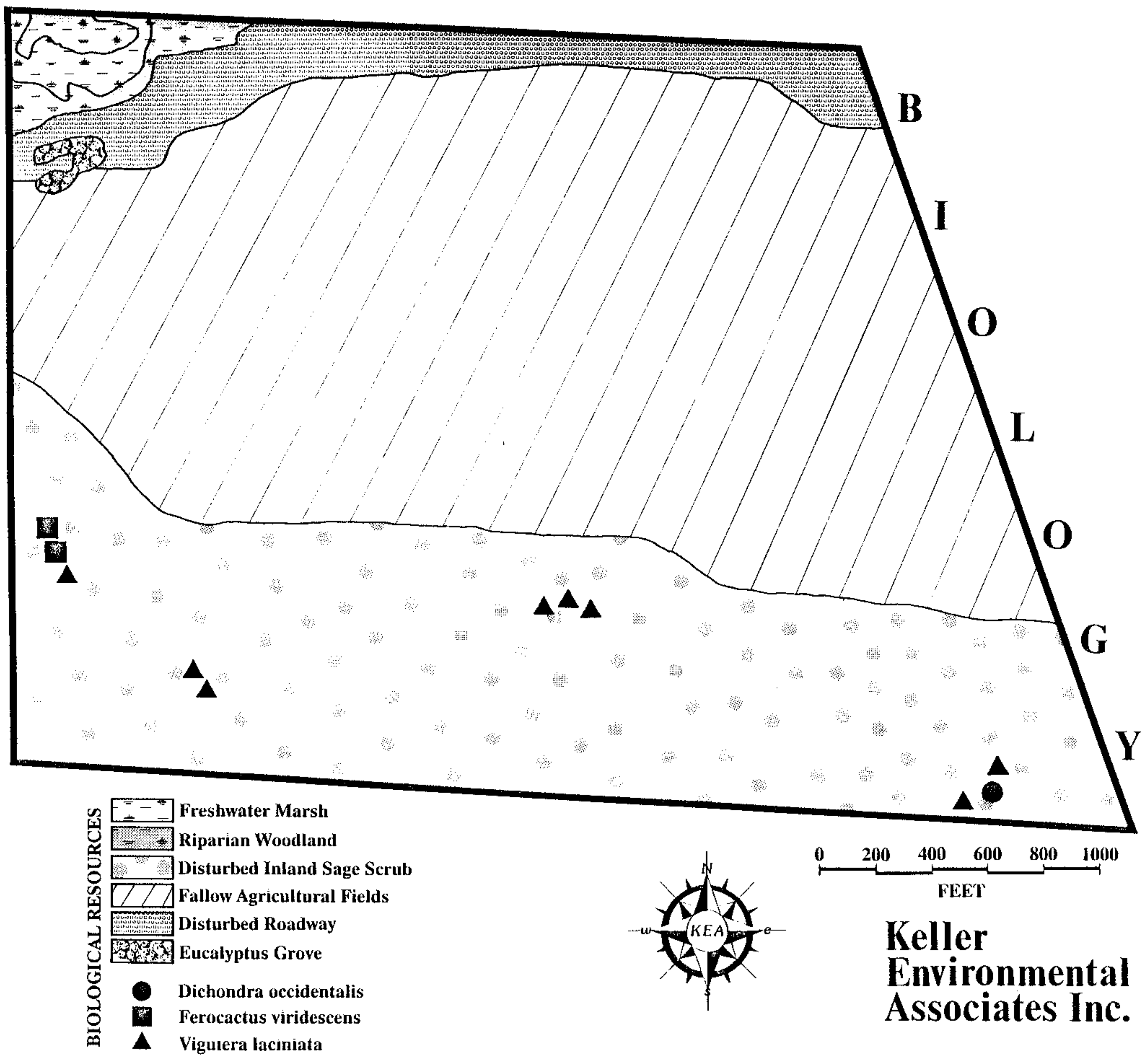



Figure 3-7

Cattails (Typha domingensis). This area is, by all indications, an intact habitat with a wide diversity of wildlife resources.

Disturbed Inland Sage Scrub. This community occurs throughout the southern portion of the project site. Use of this area by off-road vehicles has all but eliminated native vegetation on flat areas and drastically reduced the presence of vegetation on steeper slopes. Native plants indicative of this community are Flat-top Buckwheat (Eriogonum fasciculatum), California Sagebrush (Artemisis californica), and Lemonade Berry (Rhus integrifolia), Jojoba (Simmondsia chinensis), Toyon (Heteromeles arbutifolia), Bladderpod (Cleome isomeris), California Encelia (Encelia californica), Mohave Yucca (Yucca schidigera), and San Diego Sunflower (Viguiera laciniata). Due to the highly disturbed condition of the community, numerous non-native species have invaded and large areas are dominated by these annual grasses.

Fallow Agricultural Fields. Fallow Agricultural Fields dominate the gently sloping, northern portion of the property. These areas are dominated by mustards (Brassica spp.), Russian Thistle (Salsola salina), and remnant crop plants including Tomato (Lycopersicon sp.), Fava Bean (Vicia faba), and Cucumber (Cucumis sativus).

Eucalyptus Grove. The Eucalyptus grove on the site is comprised of Eucalyptus globulus and has little understory vegetation.

b. Flora

Seventy-two plant taxa were observed on the property. Of these, 27 were non-native taxa representing both invasive and cultivated plants. Due to the unseasonal timing of the survey, many of the annual and some perennial plants were not identifiable. It is, therefore, estimated that the plant checklist compiled represents approximately 60 percent of the plants present on the site. Sensitive plants are discussed in the Sensitive Biological Resources section of this report.

The site flora lacks several of the expected Mexican floral element due to off-road vehicle disturbance and the lack of south-facing slopes. This element, however, is represented on-site by San Diego Sunflower (Viguiera laciniata), Leafy Burrobush

(Hymenoclea monogyra), Coast Barrel Cactus (Ferocactus viridescens), Jojoba (Simmondsia chinensis), and Fish-hook cactus (Mammillaria dioica).

2. Zoology

a. General Wildlife Habitat

Two major habitats occur on the property. The first corresponds to the wetlands delineated in the northwestern corner of the site. This includes the Freshwater Marsh and the larger of the two Riparian Woodlands previously described. The second wildlife habitat present is a much less significant, though larger, area occupying the remainder of the property.

The wetland habitat is characterized by such wildlife as Raccoon (Procyon lotor), Opossum (Didelphis virginiana), American Coot (Fulica americana), Red-winged Blackbird (Agelaius pheniceus), Common Yellowthroat (Geothlypis trichas), and American Goldfinch (Carduelis tristis). While it is unlikely that the home ranges of many animals occur exclusively on the property, adjacent habitats along Otay River serve to enhance and expand the utility of this area. Such features as thick cattails and an island protect much of this habitat from disturbance by residents, illegal aliens, and domestic animals. However, there has been major dumping of trash and debris along roadways that transect the wetland.

Within the eastern portion of the wetland are numerous upland plants which are characteristic of sage scrub communities. These plants, while not dominant, have allowed for increased wildlife diversity in the area. Such birds are Wrentits (Chamaea fasciata), Brown Towhees (Pipilo fuscus), and Scrub Jays (Aphelocoma coerulescens) which would normally not be found in wetlands occur in this ecotonal community.

Throughout the remainder of the property, the wildlife habitat is best characterized as disturbed. Although topographic features vary significantly, and different remnant plant communities are present in different areas, the continued use of the southern portion of the site by off-road vehicles and the fallow agricultural fields to the north favor very similar animal uses. Disturbance-associated birds such as European Starlings (Sturnus vulgaris), House Finches (Carpodacus mexicanus), and

Mourning Doves (Zenaida macroura) typify the area. Disturbance-associated mammals such as Botta's Pocket Gopher (Thomomys bottae), California Ground Squirrel (Spermophilus beecheyi), and Desert Cottontails (Sylvilagus audubonii) are also common and help support a large regional raptor population.

b. Fish

Mosquito Fish (Gambusia affinis) were observed to occur in the Freshwater Marsh on the property. No other fish are expected to occur on the site.

c. Amphibians

Numerous amphibians are expected to occur within the northern wetland on the site. These include the Western Toad (Bufo boreas), Garden Slender Salamander (Batrachoseps pacificus major), and the Bullfrog (Rana catesbeiana). The only amphibian detected during the present survey was the Pacific Treefrog (Hyla regilla). No sensitive amphibians are expected to occur on the subject property.

d. Reptiles

Western Fence Lizard (Sceloporus occidentalis) and Gopher Snake (Pituophis melanoleucus) were detected on the property. Additional species expected to occur on the site include Western Rattlesnake (Crotalus viridis), Red Diamond Rattlesnake (Crotalus ruber), Western Aquatic Garter Snake (Thamnophis couchi hammondi), San Diego Horned Lizard (Phrynosoma coronatum blainvillei), and Western Whiptail (Cnemidophorus hyperythrus). Sensitive species expected to occur on the property are discussed in the Sensitive Biological Resources section of this report.

e. Birds

Thirty-five avian species were observed on the property. Included in these observations were five species of raptors common to the Otay Mesa/Otay River Valley area. No raptor nests were observed, and due to the high level of disturbance on-site, it is unlikely that any nesting occurs.

The highest diversity and the largest concentration of individual birds was found in the wetland associated with the Otay River. As previously described, the habitat in this area is such that wetland and upland species co-occur.

Several sensitive birds were observed or are expected to occasionally visit the property and are discussed in the Sensitive Biological Resources section of this report.

f. Mammals

Eight mammalian species were detected on the property and include Virginia Opossum, Desert Cottontail, California Ground Squirrel, Botta's Pocket Gopher, Woodrat, House Mouse, Coyote, and Long-tailed Weasel. All of these species are common to the area. Species expected to occur on the site as transients include Gray Fox (Urocyon cinereoargenteus) and Bobcat (Lynx rufus). Sensitive species will be discussed in the following section.

3. Sensitive Biological Resources

a. Sensitive Vegetation

Riparian Woodland has been seriously depleted in Southern California as a result of development, flood control projects, and agriculture. Because of its association with more extensive adjacent wetland areas, local wildlife is highly dependent upon the 2.6 acres of Riparian Woodland present in the northwest portion of the site even though they are not of the highest quality. Loss of any such wetland should be considered a biologically significant impact.

The isolated, minor Riparian Woodland in the side canyon, without dense cover of association with other wetlands, is of lower biological significance.

b. Sensitive Flora Expected But Not Encountered

A concentrated effort was made to locate sensitive plants known to occur in the area. The following list outlines those sensitive plants known from the area, and likely to occur, but not observed during the survey. The three numbers following the name indicate the rating of sensitivity applied to that species; it is based on the California Native Plants Society RED Code. The maximum sensitivity level for each category is 3. The first category (first number) indicates the rarity of the species; the second category indicates the degree the species would be endangered by the proposed development; and the third category indicates the distribution of the species (concentrated at this site only, or found in other areas as well).

Cordylanthus orcuttianus; Orcutt's Bird's-Beak; 3-3-2

Known from downstream area and and north of project site. Although suitable habitat does appear to exist, no plants were located on-site. Dried remains would have been readily identifiable had the plant been present.

Hemizonia conjugens; Otay Tarplant; 3-3-1

Known from areas north of the project site. Dead remains are not taxonomically separable from other Hemizonia sp. It is, therefore, possible that this species is present on the clay soils in the southern portion of the property.

Dudleya variegata; Variegated Dudleya; 1-2-2

Occasional on clay mesas and slopes from La Jolla Canyon south to Otay Mesa. The soils and seasonally wet regions of the north-facing slopes may have some remnant stands of this plant. It would be difficult to verify its absence on the site due to the timing of the survey.

Muilla clevelandii; Cleveland's Golden Star; 2-2-2

This was a frequent plant on clay soils and especially mesas in San Diego County. Disturbance and the late-season timing of the survey make it unlikely to have been observed. If present, its perennial bulbs may have persisted due to the recent nature of the disturbance.

Iva haysiana; San Diego Marsh Elder; 2-2-1

Iva haysiana is associated with wetlands and is known in many of the watercourses in the local area. It occurs near the site in the Otay River Valley, although the small size and disturbance around the wetlands of the site may preclude its presence. It would have been visible and evident at the time of the survey had it been present.

Artemisia palmeri; San Diego Sagewort; 1-1-1

This wetland plant is known from many of the wetlands in southern San Diego County. The small size and minimal development of Riparian Woodland may preclude the presence of this plant's habitat on-site. It is visible and evident at all times of the year.

Stipa diegoensis; San Diego County Needle Grass; 3-1-1

This bunchgrass is known from several sites in the Otay Mesa area. It would be expected on the north-facing clay slopes of the project, if most suitable habitat sites had not been destroyed by disturbance. The tall spikes and early leaf growth should have been evident at the time of the survey had it been present.

The following locally-occurring sensitive plant taxa are mostly restricted to dry south-facing slopes. Their potential presence on-site is low considering the aspect of slopes on-site. Disturbance may well have eliminated any relictual stands of such taxa on eastern or western exposures.

Ambrosia chenopodiifolia
Bergerocactus emoryi
Euphorbia misera
Opuntia parryi var. serpentina
Selaginella cinerascens

### c. Sensitive Plants Observed

Three plant taxa currently considered sensitive were located on the project site. These are Dichondra occidentalis, Ferocactus viridescens, and Viguiera laciniata (see Figure 3-7).

Dichondra occidentalis; Western Ponyfoot; 1-2-1

Dichondra occidentalis is considered sensitive due to its limited local distribution, although it has a relatively wide range in California. Overall, loss of the Inland Sage Scrub plant community in which this plant occurs is the most significant threat to this plant.

Western Ponyfoot occurs at two locations on the site and was probably seriously depleted by off-road vehicle traffic.

Ferocactus viridescens; San Diego Barrel Cactus; 1-3-1

Ferocactus viridescens is considered sensitive because of its limited distribution and the current threat to the species by development. There were 100+ individuals in the population occurring on-site.

The San Diego Barrel Cactus is limited to the top of a small knoll located on the western edge of the property. Other areas of apparently suitable habitat on-site have been highly disturbed by off-road vehicle activities.

Viguiera laciniata; San Diego Sunflower; 1-2-1

The San Diego Sunflower is limited to San Diego County where it is mostly found south of Mission Valley. It is occasionally a dominant element of the vegetation and is not seriously threatened with extinction at present.

The San Diego Sunflower is an occasional component of the few intact portions of the Inland Sage Scrub community. It occurs throughout the southern portions of the property, although not as a dominant plant or over extensive areas.

d. <u>Wildlife</u>

Sensitive wildlife known or expected to occur on the subject property are discussed in the Appendix and includes the sensitivity status, listing agencies or groups, status or expected status of the animal on the project site, and the anticipated impacts of the project on the organisms.

Three of these species in particular warrant additional consideration.

<u>Polioptila melanura californica</u>; California Black-tailed Gnatcatchers

These small, sensitive birds are residents of the rapidly disappearing plant community, Inland Sage Scrub. Because of the known presence of these birds in the immediate vicinity of the site, a special effort was made to locate individuals during the field investigation. However, none were observed.

Due to the highly disturbed nature and continued disturbance of Inland Sage Scrub by off-road vehicles on the site, it is unlikely that these birds will ever occupy this site if left in the current condition and allowing off-road vehicle use.

<u>Vireo bellii pusillus</u>; Least Bell's Vireo

This small, nondescript bird inhabits Riparian Woodlands and has recently been placed on the federally endangered list. While it is not, as yet, known in the vicinity of the project site, some suitable habitat is known within the Otay River Valley. This species is a migrant and would not be expected to be present at the time of the field investigation.

A general habitat overview of the on-site riparian areas suggests that it is very unlikely that this species would be present at anytime during the year. While this species favors dense willow-dominated areas with a large range in canopy age classes, the mulefat and willows that are present are generally found in small clusters of similar age.

Phrynosoma coronatum blainvillei; San Diego Horned Lizard

The open nature of the Inland Sage Scrub on the site favors this sensitive lizard and it is very likely that it is present in small numbers. Unfortunately, due to the lizard's habit of basking along trails, and its slow movement, it is likely that off-road vehicles keep the numbers of this species extremely low.

B. Impacts

The project as proposed would eliminate .92 acres of Riparian Woodland, characterized by Mulefat and facultative indicator species. It would also eliminate approximately 85 acres of highly disturbed Inland Sage Scrub, and approximately 110 acres of Fallow Agricultural Fields.

Development of the property would also cause incremental loss of raptor foraging land, and an incremental loss of the sensitive plants Ferocactus, Dichondra, and Viguiera laciniata.

No additional biological impacts are considered substantial enough to warrant discussion.

C. Mitigation

*Though no impacts are considered significant, the following measures would ensure the long-term viability of the biological resources.*

1. ~~The street drain outlet shown on the tentative map as draining into the pond area should be relocated so that runoff is released outside ponded areas. This drain should be designed to prevent minor drainage from the parking lot and the road from entering the pond. Only storm runoff, which would serve to flush the pond, should be allowed to drain through the pond.~~ *(The Tentative Map has been revised to relocate this drain so that runoff is released outside the ponded areas).*

2. Slopes adjacent to native habitats should be stabilized with native vegetation. Northern fill slopes in Lot 2 should be moved southward to avoid wetland

vegetation. The open space park should be vegetated with native plant species including trees such as Sycamore and Cottonwood. Native vegetation currently growing in the proposed open space should be left intact.

3. A 20- to 25-foot buffer surrounding the natural riparian area would be sufficient to protect that area from use associated with the future Business Park activities. The buffer should be heavily landscaped with Riparian vegetation.

4. One hundred or more mature Coast Barrel Cacti are referred to in the text. The area where they are found should not be graded prior to efforts to salvage and transplant them to a suitable site. Adjacent or nearby preserved open spaces with Inland Sage Scrub vegetation or revegetation sites are available for such transplants.

*These measures will be implemented as Conditions of Approval on the Tentative Subdivision Map.*

D. Analysis of Significance

The proposed development would eliminate .92 acres of Riparian Woodland, which is within the acceptable 1.0 acre allowed by federal agencies. Incremental losses to raptor foraging land and 3 sensitive plants would also occur from development. Suggested mitigation measures include relocating the street drain outlet in the pond area, planting with native vegetation, including a 20- to 25-foot buffer around the natural Riparian area, and transplanting one of the sensitive plant species, the Coast Barrel Cacti. Otherwise, no mitigation is necessary, and no significant impacts are expected.

## 3.8 ARCHAEOLOGY/HISTORY/PALEONTOLOGY

### A. Project Setting

#### 1. Archaeology/History

The Archaeology/History survey report, conducted by Brian F. Smith and Associates, is included in its entirety as Appendix C. The archaeological site located during the work described has been recorded as SDi-10783 at the State Clearinghouse for San Diego County and as W-3861 at the San Diego Museum of Man. The following section summarizes the report.

##### a. Archaeological Resources

As part of the evaluation of the resources located within the Otay Rio Business Park project, archaeological site files record searches were conducted at the San Diego Museum of Man and San Diego State University. The searches indicated that several cultural resources were present in the near vicinity of the project area and approximately 40 sites had been recorded within a one-mile radius of the project site. The absence of pottery (prehistoric ceramics), time-sensitive artifacts (such as small, triangular projectile points of the Kumeyaay Indians), and late period dates from any of the 40 sites located near the project suggest that these sites are attributable chronologically to the La Jolla Complex period of occupation, dating to between 6,000 and 3,000 years before the present. Artifacts associated exclusively with the earlier San Dieguito Complex are also absent.

The sites located in the vicinity of the project are unusually similar in characteristics. Nearly all of them consist of dispersed scatters of well-made scrapers, choppers, cores, and associated flakes. Very few projectile points or other bifaces have been reported. Occasionally, the scatters are more dense and are associated with midden deposits, reflecting greater intensity of use (i.e., greater numbers of people and/or greater duration). The continuity of the settlement/subsistence pattern represented by the sites suggests that the general project area, and perhaps a much larger one throughout the Otay region, was particularly rich in food resources. The sparsity of shell and bone further suggests that the area was a focus of vegetative food collecting.

Since plant products such as roots, berries, seeds, and greens would not necessarily have been concentrated in one area, the collection of such food resources would have required a wide-ranging foraging subsistence pattern. Most such patterns which have previously been studied in San Diego County have typically included numerous small sites located in various ecological niches that were temporarily occupied while the occupants collected the resources from the areas immediately adjacent to the sites. In a process of seasonal rounds, several sites would have been visited by small groups who would periodically join other clan members as food and water needs and customs dictated. At Otay Valley and Otay Mesa, the pattern of large, shallow, widely dispersed sites does not conform to the previously mentioned pattern (small, scattered sites for food collection) which is dominant elsewhere in the County. Thus, the environmental factors within Otay Valley/Otay Mesa apparently permitted modification of the basic subsistence pattern in order to exploit food resources which were particular to the area.

A study of coastal and inland sites of the La Jolla Complex throughout San Diego County was recently completed as part of a data recovery program at site SDi-5594 in San Dieguito Valley. This extensive study combined oxygen isotopic profiles of shells from coastal and inland sites to demonstrate that sites dated by radiocarbon analysis to the period of the La Jolla Complex had been seasonally occupied. Sites on the coast were primarily summer/fall occupation areas where shellfish/marine resources were capable of supporting large populations when plant resources inland had diminished. Inland sites were found to be occupied during the winter and spring seasons, when the growing season produced large quantities of plant foods (Smith 1987: 220-230; Binford 1980: 13). Comparing data from this regional study to the Otay region, and particularly SDi-10783 at the Otay Rio Business Park, the subsistence pattern in the project area is projected as being a late winter/spring occupation. This time setting and the wide-spread artifact scatters point to a seasonal (i.e., spring) foraging subsistence strategy.

b. Historical Resources

Within project boundaries, two houses and various related outbuildings are considered to be potentially historically significant. The first is situated in the northwestern corner of the project, along the river terrace, and consists of a small, square house and tool shed along with various later additions, such as packing sheds. The second structure is located near the eastern property boundary, at the base of the steep slopes which lead to Otay Mesa. This second structure is a well-preserved farmhouse and garage.

The structure situated along the river terrace in the northwest corner of the property is a redwood bungalow. In general, redwood bungalows are an architectural artifact from the period between 1880 and 1900. The primary attributes of the redwood bungalow style are the simplicity of design and the redwood used. The design was based upon four corner studs which support the roof and walls. Interior walls were non-structural or non-weight bearing, and therefore could be placed in any desired orientation. The floor supports are set on concrete blocks or piles. The exterior walls consist of a series of 1x12-inch redwood boards set vertically. At the seams of the boards, 2-1/2 x 2-1/2-inch slats were nailed to seal the cracks against the weather. The roof was set at a low angle, virtually eliminating any attic space. Redwood was used throughout the house except for the flooring, since it was the most readily available and cheapest wood source during the late 1800s and early 1900s.

The bungalow and out-buildings show evidence of heavy use during the past century. The farmhouse is presently occupied by a leaseholder, Mr. Dewayne Hafen. The home has undergone some modification, but generally is unchanged as to structure except on the south side. The structure measures 29 feet by 28 feet, and each side originally had two windows. The interior was divided into four rooms of equal size. A doorway in the center of each of the four interior walls facilitated movement from one room to the next. A diagram of the floor plan has been provided on page 63 of Appendix C. Photographs of the structure are provided on pages 65A and 65B of the same Appendix. Both the exterior and interior of the structure are in very poor condition. A septic tank was installed with outfall directly into the floodplain rather than leach lines. At present, the septic tank is inoperable, and effluent flows above ground westward from the house to a ravine.

The second farmhouse mentioned above is a slat board-type of wooden structure that represented the most numerous type of house built in the early 1900s. This type of structure took the place of the redwood bungalow as the primary house of affordability in the region. Historical analysis has confirmed that the structure was built after 1929, and, since it is younger than 60 years, is not of serious historical interest. Nevertheless, it is a fine example of the slat board style.

### 2. Paleontology

The Paleontology survey report, conducted by Thomas A. Demere of PaleoServices, is included in its entirety as Appendix D. This section is a condensed version of the report.

The distribution of paleontological resources (fossils) in an area is directly related to the distribution of the geologic layers within which the fossils are buried. River and lake deposits exist on the site from the Sweetwater, Otay, and San Diego formations which all exist in the project vicinity.

Museum locality records do not document any known fossil localities within the project site and none were found during the field walkover. It is important, however, to point out that many fossil sites presently on record in San Diego have been discovered only during residential development (grading) activities or during highway and freeway construction projects. This close correlation between fossil sites and construction is due to the fact that surface weathering quickly destroys most fossil materials. It is not until fresh unweathered exposures are made by grading that well-preserved fossils can often be recovered. Also because of the amount of grading proposed for some sites, odds are increased that this grading will unearth fossils.

In addition to this, knowing the past fossil potential of a particular geological "layer" in one area is a reliable method for determining the resource potential of that "layer" in other unexplored areas.

The Otay Formation at Eastlake (near Southwestern Junior College) has recently been shown (Demere 1986) to contain significant paleontological resources including well-preserved remains of fossil land vertebrates such as lizards, turtles, birds, hedgehogs, rabbits, rodents, carnivores, camels, mouse-deer, and oreodonts (extinct pig-like grazing animals). Together these previously reported fossil occurrences point to the high paleontological resource potential of the Otay Formation.

The San Diego Formation has been known for a long time to possess a high paleontological resource potential (Domning and Demere, 1984) and has produced large and well-preserved assemblages of fossil marine vertebrates including sharks, rays, bony fish, sea birds, fur seals, walrus', dolphins, baleen whales, and sea cows. Demere (1984) reported on the occurrence of fossiliferous exposures of the San Diego Formation at two sites within 1.5 miles of the project site (NW 1/4 of Sec. 31, T. 18 S., R. 1 W.). One of these sites (San Diego Society of Natural History Locality 3076) has produced remains of shark, ray, bony fish, albatross, fur seal, dolphin, and baleen whale.

The Sweetwater Formation is sparsely fossiliferous and has produced only a few rare remains of fossil land mammals. Because of this low fossil productivity, the Sweetwater Formation is considered to possess a low to moderate paleontological resource potential.

## B. Impacts

### 1. Archaeology/History

#### a. Archaeological Resources

The initial archaeological survey of the Otay Rio Business Park project area indicated that nearly half of the project site had some artifactual coverage. As detailed collection and mapping were carried out, five loci (artifact concentrations) and intervening lighter density areas became apparent, scattered over approximately 75 acres. While each locus exhibited individual characteristics (variations in artifact densities, artifact types, and topographical characteristics), they all conformed to a pattern of dispersed scatters, with the artifact typology consistently including well-made scrapers, utilized/retouched flakes, and milling tools.

All artifacts located as a result of the project survey were collected for analysis. Artifacts recovered during the surface collection program totaled 1,094 specimens. This total was less than that originally expected, based on the number of artifacts observed during the survey of the property. In the month intervening between the survey and the surface collection program, however, substantial amounts of rain had fallen, accompanied by fairly warm temperatures. A great deal of plant growth resulted, which effectively obscured the ground surface. The dominant ground cover consisted of wild stinging nettle, which completely blanketed some areas. This situation required that the fields be superficially disked, which was not considered to be a further disturbance of the site as the area had been plowed for at least 100 years. A drawback to the use of disking is the fact that small flakes which are ordinarily exposed by wind and rain are simply not easily seen in the freshly plowed earth. Thus, the number of tools (made more visible by the plowing) probably increased after the shallow disking, while the number of flakes which might have been recovered was very likely decreased.

In general, the majority of the artifacts were included within the categories of lithic production waste and precision tools. Ground stone tools and percussion tools comprised much smaller totals. The category of lithic production waste (including cores, flakes and debitage) included 480 specimens, accounting for 44% of the surface recovery. Precision tools (e.g., knives, scrapers, perforators) accounted for 488 artifacts, or 45% of the surface recovery. Percussion tools (e.g., hammerstones) represented 4% of the surface collection and ground stone tools (e.g., manos, pestles, metates) comprised 5% of the surface collection. Other surface items recovered from the site included 34 shell fragments and one unidentified piece of bone.

The success of the surface collection program and the relatively large quantity of cultural material recovered during that process indicated that comparable subsurface deposits might be present, especially in the areas of the greatest artifact density. The subsurface evaluation was based on the excavation of one-meter-square test units in decimeter levels. One or more units were located at each of the site loci but the subsurface excavations failed to located any significant deposits of cultural materials. Neither did randomly-placed test trenches cutting across site loci locate any significant deposits. This indicates that the site activity may have been very mobile, without requiring major, long-term camp sites.

Upon the completion of the surface recovery program and the documentation of the absence of any subsurface deposits, the field operations were terminated. Essentially, the research potential of the site was exhausted, as no further artifact concentrations remain.

The proposed development of the Otay Rio Business Park project will include grading and building upon nearly all of the area of SDi-10783. This will represent a direct impact to the site, but as the archaeological site no longer retains any research potential, subsurface deposits, or major features, the impacts to the site from development are not considered adverse or significant.

b. Historical Resources

A substantial research effort was focused upon the evaluation of the historical significance of the redwood structure. A title search for the lot upon which the bungalow is located was completed to the time of the original deed transaction on December 19, 1870, between Guadalupe E. de Arguello and James Holland. A list of title transactions between 1870 and 1901 is available at the City of Chula Vista.

An analysis of the property owners (not the second trust deed holders) was undertaken to establish the historical significance of the persons who were directly associated with the bungalow. As a result of research conducted at the San Diego Historical Society, the San Diego Public Library, and the Chula Vista Library, it was determined that none of the names of the owners appear in any register of historically relevant persons in either San Diego or Chula Vista. A list of the historical archives consulted during this study is available at the City of Chual Vista.

The analysis of the general vicinity of the bungalow was completed with the study of the forces which might have affected the structure in the past. The primary event which occurred in the early years after the house was constructed was the 1916 flood. The original Lower Otay Dam was an earth and rockfill wall with a core of boiler plate embedded in concrete anchor block (San Diego Union, 1/23/66). The dam failed during a winter storm in 1916 that included extensive rainfall and winds up to 54 m.p.h. The dam failed due to overtopping which removed support from the downstream side of the dam, allowing it to quickly erode and release the lake water (City of San Diego Engineers report, 1916). When the dam burst, a wall of water 20 feet high rushed through the valley to San Diego Bay. Twenty people were killed, the valley floor was swept clean, and the small town of Otay at the mouth of the valley (near Interstate 5 and Otay Valley Road) was destroyed (San Diego Union, December 29, 1963).

The bungalow appears to have been spared from the flood due to its position on the river terrace, which is 25 to 30 feet above the flood plain of Otay River. Aerial photographs from the 1926-1927 aerial survey of the area (County of San Diego records) show the farmhouse and farm in an undisturbed state, while the flood plain had been noticeably disturbed. A copy of this aerial photograph is presented on page 62 of the Appendix.

Aside from the 1916 flood, no other events appear to have occurred which affected the structure. Given this determination, there is little doubt that the redwood bungalow is authentic and dates to the period of the 1870s. The historical significance of the structure is based not only upon the individuals associated with the house, but also upon the historical district in which it is located. To analyze the historical district, the National Register of Historic Places was consulted. The Register does not include any buildings or sites in the Otay Valley, Otay Mesa, or the southern area of Chula Vista or National City. The City of Chula Vista has yet to formally establish and approve an historical listing or significance criteria. An informal list of historical structures prepared by the City of Chula Vista does not include the subject bungalow or any other structures in the Otay Valley. Therefore, there does not appear to be any firm evidence to relate the bungalow to an historical district or to other registered historical uses.

The historical investigation was also directed toward the identification of the trash pit for the house. Trash dumps are considered important time capsules of the materials used and discarded through time. A great deal of information can be gathered concerning the economic status of the occupants of a house from the trash dumped near the structure--their buying power, the types of mercantile goods purchased, the household goods used, the types of china and/or dishware used, etc. The trash dump for the bungalow was located approximately 50 feet west of the southwest corner of the property. Its location was confirmed by Mr. Hafen, who stated that when the septic tank had fouled and a backhoe trench was excavated to allow waste to drain to the west, he encountered a deposit of trash, old bottles, broken plates, and metal fragments. Because this location corresponds to the present location of the waste ditch, further investigations were avoided for health reasons.

The analysis of the redwood bungalow and various related historical concerns has led to the following findings:

1. The structure is in excess of 100 years old, as denoted by the 1878 Township Plat;
2. The owners of the lot and house between 1871 and 1901 did not include any historically distinguished persons;
3. There are no registered historic sites of similar description in the general area;
4. The structure is an example of a special architectural style common during the late 1800s in southern California;
5. The structure is in very poor condition;
6. The house meets the antiquity standard for nomination to the National Register, but fails to meet the other criteria for acceptance to the Register, and cannot be nominated on the basis of age alone;
7. A trash dump is present to the west of the structure which may be considered to be a potential source of significant historical data.

Due to the findings stated above, the bungalow is considered a minimally significant site, and the impacts from demolition of the bungalow for project development are not considered significant.

2. <u>Paleontology</u>

With the basic assumptions in mind concerning the paleontological resource potential of the geological rock units (formations) discussed under Project Setting, it is suggested that development of the project site could result in impacts to significant paleontological resources (principally the potentially fossiliferous deposits of the Otay and San Diego Formations). These impacts would occur when mass grading operations cut into the fossil-bearing layers in these two formations.

C. Mitigation

1. Archaeology/History

a. Archaeological Resources

In accordance with the California Public Resources Code (Section 21083.2) and the environmental ordinances of the City of Chula Vista, the cultural resources within the proposed Otay Rio Business Park project have been evaluated and were found to be significant. The potential adverse impacts to Site SDi-10783, however, are not significant since the site no longer retains any research potential or unique deposits. Therefore, no measures are proposed for the mitigation of impacts to SDi-10783. No further studies or excavations are recommended prior to the initiation of grading.

At present, indirect impacts have not been assessed. These are impacts to sites in the immediate area which might result from off-site improvements. Because of the large number of sites close to the Otay Rio Business Park project, any off-site improvements should be reviewed by an archaeologist to evaluate potential impacts before the project is initiated.

b. Historical Resources

The only recommended mitigation measure for impacts from demolition of the redwood bungalow structure and associated structures would be to closely monitor the grading of the trash dump in order to salvage any historic artifacts which might be unearthed. A report would then be generated to provide an analysis of the historic artifacts in relation to the early homesteads and farms in Otay Valley. *This measure will be implemented as a condition on the Tentative Subdivision Map.*

2. Paleontology

Mitigation *to a level of insignificance* of the impacts discussed above can be ~~ensured~~ *achieved* by implementing the following measures. *Implementation will be ensured as conditions on the Tentative Subdivision Map.*

- Prior to issuance of a mass-grading permit, the developer should present a letter to the City of Chula Vista indicating that a qualified paleontologist has been retained to carry out the resource mitigation. (A qualified paleontologist is defined as an individual with an M.S. or Ph.D. in paleontology or geology who is familiar with paleontological procedures and techniques.)

- A qualified paleontologist should be at the pre-grade meeting to consult with the grading and excavation contractors.

- A paleontological monitor should be onsite at all times during the original cutting of previously undisturbed sediments of the Otay (between elevations 300 and 420 feet) and San Diego (above elevation 420 feet) Formations to inspect cuts for contained fossils. Periodic inspections of cuts involving the Sweetwater Formation (between elevations 200 and 300 feet) is also recommended. (A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials. The paleontological monitor should work under the direction of a qualified paleontologist.

- In the event that well-preserved fossils are discovered, the paleontologist (or paleontological monitor) should be allowed to temporarily direct, divert, or halt grading to allow recovery of fossil remains in a timely manner. Because of the potential for the recovering of small fossil remains such as isolated mammal teeth, it may be necessary to set up a screen-washing operation on the site.

- Fossil remains collected during this salvage program should be cleaned, sorted, and catalogued and then, with the owner's permission, deposited in a scientific institution with paleontological collections such as the San Diego Natural History Museum.

## D. Analysis of Significance

### 1. Archaeology/History

#### a. Archaeological Resources

Site SDi-10783 represents a site of food collecting activities for the La Jolla Complex. The site appears to be one of the two largest such scatters of artifacts in the western area of Otay Valley. While the site should be considered significant, the primary element of that significance consists of the surface artifacts and their spatial distribution. The surface collection program has effectively removed and recorded the significant aspects of the resource. Based upon the data collected during this research and field study, Site SDi-10783 is evaluated as a significant resource without further research potential aside from that represented by the collected artifact assemblage. Thus, significant or adverse impacts to the site would not result from development.

#### b. Historical Resources

No significant impacts are expected to occur from demolition of the redwood bungalow and related structures. However, grading of the trash dump should be monitored in order to salvage any historic artifacts which might be unearthed.

### 2. Paleontology

Significant impacts to paleontological resources could occur with grading and subsequent project development. Implementation of the recommended mitigation measures would eliminate these potential impacts.

## 3.9 LAND USE/GENERAL PLAN ELEMENTS/ZONING

### A. Project Setting

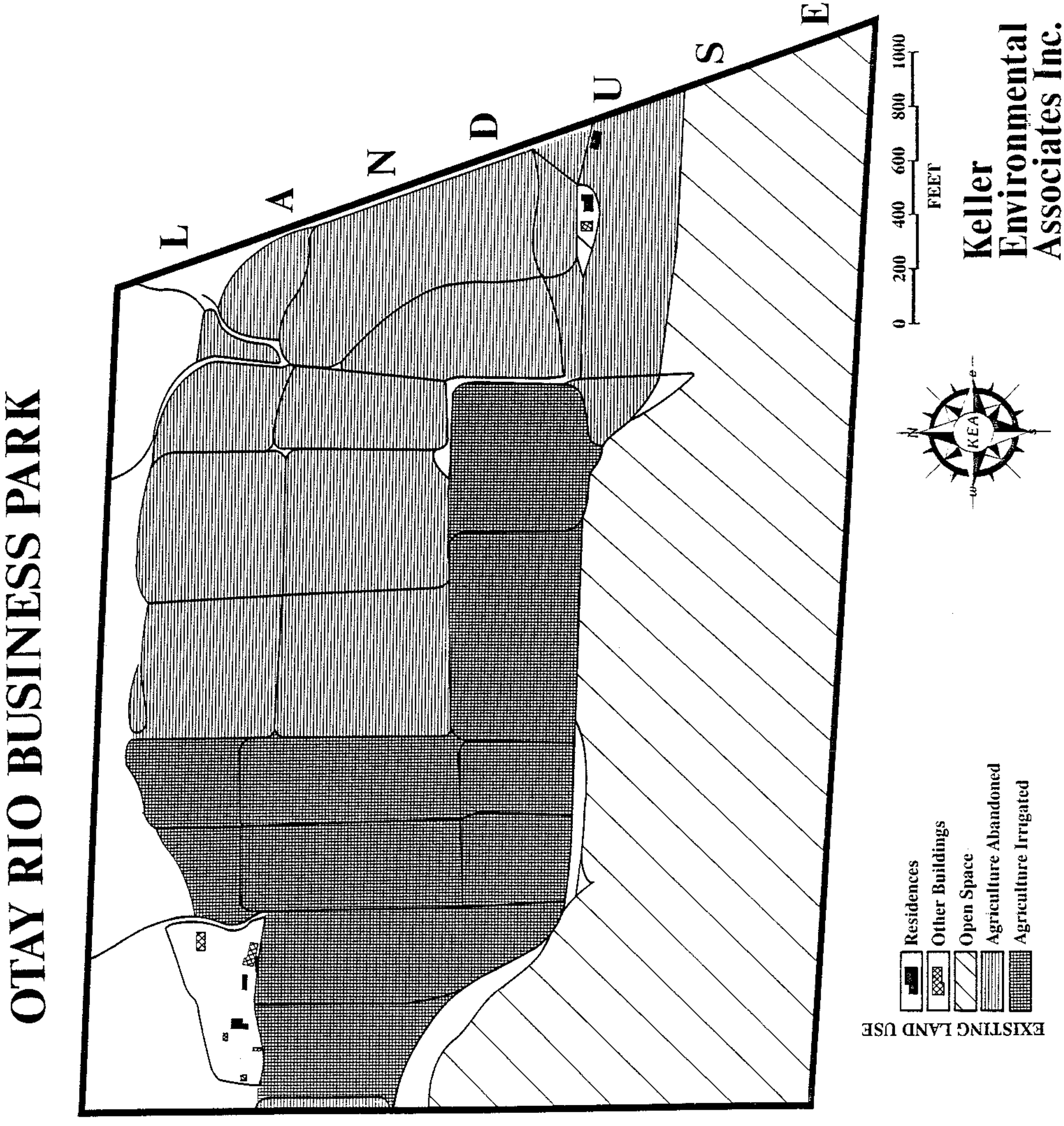
#### 1. Project Area and Surrounding Area Land Uses

The Otay Rio Project site consists of 210 acres in the extreme southeast corner of Chula Vista City; adjacent to the County of San Diego to the east, and the City of San Diego to the south and west. Otay Valley Road borders the project area on its east side.

The project site is currently rural in nature. Approximately four acres of the property are presently under cultivation, but over half the site (the gentle slopes south of the Otay drainage) has been farmed in the past and consists of fallow or abandoned fields. Three permanent residences and two mobile homes provide dwellings on the property adjacent to the field areas. There are also related outbuildings such as garages and equipment sheds.

Approximately the southern third of the property consists of steeper terrain which is presently open space. This area has been heavily utilized by unauthorized off-road vehicle recreationalists. See Figure 3-8, Existing Land Use.

Lands adjacent to the Otay Rio site are also largely undeveloped, although this character is changing. On the hills to the north of the project site, across the Otay River floodplain and Otay Valley Road, is an extensive conglomerate of auto wrecking and refinishing businesses and a mix of associated businesses. On the northeast section line of the property, there is also an existing dredging/fill area. A parking lot area and shooting range are located on the other side of Otay Valley Road to the east of the site, but the primary character of the area to the east is one of a low use, rural valley. South of the property boundary the land is currently undeveloped, but the proposed Robinhood Ridge residential development is currently in the planning stages for this area. Brown Field Air Station is located over one mile to the south on Otay Valley Road. Land uses to the west are primarily rural, consisting of river valley and scattered structures, but, again, residential development is in the planning stages for this area.



OTAY RIO BUSINESS PARK
LAND USE
EXISTING LAND USE
Residences
Other Buildings
Open Space
Agriculture Abandoned
Agriculture Irrigated
0 200 400 600 800 1000
FEET
KEA
Keller Environmental Associates Inc.


Figure 3-8

### 2. General Plans and Zoning

The project site is located in the southeast corner of the City of Chula Vista, along the City's boundary with the City of San Diego and the County of San Diego. Because of the close proximity of the other jurisdictions, the General Plan and Zoning designations for those jurisdictions will be discussed in addition to Chula Vista's General Plan and Zoning.

#### a. City of Chula Vista

The project site was annexed to the City of Chula Vista from the City of San Diego in early 1986. At that time, the City assigned General Plan and Zoning designations for the site. The General Plan designation is Low Density Residential (1-3 dwelling units per acre) for the low, flat northern portion of the site, where historically farming has occurred. Parks and Public Open Space designations have been given to the steep and hilly southern portion of the site, as well as the floodplain. The designated zones are A-8 (Agricultural, 8-acre lot size), and F-1 (Floodway). The A-8 designation covers the majority of the site, with the F-1 designation occurring just in the northwest corner. The adjacent City of Chula Vista General Plan designations to the north are Parks and Public Open Space along the Otay River floodplain, and Research and Limited Industrial north of the floodplain.

The Land Use Element of the General Plan discusses proposals and policies for each category of land use. For the Low Density Residential category, the Element calls for predominantly single-family residential development on sites ranging from one-third to one acre in size. Objectives and policies for open space are discussed in Section 3.14, Parks, Recreation, Open Space.

Regarding zoning, the purpose and intent of the Agricultural Zone is to

> provide a zone with appropriate uses for areas rural in character, which are undeveloped and not yet ready for urbanization. The zone is intended to preserve in agricultural use land which may be suited for eventual development in urban uses, and which will encourage proper timing for the economical provision of utilities, major streets, and other facilities, so that orderly development will occur (Ord. 1212, Section 1 (part), 1969: prior code Section 33.501(A).)

The purpose and intent of the floodway zone is to

> provide land use regulations to be applied on a uniform basis to such properties based upon documented and factual data from flood experience and engineering studies of possible and probable future flooding conditions, so as to prevent property damage and safeguard the health, safety and general welfare of the people. This zoning is intended to be applied to those areas which, by virtue of existing or potential construction of buildings and structures therein, or in surrounding areas, have or will have in the future the effect of creating aggravated flooding situations which theretofore, in their undeveloped state did not constitute dangers to the public health, safety or general welfare. These zones are further intended to provide such safeguards until such time as flood protective or control works in the nature of channels or levees have been constructed so as to minimize such danger in the outlying or fringe floodway areas. (Ord. 1281, Section 2 (part), 1970: Ord. 1212, Section 1 (part), 1969: prior code Section 33.525(A).)

b. City of San Diego

General Plan designations for the City of San Diego lands to the west and south of the project site include Very Low Density Residential (0-5 dwelling units per acre), Low Density Residential (5-10 dwelling units per acre), Low Medium Residential (10-15 dwelling units per acre), Industrial (adjacent to Brown Field), and Open Space. The zoning for most of the surrounding area is A-1-10 (Agriculture), HR (Hillside Review), and FW or FPF (Floodway or Floodplain Fringe)(M. Stang, 1986). The Otay Mesa Community Plan is the City's planning document for the Otay Mesa area. The general idea for development in the project vicinity is to provide lower density housing in the hilly areas, as well as on the mesa close to Otay Valley, and to intensify land use toward Brown Field. The agricultural zone will be changed as proposed and planned residential land uses in the project area are approved.

c. County of San Diego

The County's General Plan designation for the area adjacent to the project site is Impact Sensitive, which allows one dwelling unit per every 4, 8 or 20 acres depending on degree of slope. The Sensitive classification was given due to the extent of riparian areas, areas prone to flooding, and soils having potential instability hazards. The County zoning for this area is A-70(4), which is Limited Agriculture Use Regulations. This zone allows residential uses; civic uses such as essential services and fire protection services; agricultural uses such as horticulture, tree and row crops and limited packing and processing; and custom manufacturing uses. Other more intensive uses are allowed with minor use or major use permits. The County does not have any proposed plans for development in the project area; the closest projects are south near Brown Field, and northeast near the Otay Reservoir off Otay Lakes Road (Daley Corporation).

B. Impacts

Implementation of the proposed GPA and Zone Change would significantly change the type of land use allowed on the project site from low density residential to a mix of urban uses, largely light industrial. The mixture of uses, however, is considered to provide a gradual transition from the existing industrial nature of the Valley to the proposed and planned residential uses to the south and west.

The GPA proposes Research and Limited Industrial over the ~~flat~~ *previously farmed and graded* portion of the site, Medium Density Residential in the southwesterly portion, and Open Space in the southeasterly portion. The proposed zone change is to Limited Industrial (IL-P), and Residential (R-1), Floodway (F-1) and Agriculture (A-8). Once the zone has been changed, the applicant also proposes to apply for a Master Conditional Use Permit (CUP) over Lot 11 to allow service-related commercial uses. Each of these designations is described fully in Section 2.0, Project Description.

The land use impacts discussion will review: 1) the compatibility between the proposed internal land uses; 2) the compatibility of the proposed project land uses with the surrounding area existing and planned land uses; and 3) the compatibility of the proposed General Plan Amendment and Zone change with the surrounding Chula Vista and other jurisdictions' General Plan and Zone designations.

1. <u>Compatibility with Internal Site Design</u>

The proposed land uses are shown on the Tentative Map, Figure 2-4. The mix of land uses in their topographical setting is considered to be compatible for the following reasons:

- The proposed industrial areas and commercial area are physically separated from the remainder of the site by the topography; also, the commercial area would provide services and amenities which could be utilized by both the Business Park employees and residents, as well as by passers-by on Otay Valley Road.

- The proposed park is adjacent to the Otay River floodplain, and is located to provide an atmosphere suitable for leisure time and recreational opportunities for the Business Park employees.

- The proposed single-family residential areas are adjacent to open space, which is compatible.

2. <u>Compatibility of the Proposed Project Land Uses with the Surrounding Area Existing and Planned Land Uses</u>

The proposed industrial lots and the commercial lot are adjacent to: 1) Otay Valley Road, 2) County lands to the east (largely undeveloped with no current plans for development), 3) industrial land uses to the north across the Otay River floodplain, and 4) undeveloped land to the west. Though no plans have been submitted for the lots immediately to the west of the project site, future land uses are expected to be residential to conform with City of San Diego General Plan designations. The proposed uses are considered to be compatible with all of the surrounding area, with the possible exception of future low density residential uses to the west. Otay Valley Road will be upgraded in the next few years and will carry much larger traffic volumes than at present; thus, industrial uses adjacent to the road would be a good transition from noise associated with the traffic. The single-family residences proposed along the southwestern and southern boundaries would be consistent with single-family residential development anticipated for future development to the south and west. *Development of the single-family residences is dependent on the future development to the south of Robinhood Ridge, for which approval by the City of San Diego has not yet occurred.*

3. Compatibility of the Proposed GPA and Zone Change with Surrounding Area Plans and Zones

a. City of Chula Vista

Chula Vista's General Plans and Zoning to the north allow for Open Space along the Otay River and floodplain, and industrial use along Otay Valley Road and to the north. The proposed GPA and Zone Change would be compatible with these existing adjacent designations.

Currently, the City's Redevelopment Agency is preparing a Wetland Determination for the Otay Valley floodplain. The Determination will identify areas within the Otay River floodplain which are wetlands. Wetland areas will come under the protection of the U.S. Army Corps of Engineers, who require a permit (404) under the Clean Water Act for development in this area. Also, the California Department of Fish and Game (DFandG) requires notification of any change to river channels. The DFandG requires a fee from the developer for the subsequent agreement which must be completed before such changes can be made. Biological studies for this EIR found that the northwest corner of the site is a wetland area, part of the large wetland associated with the Otay River floodplain. The onsite wetland is protected by the Open Space GPA, however, a portion of it is covered by the IL-P proposed zone. The GPA would provide open space protection to this area, especially with further restrictions placed on this area during the subdivision map process. During the map process, this area should be placed in permanent open space, and later, shown on the Final Map as a restriction on the property, either in the form of designated fee title or an open space easement.

b. City of San Diego

The City's surrounding General Plan and Zoning designations allow for Very Low Density to Medium Low Density Residential development. The proposed GPA and Zone Change would be compatible with San Diego's designations to the south and southwest. The General Plans for the two jurisdictions would conflict on the west, however, where the proposed industrial GPA and Zone would conflict with San Diego's very low density (0-5 dwelling units per acre) plans.

Another land use consideration is the expansion of the Brown Field Airport's noise contours. Presently, the extension of the noise contours configuration over the City of San Diego is unknown, but it may extend toward the northwest in the direction of the project site. The City of San Diego's Very Low, Low, and Medium Low Density Residential designations in this area may then become incompatible with the high noise levels anticipated within these contours. The City presently has no plans to change these land use designations as a result of the extension of noise contours (M. Stang, 1986). *However, these designations may be revised by the City in the future.* ~~Thus, it is anticipated that the land uses adjacent to the south of the project site will remain as presently designated.~~ The project itself is not anticipated to result in any impact on airport operations, as the traffic would largely travel away (northerly) from the airport. Impacts to the land uses from airport noise are discussed in Section 3.6.

c. County of San Diego

Although the County's General Plan and Zoning designations call for limited development due to sensitive environmental constraints, the regulations do allow for some intensive land uses that would be consistent with proposed project land uses. Thus, the proposed GPA and Zone Change are not considered to be inconsistent with existing County designations.

## C. Mitigation

In order to mitigate impacts from the inconsistency of land uses on the project's western boundary, the City's Design Review Committee should ensure that the site design includes intensive buffering along the western boundary, with both physical barriers such as walls or fences, as well as screening vegetation. Also, if streets eventually connect the two areas, industrial-related traffic should be routed to the east project entrances, avoiding travel through residential areas. *The Precise Plan is the mechanism to ensure achievement of these measures.*

In order to ensure open space protection of the wetland, the subdivision map process ~~should incorporate~~ *will require that* this area *be dedicated to the City in fee title* as permanent open space, and the Final Map process should show this a restricted area, ~~either~~ by designation of ~~fee-title or an open space easement~~ *an open space maintenance district.*

D. Analysis of Significance

The proposed land uses, GPA, and Zone Change are compatible with existing and proposed land uses and plans, with the exception of industrial land uses on the western site boundary adjacent to City of San Diego designated Very Low Density residential areas. Mitigation measures include intensive buffering between these two areas, and a plan to reroute future industrial related traffic away from the residential area. Otherwise, no significant impacts are expected. *The Precise Plan, to be submitted by the devloper, would include all landscaping and design features to be implemented during project development.*

## 3.10 AESTHETICS

A. Project Setting

The project site consists of 210 acres in the Otay Valley which are bordered on the north by the Otay River drainage. While views are expansive east-west along the valley, width is narrow and views north-south measure a mile or less. Review of the scenic elements of the General Plans for the Cities of Chula Vista and San Diego showed that no scenic highways or sites are located in the project area. The overall visual impression is one of a relatively degraded, but still primarily natural, setting.

Elevations at the drainage are 120-140 feet above mean sea level (AMSL). From there the site slopes south, with elevations of 140-200 feet AMSL on the terrace adjacent to the drainage. The highest elevation onsite is at the southern edge of the property, where elevations reach 440 feet AMSL as Otay Mesa top is reached. Figures 3-3 and 3-5 show the topography of the site area.

As indicated, north to south the Otay Rio project area rises from the river drainage to the mesa top. The terrace adjacent to the river slopes gradually, but the southern third of the project area has abrupt 2:1 slopes. The terrain in this area consists of three protruding hill formations and the intervening drainages, providing the viewer with a prospect of varied relief. None of the drainages are large enough to be named.

The terrace area of the project site has been farmed between the 1920s and the present, although it has not all been under cultivation recently. Currently, due to unknown lease availability, only four acres are in agriculture. Structures on site are adjacent to the current and historical field areas. Two residences and outbuildings are located on the lower slopes of the hills in the southeast portion of the area and one permanent residence, two mobile homes, a packing shed and an agricultural warehouse are located between the fields and the river drainage at the northwest corner of the property. The hills in the southern portion of the study area have been left undeveloped to the present, but the area is heavily used by off-road vehicle recreationalists. ORV trails criss-cross the hills and the adjacent mesa tops and are highly visible on the project area hillsides. A 69kV transmission line extends roughly east-west across the property at the junction of the terrace and the slope to the mesa top.

Uses surrounding the proposed development are relatively sparse. The project area is bounded on the east by Otay Valley Road, which turns west once it crosses the Otay River drainage. North of the westerly trending part of the road and within clear view of the property (approximately 0.25-0.5 mile distant) is a large conglomerate of auto wrecking and refinishing and associated businesses. A dredging/fill area surrounded by chain-link fencing is also currently located on the northeast property boundary. Existing land uses within sight to the east include a shooting range and parking lot to the east of Otay Valley Road. Because of the road and topographic configurations, this use is primarily visible from the terrace portions of the property and the hills at the southeast corner. Trees along the eastern property boundary provide some view shielding of immediately adjacent areas, as does the denser vegetation along the northern property border where the drainage is crossed or abutted.

Views from the terrace to the east and west are rural in nature. Those to the east are particularly scenic, as the viewer looks along an increasingly narrow river valley towards distant mountains. As indicated above, views to the north are all primarily undeveloped hillsides with an extensive industrial area which draws the eye. Views to the south are short as the terrain slopes abruptly within 0.3 mile from the north property perimeter. While the small gully areas cutting through the hillside appear untouched and are quite scenic, the more accessible open hillsides are scarred by ORV trails. Once on the hillier portion of the property, views remain the same to the west and north (although perspective changes) but views to the east are lessened due to the encroachment of the southern valley ridge line.

The project's locale is also visible to viewers from surrounding areas. From the hillsides to the north, views south encompass a large portion of the drainage and associated floodplain as well as across to the opposite hills. The project site is located in the eastern portion of the terrain surveyed and its primarily rural nature is undistinguished from the lands surrounding it. Motorists along Otay Valley Road, where it trends east-west, can also view the hillsides of the proposed project, although much of the terrace area is screened by intervening riparian vegetation. Once the road turns south, portions of the site are visible to southbound drivers, although partially screened by the trees mentioned above. Northbound motorists are more likely to be looking across the valley to the opposite ridge, but may also have intermittent views onto the terrace area. Because of the steep nature of the terrain and the small north-south distance of the property, recreationalists on Otay Mesa itself would tend to look straight over the property to the other side of the valley.

B. Impacts

While specific lot uses are presently unknown, the change in land use proposed by the project will substantially alter the visual quality of the site. The Tentative Map for the proposed Business Park indicates that approximately 135 acres would be given over to commercial, light industrial and residential uses. Of these, approximately 4.5 acres are earmarked for commercial uses in the northeastern corner of the property and approximately 122 acres are proposed for light industrial uses throughout the terrace area. Forty-nine single family residential lots of varying sizes are planned in the southwest and south portions of the site. The remaining 75 acres have been identified by the developer for permanent open space (primarily on the steeper slopes). While the precise nature of the industrial and commercial businesses which will buy lots in the development is unknown, it is clear that the visual character will change substantially from its present rural nature. *The areas which will have views of the site are the same as those described above. Aditionally,* *once development occurs in the City of San Diego to the south and west of the site, those areas will also have views of the southerly and westerly portions of the site. It is unknown at this time, due to the uncertainty of future land uses in this portion of the City of San Diego, whether those viewers would be residents, employees of industrial or commercial land uses, recreationalists, or others. However, views from these areas will consist primarily of single-family residential and open space uses in the southern portion of the project site, and, from the west, of landscaping buffers, glimpses of industrial buildings, and open space. The open space on the hillsides will be the dominant visual feature from these areas. No visually sensitive areas will be impacted.*

In light of proposed development in the surrounding areas, however, project planned uses are consistent with adjacent properties. The proposed single family lots abut the Robinhood Ridge residential development while the open space separates these areas from the light industrial/commercial lots below. The latter lots extend north to the river drainage and towards an area zoned Light Industrial by the City of Chula Vista and in which the previously mentioned wrecking yards are located. The Otay Rio Business Park plan, therefore, provides a gradual buffer between the ~~approved~~ *proposed* Robinhood Ridge developments and the existing industrial development in the area. *The proposed industrial use would, however, contrast with planned low density residential development to the west.*

Construction-related impacts will also significantly alter the existing visual nature of the site; however, these impacts would be temporary, and would occur in phases. The first visual disruption from construction would occur in late 1987, and throughout 1988 as grading and construction activities would proceed over Phase I, the area in the easterly portion of the site. It is unknown at this time when Phase II construction activities would begin, as those activities are dependent on the Otay Valley Road widening.

C. Mitigation

No measures are necessary with regard to planned lot use. Project-wide plans, however, such as landscaping and construction style, ~~should~~ *will* be reviewed carefully by the City's Design Review Committee prior to Precise Plan approval. *Adherence to the Precise Plan will ensure implementation of these measures.*

Compatible uses of size, height (e.g., two stories or lower), color, facade treatment and types of materials (e.g., stained wood and other materials of a natural appearance) used should be relatively uniform within each of the commercial, industrial and residential groupings. Landscaping should also be consistent, and should be used to screen the commercial and light industrial uses from viewers along Otay Valley Road, *potential future low density residences to the west,* as well as to provide visual relief within the development. Landscaping should be accomplished with native trees and shrubs in order to conserve water, as well as to use species which readily adapt to the environment. Revegetation on the ORV trails would not only achieve aesthetic results, but would also reduce rapid erosion on these trails.

Street lighting should be consistent in style and should enhance architecture and viewsheds if possible, as well as provide adequate lighting for safety and visibility. Night-lighting in the industrial and commercial areas should be no stronger than necessary for security purposes and should be directed onto rather than off of the properties as much as is practicable. Finally, parking should be organized into a number of small areas rather than a single large area.

During construction, visual screening should be implemented along Otay Valley Road adjacent to the easterly site boundary. This screening could be in the form of a temporary wall or mesh fence.

D. Analysis of Significance

The proposed plan will definitely alter the visual character of the project area from its present rural nature to that of a more intensive use urban site. Given the nature of the surrounding zoning designations, however (see the Land Use sections), existing adjacent industrial uses, the lack of a designated scenic corridor, and the rapid growth of the surrounding communities, it is only a matter of time before such a change will take place, even if the project were not built. The visual impacts to be addressed, then, center around whether the proposed uses are presented attractively rather than whether the present rural views are preferred. Both the topography and proposed site uses are varied in nature. If the above mitigative recommendations are incorporated into building specifications, the resultant development could be an asset rather than deterrent to future development in the valley. As such, aesthetic impacts resulting from the project are considered minor.

## 3.11 COMMUNITY SOCIAL FACTOR

### A. Project Setting

The character of the project area is unique in that there is a mix of both industrial as well as agricultural uses, with very scattered residences, and a fairly obvious presence of transient illegal immigrants. The character of the area has evolved largely as a result of spontaneous growth, rather than planned development. However, in very recent years, the Cities of Chula Vista and San Diego have been involved with specific planning in this area in response to development interest in the South Bay/Otay Mesa general area. Extensive industrial and residential projects are being developed or are in the planning stages for this area. The South San Diego area is one of the fastest-growing areas in the County, and is expected to absorb a major portion of the County's growth by the year 2000.

#### 1. Population

The City of Chula Vista's population in 1980 was 83,927, and is projected to be 101,543 in 1990, and 102,148 in 2000 (a 21.7 percent increase). These totals do not include the Montgomery Community, recently annexed to the City. With the annexation of the Montgomery Community, the City recorded the largest percentage of population gain in the County since 1980.

The Chula Vista General Planning Area (GPA), which encompasses the San Diego Bay to the west, the South Bay Freeway (SR-54) to the north, the Sweetwater and Otay Reservoirs on the east, and the Otay Valley to the south, had a total population of 116,700 in 1980, and is projected to be 156,600 in 1990, and 185,700 in 2000 (a 59 percent increase). These projections include the Montgomery Community.

By comparison, the San Diego Region had a population of 1.86 million in 1980, and is projected to be 2.34 million in 1990 and 2.70 million in 2000 (a 45 percent increase)(Final Series 6 Regional Growth Forecasts, 1980-2000, SANDAG). A large percentage of the County's growth is anticipated to occur in the South County areas (near the City of Chula Vista).

2. Housing

The number of housing units in the City is projected to increase from 30,400 in 1980 to 55,652 in 2000 (54.6 percent increase). Housing in the Chula Vista GPA is projected to increase from 41,900 in 1980 to 69,600 in 2000 (66.1 percent increase), and in the San Diego Region from 670,100 in 1980 to 1.04 million in 2000 (55.7 percent increase).

The City's Housing Element of the General Plan includes a breakdown of acreage designated for each category of residential density, and states that there is enough designated land to meet the present and future housing needs. It also states that the recycling of commercial or industrial territory to residential use would serve no purpose.

Regarding the City's Affordable Housing Program, the following City policies have relevancy with new residential developments:

1. The City of Chula Vista expects every developer to address the problem of housing low and moderate income families and individuals. Where proposed projects exceed fifty dwelling units, the municipality expects the involved developers to explore methods to devote a minimum of 10% of the said developer's exploration and investigation of Federal and State subsidy programs, and other economically-feasible means of reducing the cost of housing.

2. In order to ease the burden which the above subprogram places upon the developer, the City of Chula Vista shall grant maximum 25% net density bonuses, where such would not adversely affect the order, amenity, or stability of adjacent land uses, or where such bonuses would not augment density after bonuses mandated under Section 65915 of the State Government Code. The number of housing units constituent to a density bonus granted by the City shall generally equal the number of low and moderate income housing units provided by the developer.

3. The City of Chula Vista shall require developers of projects which contain more than fifty dwelling units to participate in an "Affirmative Fair Marketing Plan," such as the BCA/HUD program. The Community Development Department shall

administer this subprogram on a continuing basis. (Explanatory Note: An "Affirmative Marketing Plan" is initiated by an agreement between a developer and the U.S. Department of Housing and Urban Development. Under this agreement, the developer prepares a market plan which is designed to attract prospective home buyers or tenants from all groups within a given market area. The primary objective of this "outreach" plan is the enlargement of housing opportunities.)

4. Prior to the submittal of residential development plans for processing, developers shall confer with the City Planning and Community Development Departments on the matter of affordable housing. These pre-planning conferences shall be used to apprise developers of local housing needs and policies; available affordable housing incentives; and, current State and Federal legislation and programming with respect to housing. These conferences should also provide a mechanism for private-public negotiation, and the formulation of incremental affordable housing programs.

3. Employment

The median income level within the City of Chula Vista (including the Montgomery Community) in 1980 was $16,906, compared with the San Diego Region's median income level of $17,107.

In 1985, Chula Vista's total employment was 37,831, an increase of 4.5 percent since 1980. The average increase County-wide was 4.1 percent. The number of employees by industry is shown below.

| Industry | No. of Employees |
|---|---|
| Agriculture, Forestry, Fishing, Mining | 405 |
| Construction | 1,545 |
| Non-Durable Manufacturing | 890 |
| Durable Manufacturing | 6,525 |
| Transportation, Utilities, Communication | 984 |
| Wholesale Trade | 1,248 |
| Retail Trade | 9,287 |
| Finance, Insurance, Real Estate | 1,587 |
| Services | 9,028 |
| Government | 6,332 |
| Military | 0 |
| Total | 37,831 |

Source: SANDAG, 1986

Chula Vista's employment base is projected to continue to grow as the area develops. Development plans in Chula Vista call for a range of land uses, including largely industrial use which follows retail trade and services in employment figures.

B. Impacts

The surrounding area community structure will be one of a mix of largely residential and industrial uses, providing both employment and housing opportunities. The proposed project does not conflict with the development trends in the area, and no adverse impacts are anticipated to the community/social structure.

The project proposes a mix of light industrial businesses and residential development. The proposed residential areas would provide approximately 49 homes. Based on an average household size of 2.7 persons per unit, the Business Park could house approximately 132 persons. This growth in the City was not anticipated, as the site was recently annexed from the City of San Diego. This does not create problems with accommodation, as the newly annexed land and future housing would be there to support the population. This population is a small fraction of a percent of the total City population expected by the years 1990 and 2000. Thus, no significant impacts are expected to occur due to the growth of population from development of this project, and no conflicts with the Housing Element occur.

The number of proposed housing units (49) constitute a fraction of a percent of the total increase in housing units from 1980 to 2000. Thus, the project would incrementally contribute to the increase in housing, and no significant impacts are cited. The developer of the project's residential area would be required to conform with previously stated policies of the Housing Element regarding the Affordable Housing Program.

The proposed project includes approximately 122 acres of land proposed for light industrial development. Because the nature of the future light industrial businesses is presently unknown, numbers of employees expected at the site cannot be determined. However, it is known that the site will generate employment opportunities, which is both consistent with the area trend, as well as vital to a City's health. No adverse impacts are therefore expected to occur to area employment due to development of the site.

C. Mitigation

No mitigation measures are necessary.

D. Analysis of Significance

No adverse impacts to the Community/Social Structure are expected from project development, rather, the project would contribute beneficially and incrementally to the area housing and employment base.

## 3.12 COMMUNITY TAX STRUCTURE

A. Project Setting

Present monies accruing to the City of Chula Vista from the Otay Rio Business Park project locale consist primarily of property taxes. The project area consists of County Assessor's parcel numbers 645-020-01, -04, -05, -06 and -07. Based on the current land uses of limited residential and agriculture, present assessed market value of the property is $2,576,088.00; resulting in $25,760.00 being collected in the past year. These monies, collected by the County, are distributed among all taxing agencies, including the City of Chula Vista, County and the school districts. Of this 1 percent, 18 percent of the tax monies collected goes to the City of Chula Vista. This would result in the City having received approximately $4,640.00 for the past year from current taxes on the property. The City also receives a portion of the six percent retail sales tax collected by the State. As related to current property uses, however, these monies are presently insignificant. Several families only live on the property and do not contribute to retail sales in any demonstrable manner.

B. Impacts

As Chillingsworth begins to develop, and parcels are sold to individual developers, land uses will change and the market value of the property will be reassessed. The future market value of the property is presently unknown, being tied to surrounding uses as well as uses proposed for the property itself. It is logical, however, that the value will rise significantly. Proposed uses are mixed for the 210-acre property, consisting of light industrial, commercial, and residential portions. These uses, varying in density and intensity, will provide better returns on the dollars invested in the property than the current low intensity agricultural uses. The raised assessed value will result in larger monetary benefits to the City from the property taxes. An increase in residential population, as well as new commercial uses and a transitory daily work population should also increase retail sales in the area. These monies, collected in the City of Chula Vista, would have a direct, although admittedly small, positive impact on the monies received by the City out of the retail sales tax.

C. Mitigation

No negative impacts to the tax base were identified, therefore no mitigative measures are recommended.

D. Analysis of Significance

Impacts to the Community Tax Structure as as result of project development are considered positive, as they result in an additional cash flow.

## 3.13 SCHOOLS

A. Project Setting

The Otay Rio Business Park development is located within the jurisdictions of two school districts; Chula Vista Elementary and Sweetwater Union High. Schools information cited below was provided by Mr. John Lynn of the Chula Vista Elementary School District and by Mr. Andrew Campbell of Sweetwater Union High School District.

At the present time, there is no available elementary facility for the project area. Any children from the surrounding area are absorbed into the system on an individual basis and dispersed to schools throughout the district. Children from the site locale presently attend Otay Elementary and Montogomery Lower Schools. A new school design to be implemented district-wide is presently being developed. Completion of the design phase is scheduled for three years from December 1986.

Two schools are available for older children; Castle Park Middle School and Castle Park High School. Castle Park Middle School has a state mandated top enrollment of 1,456 students. It is currently serving 1,253 children; 1,098 in regular education and 155 children with special educational needs. At the present time, it is anticipated that the special needs children will be moved to another facility in the fall of 1987, leaving room for 338 additional children. Enrollment at the facility for the 1987-88 school year is currently expected to increase by 85 students for this period, leaving 273 spaces available.

State mandated capacity for Castle Park High School is 1,568 students. Current enrollment totals 1,822; 254 students over capacity level. Enrollment is expected to increase in the next academic school year.

## B. Impacts

The Otay Rio project includes planned development of 49 single-family dwellings. Using multipliers provided by the Districts (0.4 SFD for Chula Vista; 0.39 SFD for Sweetwater), it was computed that the residential element of the proposed project could result in an impact of an additional 20 elementary school and 20 upper school children to the system. *However, it should be noted that the residential portion of the project is not being recommended by City staff at this time.*

Anticipated impacts to the school systems will be significant. As noted above, existing schools are nearing or exceeding state mandated capacity limits. The projected 20 elementary school children have no available school and the high school age children would attend a school already over enrollment maximums set by the state. However, development of the residential portion of the project would occur in the final phase of development, and by that time, the existing school situation may be different, resulting in different impacts. For purposes of this analysis, the existing situation is used for a "worst-case" study.

The situation is additionally complicated by the fact that there are several other proposed residential developments in the area immediately surrounding Otay Rio. Of these, only two developers have submitted precise plans as of January 1987. One of these (Pardee-California Terraces) proposes 4,756 single and multi-family residences. The other (Robinhood Homes-Robinhood Ridge) proposes ~~1,046 new units~~ *992 new units and 86* *additional units (potential)*. An additional development to be completed by Stafford-Gardner is not in the immediate area but was noted by the Sweetwater District as of concern as it would also funnel students into the Castle Park High School. Approximately 3,000 homes are projected for this development.

Therefore, although the Otay Rio project will result in a relatively slight incremental increase of students to the system, impacts of all these developments on the school system will obviously be dramatic. The existing school base is inadequate in view of the projected growth and new facilities will be needed. Standard developer fees will not provide enough income to build a school; 1986-87 predicted costs for acquisition of a 10-acre parcel and construction of an elementary facility totaled 4.5 million dollars.

C. Mitigation

*City staff is not recommending approval of the residential portion of the project at this time. However, if residential is approved at a later date*, new schools will need to be constructed for the anticipated influx of students from the proposed project and surrounding planned residential districts. To some extent, implementation of additional developer fees discussed at a Board of Trustees meeting January 5, 1987 will offset the problem. Legislation SB327 and AB2926 will require the developer to pay $1.50 per square foot of habitable space in residential developments and $0.25 per square foot in commerical and industrial developments. While the developer will need to pay into both school districts, combined total fees will not exceed the amount noted above.

Relocatable classrooms may also be used by the districts on a temporary basis until more permanent facilities can be provided. The Robinhood Ridge and California Terraces developments to the south of Otay Rio have tentatively set aside some properties for future school sites but such sites have yet to be approved by the districts. Once sites are agreed on, setting up street grids so that access is not interrupted between developments will make the schools more accessible to walking children.

Pardee and Robinhood Homes are currently in the process of setting up Mello-Roos agreements with the Districts under 1982 legislation. This law requires a study defining project areas needs and evaluation of costs per unit. An assessment process and time frame are then established. Using this process, a developer need pay no monies up front. Rather, an assessment is made to each home which will be paid off over a 25 year period through the normal taxation process. Mello-Roos funding, obviously more attractive to the developer, also allows the Districts to recover a "raw land tax" if units do not sell as anticipated.

D. Analysis of Significance

Students generated by the Otay Rio and surrounding residential projects will require new schools. The possible 40 students entering the system as a result of the project development, however, results in a very small incremental increase and is similar to the types of impacts with which the Districts are currently contending. While the cumulative effects of all the proposed projects will be significant, assessments and fees can provide funding. Plans show that school sites have been set aside by the large project developers. If school construction is carried out concurrent with residential construction, the facilities will be able to absorb the increase in student load as it is generated and no significant impact will result.

## 3.14 PARKS/RECREATION/OPEN SPACE

A. Project Setting

Because the project site has been recently annexed to the City of Chula Vista, it is not shown to be included in the Parks and Recreation and Open Space Elements of the General Plan. However, the policies of these plans apply City-wide, including the project site.

The Park and Recreation Element states that City of Chula Vista regional park needs are met by Sweetwater Regional Park, Otay Reservoir, and Silver Strand State Beach. The City is mainly concerned with developing community and neighborhood parks. The project site is adjacent to Chula Vista's Park Service District No. 16. The standards established in the Element for neighborhood and community parks base park acreage on every 1,000 persons served, and minimum park size varies from 5 acres to 15 acres.

The City collects fees from developers of residential developments (Park Land Dedication Ordinance) to aid in the purchase of neighborhood and community parks. These park fees may be waived by the City if the developer dedicates land for park development.

The Open Space Element states that open space should be preserved for the following reasons:

1. To divert development from hazardous areas such as earthquake zones, unstable soil areas, flood plains, areas of high fire risk, etc.;

2. To provide open space for outdoor recreation;

3. To protect areas of historic, scenic or cultural value;

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 included in this Element which are particularly relevant to the project site include the following:

1. Areas of unstable soils, areas near earthquake faults, and areas in flood plains shall be retained in open space uses to minimize loss of life and property;

2. Highly productive agricultural lands should be retained as open space, through use of the Land Conservation Act (Williamson Act) and such other means as may become available;

3. Additional open space for outdoor recreation use shall be acquired as vacant land develops, through the dedication and/or in lieu of fee requirements of the Park Land Dedication Ordinance;

4. As hill lands develop, canyons and steep slope areas shall be preserved as open space to the maximum extent feasible, thereby providing a natural buffer and definition to developed areas.

B. Impacts

The proposed project includes approximately 1.5 acres of park land, which would serve the Business Park employees. No dedicated park land is proposed for the residential areas. The developer would be required to compensate for the provision of parkland by payment of fees as required by the Park Land Dedication Ordinance.

Approximately 75 acres of the project site are proposed for open space (approximately 35 percent). The largest piece of contiguous open space is in the southeast corner and is quite steep. The other open space areas are generally along the steepest hillsides.

The proposed open space conforms partially with policies of the Open Space Element:

1. The existing agricultural lands are being proposed for development, which does not conform with the Plan, yet the City had already designated those lands in their General Plan for residential development;

2. The developer would be contributing to the Park Land Dedication fee, as called for in the Element; and

3. A large portion of the canyons and steep areas are being left in open space, which does conform with the Plan. A small area of hills/canyons in the southwest corner are proposed for development, yet this is a very small percentage of the project area, and would not be a significant disturbance of the project site's hills/canyons areas.

C. Mitigation

Payment of Park Land Dedication fees will mitigate impacts to Park and Recreation facilities. No other mitigation is necessary.

D. Analysis of Significance

The developer is providing passive park opportunities to the Business Park employees, yet no park land would be dedicated, necessitating payment of the Park Land Dedication fee. The developer would pay this fee, otherwise, no impacts are expected, and no mitigation would be necessary.

## 3.15 FIRE AND POLICE PROTECTION

A. Project Setting

Both fire and police protection are provided to the proposed project locale by the City of Chula Vista Fire and Police Departments. Information provided below was obtained from Ms. Carol Gove and Mr. Samuel Lopez of the Fire Department, and Mr. William Winters of the Police Department.

The project area is serviced by Chula Vista Fire Department Station No. 3, located at 266 E. Oneida Street. Three firefighters are assigned to Station No. 3. Estimated response time to the project vicinity is approximately 12 minutes, which is considered excessive by

Fire Department personnel. Average response time should be approximately four minutes; nine minutes is the upper limit of acceptability.

The apparatus housed at this station consists of a 1969 1,250 GPM American La France pumper. Twenty-four foot ground ladders are carried aboard. The physical measurement of the fire apparatus is 8'7" in height, 8' in width and 27" in length. City of Chula Vista standard street width requirements to allow engine maneuverability and turning radii are 20 feet and 40 feet, respectively, excluding curbside parking allowances.

Fire flow requirements depend on type of occupancy and square footage of buildings. Requirements vary from about 1,000 gallons per minute (gpm) to 5,000 gpm. Installation of sprinkler systems reduces the required amount of fire flow by approximately half.

The Chula Vista Police Department operates out of a headquarters at 276 Fourth Avenue. Over 130 sworn officers operate out of the precinct, and of these, approximately 30 are detectives and 25 are supervisors. Field officers total approximately 75 personnel, divided into three shifts. Taking into account officers on vacation, sick leave, or otherwise unavailable, this results in from 14-18 officers generally being able to respond to calls for assistance. These officers can draw from a pool of 30 marked cars. Between 10:00 p.m. and 2:00 a.m., shifts overlap and the number of officers is doubled. Calls are responded to from the field 95 percent of the time. Estimated response time to the project vicinity is six to eight minutes.

## B. Impacts

The proposed project street widths are sufficient to provide Chula Vista fire engines with their required maneuverability and turning requirements with two exceptions. These are streets I and K in the residential portion of the proposed project. The turning radius at the end of each of these cul-de-sacs appears to be exactly 40 feet. If a single car was parked at the turning point, the engine would be unable to maneuver.

Fire Department personnel would also be affected. The initial phases of the project would require plan checking and construction inspection and the proposed commercial and industrial businesses would require at least yearly inspections by the Fire Prevention Bureau. Most critical is the project response time. As noted above, a 12 minute response period is considered excessive. With the addition of more industrial, commercial and residential development from the proposed project as well as surrounding projects, the percentage of incidents will also increase. These issues are considered significant by the Fire Marshal.

The Otay Municipal Water District (OMWD) could serve the site with 3,000 gpm. Fire flow requirements may be as high as 5,000 gpm, depending on the type of occupancy and square footage of buildings. However, with installation of sprinkler systems, these requirements could be 2,500 gpm, well within the amount provided by OMWD.

Impacts to the present service system as perceived by Police personnel are considered to be light. The amount of proposed commercial uses is small, which will cut down on numbers of customers and thereby related problems such as shoplifting. Some traffic congestion and related accidents are expected to occur, but no serious impacts are expected to result from construction. The biggest problem perceived at this time is that the area is somewhat isolated and it takes some minutes to get there. Because staffing is not tied to population but rather to required service, personnel will only be increased if justified by a presently unknown future increase in service calls.

As the development will result in new uses for a currently rural and lightly populated area, such impacts will certainly occur. This is particularly so when proposed surrounding developments are considered. The adjacent proposed residential developments are planning for thousands of new homes and associated uses such as schools. Considered in this context, the proposed Otay Rio Business Park will result in relatively small impacts which will affect the growing system only incrementally.

C. Mitigation

Regarding the street width issue on I and K Streets, two mitigative measures are possible. Chillingsworth could either enlarge the cul-de-sac, providing the fire apparatus with the necessary 80 feet to turn in, or provide clearly marked signs and curbs prohibiting street parking in the area. Other general safety features include the installation of sprinkler and smoke detectors and the required provision of an adequate number of fire hydrants with sufficient fire flow capacity at appropriate locations onsite. *These measures will be ensured by conditions on the Tentative Subdivision Map.*

The Fire Department recommends the addition of one fire station, apparatus and personnel, as well as one fire inspector to best serve the needs of the proposed project and surrounding proposed development. The Safety Element of the City of Chula Vista General Plan indicates that the station should be

> large enough to accommodate a station office, living quarters for the on-duty personnel, areas for apparatus storage and maintenance, off-street parking, and environmental amenities, such as landscaping and walks.... New fire stations should be built to house no less (sic) than two apparatus (Safety Element, July 1974:3).

Battalion Chief Lopez (personal communication to L. Capper 1/6/87) suggested that a cooperative agreement such as an assessment district could be pursued between Chillingsworth, the surrounding area developers, and the City in order to pay for necessary facilities. In the meantime, the Cities of Chula Vista and San Diego have an Automatic Aid agreement. San Diego City is also considering a new station in the vicinity of Brown Field which would be constructed by 1990 or 1991.

Sprinkler systems may be required in some of the buildings, and Fire Department personnel will be able to determine this need once detailed plans for development, including building square footages, are submitted to the City for approval.

There is no Chula Vista City ordinance to require specific types of security. Director of Public Safety Winters, however, specifically suggested adequate lighting. This would be advised for the entire proposed development. Restricted site access throughout the industrial lots and night-watchmen for the industrial/commercial areas would also be possible. The City could also evaluate the possibility of establishing an assessment district to finance increased public services due to development in a previously non-urban area.

## D. Analysis of Significance

Fire and Police impacts to the existing setting are certain to occur, and with respect to the Fire Department especially, to be major in nature. All of these impacts are mitigable, however. While possible revenue sources and time frames are currently unknown by department personnel, the perceived impacts are solved by increased monies which should be obtainable. Therefore, overall the level of impact to City of Chula Vista Fire and Police protection services is considered low.

## 3.16 WASTE DISPOSAL

### A. Project Setting

The proposed project location is within the service area of Chula Vista Sanitary Service, located at 311 F Street, Chula Vista. Information provided below was obtained from Ms. Mary Thimm of that company and Ms. Julia Quinn at the San Diego County Solid Waste-Landfill Division.

Chula Vista Sanitary Service currently uses 11 trucks for residential pickup and 9 trucks for commercial/industrial service. Each one of the residential units can pickup from 250 homes per load, and can carry two loads per day. The commercial units can each empty 65 of the three-yard trash bins per load, and can also complete two loads per day. The Service is not presently operating at capacity; backup trucks are available.

Loads collected are disposed of at the County-owned Otay Landfill on Maxwell Road. This facility is just off Otay Valley Road; approximately 1.0 mile east of Interstate 805 and approximately 0.5 mile away from the proposed project site. The current (1/87) projected life-span of the Otay Landfill is 12 years. The County is beginning to consider evaluation of future sites in the mountainous eastern portion of the County, in North County, and in the Southbay area (the latter in agreement with the City of San Diego).

### B. Impacts

The residential portion of the proposed project includes 49 single family dwellings. These residences would require the partial services of one truck for a half day route which would be run once a week.

Impacts to the system resulting from proposed light industrial and commercial uses of the project are more difficult to project, as precise use of the space is not yet known. On the average, however, one commercial truck is required per day for each 130 units of light industrial businesses. Project proposed uses include 79 commercial and industrial lots. If users of each of these lots fill one three-yard bin per day, pickup would require between half and full-time use of one commercial unit. No problems are foreseen with these levels of service. Additional trucks are presently available and sufficient to deal with the proposed generated amounts.

Also, although minor in degree compared with waste generated in the surrounding region, Otay Rio use will incrementally decrease the lifespan of Otay Landfill.

## C. Mitigation

No recommendations were made by the Landfill Division for ways in which incremental impacts to the life of the landfill could be lessened. In order to reduce the volume of trash which contributes to these incremental impacts, however, the development could incorporate trash compactors to reduce volume (thereby reducing not only the number of trips to Otay Landfill but also the space required there).

## D. Analysis of Significance

Although the Otay Rio Project will result in increased service to an area lightly served previously, no significant impacts to the system are anticipated to occur to Chula Vista Sanitary Service. Even when impacts from planned surrounding developments are considered, the nature of the business results in low impact ratings being assessed. Increased service will provide additional monies to buy additional trucks and hire additional personnel. As the service is presently operating with more capacity than is needed, adequate response time to changed circumstances seems assured.

# 3.17 UTILITY SERVICE/ENERGY CONSERVATION

## A. Project Setting

The proposed Otay Rio Business Park locale is provided with energy by San Diego Gas and Electric (SDGandE), Southbay, located at 436 "H" Street, Chula Vista. Information provided below was obtained primarily from Mr. Richard Heilman from the Southbay office. Mr. Dan Wise of the Marketing Division of SDGandE, San Diego office, provided the information on possible natural gas use.

At the present time, the project area is served by electric lines only. The closest gas line is located approximately 5,600 feet east of where Otay Valley Road turns to trend south. Several dwellings and primarily fallow fields comprise the primary project locale land uses.

Present energy use on site is therefore minimal, consisting of small agricultural and residential loads.

One 12kV circuit line extends along Otay Valley Road both to the north and east of the project area. A 69kV transmission feeder line extending between two substations crosses the property toward the south end of the project where the terrain becomes more steep. A final distribution line extends south from Otay Valley Road where it borders the property on the north. This line is the existing SDGandE alignment located at the northwest corner of the property, and is slated for relocation.

The City of Chula Vista has in effect a Policy for the Conservation of Energy and Water (9/13/78), which has been incorporated into the Housing Element of the Chula Vista General Plan (8/21/86). Pages 2 and 3 of the Policy include the following principles:

1. All buildings should be solar oriented. The use of solar, wind, or tidal energy in all new and remodeled buildings should be encouraged. Nondepletable and renewable energy sources should be favored by this municipality's plan reviewing agencies, and depletable and nonrenewable sources should be discouraged thereby.

2. The use of landscape materials which are conducive to energy....conservation should be encouraged. These materials include...trees employed as windbreaks.

3. All residential structures should be arranged in a manner which minimizes the impact of wind upon residential comfort.

4. Walls and fences should be arranged to admit useful light and sunshine and to permit exclusion of detrimental rays.

5. Townhouse, patio home, and terrace house projects have fewer exterior walls and windows than detached single family dwelling developments, and consequently experience less heat loss. The said projects, therefore, should be promoted.

6. The use of energy-efficient appliances and equipment should be urged.

7. Builders should be encouraged to install double pane windows, skylights, pilotless gas appliances, fluorescent lighting, and roof and wall insulation where such would be cost effective as well as energy conservable.

8. The use of deciduous trees, which have a dormancy period, should be encouraged where useful to control exposure to sun.

9. All external equipment and structures related to energy or water conservation, such as solar panels, windmills, skylights, fan housings, and storage tanks, shall meet preannounced bulk and height standards of the zoning regulations and shall be governed by the City of Chula Vista's townscape planning guidelines. Exceptions to bulk and height standards may be allowed to encourage innovation where such will not be detrimental to adjacent properties.

10. The municipal officers and agencies charged with the administration and implementation of the Landscape Manual, the Design Manual of the City of Chula Vista, and the Chula Vista Town Centre Design Manual shall consider the importance of energy conservation during the course of their review of public or private projects.

11. A reduction in the size of the R-1 lot should be considered. Large lots mean extensive landscaping and irrigation, and the excessive allocation of energy to domestic use.

12. The use of fixed or movable sun control devices, adequate attic ventilation and appropriate colors should be encouraged.

Additional principles outlined by the City include the following:

1. Buildings should be wider than deep.
2. Buildings should "face" south (if maximum radiant energy is desirable).
3. The southerly exposure should be tree shaded or porched.

Finally, the Policy states:

> Although most of the planning texts confine their discussions on solar orientation to residential structures, this orientation can also be utilized in the planning of commercial, office, and industrial buildings. The avoidance of the direct, unshaded solar exposure would be essential in the designing of an office building (Appendix, Policy for the Conservation of Energy and Water, 1978).

B. Impacts

Located at the tail end of existing circuits, development on the subject property would strain the existing system. Loads resulting from the projected residential development are considered inconsequential when compared to those anticipated to result from the slated commercial and industrial uses on the property. Together, however, proposed development uses will impact the existing system. Also, other planned area developments, in conjunction with the proposed project, would result in cumulative impacts to the existing system.

A new substation has just been completed on the corner of Harvest Road just south of Otay Mesa Road and to the east of Brown Field. The current circuits feeding the project site extend from the Main Street substation in Chula Vista. Existing circuits may have to be rearranged, extended or shortened.

C. Mitigation

Energy impacts can be mitigated to some extent by such generally accepted methods as sealing of doors and windows, increases in wall and ceiling insulation, and orientation and modification of the building so as to incorporate solar benefits. Time-controlled lighting systems throughout the industrial/commercial portions of the project would also lower electrical costs.

A major energy-saving measure which the developer could undertake is to bring natural gas on-line to the project. In addition to being a "clean" energy source (natural gas combustion emits virtually no sulphur dioxide or particulate matter and produces almost no solid waste, water pollution or sludge), natural gas is cost efficient. Use of gas in homes and industrial areas is steadily increasing in desirability in San Diego County. For both residential and commercial/industrial use, gas is cost and energy efficient for heating and cooling as well as other more restricted uses. A current surplus is expected to hold through 1988, after which time supply will meet demand indefinitely. Electrical costs are currently predicted to increase by 2.5 percent by the year 2000. Natural gas costs are expected to remain the same.

SDGandE would provide gas to the project if the developer pays for building of the line to bring it in. Presently, the nearest gas line is located approximately 5,600 feet from the point at which Otay Valley Road turns south. If tenants are on the property at the conclusion of line construction, most if not all of the monies expended could be reimbursed on a pro rata basis as gas is utilized. If the lots are sold without gas hook-ups, the Lessees themselves may wish to pursue this option. Use of gas throughout the proposed development would be a desirable energy option for the City to pursue in addition to the solar options and planting the City currently endorses.

D. Analysis of Significance

While the Otay Rio Business Park project will impact the existing SDGandE service system, the level of impacts is incremental. The increments by which services will need to be modified to the area are minor when considered in light of other planned growth in the immediate area. No major energy impacts will result from construction of this project.

## 3.18 WATER AND SEWER SERVICE

A. Project Setting

1. <u>Water Availability</u>

The Otay Rio Business Park site was previously within the jurisdiction of the City of San Diego before its annexation to the City of Chula Vista. The City of San Diego is a member of the Metropolitan Water District (MWD) and the San Diego County Water Authority (CWA), whereas the City of Chula Vista is not. Because the City of Chula Vista is not a member agency, it cannot serve its jurisdiction with water. Otay Municipal Water District, also a member of the Metropolitan Water District, services much of the City of Chula Vista in the project vicinity. Also, the California American Water Company (Cal-American), using City of San Diego local water, services portions of Chula Vista to the west of the project site.

Even though the site is now outside the City of San Diego boundaries, it is presently receiving water from the City of San Diego for residential use. Even after the annexation, the site was also receiving City of San Diego water for agricultural purposes. The resident who presently lives onsite leases agricultural acreage from the developer, and was irrigating approximately 40 acres in summer, 1985, with a decreasing amount to late 1986. The resident has since terminated its water supply for agricultural purposes, but retains water supply for residential purposes. The City of San Diego has a water main alongside the south side of Otay Valley, adjacent to the project site. The Otay Municipal Water District's closest lines to the site are located approximately 7,500 feet down Otay Valley Road (to the west) at Maxwell Road.

The Metropolitan Water District (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 utilizing its total allotment, MWD's allotment could decrease to 450,000 acre feet. The Central Arizona Project, scheduled to be completed in 1985, is behind schedule, and there is presently a surplus of water in the Colorado River water, thus allowing MWD to receive its historical share. However, it can be seen that 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 to use IID's excess water for some compensation. Also, there is water 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. Thus, the availability of water supply in southern California is for the time being adequate, but changes to this situation may occur in the future.

2. Sewer Service

The City of San Diego's Otay Valley Trunk Sewer runs along the northern boundary of the project site and crosses to the south of the floodplain. This (27-inch) trunk sewer handles very low amounts of sewage presently, and has a capacity of 5.88 mgd (Varga, 1987). The trunk sewer line connects with San Diego's metro system which eventually terminates at the Point Loma Sewage Treatment facility. Chula Vista would use their own capacity in the Metro system for project-related sewage. The Point Loma Sewage Treatment plant is an advanced primary treatment facility that is continuously upgraded to meet demand, however, future plans are to upgrade the plant to a secondary treatment system.

## B. Impacts

### 1. Water Service Availability

Due to the unknown nature of the future onsite industrial developments, it is difficult to determine the amount of project site water consumption. However, calculations were made based on a "worst-case" scenario using net density for commercial and industrial uses. Based on these worst-case assumptions, the project site could consume approximately 512,000 gallons per day for residential, commercial and industrial uses, as shown by the table below.

TABLE 3-6
WATER DEMAND

| Land Use | Demand Rate | Total Demand (gallons) |
|---|---|---|
| Residential | | |
| Single Family | 500 gallons/day/dwelling | 24,500 |
| Office/Commercial | 5,000 gallons/net acre[1] | 15,600 |
| Industrial | 6,250 gallons/net acre[1] | 472,000 |
| Total Daily Consumption | | 512,100 |

[1] Gross acreage minus 30 percent land use loss in net density calculations.

In order to service the site with water, the developer must negotiate an agreement with one of the agencies that can provide the water supply. Three options appear to be possible. The first is to annex back into the City of San Diego's water service; the second is to contract services from Cal-American; and the third is to annex into Otay Municipal Water District's service area. Each option is discussed separately.

Option 1: The City of San Diego would not annex the project site back into their jurisdiction for water service only, eliminating the potential for this option.

Option 2: Both the City of San Diego and Cal-American expressed concern that the agreement between them cannot be expanded to include the project area. Cal-American's service area is located to the west of I-805, which is considered too far away to be a viable solution.

Option 3: In order to annex into Otay Municipal Water District (Otay), approvals must be obtained from the Local Agency Formation Commission (LAFCO), the MWD, and the CWA. Otay has stated that they could supply the water from their existing system. The developer would have to extend water mains approximately 7,500 feet from the closest point of connection, which is at the intersection of Maxwell Road and Otay Valley Road. Or, Otay might be able to negotiate (at the developer's expense) with San Diego for the use of their water mains already located onsite. Otay's system could supply 3,000 gallons per minute without extensive system changes. The costs to annex to Otay are approximately $168,500.00, and the tie-in costs cannot be determined until detailed plans are submitted. MWD would consider annexing the site into Otay without any annexation fees to MWD because the deannexation from their system is considered an error. The developer has an application into Otay for annexation to their District. This option appears to be the most viable as action has been taken and Otay has indicated they could supply the water.

No impacts to water availability from development on the site would occur once an agreement is made with one of the water districts. Cumulative impacts to the entire southern California water availability situation would occur from the increased water demand at the site.

2. <u>Sewer Service</u>

At this time it is difficult to determine the amount of sewage generated by the proposed development. A "worst-case" scenario is based on net acres for commercial and industrial uses, and number of dwelling units for residential use. This scenario is shown below.

TABLE 3-7
SEWAGE GENERATION

| Land Use | Generation Rate | Total Generation |
|---|---|---|
| Residential | | |
| Single Family | 280 gallons/day/dwelling | 13,720 gallons/day |
| Office/Commercial | 3,500 gallons/net acre[1] | 10,920 gallons/day |
| Industrial | 5,000 gallons/net acre[1] | 377,600 gallons/day |
| | | |
| Total Daily Generation | | 402,240 |

[1]Gross acreage minus 30 percent land use loss in net density calculations.

Again, the above shows a "worst-case" scenario, and the actual amount of sewage generated by the project would not be known until the results are obtained from the metering station.

Mr. John Lippett of the City of Chula Vista's Engineering division has discussed a tentative agreement with the City of San Diego where the City of Chula Vista would be responsible for serving the project area with sewer service, would operate and maintain the onsite lines (including San Diego's trunk sewer line), and would perform the billings for the service. Chula Vista would pay San Diego for the use of capacity in the trunk sewer line, with payment based on the amount of sewage generated. Chula Vista would install an onsite metering station to monitor sewage generation. *The developer will be responsible for the payment of all direct and incidental costs for the provision and maintenance of the sewage metering station(s).*

The project would impact the existing system by generating more sewage to this system. Based on the above scenario, the project would use approximately 7 percent of the capacity in the trunk sewer. Thus, the system does have a large amount of available capacity, and the City of San Diego is willing to take the additional project-generated sewage. Impacts to the system are not considered to be adverse or significant.

As the Otay Valley area continues to develop, the additional capacity in the San Diego trunk sewer will significantly decrease from the cumulative generation of sewage from Otay

Valley developments. The City of Chula Vista is presently discussing long-term solutions to this situation.

C. Mitigation

A final agreement between the developer and a water district (probably Otay) would be necessary to mitigate *to a level of insignificance the* potential water availability problems. This agreement should be finalized before grading permits are issued to the developer. Otherwise, no mitigation is necessary. However, in order to reduce the amount of water consumption from the site after development, which would contribute toward mitigation of cumulative impacts, the developer could include water conserving measures into the Precise Plan. Such measures include faucet and toilet devices to decrease building consumption, and landscaping with native vegetation to decrease landscaping maintenance consumption. *Some measures are required by law, and others would be subject to the City's conditions on the Tentative Subdivision Map.*

D. Analysis of Significance

Water availability would be possible upon negotiation between the developer and one of the water serving districts. It appears that an agreement is underway between the developer and Otay Municipal Water District, which must be finalized before grading and development permits are issued by Chula Vista. The developer would have to extend Otay's water mains approximately 7,500 feet, would have to pay an annexation fee of approximately $168,500.00 and tie-in costs, which are unknown at this time. The developer would agree to these conditions, thus no impacts would occur.

Sewer service is available from the City of San Diego. The developer needs to finalize an agreement with San Diego for this service. No impacts would occur.

Cumulative impacts to the southern California water availbility situation could be partially mitigated by installation of water conserving devices in buildings, and landscaping with native vegetation. The Precise Plan could include these measures.

## 3.19 TRANSPORTATION/ACCESS

The Transportation/Access study and report were performed by Basmaciyan-Darnell, Inc. (BDI) for Keller Environmental Associates, Inc. The entire report is contained as Appendix E, and is condensed in this section.

### A. Project Setting

#### 1. Existing Roadway Conditions and Future Classifications

##### a. Otay Valley Road

Otay Valley Road runs easterly from I-805 for approximately two miles, where it heads in a southerly direction to its junction with Heritage Road. West of I-805, Otay Valley Road merges with Main Street, which traverses Chula Vista, accessing the City's major north/south streets (Hilltop Drive, 3rd Avenue, 4th Avenue, and Broadway), as well as I-5.

Between I-805 and Oleander Avenue, Otay Valley Road is currently a four-lane roadway with two travel lanes in each direction, and left turn pockets at major intersections (essentially a four lane major street, lacking a raised median). When it was last counted, in 1983, this segment of Otay Valley Road was carrying 10,425 average daily trips (ADT). Figure 3-9 shows streets in the project vicinity, and Figure 3-10 summarizes the available daily traffic counts for these streets.

Between Oleander Avenue (from approximately 150' east of Oleander) and its juncture with Heritage Road, Otay Valley Road is currently a two-way, two lane roadway, approximately 28 feet wide with limited shoulder area. Just south of the river, Otay Valley Road is currently carrying 1,400 ADT (count taken by BDI 3/87).

According to the City of Chula Vista, Otay Valley Road is currently planned to be realigned to extend east to the future State Route 125 as a six-lane primary arterial. The existing north/south segment of Otay Valley Road would be realigned and renamed (part of the northerly extension of Heritage Road). This segment is also currently planned as a six-lane primary arterial. The first stage of constructing Heritage Road will take it to Otay Valley Road, forming a "T" intersection. Ultimately, it will extend northerly to Telegraph Canyon Road. This north/south segment on the east side of the project site has existing

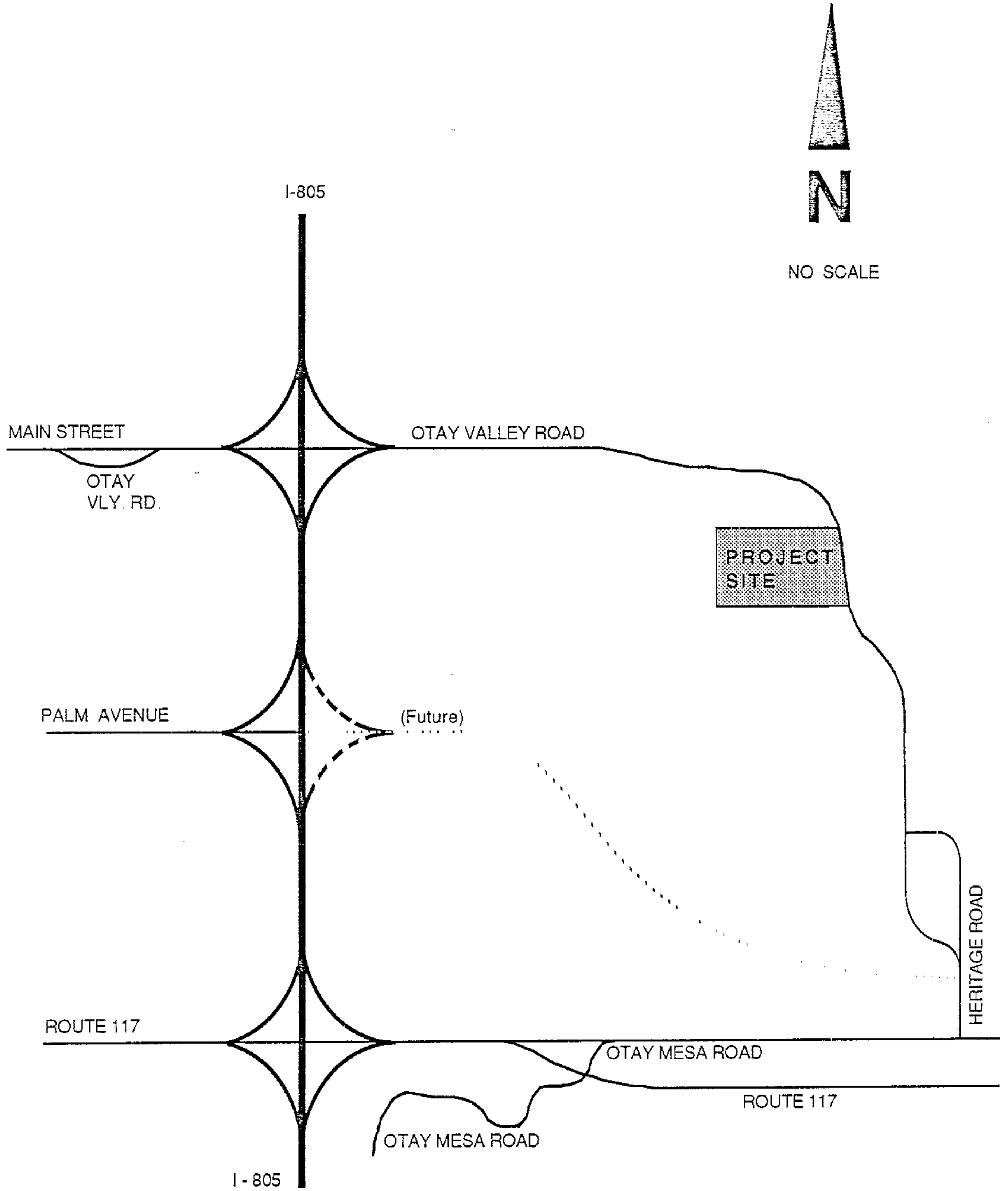



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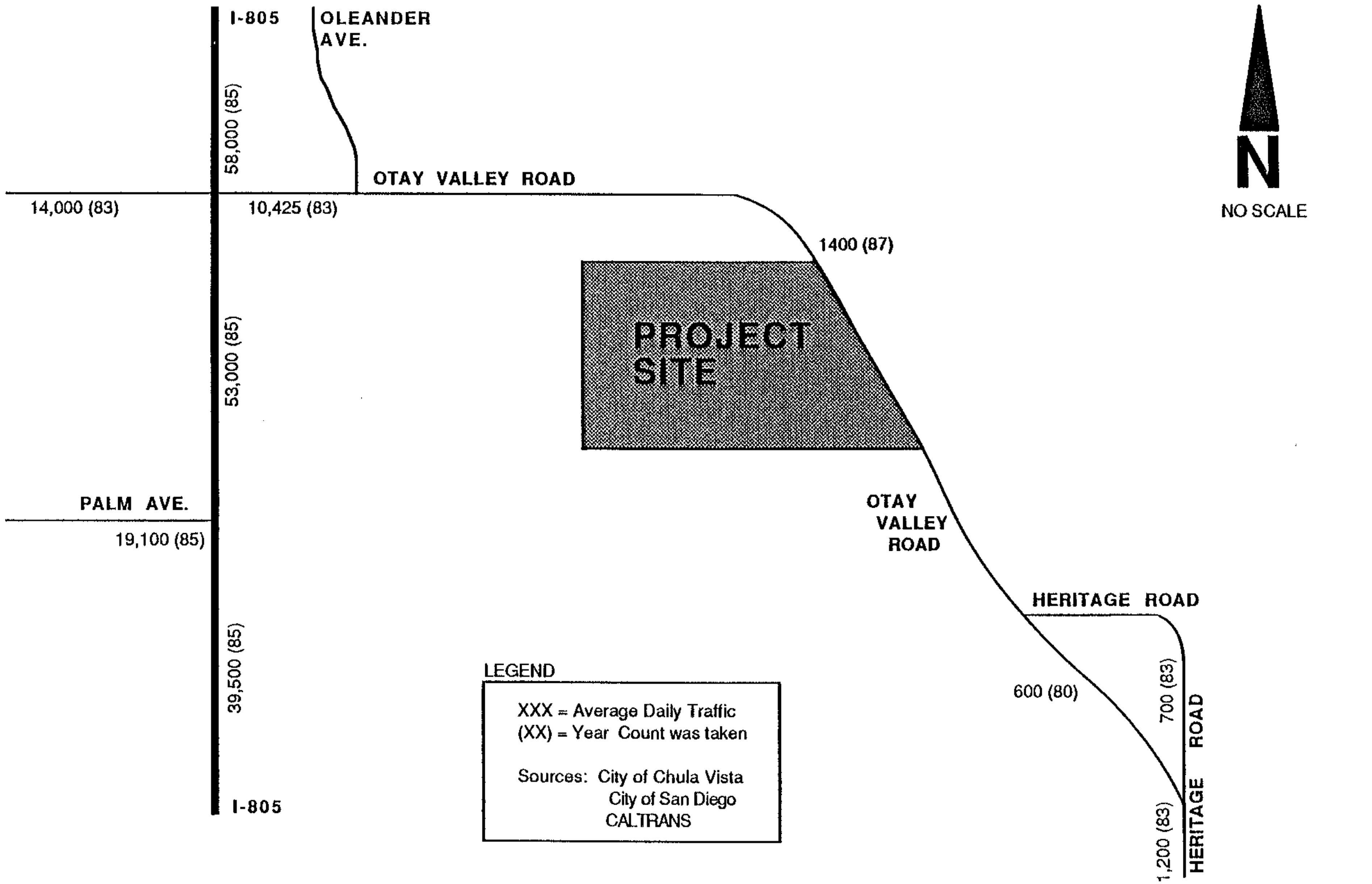
**Figure 3-9**
**VICINITY MAP**

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# EXISTING ADT IN THE VICINITY OF THE PROJECT

Figure 3-10

substandard curvature. At the time for approvals of the Tentative Map, additional right-of-way may be required of the development to straighten the alignment. This could affect some lots on the south easterly side of the site. In the future, an alignment study may need to be done.

It should be noted that an updated travel forecast and circulation study for the City of Chula Vista is in the process of being conducted. This effort is not expected to be completed until September, 1987. The classifications given by the City of Chula Vista are based on their expectation of what will be required.

The County of San Diego's Circulation Element Map shows the same alignment plans for Otay Valley Road and Heritage Road, but the classifications are different. Otay Valley Road was classified as a four lane major road. Heritage Road is shown as a four lane major south of Otay Valley Road to Palm Avenue where it is shown to be a six lane prime arterial.

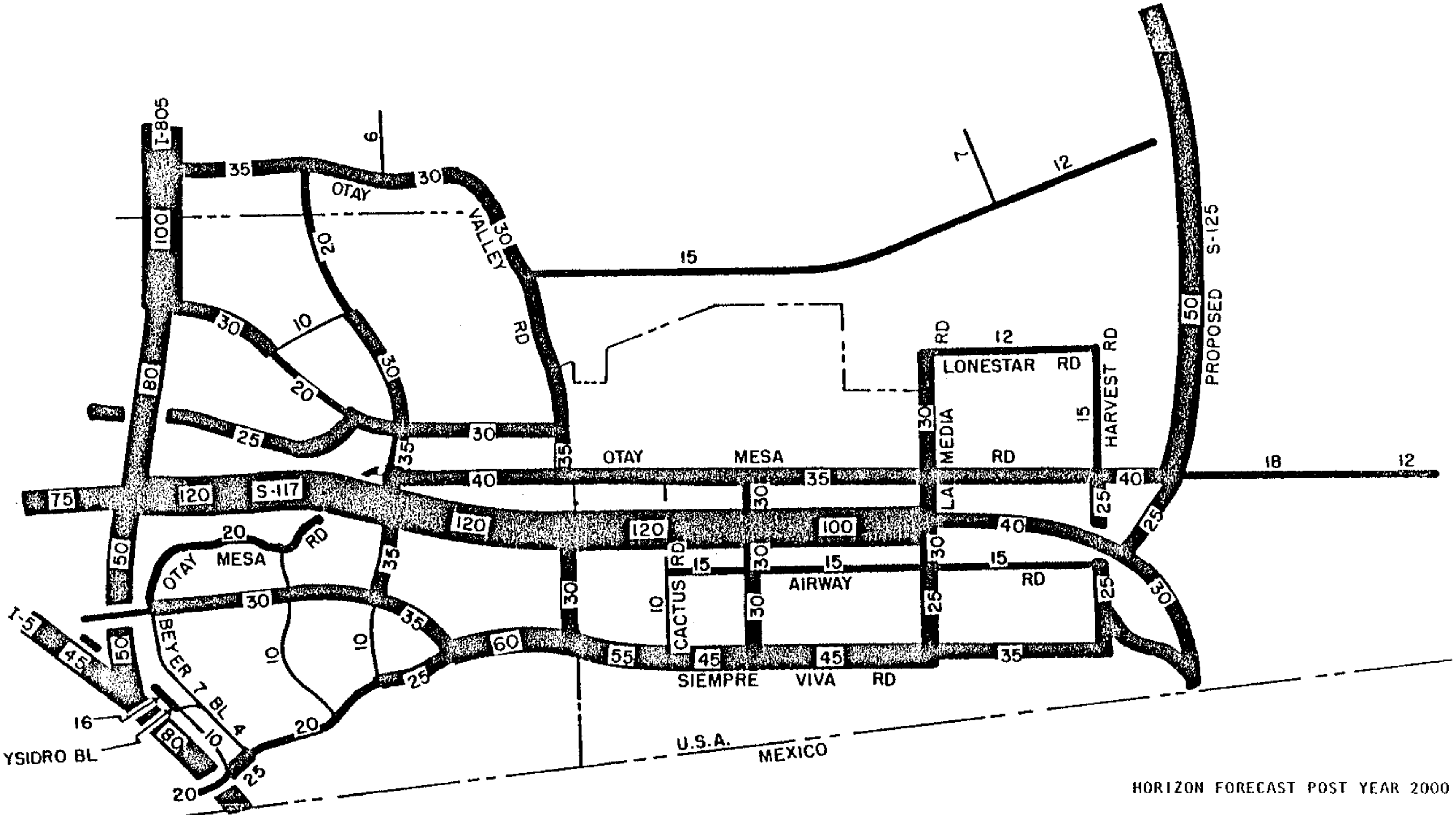
The City of San Diego's Otay Mesa Community Plan shows Otay Valley Road in its existing alignment as a six lane major street near I-805 and a four lane primary arterial to Heritage Road. Heritage Road is also shown as a six lane major street near Otay Mesa Road and a four lane primary arterial near Otay Valley Road.

b. <u>Palm Avenue</u>

Palm Avenue currently does not exist east of its interchange with I-805. To the west, Palm Avenue traverses the City of San Diego's Otay Mesa/Nestor community and provides access to I-5. Palm Avenue has a juncture with Route 75 which provides access to the City of Coronado.

In the future, Palm Avenue will extend easterly to Heritage Road (within the City of San Diego's jurisdiction). The City of San Diego classifies Palm Avenue as a four lane primary arterial east of I-805 and west of Heritage Road (there is a segment classified as a four lane major between I-805 and Heritage Road).

The County of San Diego's Circulation Element Map shows Palm Avenue as a four lane major roadway, with the same alignment as planned by the City of San Diego.



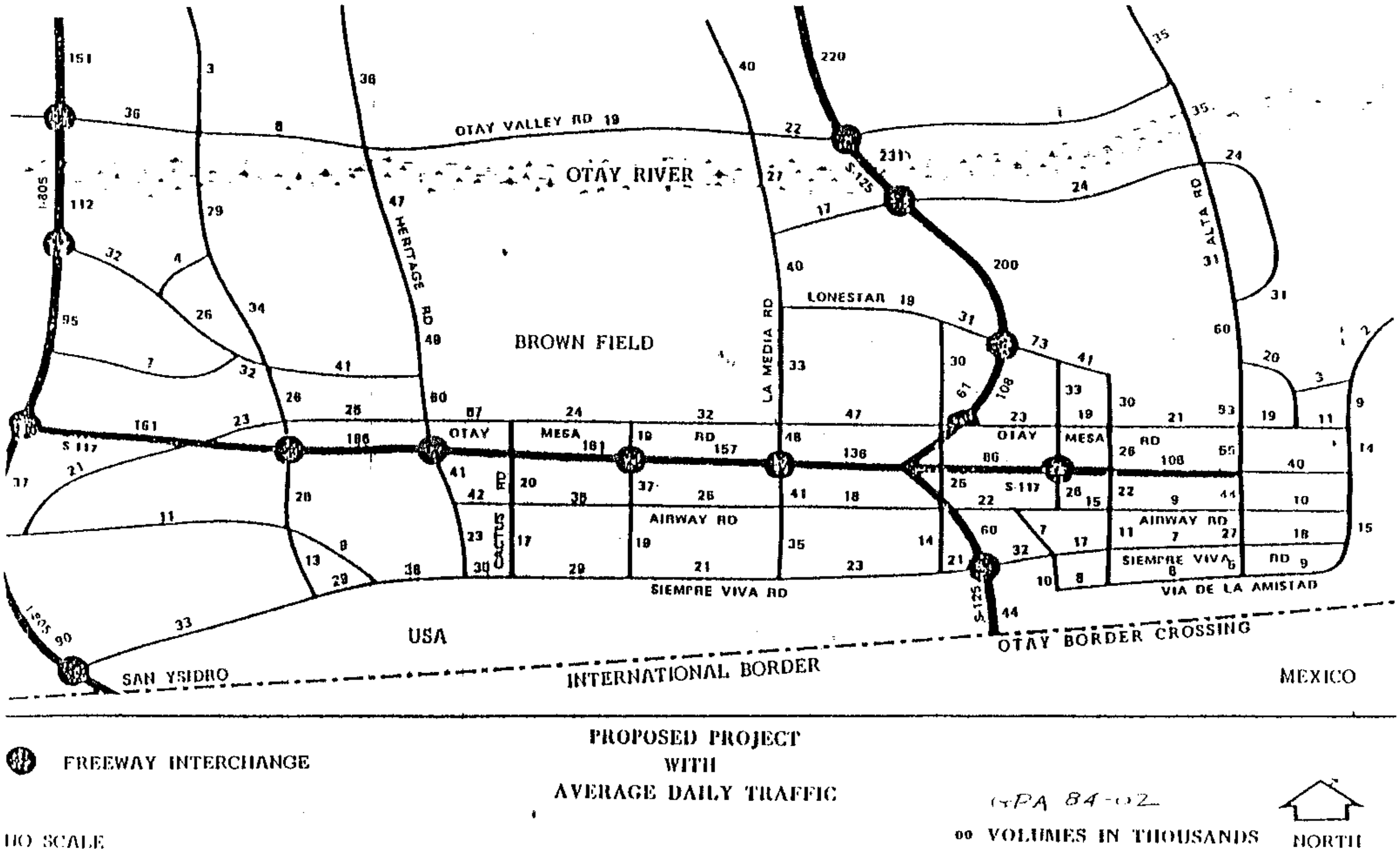

# Otay Mesa Community Plan

PLANNING DEPARTMENT ▪ CITY OF SAN DIEGO

BASMACIYAN-DARNELL, INC.

## CITY OF SAN DIEGO OTAY MESA COMMUNITY PLAN TRAFFIC PROJECTIONS

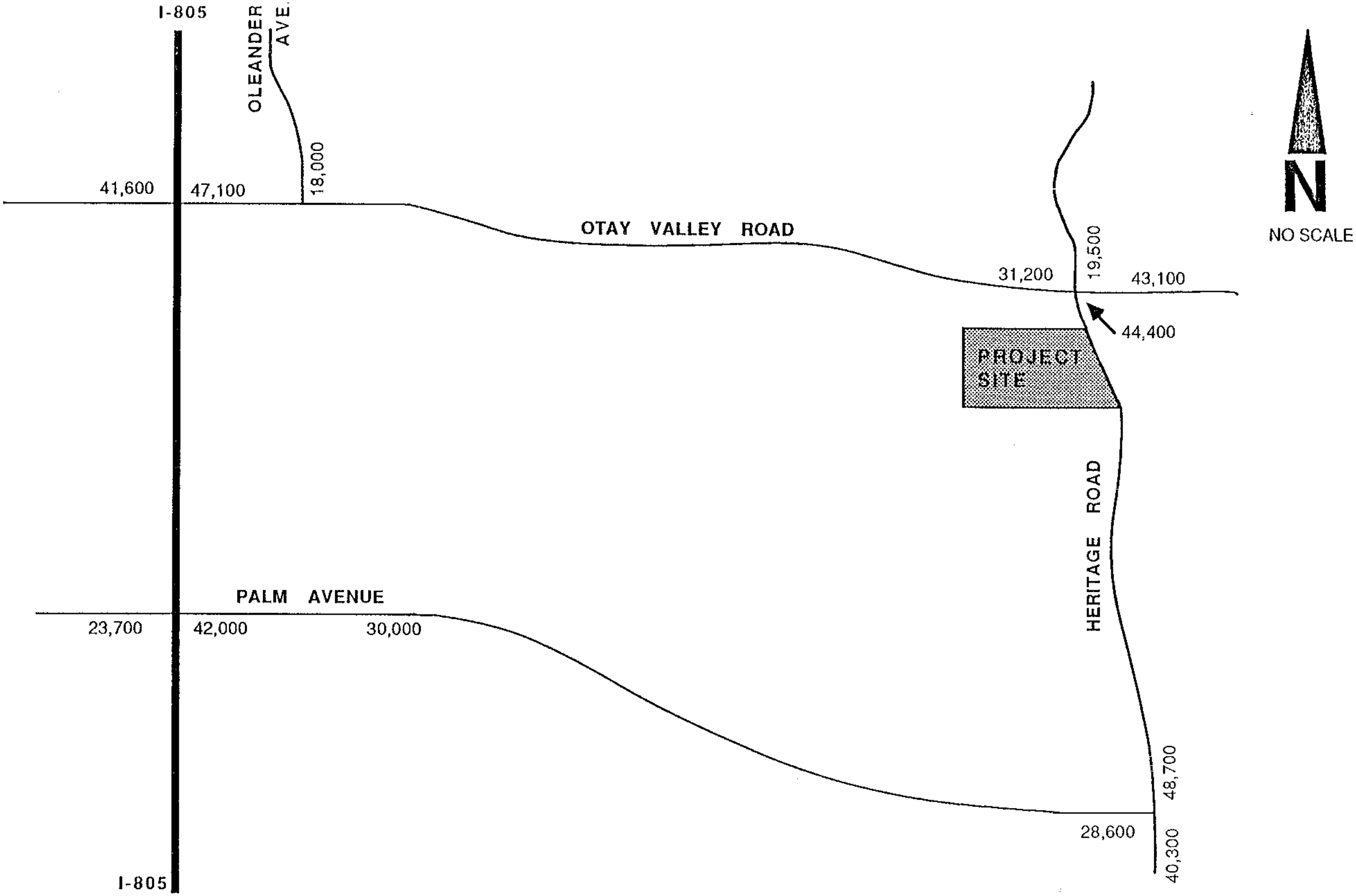
Figure 3-11




BASMACIYAN-DARNELL, INC.

# SAN DIEGO COUNTY GPA 84-02
# TRAFFIC PROJECTIONS

Figure 3-12




BASMACIYAN-DARNELL, INC.

# SANDAG ALTERNATIVE #5 TRAFFIC PROJECTIONS

Figure 3-13

### 3. Public Transportation Services

Public transportation services for the area are provided by Chula Vista Transit. The only bus route serving the area is Route 703, which does provide a connection with the San Diego Trolley at the Chula Vista H Street Trolley Station. However, the stop location for Route #703 closest to the project site is just north of Otay Valley Road, on Oleander Avenue. Therefore, the project site is not well served by transit.

As the surrounding area develops, it may become feasible for the transit agency to expand bus routes to the east. However, under the assumption that the project is built immediately, no convenient transit service would be available.

## B. Impacts

In order to assess the traffic related impacts of the project on the surrounding street system, the expected traffic which would result from the development of the site is estimated. The project traffic is then distributed and assigned to the street system and added to the existing traffic to evaluate the potential impacts.

### 1. Trip Generation

The traffic which would be expected to result from the proposed project, as well as development at the General Plan designation for the site, is estimated using trip generation rates and peak hour factors which have been developed by various agencies. These rates are published by SANDAG in their report entitled "San Diego Traffic Generators," and are accepted by the City of Chula Vista. Table 3-8 summarizes the trip rates and peak hour factors used. Table 3-9 summarizes the expected trips that would be generated by the development of the proposed project and by developing the site under the existing general plan land use designation.

As shown in Table 3-9 (trip rates and peak hour factors used), the proposed project would be expected to add 15,216 ADT to the street system, of which 1,905 and 2,151 are assigned to the morning and evening peak hours, respectively. In comparison, the existing General Plan land use designation for the site would be expected to result in 4,240 ADT of which 339 and 424 are assigned to the morning and evening peak hours, respectively. Thus, the

TABLE 3-8

TRIP GENERATION CHARACTERISTICS

| Use | Daily Trip Rate | AM Peak Hour In* | AM Peak Hour Out* | PM Peak Hour In* | PM Peak Hour Out* |
|---|---|---|---|---|---|
| Industrial | 120 trips/acre | 11.2% | 2.8% | 3.0% | 12.0% |
| Thoroughfare Commercial | 400 trips/acre | 1.8% | 1.2% | 4.5% | 4.5% |
| Single Family Residential | 10 trips/DU | 1.6% | 6.4% | 7.0% | 3.0% |

*Shown as a percentage of the daily trips

TABLE 3-9

TRIP GENERATION SUMMARY

| Use | Intensity | ADT | AM Peak In | AM Peak Out | PM Peak In | PM Peak Out |
|---|---|---|---|---|---|---|
| PROPOSED PROJECT: | | | | | | |
| Industrial | 107.8 ac. | 12,946 | 1,450 | 362 | 388 | 1,554 |
| Thoroughfare Commercial | 4.45 ac. | 1,780 | 32 | 22 | 80 | 80 |
| Single Family Res. | 49 DU | 490 | 8 | 31 | 34 | 15 |
| Total: | | 15,216 | 1,490 | 415 | 502 | 1,649 |
| EXISTING GENERAL PLAN DESIGNATION: | | | | | | |
| Single Family Residential @ 3 DU/ac.* | 424 DU | 4,240 | 68 | 271 | 297 | 127 |
| Net Increase due to Proposed Project: | | 10,976 | 1,422 | 144 | 205 | 1,522 |

*Estimated dwelling units based on 69% of the 205-acre site being developable and using 3 dwelling units/acre (low density residential designation).

proposed project would generate 10,976 more average daily trips than the existing General Plan. Of these, 1,566 and 1,727 more trips would be expected due to the proposed project during the morning and evening peak hours, respectively.

### 2. Trip Distribution

The allocation of trips to the street system is made on the basis of an estimate of likely ultimate travel destinations and the streets that would be used to reach those destinations. The basis for this is recognition of the driver's consideration of time, distance, comfort, and convenience in choosing a route. Major factors include major attractors in the area, and the roadway network itself.

The directional distribution estimated for traffic to and from the project is summarized in Table 3-10. As shown, the industrial and commercial tripmaking patterns were assumed to be oriented slightly differently from the residential tripmaking pattern. The difference was assumed to account for residential trips seeking services, schools, etc. within the area. Most notably, it was assumed that 10% of the residential trips utilize the commercial development within the site.

TABLE 3-10
TRIP DISTRIBUTION FOR PROJECT SITE

| To and From | Roadway | Percent of Project Trips Ind./Comm. | Percent of Project Trips Residential |
|---|---|---|---|
| North | I-805 | 65% | 55% |
| South | I-805 | 10% | 10% |
| South | Otay Valley Road | 10% | 10% |
| West | Otay Valley Road | 15% | 15% |
| Total: | | 100% | 90%(a) |

(a)10% of the residential trips were assumed to be attracted to the thoroughfare commercial development on the site (internal trips).

### 3. Assignment of Project Trips

The percentages of trip orientation (Table 3-10, above) were applied to the estimated trip generation for the project site for two scenarios of available access. The first assumed that only Otay Valley Road would be available for access to and from the proposed project. The second assumed that the extension of "A" Street was in place, providing secondary access for the industrial lots within the site. For this assignment, the site was sectioned to estimate the logical pattern for trips to achieve the direction of travel desired. Distance and convenience were primarily accounted for in this assignment of the project trips. Note that the residential units only take access from the extension of "J" Street, so that Otay Valley Road is the only access road for these trips (no internal connection to "A" Street).

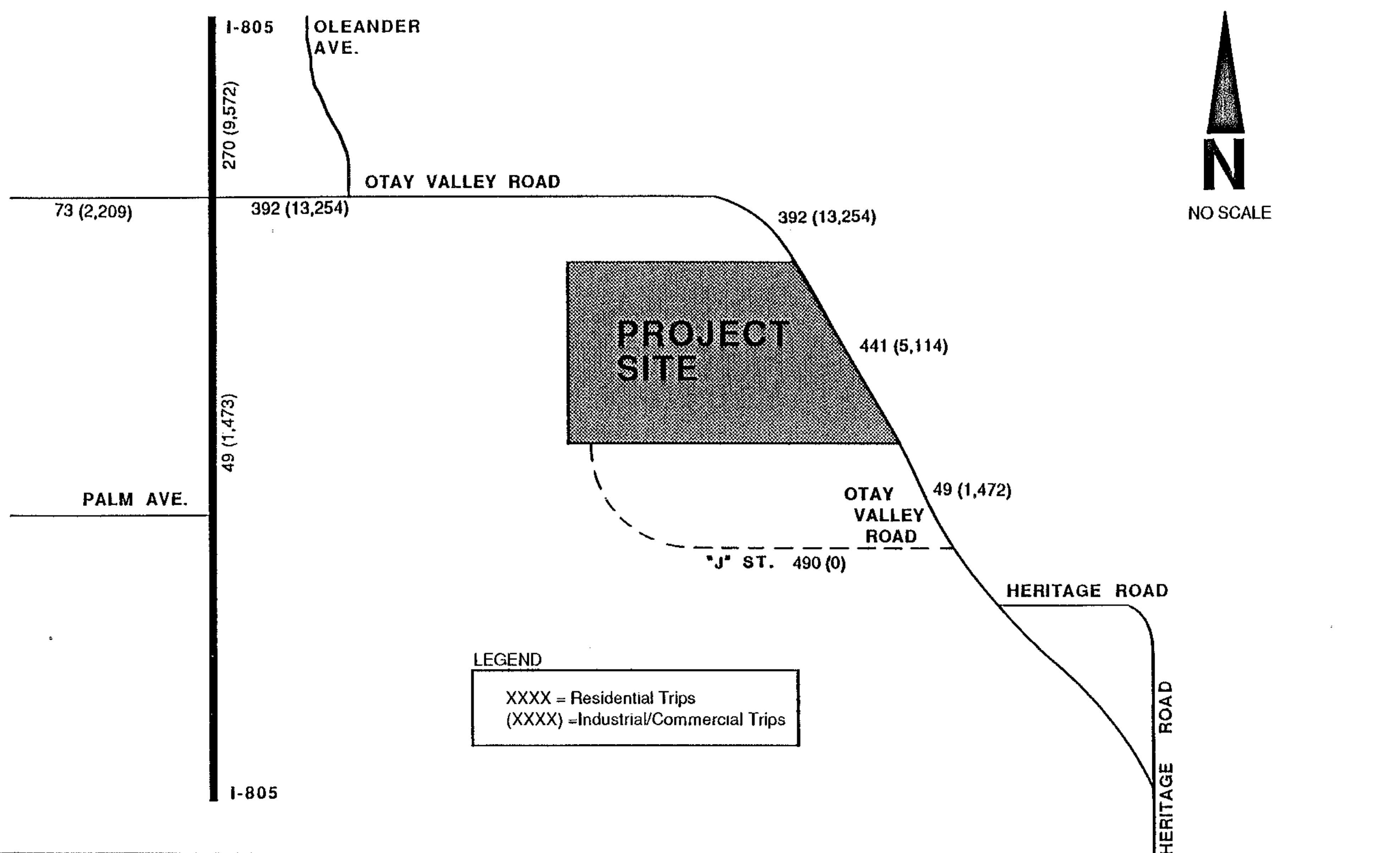
Figures 3-14 and 3-15 summarize the assignment of project trips under the two assumptions of access. The residential trip assignment is shown separately from the industrial and commercial trips. Figures 3-16 and 3-17 show the existing ADT plus the assigned trips due to the project site, for the assumptions of only Otay Valley Road available access and secondary access available, respectively.

To compare the effects of the project on the surrounding street system to what would occur if the site is developed under the existing General Plan land use designations, the low density residential estimated trip generation (Table 3-9, Trip Generation Summary) was also assigned. Figures 3-18 and 3-19 show the assigned General Plan designation trips as well as the existing ADT plus the assigned General Plan designation trips for the two scenarios of available access.

### 4. Project Impact on Surrounding Street System

Table 3-11 summarizes Figure 3-10 (Existing ADT in Project Vicinity) and Figures 3-16 through 3-19. Table 3-12 summarizes the comparison of the roadway segment volume to capacity ratios for the existing traffic and with the addition of project traffic (as proposed and at the General Plan designation).

As shown in Table 3-12, developing the property under the General Plan land use designation of low density residential does not significantly impact Otay Valley Road; the volume to capacity (V/C) ratios for the segments do not exceed 1.0 for either assumption of access, with the exception that it slightly exceeds 1.0 just north of the site (it is 1.04 on

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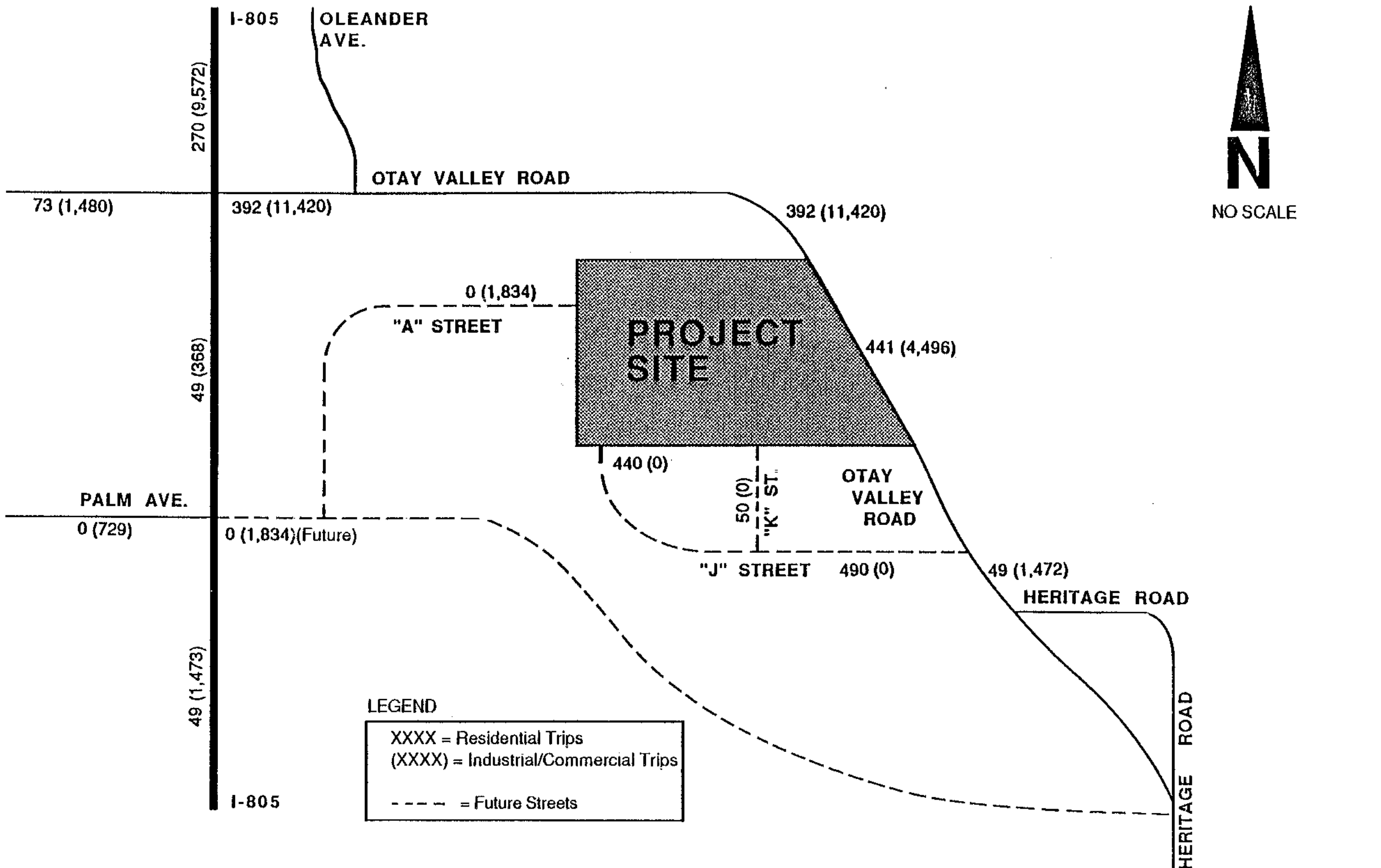
**ASSIGNMENT OF PROJECT TRIPS**
(ONLY OTAY VALLEY ROAD FOR ACCESS)

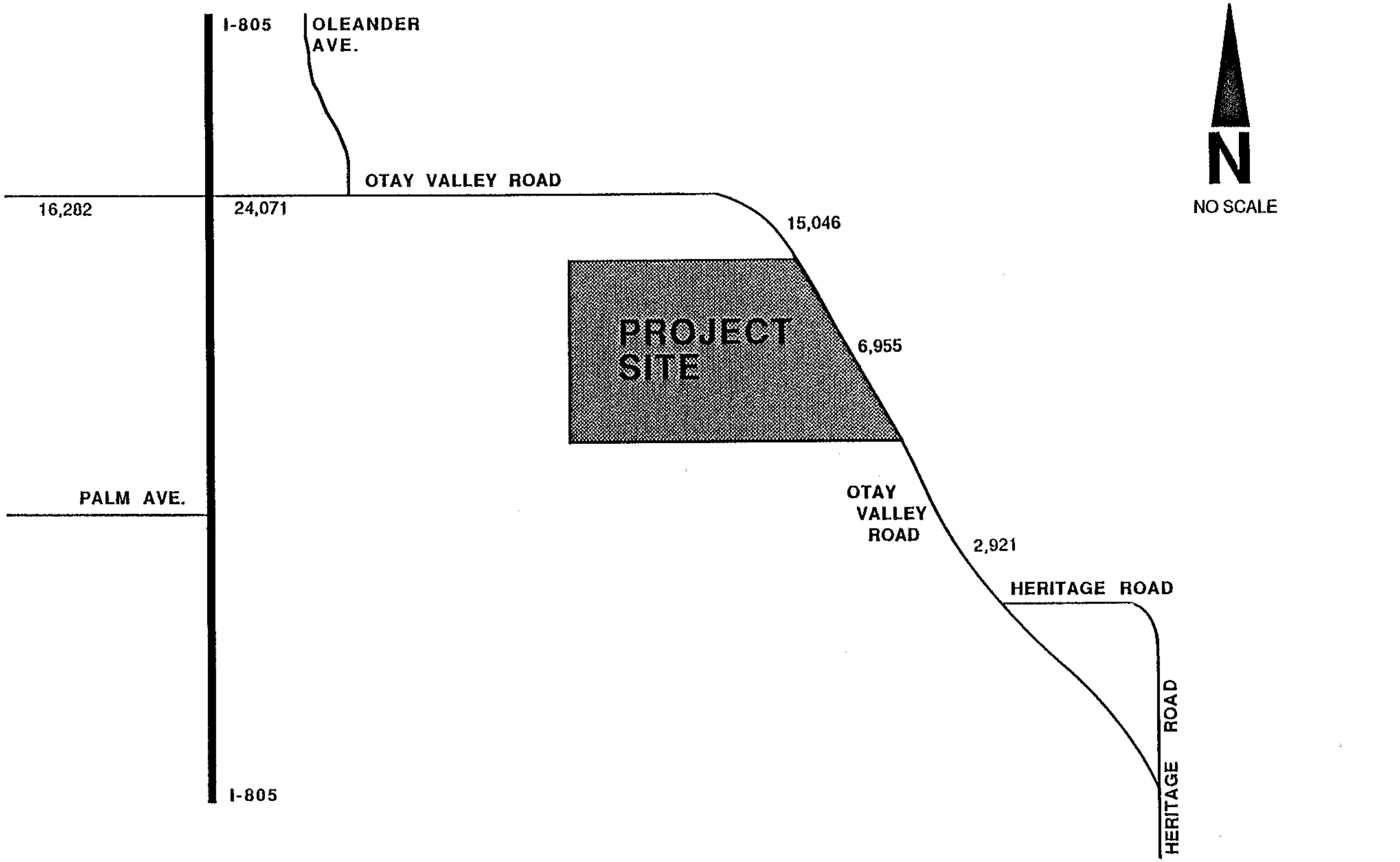
Figure 3-14




BASMACIYAN-DARNELL, INC.

**ASSIGNMENT OF PROJECT TRIPS**
(SECONDARY ACCESS FROM FUTURE STREETS)

Figure 3-15




BASMACIYAN-DARNELL, INC.

**EXISTING ADT + ASSIGNED PROJECT TRIPS**
(ONLY OTAY VALLEY ROAD FOR ACCESS)

Figure 3-16

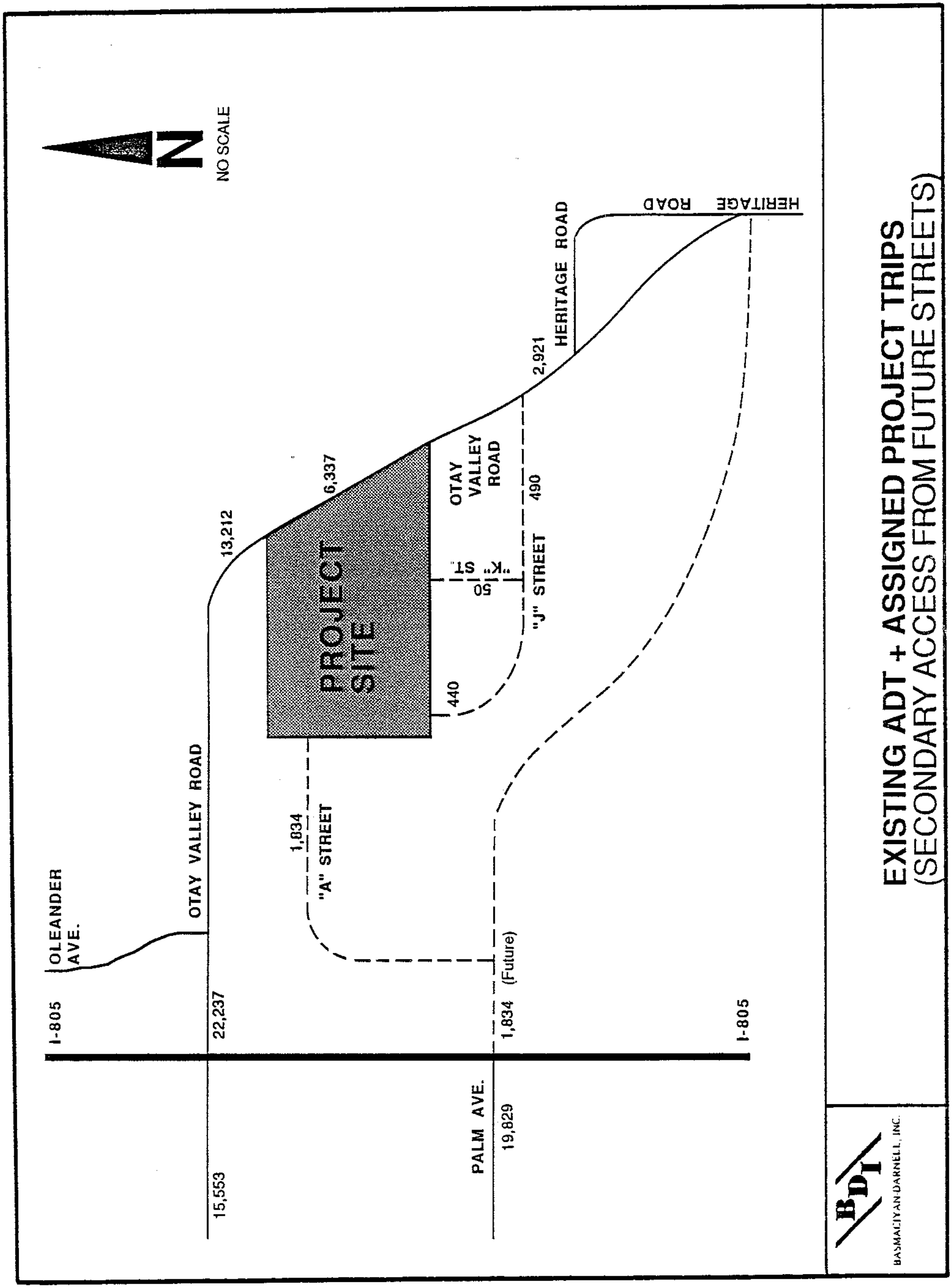
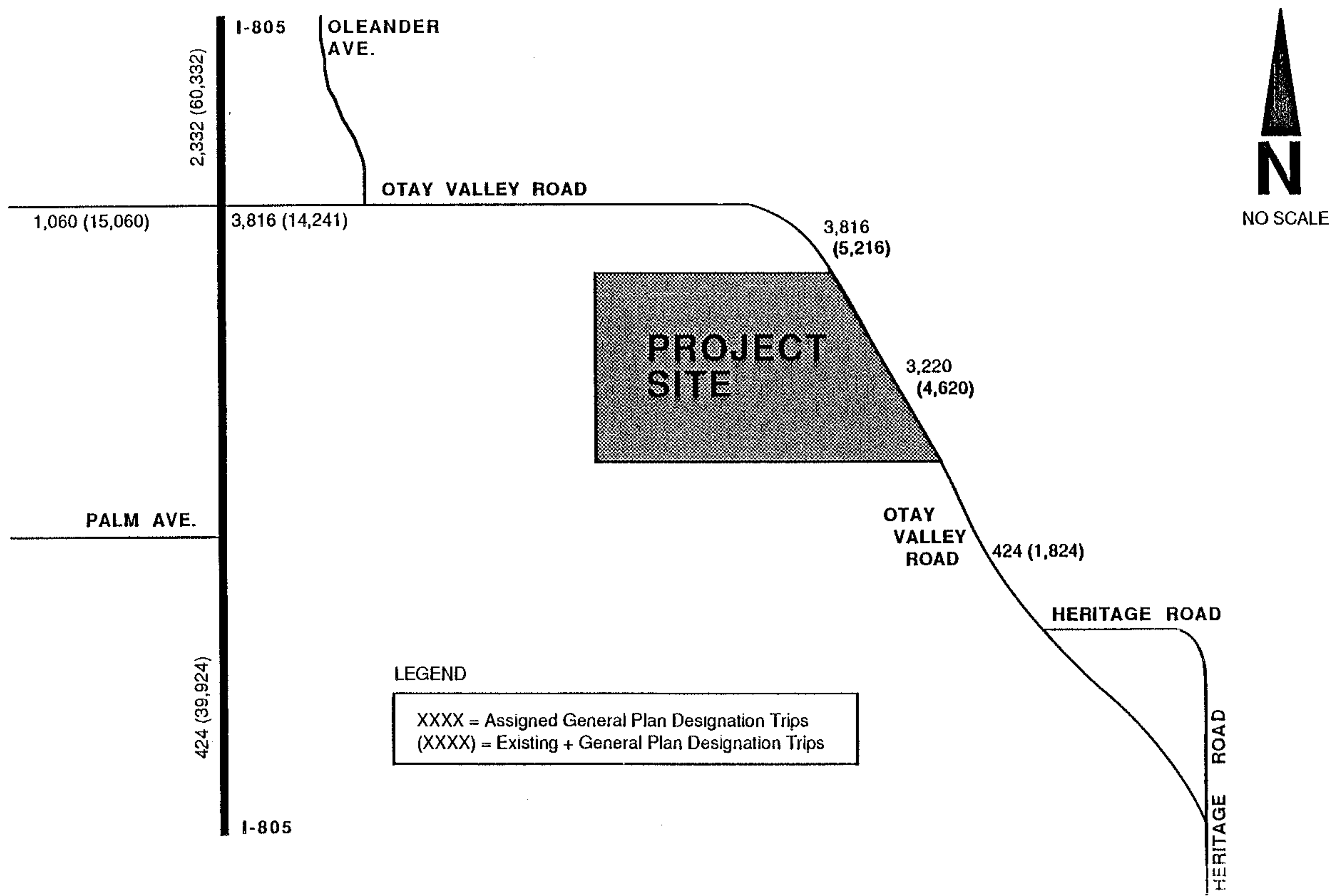

N
NO SCALE
I-805
OLEANDER AVE.
OTAY VALLEY ROAD
22,237
15,553
PALM AVE.
19,829
1,834
(Future)
"A" STREET
1,834
PROJECT SITE
440
"J" STREET
"K" ST.
50
490
OTAY VALLEY ROAD
13,212
6,337
2,921
HERITAGE ROAD
HERITAGE ROAD
I-805
EXISTING ADT + ASSIGNED PROJECT TRIPS
(SECONDARY ACCESS FROM FUTURE STREETS)
BASMACIYAN-DARNELL, INC.

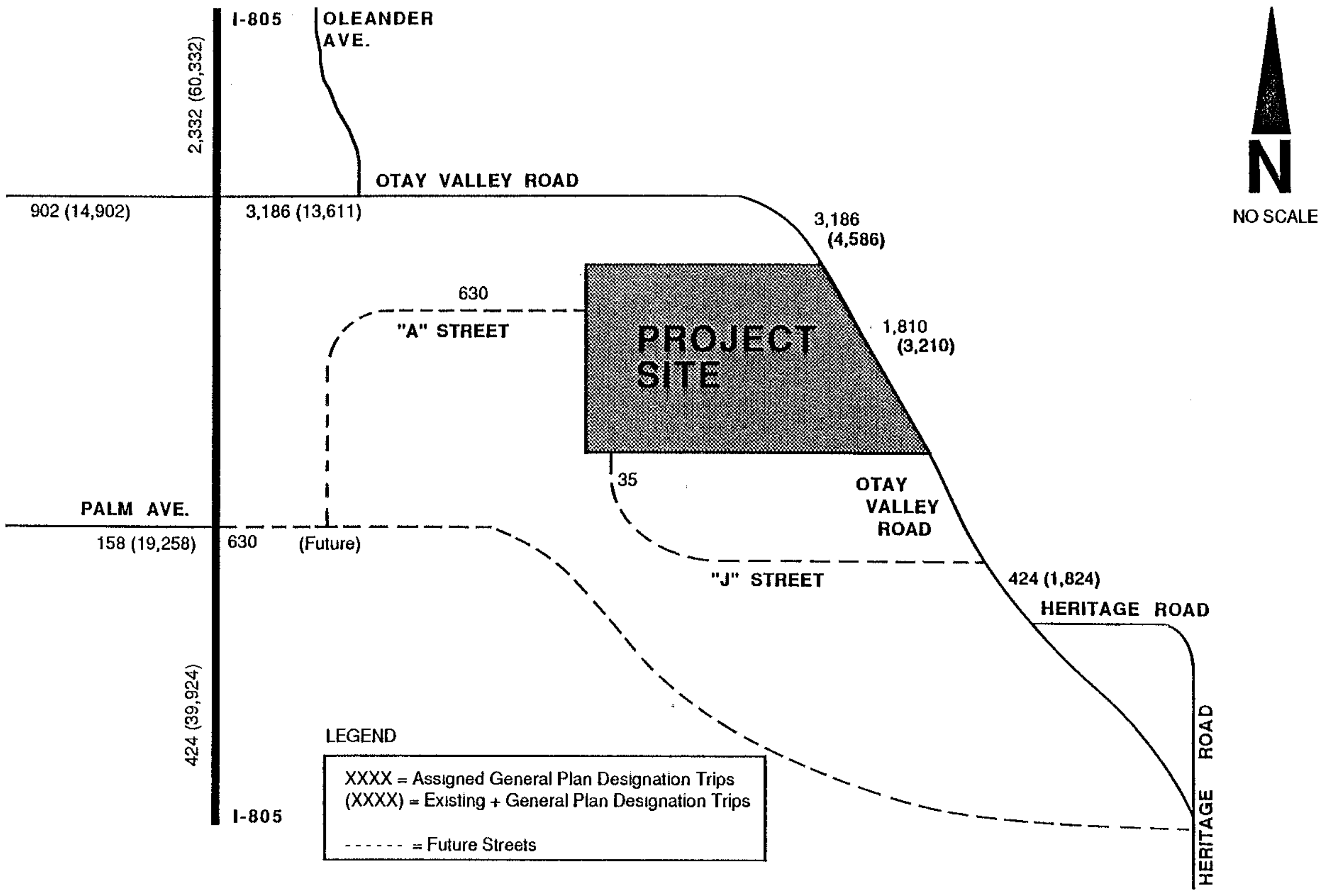
Figure 3-17




BASMACIYAN-DARNELL, INC.

**EXISTING + ASSIGNED GENERAL PLAN DESIGNATION TRIPS**
(ONLY OTAY VALLEY ROAD FOR ACCESS)

Figure 3-18




BASMACIYAN-DARNELL, INC.

**EXISTING + GENERAL PLAN DESIGNATION TRIPS**
(SECONDARY ACCESS FROM FUTURE STREETS)

Figure 3-19

TABLE 3-11

ROADWAY SEGMENT DAILY TRAFFIC VOLUMES
EXISTING AND WITH PROJECT

| Roadway Segment | Existing ADT | Existing and Project ADT | Existing and General Plan Use ADT |
|---|---|---|---|
| ASSUMING ONLY OTAY VALLEY ROAD AVAILABLE FOR ACCESS: | | | |
| Otay Valley Rd. w/o I-805 | 14,000 | 16,282 | 15,060 |
| Otay Valley Rd. I-805 to Oleander | 10,425 | 24,071 | 14,241 |
| Otay Valley Rd. adjacent to site | 1,400 | 15,046 | 5,216 |
| Otay Valley Rd. s/o site | 1,400 | 2,921 | 1,824 |
| ASSUMING SECONDARY ACCESS AVAILABLE: | | | |
| Otay Valley Rd. w/o I-805 | 14,000 | 15,553 | 14,902 |
| Otay Valley Rd. I-805 to Oleander | 10,425 | 22,237 | 13,611 |
| Otay Valley Rd. adjacent to site | 1,100 | 13,212 | 4,586 |
| Otay Valley Rd. n/o Heritage Rd. | 600 | 2,921 | 1,824 |
| Palm Avenue w/o I-805 | 19,100 | 19,829 | 19,258 |

TABLE 3-12

ROADWAY SEGMENT VOLUME TO CAPACITY RATIO COMPARISONS (a)

| Segment | Class | Capacity | Existing V/C | Existing & Project V/C | Existing & GP Use V/C |
|---|---|---|---|---|---|
| ASSUMING ONLY OTAY VALLEY ROAD AVAILABLE FOR ACCESS: | | | | | |
| Otay Vly. w/o I-805 | Major | 25,000 | 0.56 | 0.65 | 0.60 |
| Otay Vly. I-805 to Oleander | Major | 25,000 | 0.42 | 0.96 | 0.57 |
| Otay Vly. n/o site | 2-Lane Coll. | 5,000 | 0.28 | 3.01 | 1.04 |
| Otay Vly. n/o Heritage | 2-Lane Coll. | 5,000 | 0.28 | 0.58 | 0.36 |
| ASSUMING SECONDARY ACCESS AVAILABLE: | | | | | |
| Otay Vly. w/o I-805 | Major | 25,000 | 0.56 | 0.62 | 0.60 |
| Otay Vly. I-805 to Oleander | Major | 25,000 | 0.42 | 0.89 | 0.54 |
| Otay Vly. n/o site | 2-Lane Coll. | 5,000 | 0.28 | 2.64 | 0.92 |
| Otay Vly. n/o site | 2-Lane Coll. | 5,000 | 0.28 | 0.58 | 0.36 |
| Palm Avenue w/o I-805 | Major | 20,000 | 0.96 | 0.98 | 0.96 |

(a)Classifications and associated capacities for Otay Valley Road per City of Chula Vista Design Standards. Classification and capacity for Palm Avenue per City of San Diego Design Standards. Copies of these design standards are included in the Appendix.

this segment). The project's most significant increase in V/C occurs, as expected, north of the project site, where the existing V/C is 0.28 and the General Plan development of the site raises it to 1.04 with only Otay Valley Road for access.

Table 3-12 also shows that developing the property as proposed has significant impact north of the project site. The existing V/C is 0.28 (1,400 ADT) and the proposed project would raise it to 3.01 (15,046 ADT), assuming Otay Valley Road is the only access. The other road segment where the proposed project would cause the V/C to approach 1.0 is Otay Valley Road just east of I-805. With Otay Valley Road as the only access, the project raises the V/C ratio to 0.96. This is not unexpected near a freeway access.

As the proposed project is developed in a phased program, traffic will be added to the existing traffic on the two lane section of Otay Valley Road (between Oleander Avenue and the project site). At some point in the phased development, the capacity of the two lane section will be exceeded. To continue development, it will be necessary to upgrade the roadway to four lanes.

The City of Chula Vista's design ADT for a two lane local collector is 5,000. This is a slightly low figure for the capacity of a two lane roadway with little to no side friction and no intersection delays along it. This roadway compares to the County of San Diego's two lane light collector road classification. The County shows an LOS C of 7,100 ADT for a two-lane light collector (LOS D, generally accepted as capacity, is 10,900 ADT; LOS E is 16,200 ADT).

Assuming a LOS C for this roadway to be 7,100 ADT and an existing traffic volume of 1,400 ADT, the remaining volume to maintain a LOC C would be 5,700 ADT. The two lane segment north of the site was assumed to have 80% of the residential trips, and 90% of the industrial and commercial trips assigned to it (under the worst case assumption of only Otay Valley Road for access).

Possible phase one development of the site, which could be accommodated by the existing two lane collector, could include combinations of industrial, commercial, and residential lots as follows:

| Land Use | ADT | % on Otay Valley Rd. between Oleander and Site | Contributing ADT |
|---|---|---|---|
| Assuming Only Industrial Lots: | | | |
| Industrial 52.7 acres | 6,324 | 90% | 5,692 |
| Assuming the Commercial Lot and some Industrial: | | | |
| Commercial 4.45 acres | 1,780 | 90% | 1,602 |
| Industrial 37.9 acres | 454 | 90% | 4,093 |
| TOTAL: | | | 5,695 |
| Assuming Residential, Commercial, and some Industrial: | | | |
| Single Family Residential | 490 | 80% | 392 |
| Commercial Lot 4.45 acres | 1,780 | 90% | 1,602 |
| Industrial 34.3 acres | 4,116 | 90% | 3,704 |
| TOTAL: | | | 5,698 |

It should be noted that these above scenarios are for the proposed project only. Other development will be occurring in the project vicinity which will utilize Otay Valley Road. Thus, at some point in the near future, the proposed project development, in conjunction with surrounding development, will significantly raise the ADT on Otay Valley Road above acceptable levels. The proposed project incrementally contributes to this cumulative impact.

The Robinhood Ridge Traffic Analysis anticipates a total ADT of 9,945 for that development, and 40,970 ADT for the California Terraces development (consistent with the Otay Mesa Community Plan). The Robinhood Ridge project would be developed before California Terraces, though presently (April, 1987) no action beyond submittal of the Precise Plan has been taken. It is thus difficult to determine when that traffic will be added to the road system. Phase 1 of that development would generate approximately 5,064 ADT, with 20 percent, or 1,000 ADT, on Otay Valley Road north of their project area.

If Robinhood Ridge Phase 1 and Otay Rio Business Park Phase 1 (assuming Phase 1 development as shown on Figure 2-4) are developed concurrently, or before any road upgrades, together they would generate approximately 6,700 ADT to this section of Otay Valley Road. With existing volumes of approximately 1,400 ADT, a total ADT of 8,100 could be expected, well under the LOS D limit.

5. Site Plan

The site plan shows Otay Valley Road (future Heritage Road) dedicated for half width six lane prime arterial standards along the project's frontage. This is appropriate for the ultimate classification expected for this roadway (according to SANDAG's forecast and in anticipation of the new study to be completed in July, 1987). However, the roadway has a substandard alignment near the southerly portion of the site. When the Tentative Map is up for City review and approval, additional right-of-way may be required to straighten the alignment. This could affect the lots at the southeastern site boundary. In the future, an alignment study may be necessary for this segment.

The assignment of project trips within the site results in a volume at the southerly entrance/exit ("B" Street) exceeding the design standards of the proposed 52 foot roadway cross section (72 foot right-of-way). However, since this occurs near the intersection with Otay Valley Road, it will require special treatment at the intersection, rather than a larger cross section for the entire roadway.

The northerly project entrance/exit is already shown to have a four lane major street cross section near the intersection with Otay Valley Road. However, between Otay Valley Road and "G" Street, there is a median shown which does not provide left turn storage for vehicles westbound on "A" Street turning southbound onto "G" Street. The highest demand for this turning movement is approximately 100/hour in the morning peak hour, so provision for a left turn lane may not be necessary, especially since two westbound lanes would be available.

Finally, "C" and "E" Streets have straight-away sections of approximately 1,000 feet. This could lead to speeding problems, possibly requiring enforcement if problems do arise.

C. Mitigation

Significant impacts were cited to occur to the two lane segment of Otay Valley Road from developing the entire project site as proposed. Mitigation could be accomplished by phasing the project as suggested. The developer does propose to phase the project as suggested, developing 53 acres of industrial lots as Phase 1, and the remainder of the site once the road is widened. As Otay Valley Road is upgraded, the remainder of the project could be accommodated without any impacts. Otay Valley Road would need to be four lanes to accommodate the entire project, and six lanes to accommodate ultimate buildout of the project vicinity. *A Condition of Approval on the Tentative Map will allow Phase 1 development of the site until such time that the traffic volume at the river crossing on Otay Valley Road reaches 7500 ADT. If traffic volumes exceed this amount, no building permits will be issued until improvements for widening this road are under construction.*

Incremental impacts to Otay Valley Road from project development in conjunction with other area developments were cited to occur to Otay Valley Road before it is widened. This cumulative impact will be mitigated by the planned widening of the Road.

A significant impact could occur at the southerly project site entrance, where project volume would exceed design standards of the proposed 52-foot roadway cross section (72-foot right-of-way). Special treatment at this intersection, such as additional width for turn lanes, would mitigate this impact.

Impacts could occur as a result of speeding problems along the 1,000 foot straight-away sections of "C" and "E" Streets. This could be mitigated by enforcing the speed limit if problems do arise.

*Additional measures to be included as Conditions of Approval on the Tentative Map are the following:*

o *The developer shall submit a preliminary engineering study for the Otay Valley Road alignment to eliminate two substandard curves in the roadway, one adjacent to the easterly subdivision boundary, and one southerly of the subdivision. The study shall include horizontal and vertical alignments conforming to current County standards for a prime arterial and shall indicate the extent of grading which would be required to* *construct such a road. The property owners shall make an irrevocable offer of dedication for right-of-way within the subdivision boundary identified as necessary for installation of said roadway and shall grant slope easements as necessary.*

- o *Access rights to Otay Valley Road shall be relinquished from all lots abutting on Otay Valley Road.*

- o *The developer shall be responsible for the construction of Otay Valley Road along the entire frontage of the eastern subdivision boundary to Chula Vista prime arterial standards (modified for 8 foot shoulders).*

- o *The property owners shall waive the right to protest formation of a Street Improvement District for Otay Valley Road, and shall waive the right to protest formation of a Facilities Benefit Assessment District for facilities impacted by development of the subject property.*

- o *The developer shall enter into a development agreement to participate in a Facilities Benefit Assessment District.*

D. Analysis of Significance

The proposed Otay Rio Business Park project would be expected to generate 15,216 average daily trips. Of these, 1,905 and 2,151 are assigned to the morning and evening peak hours, respectively.

Otay Valley Road is built as a four lane major street between I-805 and Oleander Avenue. East of Oleander Avenue, Otay Valley Road is a two-lane facility. The project traffic impacts the two lane segment between Oleander Avenue and the site by raising the volume to capacity ratio for this segment from 0.28 to 3.01 (1,400 ADT to 15,046 ADT) for the worst case of all access taken from Otay Valley Road. For the same access consideration, the General Plan land use designation for the site would raise the volume to capacity ratio for this segment from 0.28 to 1.04 (1,400 ADT to 5,216 ADT).

Therefore, the existing traffic plus the traffic from the first phase of the project should not exceed the capacity of the roadway. The City of Chula Vista's design ADT for a two lane local collector is 5,000. Since there is little or no side friction and no intersection delays along this portion of Otay Valley Road, this design ADT is considered low as a capacity value. The County's light collector classification (which has characteristics compatible to Otay Valley Road) has a level of service C of 7,100 ADT. The existing ADT is 1,400 for this segment. In order not to exceed a reasonable operating condition for Otay Valley Road (Level of Service C, 7,100 ADT), the phase one portion of this project should not generate average daily traffic exceeding 5,700 trips along this segment.

The project does propose Phase 1 development as shown on Figure 2-4. Total ADT for this phase would be 5,692. Also, in conjunction with the Robinhood Ridge Phase 1 development, a total ADT of approximately 6,700 could be added to this segment of Otay Valley Road. With existing volumes of 1,400 ADT, a total ADT of 8,100 could be expected. This is well under the LOS D limit of 10,900 ADT.

Appropriately, the project will dedicate property along its frontage with Otay Valley Road (future Heritage Road), providing the half width cross section required for a six lane prime arterial. Due to the substandard alignment near the southerly portion of the site, at the time for Tentative Map approvals the additional right-of-way may be required. Additionally, if the half width improvements are not required to be constructed with the project, guaranty that such improvements will be constructed at the appropriate time should be provided.

Special intersection treatment may be required on "B" Street near its intersection with Otay Valley Road to accommodate expected traffic volumes. Such treatment may include additional width for turn lanes.

If the above-described measures are taken, no significant impacts would remain, and no further measures would be necessary.

## 3.20 RISK OF UPSET/HEALTH HAZARD

### A. Project Setting

Presently the site is developed with three single family homes and two mobile homes. Land use has historically been farming, though only 5 acres presently are under cultivation. Also, unauthorized off-road vehicle use occurs in the steep portions of the site. To date, no known natural or man-induced hazardous events which have endangered lives have occurred in the project area.

The City of Chula Vista's Safety and Seismic Safety Elements of the General Plan both state the City's safety plans, programs and policies. Geologic hazards are discussed primarily in the Seismic Safety Element, whereas the Safety Element focuses on fire hazards.

The Safety Element states the following with regard to fire safety in the urban environment:

1. The City of Chula Vista shall promote the establishment and maintenance of safe and effective evacuation routes; an ample peak-load water supply; adequate road widths; and safe clearances around buildings, in accordance with the legislative change embodied in Section 65302.1 of the Government Code;

2. The streets and rights-of-way of the City of Chula Vista shall be of adequate width and construction to facilitate the movement of emergency vehicles during fires and emergencies resulting from geologic hazards. Said streets and rights-of-way shall also be adequately designed to facilitate the evacuation of people during fires and the said emergencies, if and when the authorities determine that evacuation is the best course of action;

3. The open space surrounding structures shall be sufficient to promote fire safety;

4. The space separating buildings shall be consistent with the tenets and precepts of fire-safety and seismic-safety practices; and

5. The peak load water supply shall adequately meet the needs of the Chula Vista Planning Area during periods of flood, fire, and natural disaster.

The Safety Element gives required fire flow standards, and minimum road widths and clearances required around structures. This is discussed further in Section 3.15, Fire and Police Protection.

The Seismic Safety Element lists the following policy with regard to development:

1. No lands shall be subdivided, developed, or filled within the City of Chula Vista in the absence of supportable, professional evidence that the proposed subdivision, development, or land fill would be geologically safe;

2. Wherever feasible, land uses and buildings which are determined to be unsafe from geologic hazards shall be discontinued, removed, or relocated;

3. The Uniform Building Code, the Fire Code, the Uniform Code for the Abatement of Dangerous Buildings, the Subdivision Ordinance, the Zoning Ordinance, and the Emergency Plans of the City of Chula Vista and the Unified San Diego Emergency Services Organization shall effectuate the Seismic Safety Element. These specific and

precise plans shall be amended when their amendment is required to effectively implement this element;

4. The City of Chula Vista recognizes that its planning area is traversed by several faults, and that some geologic risks cannot be avoided without disproportionate public expenditures. Chula Vista therefore accepts minor property damage as the level of acceptable risk. The loss of life and major property damage are not acceptable risks, and shall be precluded through the stringent enforcement of local ordinances and the establishment of high priorities for public safety oriented capital expenditures; and

5. When a development or subdivision is proposed in an area of known geologic hazards, the developer or subdivider shall submit a report prepared by an engineering geologist to the Environmental Review Committee.

Geologic hazards onsite are shown graphically on Figure 3-1, and discussed thoroughly in that Section, 3.1.

*Hazards from aircraft operations at Brown Field are also a consideration. The Brown Field Master Plan is currently undergoing revision, however, and changes in operations are anticipated. Thus, at this time, an analysis of these hazards would not be useful. Once the Plan is approved, a supplemental hazards analysis for this project could be done.*

B. Impacts

The project design would incorporate features which would comply with policies of the Safety Element for fire safety. These features are discussed in detail in Section 3.15, Fire and Police Protection, and, in summary, the road widths, building clearances, and fire flow would be adequate to meet the Fire Department regulations. The Fire Department reviews all development plans, and recommends conditions of approval if discrepancies are found. The developer would comply with all requirements.

Grading for future project development will require remedial grading as listed in Section 3.1. The developer will accomplish all required remedial grading in order to avoid potential hazards from landslides, and soil compression and expansion. Additionally, a detailed subsurface geotechnical and soils investigation needs to be accomplished to provide specific grading, foundation, and construction recommendations before development can occur. Compliance with these measures would avoid potential geologically associated hazards. The developer will comply with all required measures.

Once the site is graded and lots sold, conditions of approval must be placed on the lots by the City for future foundation and construction activities in order that these measures are carried out.

The northwestern tip of the project site and a corner of Lot 11 lie within the Otay River Floodway and 100-year Floodplain. Natural open space is proposed for this area (Lots 1 and 2), and no impacts are expected.

C. Mitigation

No mitigation is necessary, as there are no significant impacts.

D. Analysis of Significance

The project design would incorporate measures to protect future employees and residents of the Business Park from potential hazards. These hazards include landslides, soil compression and expansion, seismically-induced groundshaking, fire, and flooding. No significant impacts are expected, and no mitigation is necssary.

## 4.0 ALTERNATIVES

The proposed General Plan Amendment, Zone Change, and Tentative Map proposals considered in the EIR for the Otay Rio Business Park would not result in adverse or significant impacts if all the recommended mitigation measures are accomplished. ~~Thus, only one alternative is discussed, the No Project alternative, which includes a discussion of development under the existing General Plan.~~

The first submittal of the project proposal included plans which would have resulted in impacts which were best mitigated by redesigns in the project proposal. The first Preliminary Draft EIR, submitted for the City's screen check review, called for three other alternatives, two of which were redesigns of the project plan. The third was an examination of mineral extraction before project development. The applicant, in response to these recommendations and alternatives, changed the project in order to eliminate these impacts, and conducted another soils study to determine the potential for mineral resources. These changes and soils study have eliminated the need for other alternative discussions beyond ~~the No Project alternative~~ those discussed below.

### 4.1 NO PROJECT

This alternative would retain the existing land use designations for the site, which are Low Density Residential and Open Space. Thus, approximately 140 acres would be developed with a maximum of 3 dwelling units per acre, totaling 420 single family units.

This alternative would significantly reduce the traffic-related impacts to Otay Valley Road from project development. As shown by Table 3-9 in the text, with the existing General Plan designation, an ADT of 4,240 would be expected, whereas with the proposed project, an ADT of 15,216 is expected (a difference of 10,976 ADT). However, Otay Valley Road would also be significantly impacted by the surrounding area proposed developments which would require widening of the Road. Road widening is already planned for Otay Valley Road, and once widened, it could accommodate the proposed project traffic within capacity levels. Thus, the reduction in traffic from this alternative is not a strong reason to choose this alternative, as Otay Valley Road would be impacted from the total area development, requiring widening.

Other areas which would result in reduced impacts from this alternative are landform and open space, because the site is presently designated open space in the hilly areas; air quality would be better with the reduced ADT; biological impacts to the ferrocactus would be eliminated; no land use or General Plan inconsistencies would occur, however, land use incompatibility would result between low density residential and the existing industrial development to the north, as well as the planned six-lane Otay Valley Road. The other area which would result in greater impacts from this alternative is schools, as more children would be generated.

Though many areas would find reductions in impacts from this alternative, all of these impacts can be mitigated. Thus, because impacts would be reduced yet not eliminated, and because this alternative does not meet the proposed project objectives, this alternative is not preferred over the proposed project.

## 4.2 DEVELOPMENT IN ACCORDANCE WITH EXISTING GENERAL PLAN DESIGNATION

This alternative would develop the site under the existing land use designations for the site, which are Low Density Residential and Open Space. Thus, approximately 140 acres would be developed with a maximum of 3 dwelling units per acre, totaling 420 single family units.

This alternative would significantly reduce the traffic-related impacts to Otay Valley Road from the project development. As shown by Table 3-9 in the text, with the existing General Plan designation, an ADT of 4,240 would be expected, whereas with the proposed project, an ADT of 15,216 is expected (a difference of 10,976 ADT). However, Otay Valley Road would also be significantly impacted by the surrounding area proposed developments which would require widening of the Road. Road widening is already planned for Otay Valley Road, and once widened, it could accommodate the proposed project traffic within capacity levels. Thus, the reduction in traffic from this alternative is not a strong reason to choose this alternative, as Otay Valley Road would be impacted from the total area development, requiring widening.

Other areas which would result in reduced impacts from this alternative are landform and open space, because the site is presently designated open space in the hilly areas; air quality would be better with the reduced ADT; biological impacts to the ferrocactus would be eliminated; no land use or General Plan inconsistencies would occur, however, land use incompatibility would result between low density residential and the existing industrial development to the north, as well as the planned six-lane Otay Valley Road. The other area which would result in greater impacts from this alternative is schools, as more children would be generated.

Though many areas would find reductions in impacts from this alternative, all of these impacts can be mitigated. Thus, because impacts would be reduced yet not eliminated, and because this alternative does not meet the proposed project objectives, this alternative is not preferred over the proposed project.

### *4.3 RETENTION OF AGRICULTURAL USE*

*The incremental loss of agricultural land due to project development is considered significant on a County-wide cumulative basis. Thus, retention of agricultural uses of the site is considered as an alternative.*

*This alternative would develop agriculture over the previously farmed areas of the site; approximately 100 acres could be farmed with maximum production of the project area. This alternative would significantly reduce or eliminate most project-related impacts. With the exception of cumulative impacts to agricultural resources, however, all project-related impacts can be reduced by implementation of mitigation measures to a level of insignificance. Additionally, the economics of developing the site for agricultural resources are, at this time, not feasible. Also, this alternative does not meet proposed project objectives. Thus, this alternative is not preferred over the proposed project.*

## 5.0 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS

The proposed GPA, Rezone, and subsequent development proposed for this project would result in a significant change in the land use and character of the project site. However, development of the site as proposed would not result in any significant unmitigable impacts.

## 6.0 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section discusses cumulative and long-term effects which adversely affect the environment. Cumulative effects are anticipated from the development of the related projects (Table 2-1) in the project vicinity.

The proposed GPA, Rezone, and subsequent development of the site as proposed for the project, would change the existing land uses from agriculture, open space, and unauthorized off-road vehicle use to a mix of urban land uses providing employment, housing, and minimal services. In order to achieve the proposed land uses, impacts would occur to the environment, all of which can be mitigated by the developer or the City.

Cumulative impacts which were discussed throughout Section 3.0 are briefly summarized below.

- Agricultural Resources - Though the site's agricultural production has decreased significantly in the past few years, it is classified as Prime agricultural land by the Soil Conservation Service. The loss of this resource is only a slight, incremental amount from the County's agricultural land base, yet, this loss, in conjunction with the conversion of agricultural lands throughout the County due to development pressures, is cumulatively significant. This incremental impact could be mitigated only by retention of the agricultural resources onsite.

- Air Quality - As with most development projects, air quality impacts are insignificant at the project scale, yet significant when added to the number of regionally proposed projects and projects under construction. Each project, including this one, can implement measures to aid in reducing emissions, such as transportation control measures.

- Schools - The proposed project would generate approximately 40 students to a system which is already over capacity, resulting in significant impacts. The proposed surrounding developments would generate thousands of students to this system, resulting in significant cumulative impacts. The developers of all proposed projects can mitigate their share of the impact by paying a "school fee" which is based on the number of square feet of industrial and commerical space, and the number of proposed residences. This fee is used toward the purchase of school sites and facilities construction.

- o Fire and Police Protection - The proposed project would incrementally increase the demand for these services, yet, in conjunction with the proposed surrounding developments, would result in significant impacts to these services. The Police Department will increase service as more calls are received; yet, the Fire Department anticipates a more imminent need for additional facilities to serve the project vicinity. That Department recommends a cooperative agreement between the area developers and the City to fund the addition of necessary facilities.

- o Waste Disposal - The proposed project's waste would incrementally decrease the life of the Otay Landfill, whereas waste from the project in conjunction with waste from the future area proposed developments, would cumulatively speed up this process. No significant impacts were cited from this cumulative impact.

- o Utility Service/Energy Conservation - The proposed project would impact the existing circuit system at the project site, and in conjunction with future proposed development, would result in cumulative impacts. These impacts can be mitigated by upgrading the system and/or by bringing in natural gas as the energy source.

- o Water and Sewer Service - Water use would incrementally contribute toward a demand for water which is beyond the resources capabilities of the southern California area. Water must be imported from the Colorado River and northern California. By installing water-saving devices in project buildings, and by landscaping with native vegetation, the project could reduce its water demand potential, incrementally aiding in water conservation in the southern California area.

  Sewage generation to the City of San Diego system would incrementally impact the Point Loma Sewage Treatment Plant and the City's Metro System capacities. The City of Chula Vista is exploring ways to handle area sewage which is dependent on San Diego's system.

- Transportation/Access - Ultimate development of the proposed project would significantly impact the existing capacity on Otay Valley Road. Development of the surrounding area proposed projects would result in significant cumulative impacts. The impacts can be mitigated by widening this existing two-lane road to a six-lane road, which is planned.

## 7.0 IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WILL RESULT FROM THE PROPOSED PROJECT

Generally, the site would change as a result of the proposed project from a rural setting to an urban setting. The irreversible changes associated with implementation of the project include:

1. The loss of Prime agricultural land (though presently it is minimally utilized for crops which are not considered highly valuable);

2. Site topography would be altered due to grading for the proposed development;

3. Air quality would be degraded slightly due to the number of project-related vehicles;

4. Ambient noise levels would be increased due to construction activities, and project-related vehicles and activities; and

5. Energy and water resources would be committed in site construction activities and as future site usage.

## 8.0 GROWTH INDUCING IMPACT OF THE PROPOSED ACTION

The Chula Vista General Planning Area (GPA) is within one of the fastest growing areas in the County. In fact, the population of the GPA is expected to increase approximately 59 percent by 2,000, whereas the San Diego Region's increase is expected to be 45 percent. The City's General Plan estimates that by 1990, almost half of the City population will be living in newly developed communities located on the mesas and foothills east of Interstate 805. The City's Growth Management Policy (General Plan, 1970) indicates that the location and quality of growth should be reviewed annually by City staff to ensure orderly growth and development of the Planning Area. The City's intent is for growth to occur in a general west to east direction.

Numerous residential and industrial projects are planned or under construction in the project vicinity (see Figure 2-5). This area encompasses largely City of Chula Vista and City of San Diego lands. One concern of growth management is that development occur adjacent to existing development, rather than in a "leap-frog" fashion. The proposed project is located adjacent to existing industrial development to the north, and within an area which is rapidly infilling with both industrial and residential uses. Thus, this "leap-frog" phenomena would not be created by development of the project.

Another gauge of premature growth is the necessity to extend services and facilities. Facilities and services are already in place on the project site, though there may be some reordering of jurisdictional authority. Fire service is not adequate to meet the needs of this area, however, the proposed project creates an incremental portion of the demand for service which will be required once the adjacent developments are constructed. Extension of fire service could encourage growth by making this service more accessible to adjacent developments.

Also, development of the project site in conjunction with all of the planned area developments would impact the existing road system significantly. Existing roads, especially Otay Valley Road, need to be upgraded. However, rather than encouraging growth, the upgraded roadways would just accommodate growth to a low level of service (described in more detail in Section 3.19, Transportation/Access).

A concern of area growth is the loss of natural open space, especially as it relates to habitat for plants and animals. The project does eliminate open space in its plan that is habitat for various species, but none of this loss is considered to significantly impact area species (see Section 3.7, Biology). The site lies contiguous to the Otay Rio Floodplain, and associated wetland, which provides habitat for many species. This area will be preserved through City development requirements.

The City's General Plan designates the lower elevations of the site for residential development, and the zoning calls for agricultural use. Both designations were recently attached to the site when it was annexed to the City from the City of San Diego. The City's General Plan indicates that the City expected growth to occur over a majority of the site, with the Agricultural zone used as a holding zone until development plans were approved by the City.

In summary, the proposed project would not induce growth in the area around the site, but would be part of a larger growth trend in the project vicinity.

## 9.0 CERTIFICATION OF ACCURACY AND QUALIFICATIONS

This Environmental Impact Report was prepared by Keller Environmental Associates, Inc. of San Diego, California. Members of Keller Environmental Associates who contributed to the report are listed below.

Christine A. Keller; M.A. Geography
Diana G. Richardson; M.A. Geography
Lisa K. Capper; J.D.; M.A. Candidate Anthropology
Peter C. Langenfeld; B.S. Geology; B.S. Geography

Consultants involved in the preparation of this report include:

| | |
|---|---|
| Basmaciyan-Darnell, Inc. | Traffic Circulation Studies |
| Herman Basmaciyan | |
| Patti Boekamp | |
| Ray Paulson | |
| Pacific Southwest Biological Services, Inc. | Biological Studies |
| R. Mitchel Beauchamp | |
| Stephen J. Montgomery | |
| Keith W. Merkel | |
| Fred T. Sproul | |
| Brian F. Smith and Associates | Archaeological Studies |
| Brian F. Smith | Paleontological Studies |
| Thomas A. Demere | |
| Hans D. Giroux | Air Quality and Noise Studies |

I hereby affirm that, to the best of our knowledge, the statements and information contained herein are in all respects true and correct, and that all known information concerning the potentially significant environmental effects of the project have been included and fully evaluated in this EIR.

Diana Gauss Richardson

Diana Gauss Richardson
Project Manager

## 10.0 ORGANIZATIONS AND PERSONS CONTACTED

California Department of Conservation, Mining and Geology Board. Mr. Dennis O'Bryant. Telephone communication, November 26, 1986.

Chula Vista, City of.

A. Community Development Department. Mr. Fred Kassman. Meeting, December 16, 1986.

B. Engineering Department. Mr. John Lippett; Mr. Chuck Glass. Written and telephone communications, December, 1986-March, 1987.

C. Fire Department. Ms. Carol Gove. Written communications, December 18, 31, 1986; telephone communication, March 16, 1987; Mr. Samuel Lopez. Telephone communication, January 6, 1987.

D. Planning Department. Mr. Doug Reid; Ms. Julie Schilling; Mr. Ken Lee. Personal and telephone communications November, December, 1986; January-March, 1987.

E. Police Department. Mr. Bill Winters. Written and telephone communications, December 18, 23, 1986; January 5, 1987.

Chula Vista Elementary School District. Mr. John Lynn. Written and telephone cummunications. December 18, 23, 31, 1986.

Chula Vista Sanitary Service. Ms. Mary Thimm. Written and telephone communications. December 18, 31, 1986.

Otay Municipal Water District. Mr. Ralph Barber. Telephone communications January-March, 1987.

Project Site Residents.

A. 1920-1983; Mr. K. Takashima. Telephone communication, December 22, 1986.

B. 1984-1986; Mr. D. Hafen. Meeting and telephone communications, December, 1986-February, 1987.

San Diego, City of.

A. Planning Department. Mr. E. Michael Stang. Meetings, December 1, 19, 1986.

B. Water Utilities Department. Mr. Milon Mills; Mr. Tibor Varga. Telephone communications, January 6, 7, 1987.

San Diego, County of.

A. Planning Department. Mr. Kaare Kyos. Meeting, January 7, 1987.

B. Solid Waste Division. Ms. Julia Quinn. Telephone communication, January 5, 1987.

San Diego Gas and Electric. Mr. Richard Heilman. Written and telephone communications, December 19, 22, 31, 1986 and January 12, 1987. Mr. Dan Wise. Meeting, January 9, 1987.

San Diego Regional Water Quality Control Board. Mr. Scott Hugenberger; Mr. Jim Munch. Meeting and telephone communications, November 26, December 5, 1986.

Sweetwater Union High School District. Mr. Andy Campbell. Written and telephone communications. December 18, 23, 1986; January 8, 1987. Ms. Margie Robertson. Telephone communication, January 2, 1987.

U.S. Department of Agriculture, Soil Conservation Service. Staff. Telephone communication, December 15, 1986.

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87-2

# APPENDICES

**OTAY RIO BUSINESS PARK**

**CHULA VISTA**

**Prepared for:**

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

**Prepared by:**

**Keller Environmental Associates, Inc.**
**964 Fifth Avenue, Suite 535**
**San Diego, CA 92101**
**619/544-1414**

**April 24, 1987**

# APPENDIX A

# NOTICE OF PREPARATION AND RESPONSES

NOTICE OF PREPARATION

TO:

FROM: Planning Department
City of Chula Vista
P. O. Box 1087
Chula Vista, CA 92012

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

CASE NO: EIR-87-2

The City of Chula Vista will prepare an environmental impact report for the project identified in the attached material. We need to know your views as to scope and content of this environmental information.

The project description, location, and the probable environmental effects are contained in the attached materials.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to: Douglas D. Reid, Environmental Review Coordinator, at the address shown above.

PROJECT APPLICANT, IF ANY: The Chillingworth Corporation

DATE: November 20, 1986

Signature: Douglas Reid

Title: Environmental Review Coordinator

Telephone: (619) 691-5101

Reference: California Administrative Code, Title 14, Sections 15035.7, 15054.3, 15066.

x-87-2

644-040-26
Walker SCott Properties/Palm
P. O. Box 85500
San Diego, CA

644-050-02
Fenton, H.G. Material Co.
P. O. Box 64
SAn Diego, CA

644-050-07
Fenton, H.G. Material

644-050-09
Takashima, Katsumi
366 Surrey Drive
Bonita, CA 92002

644-060-04
United Enterprises, Inc.
1007 Fifth Ave., Ste 1200
San Diego, CA 92101

645-010-01
Walker Scott Properties/Palm

645-010-03
Robinhood Homes, Inc.
3648 Main St.
Chula Vista, CA 92011

645-020-01
Otay Rio Business Park II
251 S. Lake Ave., Ste 612
Pasadena, CA 91101

645-020-04/05/06/07
Otay Rio Business Park
c/o The Chillingworth Corp
251 S. Lake Ave. Ste 612
Pasadena, CA 91101

645-030-03
Ostling, Stan; Jacqueline
1321 Tamarack Avenue
Carlsbad, CA

645-030-16
United Enterprises, Inc.

645-041-05
Sesi, Salim & Batool
Deddeh, Wadie & Mary
1034 H. Magnolia Ave.Ste 2
El Cajon, CA

645-051-01
Robinhood Homes, INc.

HCH & Associates
4877 Viewridge Avenue
San Diego, CA 92123

NOTICE OF PREPARATION

TO:

FROM: Planning Department
City of Chula Vista
P. O. Box 1087
Chula Vista, CA 92012

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

CASE NO: EIR-87-2

The City of Chula Vista will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the probable environmental effects are contained in the attached materials. A copy of the Initial Study [ ] is, [X] is not, attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to: Douglas D. Reid, Environmental Review Coordinator, at the address shown above. We will need the name for a contact person in your agency.

PROJECT APPLICANT, IF ANY: The Chillingworth Corporation

DATE: November 20, 1986

Signature: Douglas Reid

Title: Environmental Review Coordinator

Telephone: (619) 691-5101

Reference: California Administrative Code, Title 14, Sections 15035.7, 15054.3, 15066.

EN 12 (Rev. 12/82)

State Clearinghouse
1400 10th Street
Sacramento, CA 95814

City of San Diego
Planning Department
Environmental Quality Div.
202 C Street
San Diego, CA 92101

SANDAG
Security Pacific Plaza
1200 Third Ave., Ste 524
San Diego, CA 92101

PROJECT DESCRIPTION

The 210 acre site, located on the northerly side of the extension of Palm Avenue and the westerly side of Otay Valley Road, is being proposed as a planned industrial park. The site consists of a total of 69 lots to be developed under IL-P zoning with two exceptions. Lot 12, located in the southwest corner of the property; and a portion of Lot 18, located in the southeast corner of the property, will be developed as residential in accordance with the City of Chula Vista general plan.

The project scope will encompass a general plan amendment to general industrial land use with IL-P zoning, a precise plan and tentative subdivision map.

Attachment B

1.0 Introduction
    1.1 Purpose
    1.2 Executive Summary

2.0 Project Description

3.0 Impact Analysis
    3.1 Geology
        3.1.1 Project Setting
        3.1.2 Impact
        3.1.3 Mitigation
        3.1.4 Analysis of Significance

    (each section will include these subsections)

    3.2 Soils
    3.3 Ground Water
    3.4 Drainage (Hydrology & Hydrolics)
    3.5 Mineral Resources
    3.6 Land Form
    3.7 Conversion of Agricultural Lands
    3.8 Air Quality
    3.9 Water Quality
    3.10 Mobile Noise Source
    3.11 Stationary Noise Source
    3.12 Biology
    3.13 Archaeology
    3.14 Paleonotological Resources
    3.15 Historical Resources
    3.16 Land Uses/General Plan Elements/Zoning
    3.17 Aesthetics
    3.18 Community Social Factors
    3.19 Community Tax Structure
    3.20 Schools
    3.21 Parks, Recreation and Open Space
    3.22 Fire & Police
    3.23 Waste Disposal
    3.24 Utility Service
    3.25 Energy Conservation (State EIR Guidelines, Appendix F)
    3.26 General Governmental Support
    3.27 Transportation/Access
    3.28 Risk of Upset/Health Hazard

4.0 Alternatives to the Proposed Action

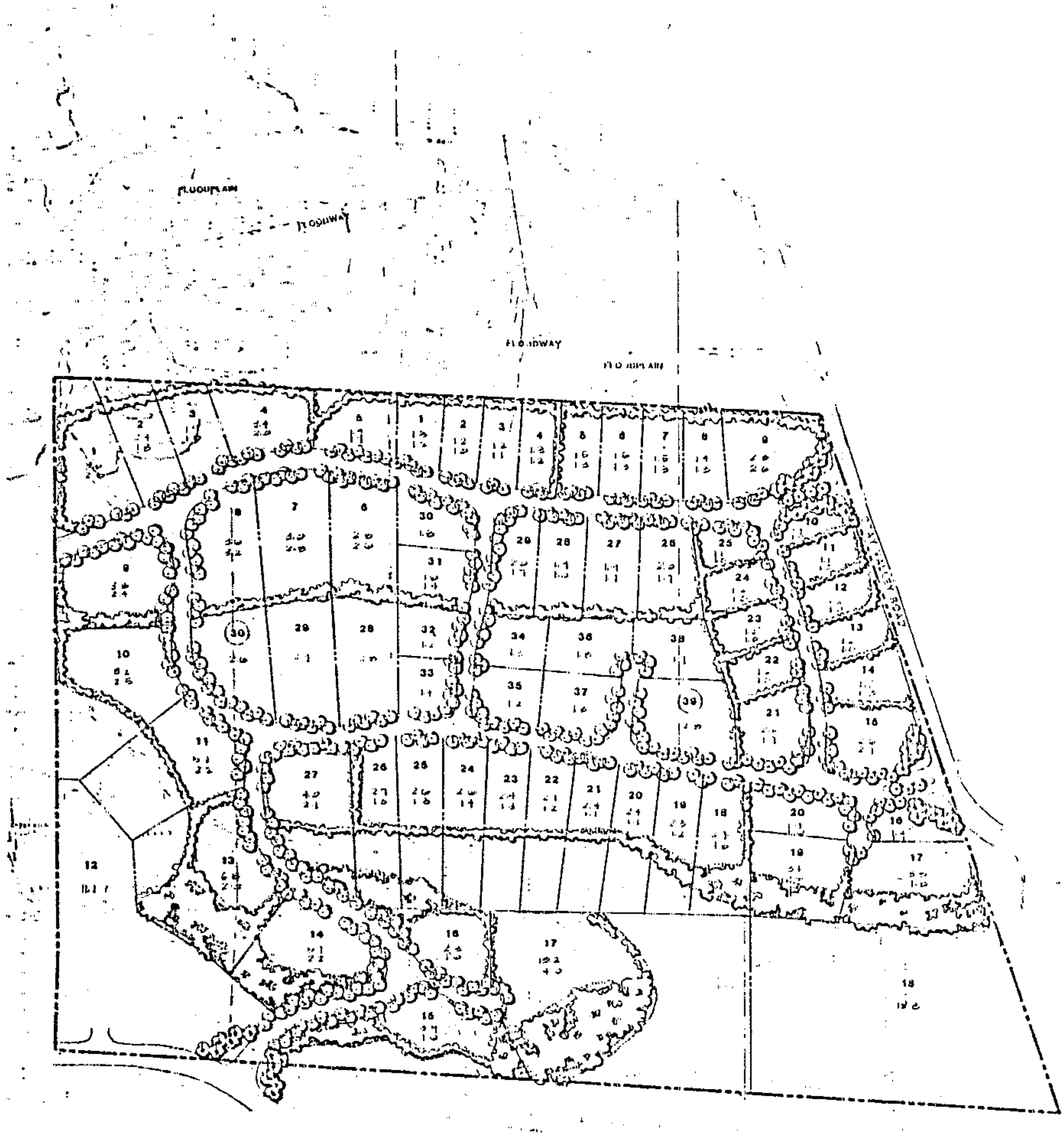
5.0 Unavoidable Significant Environmental Impacts

6.0 Relationship between Local Short-Term Use of the Environment and the Maintenance & Enhancement of Long-Term Productivity. (Including the relationship to regional land use, growth, transportation, air quality, water quality plans, policies and stratagies)

7.0 Irreversible Environmental Changes that will Result from the Proposed Project.

8.0 Growth Inducing Impact of the Proposed Action

# OTAY RIO BUSINESS PARK




Concept II

HCH & ASSOCIA

STATE OF CALIFORNIA—OFFICE OF THE GOVERNOR GEORGE DEUKMEJIAN, Governor

# OFFICE OF PLANNING AND RESEARCH

1400 TENTH STREET
SACRAMENTO, CA 95814

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BY

DEC 1

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

**DATE:** November 25, 1986

**TO:** Reviewing Agencies

**RE:** The City of Chula Vista's NOP for
Otay Rio Business Park
SCH# 86112607

Attached for your comment is the City of Chula Vista's Notice of Preparation of a draft Environmental Impact Report (EIR) for Otay Rio Business Park.

Responsible agencies must transmit their concerns and comments on the scope and content of the EIR, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of this notice. We encourage commenting agencies to respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Douglas D. Reid
The City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 92010

with a copy to the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the review process, call Glenn Stober at 916/445-0613.

Sincerely,

John Chanian

John B. Chanian
Chief Deputy Director

Attachments

cc: Douglas D. Reid

DISTRIBUTION LIST FOR SCH # 86112607

S - Sent by Lead Agency

X - Sent by Clearinghouse

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86112607

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Al Yang
State Water Resouces Control Board
Division of Water Rights
901 P Street
Sacramento, CA 95814
916/324-5716

Regional Water Quality Control Board

Region # 9 City San Diego

THE CITY OF
SAN DIEGO
CITY ADMINISTRATION BUILDING • 202 C STREET • SAN DIEGO, CALIF. 92101

ENVIRONMENTAL
QUALITY DIVISION
PLANNING
DEPARTMENT
236-5775

December 23, 1986

George Krempl, Planning Director
Chula Vista Planning Department
P.O. Box 1087
Chula Vista, CA 92012

Dear George:

Our office has received Notice of Preparation of Draft Environmental Impact Report, EIR-87-2. This 210 acre property on the southerly side of the Otay River Valley and westerly of Otay Valley Road was recently deannexed from the City of San Diego and annexed to Chula Vista.

The Otay Mesa Community Plan adopted by the City of San Diego in April, 1981, designated this property for agricultural, open space, and very low density residential (0-5 D.U. per acre) usage.

It is our understanding that the owners of this property intend to process a general plan amendment to change the majority of the land use to an industrial designation.

Please provide the Environmental Quality and Community Planning Divisions of our office copies of all reports and documents relative to this project that are distributed for public review. The contact persons in our office are Dave Potter, Principal Planner, Environmental Quality Division, 236-6772 and Allen M. Jones, Deputy Planning Director, Community Planning Division, 236-6417.

Sincerely,

Diana Dugan

Diana Dugan
Deputy Planning Director

JVC:MS:mal

cc: Allen M. Jones
Mike Stang

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BY

DEC 29 1986

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF CONSERVATION
DIVISION OF ADMINISTRATION
DIVISION OF MINES AND GEOLOGY
DIVISION OF OIL AND GAS

1416 Ninth Street
SACRAMENTO, CA 95814

DEC 31 1986

Douglas D. Reid
City of Chula Vista
276 4th Avenue
Chula Vista, CA 92010

SCH #86112607,
San Diego County

The Department of Conservation has reviewed the NOP for the planned 210-acre industrial park, Otay Rio Business Park, San Diego County. We have the following concerns on mineral resources.

Under the authority of the State Surface Mining and Reclamation Act of 1975 (SMARA), the Department of Conservation is authorized, among other responsibilities, to classify specified lands of the State according to the presence of significant mineral deposits. This mineral-land classification activity provides local governments, local property owners, and the mining industry with scientific information regarding the nature, occurrence, and distribution of mineral deposits. This information is intended for use by local government in land-use planning and mineral conservation.

Our Division of Mines and Geology has classified much of the land within the project area as containing significant deposits of aggregate resources which are of significance on both a local and regional basis. These areas have been identified as areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists[1]

We recommend that the Final EIR contain a discussion of the mineral resource potential of the project area, and the impacts that the proposed development would have on the local and regional aggregate resource supplies.

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JAN 5 19

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

If you have any questions regarding these comments, please contact Zoe McCrea, Division of Mines and Geology Environmental Review Officer, at (916) 322-3202.

Dennis J. O'Bryant
Environmental Program Coordinator

Enclosure

cc: Zoe McCrea, Division of Mines and Geology
Ed Kiessling, Division of Mines and Geology

References

1 Kohler, S.L., and Miller, R.V., 1982, Mineral land classification: aggregate materials in Western San Diego County Production-Consumption Region: California Division of Mines and Geology Special Report 153, plate 29, Imperial Beach quadrangle.

DJO:ZM:lip
0133H

STATE OF CALIFORNIA—RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

**DEPARTMENT OF WATER RESOURCES**

P.O. Box 6598

LOS ANGELES

90055

DEC 2 4 1986

City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 92010

Attention: Douglas D. Reid

Reference: Notice of Preparation of DEIR for Otay Rio Business Park, dated November 25, 1986, SCH 86112607.

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

The Department recommends that you 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,

Jay Federman
for Carlos Madrid

Carlos Madrid, Chief
Planning Branch
Southern District

Attachments

cc: Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

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JAN 5 1986

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

Department of Water Resources Recommendations for Water Conservation and Water Reclamation

'o reduce water demand, the water conservation measures described here should be implemented.

Required

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

- 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."

- 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.

- 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.

- 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.

- 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.

- Health and Safety Code Section 4047 prohibits installation of residential water softening or conditioning appliances unless certain conditions are satisfied. Included is the requirement that, in most instances, the installation of the appliance must be accompanied by water conservation devices on fixtures using softened or conditioned water.

Government Code Section 7800 specifies that lavatories in all public facilities constructed after January 1, 1985, be equipped with self-closing faucets that limit flow of hot water.

Recommendations to be implemented where applicable

_nterior:

1. Supply line pressure: Water pressure greater than 50 pounds per square inch (psi) be reduced to 50 psi or less by means of a pressure-reducing valve.

2. Drinking fountains: Drinking fountains be equipped with self-closing valves.

3. Hotel rooms: Conservation reminders be posted in rooms and restrooms.* Thermostatically controlled mixing valve be installed for bath/shower.

4. Laundry facilities: Water-conserving models of washers be used.

5. Restaurants: Water-conserving models of dishwashers be used or spray emitters that have been retrofitted for reduced flow. Drinking water be served upon request only.*

6. Ultra-low-flush toilets: 1 1/2 gallon per flush toilets be installed in all new construction.

Exterior:*

. Landscape with low water-using plants wherever feasible.

2. Minimize use of lawn by limiting it to lawn-dependent uses, such as playing fields. When lawn is used, require warm season grasses.

3. Group plants of similar water use to reduce overirrigation of low-water-using plants.

4. Provide information to occupants regarding benefits of low-water-using landscaping and sources of additional assistance.

5. Use mulch extensively in all landscaped areas. Mulch applied on top of soil will improve the water-holding capacity of the soil by reducing evaporation and soil compaction.

6. Preserve and protect existing trees and shrubs. Established plants are often adapted to low-water-using conditions and their use saves water needed to establish replacement vegetation.

---

*The Department of Water Resources or local water district may aid in developing these materials or providing other information.

7. Install efficient irrigation systems that minimize runoff and evaporation and maximize the water that will reach the plant roots. Drip irrigation, soil moisture sensors, and automatic irrigation systems are a few methods of increasing irrigation efficiency.

8. Use pervious paving material whenever feasible to reduce surface water runoff and aid in ground water recharge.

9. Grade slopes so that runoff of surface water is minimized.

10. Investigate the feasibility of utilizing reclaimed waste water, stored rainwater, or grey water for irrigation.

11. Encourage cluster development, which can reduce the amount of land being converted to urban use. This will reduce the amount of impervious paving created and thereby aid in ground water recharge.

12. Preserve existing natural drainage areas and encourage the incorporation of natural drainage systems in new developments. This aids ground water recharge.

13. To aid in ground water recharge, preserve flood plains and aquifer recharge areas as open space.

Department of Water Resources Recommendations for Flood Damage Prevention

In flood-prone areas, flood damage prevention measures required to protect a proposed development should be based on the following guidelines:

1. It is the State's policy to conserve water; any potential loss to ground water should be mitigated.

2. All building structures should be protected against a 100-year flood.

3. In those areas not covered by a Flood Insurance Rate Map or Flood Boundary and Floodway Map, issued by the Federal Emergency Management Agency, the 100-year flood elevation and boundary should be shown in the Environmental Impact Report.

4. At least one route of ingress and egress to the development should be available during a 100-year flood.

5. The slope and foundation designs for all structures should be based on detailed soils and engineering studies, especially for hillside developments.

6. Revegetation of disturbed or newly constructed slopes should be done as soon as possible (utilizing native or low-water-using plant material).

7. The potential damage to the proposed development by mudflow should be assessed and mitigated as required.

. Grading should be limited to dry months to minimize problems associated with sediment transport during construction.

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF FOOD AND AGRICULTURE

1220 N Street
Sacramento, CA 95814

December 16, 1986

Mr. Douglas Reid
The City of Chula Vista
276 Fourth Avenue
Chula Vista, California 92010

Dear Mr. Reid:

Thank you for the opportunity to comment on the forthcoming Draft Environmental Impact Report (DEIR) for the general plan amendment proposed for this industrial park project which would allow for the development of a 210 acre site to 69 lots, 67 to be developed under IL-P zoning and 2 developed as residential.

The Department of Food and Agriculture (CDFA) would appreciate a discussion of the following issues in the DEIR:

1. What is the current zoning of the property? If it is agricultural land, is it currently in production? If applicable, please indicate soil types, methods of irrigation, and crop history. Is it covered under the Williamson Act ?

2. It appears as though the proposed site is not contiguous to existing urban development. Would other sites be more appropriate for this kind of development at this time?

3. Is this site located in or surrounded by agricultural development? If so, what discussion has there been to mitigate potential use conflicts between the industrial park and local agricultural interests, such as noise, odor, dust, chemical useage, or trespassing, and traffic?

4. What pressure would this project exert on surrounding agricultural land (if applicable) to be converted to other uses?

The CDFA supports the right of local agencies to develop and implement land use policy in its area of influence, but also wants to assure that agricultural land is not prematurely and irreversibly lost due to development which is not well planned and does not consider all impacts to the environment.

RECEIVED

Sincerely,

Thomas M. Peterson

BY

DEC 2[illegible]

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

Thomas M. Peterson
Graduate Student Assistant
Agricultural Resources Branch
(916) 322-5227

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GEORGE DEUKMEJIAN, *Governor*

DEPARTMENT OF FISH AND GAME

245 W. Broadway, Suite 350
Long Beach, CA 90802-4467
(213) 590-5113

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DEC 2

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

December 17, 1986

Douglas D. Reid
City of Chula Vista
Planning Department
276 Fourth Avenue
Chula Vista, CA 92010

Dear Mr. Reid:

We have reviewed the Notice of Preparation of a Draft EIR for the Otay Rio Business Park on a 210-acre site located on the northerly side of the extension of Palm Avenue and the westerly side of Otay Valley Road. To enable our staff to adequately review and comment on this project, we recommend the following information be included in the Draft EIR:

1. A complete assessment of flora and fauna within the project area. Particular emphasis should be placed upon identifying endangered, threatened, and locally unique species.

2. Documentation of direct, indirect, and cumulative impacts expected to adversely affect biological resources within and adjacent to the project site. In addition, CEQA requires a discussion within the EIR of specific measures proposed to offset such impacts.

3. An assessment of growth-inducement factors attributable to the project. Of particular concern to us is the impact upon natural open space within and adjacent to the project site.

4. The project should include the setting aside of natural open space in sufficient acreage to provide habitat for native wildlife.

5. Landscape programs should include native trees and shrubs to provide habitat for wildlife.

The project sponsor should be advised that diversion or obstruction of the natural flow or changes in the channel, bed, or bank of any river, stream, or lake will require notification to the Department of Fish and Game as called for in the Fish and Game Code. This notification (with fee) and the subsequent agreement must be completed prior to initiating any such changes. Notification should be made after the project is approved by the

lead agency. The Corps of Engineers should also be contacted as there may be a need for a Section "404" permit as required under regulations of the Clean Water Act.

Thank you for the opportunity to review and comment on this Notice of Preparation. If you have any questions, please contact Kris Lal of our Environmental Services staff at (213) 590-5137.

Sincerely,

Fred Worthley

Fred Worthley
Regional Manager
Region 5

cc: Office of Planning & Research
(SCH 86112607)
H. McKinnie

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BY

STATE OF CALIFORNIA—BUSINESS AND TRANSPORTATION AGENCY

GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 11, P.O. BOX 85406, SAN DIEGO 92138-5406

DEC 31 1986

PLANNING DEPARTMENT
CHULA VISTA, CALIFORNIA

December 29, 1986

11-SD-805
3.7

Douglas D. Reid
Planning Department
City of Chula Vista
P.O. Box 1087
Chula Vista, CA 92012

Dear Mr. Reid:

Notice of Preparation of a Draft EIR for
EIR-87-2, SCH #86112607

Caltrans District 11 will probably not have a Responsible Agency role in the preparation of this EIR. Our contact person for traffic information is Kurth Barnes, District Project Studies Engineer, (619) 237-6952.

Sincerely,

W. R. DOTSON
District Director

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

JTC/MO:ec

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

GEORGE DEUKMEJIAN, Governor

**DEPARTMENT OF TRANSPORTATION**
DIVISION OF AERONAUTICS
1130 K STREET - 4TH FLOOR
MAIL: P.O. BOX 942874
SACRAMENTO, CA 94274-0001
(916) 322-3090
TDD (916) 323-7665



December 19, 1986

Mr. Douglas D. Reid
The City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 92010

Dear Mr. Reid:

The City of Chula Vista's NOP for Otay Rio Business Park; SCH #86112607 (In Vicinity of Brown Field Municipal Airport)

The Department of Transportation, Division of Aeronautics, has reviewed the above-referenced document with respect to those areas germane to its statutory responsibilities. The following suggestions are offered for your consideration.

Because of the close proximity of the project site to the airport, the DEIR should address the project's potential impact on airport operations as well as airport-related noise and safety impacts on the project. Consideration given to the issue of compatible land uses in the vicinity of an airport should help to relieve future conflict between airports and their surroundings.

Thank you for the opportunity to review and comment on this proposal. The Division looks forward to reviewing the DEIR.

Sincerely,

JACK D. KEMMERLY, Chief
Division of Aeronautics

Sandy Desnard

Sandy Desnard
Environmental Planner

cc: San Diego ALUC
Brown Field Muni Airport
Clearinghouse

# APPENDIX B

# BIOLOGICAL SURVEY REPORT

PSBS #103

# Report of a Biological Survey of the 210-Acre Otay Rio Business Park Project Site

Tentative Map
Chula Vista Tract No. 87-6
Rev. 2/19/87

Prepared for

Keller Environmental
964 Fifth Avenue, Suite 535
San Diego, CA 92101
(619) 544-1414

Prepared by


Pacific Southwest Biological Services, Inc.
Post Office Box 985
National City, CA 92050
(619) 477-5333

_______________________/________
R. Mitchel Beauchamp  Date
Principal Consultant


22 March 1987

## SUMMARY

At the request of Keller Environmental, Pacific Southwest Biological Services, Inc. performed a biological survey on the 210-acre Otay Rio Business Park site on the south side of the Otay River in the city of Chula Vista (Figure 1). The biological survey was performed as a part of an EIR for the site.

The project, as currently proposed, would eliminate 0.92 acres of Riparian Woodland and Freshwater Marsh, approximately 85 acres of highly disturbed Inland Sage Scrub, and approximately 110 acres of Fallow Agricultural Fields. The loss of the wetland area is significant due to its limited availability and its rapidly declining extent in Southern California.

It is recommended that the knoll just north of the southwestern corner of the property, supporting both Dichondra and Ferocactus (Figure 2), be placed in biological open space, or that prior to development, Ferocactus be salvaged from this area and transplanted into a suitable habitat protected from development activities.

. Field investigators for the current survey were Fred T. Sproul, botanist, and Keith W. Merkel, zoologist.

## GENERAL PHYSIOGRAPHY

The property lies in a recent annexation area of the City of Chula Vista. It is bounded on the east by Otay Valley Road, on the north by the Otay River channel, and on the south by Otay Mesa and City of San Diego jurisdiction, and on the west by City of San Diego and County of San Diego jurisdiction. The property is predominantly north-facing slopes and the floodplain on the south side of the Otay River. In the lower floodplain areas of the site there has been extensive agriculture. On the canyon slopes and southern mesa areas of the project site, off-road vehicle (ORV) activities have seriously degraded native habitats.

Elevations range from 110' in the northwestern corner of the property to 460' on the southern mesa area. Soils on the site are mapped as Salinas clay loam, Diablo clay, Stockpen, Linne clay, Riverwash, and recent alluvial sediments (Bowman, 1973). The underlying geology is mapped as Pleistocene marine deposits, terraces, and stream alluvium (Jenkins, 1962).

## METHODS

The botanical portion of the field survey was performed by Mr. Sproul in late November 1986. The property, with the exceptions of agricultural fields, was surveyed on foot and a check list of plant taxa was prepared (Table 1). Sensitive plants observed and vegetation communities were mapped on a field topographic map of 1" = 200' scale. Vegetation boundaries were

delineated visually. Wetlands were mapped using the USFWS wetland plants list as a guide.

The zoological portion of the survey was performed by Mr. Merkel according to the following schedule and under the conditions listed below.

| | | |
|---|---|---|
| 26 November 1986 | 0930-1230 hours | Clear, sunny; no wind; 72 degrees F. at 0930. |

Field observations were aided by binoculars (7 x 35 power). Unobserved animals were detected through indirect means (i.e. scat, tracks, vocalizations, nests and burrows, etc.).

Nomenclature used in this report is from the following standard references: vegetation, Thorne (1976); flora, Beauchamp (1986); wildlife, Laudenslayer and Grenfell (1983).

## BOTANY

### Vegetation

Four major vegetation communities are present on the project site. These include Riparian Woodland, Freshwater Marsh, Disturbed Inland Sage Scrub, and Fallow Agricultural Fields. A small Eucalyptus grove is present in the northwestern portion of the site and represents a very minor vegetation community (Figure 2).

Riparian Woodland. Riparian Woodland is found in two locations on the site. In the northwestern corner of the property, Riparian Woodland supported by the Otay River occurs over 2.6 acres. This woodland is dominated by willows (Salix lasiolepis). Additional understory species such as Mulefat (Baccharis glutinosa). Leafy Burrobush (Hymenoclea monogyra), Elderberry (Sambucus mexicana), and Goldenbush (Isocoma veneta) are common.

Within the wetland, on an island, upland species such as **Baccharis sarothroides** and **Artemisia californica** occur, illustrating the ecotonal nature of the wetland.

The second area in which Riparian Woodland occurs is in a small side canyon behind a man-made earthen dam. This site is highly disturbed and is dominated by the early successional plant Mulefat (Baccharis glutinosa), and the non-native, invasive Tamarisk (Tamarix sp.). The wetland acreage at this site is 0.1 acres.

Freshwater Marsh. Freshwater Marsh occurs within the Riparian Woodland in the northwest corner of the property. This marsh occupies 2.0 acres and is typified by open water and emergent vegetation such as Bulrush (Scirpus americanus) and Cat-

tails (Typha domingensis). This area is, by all indications, an intact habitat with a wide diversity of wildlife resources.

Disturbed Inland Sage Scrub. This degraded community occurs throughout the southern portion of the project site. Use of this area by off-road vehicles has all but eliminated native vegetation on flat areas and drastically reduced the presence of vegetation on steeper slopes. Native plants indicative of this community are Flat-top Buckwheat (Eriogonum fasciculatum), California Sagebrush (Artemisia californica), and Lemonade Berry (Rhus integrifolia), Jojoba (Simmondsia chinensis), Toyon (Heteromeles arbutifolia), Bladderpod (Cleome isomeris), California Encelia (Encelia californica), Mojave Yucca (Yucca schidigera), and San Diego Sunflower (Viguiera laciniata). Due to the highly disturbed condition of the community, numerous non-native species have invaded, and large areas are dominated by such annual grasses as Bromus spp., Avena barbata, Erodium cicutarium, Silene gallica, Marrubium vulgare, and Foeniculum vulgare.

Fallow Agricultural Fields. Fallow Agricultural Fields dominate the gently sloping, northern portion of the property. These areas are dominated by mustards (Brassica spp.), Russian Thistle (Salsola australis), and remnant crop plants including Tomato (Lycopersicon sp.), Fava Bean (Vicia faba), and Cucumber (Cucumis sativus).

Eucalyptus Grove. The Eucalyptus grove on the site is comprised of Eucalyptus globulus and has little understory vegetation.

Flora

Seventy-two plant taxa were observed on the property. Of these 27 were non-native taxa representing both invasive and cultivated plants. Due to the unseasonal timing of the survey, many of the annual and some perennial plants were not identifiable. It is, therefore, estimated that the plant checklist compiled represents approximately 60 percent of the plants present on the site. Sensitive plants are discussed in the Sensitive Biological Resources section of this report.

The site flora lacks several of the expected Mexican floral element due to disturbance and lack of south-facing slopes. This element, however, is represented on-site by Viguiera laciniata, Hymenoclea monogyra, Ferocactus viridescens, Simmondsia chinensis, and Mammillaria dioica.

ZOOLOGY

General Wildlife Habitat

Two major habitats occur on the property. The first covers the wetlands in the northwestern corner of the site, including

the Freshwater Marsh and the larger of the two Riparian Woodlands described. The second wildlife habitat is a much less significant, but larger area occupying the remainder of the property.

The wetland habitat is characterized by such wildlife as Raccoon (**Procyon lotor**), Opossum (**Didelphis virginiana**), American Coot (**Fulica americana**), Red-winged Blackbird (**Agelaius phoeniceus**), Common Yellowthroat (**Geothlypis trichas**), and American Goldfinch (**Carduelis tristis**). While it is unlikely that the home ranges of many animals occur exclusively on the property, adjacent habitats along Otay River serve to enhance and expand the utility of this area. Such features as thick cattails and an island protect much of this habitat from disturbance by residents, illegal aliens, and domestic animals. However, there has been major dumping of trash along roadways that cross the wetland.

Within the eastern portion of the wetland are numerous upland plants characteristic of sage scrub communities. These plants, while not dominant, allow increased wildlife diversity in the area. Such birds as Wrentits (**Chamaea fasciata**), Brown Towhees (**Pipilo fuscus**), and Scrub Jays (**Aphelocoma coerulescens**), which would normally not be found in wetlands, occur in this ecotonal community.

Throughout the remainder of the property, the wildlife habitat is best characterized as disturbed. Although topographic features vary significantly, and different remnant plant communities are present in different areas, the continued use of the southern portion of the site by off-road vehicles and the fallow agricultural fields to the north create similar animal habitats. Disturbance-associated birds such as European Starlings (**Sturnus vulgaris**), House Finches (**Carpodacus mexicanus**), and Mourning Doves (**Zenaida macroura**) typify the area. Disturbance-associated mammals such as Botta's Pocket Gopher (**Thomomys bottae**), California Ground Squirrel (**Spermophilus beecheyi**), and Desert Cottontails (**Sylvilagus audubonii**) are also common and help support a large regional raptor population.

Fish

Mosquito Fish (**Gambusia affinis**) were observed to occur in the Freshwater Marsh on the property. No other fish are expected to occur on the site.

**Amphibians**

Numerous amphibians are expected to occur within the northern wetland on the site. These include the Western Toad (**Bufo boreas**), Garden Slender Salamander (**Batrachoseps pacificus major**), and the Bullfrog (**Rana catesbeiana**). The only amphibian

detected during the present survey was the Pacific Treefrog (**Hyla regilla**). No sensitive amphibians are expected to occur on the subject property.

## Reptiles

Two reptilian species were detected on the property (Table 2). Additional species expected to occur on the site include Western Rattlesnake (**Crotalus viridis**), Red Diamond Rattlesnake (**Crotalus ruber**), Western Aquatic Garter Snake (**Thamnophis couchi hammondi**), San Diego Horned Lizard (**Phrynosoma coronatum blainvillei**), and Western Whiptail (**Cnemidophorus hyperythrus**). Sensitive species expected to occur on the property are discussed in the Sensitive Biological Resources section of this report.

## Birds

Thirty-five avian species were observed on the property (Table 2). Included in these observations were five species of raptors common to the Otay Mesa/Otay River Valley area. No raptor nests were observed and due to the high level of disturbance on-site, it is unlikely that any nesting occurs.

The highest diversity and the largest concentration of individual birds was found in the wetland associated with the Otay River. As previously described, the habitat in this area is such that wetland and upland species are intermixed.

Several sensitive birds were observed or are expected to occasionally visit the property. These are discussed in a later section of this report.

## Mammals

Eight mammalian species were detected on the property (Table 2). All of these species are common to the area. Species expected to occur on the site as transients include Gray Fox (**Urocyon cinereoargenteus**) and Bobcat (**Lynx rufus**). Sensitive species will be discussed in the following section.

# SENSITIVE BIOLOGICAL RESOURCES

## Sensitive Vegetation

Riparian Woodland has been seriously depleted in Southern California as a result of development, flood control projects, and agriculture. Local wildlife is highly dependent upon the 2.6 acres of Riparian Woodland present in the northwest portion of the site even though these woodlands are not of the highest quality. Loss of any such wetland should be considered a biologically significant impact.

The isolated, minor Riparian Woodland in the side canyon (Figure 2), which lacks the dense cover of larger wetlands, is of lower biological significance.

**Sensitive Flora Expected But Not Encountered**

A concentrated effort was made to locate sensitive plants known to occur in the area. The following list outlines those sensitive plants known from the area but not observed during the survey. It also indicates the likelihood of their presence on the site.

**Cordylanthus orcuttianus**
Orcutt's Bird's-Beak
3-3-2

This plant is known from a downstream area and north of the project site. Although suitable habitat does appear to exist, no plants were located on-site. Dried remains would have been readily identifiable had the plant been present.

**Hemizonia conjugens**
Otay Tarplant
3-3-1

This plant is known from areas north of the project site. Dead remains are not taxonomically separable from other Hemizonia sp. It is, therefore, possible that this species is present on the clay soils in the southern portion of the property.

**Dudleya variegata**
Variegated Dudleya
1-2-2

This plant is occasionally found on clay mesas and slopes from La Jolla Canyon south to Otay Mesa. The soils and seasonally wet regions of the north-facing slopes may have some remnant stands of this plant. It would be difficult to verify its absence or presence on the site due to the timing of the survey.

**Muilla clevelandii**
Cleveland's Golden Star
2-2-2

This plant is frequently found on clay soils, especially on mesas in San Diego County. Disturbance and the late-season timing of the survey make it unlikely to have been observed. If present, viable perennial bulbs exist, since the site was only recently disturbed.

**Iva hayslana**
San Diego Marsh Elder
2-2-1

Iva hayslana is associated with wetlands and is known in many of the watercourses in the local area. It occurs near the site in the Otay River Valley, although the small size and disturbance around the wetlands of the site may preclude its presence. Had it been present, it would have been visible and evident at the time of the survey.

**Artemisia palmeri**
San Diego Sagewort
1-1-1

This wetland plant is known from many of the wetlands in southern San Diego County. The small size and minimal development of Riparian Woodland on-site may preclude the presence of this plant's habitat. This plant is visible and evident at all times of the year.

**Stipa diegoensis**
San Diego County Needle Grass
3-1-1

This bunchgrass is known from several sites in the Otay Mesa area. It would be expected on the north-facing clay slopes of the project if most suitable habitat sites had not been destroyed by disturbance. The tall spikes and early leaf growth would have been evident at the time of the survey had it been present.

The following, locally-occurring sensitive plant taxa are mostly restricted to dry south-facing slopes. Their potential presence on-site is low, considering the aspect of slopes on-site. Disturbance may well have eliminated any relictual stands of such taxa on eastern or western exposures.

Ambrosia chenopodiifolia
Bergerocactus emoryi
Euphorbia misera
Opuntia parryi var. serpentina
Selaginella cinerascens

**Sensitive Plants Observed**

Three plant taxa currently considered sensitive were located on the project site. These are Dichondra occidentalis, Ferocactus viridescens, and Viguiera laciniata.

**Dichondra occidentalis**
Western Ponyfoot
1-2-1

**Dichondra occidentalis** is considered sensitive due to its limited local distribution, although it has a relatively wide range in California. Overall, loss of the Inland Sage Scrub plant community in which this plant occurs is the most significant threat to this plant.

Western Ponyfoot occurs at two locations on the site and was probably seriously depleted by off-road vehicle traffic (Figure 2).

**Ferocactus viridescens**
San Diego Barrel Cactus
1-3-1

**Ferocactus viridescens** is considered sensitive because of its limited distribution and the current threat to the species by development. There were 100+ individuals in the on-site population.

The San Diego Barrel Cactus is limited to the top of a small knoll located on the western edge of the property (Figure 2). Other areas of apparently suitable habitat on-site have been highly disturbed by off-road vehicle activities.

**Viguiera laciniata**
San Diego Sunflower
1-2-1

The San Diego Sunflower is limited to San Diego County where it is mostly found south of Mission Valley. It is occasionally a dominant element of the vegetation and is presently not seriously threatened with extinction.

The San Diego Sunflower is an occasional component of the few intact portions of the Inland Sage Scrub community. It occurs throughout the southern portions of the property, although not as a dominant plant or over extensive areas.

**Wildlife**

Sensitive wildlife known or expected to occur on the subject property are discussed in Table 3. The table outlines the sensitivity status, listing agencies or groups, status or expected status of the animal on the project site, and the anticipated impacts of the project on the organisms.

Three of these species, in particular, warrant additional consideration.

California Black-tailed Gnatcatchers
**Polioptila melanura californica**

These small, sensitive birds are residents of the rapidly disappearing plant community, Inland Sage Scrub. Because of the known presence of these birds in the immediate vicinity of the site, a special effort was made to locate individuals during the field investigation. However, none were observed.

Due to the highly disturbed nature and continued disturbance of Inland Sage Scrub by off-road vehicles on the site, it is unlikely that these birds will ever occupy this site if it is left in the current condition and off-road vehicle use continued.

Least Bell's Vireo
**Vireo bellii pusillus**

This small, nondescript bird inhabits Riparian Woodlands and has recently been placed on the federally endangered list. While it is not, as yet, known in the vicinity of the project site, some suitable habitat is known within the Otay River Valley. This species is a migrant and would not be expected to be present at the time of the field investigation. However, a general habitat overview of the on-site riparian areas suggests that it is very unlikely that this species would ever be found here.

San Diego Horned Lizard
**Phrynosoma coronatum blainvillei**

The open nature of the Inland Sage Scrub on the site favors this sensitive lizard and it is likely to be present in small numbers. Unfortunately, due to the lizard's habit of basking along trails, and its slow movement, it is likely that off-road vehicles keep the numbers of this species extremely low.

## EXPECTED BIOLOGICAL IMPACTS

The project as proposed would eliminate 0.92 acres of Riparian Woodland characterized by Mulefat and facultative indicator species. It would also eliminate approximately 85 acres of highly disturbed Inland Sage Scrub and approximately 110 acres of Fallow Agricultural Fields.

Development of the property would also cause an incremental loss of raptor foraging land, and an incremental loss of the sensitive plants **Ferocactus**, **Dichondra**, and **Viguiera laciniata**.

No additional biological impacts are considered substantial enough to warrant discussion.

## RECOMMENDATIONS TO REDUCE BIOLOGICAL IMPACTS

The street drain outlet shown on the tentative map as draining into the pond area should be relocated so that runoff is released outside ponded areas. This drain should be designed to prevent minor drainage from the parking lot and the road from entering the pond. Only storm runoff, which would serve to flush the pond, should be allowed to drain through the pond.

Slopes adjacent to native habitats should be stabilized with native vegetation. Northern fill slopes in Lot 2 should be moved southward to avoid wetland vegetation. The open space park should be vegetated with native plant species including trees such as Sycamore and Cottonwood. Native vegetation currently growing in the proposed open space should be left intact.

One hundred or more mature Coast Barrel Cacti are referred to in the text. The area where they are found should not be graded prior to efforts to salvage and transplant them to a suitable site. Adjacent or nearby preserved open spaces with Inland Sage Scrub vegetation or revegetation sites are available for such transplants.

Although cactus salvage projects have apparently been successful elsewhere, such transplantation is not considered as an acceptable mode of habitat preservation or sensitive plant protection.

Some concern has been indicated about buffers around wetland areas. A 100-foot buffer has been discussed. This would be an appropriate distance for a residential area with its high incidence of pet and pedestrian invasion; however, for an office park or industrial area, this may be excessive. It is recommended that a much narrower, densely vegetated buffer of 20-25 feet be utilized in lieu of a wider buffer. Plant materials which would serve as a barrier to visibility and passage as well as serve as cover and food for wildlife are:

| | |
|---|---|
| Atriplex lentiformis ssp. breweri | cover, food |
| Rubus ursinus | cover, food, barrier |
| Cleome isomeris | food |
| Berberis (Mahonia) nevinii | food, barrier |
| Opuntia littoralis | cover, bood, barrier |
| Simmondisia chinensis | cover |
| Viguiera laciniata | cover |
| Rhus integrifolia | cover |
| Eriogonum fasciculatum | cover, food |

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Table 1. Floral Checklist of the Otay Rio Business Park Site

DICOTYLEDONS

Adoxaceae - Adoxus Family
Sambucus mexicana Presl ex DC. Desert Elderberry

Amaranthaceae
*Amaranthus blitoides S. Wats.

Anacardiaceae
Rhus integrifolia (Nutt.)Benth.& Hook. Lemonade Berry
*Schinus molle L. Pepper-tree

Apocynaceae
*Nerium sp. Oleander

Asteraceae
Achillea millefolium var. californica (Pollard)Jeps. Yarrow
Artemisia californica Less. California Sagebrush
Baccharis glutinosa Pers. Mule-fat
Baccharis sarothroides Gray. Broom Baccharis
Brickellia californica (T.& G.)Gray.
*Centaurea melitensis L. Tocalote
*Cirsium vulgare (Savi)Ten. Bull Thistle
*Conyza canadensis (L.)Cronq. Horseweed
Corethrogyne filaginifolia var. glomerata Hall.
Encelia californica Nutt. California Encelia
Gnaphalium californicum DC. California Everlasting
Hazardia squarrosa (H. & A.)Greene ssp. grindelioides (DC.)Clark
Hemizonia fasciculata (DC.)T. & G. Fascicled Tarweed
Hymenoclea monogyra T. & G. ex Gray. Desert Fragrance
Isocoma veneta (H.K.B.)Greene var. furfuracea (Greene)Beauchamp
Pluchea odorata Cav. Marsh Fleabane
*Sonchus asper Sow-Thistle
Stephanomeria virgata Benth. Wreathplant
Stylocline gnaphalioides Nutt.
Viguiera laciniata Gray. San Diego Sunflower

Boraginaceae
Heliotropium curvassavicum var. oculatum (Heller)Jtn. Salt Heliotrope

Brassicaceae
*Brassica geniculata (Desf.)J. Ball. Short-pod Mustard
*Brassica nigra (L.)Koch Black Mustard

Buxaceae
Simmondsia chinensis (Link)C.K.Schneid. Jojoba

Cactaceae
Ferocactus viridescens (Nutt.)Britton & Rose. Coast Barrel Cactus
Mammillaria dioica K. Bdg. Fish-hook Cactus
*Opuntia ficus-indica (L.)Miller. Indian-Fig
Opuntia prolifera Engelm. Coast Cholla

Table 1. Floral Checklist of the Otay Rio Business Park Site (continued)

Capparaceae - Caper Family
  **Cleome isomeris** Greene. Bladderpod

Caryophyllaceae
  ***Silene gallica** L.

Chenopodiaceae
  **Atriplex canescens** (Pursh)Nutt. ssp. **canescens** Four-wing Saltbush
  **Atriplex patula** ssp. **hastata** (L.)Hall & Clem. Halberd-leaf Saltbush
  ***Salsola australis** R. Br. Russian-thistle

Convolvulaceae
  **Dichondra occidentalis** House. Western Ponyfoot

Crassulaceae
  **Dudleya edulis** (Nutt.)Moran. Ladies-Fingers

Cucurbitaceae
  **Marah macrocarpus** (Greene)Greene. Manroot

Euphorbiaceae
  **Eremocarpus setigerus** (Hook.)Benth. Doveweed
  ***Ricinus communis** L. Castor-Bean

Fabaceae
  **Astragalus trichopodus** ssp. **leucopsis** (T.& G.)Thorne. Locoweed
  **Lotus scoparius** (Nutt. in T.& G.)Ottley ssp. **scoparius** Deerweed
  **Trifolium** sp.

Geraniaceae
  ***Erodium cicutarium** (L.)L'Her. Filaree

Lythraceae - Loosestrife Family
  **Lythrum californicum** T. & G.

Malvaceae
  ***Malva parviflora** L. Cheeseweed
  **Sidalcea malvaeflora** ssp. **sparsifolia** C.L.Hitchc. Checkers

Nyctaginaceae
  **Mirabilis californica** Gray. Wishbone Plant

Polygonaceae
  **Eriogonum fasciculatum** Benth. ssp. **fasciculatum** Flat-top Buckwheat
  ***Rumex crispus** L. Curly Dock

Portulacaceae
  ***Portulaca oleracea** L. Purslane

Primulaceae
  ***Anagallis arvensis** L. Scarlet Pimpernel

Table 1. Floral Checklist of the Otay Rio Business Park Site (continued)

Rosaceae
Heteromeles arbutifolia M. Roem. Hollywood

Salicaceae
Salix lasiolepis Benth. var. lasiolepis

Solanaceae
Datura wrightii Regel. Western Jimsonweed
*Lycopersicon esculentum Mill. Cherry Tomato
*Nicotiana glauca Grah. Tree Tobacco

Tamaricaceae
*Tamarix parviflora DC. Salt-Cedar

Urticaceae
*Urtica urens L. Dwarf Nettle

MONOCOTYLEDONS

Agavaceae
Yucca schidigera Roezl ex Ortgies. Mojave Yucca

Cyperaceae
Scirpus americanus Pers. Bulrush

Liliaceae
Calochortus sp.

Poaceae
*Avena barbata L.
*Bromus mollis L. Soft Chess
*Bromus rubens L. Red Brome
*Polypogon monspeliensis (L.)Desf. Annual Beard Grass
*Setaria geniculata (Lam.)Beauv. Bristle Grass
Vulpia myuros var. hirsuta Hack. Foxtail Fescue

Typhaceae
Typha domingensis Pers. Cat-tails

* - Denotes non-native plant taxa

Table 2. Animals Observed or Detected on the Otay Rio Business Park Site

| COMMON NAME | SCIENTIFIC NAME | NUMBER OBSERVED OR MEANS OF DETECTION |
|---|---|---|
| FISH | | |
| Mosquito Fish | Gambusia affinis | Observed |
| REPTILES AND AMPHIBIANS | | |
| Hylidae (Treefrogs and Relatives) | | |
| Pacific Treefrog | Hyla regilla | Vocalization |
| Iguanidae (Iguanids) | | |
| Western Fence Lizard | Sceloporus occidentalis | Observed |
| Colubridae (Colubrids) | | |
| Gopher Snake | Pituophis melanoleucus | Observed |
| BIRDS | | |
| Cathartidae (American Vultures) | | |
| Turkey Vulture | Cathartes aura | 1 |
| Accipitridae (Hawks, Old World Vultures, and Harriers) | | |
| Black-shouldered Kite | Elanus caeruleus | 2 |
| Northern Harrier | Circus cyaneus | 2 |
| Cooper's Hawk | Accipiter cooperii | 1 |
| Red-tailed Hawk | Buteo jamaicensis | 3 |
| Falconidae (Caracaras and Falcons) | | |
| American Kestrel | Falco sparverius | 7 |
| Rallidae (Rails, Gallinules, and Coots) | | |
| American Coot | Fulica americana | 2 |
| Charadriidae (Plovers and Relatives) | | |
| Killdeer | Charadrius vociferus | 7 |
| Columbidae (Pigeons and Doves) | | |
| Rock Dove | Columba livia | 4 |
| Mourning Dove | Zenaida macroura | |
| Trochilidae (Hummingbirds) | | |
| Costa's Hummingbird | Calypte costae | many |
| Tyrannidae (Tyrant Flycatchers) | | |
| Black Phoebe | Sayornis nigricans | 8 |
| Say's Phoebe | Sayornis saya | 2 |
| Western Kingbird | Tyrannus verticalis | many |

Table 2. Animals Observed or Detected on the Otay Rio Business Park Site

| COMMON NAME | SCIENTIFIC NAME | NUMBER OBSERVED OR MEANS OF DETECTION |
|---|---|---|
| BIRDS (continued) | | |
| Corvidae (Jays, Magpies, and Crows) | | |
| Scrub Jay | Aphelocoma coerulescens | 1 |
| Common Raven | Corvus corax | 4 |
| Aegithalidae (Bushtit) | | |
| Bushtit | Psaltriparus minimus | 10+ |
| Troglodytidae (Wrens) | | |
| House Wren | Troglodytes aedon | 11 |
| Marsh Wren | Cistothorus palustris | |
| Muscicapidae (Old World Warblers, Gnatcatchers, Kinglets, Thrushes, Bluebirds and Wrentit) | | |
| Blue-gray Gnatcatcher | Polioptila caerulea | 1 |
| Wrentit | Chamaea fasciata | 11 |
| Mimidae (Mockingbirds and Thrashers) | | |
| Northern Mockingbird | Mimus polyglottos | 11 |
| California Thrasher | Toxostoma redivivum | 2 |
| Laniidae (Shrikes) | | |
| Loggerhead Shrike | Lanius ludovicianus | 1 |
| Sturnidae (Starlings) | | |
| European Starling | Sturnus vulgaris | 3 |
| Emberizidae (Wood Warblers, Sparrows, Blackbirds, and Relatives) | | |
| Yellow-rumped Warbler | Dendroica coronata | many |
| Common Yellowthroat | Geothlypis trichas | |
| Blue Grosbeak | Guiraca caerulea | many |
| Brown Towhee | Pipilo fuscus | |
| Nevada Savannah Sparrow | Passerculus sandwichensis nevadensis | many |
| Song Sparrow | Melospiza melodia | |
| White-crowned Sparrow | Zonotrichia leucophrys | |
| Red-winged Blackbird | Agelaius phoeniceus | 4 |
| Western Meadowlark | Sturnella neglecta | many |
| Fringillidae (Finches) | | |
| American Goldfinch | Carduelis tristis | 6 |
| MAMMALS | | |
| Didelphidae (Opossums) | | |
| Virginia Opossum | Didelphis virginiana | Tracks |
| Leporidae (Rabbits and Hares) | | |
| Desert Cottontail | Sylvilagus audubonii | Observed |

Table 2. Animals Observed or Detected on the Otay Rio Business Park Site

| COMMON NAME | SCIENTIFIC NAME | NUMBER OBSERVED OR MEANS OF DETECTION |
|---|---|---|
| **MAMMALS** (continued) | | |
| **Sciuridae** (Squirrels, Chipmunks and Marmots) | | |
| California Ground Squirrel | **Spermophilus beecheyi** | Observed |
| **Geomyidae** (Pocket Gophers) | | |
| Botta's Pocket Gopher | **Thomomys bottae** | Observed |
| **Cricetidae** (Deer Mice, Voles, and Relatives) | | |
| Woodrat | **Neotoma** sp. | Nest |
| **Muridae** (Old World Rats and Mice) | | |
| House Mouse | **Mus musculus** | Remains |
| **Canidae** (Foxes, Wolves, and Relatives) | | |
| Coyote | **Canis latrans** | Scat |
| **Mustelidae** (Weasels, Badgers, and Relatives) | | |
| Long-tailed Weasel | **Mustela frenata** | Tracks |

Table 3. Sensitive Wildlife Species Known to Occur or Potentially Occurring on the Otay Rio Business Park Site

| COMMON NAME (SCIENTIFIC NAME) | OFFICIAL STATUS | STATUS ON SITE | EXPECTED PROJECT IMPACT |
|---|---|---|---|
| REPTILES | | | |
| San Diego Horned Lizard (Phrynosoma coronatum blainvillei) | USFWS - Category 2<br>IUCN - Depleted<br>SDHS - Endangered<br>Stewart - Depleted<br>CDFG-2 - Protected Reptile<br>CDFG - Threatened<br>Ashton - Threatened | Likely resident in small numbers | Loss of on-site population; not significant. |
| Orange-throated Whiptail (Cnemidophorus hyperythrus) | IUCN - Rare, depleted<br>USFWS - Category 2<br>SDHS - Threatened<br>Stewart - Depleted<br>CDFG-2 - Protected reptile, should be declared rare<br>SDNGWS - Needing protection and study<br>Ashton - Threatened | Likely resident in small numbers | Loss of on-site population not significant. |
| Two-striped Garter Snake (Thamnophis couchi hammondi) | CDFG - Depleted, needing protection<br>IUCN - Depleted<br>SDHS - Threatened; protected from commercial trade by CITES (a treaty)<br>Stewart - Depleted<br>Ashton - Threatened | Likely resident in Freshwater Marsh/Riparian Woodland on-site | Loss of on-site population not significant |

Table 3. Sensitive Wildlife Species Known to Occur or Potentially Occurring on the Otay Rio Business Park Site (continued)

| COMMON NAME (SCIENTIFIC NAME) | OFFICIAL STATUS | STATUS ON SITE | EXPECTED PROJECT IMPACT |
|---|---|---|---|
| BIRDS | | | |
| Turkey Vulture (Cathartes aura) | Everett - Declining Special Concern | Frequents site | Loss of foraging habitat not significant |
| Black-shouldered Kite (Elanus caeruleus) | CDFG - Fully Protected | Forages on site | Loss of foraging habitat not significant |
| Northern Harrier (Circus cyaneus) | Blue List<br>SDNGWS<br>Everett - Declining<br>Remsen - 2nd priority | Forages on site | Loss of foraging habitat not significant |
| Cooper's Hawk (Accipiter cooperii) | Blue List<br>Everett - Declining<br>Remsen - 2nd priority | Forages on site | Loss of foraging habitat not significant |
| BIRDS (continued) | | | |
| Golden Eagle (Aquila chrysaetos) | Protected under Bald Eagle Act<br>CDFG - Fully Protected<br>SDNGWS<br>Remsen - 3rd priority | Likely to infrequently forage on site | Loss of potential foraging habitat; not significant |
| Prairie Falcon (Falco mexicanus) | SDNGWS<br>Remsen - 3rd priority<br>USFS - Sensitive | Possible visitor to site | Not significant |
| Scrub Jay (Aphelocoma coerulescens) | Blue List | Resident on site | Loss of habitat; not significant |
| Bewick's Wren (Thryomanes bewickii) | Blue List | Resident on site | Loss of habitat; not significant |

Table 3. Sensitive Wildlife Species Known to Occur or Potentially Occurring on the Otay Rio Business Park Site (continued)

| COMMON NAME (SCIENTIFIC NAME) | OFFICIAL STATUS | STATUS ON SITE | EXPECTED PROJECT IMPACT |
|---|---|---|---|
| BIRDS (continued) | | | |
| Blue-gray Gnatcatcher (Polioptila caerulea) | Everett - Declining | Observed on site | Loss of habitat; not significant |
| California Black-tailed Gnatcatcher (Polioptila melanura californica) | Remsen - 2nd priority<br>Everett - Declining<br>USFWS - Category 2 | Unlikely to occur of site | See text |
| Loggerhead Shrike (Lanius ludovicianus) | Blue List | Occurs on site | Loss of habitat, not significant |
| Least Bell's Vireo (Vireo bellii pusillus) | CDFG - Endangered<br>Remsen - 1st priority<br>SDNGWS<br>Everett - Declining<br>USFWS - Endangered | Habitat is limited on site; unlikely to occur here | See text |
| Common Yellowthroat (Geothlypis trichas) | Remsen - 2nd priority | Present in Riparian Woodland on site | Not significant |
| MAMMALS | | | |
| Bobcat (Lynx rufus) | Currently under study by CDFG, may receive protected status. | Likely to be an infrequent visitor to site | Not significant |

Table 3. Sensitive Wildlife Species Known to Occur or Potentially Occurring on the Otay Rio Business Park Site (continued)

## LEGEND

USFWS - U.S. Fish and Wildlife Service (1986)

CDFG - California Department of Fish and Game

IUCN - International Union for the Conservation of Nature and Natural Resources (1979)

BL - Audubon Blue List for 1986 (Tate, 1986)

Remsen (1978) - Species of Special Concern - Priority I, II or III, in decreaseing order of sensitivity.

Everett (1979) - Threatened, Declining and Sensitive Bird Species in San Diego County.

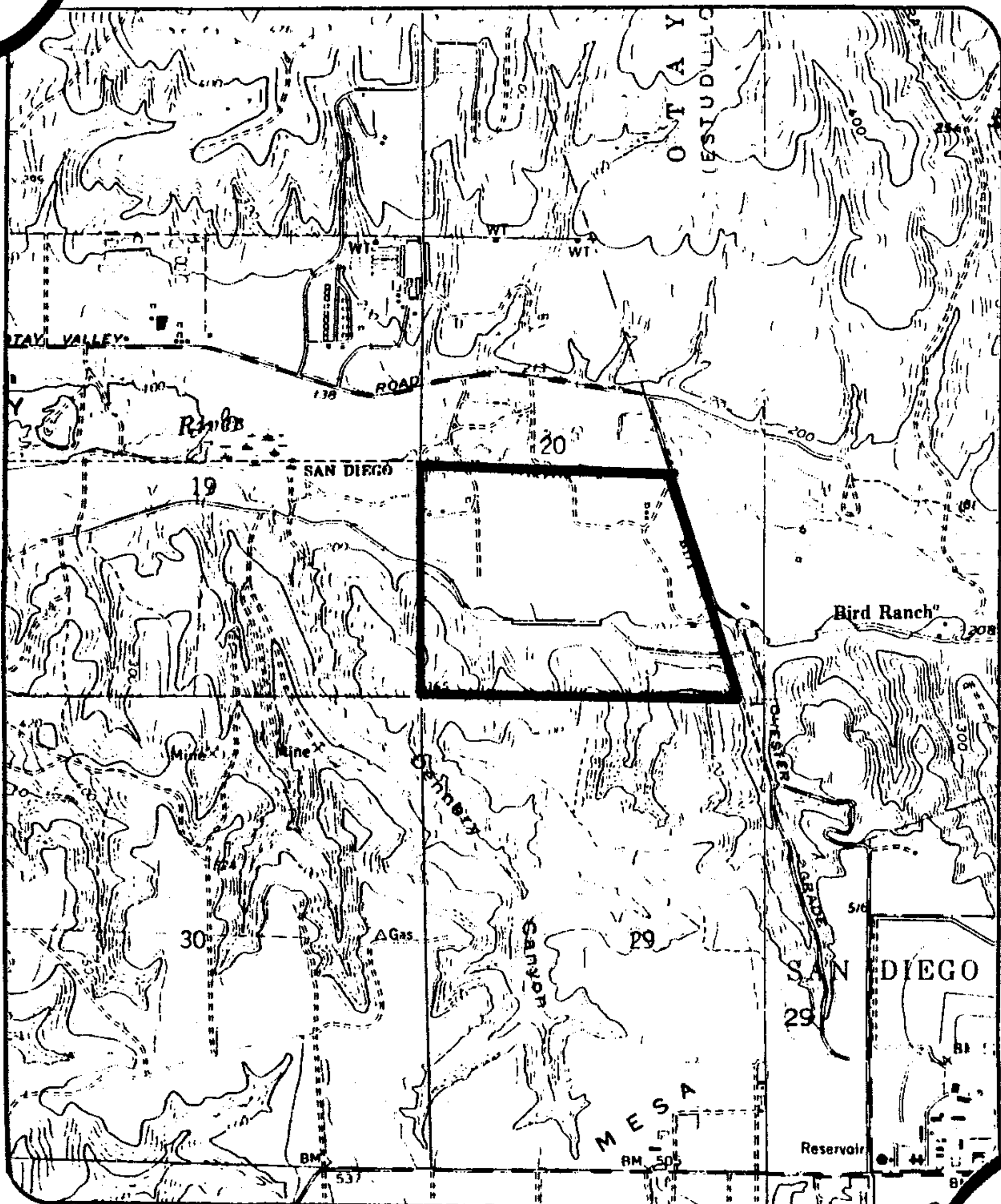
SDHS - San Diego Herpetological Society (1980)

Ashton (1976) - Endangered and Threatened Amphibians and Reptiles in the United States

Stewart (1971) - Rare, Endangered and Depleted Amphibians and Reptiles in California.

SDNGWS - San Diego Non-Game Wildlife Subcommittee (1976)

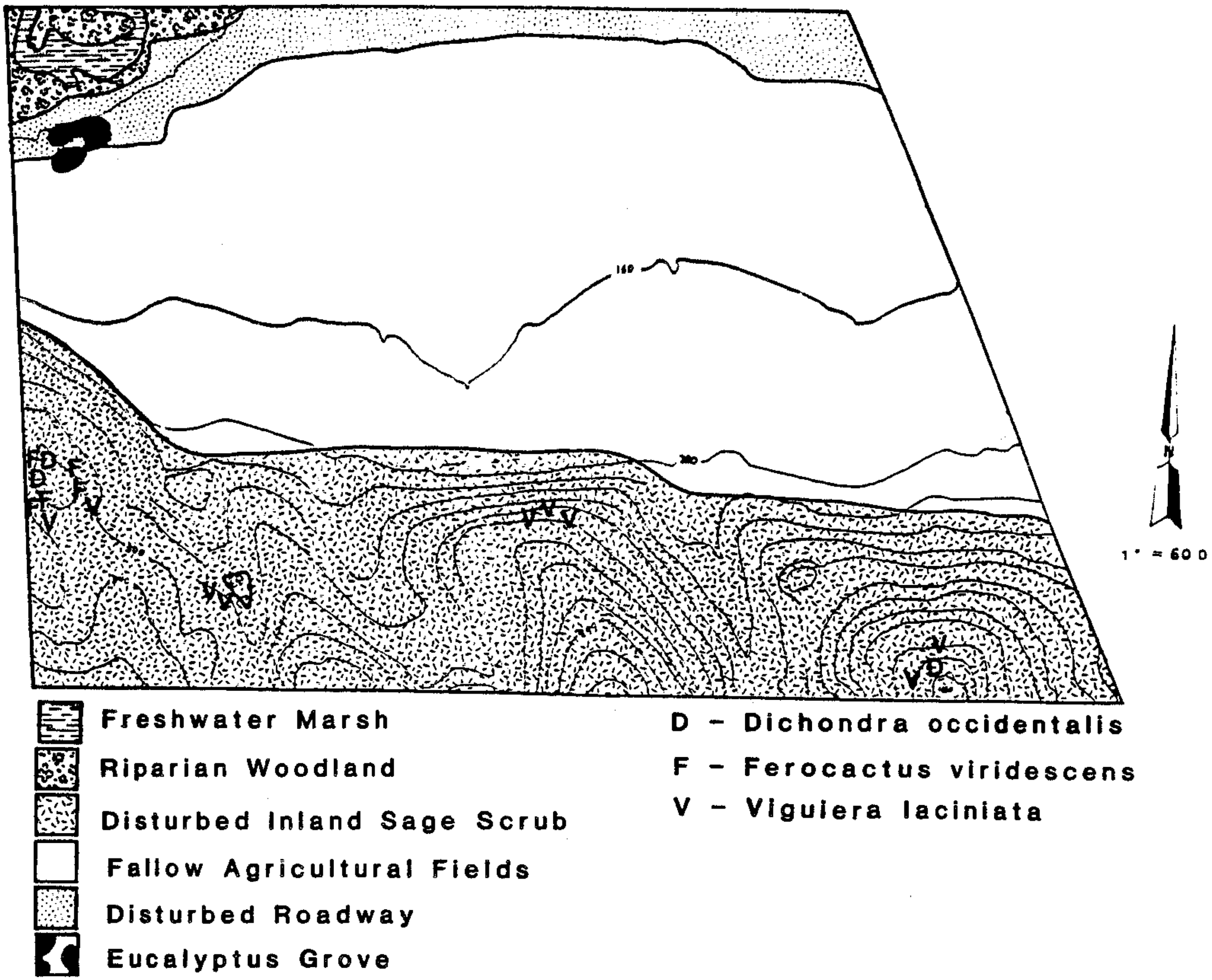
# Figure 1. Vicinity Map




base map: USGS, Imperial Beach

Quadrangle

Figure 2. Vegetation and Rare Plant Map



# APPENDIX C

# ARCHAEOLOGICAL SURVEY REPORT

# THE ARCHAEOLOGICAL INVESTIGATIONS AT THE OTAY RIO BUSINESS PARK PROJECT

*A Cultural Resource Survey of 210 Acres and the Evaluation of the Loci of Site W-3861*

Prepared For:

The City of Chula Vista
and
The Chillingsworth Corporation
Represented by Keller Environmental Associates, Inc.

Prepared By: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February 2, 1987

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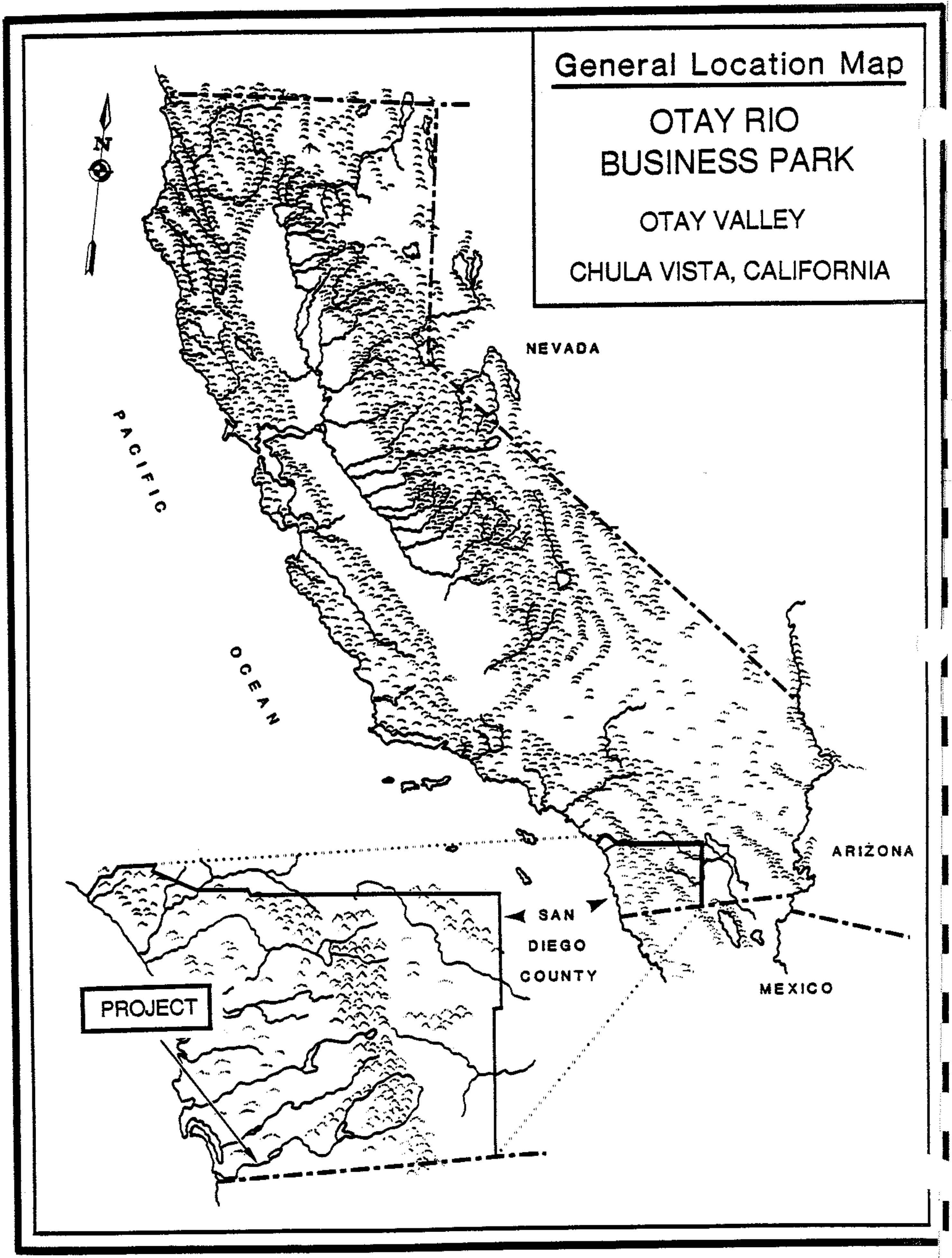
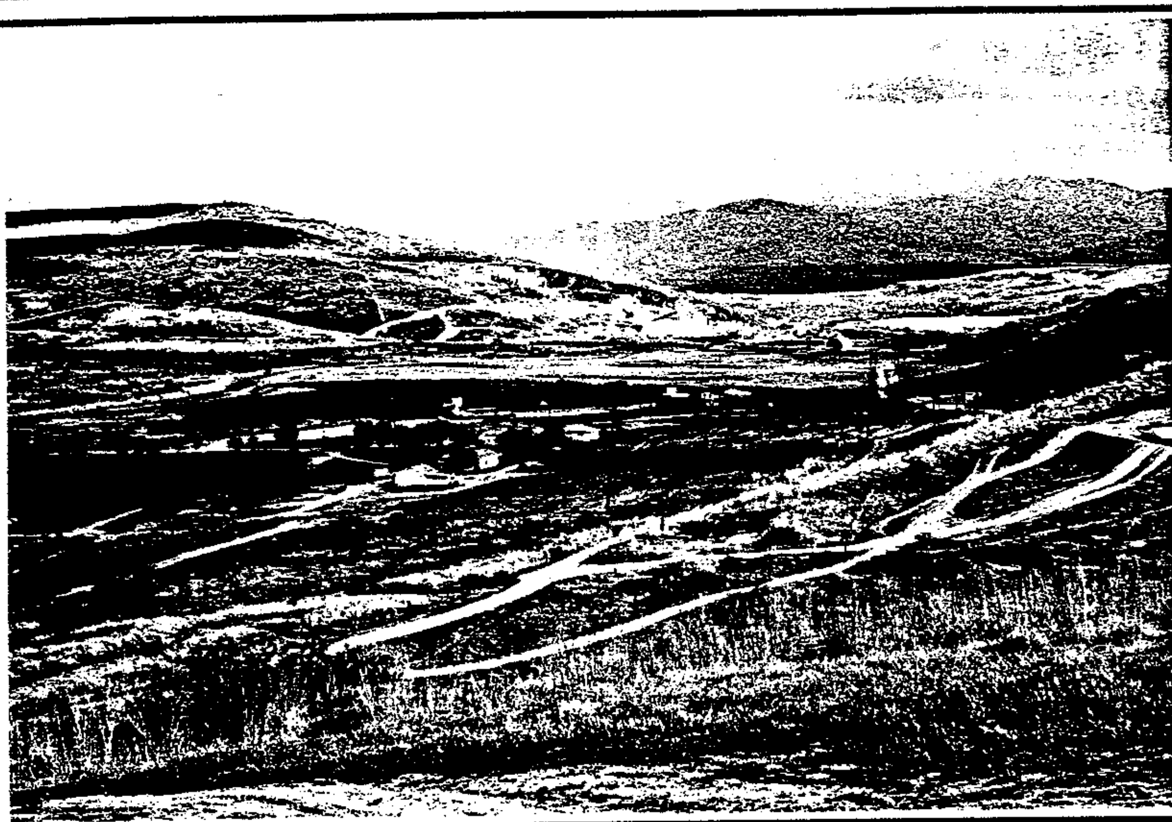
## ABSTRACT

The following study has been completed as part of an environmental impact report for the Otay Rio Business Park project located in Otay Valley. The archaeological study included a survey of the 210-acre parcel, the testing and evaluation of a large prehistoric La Jolla Complex site, W-3861, the historical assessment of two houses located on the property, and the analysis of all recovered cultural materials. The investigation of W-3861 demonstrated that the site was significant, but limited to an extensive surface scatter which covered 70 to 80 acres of the project. Following an intensive surface collection and testing, W-3861 was evaluated as retaining no further research potential, sensitive features, or cultural deposits. The proposed development will impact the site; however, because the site lacks research potential and sensitive deposits, the impacts are not considered significant and no mitigation measures will be required.

One of the structures on the property was determined to be a redwood bungalow which dates to the 1870s and is of some historical interest. Following in-depth historical studies, it has been determined that while the significance of the bungalow is considered to be minor, the associated trash dump may be a significant deposit. Therefore, a mitigative measure has been recommended for the monitoring of the removal of the dump during grading to recover any sensitive historical objects.


General Location Map
OTAY RIO
BUSINESS PARK
OTAY VALLEY
CHULA VISTA, CALIFORNIA
N
NEVADA
PACIFIC
OCEAN
SAN
DIEGO
COUNTY
ARIZONA
MEXICO
PROJECT



VIEW OF THE SOUTHERN PROPERTY BOUNDARY LOOKING EAST UP THE OTAY VALLEY TOWARDS THE SAN YSIDRO MOUNTAINS.

NORTHEAST PROPERTY CORNER WITH MT. MIGUEL IN DISTANCE.

## 1.0 INTRODUCTION

The following report has been prepared in compliance with the California Public Resources Code (Section 21083.2) and the environmental policies of the City of Chula Vista. The contents of the report include descriptions of the project setting, methodologies utilized, survey procedures and results, identification of resources, discussion of the testing and surface collection, an evaluation of significance, and recommendations for future actions.

### 1.1 SCOPE OF WORK

The initial scope of work included the archaeological reconnaissance of the 210-acre Otay Rio Business Park project to locate any cultural resources which might be present. When several loci of Site W-3861 were identified, the scope of work was expanded to include a testing and evaluation program. This secondary stage of testing was designed to determine the significance of the loci of W-3861 and to permit the analysis of potentially adverse impacts to the site from the proposed project.

### 1.2 PROJECT SETTING

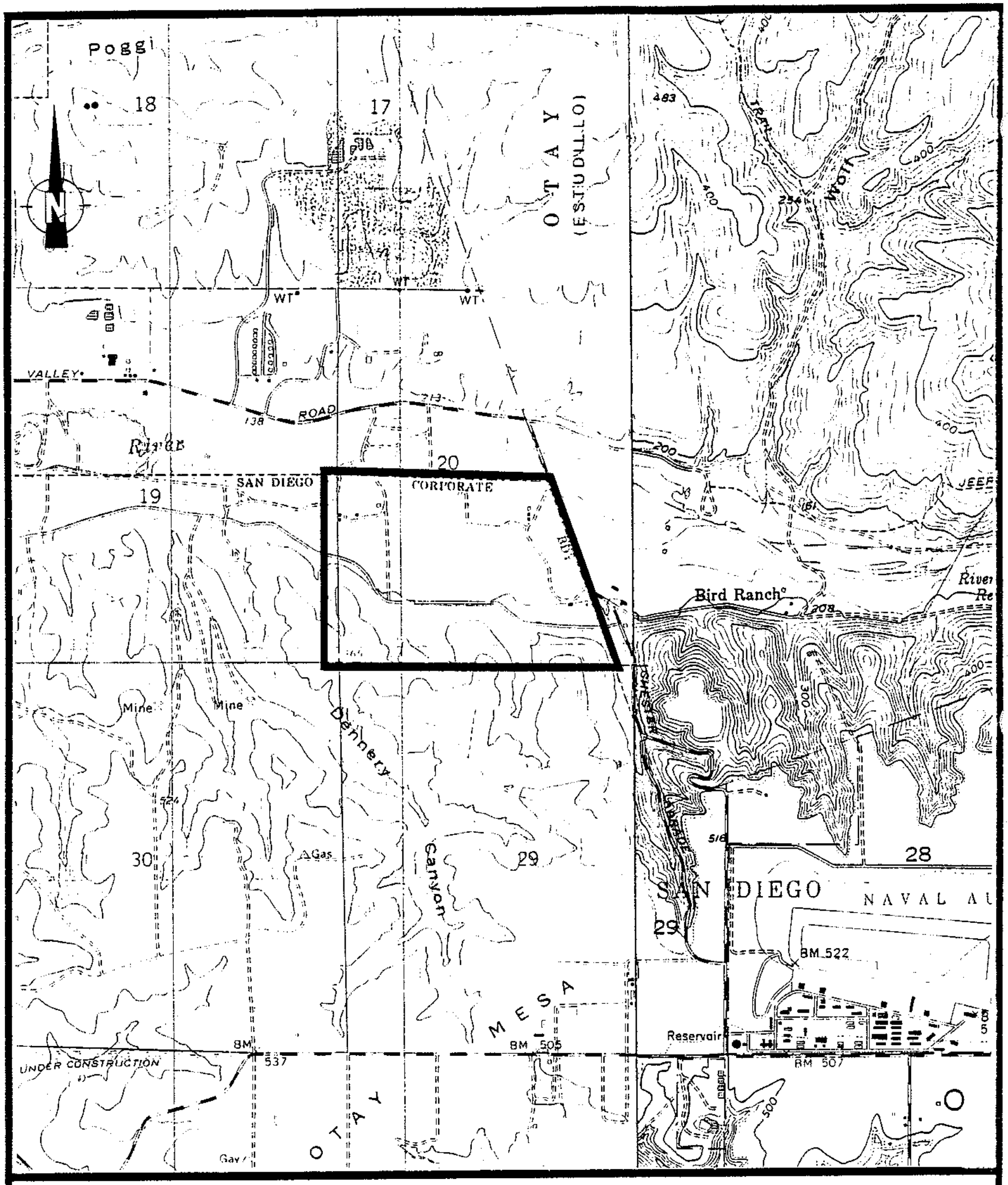
The proposed Otay Rio Business Park project is a roughly rectangular parcel of land situated on the south side of the Otay River and west of Otay Valley Road. The project includes the alluvial flood plain and valley floor in addition to the steep valley walls that rise to Otay Mesa to the south of the project. Approximately two-thirds of the property lies within the valley floor, while the remaining one-third consists of the steep slopes and canyons where Otay Valley and Otay Mesa meet. Elevations within the property range from 460 feet AMSL on the southeast boundary to 115 feet AMSL along the flood plain in the northwest corner of the property.

The two-thirds of the property which lies along the valley floor has been utilized for 80 to 100 years as farm land. As might be expected, this long period of use has resulted in the severe impaction of the ground surface through cultivation, road construction, water line installation, and contour smoothing. Two farm houses and several support structures associated with the agricultural use of the property are present within the project. One is situated in the southeastern area of the property along Otay Valley Road, while the second is located adjacent to the river course in the northwestern corner of the project. Present use of the land by leaseholders includes the cultivation of tomatoes, cucumbers, and beans.

Geologically, the property encompasses a variety of soils and formations. The lower elevations are representative of alluvial clays and sands indicative of a flood plain. Backhoe trenches excavated as part of the sampling program provided a series of complementary profiles. These profiles revealed three soil horizons. The first (the "A" horizon) consisted of a dark brown, alluvial, clayee loam to an average depth of five to six feet. The second horizon (the "B" horizon) consisted of a coarse, light brown, sandy loam between six and seven feet in depth. The "C" horizon included a very coarse sand and pebble lens with very little dirt or loam. The "C" horizon was present between seven and ten feet in depth.

The southern area of the project includes the northern edge of Otay Mesa. The strata exposed below the lip of the mesa to the valley floor include the San Diego Formation, the Otay Formation, and the Sweetwater Formation. Below the river terrace, deposits on the valley floor include sandstone elements of the Mission Valley Formation (Gastil and Higley 1977: 48).

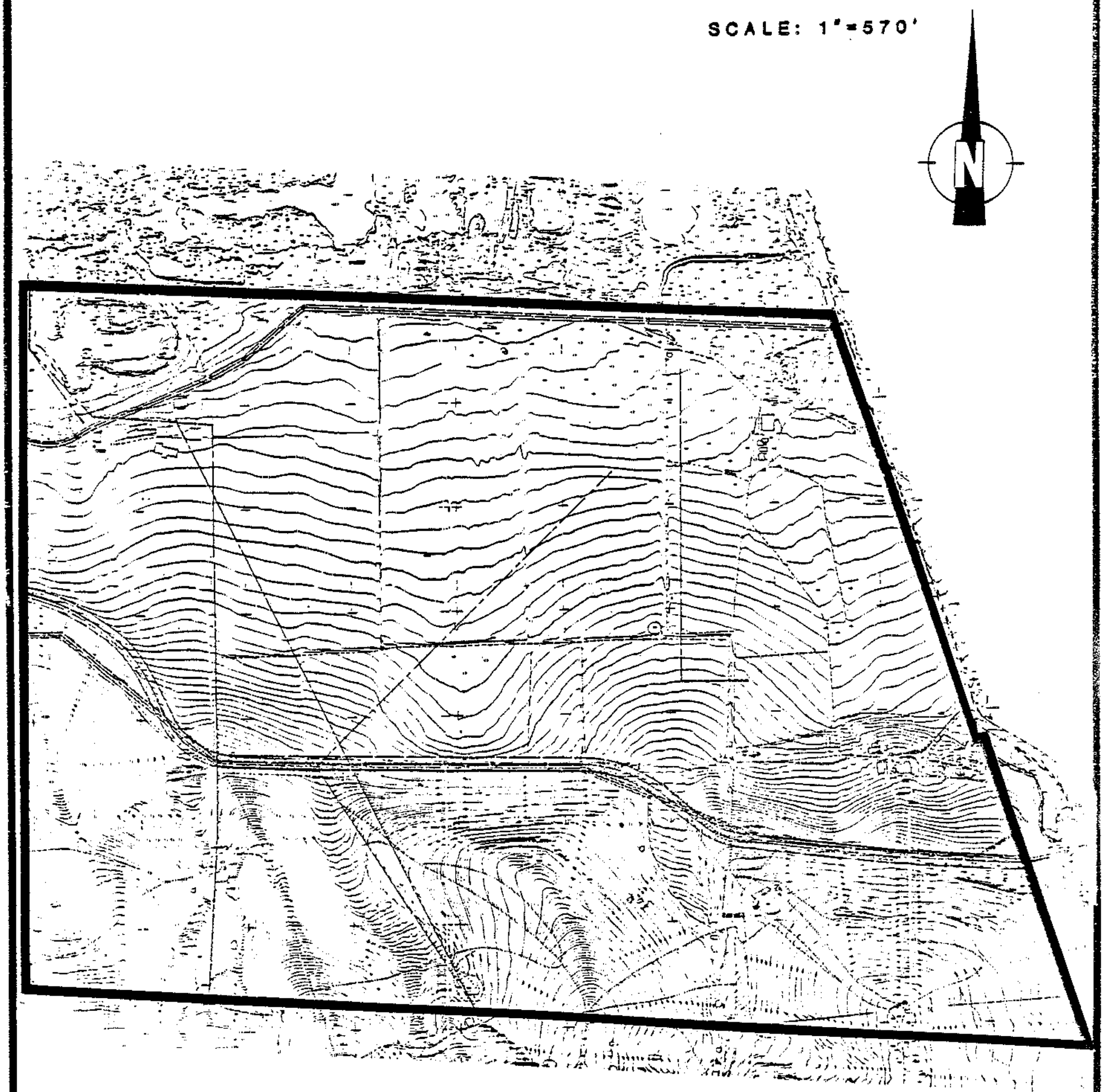
The biological setting is completely dominated by historic impacts. The entire river terrace (the northern two-thirds of the property) has been intensively cultivated for approximately 100 years. Aerial photographs taken during the 1920s indicate that even then much of the area of steep slopes and canyons was plowed. The flood plain has also been impacted by gravel mining, which has altered the river course and changed vegetation patterns.




# OTAY RIO BUSINESS PARK

U.S.G.S. IMPERIAL BEACH

OTAY VALLEY, CHULA VISTA, CALIFORNIA




# PROJECT BOUNDARY MAP

## OTAY RIO BUSINESS PARK

### OTAY VALLEY, CHULA VISTA

## 2.0 METHODOLOGY

The following section will discuss the concepts and techniques employed to survey the 210-acre parcel and, subsequently, to sample and evaluate the cultural resources discovered.

### 2.1 SURVEY METHODOLOGY

The topography and ground visibility encountered at the Otay Rio Business Park project mandated the most appropriate reconnaissance technique to be employed. The two-thirds of the project within the valley floor or river terrace was generally flat and slightly sloping, and was recently plowed (within two to three months prior to the survey). Since there were no hindrances to the survey, the technique employed was essentially a textbook-style, linear transect methodology. Transects, or survey paths, were aligned from north to south at 15-meter intervals across the wide, east/west expanse of the project within the valley floor. The use of rigidly aligned and spaced survey transects ensured a thorough coverage of the property. Field archaeologists were stationed at each of the transects (eight to ten at a time), and, in unison, the group proceeded to walk the transects in a sweep of the area. All artifacts observed were flagged for later recovery.

In the southern one-third of the project, where the valley floor gave way to the steep slopes rising to the edge of Otay Mesa, the use of the linear transect technique was impractical. The steepness of the slopes prevented the implementation of a controlled reconnaissance. Therefore, in the areas of steep, rugged terrain, the survey process was altered to consist of an intuitive search of potentially sensitive areas. The use of this intuitive process did not compromise the integrity of the survey, since all of the nearly level and moderate slopes were closely inspected, and only the steepest areas (i.e., 15% to 40% slopes) were avoided.

In addition to the reconnaissance of the subject property, other areas located immediately adjacent to the project were also inspected to ascertain the potential for sensitive sites that might be indirectly impacted by the development of the Otay Rio Business Park. All of the general characteristics of the surface expressions of archaeological resources encountered were mapped and recorded.

## 2.2 TEST AND EVALUATION PROCEDURES

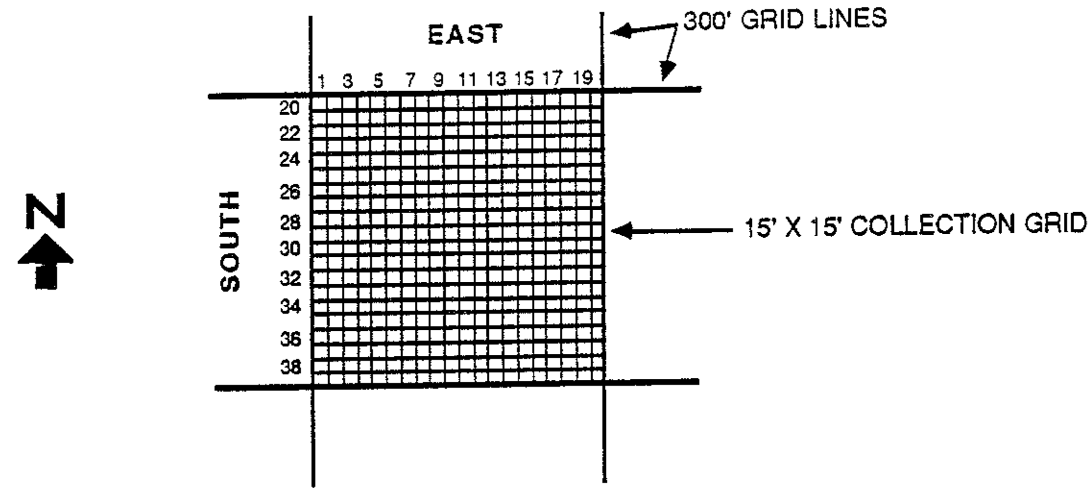
Upon the conclusion of the survey, the resources discovered were subjected to a documentation program. This program was designed to accumulate the information necessary from all aspects of the archaeological site to evaluate the significance of the site and the potential impacts from the proposed development, in accordance with state and local ordinances. The documentation program was conducted in two phases. The first was an extensive, exhaustive surface collection procedure to locate and recover all surface cultural materials. The second phase was a subsurface investigation of test units (each measuring one meter square) and backhoe trenches to determine the potential for the presence of subsurface cultural deposits.

### 2.2.1 Surface Collection Techniques

The survey process at the Otay Rio Business Park project delineated an area of approximately 70 to 80 acres that contained varying densities of surface artifacts. Extremely large artifact scatters such as those encountered at the project are unusual in the San Diego region, and require specialized techniques to recover and process the surface artifact data. Coupled with the large size of the surface scatter was a very brief time period (five weeks) which had been allocated for the completion of the testing program and report. In order to accomplish the recovery of surface artifacts as rapidly as possible in a controlled fashion, a grid-oriented, block technique was implemented.

The grid system was based upon the division of the property into 300-foot squares aligned parallel to the northern property boundary on the basis of a fixed grid format. The intersecting grid lines created 106, 300-foot-square grid squares. By establishing such a fixed grid system, every location within the project could be included within a strict sampling universe. A map has been provided on page 9 which illustrates the grid layout.

The alignment of the grid was established by surveyors from HCH and Associates. A monument was staked at each designated grid intersection to provide reference points for use during the surface collection. Each grid square was subsequently further subdivided into blocks measuring 15 feet square. Four hundred such blocks were included within each 300-foot-square grid section. Thus, the property potentially could be divided into 42,400 15-foot-square blocks.




EXAMPLE OF GRID SYSTEM DESIGNED FOR SITE SURFACE COLLECTION, SHOWING EAST AND SOUTH COORDINATE NUMBERS.

In order to provide recordation coordinates for each 15-foot-square block, a numbering sequence was implemented which originated at the northwest property corner. Each 15-foot increment to the east of the northwest corner was given successive "E" numbers (E1, E2, E3 . . . E300), and each 15-foot increment to the south of the northwest corner was given an "S" number (S1, S2, S3 . . . S210). Each individual 15-foot square was then designated by coordinates which consisted of an "E" number and an "S" number, such as "E150/S26."

Once the grid system was established, the controlled collection of artifacts from the surface of the entire area was possible. The technique utilized to physically examine each 15-foot-square within the archaeological site included the use of a square of one-inch PVC pipe joined to create a 15-foot-square box. The PVC square was set in place at the intersection of specific grid coordinates, and all cultural materials within the square were collected and labelled with the collection site location coordinates. In order to facilitate the orderly yet speedy movement of the PVC square to successive grid locations, control lines (string) were strung along stakes oriented from north to south along the grid lines. By aligning the PVC square to the string at measured intervals, absolute control was maintained and a complete recovery ensured within each grid square within the archaeological site. Photographs have been presented on pages 19 and 20 which illustrate the field implementation of this system. For the majority of the surface collection, three PVC squares were utilized to collect from adjoining grid sections.

As the PVC squares were moved along the grid, the field supervisor kept a log of grid sections which had been examined and whether or not the collection effort resulted in the recovery of any cultural materials. A three-wheeled ATV and trailer were utilized to hold and transport artifacts as they were collected. The ability to have a vehicle move along with the PVC squares during the collection program greatly aided the proficiency of the operation.

### 2.2.2 Subsurface Excavation Techniques

The subsurface examination of the archaeological site was intended to identify depths and limits of any cultural deposits. Utilizing data from the surface collection program to focus upon areas of greater expression of surface artifacts, two types of subsurface excavations were implemented. The first was a one-meter-square test unit. Each unit was excavated in 10-centimeter levels using standard archaeological techniques. Of the six units excavated at the site during the current study, three were dry-screened using one-eighth-inch mesh screen, and three were wet-screened using hoses and one-sixteenth-inch mesh rubberized screen.

The second type of subsurface test utilized at the project was a backhoe trench. A backhoe was used to excavate a series of trenches to expose both long, shallow soil profiles and deep (ten-foot) pits.

## 3.0 BACKGROUND RESEARCH INFORMATION

As part of the evaluation of the resources located within the Otay Rio Business Park project, archaeological site files record searches were conducted at the San Diego Museum of Man and San Diego State University. The results of these searches have been provided in Appendix II of this report. The searches indicated that several cultural resources were present in the near vicinity of the project. Approximately 40 sites have been recorded within a one-mile radius of the Otay Rio project. These sites, along with general descriptions of the resources, are listed below:

TABLE 1

Archaeological Sites Located Adjacent to the Otay Rio Business Park Project

| Site | Description | Culture |
|---|---|---|
| SDi-4738 | Artifact scatter | San Dieguito(?) |
| SDi-6699 | Artifact scatter with possible subsurface deposit | Not Listed |
| SDi-6941 | Temporary camp site, consisting of four loci of artifact concentrations. Milling tools, projectile points, and scrapers were found, as was shell. | San Dieguito/La Jolla |
| SDi-7604 | Large, dispersed site of artifact scatters. | La Jolla |
| SDi-7983 | Large, dispersed scatter of artifacts. | Not Listed |
| SDi-7984 | Light scatter of artifacts, including cores, hammerstones, flakes, and scrapers. | Not Listed |
| SDi-8065 | A large, light scatter of artifacts, including scraper/planes, manos, and flakes. | La Jolla |
| SDi-8912 | A large, light scatter of artifacts, including manos, hammerstones, choppers, and scrapers. | La Jolla |
| SDi-10055 | A light lithic scatter along a ridge, consisting of flakes, choppers, hammerstones, cores, and scrapers. | Not Listed |
| SDi-10056 | A very light lithic scatter. | Not Listed |

| Site | Description | Culture |
|---|---|---|
| SDi-10057 | A large, light lithic scatter of scrapers, flakes, and hammerstones. | Not Listed |
| SDi-10058 | A large camp site consisting of ground stone tools, shell, flaked stone tools (scrapers), and flakes. Subsurface deposits noted. | La Jolla |
| SDi-10059 | A very small scatter of artifacts on a ridge. | Not Listed |
| SDi-10060 | A small but moderately dense artifact scatter, with shell. | Possibly La Jolla |
| SDi-10188 | A sparse, widely dispersed artifact scatter. | Not Listed |
| SDi-10189 | A large, light scatter of tools and flakes, with some shell. | San Dieguito/ La Jolla |
| SDi-10190 | A large, dispersed scatter of artifacts, including scrapers, cores, and flakes, with some shell. | Not Listed |
| SDi-10191 | A light, dispersed lithic scatter which included flakes, cores, and flaked tools. | Not Listed |
| SDi-10192 | A small artifact scatter with flakes, cores, scrapers, and choppers. | Not Listed |
| SDi-10193 | A very sparse artifact scatter. | Not Listed |
| SDi-10194 | A very sparse artifact scatter. | Not Listed |
| SDi-10198 | A large lithic scatter of varying densities, with hundreds of flakes, some scrapers, hammerstones, and cores. | Not Listed |
| SDi-10199 | A light lithic scatter with a small number of tools. | Not Listed |
| SDi-10201 | A light lithic scatter and temporary camp. Artifacts included ground stone tools and scrapers. | Not Listed |
| SDi-10202 | A very sparse lithic scatter. | Not Listed |
| SDi-10203 | A light lithic scatter, including scrapers and ground stone tools. | Not Listed |
| SDi-10204 | A very sparse lithic scatter. | Not Listed |
| SDi-10285 | A sparse, dispersed lithic scatter, with scrapers, cores, and flakes. | Not Listed |

| Site | Description | Culture |
|---|---|---|
| SDi-10286 | A sparse, dispersed lithic scatter, with scrapers, cores, and flakes. | Not Listed |
| SDi-10452 | A large, dense scatter of artifacts with shell. Camp site several acres in size. | La Jolla |
| SDi-10471 | Extremely large scatter of patinated tools; large camp site. | San Dieguito |
| SDi-10472 | Light lithic scatter. | San Dieguito |
| SDi-10473 | Light lithic scatter. | San Dieguito |
| SDi-10489 | Light lithic scatter. | Not Listed |
| SDi-10622 | Sparse lithic scatter, primarily of flakes. | Not Listed |
| SDi-10649 | A small, moderately dense artifact scatter. | Not Listed |
| SDi-10650 | A small, moderately dense artifact scatter. | Not Listed |
| W-3513 | A light, dispersed scatter of artifacts along the edge of a mesa. | Not Listed |
| W-3514 | A small, highly disturbed artifact and shell midden. | La Jolla |

* * *

The study of the archaeological record of adjacent sites points to a number of pertinent trends. First, there are no indications that any of the sites are affiliated with the Late Prehistoric component, the Kumeyaay Indians. The absence of pottery (prehistoric ceramics), time-sensitive artifacts (such as small, triangular projectile points of the Kumeyaay Indians), and late period dates from any of the 40 sites located near the project suggest that these sites chronologically are attributable to the La Jolla Complex period of occupation, between 6,000 and 3,000 years before the present. It is also noteworthy that none of the site records include descriptions of artifacts which are exclusively associated with the San Dieguito Complex. Sites SDi-10471 and SDi-10472, which were recorded by Fink in 1973 as sites of the San Dieguito Complex, actually appear to be similar to most of the other sites in the area which are attributed to the La Jolla Complex.

The sites in the vicinity of the project are unusually similar in characteristics. Nearly all of the sites are widely dispersed scatters of well-made scrapers, choppers, cores, utilized/ retouched flakes, and associated flakes. Very few projectile points or lanceolate blades (bifaces) have been reported. Occasionally, the scatters were more dense and were associated with midden deposits, reflecting locations of aggregation. The continuity of the settlement/subsistence pattern represented by the sites suggests that this area, and perhaps a much larger one throughout Otay Mesa, was a particularly rich food resource area for the La Jolla Complex. The sparcity of shell further suggests that the area was a focus of vegetative food collecting probably associated with seasonal shifts in the La Jolla subsistence pattern, as demonstrated by Smith (1987).

## 4.0 RESULTS OF FIELD INVESTIGATIONS

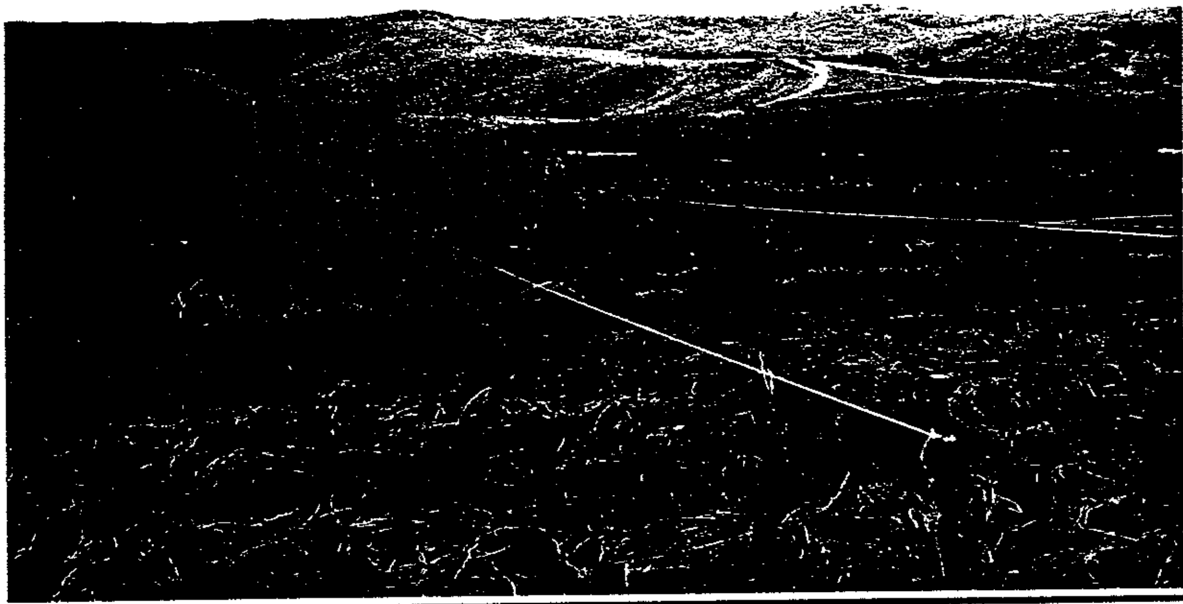
The scope of work necessary to fully evaluate the cultural resources within the Otay Rio Business Park project entailed a considerable number of man-hours to accomplish. The phases of the field investigation included a complete surface collection of artifacts and a subsurface excavation program. The surface collection was completed in a grid format over the entire resource area, with no emphasis placed on artifact frequency. As a result of the surface collection analysis, areas of varying artifact frequency were identified that delineated distinct loci, or differing locations of cultural activity. Thus, the entire project area was listed as Site W-3861 (SDi-10057), with five different major loci. A map of the site which delineates Loci 1 through 5 is provided on page 17.

The following subsections will briefly describe the results of the recovery from the loci of Site W-3861, the dimensions and characteristics of each locus, and the results of the subsurface tests. The in-depth analysis of the artifact collection is provided in a subsequent section.

### 4.1 SURFACE COLLECTION RESULTS AND DELINEATION OF LOCI OF SITE W-3861

The approximately 70-acre area of Site W-3861was divided into 36 300-foot-square sections and incorporated into a grid system which included the entire 210-acre parcel. The 36 sections were then each subdivided into 400, 15-foot-square squares that represented the basic units of the collection program. The total number of potential collection squares within the 36 sections was approximately 14,400 squares. A more in-depth discussion of this grid system is provided in Section 2.2.1, on page 10.

Time constraints prevented the inspection of each of the 14,400 squares. However, every square within the five designated loci of W-3861 was examined. The squares which were not studied were located between the loci. Unfortunately, some isolated artifacts probably were not collected. During the surface collection program, a total of 7,100 squares were inspected. This represented an area of 1,597,500 square feet, or 37 acres of the site. The remainder of the site



VIEW OF SURFACE COLLECTION PROCESS. THE STRINGS IN THE PHOTO ACT AS NORTH/SOUTH GUIDELINES ALONG THE GRID AXIS.

VIEW OF SURFACE COLLECTION PROCESS WHICH EMPLOYED 15' X 15' PVC SQUARES ORIENTED TO GRID ALIGNMENT.

AS EACH PVC SQUARE WAS ALIGNED IN PLACE, THE AREA WITHIN THE SQUARE WAS SCRUTINIZED FOR ARTIFACTS.

VIEW OF A TYPICAL SURFACE FIND IN THE PLOWED FIELDS.

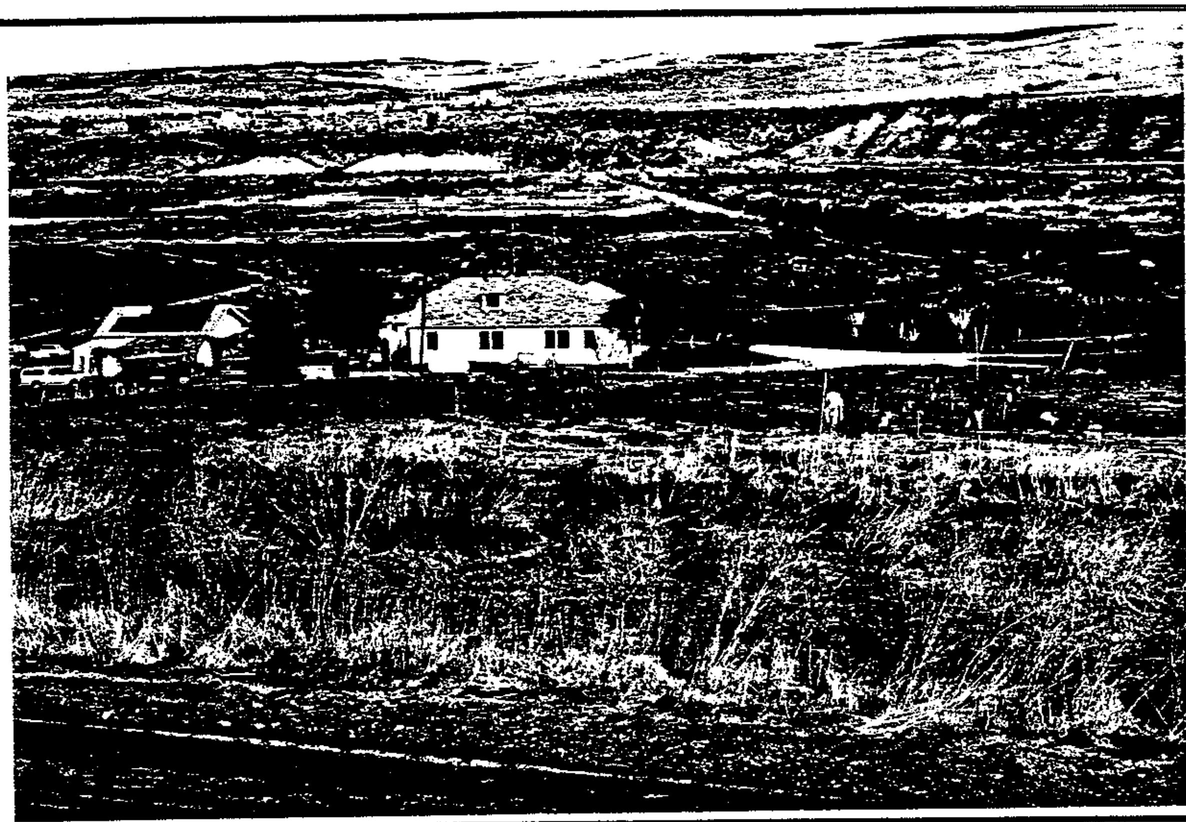
TABLE 2

Artifact Recovery Summary
Site W-3861

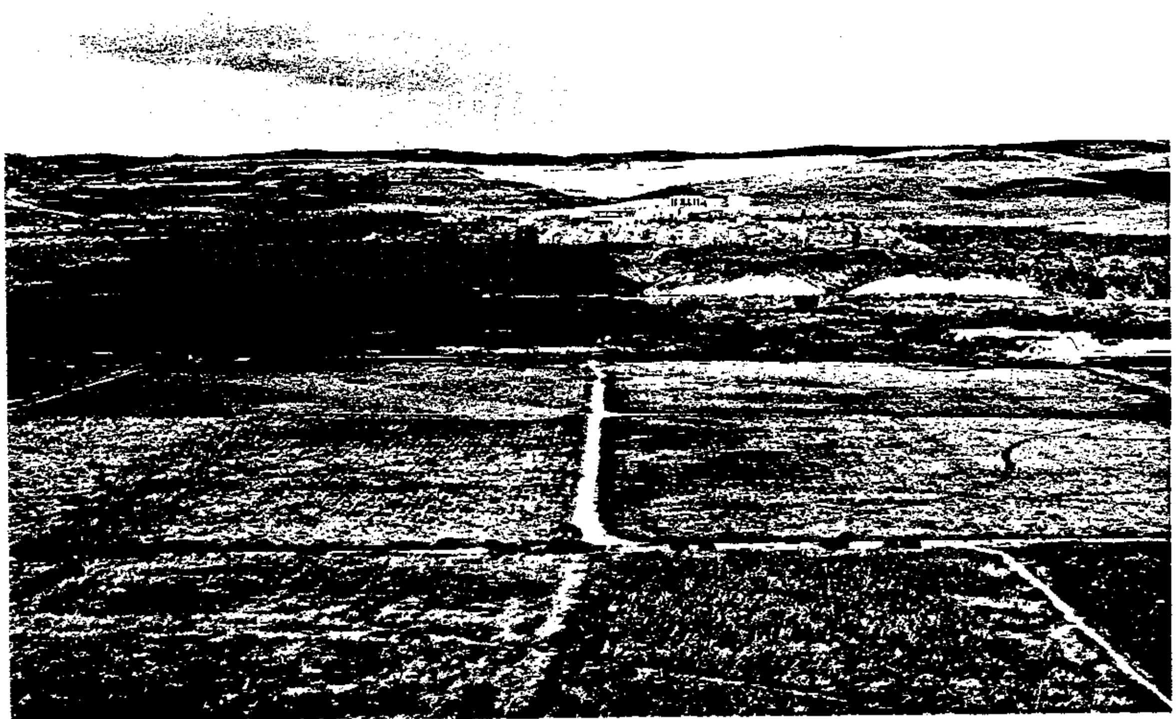
| Tool Category | Artifact Type | Quantity Surface | Quantity Subsurface |
|---|---|---|---|
| Lithic Production Waste | Cores | 82 | --- |
| | Flakes | 279 | 26 |
| | Debitage | 92 | 1 |
| Percussion Tools | Hammerstones | 41 | --- |
| | Choppers | 22 | --- |
| | Cleavers | 1 | --- |
| Precision Tools | Scrapers | 239 | --- |
| | Utilized Flakes | 196 | --- |
| | Spokeshaves | 18 | --- |
| | Perforators | 17 | 1 |
| | Knives | 16 | --- |
| | Gravers | 1 | --- |
| | Bifaces | 1 | --- |
| Ground Stone Tools | Manos | 48 | --- |
| | Metates | 3 | --- |
| | Mullers | 2 | --- |
| | Pestles | 1 | --- |
| Shell | | 34 | --- |
| Bone | | 1 | --- |
| Total Artifacts Recovered | | 1094 | 28 |

VIEW OF LOCUS 1, W-3861 FROM THE SOUTHERN PROPERTY BOUNDARY LOOKING NORTHWEST.

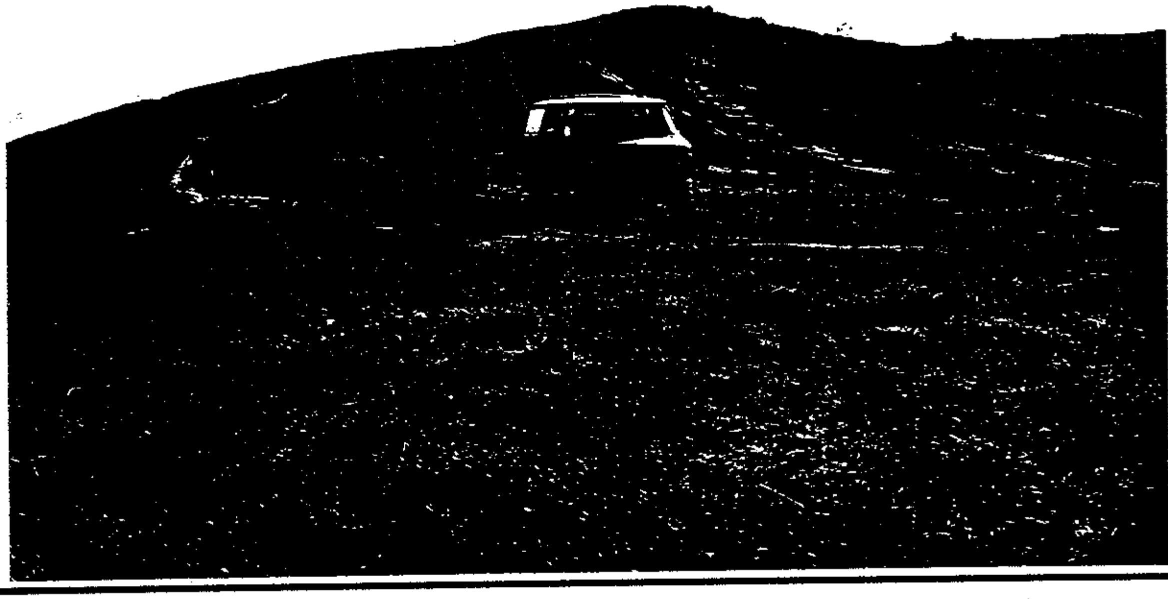
THE SURFACE OF LOCUS 1 WAS IMPROVED FOR SURFACE COLLECTION BY DISKING AS NOTED IN THIS PHOTOGRAPH.



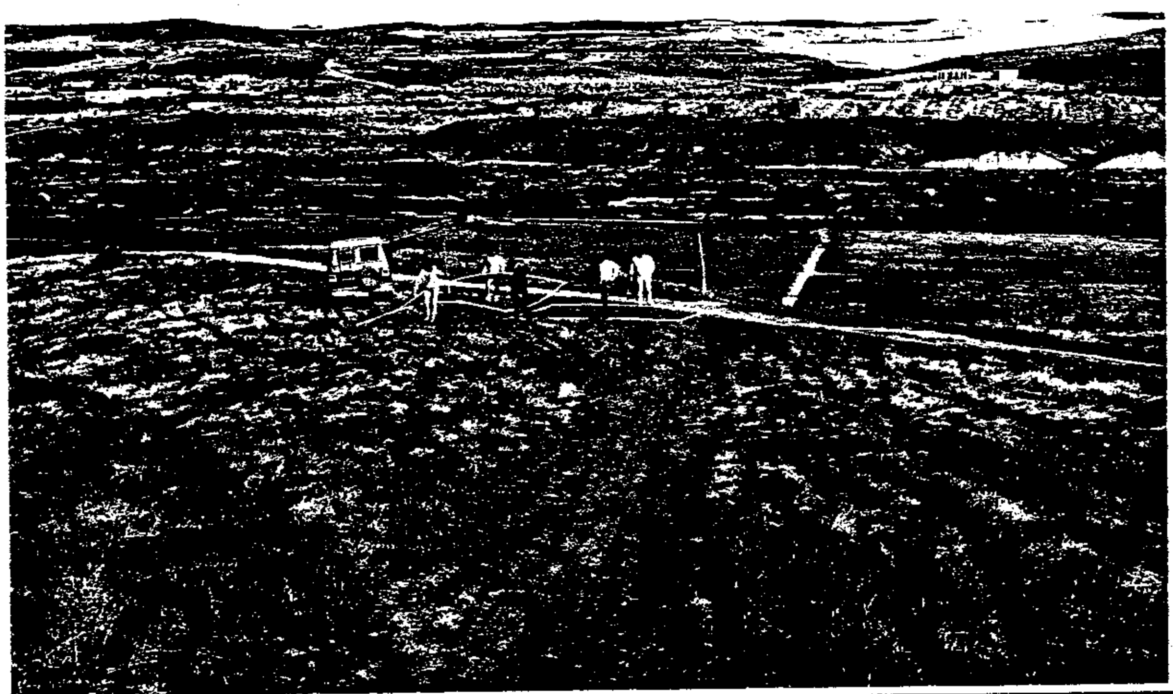
VIEW OF LOCUS 4, W-3861 FROM THE BASE OF THE CLIFFS SOUTH OF THE LOCUS. SURFACE COLLECTION IS IN PROGRESS.



VIEW OF LOCI 2 AND 3 FROM SOUTHERN PROPERTY BOUNDARY.



VIEW OF THE SOUTH END OF LOCUS 5.



VIEW OF NORTH END OF LOCUS 5 DURING SURFACE COLLECTION.

area, consisting of approximately 30 to 40 acres, included such a sparse artifact scatter that the use of the meticulous grid square inspection was unjustifiable. A map has been provided on page 9 which illustrates the areas inspected during the surface collection program.

The artifact inventory from the surface collection program included 1,094 specimens. This total was less than had originally been expected, on the basis of the frequency of artifacts observed during the survey of the property. However, in the time intervening between the survey and the surface collection program (approximately one month), substantial amounts of rain had fallen, accompanied by fairly warm temperatures. As a result, the fertile ground supported a great deal of plant growth which effectively obscured the ground surface. The dominant ground cover consisted of wild stinging nettle, which completely blanketed some areas. This situation required that the fields be superficially disked to turn under the intense plant growth. This practice was not considered to be a further disturbance of the site since the area had been plowed for at least 100 years. Rather, the shallow disking facilitated much improved ground visibility. The only drawback to the use of disking is the fact that small flakes which are usually exposed by wind and rain are simply not easily seen in the freshly plowed earth. Thus, the number of tools (which are more visible after plowing) which were recovered probably increased after the shallow disking, while the number of flakes which might have been recovered very likely greatly decreased.

The surface recovery resulted in the controlled collection of 1,094 specimens. These are summarized in Table 2 on page 21. In general, the majority of the artifacts were included within the categories of lithic production waste and precision tools. Ground stone tools and percussion tools comprised much smaller totals. The category of lithic production waste included 480 specimens (82 cores, 92 debitage, and 279 flakes), accounting for 43.88% of the surface recovery. Precision tools accounted for 488 specimens, or 44.61% of the surface recovery, and included one graver, 17 knives, 17 perforators, 239 scrapers, 18 spokeshaves, and 196 utilized/retouched flakes. Percussion tools consisted of one cleaver and 41 hammerstones, which represented 3.83% of the surface collection. Ground stone tools included 48 manos, three metate fragments, one pestle, and one muller, which comprised 4.75 % of the surface collection. Non-lithic surface artifacts included 34 shell fragments and one unidentified piece of bone.

### 4.1.1 Delineation of Loci Boundaries

The surface recovery data from the grid system collection program was plotted on the project map to graphically illustrate the pattern of artifact concentrations. This process facilitated the delineation of Site W-3861 into five loci with relatively light intervening scatters. The boundaries of the five loci are illustrated on page 17. Loci 1 and 4 are characterized by dense, central concentrations of artifacts surrounded by decreasing artifact frequencies. Loci 2 and 3 are only moderate artifact scatters without any substantial central concentrations. Locus 5 is a linear dispersion due to its confinement to a narrow ridge and, therefore, differs from the other loci in the configuration of the artifact pattern. The following subsection will provide descriptions of each of the loci and their characteristics.

### 4.1.2 Site W-3861 - Locus 1

Locus 1 was the largest component and contained the greatest frequency of artifacts of the loci of W-3861. Locus 1 is situated in the northwestern portion of the project along the river terrace which overlooks the Otay River. The overall measurements of the site are 750 feet from southwest to northeast by 600 feet from north to south. The area of the greatest artifact density measures 350 feet by 300 feet in the northeastern portion of the locus. Apparently, the northern and northwestern sections of the site have been removed by the prior installation of a sewer line.

The configuration of the site and the pattern of tool deposition have been illustrated on pages 31 through 34. The tool recovery pattern was generally evenly distributed for the different tool types. A selection of tool types has been plotted separately to enhance the distribution evaluation. While formulas such as the Nearest Neighbor Index (Price 1978: 3-4) were not used to discern spatial distribution due to the shortage of time during which this report was produced, the use of graphs to plot the individual tool recoveries did provide a reasonable review of the spatial distribution.

As noted previously, the plotting of the tool recoveries indicated that the area of the locus which contained the highest density of artifacts measured 350 feet by 300 feet. A review of the plots of specific artifact types recovered from Locus 1 revealed only vague patterns of artifact associations or clustering. It is possible that long-term plowing of the area in the past has caused some level of dispersion and initiated a disassociation of clustered artifacts.

#### 4.1.3 Site W-3861 - Locus 2

The second distinct concentration of artifacts at W-3861 was Locus 2, located 600 feet east of Locus 1. Like Locus 1, this area was situated along the northern property boundary, on the river terrace above the Otay River. The size and location of Locus 2 are shown on page 35. The locus consisted of a more moderately dense scatter of artifacts which measured 500 feet from north to south by 400 feet from east to west. The greatest density of surface materials was found in the southern section of the locus, in an area measuring 200 feet square.

Graphic plots of the artifacts recovered at Locus 2 are provided on pages 36 through 38. These plots illustrate two clusters within the area of greatest density. Both of these clusters were characterized by a significant recovery of utilized flakes and scrapers. The lack of hammerstones and flakes in any significant quantities, together with the presence of clusters of utilized flakes and scrapers, suggests that Locus 2 was primarily a food collection/processing site. Although the size and density of the tool scatter was smaller at Locus 2 than at Locus 1, the quality of the recovered precision tools was identical.

#### 4.1.4 Site W-3861 - Locus 3

The third locus of W-3861 was a very light lithic scatter located 300 feet north of Locus 2. The recovery data indicated that the locus measured 500 feet from north to south by 300 feet from east to west. The location and boundaries of Locus 3 are illustrated on page 39. The locus was characterized by an evenly dispersed scatter of lithic materials which lacked any notable clustering of tools. In comparison to the other loci, this locus demonstrated a higher frequency of flakes and lithic production waste than scrapers or other precision tools (see pages 40 through 42 for graphic illustrations of the artifact distribution).

The information gathered at Locus 3 indicates that it is a widely dispersed food collecting site which exhibits evidence of tool maintenance (flakes). The lack of any discernible point of aggregation may be interpreted as a characteristic of the site function; namely, the locus appears to have been a foraging area associated with one of the occupation camps at Loci 1, 2 or 4.

#### 4.1.5 Site W-3861 - Locus 4

The fourth locus of W-3861 was a very dense lithic scatter near the farmhouse in the southeastern portion of the project. The location and size of the locus are illustrated on page 43. Locus 4 measured 500 feet from east to west by 250 feet from north to south. Within the boundaries of the locus, artifact clusters were difficult to identify, given the large quantity of artifacts present. However, at least four major concentrations were perceived, although none of these demonstrated any distinguishing characteristics other than an increase in the frequency of artifacts.

Locus 4 is somewhat distinct from the other loci of W-3861. This locus contained a larger quantity of cores and flakes than the other loci, but was devoid of hammerstones. In addition, despite the large quantity of artifacts, Locus 4 was notably lacking in ground stone tools. Comparing Loci 4 and 1, which contained corresponding densities of artifacts and tool types, Locus 4 was distinct due to an increased number of cores and flakes, and a decreased number of hammerstones and ground stone tools, especially manos. Graphic plots of the recovered tool types are presented on pages 44 through 46.

The function of Locus 4 is considered to have been slightly different than the function of the other loci of W-3861, based upon the artifact types and densities present. The larger quantity of cores and flakes, and the higher frequency of felsite and basalt cobbles occurring naturally at the site, suggest that artifact manufacture was a primary activity at the locus. The difficulty with this interpretation is the absence of hammerstones. Since the locus was subjected to an intense surface recovery program, it is unlikely that the absence of hammerstones from the collection at Locus 4 is due to sampling error. The size of the locus (which was somewhat smaller than the other loci) and the concentration of the artifacts suggests that the site activity was focused within a small area. While the other loci represent a more wide-ranging, centrally-based foraging pattern, Locus 4 is more restricted in the distribution of its artifacts. Therefore, while the presence of scrapers and utilized/retouched flakes denote some degree of food processing and collection, the large numbers of cores and flakes indicate tool manufacture. The near absence of manos suggests that no substantial food preparation took place beyond simple food collection and initial reduction procedures.

#### 4.1.6 Site W-3861 - Locus 5

The last locus of W-3861 to be studied was located on a terrace and associated slopes north of Otay Mesa, overlooking the remaining loci to the north. The location and boundaries of this locus have been illustrated on page 47. The locus measures 600 feet from north to south by 250 feet from east to west, and is characterized by intermittent densities of artifacts scattered along a narrow ridge line and associated slopes. The plotting of the recovery data illustrated four areas within which most of the collection from Locus 5 was clustered. It was difficult to determine to what extent erosion and off-road traffic have affected the pattern of artifact distribution and the clustering of artifacts that has already been noted.

The tool collection from Locus 5 was similar to that recovered from Locus 4 (see pages 48 through 50 for illustrations of the tool recovery distribution). A higher percentage of the collection consisted of cores and flakes than at Loci 1, 2, and 3. Another similarity to Locus 4 was the absence of hammerstones. As was noted for this same circumstance at Locus 4, the thoroughness of the surface collection procedure eliminates the possibility that sampling error would explain this absence of hammerstones at Locus 5.

The tools recovered from Locus 5 reflect the pattern observed at Loci 1 through 4. The scrapers tend to be well-made, cobble/core tools which exhibit evidence of use. The utilized flakes recovered from the locus show occasional signs of retouch. Ground stone tools were also present (four manos were recovered). The function of the locus was anticipated to be different from that noted at the other loci due to the very distinct topographic setting at Locus 5. However, the continuity of the tool assemblage with the cultural materials recovered from the remainder of W-3861 would suggest that a similar function is attributable to Locus 5 as to Loci 1 through 4.

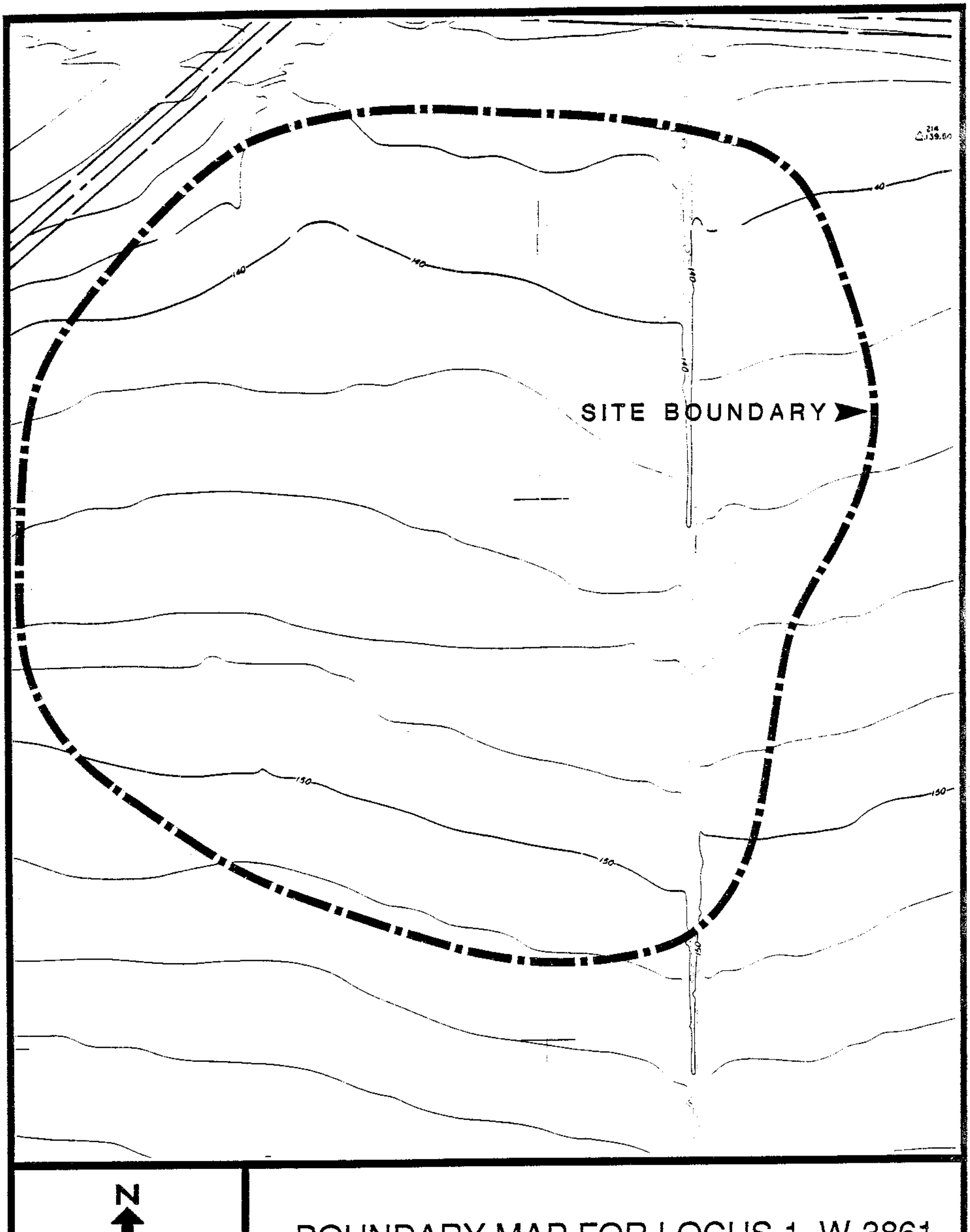
* * *

The discussion of the five loci of W-3861 includes the majority of the surface scatter of cultural materials. However, between each of the loci are areas where additional artifacts may be present, but the frequency is too low to merit an in-depth surface recovery program. Thus, although the site boundaries outlined on page 17 encompass 70 to 80 acres, the vast majority of the artifacts recovered were collected within the 30 t0 40 acres represented by the loci of W-3861.

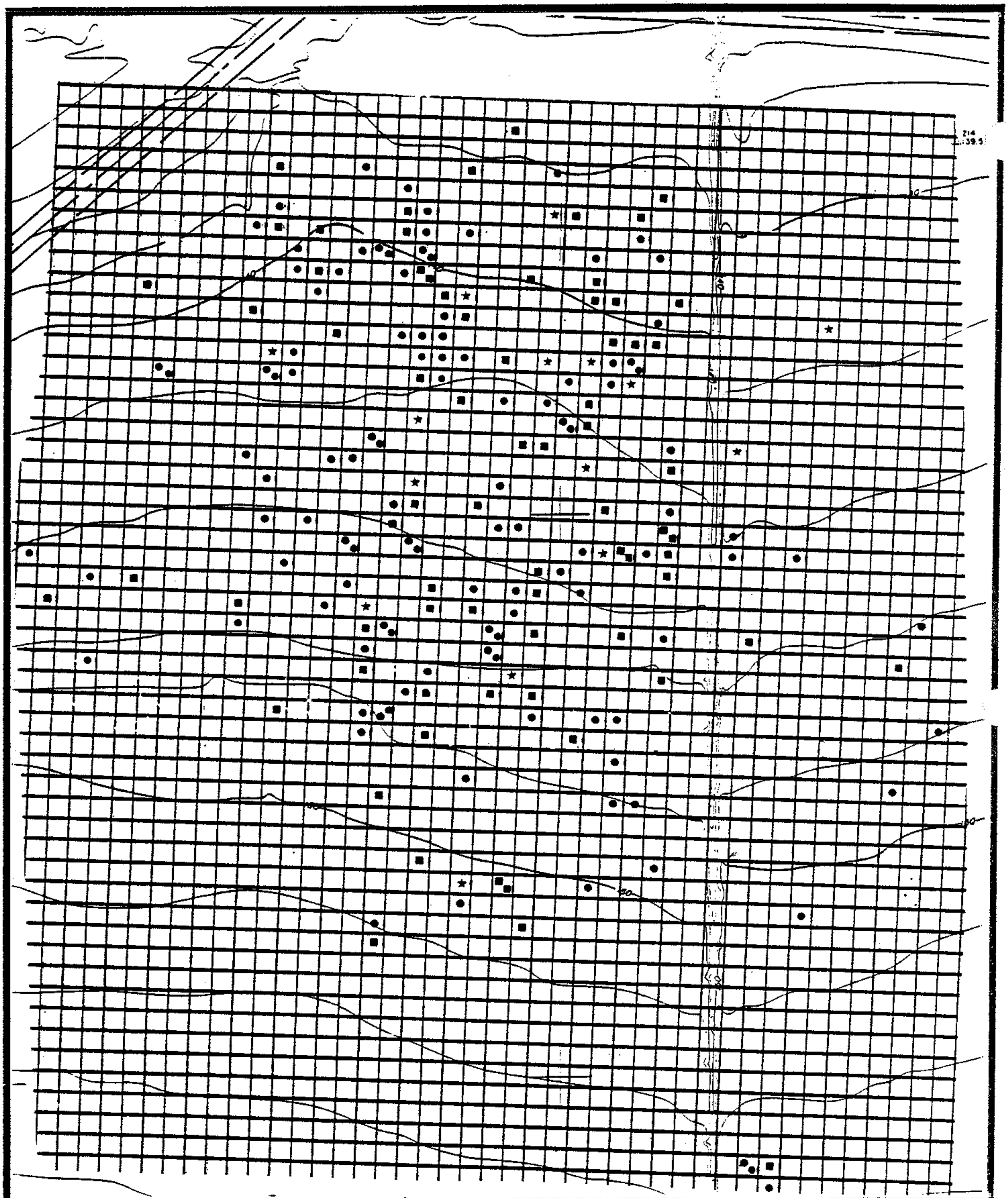
An effort was made during the surface reconnaissance to gather cultural materials from Site SDi-10059, which is actually Locus 6 of W-3861. This locus is situated on a terrace 1,500 feet south of Locus 1, and was originally recorded as a light density surface scatter (San Diego Museum of Man records, 1984). When the area was visited during the current study, the ten artifacts and small quantity of flakes reported at the site were not visible. Apparently, either intensely destructive off-road vehicle activity has completely dispersed the resource, or some parts of the resource which were present were hidden from view by patches of tall grass. In either case, no evidence of the resource was visible, and the resource is considered to have been completely impacted.

### 4.2 SUBSURFACE INVESTIGATIONS AT W-3861

The success of the surface collection program and the large quantities of cultural materials recovered during that process were interpreted as an indication that comparable subsurface deposits would be present, especially in the areas of the dominant loci, 1 and 4. The subsurface evaluation was based on the excavation of one-meter-square test units in decimeter levels. The units were located at Loci 1 and 4 initially, with the addition of subsequent units at the remaining loci.




BOUNDARY MAP FOR LOCUS 1, W-3861



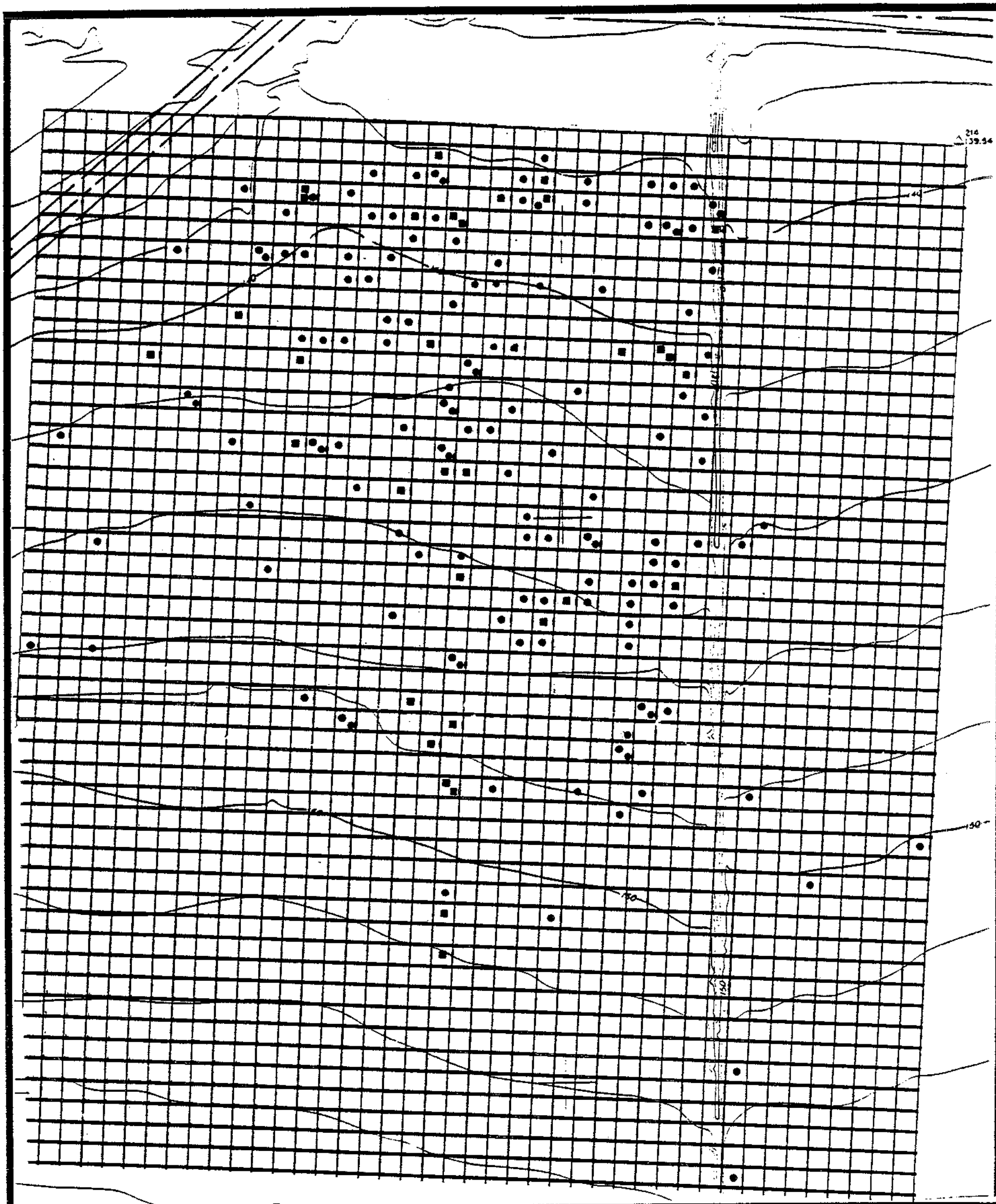
N

SCALE: 1" = 100'

DISTRIBUTION OF PRECISION TOOLS AT LOCUS 1

● -- SCRAPERS ■ -- UTILIZED FLAKES

★ -- KNIVES / PERFORATORS / SPOKESHAVES / GRAVERS

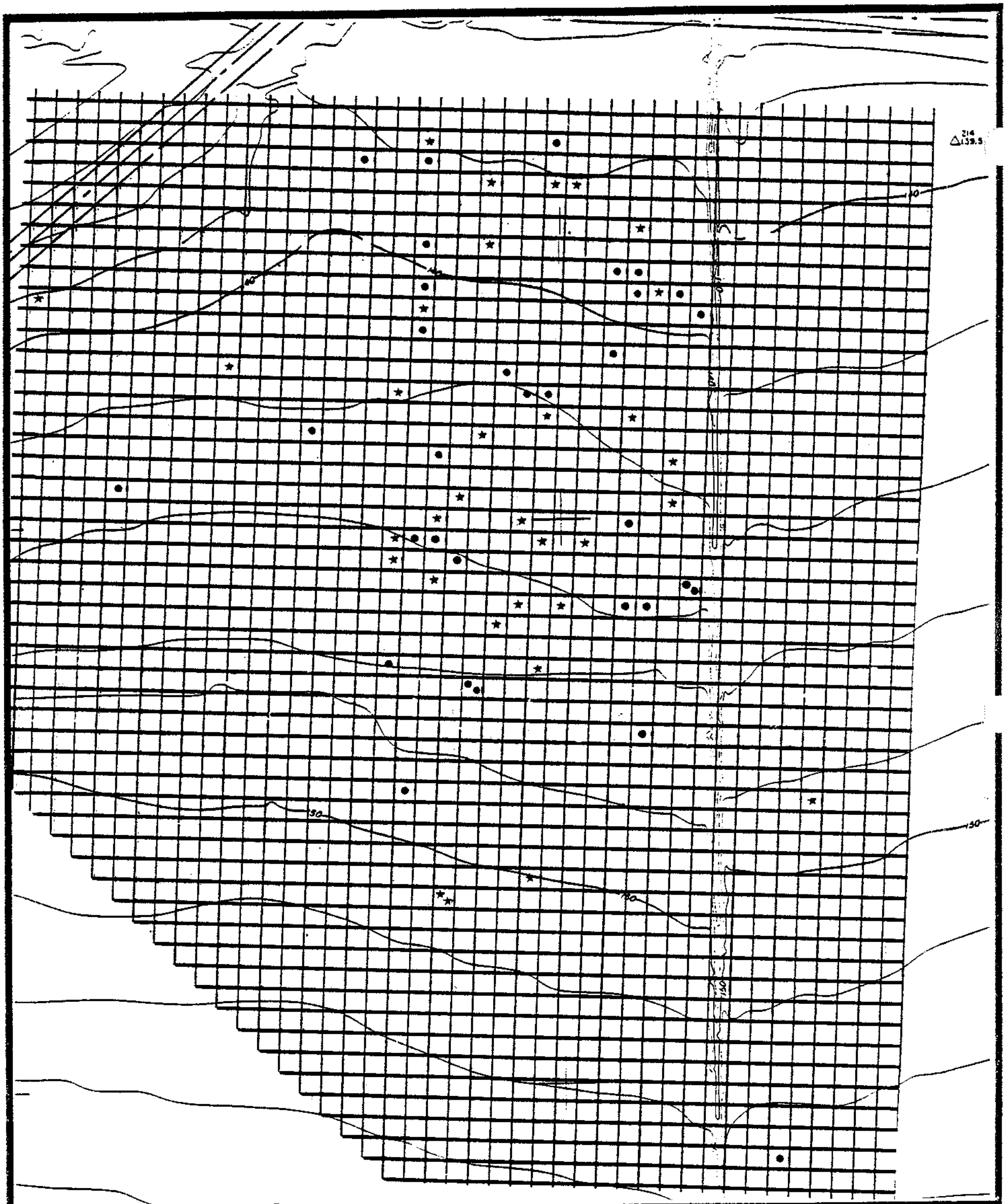



N

SCALE: 1" = 100'

DISTRIBUTION OF LITHIC PRODUCTION WASTE AT LOCUS 1

● -- FLAKES / DEBITAGE ■ -- CORES

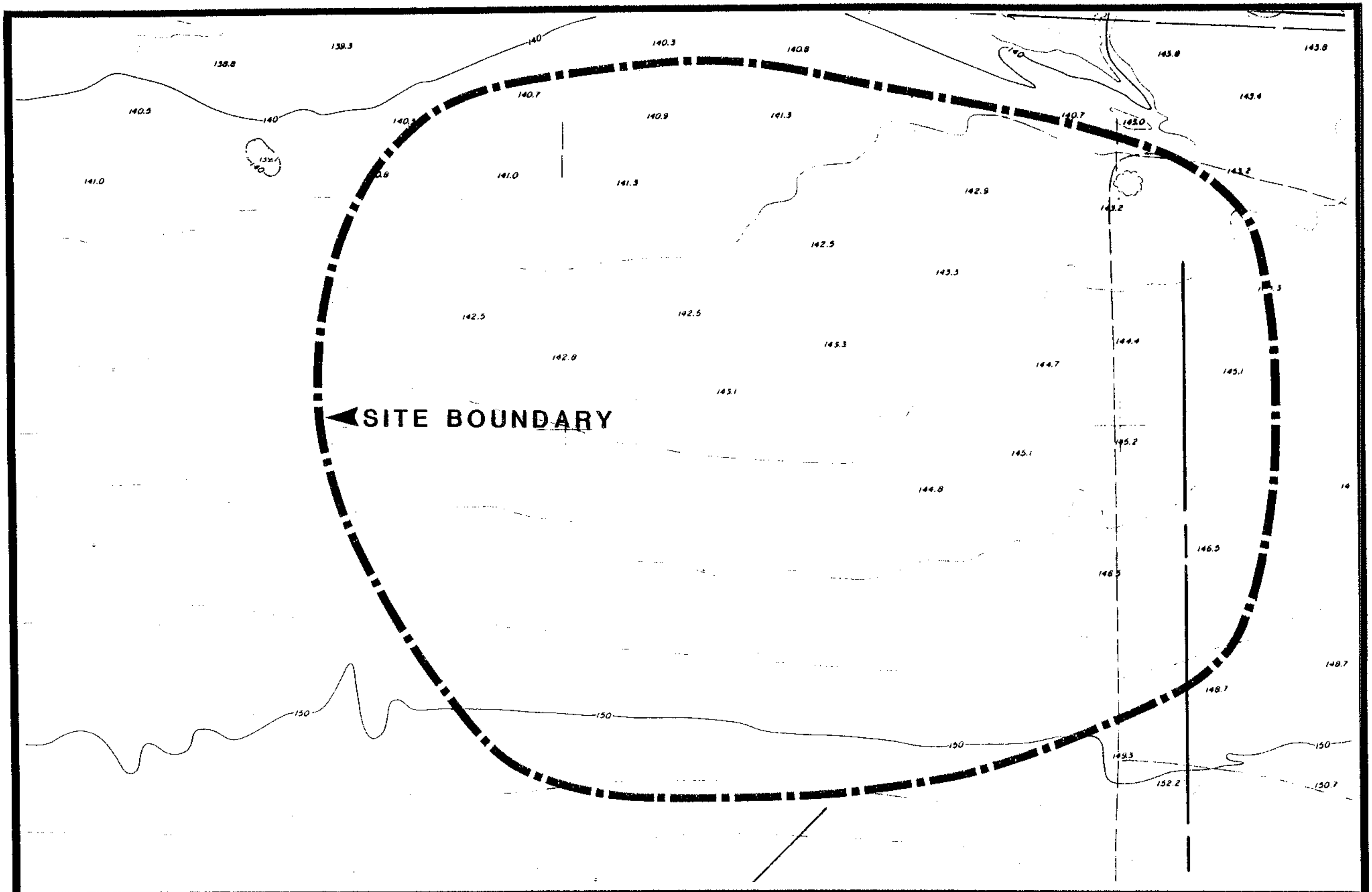


N

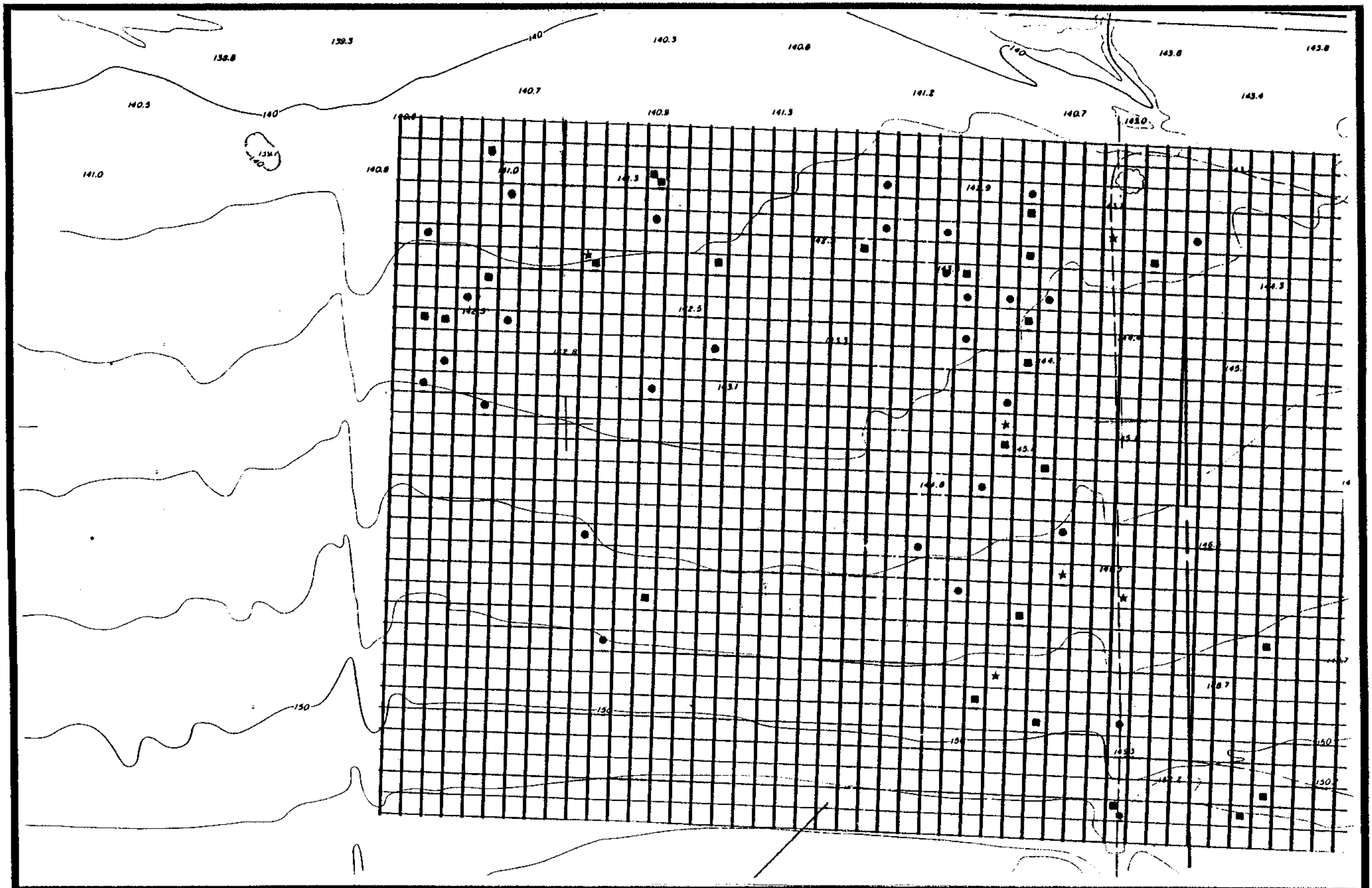
SCALE: 1" = 100'

DISTRIBUTION OF PERCUSSION AND GROUNDSTONE TOOLS AT LOCUS 1

★--PERCUSSION TOOLS ● -- GROUNDSTONE TOOLS

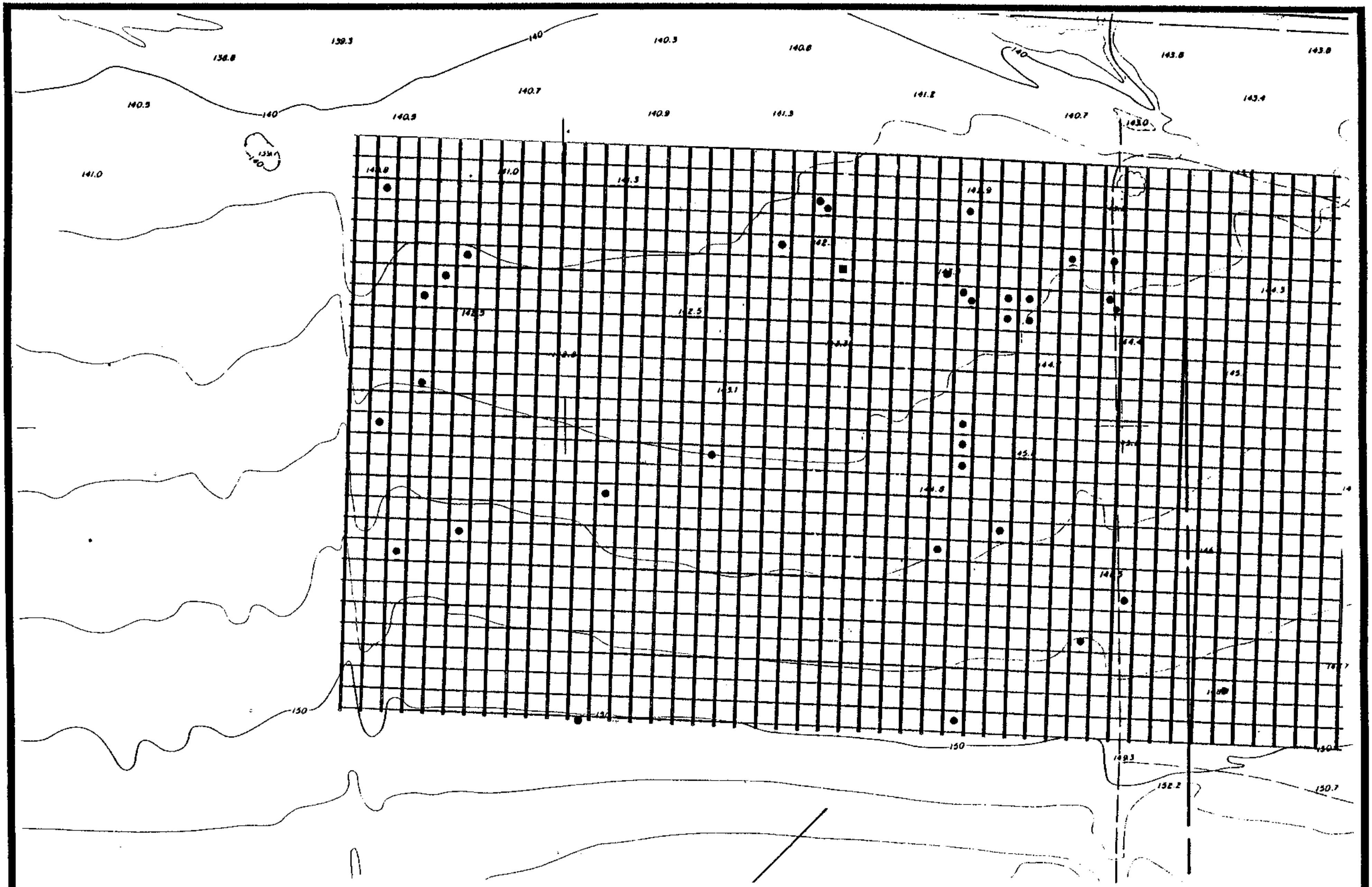



BOUNDARY MAP FOR LOCUS 2, W-3861



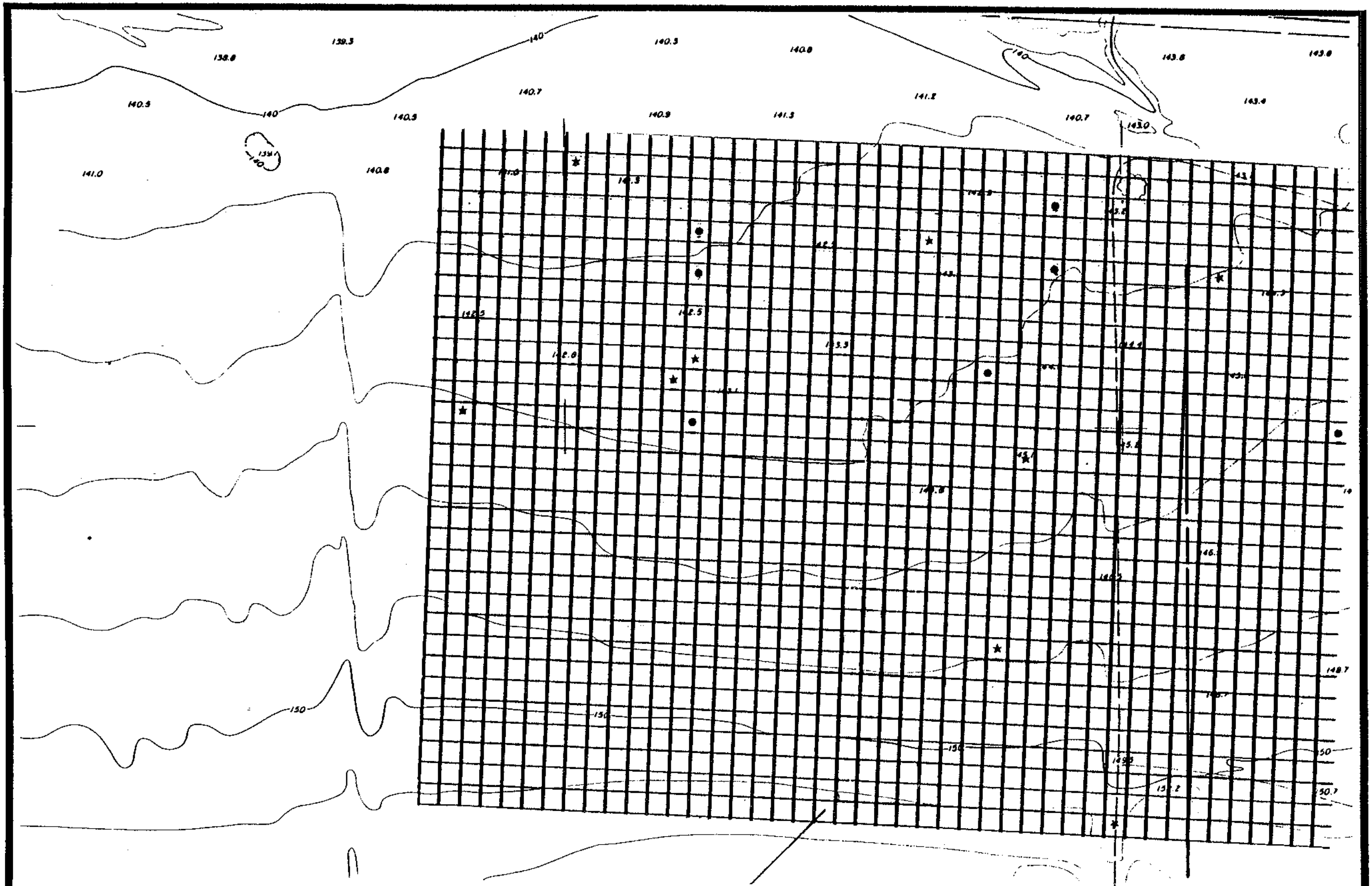

DISTRIBUTION OF PRECISION TOOLS AT LOCUS 2

● -- SCRAPERS ■ -- UTILIZED FLAKES ★ -- KNIVES / PERFORATORS / SPOKESHAVES / GRAVERS




DISTRIBUTION OF LITHIC PRODUCTION WASTE AT LOCUS 2

● -- FLAKES / DEBITAGE ■ -- CORES



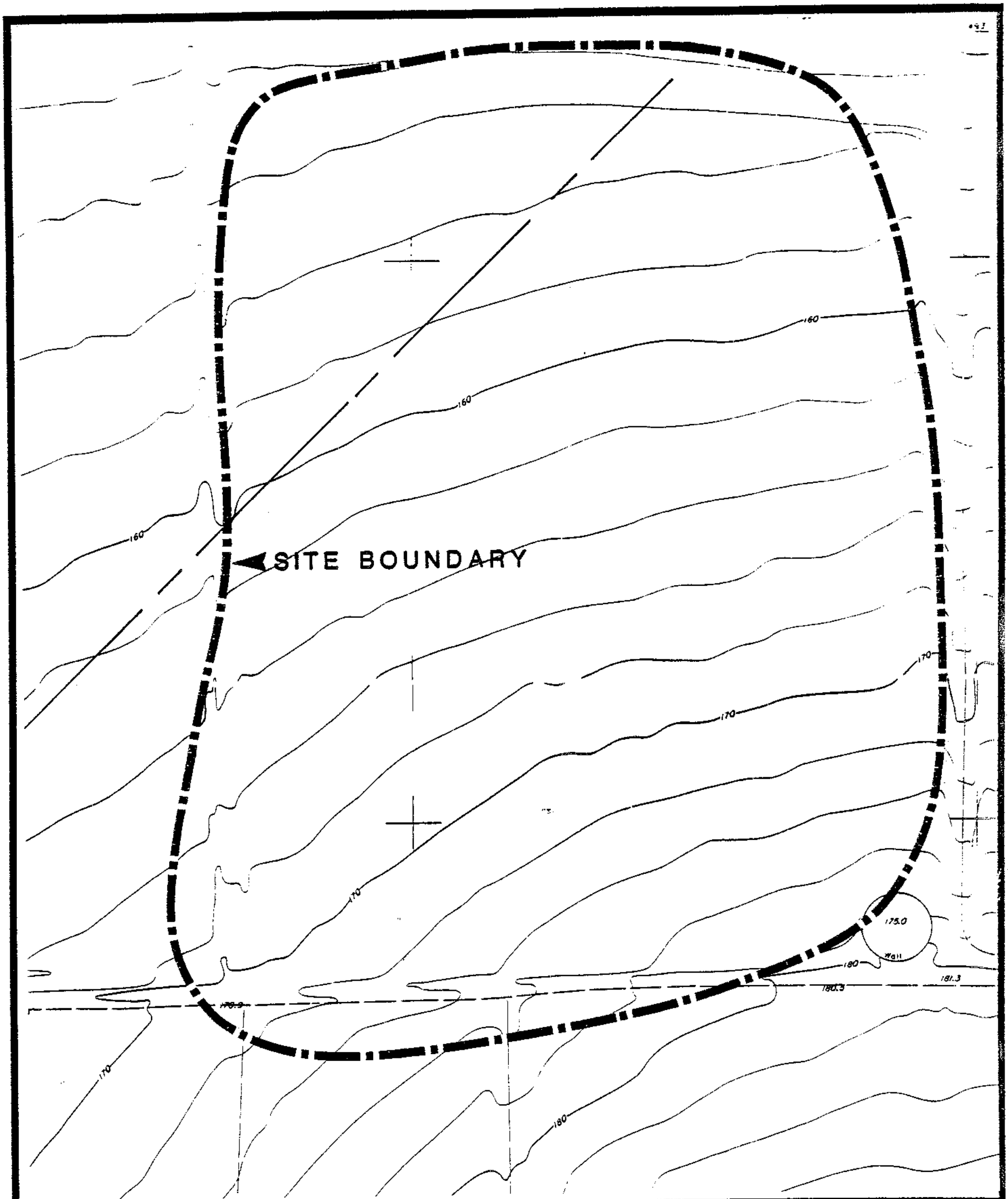

N

SCALE: 1" = 100'

DISTRIBUTION OF PERCUSSION AND GROUNDSTONE TOOLS AT LOCUS 2

★ -- PERCUSSION TOOLS

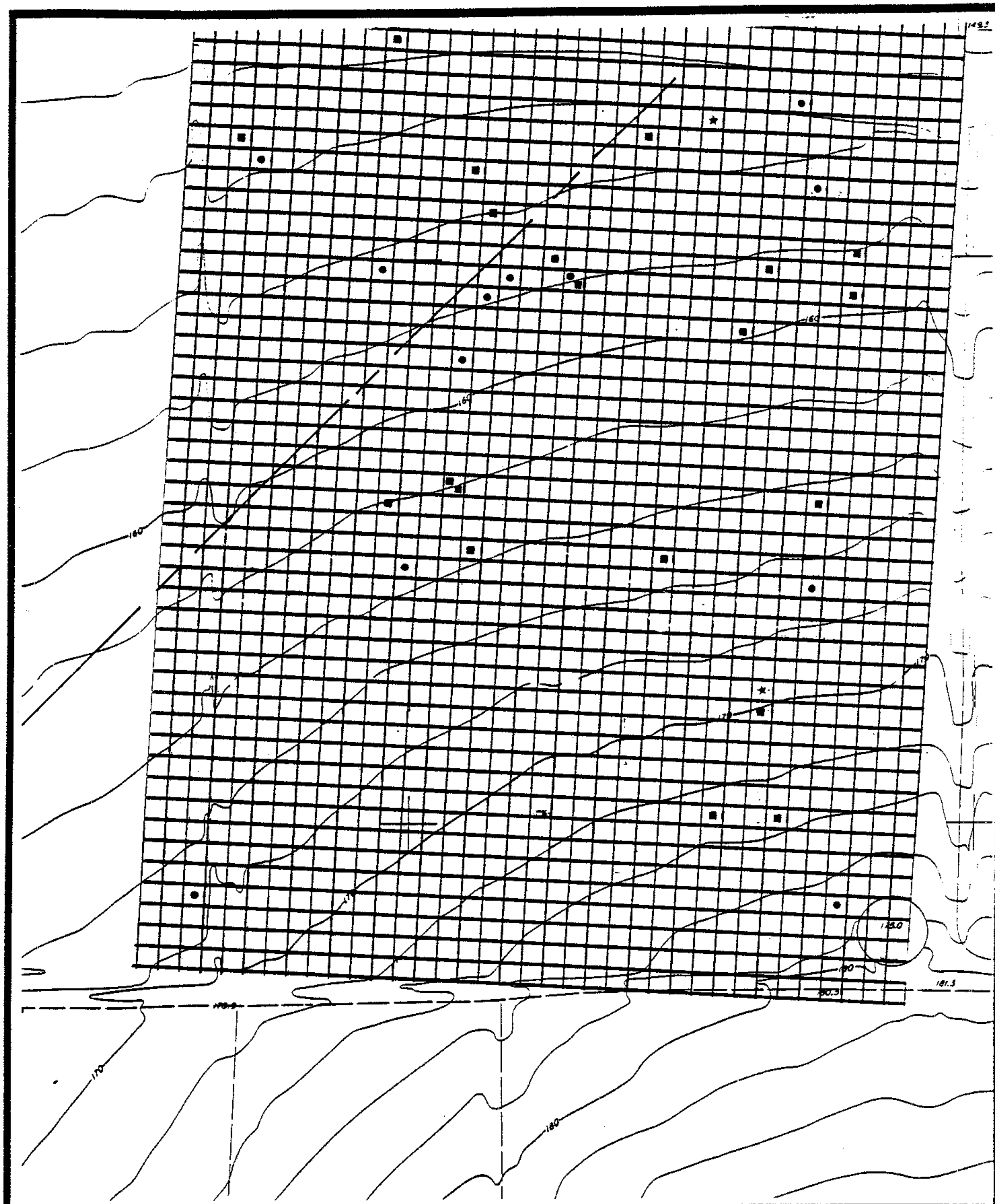
● -- GROUNDSTONE TOOLS




N

SCALE: 1" = 100'

BOUNDARY MAP FOR LOCUS 3, W-3861



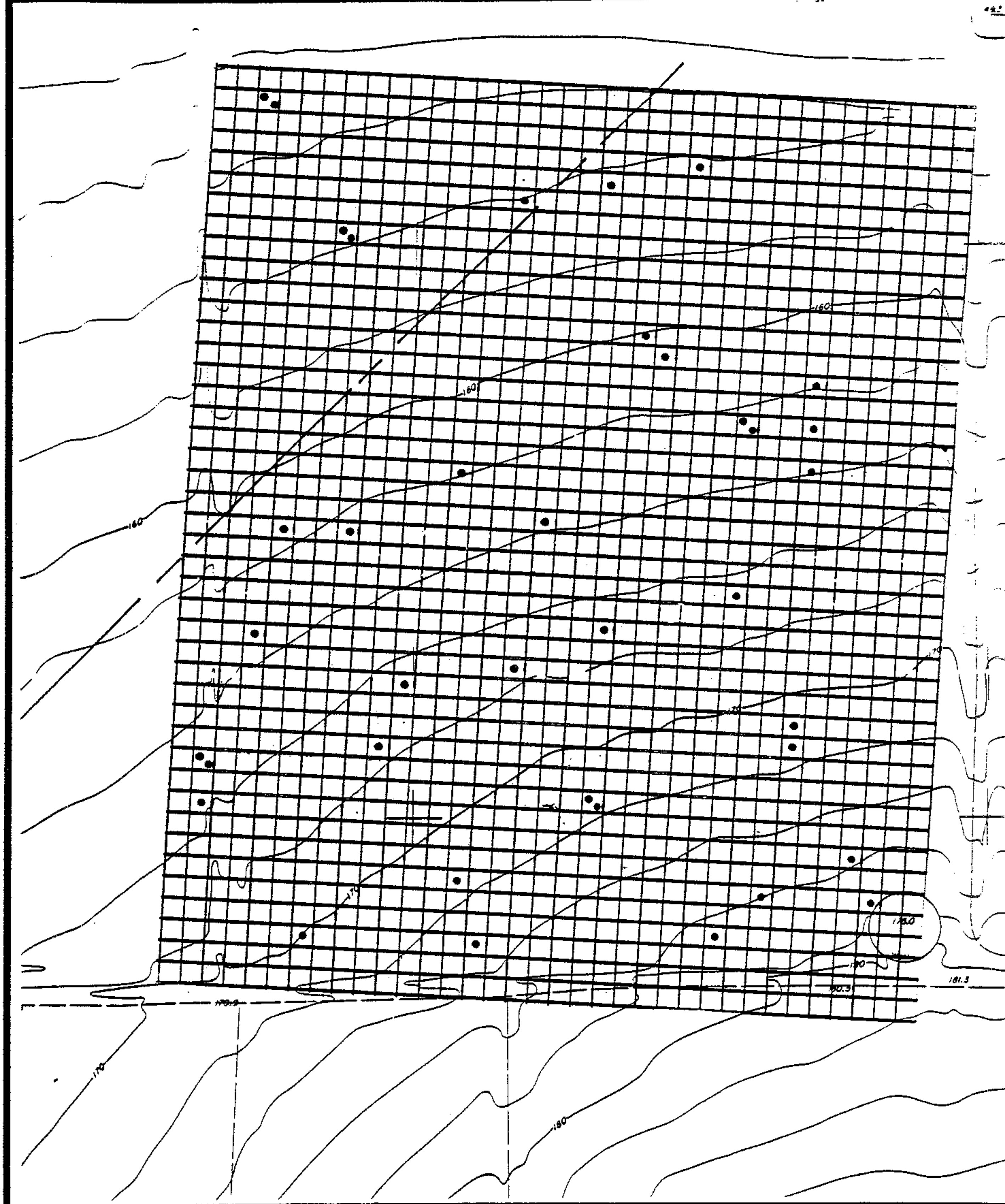
N

SCALE: 1" = 100'

DISTRIBUTION OF PRECISION TOOLS AT LOCUS 3

● -- SCRAPERS ■ -- UTILIZED FLAKES

★ -- KNIVES / PERFORATORS / SPOKESHAVES / GRAVERS

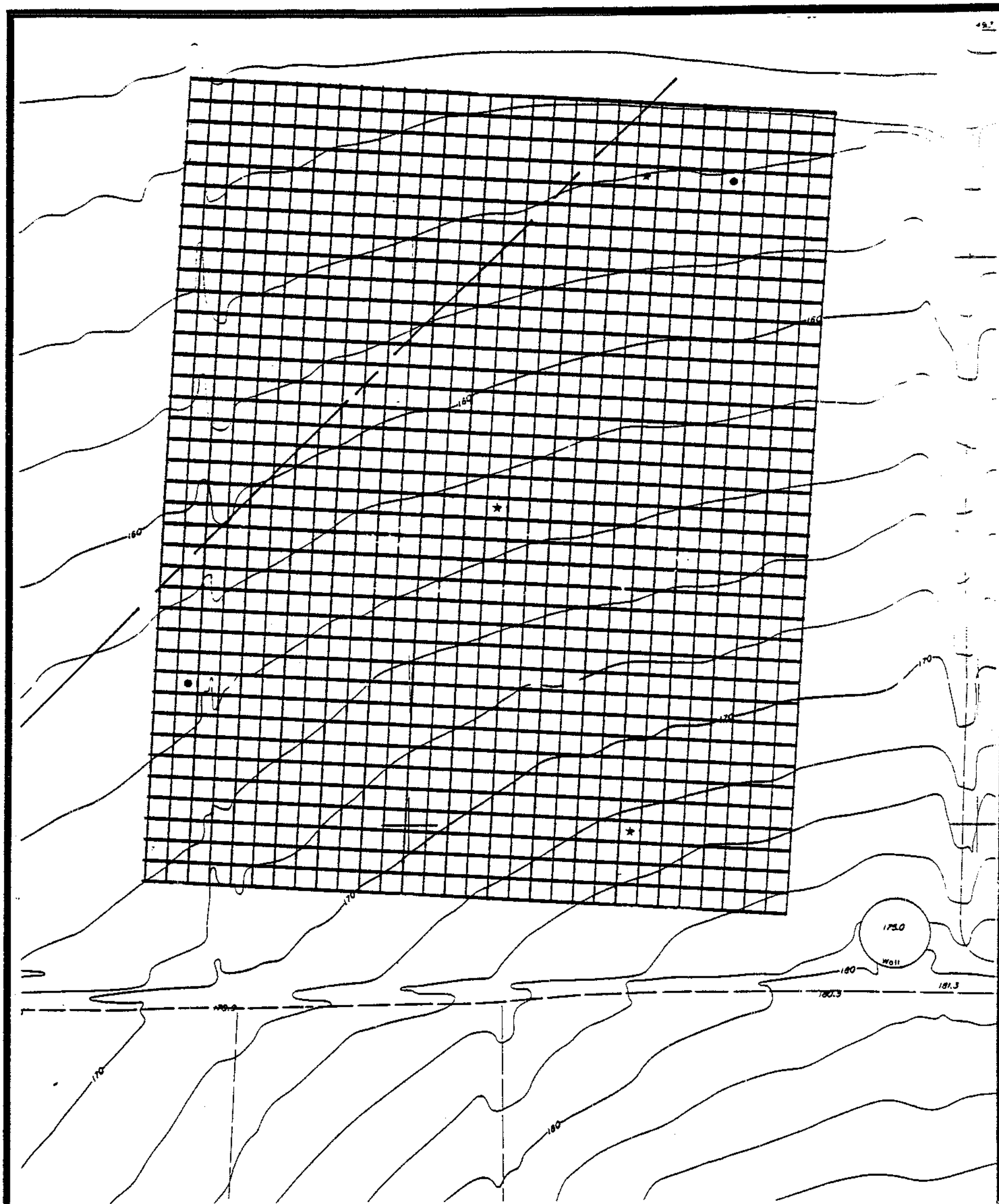



N

SCALE: 1" = 100'

DISTRIBUTION OF LITHIC PRODUCTION WASTE AT LOCUS 3

● -- FLAKES / DEBITAGE ■ -- CORES

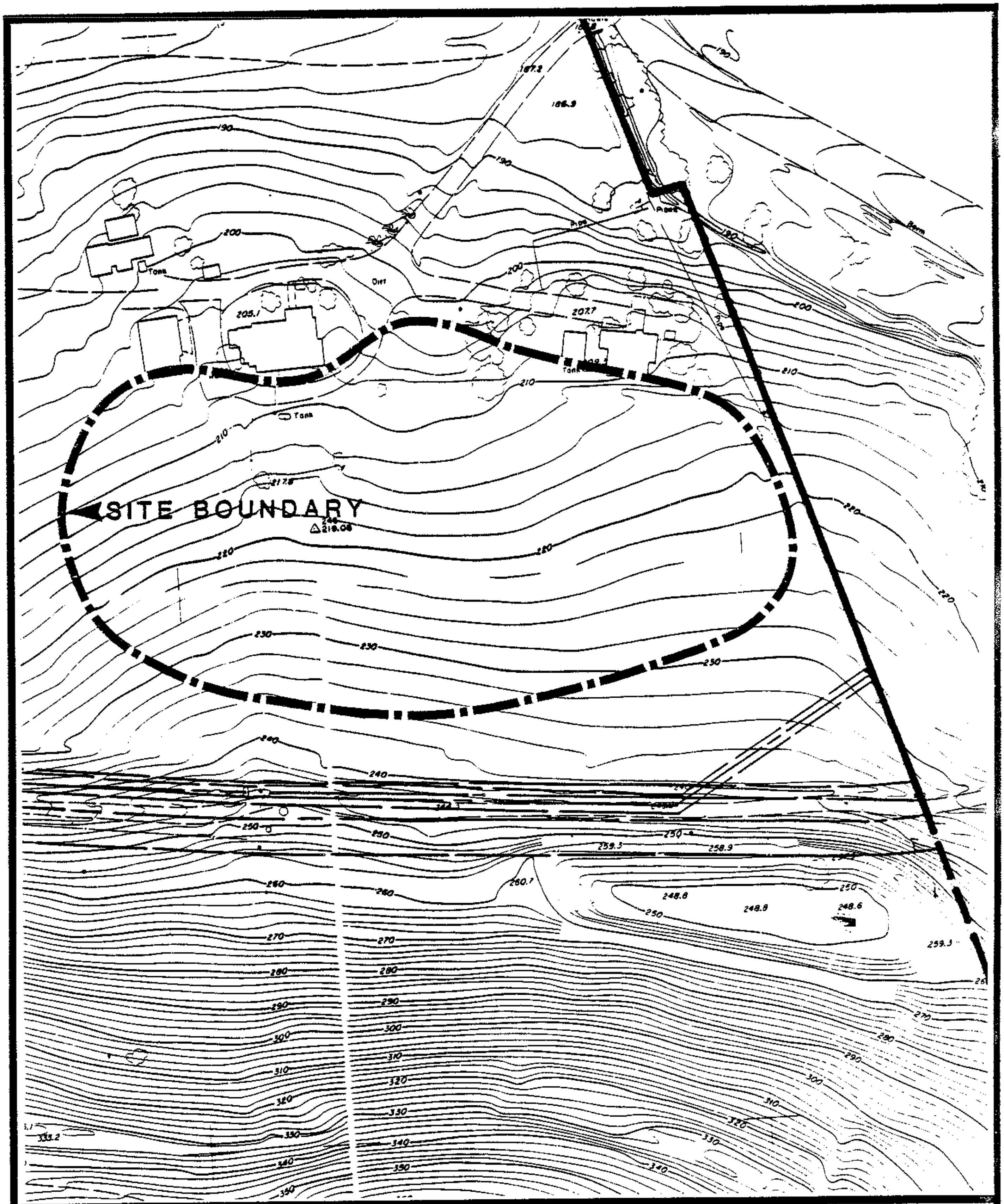



N

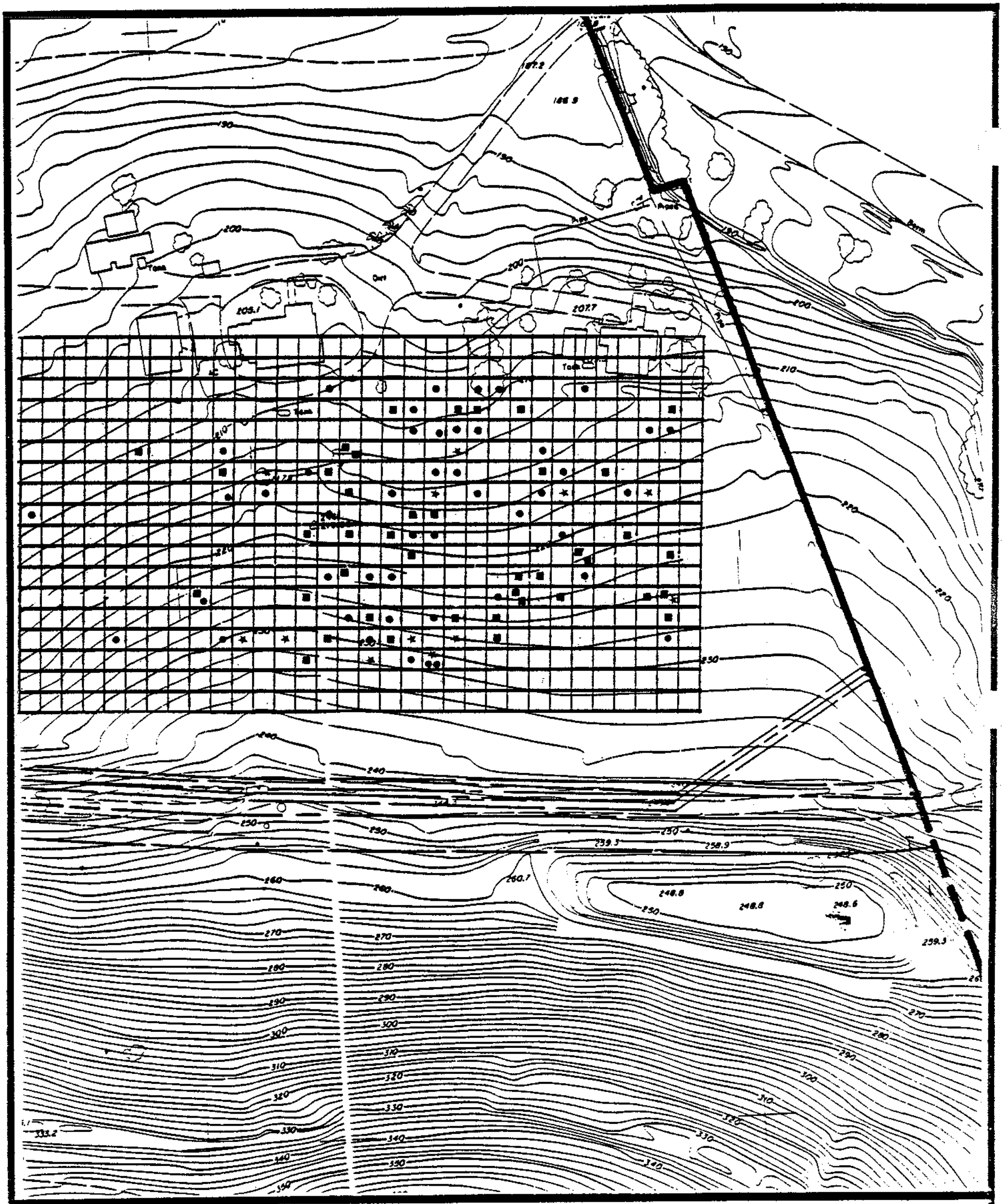
SCALE: 1" = 100'

DISTRIBUTION OF PERCUSSION AND GROUNDSTONE TOOLS AT LOCUS 3

★--PERCUSSION TOOLS ● -- GROUNDSTONE TOOLS




BOUNDARY MAP FOR LOCUS 4, W-3861



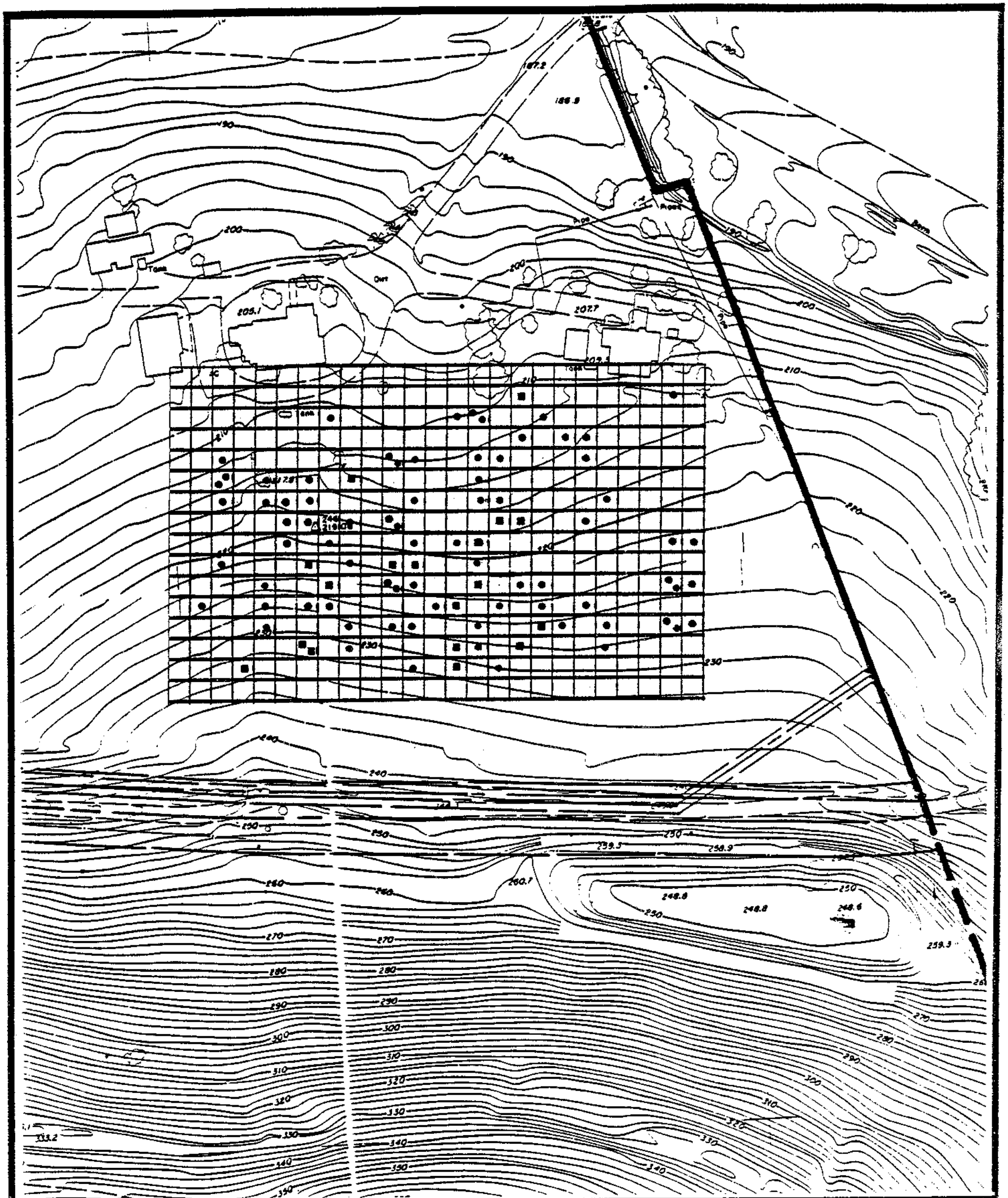
N

SCALE: 1" = 100'

DISTRIBUTION OF PRECISION TOOLS AT LOCUS 4

● -- SCRAPERS ■ -- UTILIZED FLAKES

★ -- KNIVES / PERFORATORS / SPOKESHAVES / GRAVERS

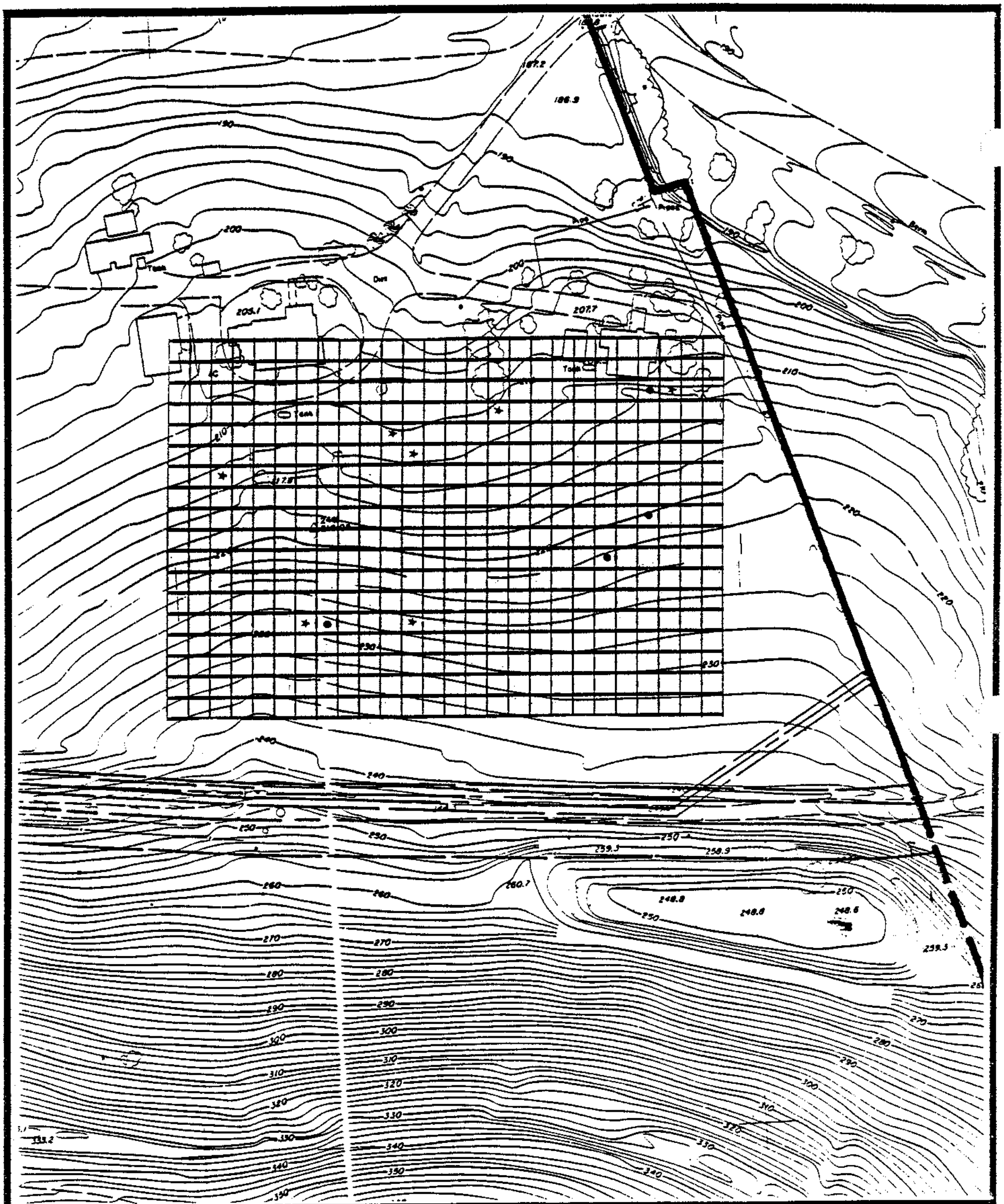


N

SCALE: 1" = 100'

DISTRIBUTION OF LITHIC PRODUCTION WASTE AT LOCUS 4

● -- FLAKES / DEBITAGE ■ -- CORES

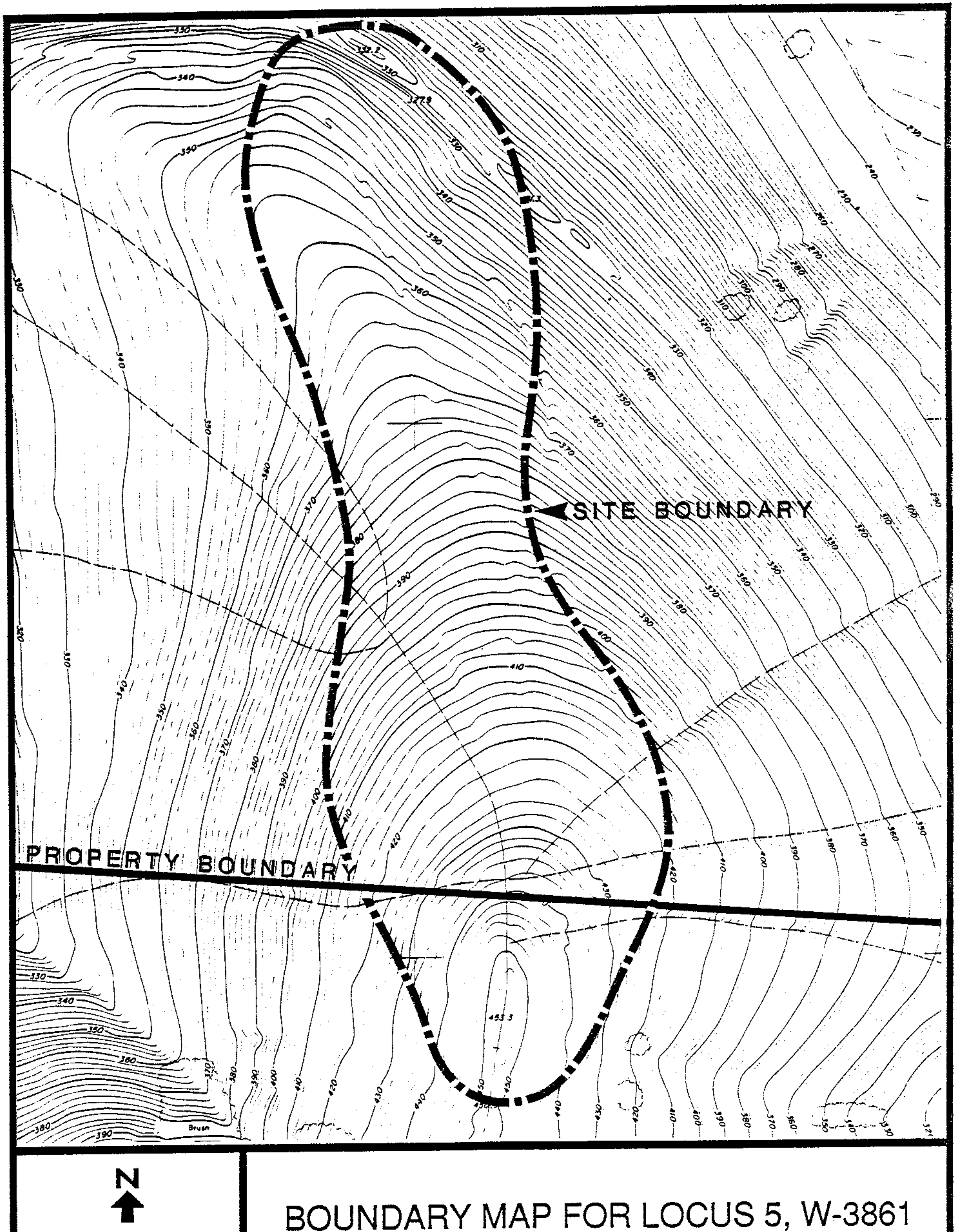



N

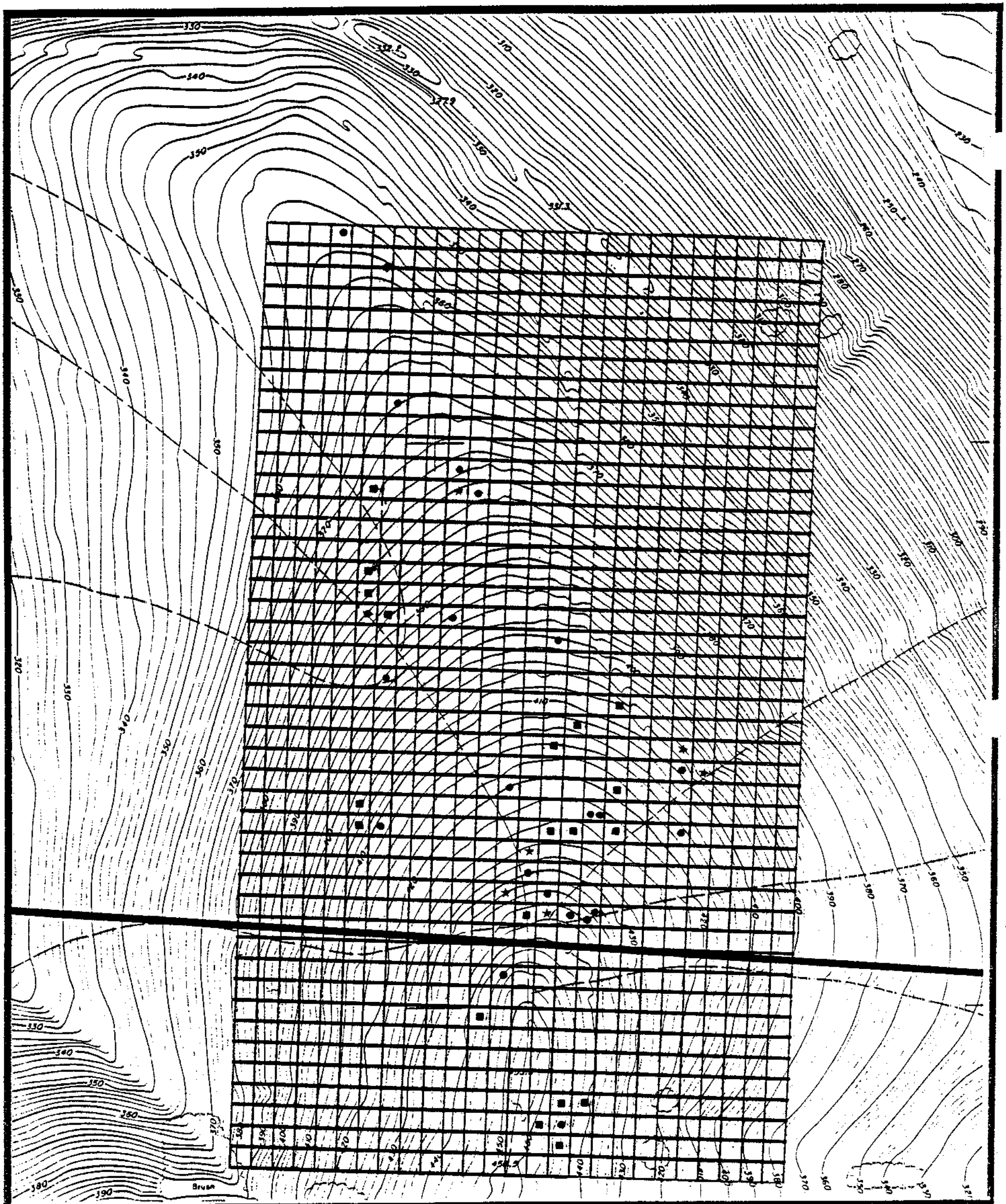
SCALE: 1" = 100'

DISTRIBUTION OF PERCUSSION AND GROUNDSTONE TOOLS AT LOCUS 4

★ --PERCUSSION TOOLS ● -- GROUNDSTONE TOOLS




BOUNDARY MAP FOR LOCUS 5, W-3861



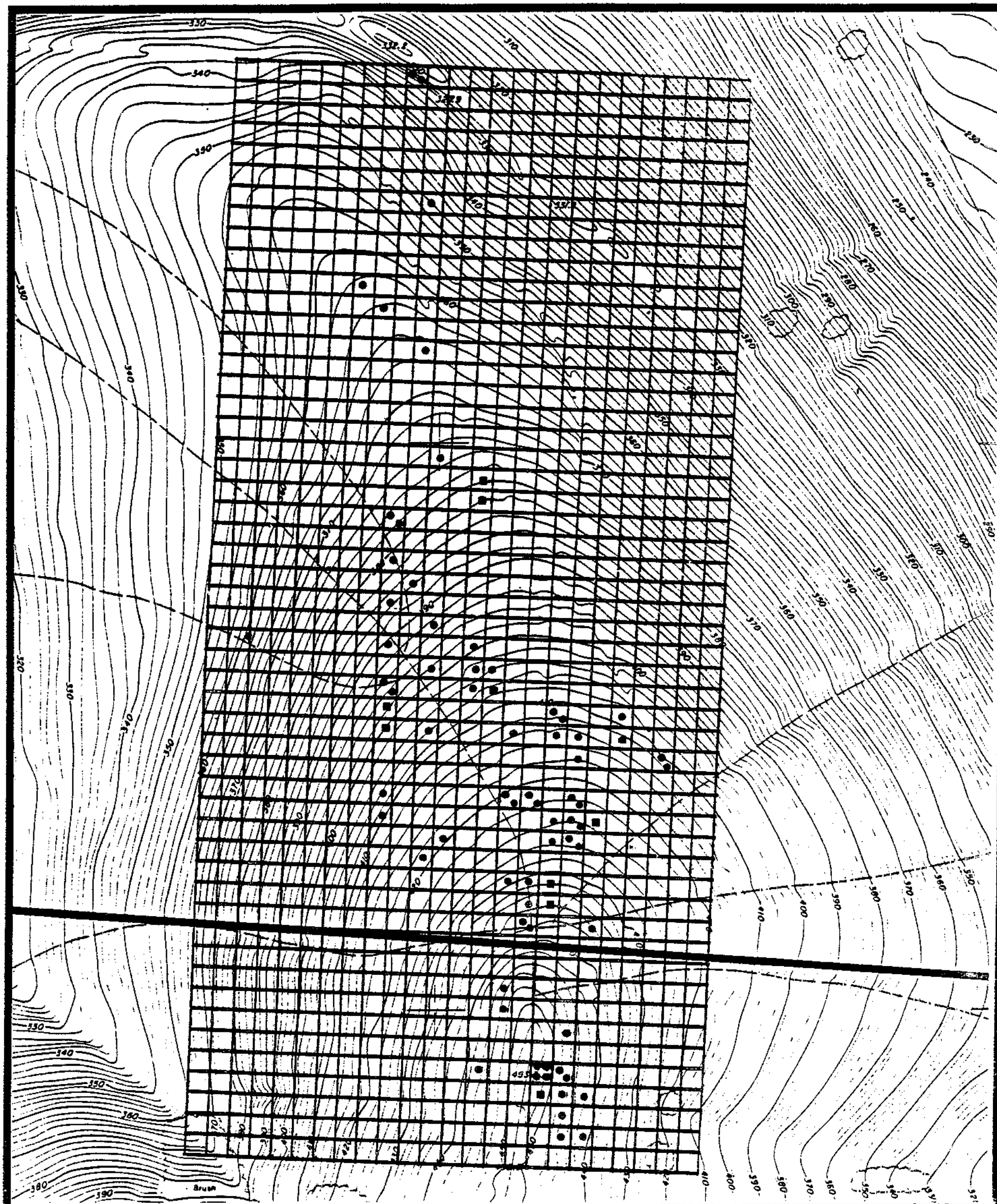
N

SCALE: 1" = 100'

DISTRIBUTION OF PRECISION TOOLS AT LOCUS 5

● -- SCRAPERS ■ -- UTILIZED FLAKES

★ -- KNIVES / PERFORATORS / SPOKESHAVES / GRAVERS

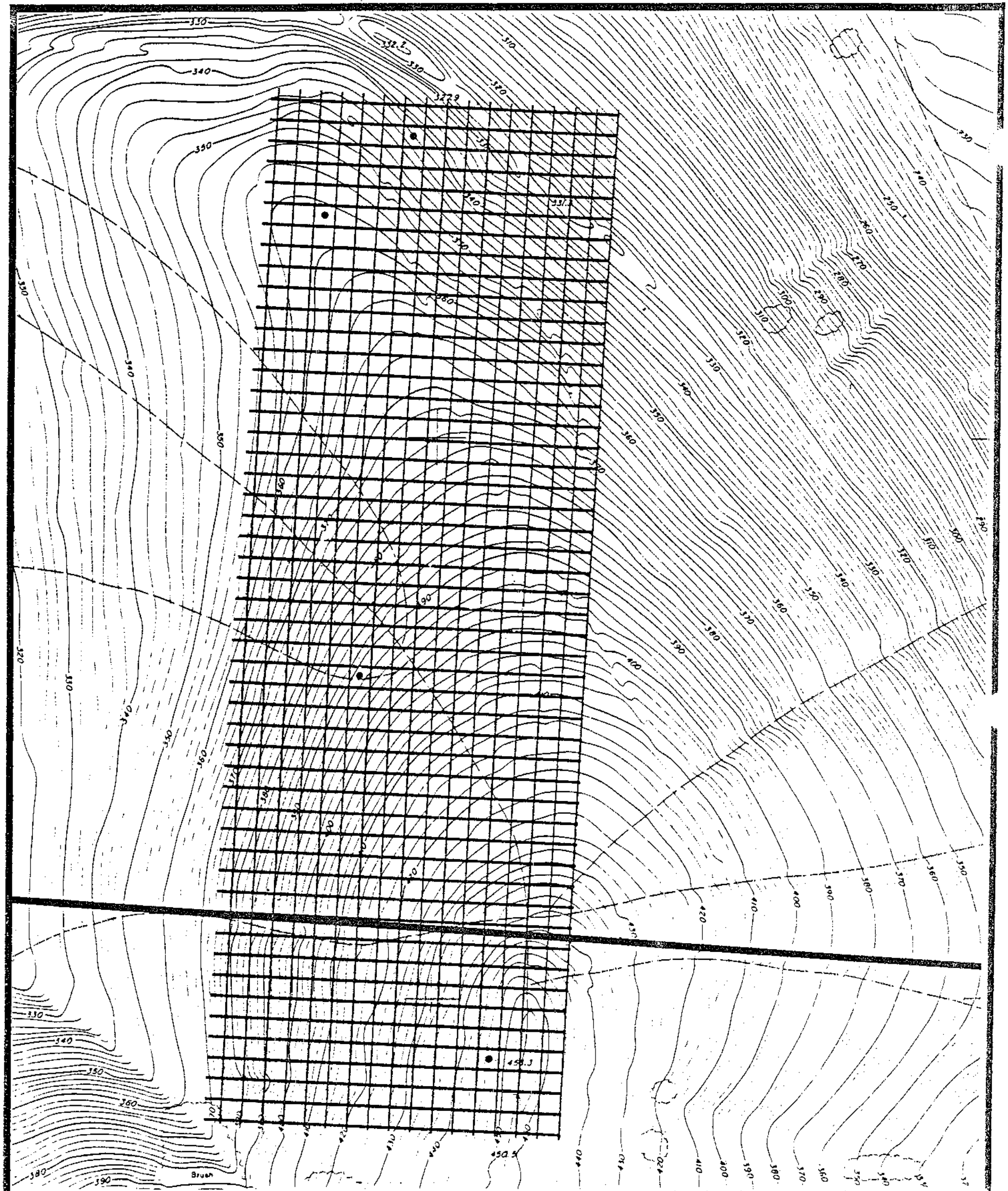


N

SCALE: 1" = 100'

DISTRIBUTION OF LITHIC PRODUCTION WASTE AT LOCUS 5

● -- FLAKES / DEBITAGE ■ -- CORES



N

SCALE: 1" = 100'

DISTRIBUTION OF PERCUSSION AND GROUNDSTONE TOOLS AT LOCUS 5

■ --PERCUSSION TOOLS ● -- GROUNDSTONE TOOLS

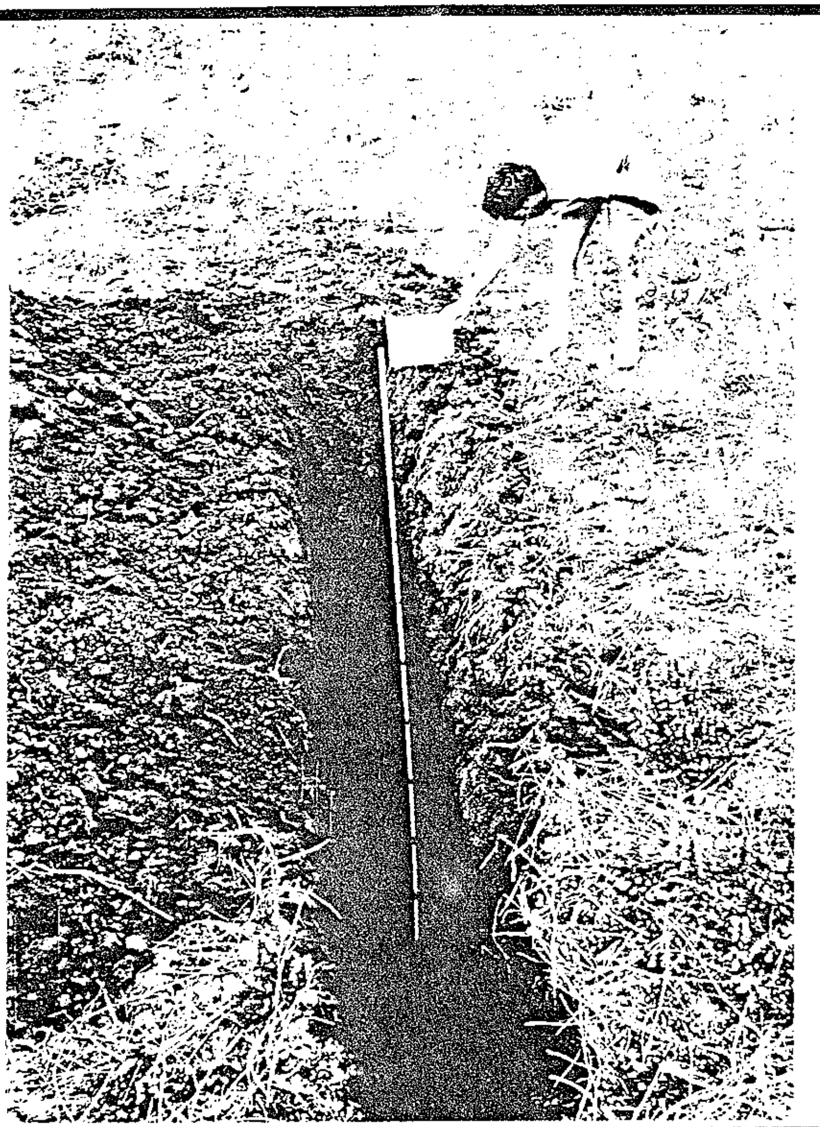
However, as will be discussed in the following paragraphs, the near absence of any type of subsurface deposits negated the need for an extensive posthole and test unit excavation program.

### 4.2.1 Results of Subsurface Excavations

A total of six one-meter-square test units were excavated at W-3861. Of these six units, five were placed at Locus 1 and one was located at Locus 4. These two loci represented the largest quantities of surface artifacts from W-3861, and were assumed to correspond to subsurface deposits. When these six units were found to be very sparse in cultural materials, the test units planned for Loci 2, 3, and 5 were abandoned.

The locations of the six test units excavated at W-3861 have been illustrated on page 53. Test Unit 1 was located at Locus 4, while Units 2 through 6 were placed at Locus 1. A table has been provided on page 54 which records the depths and recoveries of the units. Of the six units, 1, 3, and 4 were wet-screened through one-sixteenth-inch mesh rubberized screen, while Units 2, 5, and 6 were dry-screened through one-sixteenth-inch mesh screening. The use of wet-screening was necessitated by the heavy clay content of the soil. The clayee characteristic of most of the soil made normal dry-screening nearly impossible.

The results of the test units were generally negative, revealing the presence of no subsurface deposits. Only Test Unit 1 at Locus 4 produced a recovery of materials through three levels. Twenty-four specimens were recovered from Unit 1: one tool, 22 flakes, and one debitage. The soil at this location was composed of a rocky, very dense clay. Part of the rock content at Locus 4 consisted of basalt and felsite cobbles. It is possible that some of the flakes from Unit 1 are the result of cultivation. Most of the flakes from Unit 1 are small and lack identifiable bulbs of percussion or striking platforms. Thus, despite the fact that Unit 1 produced the largest subsurface recovery at W-3861, the results are questionable and are not interpreted as an indication of a significant subsurface deposit.



VIEW OF TEST TRENCH 6,
WHICH WAS EXCAVATED
TO 10 FEET IN DEPTH.

VIEW OF TEST UNIT 2,
AT THE 10-20 CM. LEVEL.

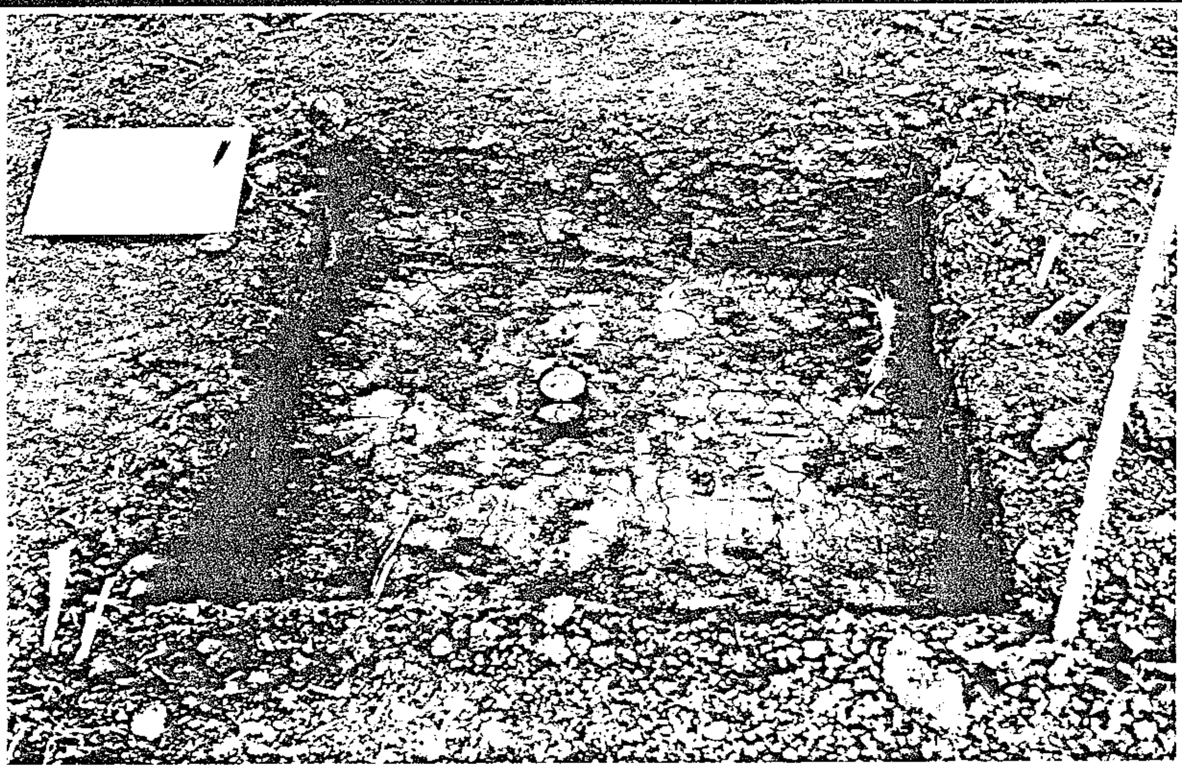


TABLE 3

Test Unit Excavation Results
Site W-3861

| Test Unit Number | Locus Number | Level | Recovery | Material |
|---|---|---|---|---|
| 1 | 4 | 0-10 cm. | 1 Flake | Basalt |
| | | | 1 Debitage | Basalt |
| | | | 1 Perforator | Basalt |
| | | 10-20 cm. | 11 Flakes | Basalt |
| | | 20-30 cm. | 10 Flakes | Basalt |
| | | 30-40 cm. | No Recovery | |
| 2 | 1 | 0-10 cm. | No Recovery | |
| | | 10-20 cm. | No Recovery | |
| | | 20-30 cm. | No Recovery | |
| 3 | 1 | 0-10 cm. | 1 Flake | Felsite |
| | | 10-20 cm. | No Recovery | |
| | | 20-30 cm. | No Recovery | |
| 4 | 1 | 0-10 cm. | 1 Flake | Felsite |
| | | 10-20 cm. | 1 Flake | Basalt |
| | | 20-30 cm. | 1 Flake | Basalt |
| 5 | 1 | 0-10 cm. | No Recovery | |
| | | 10-20 cm. | No Recovery | |
| | | 20-30 cm. | No Recovery | |
| 6 | 1 | 0-10 cm. | No Recovery | |
| | | 10-20 cm. | No Recovery | |
| | | 20-30 cm. | No Recovery | |

The remaining test units were excavated within Locus 1, where the highest quantity of surface artifacts was recovered. The collective recovery from Test Units 2 through 6 at Locus 1 was four flakes. This recovery was disappointingly small and did not reflect the size of the surface collection. The soil throughout most of the units at Locus 1 was a dark brown, clayee loam, with pockets of clay and occasionally sandy loam.

The wide separation between the units at Locus 1 ensured a representative coverage. Based upon the negative findings of the test units and the fact that the wide separation of the units reflected the subsurface content of the area of greatest surface recovery, the test unit excavation procedure was abandoned. In lieu of excavating test units at the remaining loci of W-3861, a backhoe was employed to excavate several trenches and provide profiles of the site that might indicate significant areas with a greater potential for subsurface deposits.

4.2.2 Results of Trenching Program at Site W-3861

A trenching program was implemented to evaluate subsurface content due to the poor results of the test unit excavations. A backhoe with an 18-inch bucket was utilized to excavate ten trenches of various lengths at Loci 1 and 2, and in general along the northern property line. The positions of the trenches have been shown on page 53. The lengths and depths of the trenches have been included in Table 4 on page 56.

Two types of trenches were excavated. The first type (Trenches 1 and 10) were long and shallow trenches (averaging three feet in depth) designed to reveal extended profiles of the upper subsurface soil horizon. The second type (Trenches 2 through 9) consisted of short, deep trenches, attaining ten feet in depth. These deep trenches were designed to analyze the potential for deep, buried cultural deposits and the possibility that flood action had impacted the site.

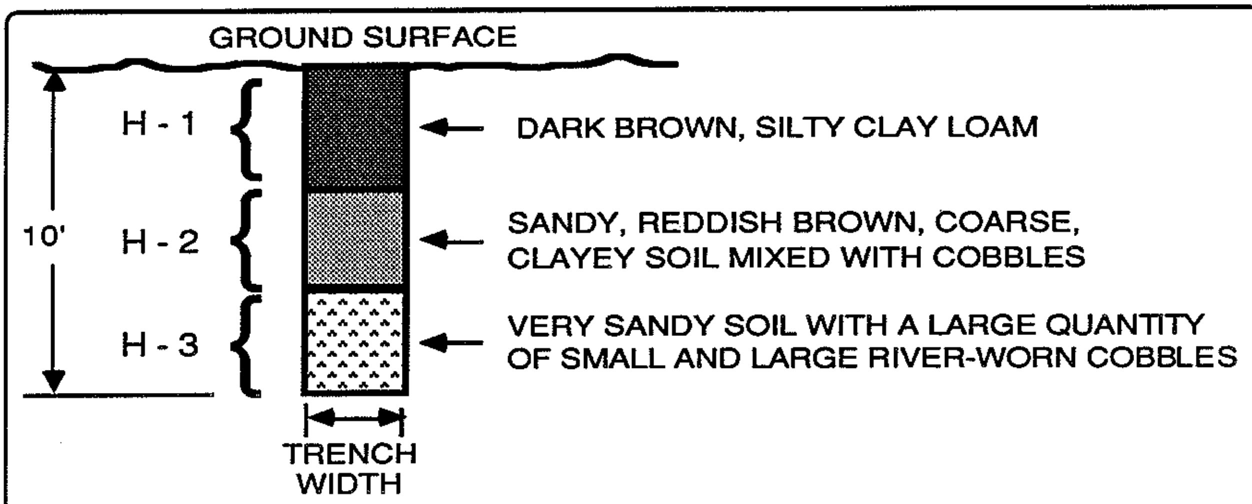
The deep trenches were excavated at approximately 300-foot increments across the northern area of the property, south of the sewer pipeline. The deep trenches exposed profiles that were very consistent. With some variation in the depths of the soil horizons (H-1, H-2, H-3), each profile displayed an upper horizon of dark brown, silty clay soil (H-1), a middle horizon of sandy,

TABLE 4

Trench Excavation Data
Site W-3861

| Trench Number | Depth | Length | Comments |
|---|---|---|---|
| 1 | 3 Feet | 115 Feet | No evidence of subsurface deposits. |
| 2 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 3 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 4 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 5 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 6 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 7 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 8 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 9 | 10 Feet | 12 Feet | River terrace soil profile; no cultural deposits. |
| 10 | 2-3 Feet | 345 Feet | Cut east/west, directly through Locus 1. No cultural deposits were observed. |

reddish brown, coarse, clayee soil with some cobbles (H-2), and a bottom horizon (H-3) of very sa cobbles.




TYPICAL SOIL PROFILE FROM RIVER TERRACE AT SITE W-3861 -- OTAY RIO BUSINESS PARK PROJECT

The trenches provided information that led to the conclusion that flood action had not destroyed or buried any cultural resources. The river terrace upon which the site is situated exhibits a very typical geological profile that does not indicate that any floods inundated the area since the occupation of W-3861 approximately 5,000 years ago. Thus, the lack of any cultural materials in the profiles and the absence of evidence that might have suggested that floods had impacted the area are interpreted as confirmation that the cultural resources at W-3861 consist primarily of surface scatters.

4.3 SUMMARY OF FIELD INVESTIGATIONS

Site W-3861 is a very unique site for San Diego County, although it conforms to a pattern which is report often within Otay Valley and Otay Mesa. The surface investigations at the site resulted in the recovery of over 1,100 specimens -- tools used by the La Jolla Complex as part of their subsistence adaptation to this river valley.

The surface collection program represents a large investment in time that was required to inspect approximately 1.5 million square feet of surface area at W-3861. This large-scale surface recovery program revealed distribution patterns and artifact associations which facilitated the division of the 70 to 80 acres of W-3861 into 30 to 40 acres of loci (artifact concentrations), with the remaining 30+ acres consisting of much less dense scatters of artifacts intervening between the major loci. While the surface collection program successfully identified site contents and boundaries, the subsurface excavations failed to locate any significant deposits of cultural materials. This is interpreted as an indication that the site activity must have been very mobile, without requiring major, long-term camp sites.

Upon the completion of the surface recovery program and the documentation of the absence of any subsurface deposits, the field operations were terminated. Essentially, the research potential of the site was exhausted, as no further artifact concentrations remain.

## 5.0 HISTORIC RESOURCES

Within the project boundaries, two houses and several related outbuildings were considered to be potentially signficant. An investigation of these structures was undertaken as an adjunct to the evaluation of the prehistoric site. The two structures are located at opposite ends of the project. The first, situated in the northwestern corner of the project along the river terrace, is a small, square house and tool shed along with various later additions, such as packing sheds. The second structure is located near the eastern property boundary, at the base of the steep slopes which lead to Otay Mesa. This second structure is a well-preserved farmhouse and garage. The following subsections will briefly describe the findings of the historical analysis.

### 5.1 FARMHOUSE COMPOUND 1 (NORTHWEST LOCATION)

The first structure analyzed was that situated along the river terrace in the northwest corner of the property. The location of the compound has been illustrated on the map on page 17. The principal structure of interest was the farmhouse, which is a redwood bungalow. In general, redwood bungalows are an architectural artifact from the period between 1870 and 1900. The primary attributes of the redwood bungalow style are the simplicity of design and the redwood used. The design was based upon four corner studs which support the roof and walls. Interior walls were non-structural or non-weight-bearing, and therefore could be placed in any desired orientation. The joists and floor supports are set on concrete blocks or piles. The exterior walls consist of a series of 1x12-inch redwood boards set vertically. At the seams of the boards, 2 1/2 x 2 1/2-inch slats were nailed to seal the cracks against the weather. The roof was set at a low angle, virtually eliminating any attic space. Redwood was used throughout the house except for the flooring, since it was the most readily available and cheapest wood source during the late 1800s and early 1900s. This fact helps to chronologically place the structure.

The farmhouse is presently occupied by a leaseholder, Mr. Dewayne Heffen. The structure has endured some modification, but generally is unchanged except on the south side. The structure measures 29 feet by 28 feet. The interior is divided into four rooms of nearly equal size. A scaled schematic drawing of the floor plan has been provided on page 63. Photographs of the structure are provided on pages 65A and 65B. The exterior of the structure is in very poor condition. While the redwood from which the house was constructed has resisted decay, the paint has peeled and permitted weathering. The interior is also in poor condition. The ceiling is constructed from sheets of compressed fiberboard (48" x 53") commonly used in the late 1800s. All of these sheets sag due to the accumulated effects of moisture over the years. The walls and floors are also original, and suffer from years of neglect. The installation of electrical wiring has affected the integrity of the structure: holes were bored into the floor boards to install outlets, and exposed wiring was run along the walls. Ceiling lights generally dangle from the ceiling on electrical wires. Most of the interior doors have been removed.

The addition of utilities to the structure also included plumbing. A bathroom was installed in the southwest corner of the enclosed porch. A septic tack was installed with an outfall directly into the floodplain rather than leach lines. At present, the septic tank is inoperable, and effluent flows above ground westward from the house to a ravine.

The historical investigation was also directed toward the identification of the trash pit for the house. Trash dumps are considered important time capsules of the materials used and discarded through time. A great deal of information can be gathered concerning the economic status of the occupants of a house from the trash dumped near the structure — their buying power, the types of mercantile goods purchased, the household goods used, the types of china and/or dishware used, etc. The trash dump for the bungalow was located approximately 50 feet west of the southwest corner of the property. Its location was confirmed by Mr. Heffen, who stated that when the septic tank had fouled and a backhoe trench was excavated to allow waste to drain to the west, he encountered a deposit of trash, old bottles, broken plates, and metal fragments. Because this location corresponds to the present location of the waste ditch, further investigations were avoided for health reasons.

A substantial research effort was focused upon the evaluation of the historical significance of the structure. A title search for the lot upon which the bungalow is located was completed to the time of the original deed transaction on December 19, 1870, between Guadalupe E. de Arguello and James Holland. A list of title transactions between 1870 and 1901 has been provided in Appendix III. Although title to the property was transferred several times via second trust deeds and other loan instruments, the principal owners were James Holland (1870-1881), John R. Stanwood (1881-1882), R. M Powers (1882-1889), and James H Harwood (1889-1900). John Stanwood applied for the actual patent from the U. S. Government in 1882, and his name appears on the original township plat which was surveyed between 1853 and 1879. The bungalow, labelled with Stanwood's name, is shown on the plat in approximately the same location in 1870 as it appears today. However, a slight discrepancy exists in the record and township plat. Stanwood legally took title in 1881 from the U S Receiver. Thus, some time between 1870 and 1881, it appears that James Holland either defaulted on his mortgage or abandoned the property. Stanwood took possession at least by 1878 in order for his name to appear on the township plat, but it was not until 1881 that Stanwood acquired the U. S. Receiver's receipt for the property

An analysis of the property owners (not the second trust deed holders) was undertaken to establish the historical significance of the persons who were directly associated with the bungalow. As a result of research conducted at the San Diego Historical Society, the San Diego Public Library, and the Chula Vista Library, it was determined that none of the names of the owners appear in any register of historically relevant persons in either San Diego or Chula Vista. A list of the historical archives consulted during this study is provided in Appendix IV.

The analysis of the general vicinity of the bungalow was completed with the study of the forces which might have affected the structure in the past. The primary event which occurred in the early years after the house was constructed was the 1916 flood. The original Lower Otay Dam was an earth and rockfill wall with a core of boiler plate embedded in concrete anchor block (<u>San Diego Union</u>, 1/23/66). The dam failed during a winter storm in 1916 that included extensive rainfall and winds up to 54 m. p. h. The dam failed due to overtopping which removed support from the downstream side of the dam, allowing it to quickly erode and release the lake water (City of San Diego Engineers report, 1916). When the dam burst, a wall of water 20 feet high rushed through the valley to San

Diego Bay. Twenty people were killed, the valley floor was swept clean, and the small town of Otay at the mouth of the valley (near Interstate 5 and Otay Valley Road) was destroyed (San Diego Union, December 29, 1963).

The bungalow appears to have been spared from the flood due to its position on the river terrace, which is 25 to 30 feet above the flood plain of Otay River. Aerial photographs from the 1926-1927 aerial survey of the area (County of San Diego records) show the farmhouse and farm in an undisturbed state, while the flood plain had been noticeably disturbed. A copy of this aerial photograph is presented on page 62.

Aside from the 1916 flood, no other events appear to have occurred which affected the structure. Given this determination, there is little doubt that the redwood bungalow is authentic and dates to the period of the 1870s. The historical significance of the structure is based not only upon the individuals associated with the house, but also upon the historical district in which it is located. To analyze the historical district, the National Register of Historic Places was consulted. The Register does not include any buildings or sites in the Otay Valley, Otay Mesa or the southern area of Chula Vista and National City. The City of Chula Vista has yet to formally establish and approve an historical listing or significance criteria. An informal list of historical structures prepared by the City of Chula Vista does not include the subject bungalow or any other structures in the Otay Valley. Therefore, there does not appear to be any firm evidence to relate the bungalow to an historical district or to other registered historical sites.

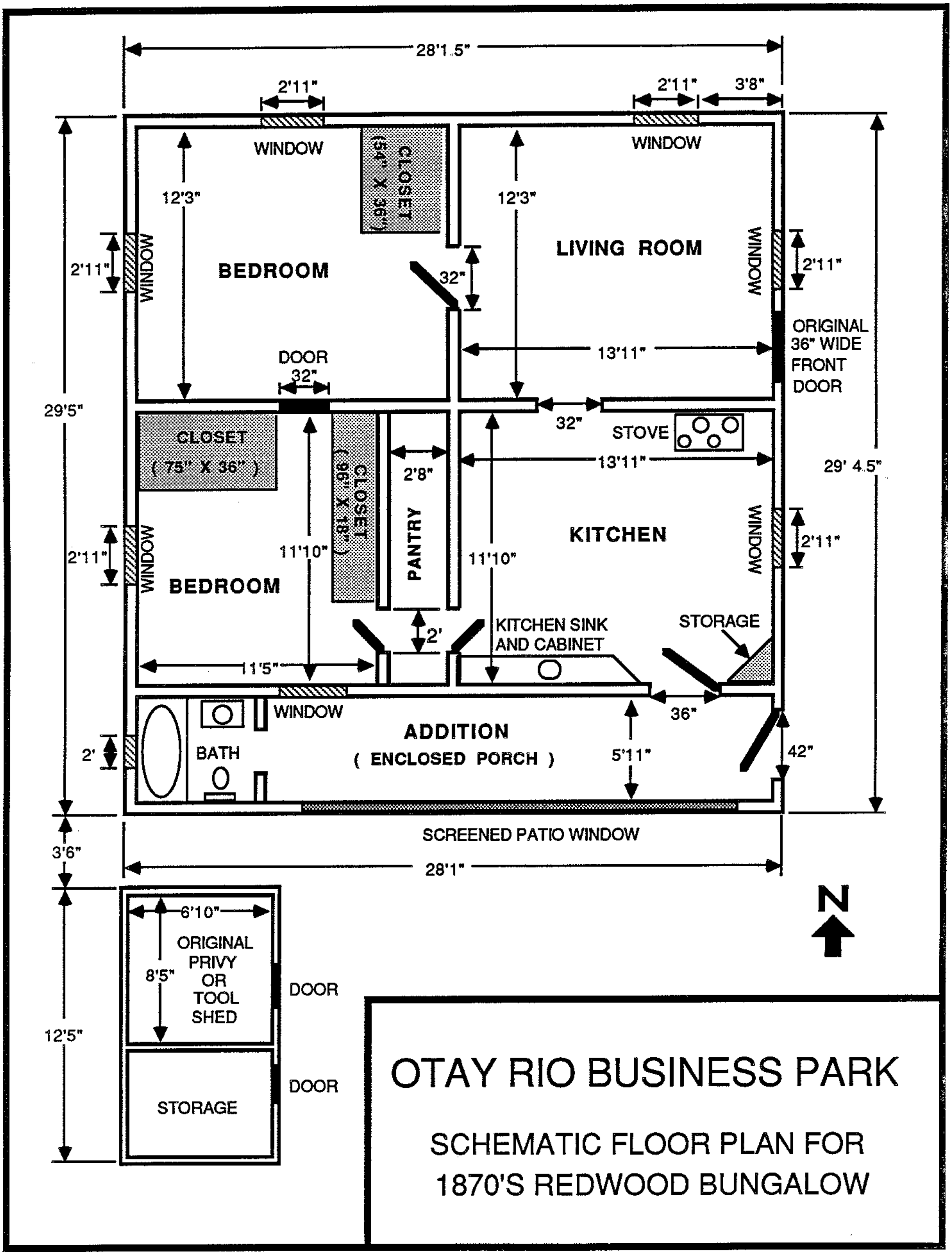
The analysis of the redwood bungalow and various related historical concerns has led to the following findings:

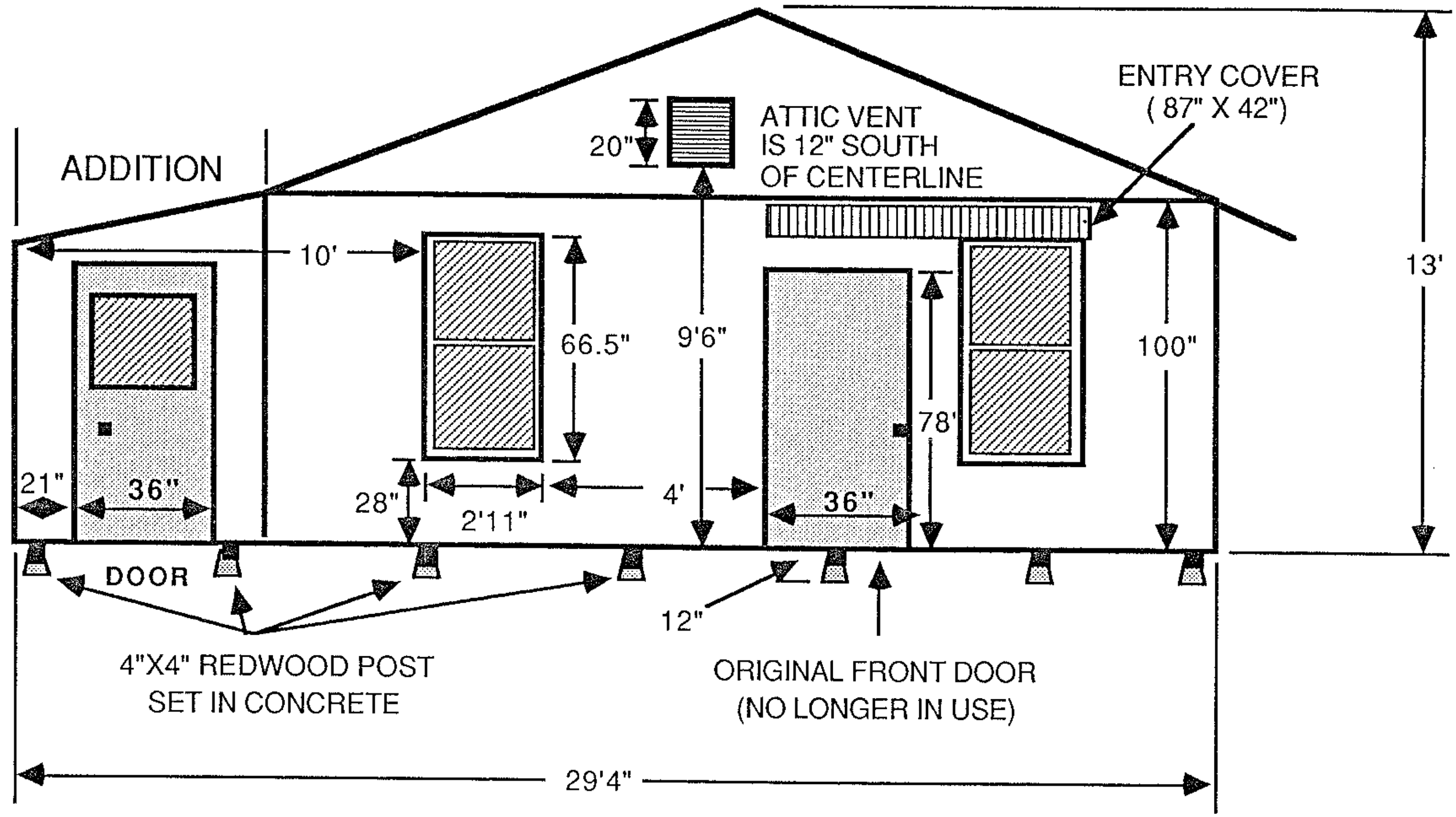
1) The structure is in excess of 100 years old, as denoted by the 1878 Township Plat;
2) The owners of the lot and house between 1871 and 1901 did not include any historically distinguished persons;
3) There are no registered historic sites of similar description in the general area;
4) The structure is an example of a special architectural style common during the late 1800s in Southern California;
5) The structure is in very poor condition;
6) The house meets the antiquity standard for nomination to the National Register, but fails to meet the other criteria for acceptance to the Register, and cannot be nominated on the basis of age alone;
7) A trash dump is present to the west of the structure which may be considered to be a potential source of significant historical data.

### 5.2 FARMHOUSE COMPOUND 2

The second farmhouse is located near the eastern project boundary, as noted on the map on page 17. This structure is a slat board-type of wooden structure that represented the most numerous type of house built in the early 1900s. This type of structure took the place of the redwood bungalow as the primary house of affordability in the region. Historical analysis has confirmed that the structure was built after 1929 (see Point 5 of Section 5.1). Since this house is younger than 60 years old, it is not of serious historical interest. Nevertheless, the house is a fine example of the slat board style. Photographs of the structure appear on page 66.

VIEW OF PROJECT AS IT APPEARS ON THE
1926-1927 AERIAL PHOTOGRAPHIC SURVEY

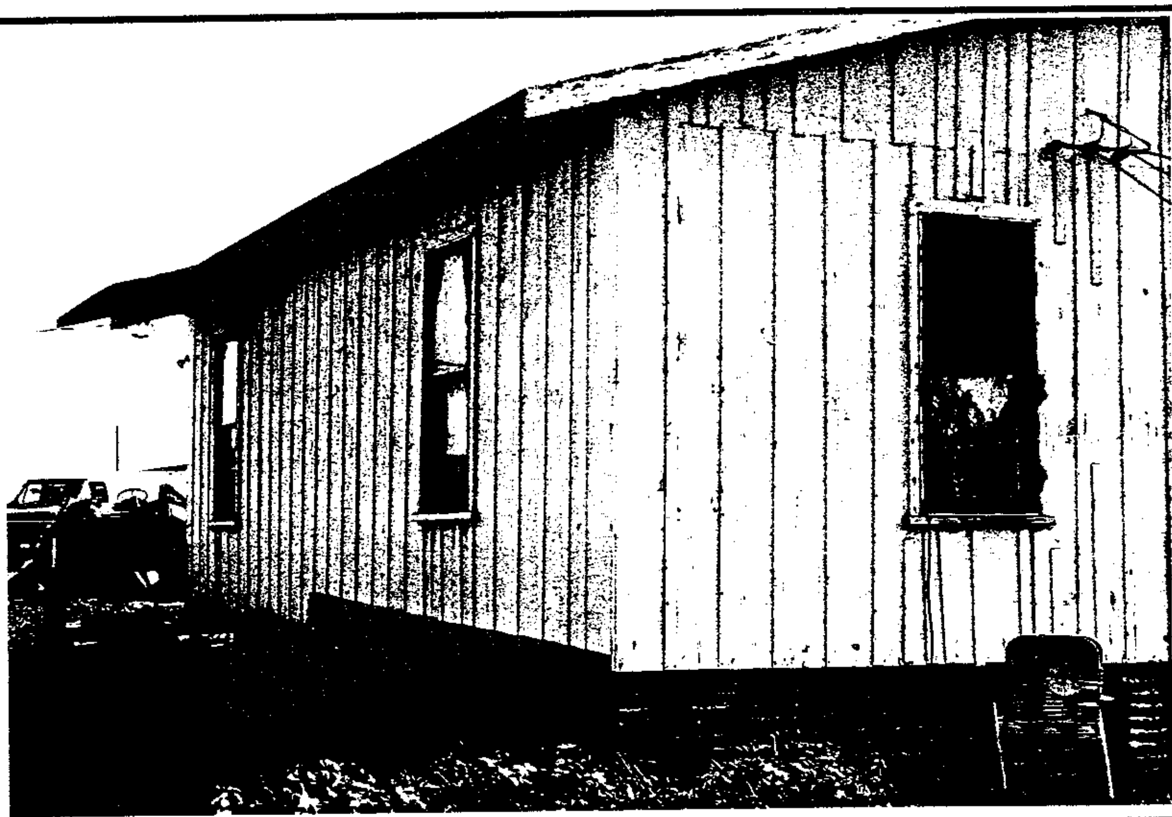

28'1.5"
2'11"
2'11"
3'8"
WINDOW
WINDOW
CLOSET (54" X 36")
12'3"
12'3"
LIVING ROOM
WINDOW
2'11"
2'11"
WINDOW
BEDROOM
32"
ORIGINAL 36" WIDE FRONT DOOR
13'11"
DOOR 32"
29'5"
32"
STOVE
CLOSET ( 75" X 36" )
CLOSET ( 96" X 18" )
2'8"
13'11"
29' 4.5"
KITCHEN
2'11"
WINDOW
PANTRY
11'10"
11'10"
WINDOW
2'11"
BEDROOM
2'
KITCHEN SINK AND CABINET
STORAGE
11'5"
WINDOW
36"
ADDITION
( ENCLOSED PORCH )
BATH
2'
5'11"
42"
SCREENED PATIO WINDOW
3'6"
28'1"
N
6'10"
ORIGINAL PRIVY OR TOOL SHED
8'5"
DOOR
12'5"
DOOR
STORAGE
OTAY RIO BUSINESS PARK
SCHEMATIC FLOOR PLAN FOR 1870'S REDWOOD BUNGALOW



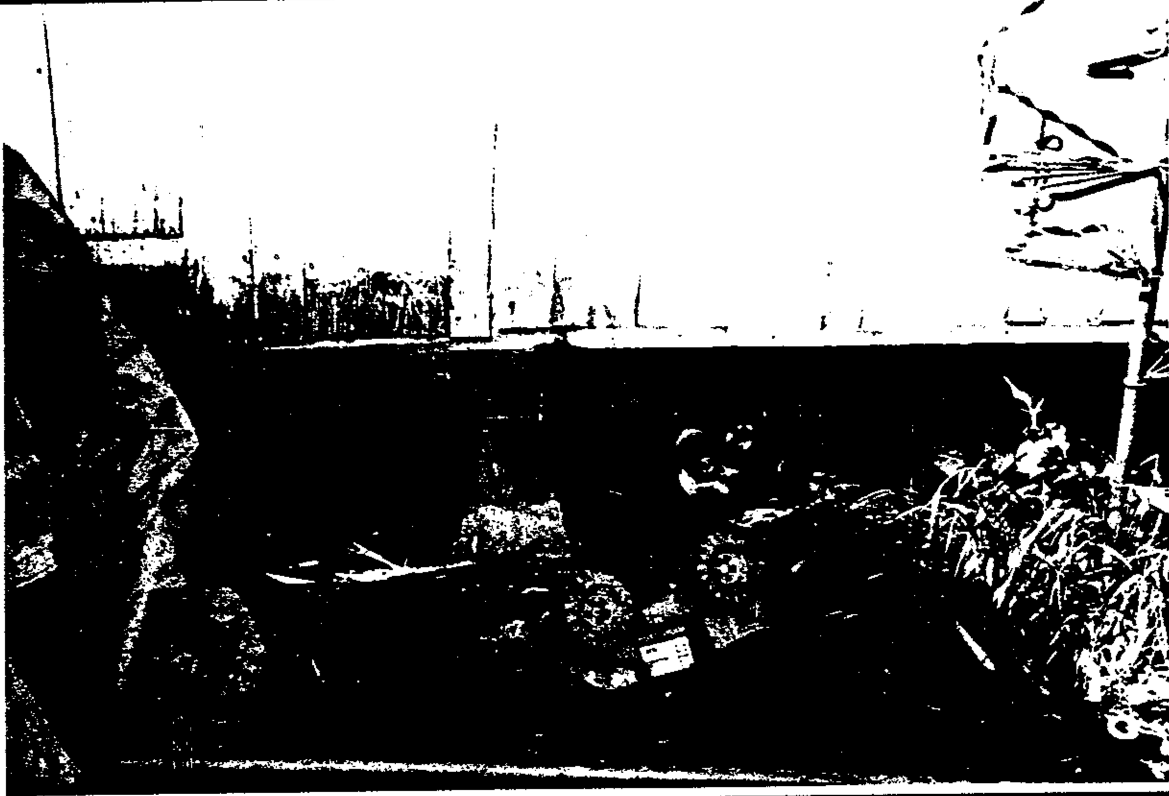

# OTAY RIO BUSINESS PARK

EXTERIOR VIEW OF EAST SIDE OF 1870'S REDWOOD BUNGALOW

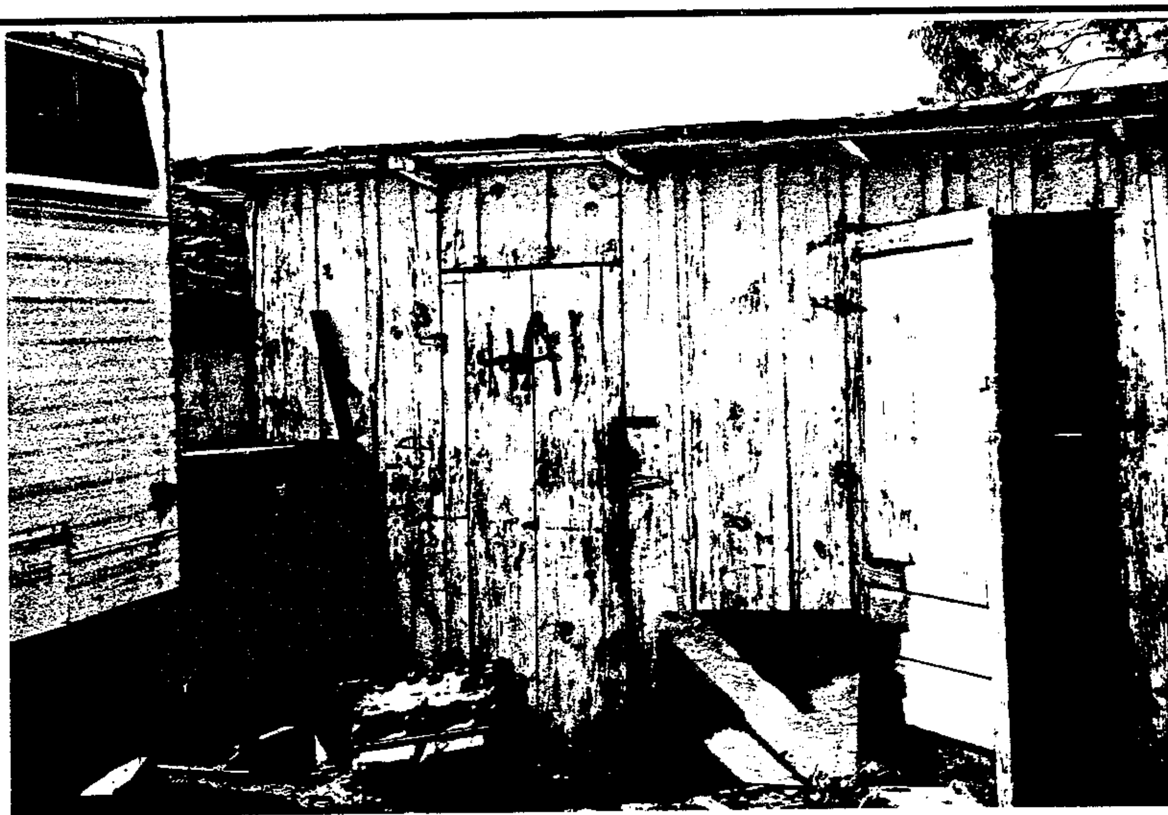
VIEW OF EAST SIDE OF THE PRE - 1900 REDWOOD BUNGALOW
AT LOCUS 1, SITE W-3861.



VIEW OF THE NORTH (LEFT) AND WEST (RIGHT)
SIDES OF THE BUNGALOW.

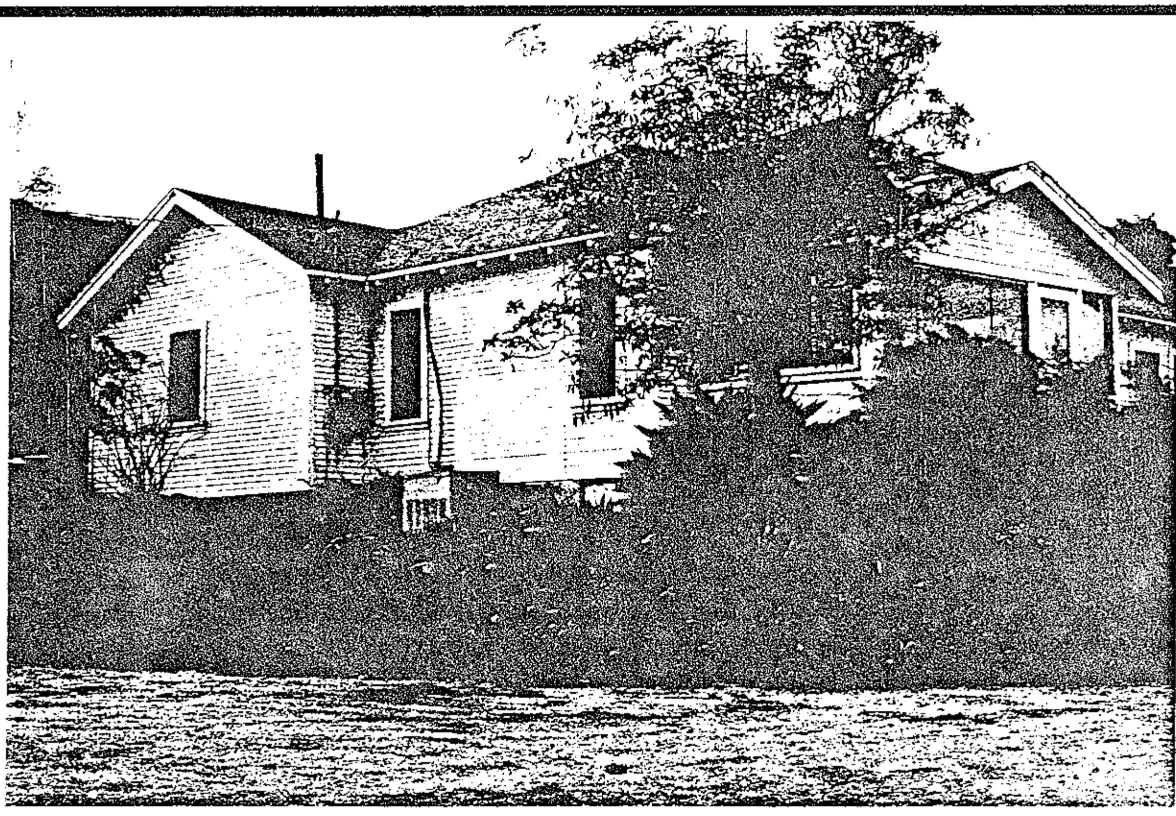


TYPICAL SUPPORT FOR THE FLOOR OF THE BUNGALOW.



TOOL SHED OF THE SAME PERIOD AS THE BUNGALOW, WAS ONCE THE OUTDOOR LATRINE.

VIEW OF POST - 1929 FARMHOUSE AT LOCUS 4, SITE W-3861.
TOP VIEW IS NORTH SIDE OF HOUSE WHILE THE BOTTOM VIEW IS THE EAST SIDE OF THE HOUSE.



## 6.0 ANALYSIS OF RECOVERED ARTIFACTS

The following section will discuss the types and attributes of artifacts discovered at W-3861. The distinction of recovery locations by locus has been omitted from this discussion since all of the artifacts appear to be contemporaneous based upon a comparison of characteristic traits such as lithic material, style of construction, flaking patterns and use-wear. Thus, the collection is being considered as a whole recovery from within the site boundaries of W-3861.

Subsequent sections will discuss the individual types of artifacts recovered from W-3861. For each type of artifact, a table has been provided which lists the individual specimens that were classified under that type, along with recovery locations and lithic materials used. In some cases, subtypes have also been listed, such as side, end, or bilateral scrapers.

The laboratory analysis of the recovered cultural materials was initiated by dividing the artifacts into two groups -- lithic and non-lithic specimens. The lithic artifacts comprised 96.88% of the total artifact recovery. The remainder of the collection (3.12%) consisted of non-lithic items, including 34 shell fragments and one bone fragment. The lithic analysis to follow is based upon a typology for the La Jolla Complex which was developed as part of studies of major coastal La Jolla sites near Del Mar and Carlsbad (Smith and Moriarty 1985; Smith 1987). The artifact classification system utilized to analyze the artifacts is presented in Table 5. This classification system is oriented primarily to the La Jolla Complex and to the cobble/core lithic technology developed by that culture.

## TABLE 5

Artifact Classification -- Lithic Cultural Materials

I. PRODUCTION WASTE
- A. Cores
  - 1. Flake Production Cores
  - 2. Primary Production Cores
  - 3. Tool Production Blank Cores
  - 4. Amorphous Cores
- B. Flakes (Whole and Fragments)
  - 1. Primary Cortex Flakes
  - 2. Secondary Cortex Flakes
  - 3. Interior Flakes
  - 4. Pressure Flakes
- C. Debitage

II. TOOLS
- A. Percussion Tools
  - 1. Hammerstones
    - a. Spherical
    - b. Rectangular
    - c. Triangular
    - d. Circular
  - 2. Pounders
  - 3. Choppers
- B. Precision Tools
  - 1. Unifacially Flaked Precision Tools
    - a. Scrapers (Side, Bilateral, Domed)
    - b. Flake Scrapers
    - c. Cobble Scrapers
    - d. Scraper Planes
    - e. Spokeshaves
    - f. Perforators
    - g. Utilized and Retouched Flakes
  - 2. Bifacially Flaked Precision Tools
    - a. Projectile Points
    - b. Bifaces
    - c. Composite Tools
- C. Ground Stone Tools
  - 1. Manos
  - 2. Muller/Pounders
  - 3. Pestles
  - 4. Abraders
  - 5. Metates
  - 6. Portable Mortars
- D. Other Specialized Artifacts
  - 1. Charmstones
  - 2. Pendants/Beads
  - 3. Doughnut Stones
  - 4. Plummet Stones

TABLE 6

Lithic Distribution and Artifact Recovery Summary

| Tool Category | Artifact Type | Subtype | Material | Quantity |
|---|---|---|---|---|
| Lith. Prod. Waste | Cores | Triangular | Felsite | 1 |
| Lith. Prod. Waste | Cores | | Basalt | 32 |
| Lith. Prod. Waste | Cores | | Felsite | 43 |
| Lith. Prod. Waste | Cores | | Quartz | 1 |
| Lith. Prod. Waste | Cores | | Quartzite | 5 |
| Lith. Prod. Waste | Debitage | | Basalt | 49 |
| Lith. Prod. Waste | Debitage | | Felsite | 36 |
| Lith. Prod. Waste | Debitage | | Quartzite | 8 |
| Lith. Prod. Waste | Flakes | | Basalt | 130 |
| Lith. Prod. Waste | Flakes | | Felsite | 150 |
| Lith. Prod. Waste | Flakes | | Quartzite | 25 |
| Percussion Tools | Choppers | | Basalt | 11 |
| Percussion Tools | Choppers | | Felsite | 8 |
| Percussion Tools | Choppers | | Quartzite | 3 |
| Percussion Tools | Cleavers | | Felsite | 1 |
| Percussion Tools | Hammerstones | Circular | Basalt | 6 |
| Percussion Tools | Hammerstones | Circular | Felsite | 6 |
| Percussion Tools | Hammerstones | Circular | Quartzite | 1 |
| Percussion Tools | Hammerstones | Rectangular | Basalt | 3 |
| Percussion Tools | Hammerstones | Rectangular | Granite | 1 |
| Percussion Tools | Hammerstones | Spherical | Basalt | 5 |
| Percussion Tools | Hammerstones | Spherical | Felsite | 3 |
| Percussion Tools | Hammerstones | Spherical | Quartzite | 1 |
| Percussion Tools | Hammerstones | Triangular | Basalt | 6 |
| Percussion Tools | Hammerstones | Triangular | Felsite | 4 |
| Percussion Tools | Hammerstones | Triangular | Quartzite | 3 |
| Percussion Tools | Hammerstones | | Basalt | 2 |
| Precision Tools | Gravers | | Felsite | 1 |
| Precision Tools | Knives | Biface | Basalt | 2 |
| Precision Tools | Knives | Biface | Felsite | 4 |
| Precision Tools | Knives | Uniface | Basalt | 3 |
| Precision Tools | Knives | Uniface | Felsite | 8 |

| Tool Category | Artifact Type | Subtype | Material | Quantity |
|---|---|---|---|---|
| Precision Tools | Perforators | Rectangular | Felsite | 1 |
| Precision Tools | Perforators | Triangular | Felsite | 1 |
| Precision Tools | Perforators | | Basalt | 5 |
| Precision Tools | Perforators | | Felsite | 11 |
| Precision Tools | Scrapers | Beaked | Felsite | 2 |
| Precision Tools | Scrapers | Bilateral | Basalt | 9 |
| Precision Tools | Scrapers | Bilateral | Felsite | 17 |
| Precision Tools | Scrapers | Bilateral | Quartzite | 3 |
| Precision Tools | Scrapers | Bilateral | Felsite | 1 |
| Precision Tools | Scrapers | Bilateral | Quartzite | 1 |
| Precision Tools | Scrapers | Cobble | Basalt | 2 |
| Precision Tools | Scrapers | Discoidal | Felsite | 1 |
| Precision Tools | Scrapers | Domed | Basalt | 5 |
| Precision Tools | Scrapers | Domed | Felsite | 10 |
| Precision Tools | Scrapers | Domed | Quartzite | 1 |
| Precision Tools | Scrapers | Domed | Felsite | 1 |
| Precision Tools | Scrapers | End | Basalt | 18 |
| Precision Tools | Scrapers | End | Felsite | 27 |
| Precision Tools | Scrapers | End | Quartzite | 2 |
| Precision Tools | Scrapers | Flake | Basalt | 18 |
| Precision Tools | Scrapers | Flake | Felsite | 38 |
| Precision Tools | Scrapers | Flake | Quartzite | 7 |
| Precision Tools | Scrapers | Plane | Basalt | 13 |
| Precision Tools | Scrapers | Plane | Felsite | 8 |
| Precision Tools | Scrapers | Plane | Quartzite | 1 |
| Precision Tools | Scrapers | Rectangular | Basalt | 1 |
| Precision Tools | Scrapers | Side | Basalt | 21 |
| Precision Tools | Scrapers | Side | Felsite | 27 |
| Precision Tools | Scrapers | Side | Quartzite | 4 |
| Precision Tools | Scrapers | Thumbnail | Felsite | 1 |
| Precision Tools | Spokeshaves | | Basalt | 10 |
| Precision Tools | Spokeshaves | | Felsite | 7 |
| Precision Tools | Spokeshaves | | Quartzite | 1 |
| Precision Tools | Utilized Flakes | Spokeshave | Felsite | 1 |
| Precision Tools | Utilized Flakes | | Basalt | 63 |
| Precision Tools | Utilized Flakes | | Felsite | 116 |
| Precision Tools | Utilized Flakes | | Quartzite | 16 |
| Ground Stone Tools | Manos | Biface | Basalt | 6 |
| Ground Stone Tools | Manos | Biface | Granite | 21 |
| Ground Stone Tools | Manos | Biface | Quartz | 1 |
| Ground Stone Tools | Manos | Biface | Quartzite | 7 |
| Ground Stone Tools | Manos | Uniface | Basalt | 4 |
| Ground Stone Tools | Manos | Uniface | Granite | 7 |

| Tool Category | Artifact Type | Subtype | Material | Quantity |
|---|---|---|---|---|
| Ground Stone Tools | Manos | | Granite | 2 |
| Ground Stone Tools | Metates | | Basalt | 1 |
| Ground Stone Tools | Metates | | Granite | 2 |
| Ground Stone Tools | Mullers | | Granite | 1 |
| Ground Stone Tools | Mullers | | Granodiorite | 1 |
| Ground Stone Tools | Pestles | | Basalt | 1 |
| Shell | | | Chione | 20 |
| Shell | | | Haliotis | 1 |
| Shell | | | Mytilus | 3 |
| Shell | | | Pecten | 1 |
| Shell | | | Pismo | 7 |
| Shell | | | Tagelus | 1 |
| Shell | | | Whelk | 1 |
| VBone | | | | 1 |
| Total Artifacts Recovered | | | | 1122 |

## 6.1 PRODUCTION WASTE

### 6.1.1 Cores

The manufacture of stone tools required the reduction of a chosen lithic material into a specific form. The source of the lithic material (cores) and the waste left from the manufacturing process (flakes and debitage) represent the category of stone artifacts known as lithic production waste. At W-3861, 480 specimens of lithic production waste were recovered. These included 82 cores, 93 debitage, and 305 flakes. The individual specimens, recovery locations, and lithic materials for cores are listed in Table 7, for debitage in Table 8, and for flakes in Table 9.

The cores from W-3861 generally are classified as expended cores. These are cores which were struck several times to remove flakes for tool manufacture. The lithic materials represented in this recovery included 44 felsite cores, 32 basalt cores, five quartzite cores, and one quartz core. None of the cores appeared to have been taken from a quarry; rather, nearly all of the cores retained some portion of cobble cortex that indicated that the cores had originated as cobbles from the immediate area.

### 6.1.2 Debitage

As cores were hammered to detect lithic forms for artifact manufacture, often angular waste, or debitage, resulted from the hammering process. Once removed from the original stone, debitage was not used, but was discarded as waste. The collection from W-3861 included 93 specimens of debitage. Most of these items were small (less than two inches in any dimension) and of poor quality lithic material. The lithic distribution of the recovered debitage include 49 basalt items, 36 felsite items, and eight quartzite specimens.

### 6.1.3 Flakes

The final category of lithic production waste consists of flakes. The majority of the recovered flakes exhibited characteristics that reflect tool manufacture or maintenance. A striking platform and bulb of percussion were observed on nearly all of the flakes. The flakes did demonstrate a wide range in size, from less than a centimeter ro more than five centimeters in length. A total of 305 flakes were recovered from W-3861: 279 from the surface and 26 from the subsurface excavations. The flake collection represents 27.18% of the artifact collection from the subject site.

The lithic distribution within the category of flakes was nearly equal for felsite (150 specimens) and basalt (130 specimens), with a small number of quartzite flakes (25 specimens) also included. A comparison of the lithic distributions for flakes, cores, and debitage within the lithic production waste category (below) reveals that felsite dominated the recoveries of cores and flakes, but basalt dominated the recoveries of debitage.

| | Felsite | Basalt |
|---|---|---|
| Cores | 53.7% | 39.0% |
| Flakes | 49.2% | 42.6% |
| Debitage | 38.7% | 52.7% |

When the totals for the categories are averaged, the differential between felsite and basalt is quite small (2.4%). However, in the various tool categories, such as scrapers, felsite accounted for nearly 20% more of the tools than did basalt.

### 6.2 PERCUSSION TOOLS

Percussion tools are a class of artifacts which are characterized as heavy, large implements which required very little modificaton to make useful. Percussion tools were used for forceful striking and percussive flaking. The principal types of percussion tools include hammerstones, choppers, and cleavers. The percussion tool class accounted for 64 specimens, or 5.7% of the artifact collection from W-3861.

TABLE 7 - Cores Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 2 | W-3861 | Lith. Prod. Waste | E74/S21 | Cores | | Basalt | 1 | |
| 12 | W-3861 | Lith. Prod. Waste | E74/S34 | Cores | | Basalt | 1 | |
| 31 | W-3861 | Lith. Prod. Waste | E75/S20 | Cores | | Basalt | 1 | |
| 50 | W-3861 | Lith. Prod. Waste | E75/S45 | Cores | | Basalt | 1 | |
| 86 | W-3861 | Lith. Prod. Waste | E76/S46 | Cores | | Basalt | 1 | |
| 103 | W-3861 | Lith. Prod. Waste | E77/S38 | Cores | | Basalt | 1 | |
| 156 | W-3861 | Lith. Prod. Waste | E80/S20 | Cores | | Basalt | 1 | |
| 180 | W-3861 | Lith. Prod. Waste | E81/S20 | Cores | | Basalt | 1 | |
| 193 | W-3861 | Lith. Prod. Waste | E81/S40 | Cores | | Basalt | 1 | |
| 268 | W-3861 | Lith. Prod. Waste | E86/S27 | Cores | | Basalt | 1 | |
| 312 | W-3861 | Lith. Prod. Waste | E87/S38 | Cores | | Basalt | 1 | |
| 365 | W-3861 | Lith. Prod. Waste | E232/S133 | Cores | | Basalt | 1 | |
| 401 | W-3861 | Lith. Prod. Waste | E233/S133 | Cores | | Basalt | 1 | |
| 418 | W-3861 | Lith. Prod. Waste | E238/S137 | Cores | | Basalt | 1 | |
| 487 | W-3861 | Lith. Prod. Waste | E238/S125 | Cores | | Basalt | 1 | |
| 490 | W-3861 | Lith. Prod. Waste | E238/S127 | Cores | | Basalt | 1 | |
| 516 | W-3861 | Lith. Prod. Waste | E236/S132 | Cores | | Basalt | 1 | |
| 546 | W-3861 | Lith. Prod. Waste | E228/S133 | Cores | | Basalt | 1 | |
| 551 | W-3861 | Lith. Prod. Waste | E228/S137 | Cores | | Basalt | 1 | |
| 568 | W-3861 | Lith. Prod. Waste | E145/S177 | Cores | | Basalt | 1 | |
| 696 | W-3861 | Lith. Prod. Waste | E225/S134 | Cores | | Basalt | 1 | |
| 705 | W-3861 | Lith. Prod. Waste | E35/S56 | Cores | | Basalt | 1 | |
| 738 | W-3861 | Lith. Prod. Waste | E62/S28 | Cores | | Basalt | 1 | |
| 836 | W-3861 | Lith. Prod. Waste | E136/S147 | Cores | | Basalt | 1 | |
| 865 | W-3861 | Lith. Prod. Waste | E235/S137 | Cores | | Basalt | 1 | |
| 873 | W-3861 | Lith. Prod. Waste | E246/S134 | Cores | | Basalt | 1 | |
| 917 | W-3861 | Lith. Prod. Waste | E227/S133 | Cores | | Basalt | 1 | |
| 918 | W-3861 | Lith. Prod. Waste | E227/S130 | Cores | | Basalt | 1 | |
| 984 | W-3861 | Lith. Prod. Waste | E141/S178 | Cores | | Basalt | 1 | |
| 985 | W-3861 | Lith. Prod. Waste | E141/S179 | Cores | | Basalt | 1 | |
| 1019 | W-3861 | Lith. Prod. Waste | E149/S187 | Cores | | Basalt | 1 | |
| 1066 | W-3861 | Lith. Prod. Waste | E150/S183 | Cores | | Basalt | 1 | |

TABLE 7 - Cores Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 32 | |
| 138 | W-3861 | Lith. Prod. Waste | E79/S27 | Cores | Triangular | Felsite | 1 | |
| 7 | W-3861 | Lith. Prod. Waste | E74/S27 | Cores | | Felsite | 1 | |
| 29 | W-3861 | Lith. Prod. Waste | E75/S19 | Cores | | Felsite | 1 | |
| 40 | W-3861 | Lith. Prod. Waste | E75/S28 | Cores | | Felsite | 1 | |
| 56 | W-3861 | Lith. Prod. Waste | E76/S21 | Cores | | Felsite | 1 | |
| 57 | W-3861 | Lith. Prod. Waste | E76/S21 | Cores | | Felsite | 1 | |
| 75 | W-3861 | Lith. Prod. Waste | E76/S33 | Cores | | Felsite | 1 | |
| 99 | W-3861 | Lith. Prod. Waste | E77/S33 | Cores | | Felsite | 1 | |
| 109 | W-3861 | Lith. Prod. Waste | E77/S45 | Cores | | Felsite | 1 | |
| 115 | W-3861 | Lith. Prod. Waste | E77/S55 | Cores | | Felsite | 1 | |
| 134 | W-3861 | Lith. Prod. Waste | E78/S48 | Cores | | Felsite | 1 | |
| 135 | W-3861 | Lith. Prod. Waste | E78/S48 | Cores | | Felsite | 1 | |
| 155 | W-3861 | Lith. Prod. Waste | E80/S19 | Cores | | Felsite | 1 | |
| 166 | W-3861 | Lith. Prod. Waste | E80/S35 | Cores | | Felsite | 1 | |
| 231 | W-3861 | Lith. Prod. Waste | E83/S39 | Cores | | Felsite | 1 | |
| 235 | W-3861 | Lith. Prod. Waste | E84/S27 | Cores | | Felsite | 1 | |
| 269 | W-3861 | Lith. Prod. Waste | E86/S27 | Cores | | Felsite | 1 | |
| 303 | W-3861 | Lith. Prod. Waste | E87/S28 | Cores | | Felsite | 1 | |
| 375 | W-3861 | Lith. Prod. Waste | E235/S138 | Cores | | Felsite | 1 | |
| 414 | W-3861 | Lith. Prod. Waste | E238/S131 | Cores | | Felsite | 1 | |
| 482 | W-3861 | Lith. Prod. Waste | E92/S60 | Cores | | Felsite | 1 | |
| 500 | W-3861 | Lith. Prod. Waste | E237/S131 | Cores | | Felsite | 1 | |
| 503 | W-3861 | Lith. Prod. Waste | E237/S136 | Cores | | Felsite | 1 | |
| 518 | W-3861 | Lith. Prod. Waste | E236/S136 | Cores | | Felsite | 1 | |
| 520 | W-3861 | Lith. Prod. Waste | E236/S134 | Cores | | Felsite | 1 | |
| 526 | W-3861 | Lith. Prod. Waste | E235/S127 | Cores | | Felsite | 1 | |
| 532 | W-3861 | Lith. Prod. Waste | E235/S135 | Cores | | Felsite | 1 | |
| 550 | W-3861 | Lith. Prod. Waste | E228/S137 | Cores | | Felsite | 1 | |
| 565 | W-3861 | Lith. Prod. Waste | E145/S168 | Cores | | Felsite | 1 | |
| 566 | W-3861 | Lith. Prod. Waste | E145/S168 | Cores | | Felsite | 1 | |

TABLE 7 - Cores Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 583 | W-3861 | Lith. Prod. Waste | E150/S22 | Cores | | Felsite | 1 | |
| 663 | W-3861 | Lith. Prod. Waste | E178/S39 | Cores | | Felsite | 1 | |
| 761 | W-3861 | Lith. Prod. Waste | E69/S20 | Cores | | Felsite | 1 | |
| 767 | W-3861 | Lith. Prod. Waste | E69/S24 | Cores | | Felsite | 1 | ** |
| 773 | W-3861 | Lith. Prod. Waste | E69/S29 | Cores | | Felsite | 1 | |
| 775 | W-3861 | Lith. Prod. Waste | E69/S32 | Cores | | Felsite | 1 | |
| 859 | W-3861 | Lith. Prod. Waste | E230/S129 | Cores | | Felsite | 1 | |
| 930 | W-3861 | Lith. Prod. Waste | E239/S136 | Cores | | Felsite | 1 | |
| 1018 | W-3861 | Lith. Prod. Waste | E149/S186 | Cores | | Felsite | 1 | |
| 1022 | W-3861 | Lith. Prod. Waste | E149/S187 | Cores | | Felsite | 1 | |
| 1026 | W-3861 | Lith. Prod. Waste | E149/S194 | Cores | | Felsite | 1 | |
| 1069 | W-3861 | Lith. Prod. Waste | E150/S184 | Cores | | Felsite | 1 | |
| 1073 | W-3861 | Lith. Prod. Waste | E147/S187 | Cores | | Felsite | 1 | |
| 1086 | W-3861 | Lith. Prod. Waste | E152/S179 | Cores | | Felsite | 1 | |
| | | | | | | | 44 | |
| 319 | W-3861 | Lith. Prod. Waste | E88/S21 | Cores | | Quartz | 1 | |
| | | | | | | | 1 | |
| 73 | W-3861 | Lith. Prod. Waste | E76/S32 | Cores | | Quartzite | 1 | |
| 745 | W-3861 | Lith. Prod. Waste | E66/S26 | Cores | | Quartzite | 1 | |
| 855 | W-3861 | Lith. Prod. Waste | E225/S138 | Cores | | Quartzite | 1 | |
| 1027 | W-3861 | Lith. Prod. Waste | E149/S195 | Cores | | Quartzite | 1 | |
| 1075 | W-3861 | Lith. Prod. Waste | E147/S191 | Cores | | Quartzite | 1 | |
| | | | | | | | 5 | |
| | | | | | | | 82 | |

TABLE 8 - Debitage Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 58 | W-3861 | Lith. Prod. Waste | E76/S21 | Debitage | | Basalt | 1 | |
| 66 | W-3861 | Lith. Prod. Waste | E76/S25 | Debitage | | Basalt | 1 | |
| 150 | W-3861 | Lith. Prod. Waste | E79/S48 | Debitage | | Basalt | 1 | |
| 165 | W-3861 | Lith. Prod. Waste | E80/S35 | Debitage | | Basalt | 1 | |
| 199 | W-3861 | Lith. Prod. Waste | E82/S19 | Debitage | | Basalt | 1 | |
| 275 | W-3861 | Lith. Prod. Waste | E86/S36 | Debitage | | Basalt | 1 | |
| 277 | W-3861 | Lith. Prod. Waste | E86/S37 | Debitage | | Basalt | 1 | |
| 284 | W-3861 | Lith. Prod. Waste | E86/S43 | Debitage | | Basalt | 1 | |
| 327 | W-3861 | Lith. Prod. Waste | E88/S32 | Debitage | | Basalt | 1 | |
| 338 | W-3861 | Lith. Prod. Waste | E88/S38 | Debitage | | Basalt | 1 | |
| 361 | W-3861 | Lith. Prod. Waste | E232/S136 | Debitage | | Basalt | 1 | |
| 368 | W-3861 | Lith. Prod. Waste | E232/S131 | Debitage | | Basalt | 1 | |
| 439 | W-3861 | Lith. Prod. Waste | E73/S23 | Debitage | | Basalt | 1 | |
| 442 | W-3861 | Lith. Prod. Waste | E73/S28 | Debitage | | Basalt | 1 | |
| 471 | W-3861 | Lith. Prod. Waste | E71/S32 | Debitage | | Basalt | 1 | |
| 499 | W-3861 | Lith. Prod. Waste | E237/S130 | Debitage | | Basalt | 1 | |
| 519 | W-3861 | Lith. Prod. Waste | E236/S136 | Debitage | | Basalt | 1 | |
| 544 | W-3861 | Lith. Prod. Waste | E228/S130 | Debitage | | Basalt | 1 | |
| 574 | W-3861 | Lith. Prod. Waste | E148/S21 | Debitage | | Basalt | 1 | |
| 582 | W-3861 | Lith. Prod. Waste | E150/S20 | Debitage | | Basalt | 1 | |
| 668 | W-3861 | Lith. Prod. Waste | TU1/0-10 | Debitage | | Basalt | 1 | |
| 691 | W-3861 | Lith. Prod. Waste | E225/S129 | Debitage | | Basalt | 1 | |
| 697 | W-3861 | Lith. Prod. Waste | E225/S135 | Debitage | | Basalt | 1 | |
| 716 | W-3861 | Lith. Prod. Waste | E70/S27 | Debitage | | Basalt | 1 | |
| 741 | W-3861 | Lith. Prod. Waste | E64/S30 | Debitage | | Basalt | 1 | |
| 756 | W-3861 | Lith. Prod. Waste | E68/S38 | Debitage | | Basalt | 1 | |
| 784 | W-3861 | Lith. Prod. Waste | E72/S34 | Debitage | | Basalt | 1 | |
| 789 | W-3861 | Lith. Prod. Waste | E72/S45 | Debitage | | Basalt | 1 | |
| 797 | W-3861 | Lith. Prod. Waste | E53/S46 | Debitage | | Basalt | 1 | |
| 807 | W-3861 | Lith. Prod. Waste | E130/S29 | Debitage | | Basalt | 1 | |
| 810 | W-3861 | Lith. Prod. Waste | E132/S73 | Debitage | | Basalt | 1 | |
| 827 | W-3861 | Lith. Prod. Waste | E134/S59 | Debitage | | Basalt | 1 | |

TABLE 8 - Debitage Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 845 | W-3861 | Lith. Prod. Waste | E144/S72 | Debitage | | Basalt | 1 | |
| 867 | W-3861 | Lith. Prod. Waste | E246/S125 | Debitage | | Basalt | 1 | |
| 870 | W-3861 | Lith. Prod. Waste | E246/S132 | Debitage | | Basalt | 1 | |
| 871 | W-3861 | Lith. Prod. Waste | E246/S132 | Debitage | | Basalt | 1 | |
| 978 | W-3861 | Lith. Prod. Waste | E141/S169 | Debitage | | Basalt | 1 | |
| 980 | W-3861 | Lith. Prod. Waste | E141/S173 | Debitage | | Basalt | 1 | |
| 982 | W-3861 | Lith. Prod. Waste | E141/S177 | Debitage | | Basalt | 1 | |
| 983 | W-3861 | Lith. Prod. Waste | E141/S177 | Debitage | | Basalt | 1 | |
| 995 | W-3861 | Lith. Prod. Waste | E142/S154 | Debitage | | Basalt | 1 | |
| 1004 | W-3861 | Lith. Prod. Waste | E143/S57 | Debitage | | Basalt | 1 | |
| 1008 | W-3861 | Lith. Prod. Waste | E147/S179 | Debitage | | Basalt | 1 | |
| 1049 | W-3861 | Lith. Prod. Waste | E142/S92 | Debitage | | Basalt | 1 | |
| 1071 | W-3861 | Lith. Prod. Waste | E147/S186 | Debitage | | Basalt | 1 | |
| 1078 | W-3861 | Lith. Prod. Waste | E148/S186 | Debitage | | Basalt | 1 | |
| 1080 | W-3861 | Lith. Prod. Waste | E148/S187 | Debitage | | Basalt | 1 | |
| 1090 | W-3861 | Lith. Prod. Waste | E157/S65 | Debitage | | Basalt | 1 | |
| 1125 | W-3861 | Lith. Prod. Waste | E157/S44 | Debitage | | Basalt | 1 | |
| | | | | | | | 49 | |
| 1 | W-3861 | Lith. Prod. Waste | E74/S19 | Debitage | | Felsite | 1 | |
| 14 | W-3861 | Lith. Prod. Waste | E74/S37 | Debitage | | Felsite | 1 | |
| 62 | W-3861 | Lith. Prod. Waste | E76/S23 | Debitage | | Felsite | 1 | |
| 118 | W-3861 | Lith. Prod. Waste | E78/S20 | Debitage | | Felsite | 1 | |
| 224 | W-3861 | Lith. Prod. Waste | E83/S34 | Debitage | | Felsite | 1 | |
| 225 | W-3861 | Lith. Prod. Waste | E83/S36 | Debitage | | Felsite | 1 | |
| 259 | W-3861 | Lith. Prod. Waste | E85/S39 | Debitage | | Felsite | 1 | |
| 289 | W-3861 | Lith. Prod. Waste | E86/S46 | Debitage | | Felsite | 1 | |
| 290 | W-3861 | Lith. Prod. Waste | E86/S46 | Debitage | | Felsite | 1 | |
| 292 | W-3861 | Lith. Prod. Waste | E86/S47 | Debitage | | Felsite | 1 | |
| 314 | W-3861 | Lith. Prod. Waste | E87/S39 | Debitage | | Felsite | 1 | |
| 357 | W-3861 | Lith. Prod. Waste | E232/S137 | Debitage | | Felsite | 1 | |
| 376 | W-3861 | Lith. Prod. Waste | E147/S85 | Debitage | | Felsite | 1 | |

## TABLE 8 - Debitage Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 498 | W-3861 | Lith. Prod. Waste | E237/S130 | Debitage | | Felsite | 1 | |
| 517 | W-3861 | Lith. Prod. Waste | E236/S133 | Debitage | | Felsite | 1 | |
| 543 | W-3861 | Lith. Prod. Waste | E228/S129 | Debitage | | Felsite | 1 | |
| 553 | W-3861 | Lith. Prod. Waste | E139/S158 | Debitage | | Felsite | 1 | |
| 572 | W-3861 | Lith. Prod. Waste | E146/S49 | Debitage | | Felsite | 1 | |
| 693 | W-3861 | Lith. Prod. Waste | E225/S129 | Debitage | | Felsite | 1 | |
| 704 | W-3861 | Lith. Prod. Waste | E35/S56 | Debitage | | Felsite | 1 | |
| 721 | W-3861 | Lith. Prod. Waste | E70/S32 | Debitage | | Felsite | 1 | |
| 788 | W-3861 | Lith. Prod. Waste | E72/S45 | Debitage | | Felsite | 1 | |
| 842 | W-3861 | Lith. Prod. Waste | E138/S80 | Debitage | | Felsite | 1 | |
| 874 | W-3861 | Lith. Prod. Waste | E246/S134 | Debitage | | Felsite | 1 | |
| 875 | W-3861 | Lith. Prod. Waste | E246/S134 | Debitage | | Felsite | 1 | |
| 878 | W-3861 | Lith. Prod. Waste | E246/S135 | Debitage | | Felsite | 1 | |
| 900 | W-3861 | Lith. Prod. Waste | E226/S130 | Debitage | | Felsite | 1 | |
| 926 | W-3861 | Lith. Prod. Waste | E239/S126 | Debitage | | Felsite | 1 | |
| 927 | W-3861 | Lith. Prod. Waste | E239/S134 | Debitage | | Felsite | 1 | |
| 951 | W-3861 | Lith. Prod. Waste | E242/S137 | Debitage | | Felsite | 1 | |
| 1005 | W-3861 | Lith. Prod. Waste | E146/S194 | Debitage | | Felsite | 1 | |
| 1032 | W-3861 | Lith. Prod. Waste | E143/S179 | Debitage | | Felsite | 1 | |
| 1042 | W-3861 | Lith. Prod. Waste | E130/S53 | Debitage | | Felsite | 1 | |
| 1043 | W-3861 | Lith. Prod. Waste | E133/S52 | Debitage | | Felsite | 1 | |
| 1051 | W-3861 | Lith. Prod. Waste | E142/S172 | Debitage | | Felsite | 1 | |
| 1076 | W-3861 | Lith. Prod. Waste | E147/S192 | Debitage | | Felsite | 1 | |
| | | | | | | | 36 | |
| 77 | W-3861 | Lith. Prod. Waste | E76/S33 | Debitage | | Quartzite | 1 | |
| 153 | W-3861 | Lith. Prod. Waste | E80/S18 | Debitage | | Quartzite | 1 | |
| 226 | W-3861 | Lith. Prod. Waste | E83/S36 | Debitage | | Quartzite | 1 | |
| 313 | W-3861 | Lith. Prod. Waste | E87/S38 | Debitage | | Quartzite | 1 | |
| 585 | W-3861 | Lith. Prod. Waste | E150/S58 | Debitage | | Quartzite | 1 | |
| 804 | W-3861 | Lith. Prod. Waste | E129/S37 | Debitage | | Quartzite | 1 | |
| 805 | W-3861 | Lith. Prod. Waste | E130/S24 | Debitage | | Quartzite | 1 | |

TABLE 8 - Debitage Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 828 | W-3861 | Lith. Prod. Waste | E134/S59 | Debitage | | Quartzite | 1 | |
| | | | | | | | 8 | |
| | | | | | | | 93 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 3 | W-3861 | Lith. Prod. Waste | E74/S22 | Flakes | | Basalt | 1 | |
| 33 | W-3861 | Lith. Prod. Waste | E75/S21 | Flakes | | Basalt | 1 | |
| 69 | W-3861 | Lith. Prod. Waste | E76/S29 | Flakes | | Basalt | 1 | |
| 70 | W-3861 | Lith. Prod. Waste | E76/S30 | Flakes | | Basalt | 1 | |
| 94 | W-3861 | Lith. Prod. Waste | E77/S28 | Flakes | | Basalt | 1 | |
| 95 | W-3861 | Lith. Prod. Waste | E77/S28 | Flakes | | Basalt | 1 | |
| 120 | W-3861 | Lith. Prod. Waste | E78/S23 | Flakes | | Basalt | 1 | |
| 176 | W-3861 | Lith. Prod. Waste | E80/S42 | Flakes | | Basalt | 1 | |
| 188 | W-3861 | Lith. Prod. Waste | E81/S36 | Flakes | | Basalt | 1 | |
| 192 | W-3861 | Lith. Prod. Waste | E81/S39 | Flakes | | Basalt | 1 | |
| 230 | W-3861 | Lith. Prod. Waste | E83/S39 | Flakes | | Basalt | 1 | |
| 232 | W-3861 | Lith. Prod. Waste | E83/S48 | Flakes | | Basalt | 1 | |
| 248 | W-3861 | Lith. Prod. Waste | E85/S22 | Flakes | | Basalt | 1 | |
| 283 | W-3861 | Lith. Prod. Waste | E86/S41 | Flakes | | Basalt | 1 | |
| 286 | W-3861 | Lith. Prod. Waste | E86/S44 | Flakes | | Basalt | 1 | |
| 299 | W-3861 | Lith. Prod. Waste | E87/S21 | Flakes | | Basalt | 1 | |
| 317 | W-3861 | Lith. Prod. Waste | E88/S20 | Flakes | | Basalt | 1 | |
| 320 | W-3861 | Lith. Prod. Waste | E88/S23 | Flakes | | Basalt | 1 | |
| 325 | W-3861 | Lith. Prod. Waste | E88/S28 | Flakes | | Basalt | 1 | |
| 326 | W-3861 | Lith. Prod. Waste | E88/S30 | Flakes | | Basalt | 1 | |
| 362 | W-3861 | Lith. Prod. Waste | E232/S134 | Flakes | | Basalt | 1 | |
| 367 | W-3861 | Lith. Prod. Waste | E232/S131 | Flakes | | Basalt | 1 | |
| 370 | W-3861 | Lith. Prod. Waste | E232/S128 | Flakes | | Basalt | 1 | |
| 374 | W-3861 | Lith. Prod. Waste | E232/S126 | Flakes | | Basalt | 1 | |
| 377 | W-3861 | Lith. Prod. Waste | E147/S85 | Flakes | | Basalt | 1 | |
| 378 | W-3861 | Lith. Prod. Waste | E147/S77 | Flakes | | Basalt | 1 | |
| 398 | W-3861 | Lith. Prod. Waste | E233/S130 | Flakes | | Basalt | 1 | |
| 407 | W-3861 | Lith. Prod. Waste | E233/S138 | Flakes | | Basalt | 1 | |
| 408 | W-3861 | Lith. Prod. Waste | E68/S21 | Flakes | | Basalt | 1 | |
| 416 | W-3861 | Lith. Prod. Waste | E238/S134 | Flakes | | Basalt | 1 | |
| 421 | W-3861 | Lith. Prod. Waste | E131/S23 | Flakes | | Basalt | 1 | |
| 433 | W-3861 | Lith. Prod. Waste | E150/S196 | Flakes | | Basalt | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 438 | W-3861 | Lith. Prod. Waste | E73/S21 | Flakes | | Basalt | 1 | |
| 441 | W-3861 | Lith. Prod. Waste | E73/S26 | Flakes | | Basalt | 1 | |
| 449 | W-3861 | Lith. Prod. Waste | E91/S36 | Flakes | | Basalt | 1 | |
| 450 | W-3861 | Lith. Prod. Waste | E91/S36 | Flakes | | Basalt | 1 | |
| 461 | W-3861 | Lith. Prod. Waste | E99/S50 | Flakes | | Basalt | 1 | |
| 466 | W-3861 | Lith. Prod. Waste | E71/S23 | Flakes | | Basalt | 1 | |
| 469 | W-3861 | Lith. Prod. Waste | E71/S27 | Flakes | | Basalt | 1 | |
| 506 | W-3861 | Lith. Prod. Waste | E237/S138 | Flakes | | Basalt | 1 | |
| 531 | W-3861 | Lith. Prod. Waste | E235/S132 | Flakes | | Basalt | 1 | |
| 545 | W-3861 | Lith. Prod. Waste | E228/S131 | Flakes | | Basalt | 1 | |
| 581 | W-3861 | Lith. Prod. Waste | E150/S20 | Flakes | | Basalt | 1 | |
| 592 | W-3861 | Lith. Prod. Waste | E153/S67 | Flakes | | Basalt | 1 | |
| 593 | W-3861 | Lith. Prod. Waste | E153/S67 | Flakes | | Basalt | 1 | |
| 594 | W-3861 | Lith. Prod. Waste | E153/S75 | Flakes | | Basalt | 1 | |
| 611 | W-3861 | Lith. Prod. Waste | E155/S89 | Flakes | | Basalt | 1 | |
| 613 | W-3861 | Lith. Prod. Waste | E156/S23 | Flakes | | Basalt | 1 | |
| 635 | W-3861 | Lith. Prod. Waste | E160/S87 | Flakes | | Basalt | 1 | |
| 643 | W-3861 | Lith. Prod. Waste | E163/S40 | Flakes | | Basalt | 1 | |
| 664 | W-3861 | Lith. Prod. Waste | E178/S43 | Flakes | | Basalt | 1 | |
| 666 | W-3861 | Lith. Prod. Waste | TU1/0-10 | Flakes | | Basalt | 1 | |
| 669 | W-3861 | Lith. Prod. Waste | TU1/20-30 | Flakes | | Basalt | 4 | |
| 670 | W-3861 | Lith. Prod. Waste | TU1/20-30 | Flakes | | Basalt | 6 | |
| 671 | W-3861 | Lith. Prod. Waste | TU1/10-20 | Flakes | | Basalt | 3 | |
| 672 | W-3861 | Lith. Prod. Waste | TU1/10-20 | Flakes | | Basalt | 8 | |
| 675 | W-3861 | Lith. Prod. Waste | TU4/10-20 | Flakes | | Basalt | 1 | |
| 676 | W-3861 | Lith. Prod. Waste | TU4/20-30 | Flakes | | Basalt | 1 | |
| 690 | W-3861 | Lith. Prod. Waste | E225/S129 | Flakes | | Basalt | 1 | |
| 701 | W-3861 | Lith. Prod. Waste | E31/S53 | Flakes | | Basalt | 1 | |
| 709 | W-3861 | Lith. Prod. Waste | E59/S37 | Flakes | | Basalt | 1 | |
| 725 | W-3861 | Lith. Prod. Waste | E70/S44 | Flakes | | Basalt | 1 | |
| 727 | W-3861 | Lith. Prod. Waste | E70/S45 | Flakes | | Basalt | 1 | |
| 730 | W-3861 | Lith. Prod. Waste | E57/S42 | Flakes | | Basalt | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 732 | W-3861 | Lith. Prod. Waste | E58/S32 | Flakes | | Basalt | 1 | |
| 740 | W-3861 | Lith. Prod. Waste | E64/S30 | Flakes | | Basalt | 1 | |
| 747 | W-3861 | Lith. Prod. Waste | E66/S32 | Flakes | | Basalt | 1 | |
| 748 | W-3861 | Lith. Prod. Waste | E67/S23 | Flakes | | Basalt | 1 | |
| 749 | W-3861 | Lith. Prod. Waste | E67/S23 | Flakes | | Basalt | 1 | |
| 751 | W-3861 | Lith. Prod. Waste | E67/S35 | Flakes | | Basalt | 1 | |
| 769 | W-3861 | Lith. Prod. Waste | E69/S27 | Flakes | | Basalt | 1 | |
| 778 | W-3861 | Lith. Prod. Waste | E72/S19 | Flakes | | Basalt | 1 | |
| 779 | W-3861 | Lith. Prod. Waste | E72/S21 | Flakes | | Basalt | 1 | |
| 799 | W-3861 | Lith. Prod. Waste | E95/S51 | Flakes | | Basalt | 1 | |
| 809 | W-3861 | Lith. Prod. Waste | E131/S78 | Flakes | | Basalt | 1 | |
| 814 | W-3861 | Lith. Prod. Waste | E133/S36 | Flakes | | Basalt | 1 | |
| 819 | W-3861 | Lith. Prod. Waste | E140/S70 | Flakes | | Basalt | 1 | |
| 824 | W-3861 | Lith. Prod. Waste | E129/S84 | Flakes | | Basalt | 1 | |
| 830 | W-3861 | Lith. Prod. Waste | E135/S73 | Flakes | | Basalt | 1 | |
| 846 | W-3861 | Lith. Prod. Waste | E128/S19 | Flakes | | Basalt | 1 | |
| 850 | W-3861 | Lith. Prod. Waste | E128/S31 | Flakes | | Basalt | 1 | |
| 864 | W-3861 | Lith. Prod. Waste | E230/S137 | Flakes | | Basalt | 1 | |
| 912 | W-3861 | Lith. Prod. Waste | E226/S134 | Flakes | | Basalt | 1 | |
| 914 | W-3861 | Lith. Prod. Waste | E226/S136 | Flakes | | Basalt | 1 | |
| 929 | W-3861 | Lith. Prod. Waste | E239/S135 | Flakes | | Basalt | 1 | |
| 937 | W-3861 | Lith. Prod. Waste | E240/S135 | Flakes | | Basalt | 1 | |
| 939 | W-3861 | Lith. Prod. Waste | E241/S127 | Flakes | | Basalt | 1 | |
| 940 | W-3861 | Lith. Prod. Waste | E241/S128 | Flakes | | Basalt | 1 | |
| 945 | W-3861 | Lith. Prod. Waste | E241/S135 | Flakes | | Basalt | 1 | |
| 964 | W-3861 | Lith. Prod. Waste | E140/S159 | Flakes | | Basalt | 1 | |
| 976 | W-3861 | Lith. Prod. Waste | E141/S177 | Flakes | | Basalt | 1 | |
| 979 | W-3861 | Lith. Prod. Waste | E141/S171 | Flakes | | Basalt | 1 | |
| 986 | W-3861 | Lith. Prod. Waste | E141/S182 | Flakes | | Basalt | 1 | |
| 987 | W-3861 | Lith. Prod. Waste | E141/S183 | Flakes | | Basalt | 1 | |
| 1001 | W-3861 | Lith. Prod. Waste | E146/S56 | Flakes | | Basalt | 1 | |
| 1002 | W-3861 | Lith. Prod. Waste | E143/S79 | Flakes | | Basalt | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 1012 | W-3861 | Lith. Prod. Waste | E149/S183 | Flakes | | Basalt | 1 | |
| 1014 | W-3861 | Lith. Prod. Waste | E149/S183 | Flakes | | Basalt | 1 | |
| 1023 | W-3861 | Lith. Prod. Waste | E149/S194 | Flakes | | Basalt | 1 | |
| 1024 | W-3861 | Lith. Prod. Waste | E149/S194 | Flakes | | Basalt | 1 | |
| 1025 | W-3861 | Lith. Prod. Waste | E149/S194 | Flakes | | Basalt | 1 | |
| 1030 | W-3861 | Lith. Prod. Waste | E143/S174 | Flakes | | Basalt | 1 | |
| 1044 | W-3861 | Lith. Prod. Waste | E133/S43 | Flakes | | Basalt | 1 | |
| 1050 | W-3861 | Lith. Prod. Waste | E142/S161 | Flakes | | Basalt | 1 | |
| 1052 | W-3861 | Lith. Prod. Waste | E148/S182 | Flakes | | Basalt | 1 | |
| 1053 | W-3861 | Lith. Prod. Waste | E148/S182 | Flakes | | Basalt | 1 | |
| 1059 | W-3861 | Lith. Prod. Waste | E150/S179 | Flakes | | Basalt | 1 | |
| 1067 | W-3861 | Lith. Prod. Waste | E150/S183 | Flakes | | Basalt | 1 | |
| 1091 | W-3861 | Lith. Prod. Waste | E157/S67 | Flakes | | Basalt | 1 | |
| 1092 | W-3861 | Lith. Prod. Waste | E157/S69 | Flakes | | Basalt | 1 | |
| 1093 | W-3861 | Lith. Prod. Waste | E157/S81 | Flakes | | Basalt | 1 | |
| 1112 | W-3861 | Lith. Prod. Waste | E157/S24 | Flakes | | Basalt | 1 | |
| 1113 | W-3861 | Lith. Prod. Waste | E157/S24 | Flakes | | Basalt | 1 | |
| | | | | | | | 130 | |
| 6 | W-3861 | Lith. Prod. Waste | E74/S26 | Flakes | | Felsite | 1 | |
| 17 | W-3861 | Lith. Prod. Waste | E74/S40 | Flakes | | Felsite | 1 | |
| 25 | W-3861 | Lith. Prod. Waste | E75/S19 | Flakes | | Felsite | 1 | |
| 45 | W-3861 | Lith. Prod. Waste | E75/S37 | Flakes | | Felsite | 1 | |
| 71 | W-3861 | Lith. Prod. Waste | E76/S30 | Flakes | | Felsite | 1 | |
| 74 | W-3861 | Lith. Prod. Waste | E76/S32 | Flakes | | Felsite | 1 | |
| 88 | W-3861 | Lith. Prod. Waste | E77/S24 | Flakes | | Felsite | 1 | |
| 93 | W-3861 | Lith. Prod. Waste | E77/S28 | Flakes | | Felsite | 1 | |
| 98 | W-3861 | Lith. Prod. Waste | E77/S31 | Flakes | | Felsite | 1 | |
| 101 | W-3861 | Lith. Prod. Waste | E77/S37 | Flakes | | Felsite | 1 | |
| 106 | W-3861 | Lith. Prod. Waste | E77/S42 | Flakes | | Felsite | 1 | |
| 107 | W-3861 | Lith. Prod. Waste | E77/S42 | Flakes | | Felsite | 1 | |
| 112 | W-3861 | Lith. Prod. Waste | E77/S52 | Flakes | | Felsite | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 122 | W-3861 | Lith. Prod. Waste | E78/S24 | Flakes | | Felsite | 1 | |
| 125 | W-3861 | Lith. Prod. Waste | E78/S27 | Flakes | | Felsite | 1 | |
| 128 | W-3861 | Lith. Prod. Waste | E78/S31 | Flakes | | Felsite | 1 | |
| 136 | W-3861 | Lith. Prod. Waste | E79/S19 | Flakes | | Felsite | 1 | |
| 137 | W-3861 | Lith. Prod. Waste | E79/S20 | Flakes | | Felsite | 1 | |
| 140 | W-3861 | Lith. Prod. Waste | E79/S30 | Flakes | | Felsite | 1 | |
| 141 | W-3861 | Lith. Prod. Waste | E79/S30 | Flakes | | Felsite | 1 | |
| 142 | W-3861 | Lith. Prod. Waste | E79/S33 | Flakes | | Felsite | 1 | |
| 146 | W-3861 | Lith. Prod. Waste | E79/S40 | Flakes | | Felsite | 1 | |
| 159 | W-3861 | Lith. Prod. Waste | E80/S24 | Flakes | | Felsite | 1 | |
| 169 | W-3861 | Lith. Prod. Waste | E80/S36 | Flakes | | Felsite | 1 | |
| 170 | W-3861 | Lith. Prod. Waste | E80/S39 | Flakes | | Felsite | 1 | |
| 187 | W-3861 | Lith. Prod. Waste | E81/S32 | Flakes | | Felsite | 1 | |
| 195 | W-3861 | Lith. Prod. Waste | E81/S41 | Flakes | | Felsite | 1 | |
| 202 | W-3861 | Lith. Prod. Waste | E82/S20 | Flakes | | Felsite | 1 | |
| 207 | W-3861 | Lith. Prod. Waste | E82/S30 | Flakes | | Felsite | 1 | |
| 218 | W-3861 | Lith. Prod. Waste | E82/S54 | Flakes | | Felsite | 1 | |
| 220 | W-3861 | Lith. Prod. Waste | E83/S24 | Flakes | | Felsite | 1 | |
| 229 | W-3861 | Lith. Prod. Waste | E83/S38 | Flakes | | Felsite | 1 | |
| 245 | W-3861 | Lith. Prod. Waste | E85/S19 | Flakes | | Felsite | 1 | |
| 258 | W-3861 | Lith. Prod. Waste | E85/S38 | Flakes | | Felsite | 1 | |
| 262 | W-3861 | Lith. Prod. Waste | E85/S49 | Flakes | | Felsite | 1 | |
| 264 | W-3861 | Lith. Prod. Waste | E86/S21 | Flakes | | Felsite | 1 | |
| 274 | W-3861 | Lith. Prod. Waste | E86/S31 | Flakes | | Felsite | 1 | |
| 281 | W-3861 | Lith. Prod. Waste | E86/S40 | Flakes | | Felsite | 1 | |
| 285 | W-3861 | Lith. Prod. Waste | E86/S44 | Flakes | | Felsite | 1 | |
| 293 | W-3861 | Lith. Prod. Waste | E86/S48 | Flakes | | Felsite | 1 | |
| 297 | W-3861 | Lith. Prod. Waste | E87/S20 | Flakes | | Felsite | 1 | |
| 306 | W-3861 | Lith. Prod. Waste | E87/S29 | Flakes | | Felsite | 1 | |
| 311 | W-3861 | Lith. Prod. Waste | E87/S37 | Flakes | | Felsite | 1 | |
| 315 | W-3861 | Lith. Prod. Waste | E87/S44 | Flakes | | Felsite | 1 | |
| 322 | W-3861 | Lith. Prod. Waste | E88/S25 | Flakes | | Felsite | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 333 | W-3861 | Lith. Prod. Waste | E88/S36 | Flakes | | Felsite | 1 | |
| 345 | W-3861 | Lith. Prod. Waste | E234/S138 | Flakes | | Felsite | 1 | |
| 347 | W-3861 | Lith. Prod. Waste | E234/S135 | Flakes | | Felsite | 1 | |
| 359 | W-3861 | Lith. Prod. Waste | E232/S136 | Flakes | | Felsite | 1 | |
| 363 | W-3861 | Lith. Prod. Waste | E232/S134 | Flakes | | Felsite | 1 | |
| 371 | W-3861 | Lith. Prod. Waste | E232/S128 | Flakes | | Felsite | 1 | |
| 380 | W-3861 | Lith. Prod. Waste | E139/S34 | Flakes | | Felsite | 1 | |
| 384 | W-3861 | Lith. Prod. Waste | E144/S184 | Flakes | | Felsite | 1 | |
| 388 | W-3861 | Lith. Prod. Waste | E30/S50 | Flakes | | Felsite | 1 | |
| 395 | W-3861 | Lith. Prod. Waste | E233/S128 | Flakes | | Felsite | 1 | |
| 400 | W-3861 | Lith. Prod. Waste | E233/S132 | Flakes | | Felsite | 1 | |
| 403 | W-3861 | Lith. Prod. Waste | E233/S134 | Flakes | | Felsite | 1 | |
| 411 | W-3861 | Lith. Prod. Waste | E68/S23 | Flakes | | Felsite | 1 | |
| 426 | W-3861 | Lith. Prod. Waste | E150/S193 | Flakes | | Felsite | 1 | |
| 429 | W-3861 | Lith. Prod. Waste | E150/S195 | Flakes | | Felsite | 1 | |
| 430 | W-3861 | Lith. Prod. Waste | E150/S195 | Flakes | | Felsite | 1 | |
| 431 | W-3861 | Lith. Prod. Waste | E150/S195 | Flakes | | Felsite | 1 | |
| 435 | W-3861 | Lith. Prod. Waste | E150/S196 | Flakes | | Felsite | 1 | |
| 468 | W-3861 | Lith. Prod. Waste | E71/S20 | Flakes | | Felsite | 1 | |
| 483 | W-3861 | Lith. Prod. Waste | E92/S60 | Flakes | | Felsite | 1 | |
| 484 | W-3861 | Lith. Prod. Waste | E92/S66 | Flakes | | Felsite | 1 | |
| 493 | W-3861 | Lith. Prod. Waste | E238/S129 | Flakes | | Felsite | 1 | |
| 497 | W-3861 | Lith. Prod. Waste | E237/S128 | Flakes | | Felsite | 1 | |
| 502 | W-3861 | Lith. Prod. Waste | E237/S135 | Flakes | | Felsite | 1 | |
| 508 | W-3861 | Lith. Prod. Waste | E236/S126 | Flakes | | Felsite | 1 | |
| 512 | W-3861 | Lith. Prod. Waste | E236/S128 | Flakes | | Felsite | 1 | |
| 513 | W-3861 | Lith. Prod. Waste | E236/S129 | Flakes | | Felsite | 1 | |
| 523 | W-3861 | Lith. Prod. Waste | E235/S126 | Flakes | | Felsite | 1 | |
| 524 | W-3861 | Lith. Prod. Waste | E235/S126 | Flakes | | Felsite | 1 | |
| 536 | W-3861 | Lith. Prod. Waste | E229/S126 | Flakes | | Felsite | 1 | |
| 538 | W-3861 | Lith. Prod. Waste | E229/S132 | Flakes | | Felsite | 1 | |
| 548 | W-3861 | Lith. Prod. Waste | E228/S135 | Flakes | | Felsite | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 567 | W-3861 | Lith. Prod. Waste | E145/S175 | Flakes | | Felsite | 1 | |
| 569 | W-3861 | Lith. Prod. Waste | E145/S177 | Flakes | | Felsite | 1 | |
| 577 | W-3861 | Lith. Prod. Waste | E149/S178 | Flakes | | Felsite | 1 | |
| 579 | W-3861 | Lith. Prod. Waste | E149/S179 | Flakes | | Felsite | 1 | |
| 587 | W-3861 | Lith. Prod. Waste | E151/S55 | Flakes | | Felsite | 1 | |
| 596 | W-3861 | Lith. Prod. Waste | E153/S91 | Flakes | | Felsite | 1 | |
| 597 | W-3861 | Lith. Prod. Waste | E153/S180 | Flakes | | Felsite | 1 | |
| 598 | W-3861 | Lith. Prod. Waste | E153/S180 | Flakes | | Felsite | 1 | |
| 606 | W-3861 | Lith. Prod. Waste | E155/S36 | Flakes | | Felsite | 1 | |
| 629 | W-3861 | Lith. Prod. Waste | E158/S35 | Flakes | | Felsite | 1 | |
| 638 | W-3861 | Lith. Prod. Waste | E162/S22 | Flakes | | Felsite | 1 | |
| 645 | W-3861 | Lith. Prod. Waste | E164/S22 | Flakes | | Felsite | 1 | |
| 647 | W-3861 | Lith. Prod. Waste | E164/S24 | Flakes | | Felsite | 1 | |
| 648 | W-3861 | Lith. Prod. Waste | E164/S24 | Flakes | | Felsite | 1 | |
| 657 | W-3861 | Lith. Prod. Waste | E172/S42 | Flakes | | Felsite | 1 | |
| 661 | W-3861 | Lith. Prod. Waste | E176/S30 | Flakes | | Felsite | 1 | |
| 673 | W-3861 | Lith. Prod. Waste | TU3/0-10 | Flakes | | Felsite | 1 | |
| 674 | W-3861 | Lith. Prod. Waste | TU4/0-10 | Flakes | | Felsite | 1 | |
| 684 | W-3861 | Lith. Prod. Waste | E223/S135 | Flakes | | Felsite | 1 | |
| 688 | W-3861 | Lith. Prod. Waste | E224/S130 | Flakes | | Felsite | 1 | |
| 694 | W-3861 | Lith. Prod. Waste | E225/S133 | Flakes | | Felsite | 1 | |
| 698 | W-3861 | Lith. Prod. Waste | E225/S135 | Flakes | | Felsite | 1 | |
| 712 | W-3861 | Lith. Prod. Waste | E63/S23 | Flakes | | Felsite | 1 | |
| 724 | W-3861 | Lith. Prod. Waste | E70/S40 | Flakes | | Felsite | 1 | |
| 760 | W-3861 | Lith. Prod. Waste | E69/S20 | Flakes | | Felsite | 1 | |
| 765 | W-3861 | Lith. Prod. Waste | E69/S23 | Flakes | | Felsite | 1 | |
| 780 | W-3861 | Lith. Prod. Waste | E72/S24 | Flakes | | Felsite | 1 | |
| 812 | W-3861 | Lith. Prod. Waste | E132/S22 | Flakes | | Felsite | 1 | |
| 823 | W-3861 | Lith. Prod. Waste | E129/S84 | Flakes | | Felsite | 1 | |
| 826 | W-3861 | Lith. Prod. Waste | E129/S86 | Flakes | | Felsite | 1 | |
| 829 | W-3861 | Lith. Prod. Waste | E134/S92 | Flakes | | Felsite | 1 | |
| 852 | W-3861 | Lith. Prod. Waste | E128/S30 | Flakes | | Felsite | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

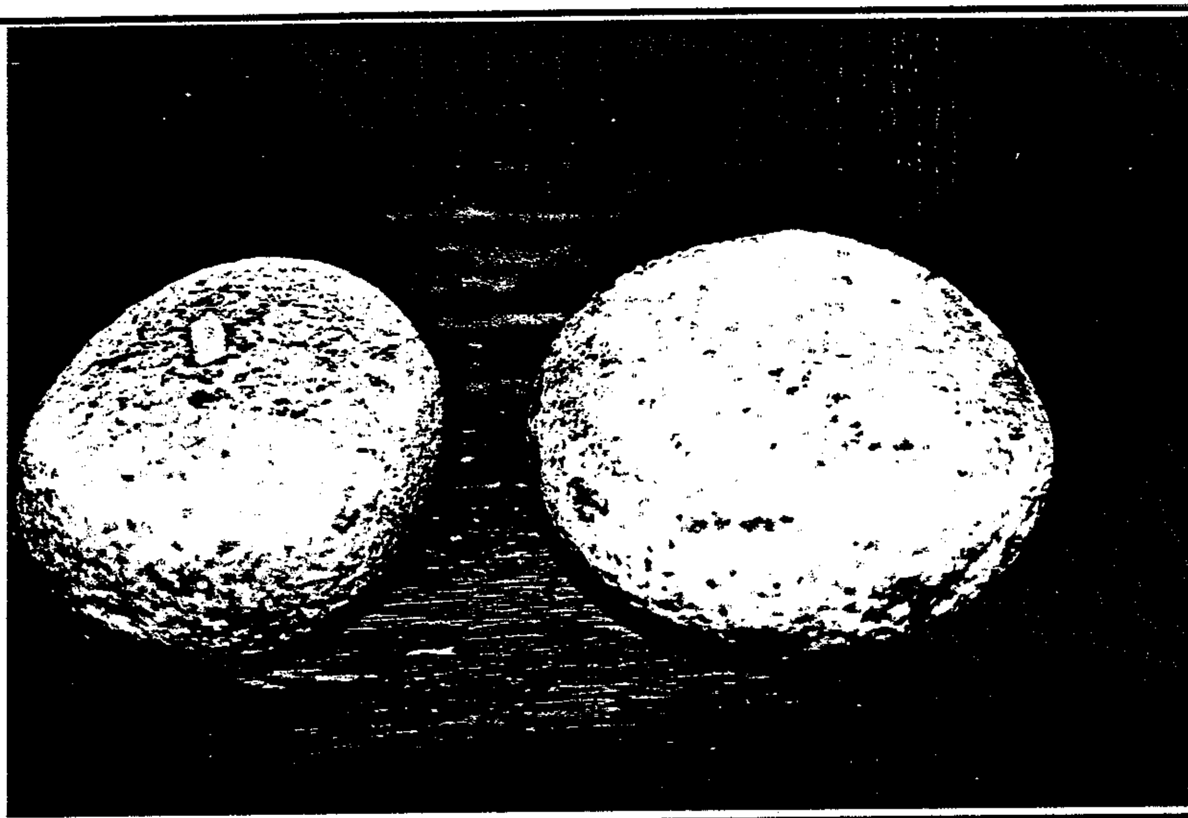
| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 863 | W-3861 | Lith. Prod. Waste | E230/S136 | Flakes | | Felsite | 1 | |
| 876 | W-3861 | Lith. Prod. Waste | E246/S134 | Flakes | | Felsite | 1 | |
| 877 | W-3861 | Lith. Prod. Waste | E246/S135 | Flakes | | Felsite | 1 | |
| 905 | W-3861 | Lith. Prod. Waste | E226/S131 | Flakes | | Felsite | 1 | |
| 908 | W-3861 | Lith. Prod. Waste | E226/S133 | Flakes | | Felsite | 1 | |
| 913 | W-3861 | Lith. Prod. Waste | E226/S135 | Flakes | | Felsite | 1 | |
| 916 | W-3861 | Lith. Prod. Waste | E227/S132 | Flakes | | Felsite | 1 | |
| 919 | W-3861 | Lith. Prod. Waste | E227/S130 | Flakes | | Felsite | 1 | |
| 921 | W-3861 | Lith. Prod. Waste | E231/S131 | Flakes | | Felsite | 1 | |
| 931 | W-3861 | Lith. Prod. Waste | E240/S127 | Flakes | | Felsite | 1 | |
| 944 | W-3861 | Lith. Prod. Waste | E241/S131 | Flakes | | Felsite | 1 | |
| 946 | W-3861 | Lith. Prod. Waste | E242/S130 | Flakes | | Felsite | 1 | |
| 972 | W-3861 | Lith. Prod. Waste | E141/S148 | Flakes | | Felsite | 1 | |
| 973 | W-3861 | Lith. Prod. Waste | E141/S148 | Flakes | | Felsite | 1 | |
| 977 | W-3861 | Lith. Prod. Waste | E141/S169 | Flakes | | Felsite | 1 | |
| 992 | W-3861 | Lith. Prod. Waste | E137/S83 | Flakes | | Felsite | 1 | |
| 997 | W-3861 | Lith. Prod. Waste | E144/S31 | Flakes | | Felsite | 1 | |
| 1009 | W-3861 | Lith. Prod. Waste | E147/S182 | Flakes | | Felsite | 1 | |
| 1010 | W-3861 | Lith. Prod. Waste | E147/S182 | Flakes | | Felsite | 1 | |
| 1015 | W-3861 | Lith. Prod. Waste | E149/S183 | Flakes | | Felsite | 1 | |
| 1016 | W-3861 | Lith. Prod. Waste | E149/S184 | Flakes | | Felsite | 1 | |
| 1029 | W-3861 | Lith. Prod. Waste | E143/S166 | Flakes | | Felsite | 1 | |
| 1031 | W-3861 | Lith. Prod. Waste | E143/S176 | Flakes | | Felsite | 1 | |
| 1033 | W-3861 | Lith. Prod. Waste | E143/S185 | Flakes | | Felsite | 1 | |
| 1037 | W-3861 | Lith. Prod. Waste | E151/S188 | Flakes | | Felsite | 1 | |
| 1057 | W-3861 | Lith. Prod. Waste | E149/S63 | Flakes | | Felsite | 1 | |
| 1058 | W-3861 | Lith. Prod. Waste | E149/S63 | Flakes | | Felsite | 1 | |
| 1061 | W-3861 | Lith. Prod. Waste | E150/S180 | Flakes | | Felsite | 1 | |
| 1063 | W-3861 | Lith. Prod. Waste | E150/S182 | Flakes | | Felsite | 1 | |
| 1064 | W-3861 | Lith. Prod. Waste | E150/S182 | Flakes | | Felsite | 1 | |
| 1065 | W-3861 | Lith. Prod. Waste | E150/S182 | Flakes | | Felsite | 1 | |
| 1082 | W-3861 | Lith. Prod. Waste | E148/S188 | Flakes | | Felsite | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

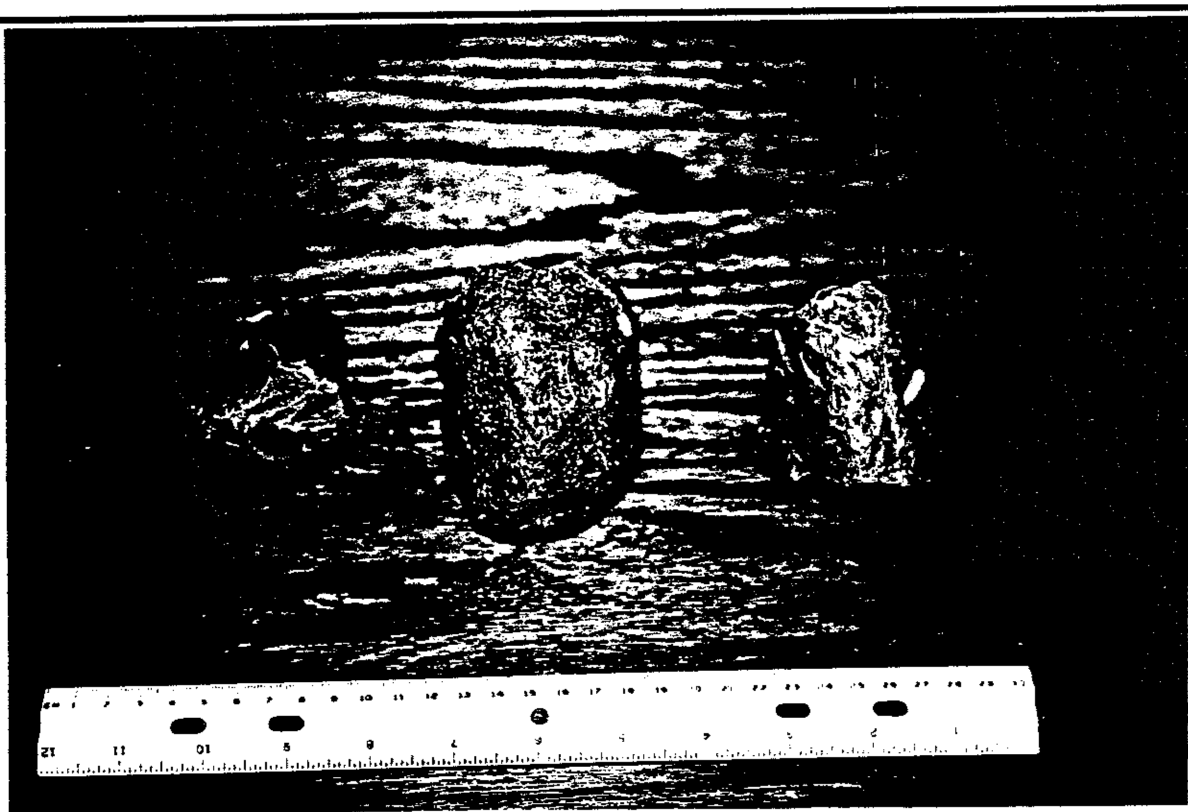
| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 1084 | W-3861 | Lith. Prod. Waste | E152/S178 | Flakes | | Felsite | 1 | |
| 1100 | W-3861 | Lith. Prod. Waste | E159/S24 | Flakes | | Felsite | 1 | |
| 1101 | W-3861 | Lith. Prod. Waste | E159/S24 | Flakes | | Felsite | 1 | |
| 1102 | W-3861 | Lith. Prod. Waste | E159/S24 | Flakes | | Felsite | 1 | |
| 1103 | W-3861 | Lith. Prod. Waste | E159/S24 | Flakes | | Felsite | 1 | |
| 1111 | W-3861 | Lith. Prod. Waste | E157/S20 | Flakes | | Felsite | 1 | |
| 1117 | W-3861 | Lith. Prod. Waste | E157/S30 | Flakes | | Felsite | 1 | |
| 1118 | W-3861 | Lith. Prod. Waste | E157/S30 | Flakes | | Felsite | 1 | |
| 1120 | W-3861 | Lith. Prod. Waste | E157/S32 | Flakes | | Felsite | 1 | |
| | | | | | | | 150 | |
| 9 | W-3861 | Lith. Prod. Waste | E74/S31 | Flakes | | Quartzite | 1 | |
| 28 | W-3861 | Lith. Prod. Waste | E75/S19 | Flakes | | Quartzite | 1 | |
| 157 | W-3861 | Lith. Prod. Waste | E80/S20 | Flakes | | Quartzite | 1 | |
| 205 | W-3861 | Lith. Prod. Waste | E82/S29 | Flakes | | Quartzite | 1 | |
| 246 | W-3861 | Lith. Prod. Waste | E85/S21 | Flakes | | Quartzite | 1 | |
| 298 | W-3861 | Lith. Prod. Waste | E87/S20 | Flakes | | Quartzite | 1 | |
| 318 | W-3861 | Lith. Prod. Waste | E88/S20 | Flakes | | Quartzite | 1 | |
| 432 | W-3861 | Lith. Prod. Waste | E150/S195 | Flakes | | Quartzite | 1 | |
| 492 | W-3861 | Lith. Prod. Waste | E238/S129 | Flakes | | Quartzite | 1 | |
| 562 | W-3861 | Lith. Prod. Waste | E141/S89 | Flakes | | Quartzite | 1 | |
| 570 | W-3861 | Lith. Prod. Waste | E145/S177 | Flakes | | Quartzite | 1 | |
| 571 | W-3861 | Lith. Prod. Waste | E145/S177 | Flakes | | Quartzite | 1 | |
| 578 | W-3861 | Lith. Prod. Waste | E149/S178 | Flakes | | Quartzite | 1 | |
| 620 | W-3861 | Lith. Prod. Waste | E156/S82 | Flakes | | Quartzite | 1 | |
| 650 | W-3861 | Lith. Prod. Waste | E165/S38 | Flakes | | Quartzite | 1 | |
| 720 | W-3861 | Lith. Prod. Waste | E70/S32 | Flakes | | Quartzite | 1 | |
| 734 | W-3861 | Lith. Prod. Waste | E60/S42 | Flakes | | Quartzite | 1 | |
| 744 | W-3861 | Lith. Prod. Waste | E66/S20 | Flakes | | Quartzite | 1 | |
| 791 | W-3861 | Lith. Prod. Waste | E43/S46 | Flakes | | Quartzite | 1 | |
| 848 | W-3861 | Lith. Prod. Waste | E128/S25 | Flakes | | Quartzite | 1 | |
| 881 | W-3861 | Lith. Prod. Waste | E246/S135 | Flakes | | Quartzite | 1 | |

TABLE 9 - Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 903 | W-3861 | Lith. Prod. Waste | E226/S129 | Flakes | | Quartzite | 1 | |
| 950 | W-3861 | Lith. Prod. Waste | E242/S136 | Flakes | | Quartzite | 1 | |
| 1040 | W-3861 | Lith. Prod. Waste | E151/S197 | Flakes | | Quartzite | 1 | |
| 1070 | W-3861 | Lith. Prod. Waste | E150/S184 | Flakes | | Quartzite | 1 | |
| | | | | | | | 25 | |
| | | | | | | | 305 | |



SELECTED MANOS FROM W-3861.
( L. TO R.: CAT. #557 AND #102 )



SELECTED HAMMERSTONES FROM W-3861.
( L. TO R.: CAT. #233, #755 AND #639 )

### 6.2.1 Hammerstones

Hammerstones are percussion artifacts which originated as pebbles, cobbles, or block-derived rocks and required no modification before use, although many were modified to a particular shape to enhance their usefulness. Most hammerstones may be identified by battering on one or more sides, as they were used to pound, pulp or hammer both soft (i.e., food) and hard (i.e., stone) materials. Hammerstones may be divided into four subtypes: spherical, rectangular, triangular, and circular. They are distinguished by morphological differences, although use requirements probably determined the type of hammerstone form.

The hammerstones recovered from W-3861 included 13 circular, four rectangular, nine spherical, 13 triangular, and two unclassifiable specimens. The lithic distribution included 22 basalt, 13 felsite, one granite, and five quartzite hammerstones. The hammerstones from W-3861 conform to the pattern of hammerstones generally found at sites of the La Jolla Complex. It is interesting to note that nearly all of the hammerstones were recovered from Locus 1, which would suggest that the center of activity at Site W-3861 may have been situated in this area.

### 6.2.2 Choppers and Cleavers

Choppers are large, multipurpose percussion tools which were used for cleaving, crushing, cutting and heavy scraping. They were commonly derived from cobbles, and the smooth cobble backing was used as a grip. Choppers and cleavers are closely related in terms of use; however, while both include jagged cutting edges, choppers possess a working edge which transverses the longest axis, and whole cleavers display a working edge which parallels the longest axis.

The category of choppers/cleavers at W-3861 was represented by 22 choppers and one cleaver. For the most part, the choppers from W-3861 are ten to fifteen percent smaller than choppers which are typical of coastal sites (Smith and Moriarty 1985: 442). The choppers included 11 basalt, eight felsite, and 3 quartzite specimens; the one cleaver recovered from the site was constructed from felsite. The distribution of lithic materials was generally uniform for all of the loci of the site.

TABLE 10 - Hammerstones Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 121 | W-3861 | Percussion Tools | E78/S23 | Hammerstones | Circular | Basalt | 1 | |
| 167 | W-3861 | Percussion Tools | E80/S36 | Hammerstones | Circular | Basalt | 1 | |
| 227 | W-3861 | Percussion Tools | E83/S37 | Hammerstones | Circular | Basalt | 1 | |
| 473 | W-3861 | Percussion Tools | E71/S45 | Hammerstones | Circular | Basalt | 1 | |
| 722 | W-3861 | Percussion Tools | E70/S38 | Hammerstones | Circular | Basalt | 1 | |
| 785 | W-3861 | Percussion Tools | E72/S35 | Hammerstones | Circular | Basalt | 1 | ** |
| | | | | | | | 6 | |
| 256 | W-3861 | Percussion Tools | E85/S31 | Hammerstones | Rectangular | Basalt | 1 | |
| 391 | W-3861 | Percussion Tools | E51/S37 | Hammerstones | Rectangular | Basalt | 1 | |
| 798 | W-3861 | Percussion Tools | E95/S49 | Hammerstones | Rectangular | Basalt | 1 | |
| | | | | | | | 3 | |
| 185 | W-3861 | Percussion Tools | E81/S31 | Hammerstones | Spherical | Basalt | 1 | |
| 266 | W-3861 | Percussion Tools | E86/S25 | Hammerstones | Spherical | Basalt | 1 | Fragment |
| 743 | W-3861 | Percussion Tools | E62/S36 | Hammerstones | Spherical | Basalt | 1 | |
| 755 | W-3861 | Percussion Tools | E68/S37 | Hammerstones | Spherical | Basalt | 1 | ** |
| 1123 | W-3861 | Percussion Tools | E157/S42 | Hammerstones | Spherical | Basalt | 1 | ** |
| | | | | | | | 5 | |
| 15 | W-3861 | Percussion Tools | E74/S38 | Hammerstones | Triangular | Basalt | 1 | |
| 113 | W-3861 | Percussion Tools | E77/S54 | Hammerstones | Triangular | Basalt | 1 | |
| 295 | W-3861 | Percussion Tools | E86/S49 | Hammerstones | Triangular | Basalt | 1 | |
| 307 | W-3861 | Percussion Tools | E87/S33 | Hammerstones | Triangular | Basalt | 1 | |
| 457 | W-3861 | Percussion Tools | E94/S65 | Hammerstones | Triangular | Basalt | 1 | |
| 840 | W-3861 | Percussion Tools | E135/S19 | Hammerstones | Triangular | Basalt | 1 | ** |
| | | | | | | | 6 | |
| 728 | W-3861 | Percussion Tools | E57/S26 | Hammerstones | | Basalt | 1 | Fragment |
| 746 | W-3861 | Percussion Tools | E66/S30 | Hammerstones | | Basalt | 1 | |
| | | | | | | | 2 | |

TABLE 10 - Hammerstones Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 129 | W-3861 | Percussion Tools | E78/S32 | Hammerstones | Circular | Felsite | 1 | |
| 172 | W-3861 | Percussion Tools | E80/S41 | Hammerstones | Circular | Felsite | 1 | |
| 190 | W-3861 | Percussion Tools | E81/S37 | Hammerstones | Circular | Felsite | 1 | |
| 308 | W-3861 | Percussion Tools | E87/S35 | Hammerstones | Circular | Felsite | 1 | |
| 639 | W-3861 | Percussion Tools | E163/S50 | Hammerstones | Circular | Felsite | 1 | ** |
| 653 | W-3861 | Percussion Tools | E167/S24 | Hammerstones | Circular | Felsite | 1 | ** |
| | | | | | | | 6 | |
| 26 | W-3861 | Percussion Tools | E75/S19 | Hammerstones | Spherical | Felsite | 1 | |
| 80 | W-3861 | Percussion Tools | E76/S36 | Hammerstones | Spherical | Felsite | 1 | Fragment |
| 233 | W-3861 | Percussion Tools | E84/S22 | Hammerstones | Spherical | Felsite | 1 | ** |
| | | | | | | | 3 | |
| 37 | W-3861 | Percussion Tools | E75/S26 | Hammerstones | Triangular | Felsite | 1 | |
| 100 | W-3861 | Percussion Tools | E77/S35 | Hammerstones | Triangular | Felsite | 1 | |
| 147 | W-3861 | Percussion Tools | E79/S41 | Hammerstones | Triangular | Felsite | 1 | |
| 247 | W-3861 | Percussion Tools | E85/S22 | Hammerstones | Triangular | Felsite | 1 | |
| | | | | | | | 4 | |
| 211 | W-3861 | Percussion Tools | E82/S40 | Hammerstones | Rectangular | Granite | 1 | |
| | | | | | | | 1 | |
| 8 | W-3861 | Percussion Tools | E74/S30 | Hammerstones | Circular | Quartzite | 1 | ** |
| | | | | | | | 1 | |
| 989 | W-3861 | Percussion Tools | E142/S29 | Hammerstones | Spherical | Quartzite | 1 | ** |
| | | | | | | | 1 | |
| 117 | W-3861 | Percussion Tools | E78/S20 | Hammerstones | Triangular | Quartzite | 1 | |
| 201 | W-3861 | Percussion Tools | E82/S20 | Hammerstones | Triangular | Quartzite | 1 | Fragment |
| 410 | W-3861 | Percussion Tools | E68/S22 | Hammerstones | Triangular | Quartzite | 1 | |
| | | | | | | | 3 | |

TABLE 10 - Hammerstones Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 41 | |

TABLE 11 - Choppers and Cleavers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 13 | W-3861 | Percussion Tools | E74/S37 | Choppers | | Basalt | 1 | |
| 84 | W-3861 | Percussion Tools | E76/S39 | Choppers | | Basalt | 1 | |
| 179 | W-3861 | Percussion Tools | E81/S20 | Choppers | | Basalt | 1 | |
| 396 | W-3861 | Percussion Tools | E233/S128 | Choppers | | Basalt | 1 | |
| 495 | W-3861 | Percussion Tools | E237/S126 | Choppers | | Basalt | 1 | |
| 651 | W-3861 | Percussion Tools | E165/S38 | Choppers | | Basalt | 1 | ** |
| 795 | W-3861 | Percussion Tools | E50/S34 | Choppers | | Basalt | 1 | |
| 808 | W-3861 | Percussion Tools | E130/S31 | Choppers | | Basalt | 1 | |
| 866 | W-3861 | Percussion Tools | E246/S125 | Choppers | | Basalt | 1 | |
| 1047 | W-3861 | Percussion Tools | E153/S22 | Choppers | | Basalt | 1 | ** |
| 1055 | W-3861 | Percussion Tools | E149/S53 | Choppers | | Basalt | 1 | |
| | | | | | | | 11 | |
| 184 | W-3861 | Percussion Tools | E81/S30 | Choppers | | Felsite | 1 | |
| 196 | W-3861 | Percussion Tools | E81/S52 | Choppers | | Felsite | 1 | |
| 372 | W-3861 | Percussion Tools | E232/S128 | Choppers | | Felsite | 1 | |
| 404 | W-3861 | Percussion Tools | E233/S136 | Choppers | | Felsite | 1 | |
| 549 | W-3861 | Percussion Tools | E228/S136 | Choppers | | Felsite | 1 | |
| 628 | W-3861 | Percussion Tools | E158/S33 | Choppers | | Felsite | 1 | |
| 692 | W-3861 | Percussion Tools | E225/S129 | Choppers | | Felsite | 1 | |
| 1003 | W-3861 | Percussion Tools | E143/S69 | Choppers | | Felsite | 1 | |
| | | | | | | | 8 | |
| 215 | W-3861 | Percussion Tools | E82/S44 | Choppers | | Quartzite | 1 | |
| 556 | W-3861 | Percussion Tools | E141/S30 | Choppers | | Quartzite | 1 | |
| 586 | W-3861 | Percussion Tools | E150/S84 | Choppers | | Quartzite | 1 | |
| | | | | | | | 3 | |
| 114 | W-3861 | Percussion Tools | E77/S54 | Cleavers | | Felsite | 1 | |
| | | | | | | | 1 | |
| | | | | | | | 23 | |

## 6.3 PRECISION TOOLS

The precision tool class is generally represented by smaller, lighter implements than other tool classes, and the artifacts in this category required a greater degree of craftsmanship to manufacture. Within this broad class are included utilized flakes, scrapers, planers, perforators, projectile points, and spokeshaves. As a group, precision tools comprised the largest number of artifacts collected from W-3861. The total number of recovered precision tools is 489, including 239 scrapers, 196 utilized flakes, 18 spokeshaves, 18 perforators, one graver, and 17 knives. The precision tool class represented 43.6 % of the artifact collection from the project.

### 6.3.1 Scrapers

The category of scrapers includes those tools which were used to scrape, cut, or flense wood, flesh, or other fibrous organic materials in a reduction-focused activity (Barnett 1973: 101). The scraper category may be further divided into subtypes that reflect morphological characteristics which differ among the scrapers. While the number of subtypes can vary considerably according to the background of the researcher, the most common subtypes are side scrapers, rectangular scrapers, flake scrapers, end scrapers, domed scrapers, cobble scrapers, bilateral scrapers, and beaked scrapers. These types are commonly recovered from sites of the La Jolla Complex (Smith and Moriarty 1985: 456).

The numbers of each scraper subtype recovered from W-3861 are provided below:

| | |
|---|---|
| Side Scrapers | 52 |
| Rectangular Scrapers | 1 |
| Flake Scrapers | 63 |
| Domed Scrapers | 17 |
| Discoidal Scrapers | 1 |
| Bilateral Scrapers | 31 |
| Beaked Scrapers | 2 |
| Thumbnail Scrapers | 1 |
| Scraper Planes | 22 |
| End Scrapers | 47 |
| Cobble Scrapers | 2 |
| | -------- |
| Total Scrapers | 239 |

The dominant scraper subtypes included in the recovery from W-3861 were flake scrapers (26.4%), side scrapers (21.8%), end scrapers (19.7%), bilateral scrapers (13.0%) and scraper planes (9.2%). These five major subtypes account for 90.10% of the scrapers recovered from W-3861. The lithic materials used to construct the scrapers included felsite (133 specimens), basalt (87 specimens), and quartzite (19 specimens).

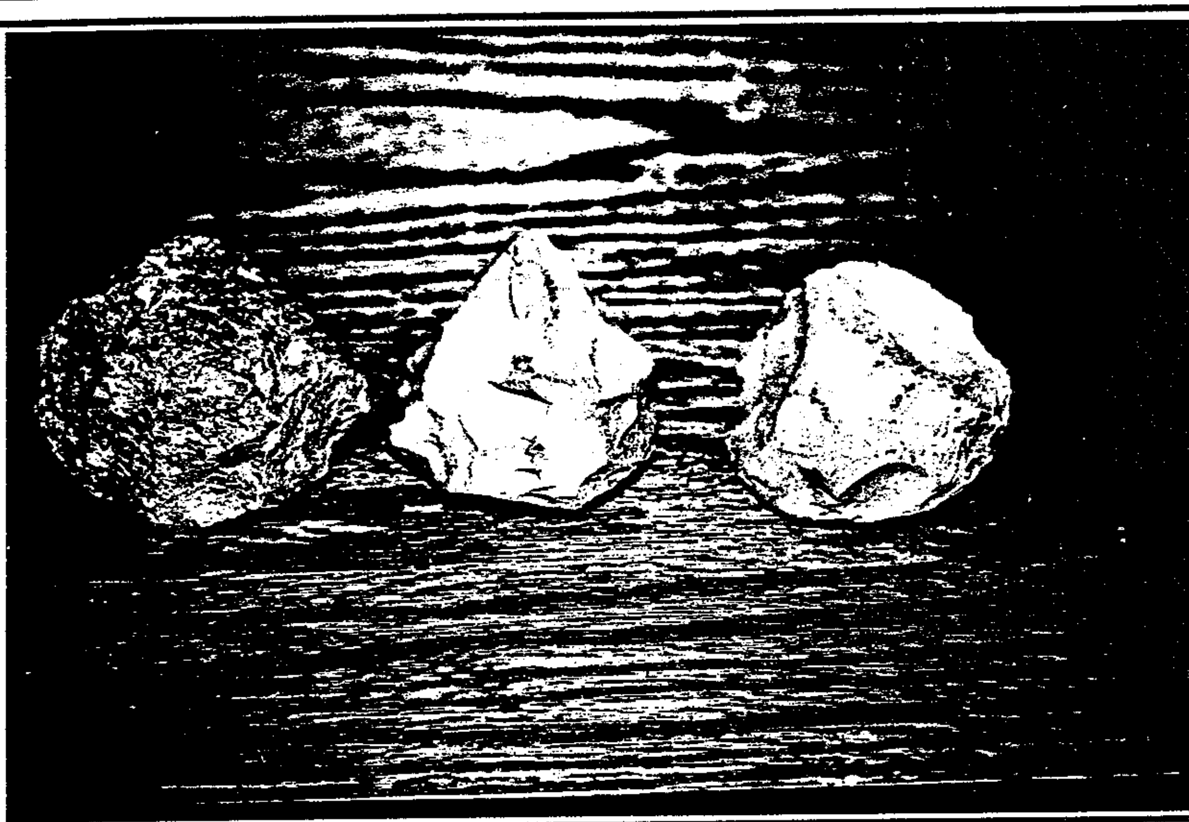
The scrapers from W-3861 comprised the most numerous tool category, and the second most numerous artifact group following production waste. Scrapers were the dominant tool type collected at each of the loci of W-3861, indicating that a common site function, such as plant reduction, occurred at each of the loci.

### 6.3.2 Utilized/Retouched Flakes

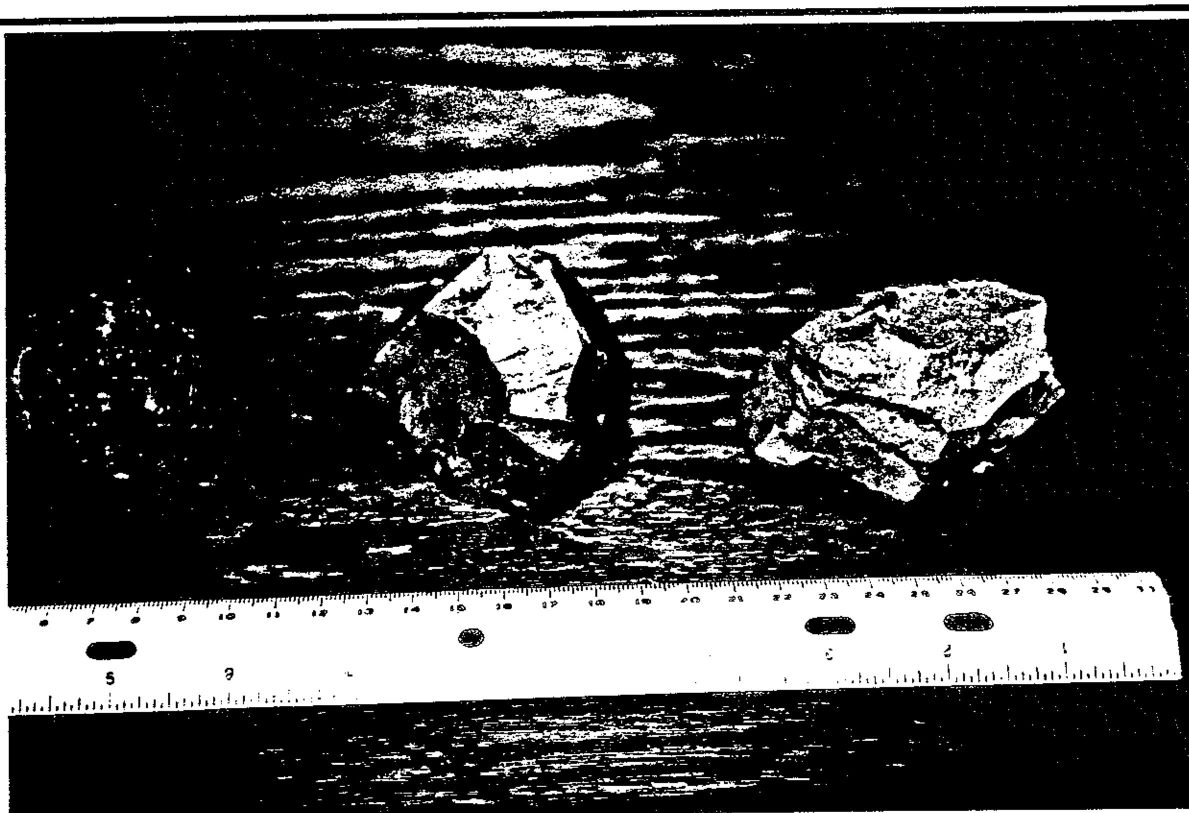
The category of utilized/retouched flakes consists of the simplest tool form found in the tool assemblage of the La Jolla Complex. These tools include a broad selection of flakes which display some indication of utilization and/or modification subsequent to their removal from a parent rock or core. It is often difficult to determine whether a utilized flake has been modified to enhance its working edge (a retouched flake) or if wear resulting from its use has caused the modification (a utilized flake); therefore, the category of utilized flakes is used to represent both utilized and retouched flakes.

At Site W-3861, the category of utilized flakes included 196 specimens, comprising 17.47% of the artifact recovery. The majority of these tools were very simple blades (length is twice the width) with sharp, thin edges which were used to cut or scrape. Aside from the obvious use and occasional retouch, none of the specimens was particularly noteworthy.

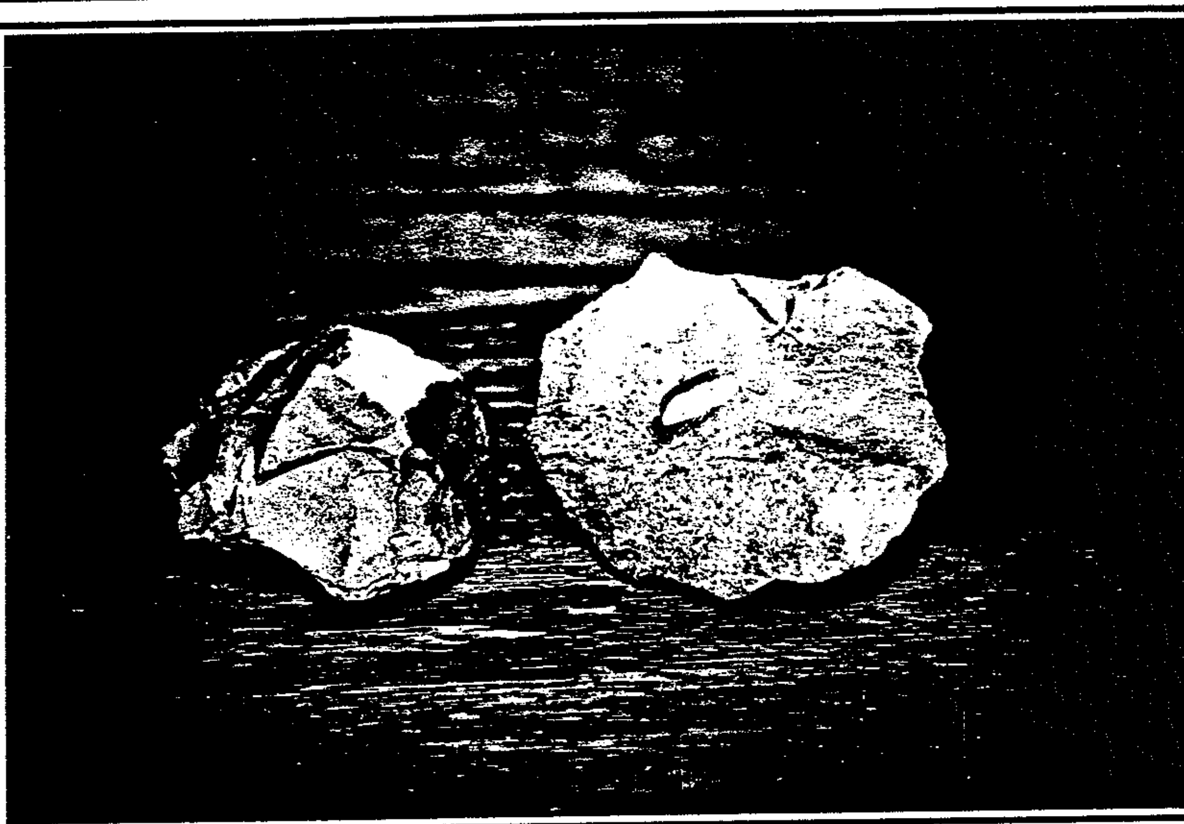
The lithic distribution for the utilized flakes consisted of 117 felsite specimens (59.69% of the category), 63 basalt specimens (32.14%), and 16 quartzite specimens (8.16%). The utilized flakes were recovered from all of the loci of W-3861, but were most frequent at Locus 1.



SELECTED DOMED SCRAPERS FROM W-3861.
( L. TO R.: CAT. #1000, #1126 AND #174 )

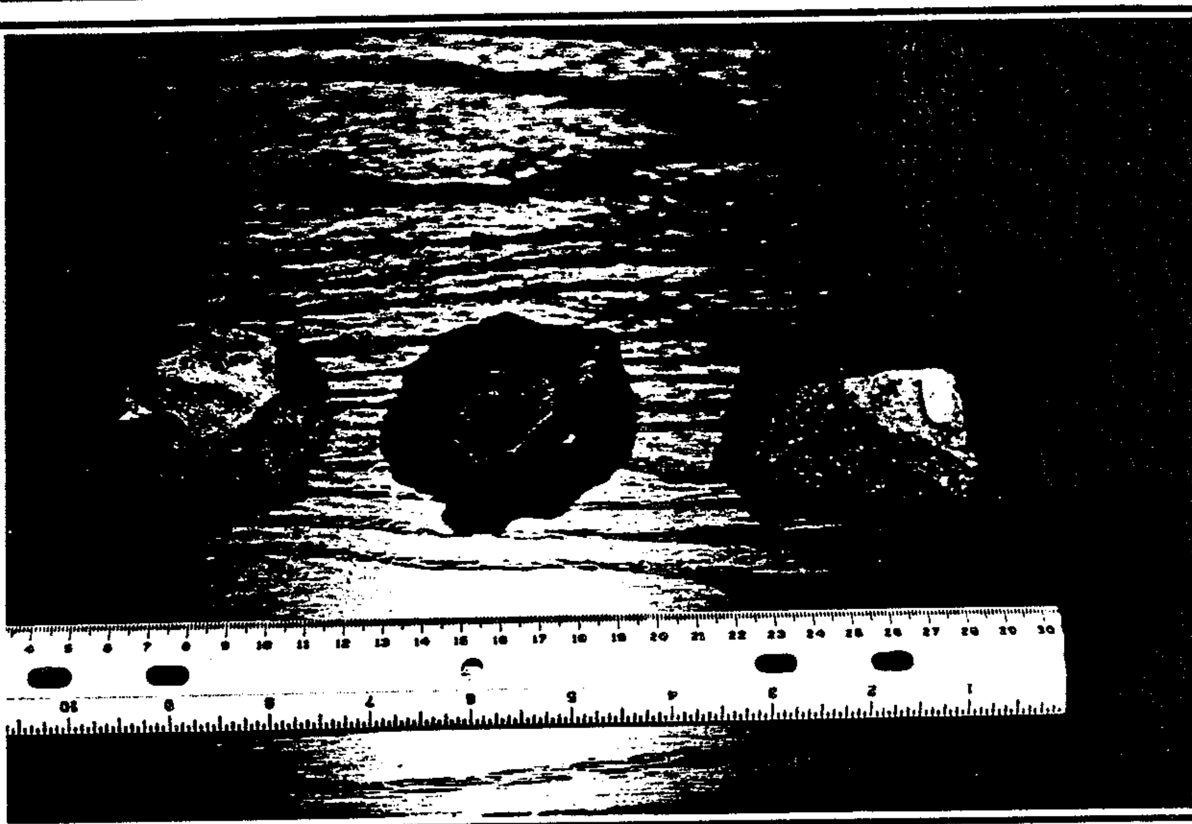


SELECTED SCRAPER PLANES FROM W-3861.
( L. TO R.: CAT. #835, #652 AND #1115 )



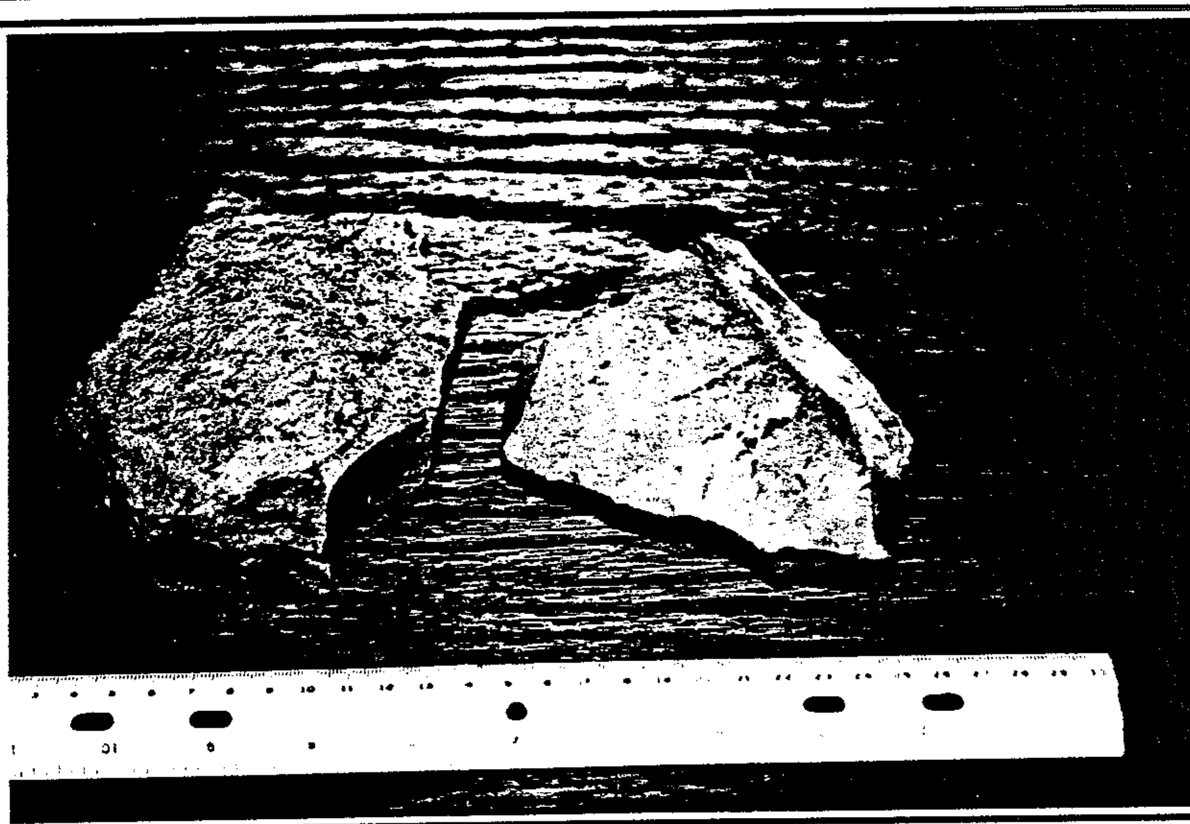
SELECTED SCRAPERS FROM W-3861.
( L. TO R.: CAT. #632 AND #463 )

A COBBLE END SCRAPER AND A SCRAPER PLANE FROM W-3861.
( L. TO R.: CAT. #340 AND #776 )

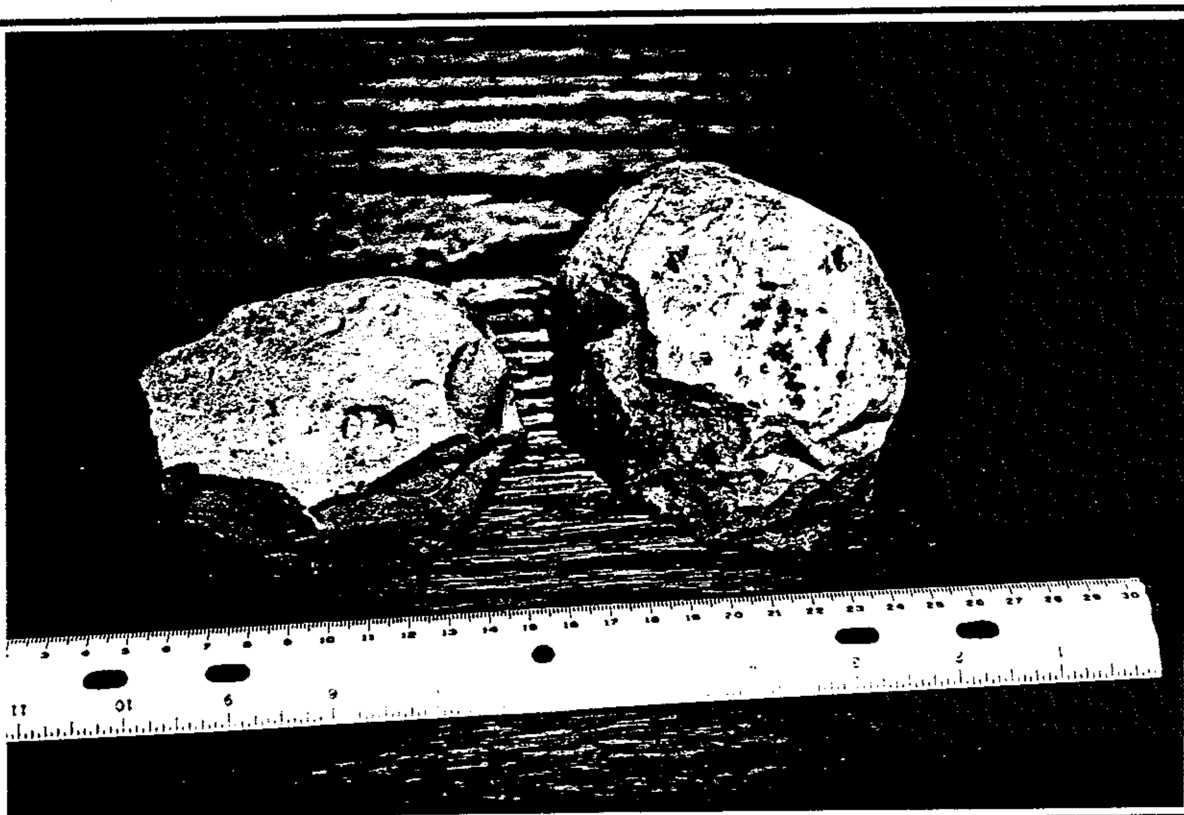


DOMED SCRAPERS AND A BILATERAL SIDE SCRAPER FROM W-3861.
( L. TO R.: CAT. #119 AND #811 [DOMED] AND #356 [BILATERAL SIDE] )

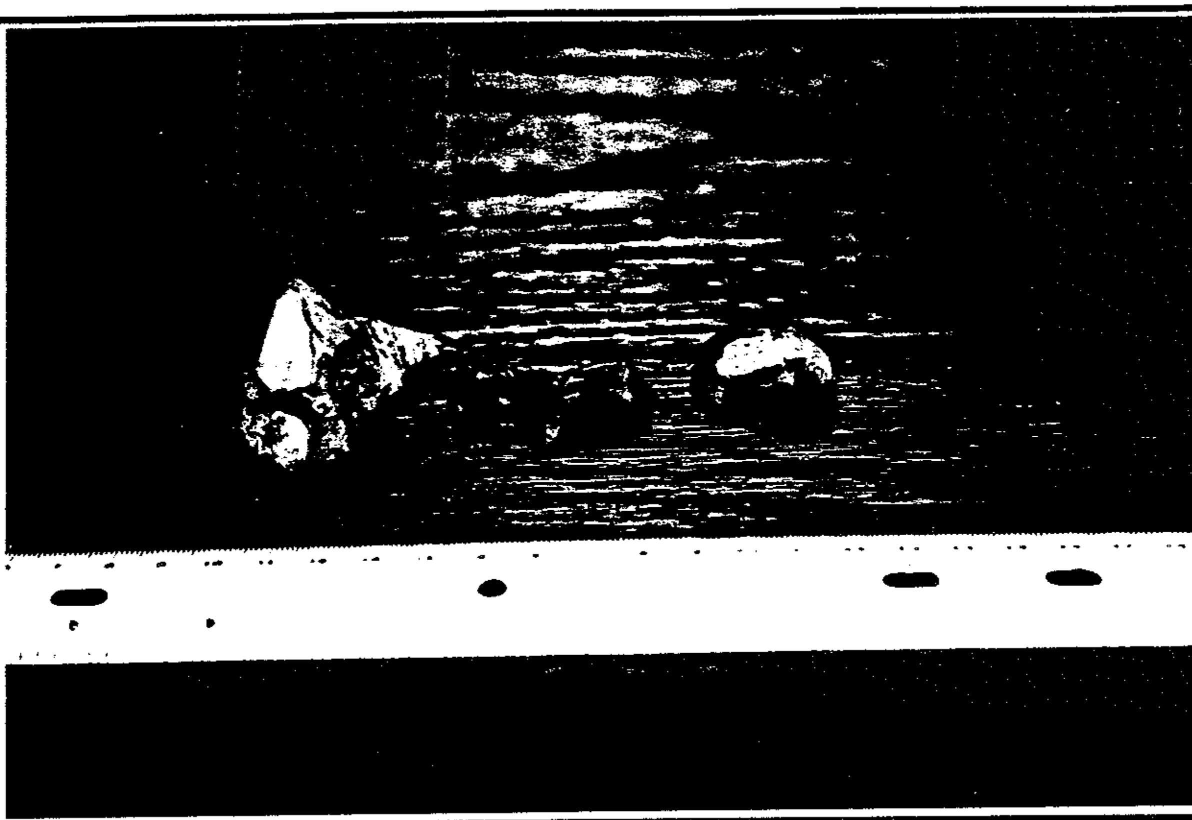
SELECTED SIDE SCRAPERS FROM W-3861.
( L. TO R.: CAT. #708, #364, #736 AND #465 )



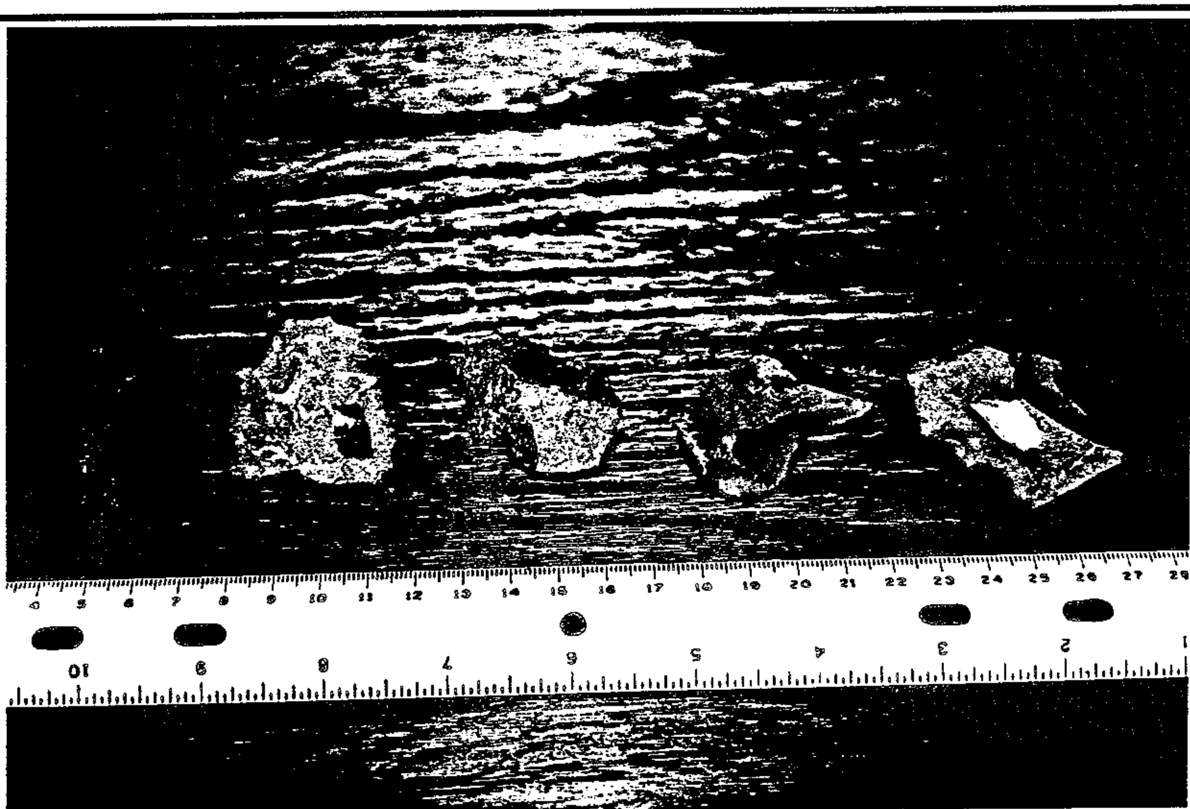
SELECTED LARGE FLAKE-SCRAPING TOOLS FROM W-3861.
( L. TO R.: #436 AND #287 )



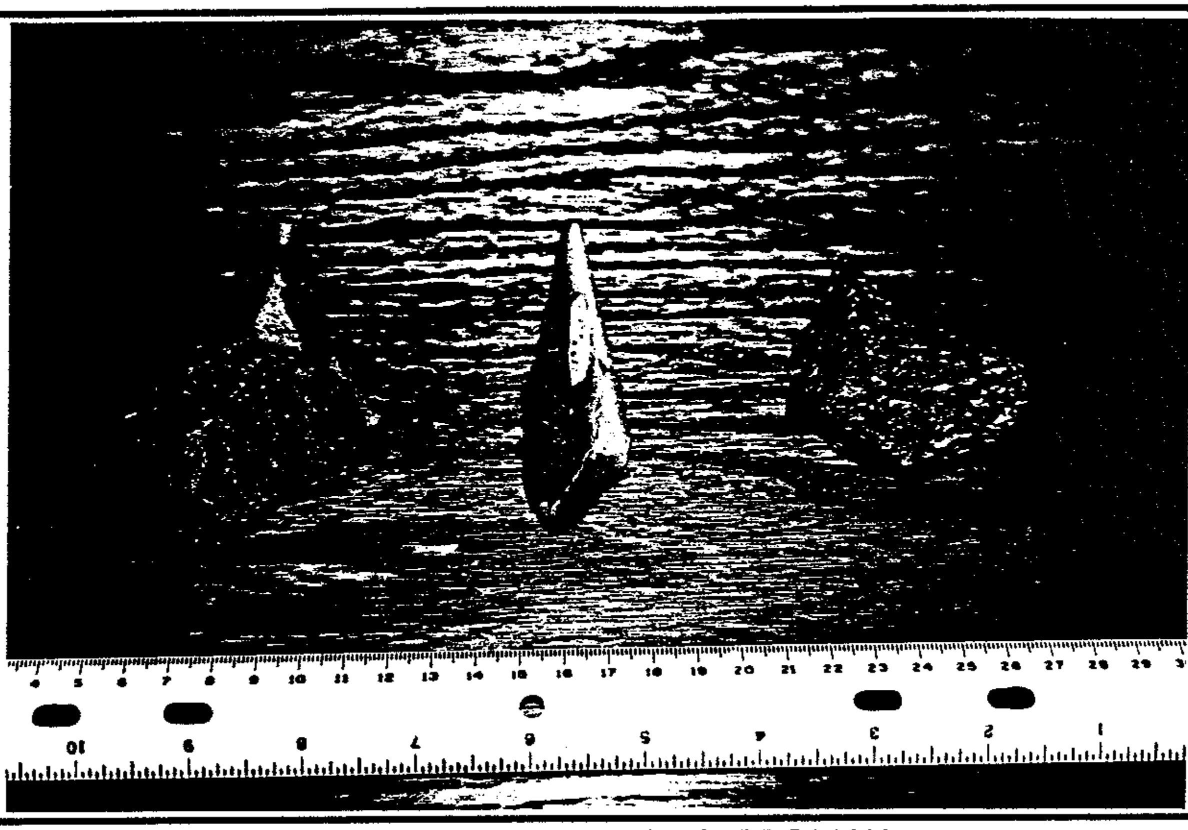
LARGE SCRAPER PLANES ( OR SIDE SCRAPERS) FROM W-3861.
( L. TO R.: CAT. #234 AND #695 )



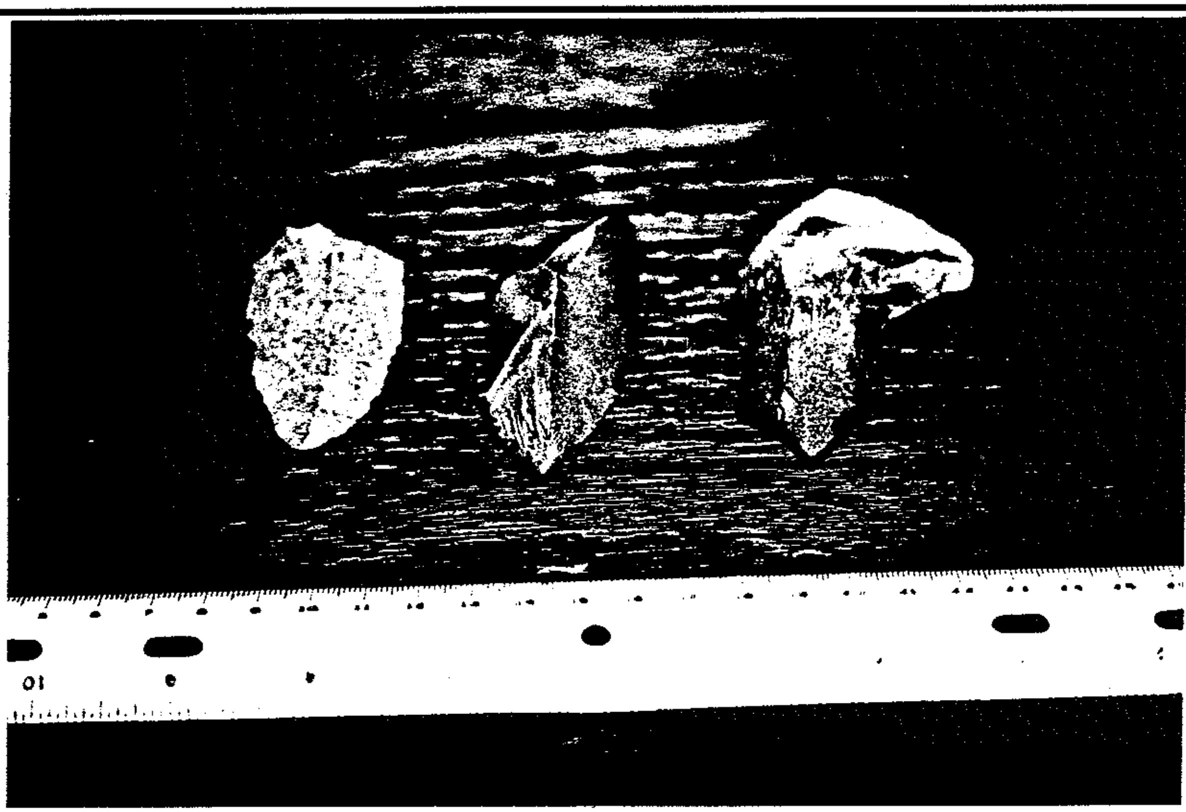
DOMED SCRAPER, GRAVER AND PLANE FROM W-3861.
( L. TO R.: CAT. #915, #4 AND #275 )



KNIVES, BIFACE BLADE, AND UTILIZED FLAKES FROM W-3861.
( L. TO R. : CAT. #770, #78, #832 AND #960 )



SELECTED PERFORATORS FROM W-3861.
( L. TO R.: CAT. #72, #637 AND # 667 )



SELECTED BLADES AND KNIVES FROM W-3861.
( L. TO R.: CAT. #634, #943 AND #175 )

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 82 | W-3861 | Precision Tools | E76/S37 | Scrapers | Bilateral | Basalt | 1 | |
| 126 | W-3861 | Precision Tools | E78/S28 | Scrapers | Bilateral | Basalt | 1 | |
| 343 | W-3861 | Precision Tools | E234/S138 | Scrapers | Bilateral | Basalt | 1 | |
| 489 | W-3861 | Precision Tools | E238/S126 | Scrapers | Bilateral | Basalt | 1 | |
| 679 | W-3861 | Precision Tools | E215/S131 | Scrapers | Bilateral | Basalt | 1 | |
| 680 | W-3861 | Precision Tools | E219/S137 | Scrapers | Bilateral | Basalt | 1 | |
| 717 | W-3861 | Precision Tools | E70/S28 | Scrapers | Bilateral | Basalt | 1 | |
| 847 | W-3861 | Precision Tools | E128/S23 | Scrapers | Bilateral | Basalt | 1 | |
| 901 | W-3861 | Precision Tools | E226/S130 | Scrapers | Bilateral | Basalt | 1 | |
| | | | | | | | 9 | |
| 771 | W-3861 | Precision Tools | E128/S30 | Scrapers | Cobble | Basalt | 1 | |
| 776 | W-3861 | Precision Tools | E69/S35 | Scrapers | Cobble | Basalt | 1 | ** |
| | | | | | | | 2 | |
| 530 | W-3861 | Precision Tools | E235/S129 | Scrapers | Domed | Basalt | 1 | |
| 806 | W-3861 | Precision Tools | E130/S26 | Scrapers | Domed | Basalt | 1 | |
| 924 | W-3861 | Precision Tools | E231/S137 | Scrapers | Domed | Basalt | 1 | |
| 991 | W-3861 | Precision Tools | E142/S60 | Scrapers | Domed | Basalt | 1 | |
| 1000 | W-3861 | Precision Tools | E146/S60 | Scrapers | Domed | Basalt | 1 | ** |
| | | | | | | | 5 | |
| 38 | W-3861 | Precision Tools | E75/S27 | Scrapers | End | Basalt | 1 | |
| 189 | W-3861 | Precision Tools | E81/S36 | Scrapers | End | Basalt | 1 | |
| 301 | W-3861 | Precision Tools | E87/S23 | Scrapers | End | Basalt | 1 | |
| 328 | W-3861 | Precision Tools | E88/S32 | Scrapers | End | Basalt | 1 | |
| 344 | W-3861 | Precision Tools | E234/S138 | Scrapers | End | Basalt | 1 | |
| 346 | W-3861 | Precision Tools | E234/S136 | Scrapers | End | Basalt | 1 | |
| 352 | W-3861 | Precision Tools | E234/S129 | Scrapers | End | Basalt | 1 | |
| 507 | W-3861 | Precision Tools | E236/S125 | Scrapers | End | Basalt | 1 | |
| 509 | W-3861 | Precision Tools | E236/S126 | Scrapers | End | Basalt | 1 | |
| 515 | W-3861 | Precision Tools | E236/S130 | Scrapers | End | Basalt | 1 | ** |

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 534 | W-3861 | Precision Tools | E229/S125 | Scrapers | End | Basalt | 1 | |
| 633 | W-3861 | Precision Tools | E160/S37 | Scrapers | End | Basalt | 1 | |
| 768 | W-3861 | Precision Tools | E69/S25 | Scrapers | End | Basalt | 1 | |
| 862 | W-3861 | Precision Tools | E230/S136 | Scrapers | End | Basalt | 1 | |
| 869 | W-3861 | Precision Tools | E246/S127 | Scrapers | End | Basalt | 1 | |
| 923 | W-3861 | Precision Tools | E231/S134 | Scrapers | End | Basalt | 1 | |
| 988 | W-3861 | Precision Tools | E141/S184 | Scrapers | End | Basalt | 1 | |
| 1045 | W-3861 | Precision Tools | E151/S20 | Scrapers | End | Basalt | 1 | |
| | | | | | | | 18 | |
| 21 | W-3861 | Precision Tools | E74/S43 | Scrapers | Flake | Basalt | 1 | |
| 23 | W-3861 | Precision Tools | E74/S46 | Scrapers | Flake | Basalt | 1 | |
| 46 | W-3861 | Precision Tools | E75/S41 | Scrapers | Flake | Basalt | 1 | |
| 48 | W-3861 | Precision Tools | E75/S45 | Scrapers | Flake | Basalt | 1 | |
| 63 | W-3861 | Precision Tools | E76/S23 | Scrapers | Flake | Basalt | 1 | |
| 64 | W-3861 | Precision Tools | E76/S23 | Scrapers | Flake | Basalt | 1 | |
| 173 | W-3861 | Precision Tools | E80/S41 | Scrapers | Flake | Basalt | 1 | |
| 385 | W-3861 | Precision Tools | E144/S174 | Scrapers | Flake | Basalt | 1 | |
| 406 | W-3861 | Precision Tools | E233/S138 | Scrapers | Flake | Basalt | 1 | |
| 440 | W-3861 | Precision Tools | E73/S23 | Scrapers | Flake | Basalt | 1 | |
| 618 | W-3861 | Precision Tools | E156/S51 | Scrapers | Flake | Basalt | 1 | |
| 683 | W-3861 | Precision Tools | E223/S135 | Scrapers | Flake | Basalt | 1 | |
| 772 | W-3861 | Precision Tools | E69/S29 | Scrapers | Flake | Basalt | 1 | |
| 803 | W-3861 | Precision Tools | E129/S30 | Scrapers | Flake | Basalt | 1 | |
| 833 | W-3861 | Precision Tools | E136/S38 | Scrapers | Flake | Basalt | 1 | |
| 981 | W-3861 | Precision Tools | E141/S177 | Scrapers | Flake | Basalt | 1 | |
| 1114 | W-3861 | Precision Tools | E157/S26 | Scrapers | Flake | Basalt | 1 | |
| 1119 | W-3861 | Precision Tools | E157/S30 | Scrapers | Flake | Basalt | 1 | |
| | | | | | | | 18 | |
| 11 | W-3861 | Precision Tools | E74/S32 | Scrapers | Plane | Basalt | 1 | |
| 270 | W-3861 | Precision Tools | E86/S28 | Scrapers | Plane | Basalt | 1 | |

## TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 354 | W-3861 | Precision Tools | E234/S125 | Scrapers | Plane | Basalt | 1 | |
| 392 | W-3861 | Precision Tools | E233/S126 | Scrapers | Plane | Basalt | 1 | |
| 413 | W-3861 | Precision Tools | E238/S131 | Scrapers | Plane | Basalt | 1 | |
| 510 | W-3861 | Precision Tools | E236/S127 | Scrapers | Plane | Basalt | 1 | |
| 707 | W-3861 | Precision Tools | E39/S52 | Scrapers | Plane | Basalt | 1 | |
| 731 | W-3861 | Precision Tools | E57/S42 | Scrapers | Plane | Basalt | 1 | |
| 777 | W-3861 | Precision Tools | E69/S36 | Scrapers | Plane | Basalt | 1 | |
| 787 | W-3861 | Precision Tools | E72/S41 | Scrapers | Plane | Basalt | 1 | |
| 793 | W-3861 | Precision Tools | E46/S28 | Scrapers | Plane | Basalt | 1 | |
| 843 | W-3861 | Precision Tools | E140/S31 | Scrapers | Plane | Basalt | 1 | |
| 1115 | W-3861 | Precision Tools | E157/S26 | Scrapers | Plane | Basalt | 1 | ** |
| | | | | | | | 13 | |
| 742 | W-3861 | Precision Tools | E64/S30 | Scrapers | Rectangular | Basalt | 1 | |
| | | | | | | | 1 | |
| 5 | W-3861 | Precision Tools | E74/S23 | Scrapers | Side | Basalt | 1 | |
| 32 | W-3861 | Precision Tools | E75/S20 | Scrapers | Side | Basalt | 1 | |
| 59 | W-3861 | Precision Tools | E76/S22 | Scrapers | Side | Basalt | 1 | |
| 96 | W-3861 | Precision Tools | E77/S29 | Scrapers | Side | Basalt | 1 | |
| 158 | W-3861 | Precision Tools | E80/S20 | Scrapers | Side | Basalt | 1 | |
| 228 | W-3861 | Precision Tools | E83/S38 | Scrapers | Side | Basalt | 1 | |
| 241 | W-3861 | Precision Tools | E84/S37 | Scrapers | Side | Basalt | 1 | |
| 272 | W-3861 | Precision Tools | E86/S28 | Scrapers | Side | Basalt | 1 | |
| 447 | W-3861 | Precision Tools | E73/S39 | Scrapers | Side | Basalt | 1 | |
| 458 | W-3861 | Precision Tools | E94/S96 | Scrapers | Side | Basalt | 1 | |
| 494 | W-3861 | Precision Tools | E237/S125 | Scrapers | Side | Basalt | 1 | |
| 501 | W-3861 | Precision Tools | E237/S135 | Scrapers | Side | Basalt | 1 | |
| 542 | W-3861 | Precision Tools | E228/S129 | Scrapers | Side | Basalt | 1 | |
| 564 | W-3861 | Precision Tools | E145/S168 | Scrapers | Side | Basalt | 1 | |
| 573 | W-3861 | Precision Tools | E146/S182 | Scrapers | Side | Basalt | 1 | |
| 605 | W-3861 | Precision Tools | E155/S28 | Scrapers | Side | Basalt | 1 | |

## TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 753 | W-3861 | Precision Tools | E68/S29 | Scrapers | Side | Basalt | 1 | |
| 856 | W-3861 | Precision Tools | E137/S43 | Scrapers | Side | Basalt | 1 | |
| 1041 | W-3861 | Precision Tools | E130/S55 | Scrapers | Side | Basalt | 1 | |
| 1089 | W-3861 | Precision Tools | E157/S55 | Scrapers | Side | Basalt | 1 | |
| 1096 | W-3861 | Precision Tools | E154/S180 | Scrapers | Side | Basalt | 1 | |
| | | | | | | | 21 | |
| 164 | W-3861 | Precision Tools | E80/S34 | Scrapers | Beaked | Felsite | 1 | |
| 223 | W-3861 | Precision Tools | E83/S31 | Scrapers | Beaked | Felsite | 1 | |
| | | | | | | | 2 | |
| 92 | W-3861 | Precision Tools | E77/S28 | Scrapers | Bilateral | Felsite | 1 | ** |
| 149 | W-3861 | Precision Tools | E79/S48 | Scrapers | Bilateral | Felsite | 1 | |
| 175 | W-3861 | Precision Tools | E80/S42 | Scrapers | Bilateral | Felsite | 1 | ** |
| 243 | W-3861 | Precision Tools | E84/S39 | Scrapers | Bilateral | Felsite | 1 | |
| 271 | W-3861 | Precision Tools | E86/S28 | Scrapers | Bilateral | Felsite | 1 | ** |
| 324 | W-3861 | Precision Tools | E88/S26 | Scrapers | Bilateral | Felsite | 1 | ** |
| 356 | W-3861 | Precision Tools | E232/S137 | Scrapers | Bilateral | Felsite | 1 | ** |
| 394 | W-3861 | Precision Tools | E233/S127 | Scrapers | Bilateral | Felsite | 1 | ** |
| 444 | W-3861 | Precision Tools | E73/S33 | Scrapers | Bilateral | Felsite | 1 | |
| 446 | W-3861 | Precision Tools | E73/S37 | Scrapers | Bilateral | Felsite | 1 | ** |
| 463 | W-3861 | Precision Tools | E101/S40 | Scrapers | Bilateral | Felsite | 1 | ** |
| 621 | W-3861 | Precision Tools | E158/S21 | Scrapers | Bilateral | Felsite | 1 | ** |
| 636 | W-3861 | Precision Tools | E160/S89 | Scrapers | Bilateral | Felsite | 1 | ** |
| 642 | W-3861 | Precision Tools | E163/S46 | Scrapers | Bilateral | Felsite | 1 | ** |
| 757 | W-3861 | Precision Tools | E68/S41 | Scrapers | Bilateral | Felsite | 1 | |
| 938 | W-3861 | Precision Tools | E241/S125 | Scrapers | Bilateral | Felsite | 1 | |
| 1048 | W-3861 | Precision Tools | E153/S38 | Scrapers | Bilateral | Felsite | 1 | ** |
| | | | | | | | 17 | |
| 560 | W-3861 | Precision Tools | E141/S61 | Scrapers | Bilateral | Felsite | 1 | |
| | | | | | | | 1 | |

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 174 | W-3861 | Precision Tools | E80/S42 | Scrapers | Discoidal | Felsite | 1 | ** |
| | | | | | | | 1 | |
| 119 | W-3861 | Precision Tools | E78/S22 | Scrapers | Domed | Felsite | 1 | ** |
| 525 | W-3861 | Precision Tools | E235/S126 | Scrapers | Domed | Felsite | 1 | ** |
| 600 | W-3861 | Precision Tools | E154/S25 | Scrapers | Domed | Felsite | 1 | |
| 604 | W-3861 | Precision Tools | E155/S26 | Scrapers | Domed | Felsite | 1 | ** |
| 652 | W-3861 | Precision Tools | E166/S23 | Scrapers | Domed | Felsite | 1 | ** |
| 781 | W-3861 | Precision Tools | E72/S24 | Scrapers | Domed | Felsite | 1 | ** |
| 811 | W-3861 | Precision Tools | E132/S21 | Scrapers | Domed | Felsite | 1 | ** |
| 835 | W-3861 | Precision Tools | E136/S60 | Scrapers | Domed | Felsite | 1 | ** |
| 975 | W-3861 | Precision Tools | E141/S163 | Scrapers | Domed | Felsite | 1 | ** |
| 1021 | W-3861 | Precision Tools | E149/S187 | Scrapers | Domed | Felsite | 1 | |
| | | | | | | | 10 | |
| 632 | W-3861 | Precision Tools | E158/S74 | Scrapers | Domed | Felsite | 1 | ** |
| | | | | | | | 1 | |
| 22 | W-3861 | Precision Tools | E74/S45 | Scrapers | End | Felsite | 1 | |
| 49 | W-3861 | Precision Tools | E75/S45 | Scrapers | End | Felsite | 1 | |
| 85 | W-3861 | Precision Tools | E76/S44 | Scrapers | End | Felsite | 1 | |
| 183 | W-3861 | Precision Tools | E81/S30 | Scrapers | End | Felsite | 1 | |
| 194 | W-3861 | Precision Tools | E81/S40 | Scrapers | End | Felsite | 1 | |
| 206 | W-3861 | Precision Tools | E82/S30 | Scrapers | End | Felsite | 1 | |
| 221 | W-3861 | Precision Tools | E83/S29 | Scrapers | End | Felsite | 1 | |
| 255 | W-3861 | Precision Tools | E85/S29 | Scrapers | End | Felsite | 1 | |
| 263 | W-3861 | Precision Tools | E85/S53 | Scrapers | End | Felsite | 1 | |
| 340 | W-3861 | Precision Tools | E88/S42 | Scrapers | End | Felsite | 1 | ** |
| 369 | W-3861 | Precision Tools | E232/S130 | Scrapers | End | Felsite | 1 | |
| 387 | W-3861 | Precision Tools | E144/S167 | Scrapers | End | Felsite | 1 | |
| 436 | W-3861 | Precision Tools | E150/S196 | Scrapers | End | Felsite | 1 | ** |
| 448 | W-3861 | Precision Tools | E91/S36 | Scrapers | End | Felsite | 1 | |

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 475 | W-3861 | Precision Tools | E92/S37 | Scrapers | End | Felsite | 1 | |
| 641 | W-3861 | Precision Tools | E163/S50 | Scrapers | End | Felsite | 1 | |
| 665 | W-3861 | Precision Tools | Trench 10 | Scrapers | End | Felsite | 1 | |
| 715 | W-3861 | Precision Tools | E70/S24 | Scrapers | End | Felsite | 1 | |
| 800 | W-3861 | Precision Tools | E95/S53 | Scrapers | End | Felsite | 1 | |
| 816 | W-3861 | Precision Tools | E140/S64 | Scrapers | End | Felsite | 1 | |
| 883 | W-3861 | Precision Tools | E246/S137 | Scrapers | End | Felsite | 1 | |
| 932 | W-3861 | Precision Tools | E240/S128 | Scrapers | End | Felsite | 1 | |
| 933 | W-3861 | Precision Tools | E240/S130 | Scrapers | End | Felsite | 1 | |
| 949 | W-3861 | Precision Tools | E242/S134 | Scrapers | End | Felsite | 1 | |
| 967 | W-3861 | Precision Tools | E140/S173 | Scrapers | End | Felsite | 1 | |
| 1036 | W-3861 | Precision Tools | E151/S182 | Scrapers | End | Felsite | 1 | |
| 1038 | W-3861 | Precision Tools | E151/S188 | Scrapers | End | Felsite | 1 | |
| | | | | | | | 27 | |
| 4 | W-3861 | Precision Tools | E74/S23 | Scrapers | Flake | Felsite | 1 | ** |
| 10 | W-3861 | Precision Tools | E74/S32 | Scrapers | Flake | Felsite | 1 | |
| 35 | W-3861 | Precision Tools | E75/S24 | Scrapers | Flake | Felsite | 1 | |
| 43 | W-3861 | Precision Tools | E75/S36 | Scrapers | Flake | Felsite | 1 | |
| 54 | W-3861 | Precision Tools | E75/S55 | Scrapers | Flake | Felsite | 1 | |
| 67 | W-3861 | Precision Tools | E76/S27 | Scrapers | Flake | Felsite | 1 | |
| 90 | W-3861 | Precision Tools | E77/S26 | Scrapers | Flake | Felsite | 1 | |
| 145 | W-3861 | Precision Tools | E79/S39 | Scrapers | Flake | Felsite | 1 | |
| 152 | W-3861 | Precision Tools | E79/S54 | Scrapers | Flake | Felsite | 1 | |
| 162 | W-3861 | Precision Tools | E80/S30 | Scrapers | Flake | Felsite | 1 | |
| 191 | W-3861 | Precision Tools | E81/S39 | Scrapers | Flake | Felsite | 1 | |
| 216 | W-3861 | Precision Tools | E82/S45 | Scrapers | Flake | Felsite | 1 | |
| 261 | W-3861 | Precision Tools | E85/S45 | Scrapers | Flake | Felsite | 1 | |
| 287 | W-3861 | Precision Tools | E86/S45 | Scrapers | Flake | Felsite | 1 | ** |
| 291 | W-3861 | Precision Tools | E86/S47 | Scrapers | Flake | Felsite | 1 | |
| 294 | W-3861 | Precision Tools | E86/S49 | Scrapers | Flake | Felsite | 1 | Fragment |
| 397 | W-3861 | Precision Tools | E233/S129 | Scrapers | Flake | Felsite | 1 | |

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 437 | W-3861 | Precision Tools | E73/S19 | Scrapers | Flake | Felsite | 1 | |
| 454 | W-3861 | Precision Tools | E94/S65 | Scrapers | Flake | Felsite | 1 | |
| 455 | W-3861 | Precision Tools | E94/S65 | Scrapers | Flake | Felsite | 1 | |
| 576 | W-3861 | Precision Tools | E149/S175 | Scrapers | Flake | Felsite | 1 | ** |
| 599 | W-3861 | Precision Tools | E154/S23 | Scrapers | Flake | Felsite | 1 | |
| 616 | W-3861 | Precision Tools | E156/S35 | Scrapers | Flake | Felsite | 1 | |
| 714 | W-3861 | Precision Tools | E70/S23 | Scrapers | Flake | Felsite | 1 | |
| 729 | W-3861 | Precision Tools | E57/S42 | Scrapers | Flake | Felsite | 1 | |
| 736 | W-3861 | Precision Tools | E61/S39 | Scrapers | Flake | Felsite | 1 | ** |
| 754 | W-3861 | Precision Tools | E68/S33 | Scrapers | Flake | Felsite | 1 | |
| 762 | W-3861 | Precision Tools | E69/S21 | Scrapers | Flake | Felsite | 1 | |
| 783 | W-3861 | Precision Tools | E72/S33 | Scrapers | Flake | Felsite | 1 | |
| 839 | W-3861 | Precision Tools | E95/S37 | Scrapers | Flake | Felsite | 1 | |
| 920 | W-3861 | Precision Tools | E227/S130 | Scrapers | Flake | Felsite | 1 | |
| 956 | W-3861 | Precision Tools | E244/S130 | Scrapers | Flake | Felsite | 1 | |
| 959 | W-3861 | Precision Tools | E245/S127 | Scrapers | Flake | Felsite | 1 | |
| 1035 | W-3861 | Precision Tools | E151/S182 | Scrapers | Flake | Felsite | 1 | |
| 1074 | W-3861 | Precision Tools | E147/S190 | Scrapers | Flake | Felsite | 1 | ** |
| 1079 | W-3861 | Precision Tools | E148/S186 | Scrapers | Flake | Felsite | 1 | |
| 1104 | W-3861 | Precision Tools | E159/S26 | Scrapers | Flake | Felsite | 1 | |
| | | | | | | | 37 | |
| 851 | W-3861 | Precision Tools | E229/S131 | Scrapers | Flakes | Felsite | 1 | |
| | | | | | | | 1 | |
| 68 | W-3861 | Precision Tools | E76/S28 | Scrapers | Plane | Felsite | 1 | |
| 222 | W-3861 | Precision Tools | E83/S31 | Scrapers | Plane | Felsite | 1 | |
| 381 | W-3861 | Precision Tools | E139/S22 | Scrapers | Plane | Felsite | 1 | |
| 399 | W-3861 | Precision Tools | E233/S132 | Scrapers | Plane | Felsite | 1 | |
| 423 | W-3861 | Precision Tools | E131/S32 | Scrapers | Plane | Felsite | 1 | |
| 491 | W-3861 | Precision Tools | E238/S128 | Scrapers | Plane | Felsite | 1 | |
| 695 | W-3861 | Precision Tools | E225/S134 | Scrapers | Plane | Felsite | 1 | ** |

## TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 708 | W-3861 | Precision Tools | E39/S54 | Scrapers | Plane | Felsite | 1 | ** |
| | | | | | | | 8 | |
| 47 | W-3861 | Precision Tools | E75/S41 | Scrapers | Side | Felsite | 1 | |
| 91 | W-3861 | Precision Tools | E77/S27 | Scrapers | Side | Felsite | 1 | |
| 108 | W-3861 | Precision Tools | E77/S43 | Scrapers | Side | Felsite | 1 | |
| 168 | W-3861 | Precision Tools | E80/S36 | Scrapers | Side | Felsite | 1 | |
| 171 | W-3861 | Precision Tools | E80/S41 | Scrapers | Side | Felsite | 1 | |
| 200 | W-3861 | Precision Tools | E82/S19 | Scrapers | Side | Felsite | 1 | Fragment |
| 234 | W-3861 | Precision Tools | E84/S23 | Scrapers | Side | Felsite | 1 | ** |
| 316 | W-3861 | Precision Tools | E87/S49 | Scrapers | Side | Felsite | 1 | |
| 330 | W-3861 | Precision Tools | E88/S35 | Scrapers | Side | Felsite | 1 | |
| 348 | W-3861 | Precision Tools | E234/S132 | Scrapers | Side | Felsite | 1 | |
| 358 | W-3861 | Precision Tools | E232/S136 | Scrapers | Side | Felsite | 1 | |
| 364 | W-3861 | Precision Tools | E232/S134 | Scrapers | Side | Felsite | 1 | ** |
| 424 | W-3861 | Precision Tools | E150/S188 | Scrapers | Side | Felsite | 1 | |
| 464 | W-3861 | Precision Tools | E102/S33 | Scrapers | Side | Felsite | 1 | |
| 465 | W-3861 | Precision Tools | E102/S45 | Scrapers | Side | Felsite | 1 | ** |
| 677 | W-3861 | Precision Tools | E212/S124 | Scrapers | Side | Felsite | 1 | |
| 686 | W-3861 | Precision Tools | E224/S130 | Scrapers | Side | Felsite | 1 | |
| 699 | W-3861 | Precision Tools | E225/S137 | Scrapers | Side | Felsite | 1 | |
| 700 | W-3861 | Precision Tools | E31/S53 | Scrapers | Side | Felsite | 1 | |
| 723 | W-3861 | Precision Tools | E70/S38 | Scrapers | Side | Felsite | 1 | |
| 733 | W-3861 | Precision Tools | E58/S38 | Scrapers | Side | Felsite | 1 | |
| 737 | W-3861 | Precision Tools | E61/S43 | Scrapers | Side | Felsite | 1 | |
| 739 | W-3861 | Precision Tools | E64/S30 | Scrapers | Side | Felsite | 1 | |
| 813 | W-3861 | Precision Tools | E133/S27 | Scrapers | Side | Felsite | 1 | ** |
| 820 | W-3861 | Precision Tools | E129/S90 | Scrapers | Side | Felsite | 1 | |
| 935 | W-3861 | Precision Tools | E240/S132 | Scrapers | Side | Felsite | 1 | |
| 942 | W-3861 | Precision Tools | E241/S129 | Scrapers | Side | Felsite | 1 | |
| | | | | | | | 27 | |

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 527 | W-3861 | Precision Tools | E235/S127 | Scrapers | Thumbnail | Felsite | 1 | |
| | | | | | | | 1 | |
| 81 | W-3861 | Precision Tools | E76/S37 | Scrapers | Bilateral | Quartzite | 1 | |
| 409 | W-3861 | Precision Tools | E68/S22 | Scrapers | Bilateral | Quartzite | 1 | |
| 910 | W-3861 | Precision Tools | E226/S133 | Scrapers | Bilateral | Quartzite | 1 | |
| | | | | | | | 3 | |
| 529 | W-3861 | Precision Tools | E235/S127 | Scrapers | Bilateral | Quartzite | 1 | |
| | | | | | | | 1 | |
| 472 | W-3861 | Precision Tools | E71/S36 | Scrapers | Domed | Quartzite | 1 | |
| | | | | | | | 1 | |
| 685 | W-3861 | Precision Tools | E224/S128 | Scrapers | End | Quartzite | 1 | |
| 1046 | W-3861 | Precision Tools | E151/S22 | Scrapers | End | Quartzite | 1 | |
| | | | | | | | 2 | |
| 55 | W-3861 | Precision Tools | E76/S21 | Scrapers | Flake | Quartzite | 1 | |
| 309 | W-3861 | Precision Tools | E87/S37 | Scrapers | Flake | Quartzite | 1 | |
| 425 | W-3861 | Precision Tools | E150/S188 | Scrapers | Flake | Quartzite | 1 | |
| 607 | W-3861 | Precision Tools | E155/S40 | Scrapers | Flake | Quartzite | 1 | |
| 837 | W-3861 | Precision Tools | E138/S155 | Scrapers | Flake | Quartzite | 1 | ** |
| 841 | W-3861 | Precision Tools | E138/S74 | Scrapers | Flake | Quartzite | 1 | |
| 1098 | W-3861 | Precision Tools | E154/S183 | Scrapers | Flake | Quartzite | 1 | |
| | | | | | | | 7 | |
| 445 | W-3861 | Precision Tools | E73/S37 | Scrapers | Plane | Quartzite | 1 | |
| | | | | | | | 1 | |
| 265 | W-3861 | Precision Tools | E86/S22 | Scrapers | Side | Quartzite | 1 | |
| 342 | W-3861 | Precision Tools | E88/S51 | Scrapers | Side | Quartzite | 1 | |

TABLE 12 - Scrapers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 460 | W-3861 | Precision Tools | E99/S48 | Scrapers | Side | Quartzite | 1 | |
| 718 | W-3861 | Precision Tools | E70/S29 | Scrapers | Side | Quartzite | 1 | |
| | | | | | | | 4 | |
| | | | | | | | 239 | |

TABLE 13 - Utilized Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 20 | W-3861 | Precision Tools | E74/S43 | Utilized Flakes | | Basalt | 1 | |
| 42 | W-3861 | Precision Tools | E75/S36 | Utilized Flakes | | Basalt | 1 | |
| 65 | W-3861 | Precision Tools | E76/S24 | Utilized Flakes | | Basalt | 1 | |
| 79 | W-3861 | Precision Tools | E76/S35 | Utilized Flakes | | Basalt | 1 | |
| 89 | W-3861 | Precision Tools | E77/S25 | Utilized Flakes | | Basalt | 1 | |
| 97 | W-3861 | Precision Tools | E77/S29 | Utilized Flakes | | Basalt | 1 | |
| 181 | W-3861 | Precision Tools | E81/S24 | Utilized Flakes | | Basalt | 1 | |
| 198 | W-3861 | Precision Tools | E81/S53 | Utilized Flakes | | Basalt | 1 | |
| 208 | W-3861 | Precision Tools | E82/S32 | Utilized Flakes | | Basalt | 1 | |
| 257 | W-3861 | Precision Tools | E85/S35 | Utilized Flakes | | Basalt | 1 | |
| 282 | W-3861 | Precision Tools | E86/S41 | Utilized Flakes | | Basalt | 1 | |
| 296 | W-3861 | Precision Tools | E87/S20 | Utilized Flakes | | Basalt | 1 | |
| 336 | W-3861 | Precision Tools | E88/S37 | Utilized Flakes | | Basalt | 1 | |
| 353 | W-3861 | Precision Tools | E234/S127 | Utilized Flakes | | Basalt | 1 | |
| 355 | W-3861 | Precision Tools | E232/S137 | Utilized Flakes | | Basalt | 1 | |
| 382 | W-3861 | Precision Tools | E139/S20 | Utilized Flakes | | Basalt | 1 | |
| 383 | W-3861 | Precision Tools | E139/S20 | Utilized Flakes | | Basalt | 1 | |
| 402 | W-3861 | Precision Tools | E233/S133 | Utilized Flakes | | Basalt | 1 | |
| 415 | W-3861 | Precision Tools | E238/S134 | Utilized Flakes | | Basalt | 1 | |
| 419 | W-3861 | Precision Tools | E238/S137 | Utilized Flakes | | Basalt | 1 | |
| 427 | W-3861 | Precision Tools | E150/S195 | Utilized Flakes | | Basalt | 1 | |
| 456 | W-3861 | Precision Tools | E94/S65 | Utilized Flakes | | Basalt | 1 | |
| 476 | W-3861 | Precision Tools | E92/S41 | Utilized Flakes | | Basalt | 1 | |
| 488 | W-3861 | Precision Tools | E238/S126 | Utilized Flakes | | Basalt | 1 | |
| 496 | W-3861 | Precision Tools | E237/S126 | Utilized Flakes | | Basalt | 1 | |
| 535 | W-3861 | Precision Tools | E229/S125 | Utilized Flakes | | Basalt | 1 | |
| 547 | W-3861 | Precision Tools | E228/S135 | Utilized Flakes | | Basalt | 1 | |
| 552 | W-3861 | Precision Tools | E228/S138 | Utilized Flakes | | Basalt | 1 | |
| 558 | W-3861 | Precision Tools | E141/S55 | Utilized Flakes | | Basalt | 1 | |
| 603 | W-3861 | Precision Tools | E155/S24 | Utilized Flakes | | Basalt | 1 | |
| 609 | W-3861 | Precision Tools | E155/S59 | Utilized Flakes | | Basalt | 1 | |
| 640 | W-3861 | Precision Tools | E163/S50 | Utilized Flakes | | Basalt | 1 | |

TABLE 13 - Utilized Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 646 | W-3861 | Precision Tools | E164/S24 | Utilized Flakes | | Basalt | 1 | |
| 687 | W-3861 | Precision Tools | E224/S130 | Utilized Flakes | | Basalt | 1 | |
| 702 | W-3861 | Precision Tools | E31/S54 | Utilized Flakes | | Basalt | 1 | |
| 711 | W-3861 | Precision Tools | E63/S25 | Utilized Flakes | | Basalt | 1 | |
| 713 | W-3861 | Precision Tools | E63/S39 | Utilized Flakes | | Basalt | 1 | |
| 752 | W-3861 | Precision Tools | E68/S26 | Utilized Flakes | | Basalt | 1 | |
| 758 | W-3861 | Precision Tools | E68/S41 | Utilized Flakes | | Basalt | 1 | |
| 759 | W-3861 | Precision Tools | E69/S19 | Utilized Flakes | | Basalt | 1 | |
| 764 | W-3861 | Precision Tools | E69/S22 | Utilized Flakes | | Basalt | 1 | |
| 766 | W-3861 | Precision Tools | E69/S24 | Utilized Flakes | | Basalt | 1 | |
| 782 | W-3861 | Precision Tools | E72/S27 | Utilized Flakes | | Basalt | 1 | |
| 817 | W-3861 | Precision Tools | E140/S70 | Utilized Flakes | | Basalt | 1 | |
| 821 | W-3861 | Precision Tools | E129/S54 | Utilized Flakes | | Basalt | 1 | |
| 834 | W-3861 | Precision Tools | E136/S49 | Utilized Flakes | | Basalt | 1 | |
| 872 | W-3861 | Precision Tools | E246/S133 | Utilized Flakes | | Basalt | 1 | |
| 880 | W-3861 | Precision Tools | E246/S135 | Utilized Flakes | | Basalt | 1 | |
| 906 | W-3861 | Precision Tools | E226/S132 | Utilized Flakes | | Basalt | 1 | |
| 941 | W-3861 | Precision Tools | E241/S129 | Utilized Flakes | | Basalt | 1 | |
| 947 | W-3861 | Precision Tools | E242/S133 | Utilized Flakes | | Basalt | 1 | |
| 965 | W-3861 | Precision Tools | E140/S167 | Utilized Flakes | | Basalt | 1 | |
| 966 | W-3861 | Precision Tools | E140/S171 | Utilized Flakes | | Basalt | 1 | |
| 971 | W-3861 | Precision Tools | E140/S183 | Utilized Flakes | | Basalt | 1 | |
| 994 | W-3861 | Precision Tools | E137/S71 | Utilized Flakes | | Basalt | 1 | |
| 999 | W-3861 | Precision Tools | E146/S60 | Utilized Flakes | | Basalt | 1 | |
| 1013 | W-3861 | Precision Tools | E149/S183 | Utilized Flakes | | Basalt | 1 | |
| 1062 | W-3861 | Precision Tools | E150/S180 | Utilized Flakes | | Basalt | 1 | |
| 1085 | W-3861 | Precision Tools | E152/S178 | Utilized Flakes | | Basalt | 1 | |
| 1087 | W-3861 | Precision Tools | E152/S181 | Utilized Flakes | | Basalt | 1 | |
| 1088 | W-3861 | Precision Tools | E152/S183 | Utilized Flakes | | Basalt | 1 | |
| 1094 | W-3861 | Precision Tools | E157/S85 | Utilized Flakes | | Basalt | 1 | |
| 1108 | W-3861 | Precision Tools | E159/S46 | Utilized Flakes | | Basalt | 1 | |
| | | | | | | | 63 | |

TABLE 13 - Utilized Fla[illegible] Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 148 | W-3861 | Precision Tools | E79/S41 | Utilized Flakes | Spokeshave | Felsite | 1 | |
| 18 | W-3861 | Precision Tools | E74/S41 | Utilized Flakes | | Felsite | 1 | |
| 30 | W-3861 | Precision Tools | E75/S20 | Utilized Flakes | | Felsite | 1 | |
| 52 | W-3861 | Precision Tools | E75/S49 | Utilized Flakes | | Felsite | 1 | |
| 60 | W-3861 | Precision Tools | E76/S22 | Utilized Flakes | | Felsite | 1 | |
| 61 | W-3861 | Precision Tools | E76/S22 | Utilized Flakes | | Felsite | 1 | |
| 87 | W-3861 | Precision Tools | E77/S24 | Utilized Flakes | | Felsite | 1 | |
| 104 | W-3861 | Precision Tools | E77/S39 | Utilized Flakes | | Felsite | 1 | |
| 105 | W-3861 | Precision Tools | E77/S40 | Utilized Flakes | | Felsite | 1 | |
| 110 | W-3861 | Precision Tools | E77/S45 | Utilized Flakes | | Felsite | 1 | |
| 116 | W-3861 | Precision Tools | E78/S19 | Utilized Flakes | | Felsite | 1 | |
| 123 | W-3861 | Precision Tools | E78/S26 | Utilized Flakes | | Felsite | 1 | |
| 127 | W-3861 | Precision Tools | E78/S30 | Utilized Flakes | | Felsite | 1 | ** |
| 133 | W-3861 | Precision Tools | E78/S46 | Utilized Flakes | | Felsite | 1 | |
| 154 | W-3861 | Precision Tools | E80/S18 | Utilized Flakes | | Felsite | 1 | ** |
| 177 | W-3861 | Precision Tools | E80/S44 | Utilized Flakes | | Felsite | 1 | |
| 197 | W-3861 | Precision Tools | E81/S53 | Utilized Flakes | | Felsite | 1 | |
| 209 | W-3861 | Precision Tools | E82/S38 | Utilized Flakes | | Felsite | 1 | |
| 212 | W-3861 | Precision Tools | E82/S40 | Utilized Flakes | | Felsite | 1 | |
| 213 | W-3861 | Precision Tools | E82/S41 | Utilized Flakes | | Felsite | 1 | |
| 214 | W-3861 | Precision Tools | E82/S44 | Utilized Flakes | | Felsite | 1 | |
| 217 | W-3861 | Precision Tools | E82/S54 | Utilized Flakes | | Felsite | 1 | |
| 238 | W-3861 | Precision Tools | E84/S30 | Utilized Flakes | | Felsite | 1 | |
| 239 | W-3861 | Precision Tools | E84/S31 | Utilized Flakes | | Felsite | 1 | |
| 249 | W-3861 | Precision Tools | E85/S24 | Utilized Flakes | | Felsite | 1 | |
| 253 | W-3861 | Precision Tools | E85/S25 | Utilized Flakes | | Felsite | 1 | |
| 254 | W-3861 | Precision Tools | E85/S27 | Utilized Flakes | | Felsite | 1 | |
| 267 | W-3861 | Precision Tools | E86/S25 | Utilized Flakes | | Felsite | 1 | |
| 279 | W-3861 | Precision Tools | E86/S37 | Utilized Flakes | | Felsite | 1 | |
| 300 | W-3861 | Precision Tools | E87/S21 | Utilized Flakes | | Felsite | 1 | |
| 304 | W-3861 | Precision Tools | E87/S28 | Utilized Flakes | | Felsite | 1 | |
| 305 | W-3861 | Precision Tools | E87/S28 | Utilized Flakes | | Felsite | 1 | |

TABLE 13 - Utilized Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 310 | W-3861 | Precision Tools | E87/S37 | Utilized Flakes | | Felsite | 1 | |
| 321 | W-3861 | Precision Tools | E88/S25 | Utilized Flakes | | Felsite | 1 | |
| 329 | W-3861 | Precision Tools | E88/S33 | Utilized Flakes | | Felsite | 1 | |
| 331 | W-3861 | Precision Tools | E88/S35 | Utilized Flakes | | Felsite | 1 | |
| 334 | W-3861 | Precision Tools | E88/S36 | Utilized Flakes | | Felsite | 1 | |
| 335 | W-3861 | Precision Tools | E88/S37 | Utilized Flakes | | Felsite | 1 | |
| 337 | W-3861 | Precision Tools | E88/S38 | Utilized Flakes | | Felsite | 1 | |
| 341 | W-3861 | Precision Tools | E88/S44 | Utilized Flakes | | Felsite | 1 | |
| 349 | W-3861 | Precision Tools | E234/S132 | Utilized Flakes | | Felsite | 1 | |
| 350 | W-3861 | Precision Tools | E234/S131 | Utilized Flakes | | Felsite | 1 | |
| 360 | W-3861 | Precision Tools | E232/S136 | Utilized Flakes | | Felsite | 1 | |
| 366 | W-3861 | Precision Tools | E232/S132 | Utilized Flakes | | Felsite | 1 | |
| 373 | W-3861 | Precision Tools | E232/S126 | Utilized Flakes | | Felsite | 1 | |
| 379 | W-3861 | Precision Tools | E139/S41 | Utilized Flakes | | Felsite | 1 | |
| 390 | W-3861 | Precision Tools | E47/S43 | Utilized Flakes | | Felsite | 1 | |
| 417 | W-3861 | Precision Tools | E238/S134 | Utilized Flakes | | Felsite | 1 | |
| 422 | W-3861 | Precision Tools | E131/S25 | Utilized Flakes | | Felsite | 1 | |
| 428 | W-3861 | Precision Tools | E150/S195 | Utilized Flakes | | Felsite | 1 | |
| 434 | W-3861 | Precision Tools | E150/S196 | Utilized Flakes | | Felsite | 1 | |
| 453 | W-3861 | Precision Tools | E94/S65 | Utilized Flakes | | Felsite | 1 | |
| 467 | W-3861 | Precision Tools | E71/S23 | Utilized Flakes | | Felsite | 1 | |
| 504 | W-3861 | Precision Tools | E237/S136 | Utilized Flakes | | Felsite | 1 | |
| 505 | W-3861 | Precision Tools | E237/S137 | Utilized Flakes | | Felsite | 1 | |
| 528 | W-3861 | Precision Tools | E235/S127 | Utilized Flakes | | Felsite | 1 | |
| 533 | W-3861 | Precision Tools | E235/S136 | Utilized Flakes | | Felsite | 1 | |
| 537 | W-3861 | Precision Tools | E229/S129 | Utilized Flakes | | Felsite | 1 | |
| 540 | W-3861 | Precision Tools | E229/S137 | Utilized Flakes | | Felsite | 1 | |
| 559 | W-3861 | Precision Tools | E141/S57 | Utilized Flakes | | Felsite | 1 | |
| 563 | W-3861 | Precision Tools | E141/S174 | Utilized Flakes | | Felsite | 1 | |
| 580 | W-3861 | Precision Tools | E149/S179 | Utilized Flakes | | Felsite | 1 | |
| 595 | W-3861 | Precision Tools | E153/S85 | Utilized Flakes | | Felsite | 1 | |
| 601 | W-3861 | Precision Tools | E154/S62 | Utilized Flakes | | Felsite | 1 | |

TABLE 13 - Utilized Flakes .ecovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 617 | W-3861 | Precision Tools | E156/S45 | Utilized Flakes | | Felsite | 1 | |
| 619 | W-3861 | Precision Tools | E156/S80 | Utilized Flakes | | Felsite | 1 | |
| 623 | W-3861 | Precision Tools | E158/S21 | Utilized Flakes | | Felsite | 1 | |
| 624 | W-3861 | Precision Tools | E158/S23 | Utilized Flakes | | Felsite | 1 | |
| 625 | W-3861 | Precision Tools | E158/S27 | Utilized Flakes | | Felsite | 1 | |
| 627 | W-3861 | Precision Tools | E158/S29 | Utilized Flakes | | Felsite | 1 | |
| 630 | W-3861 | Precision Tools | E158/S41 | Utilized Flakes | | Felsite | 1 | |
| 631 | W-3861 | Precision Tools | E158/S70 | Utilized Flakes | | Felsite | 1 | |
| 649 | W-3861 | Precision Tools | E164/S49 | Utilized Flakes | | Felsite | 1 | |
| 654 | W-3861 | Precision Tools | E169/S50 | Utilized Flakes | | Felsite | 1 | |
| 656 | W-3861 | Precision Tools | E172/S42 | Utilized Flakes | | Felsite | 1 | |
| 659 | W-3861 | Precision Tools | E175/S35 | Utilized Flakes | | Felsite | 1 | |
| 662 | W-3861 | Precision Tools | E178/S37 | Utilized Flakes | | Felsite | 1 | |
| 681 | W-3861 | Precision Tools | E220/S128 | Utilized Flakes | | Felsite | 1 | |
| 682 | W-3861 | Precision Tools | E223/S135 | Utilized Flakes | | Felsite | 1 | |
| 710 | W-3861 | Precision Tools | E59/S41 | Utilized Flakes | | Felsite | 1 | |
| 726 | W-3861 | Precision Tools | E70/S45 | Utilized Flakes | | Felsite | 1 | |
| 790 | W-3861 | Precision Tools | E42/S47 | Utilized Flakes | | Felsite | 1 | |
| 801 | W-3861 | Precision Tools | E129/S28 | Utilized Flakes | | Felsite | 1 | |
| 818 | W-3861 | Precision Tools | E140/S70 | Utilized Flakes | | Felsite | 1 | |
| 831 | W-3861 | Precision Tools | E136/S24 | Utilized Flakes | | Felsite | 1 | |
| 857 | W-3861 | Precision Tools | E230/S128 | Utilized Flakes | | Felsite | 1 | |
| 858 | W-3861 | Precision Tools | E230/S128 | Utilized Flakes | | Felsite | 1 | |
| 860 | W-3861 | Precision Tools | E230/S130 | Utilized Flakes | | Felsite | 1 | |
| 868 | W-3861 | Precision Tools | E246/S126 | Utilized Flakes | | Felsite | 1 | |
| 882 | W-3861 | Precision Tools | E246/S136 | Utilized Flakes | | Felsite | 1 | |
| 911 | W-3861 | Precision Tools | E226/S134 | Utilized Flakes | | Felsite | 1 | |
| 922 | W-3861 | Precision Tools | E231/S132 | Utilized Flakes | | Felsite | 1 | |
| 928 | W-3861 | Precision Tools | E239/S134 | Utilized Flakes | | Felsite | 1 | |
| 934 | W-3861 | Precision Tools | E240/S130 | Utilized Flakes | | Felsite | 1 | |
| 936 | W-3861 | Precision Tools | E240/S135 | Utilized Flakes | | Felsite | 1 | |
| 948 | W-3861 | Precision Tools | E242/S133 | Utilized Flakes | | Felsite | 1 | |

## TABLE 13 - Utilized Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 952 | W-3861 | Precision Tools | E243/S129 | Utilized Flakes | | Felsite | 1 | |
| 957 | W-3861 | Precision Tools | E244/S132 | Utilized Flakes | | Felsite | 1 | |
| 963 | W-3861 | Precision Tools | E140/S157 | Utilized Flakes | | Felsite | 1 | |
| 968 | W-3861 | Precision Tools | E140/S173 | Utilized Flakes | | Felsite | 1 | |
| 970 | W-3861 | Precision Tools | E140/S182 | Utilized Flakes | | Felsite | 1 | |
| 996 | W-3861 | Precision Tools | E143/S24 | Utilized Flakes | | Felsite | 1 | |
| 998 | W-3861 | Precision Tools | E145/S59 | Utilized Flakes | | Felsite | 1 | |
| 1006 | W-3861 | Precision Tools | E146/S192 | Utilized Flakes | | Felsite | 1 | |
| 1011 | W-3861 | Precision Tools | E147/S184 | Utilized Flakes | | Felsite | 1 | |
| 1017 | W-3861 | Precision Tools | E149/S184 | Utilized Flakes | | Felsite | 1 | |
| 1028 | W-3861 | Precision Tools | E149/S196 | Utilized Flakes | | Felsite | 1 | |
| 1034 | W-3861 | Precision Tools | E151/S182 | Utilized Flakes | | Felsite | 1 | |
| 1039 | W-3861 | Precision Tools | E151/S195 | Utilized Flakes | | Felsite | 1 | |
| 1056 | W-3861 | Precision Tools | E149/S53 | Utilized Flakes | | Felsite | 1 | |
| 1060 | W-3861 | Precision Tools | E150/S179 | Utilized Flakes | | Felsite | 1 | |
| 1068 | W-3861 | Precision Tools | E150/S183 | Utilized Flakes | | Felsite | 1 | |
| 1081 | W-3861 | Precision Tools | E148/S188 | Utilized Flakes | | Felsite | 1 | |
| 1105 | W-3861 | Precision Tools | E159/S34 | Utilized Flakes | | Felsite | 1 | |
| 1109 | W-3861 | Precision Tools | E159/S58 | Utilized Flakes | | Felsite | 1 | |
| 1110 | W-3861 | Precision Tools | E159/S60 | Utilized Flakes | | Felsite | 1 | |
| 1122 | W-3861 | Precision Tools | E157/S32 | Utilized Flakes | | Felsite | 1 | |
| | | | | | | | 117 | |
| 41 | W-3861 | Precision Tools | E75/S28 | Utilized Flakes | | Quartzite | 1 | |
| 53 | W-3861 | Precision Tools | E75/S55 | Utilized Flakes | | Quartzite | 1 | |
| 111 | W-3861 | Precision Tools | E77/S51 | Utilized Flakes | | Quartzite | 1 | |
| 143 | W-3861 | Precision Tools | E79/S35 | Utilized Flakes | | Quartzite | 1 | |
| 161 | W-3861 | Precision Tools | E80/S28 | Utilized Flakes | | Quartzite | 1 | |
| 186 | W-3861 | Precision Tools | E81/S32 | Utilized Flakes | | Quartzite | 1 | |
| 219 | W-3861 | Precision Tools | E83/S21 | Utilized Flakes | | Quartzite | 1 | |
| 244 | W-3861 | Precision Tools | E84/S46 | Utilized Flakes | | Quartzite | 1 | |
| 389 | W-3861 | Precision Tools | E30/S50 | Utilized Flakes | | Quartzite | 1 | |

TABLE 13 - Utilized Flakes Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 420 | W-3861 | Precision Tools | E131/S19 | Utilized Flakes | | Quartzite | 1 | |
| 462 | W-3861 | Precision Tools | E100/S43 | Utilized Flakes | | Quartzite | 1 | |
| 561 | W-3861 | Precision Tools | E141/S73 | Utilized Flakes | | Quartzite | 1 | |
| 584 | W-3861 | Precision Tools | E150/S24 | Utilized Flakes | | Quartzite | 1 | |
| 588 | W-3861 | Precision Tools | E151/S73 | Utilized Flakes | | Quartzite | 1 | |
| 655 | W-3861 | Precision Tools | E170/S49 | Utilized Flakes | | Quartzite | 1 | |
| 796 | W-3861 | Precision Tools | E53/S44 | Utilized Flakes | | Quartzite | 1 | |
| | | | | | | | 16 | |
| | | | | | | | 196 | |

TABLE 14 - Spokeshaves Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 151 | W-3861 | Precision Tools | E79/S52 | Spokeshaves | | Basalt | 1 | |
| 278 | W-3861 | Precision Tools | E86/S37 | Spokeshaves | | Basalt | 1 | |
| 351 | W-3861 | Precision Tools | W234/S130 | Spokeshaves | | Basalt | 1 | |
| 393 | W-3861 | Precision Tools | E233/S127 | Spokeshaves | | Basalt | 1 | |
| 405 | W-3861 | Precision Tools | E233/S137 | Spokeshaves | | Basalt | 1 | |
| 644 | W-3861 | Precision Tools | E163/S40 | Spokeshaves | | Basalt | 1 | |
| 794 | W-3861 | Precision Tools | E46/S28 | Spokeshaves | | Basalt | 1 | |
| 879 | W-3861 | Precision Tools | E246/S135 | Spokeshaves | | Basalt | 1 | |
| 909 | W-3861 | Precision Tools | E226/S133 | Spokeshaves | | Basalt | 1 | |
| 1072 | W-3861 | Precision Tools | E147/S187 | Spokeshaves | | Basalt | 1 | |
| | | | | | | | 10 | |
| 386 | W-3861 | Precision Tools | E144/S167 | Spokeshaves | | Felsite | 1 | |
| 474 | W-3861 | Precision Tools | E92/S32 | Spokeshaves | | Felsite | 1 | |
| 521 | W-3861 | Precision Tools | E236/S137 | Spokeshaves | | Felsite | 1 | |
| 610 | W-3861 | Precision Tools | E155/S79 | Spokeshaves | | Felsite | 1 | |
| 832 | W-3861 | Precision Tools | E136/S24 | Spokeshaves | | Felsite | 1 | |
| 960 | W-3861 | Precision Tools | E245/S130 | Spokeshaves | | Felsite | 1 | ** |
| 1095 | W-3861 | Precision Tools | E154/S179 | Spokeshaves | | Felsite | 1 | |
| | | | | | | | 7 | |
| 589 | W-3861 | Precision Tools | E152/S52 | Spokeshaves | | Quartzite | 1 | |
| | | | | | | | 1 | |
| | | | | | | | 18 | |

### 6.3.3 Spokeshaves

Spokeshaves are morphologically distinct precision tools which are recognized by "U-" or "V"-shaped indentations which were used to modify wood or bone. Very often, spokeshave tools display very little modification other than this indentation. At W-3861, 18 spokeshaves were recovered, of which ten were basalt, seven were felsite and one was quartzite.

### 6.3.4 Perforators

The category of perforators includes both those tools which were manufactured for use as perforators as well as retouched flakes which served as perforator-type tools. Perforators were used to puncture, drill, or bore wood, vegetable matter, or flesh. These tools characteristically display an extended, narrow tip, and are often finely retouched. Tools in this subclass include borers, drills, and gravers.

Eighteen perforators and one graver were recovered from W-3861. The perforators were generally derived from larger flakes which provided an elongated corner that served as the perforating point. The lithic materials used to manufacture the recovered perforators include felsite (13 specimens) and basalt (five specimens). The single graver recovered from the site includes a finely worked point rather than a fortuitous, elongated corner, and was manufactured from felsite.

### 6.3.5 Knives

The category of knives represents a class of tools which have a long, narrow working edge which displays a wear pattern caused by a sawing action rather than scraping. Other than this working edge, knives exhibit no other definitive characteristics. At W-3861, 16 knives were recovered, uniformly distributed throughout the five loci. The lithic distribution of the knives included 11 felsite specimens and five basalt specimens.

### 6.3.6 Bifaces

A biface is essentially a bifacially flaked projectile point or knife. At W-3861, only a single biface was discovered. This specimen (Cat. #78) is a midsection of a felsite lanceolate blade.

TABLE 15 - Perforators and Gravers Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 160 | W-3861 | Precision Tools | E80/S26 | Gravers | | Felsite | 1 | ** |
| | | | | | | | 1 | |
| 72 | W-3861 | Precision Tools | E76/S31 | Perforators | | Basalt | 1 | ** |
| 514 | W-3861 | Precision Tools | E236/S129 | Perforators | | Basalt | 1 | |
| 667 | W-3861 | Precision Tools | TU1/0-10 | Perforators | | Basalt | 1 | |
| 678 | W-3861 | Precision Tools | E213/S125 | Perforators | | Basalt | 1 | |
| 925 | W-3861 | Precision Tools | E231/S137 | Perforators | | Basalt | 1 | |
| | | | | | | | 5 | |
| 861 | W-3861 | Precision Tools | E230/S134 | Perforators | Rectangular | Felsite | 1 | |
| 124 | W-3861 | Precision Tools | E78/S26 | Perforators | Triangular | Felsite | 1 | |
| 16 | W-3861 | Precision Tools | E74/S40 | Perforators | | Felsite | 1 | ** |
| 240 | W-3861 | Precision Tools | E84/S33 | Perforators | | Felsite | 1 | |
| 242 | W-3861 | Precision Tools | E84/S37 | Perforators | | Felsite | 1 | |
| 273 | W-3861 | Precision Tools | E86/S29 | Perforators | | Felsite | 1 | |
| 451 | W-3861 | Precision Tools | E91/S48 | Perforators | | Felsite | 1 | |
| 522 | W-3861 | Precision Tools | E235/S126 | Perforators | | Felsite | 1 | |
| 637 | W-3861 | Precision Tools | E162/S22 | Perforators | | Felsite | 1 | ** |
| 902 | W-3861 | Precision Tools | E226/S129 | Perforators | | Felsite | 1 | |
| 915 | W-3861 | Precision Tools | E227/S137 | Perforators | | Felsite | 1 | |
| 1020 | W-3861 | Precision Tools | E149/S187 | Perforators | | Felsite | 1 | |
| 1097 | W-3861 | Precision Tools | E154/S180 | Perforators | | Felsite | 1 | |
| | | | | | | | 13 | |
| | | | | | | | 19 | |

TABLE 16 - Bifaces and Knives Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 78 | W-3861 | Precision Tools | E76/S34 | Bifaces | | Felsite | 1 | ** |
| | | | | | | | 1 | |
| 443 | W-3861 | Precision Tools | E73/S30 | Knives | Biface | Basalt | 1 | |
| 774 | W-3861 | Precision Tools | E69/S29 | Knives | Biface | Basalt | 1 | ** |
| 770 | W-3861 | Precision Tools | E69/S28 | Knives | Uniface | Basalt | 1 | ** |
| 854 | W-3861 | Precision Tools | E225/S137 | Knives | Uniface | Basalt | 1 | |
| 1121 | W-3861 | Precision Tools | E157/S32 | Knives | Uniface | Basalt | 1 | |
| | | | | | | | 5 | |
| 204 | W-3861 | Precision Tools | E82/S28 | Knives | Biface | Felsite | 1 | |
| 237 | W-3861 | Precision Tools | E84/S28 | Knives | Biface | Felsite | 1 | |
| 511 | W-3861 | Precision Tools | E236/S127 | Knives | Biface | Felsite | 1 | |
| 203 | W-3861 | Precision Tools | E82/S21 | Knives | Uniface | Felsite | 1 | |
| 452 | W-3861 | Precision Tools | E96/S26 | Knives | Uniface | Felsite | 1 | |
| 634 | W-3861 | Precision Tools | E160/S39 | Knives | Uniface | Felsite | 1 | ** |
| 763 | W-3861 | Precision Tools | E69/S22 | Knives | Uniface | Felsite | 1 | |
| 904 | W-3861 | Precision Tools | E226/S131 | Knives | Uniface | Felsite | 1 | |
| 943 | W-3861 | Precision Tools | E241/S130 | Knives | Uniface | Felsite | 1 | ** |
| 1054 | W-3861 | Precision Tools | E148/S185 | Knives | Uniface | Felsite | 1 | |
| 1124 | W-3861 | Precision Tools | E157/S44 | Knives | Uniface | Felsite | 1 | |
| | | | | | | | 11 | |
| | | | | | | | 17 | |

## 6.4 GROUND STONE TOOLS

Ground stone tools were made by and used for abrasion. They were utilized primarily to grind food into an edible form. Ground stone tools were either active or passive implements. Active ground stone tools were hand-held and were used to impart the force against the material being ground. Passive tools were stationary receptacles which held the materials during the process. At W-3861, the recovered ground stone tools consisted of manos, pestles, mullers and metates. A total of 52 grinding implements were recovered from the site, accounting for 4.63% of the total artifact recovery.

### 6.4.1 Manos and Mullers

Manos are shaped or otherwise modified cobbles or block stones which were used to grind vegetative materials prior to consumption. Manos exhibit unifacial, bifacial, or even trifacial surface smoothness. Manos were often pecked, which produced small indentations to improve grinding surfaces that had become too smooth. Manos were essential to food preparation over the 8,000 to 9,000 years of prehistoric occupation in the San Diego region.

A total of 48 manos were recovered from W-3861. The majority of these were discovered at Locus 1. The mano recovery was subclassified according to the number of smoothed faces each tool displayed. Eleven uniface (one smooth side) and 35 biface (two smooth sides) manos were collected, along with two fragments which were not classifiable. The lithic materials employed to create the manos included granite (30 specimens), basalt (10 specimens), quartzite (seven specimens) and quartz (one specimen).

Mullers are similar to manos in that they are also hand-held tools used to abrade or grind soft materials. However, mullers differ from manos because they were used to crush as well as abrade. Only two mullers were recovered from W-3861, suggesting that this tool type was not frequently utilized in the subsistence pattern at the site.

TABLE 17 - Manos, Mullers, anc estles Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 44 | W-3861 | Ground Stone Tools | E75/S37 | Manos | Biface | Basalt | 1 | |
| 131 | W-3861 | Ground Stone Tools | E78/S44 | Manos | Biface | Basalt | 1 | Fragment |
| 139 | W-3861 | Ground Stone Tools | E79/S29 | Manos | Biface | Basalt | 1 | Fragment |
| 178 | W-3861 | Ground Stone Tools | E81/S18 | Manos | Biface | Basalt | 1 | Fragment |
| 251 | W-3861 | Ground Stone Tools | E85/S24 | Manos | Biface | Basalt | 1 | Fragment |
| 260 | W-3861 | Ground Stone Tools | E85/S40 | Manos | Biface | Basalt | 1 | Fragment |
| | | | | | | | 6 | |
| 163 | W-3861 | Ground Stone Tools | E80/S30 | Manos | Uniface | Basalt | 1 | ** |
| 288 | W-3861 | Ground Stone Tools | E86/S46 | Manos | Uniface | Basalt | 1 | Fragment |
| 412 | W-3861 | Ground Stone Tools | E68/S24 | Manos | Uniface | Basalt | 1 | Fragment |
| 459 | W-3861 | Ground Stone Tools | E94/S96 | Manos | Uniface | Basalt | 1 | |
| | | | | | | | 4 | |
| 102 | W-3861 | Ground Stone Tools | E77/S38 | Manos | Biface | Granite | 1 | ** |
| 132 | W-3861 | Ground Stone Tools | E78/S44 | Manos | Biface | Granite | 1 | |
| 182 | W-3861 | Ground Stone Tools | E81/S30 | Manos | Biface | Granite | 1 | |
| 276 | W-3861 | Ground Stone Tools | E86/S36 | Manos | Biface | Granite | 1 | |
| 280 | W-3861 | Ground Stone Tools | E86/S40 | Manos | Biface | Granite | 1 | Fragment |
| 302 | W-3861 | Ground Stone Tools | E87/S25 | Manos | Biface | Granite | 1 | Fragment |
| 323 | W-3861 | Ground Stone Tools | E88/S26 | Manos | Biface | Granite | 1 | Fragment |
| 539 | W-3861 | Ground Stone Tools | E229/S136 | Manos | Biface | Granite | 1 | Fragment |
| 555 | W-3861 | Ground Stone Tools | E141/S22 | Manos | Biface | Granite | 1 | |
| 557 | W-3861 | Ground Stone Tools | E141/S32 | Manos | Biface | Granite | 1 | ** |
| 591 | W-3861 | Ground Stone Tools | E153/S53 | Manos | Biface | Granite | 1 | |
| 622 | W-3861 | Ground Stone Tools | E158/S21 | Manos | Biface | Granite | 1 | Fragment |
| 658 | W-3861 | Ground Stone Tools | E173/S31 | Manos | Biface | Granite | 1 | Fragment |
| 706 | W-3861 | Ground Stone Tools | E35/S56 | Manos | Biface | Granite | 1 | |
| 786 | W-3861 | Ground Stone Tools | E72/S19 | Manos | Biface | Granite | 1 | |
| 822 | W-3861 | Ground Stone Tools | E129/S78 | Manos | Biface | Granite | 1 | |
| 844 | W-3861 | Ground Stone Tools | E141/S25 | Manos | Biface | Granite | 1 | Fragment |
| 954 | W-3861 | Ground Stone Tools | E243/S133 | Manos | Biface | Granite | 1 | Fragment |

TABLE 17 - Manos, Mullers, and Pestles Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 969 | W-3861 | Ground Stone Tools | E140/S177 | Manos | Biface | Granite | 1 | |
| 1077 | W-3861 | Ground Stone Tools | E147/S194 | Manos | Biface | Granite | 1 | |
| 1099 | W-3861 | Ground Stone Tools | E159/S24 | Manos | Biface | Granite | 1 | Fragment |
| | | | | | | | 21 | |
| 250 | W-3861 | Ground Stone Tools | E85/S24 | Manos | Uniface | Granite | 1 | Fragment |
| 252 | W-3861 | Ground Stone Tools | E85/S25 | Manos | Uniface | Granite | 1 | Fragment |
| 614 | W-3861 | Ground Stone Tools | E156/S29 | Manos | Uniface | Granite | 1 | |
| 703 | W-3861 | Ground Stone Tools | E35/S54 | Manos | Uniface | Granite | 1 | |
| 719 | W-3861 | Ground Stone Tools | E70/S32 | Manos | Uniface | Granite | 1 | |
| 838 | W-3861 | Ground Stone Tools | E138/S155 | Manos | Uniface | Granite | 1 | |
| 961 | W-3861 | Ground Stone Tools | E245/S131 | Manos | Uniface | Granite | 1 | |
| | | | | | | | 7 | |
| 735 | W-3861 | Ground Stone Tools | E61/S35 | Manos | | Granite | 1 | Fragment |
| 974 | W-3861 | Ground Stone Tools | E141/S151 | Manos | | Granite | 1 | Fragment |
| | | | | | | | 2 | |
| 792 | W-3861 | Ground Stone Tools | E45/S52 | Manos | Biface | Quartz | 1 | Fragment |
| | | | | | | | 1 | |
| 19 | W-3861 | Ground Stone Tools | E74/S43 | Manos | Biface | Quartzite | 1 | Fragment |
| 24 | W-3861 | Ground Stone Tools | E75/S19 | Manos | Biface | Quartzite | 1 | |
| 34 | W-3861 | Ground Stone Tools | E75/S23 | Manos | Biface | Quartzite | 1 | |
| 36 | W-3861 | Ground Stone Tools | E75/S26 | Manos | Biface | Quartzite | 1 | |
| 39 | W-3861 | Ground Stone Tools | E75/S27 | Manos | Biface | Quartzite | 1 | Fragment |
| 51 | W-3861 | Ground Stone Tools | E75/S49 | Manos | Biface | Quartzite | 1 | |
| 339 | W-3861 | Ground Stone Tools | E88/S39 | Manos | Biface | Quartzite | 1 | |
| | | | | | | | 7 | |
| 958 | W-3861 | Ground Stone Tools | E245/S125 | Mullers | | Granite | 1 | |
| | | | | | | | 1 | |

TABLE 17 - Manos, Mullers, and Pestles Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 236 | W-3861 | Ground Stone Tools | E84/S28 | Mullers | | Granodiorite | 1 | |
| | | | | | | | 1 | |
| 76 | W-3861 | Ground Stone Tools | E76/S33 | Pestles | | Basalt | 1 | |
| | | | | | | | 1 | |
| | | | | | | | 51 | |

### 6.4.2 Metates

The passive component of the milling process (which included manos as the active components) consists of metates. These artifacts are large cobble or block-derived receptive instruments used to grind food substances. Metates are usually either deep-basined receptacles or shallow, flat surfaces. The three metates from W-3861 include one deep-basined specimen and two shallow specimens. All three are fragments, and have been scarred by the past plowing which has occurred at the site. The small number of metates recovered from W-3861 is not surprising, since such large rocks were often hauled out of fields because they were obstacles to plows. A few piles of rocks collected by farmers over several years near Locus 1 were searched, however no metates were found. All three metate fragments were discovered at Locus 1.

## 6.5 NON-LITHIC RECOVERY

The non-lithic recovery from W-3861 consisted of one unidentified bone fragment and 34 shell fragments. The bone discovered is of questionable provenience, since some butchered bone was observed in the plowed fields at Loci 1 and 4.

The shell fragments were discovered primarily at Loci 1, 2, and 5. The species analysis resulted in the following classification of the fragments:

| Species | Common Name | Quantity |
|---|---|---|
| Chione ssp. | Clam | 20 Fragments |
| Mytilus Californianus | Mussel | 3 Fragments |
| Haliotis fulgens | Abalone | 1 Fragment |
| Pecten diegensis | Scallop | 1 Fragment |
| Tivela stultorum | Pismo Clam | 7 Fragments |
| Tagelus californianus | Jackknife Clam | 1 Fragment |
| Jaton festivus | Whelk | 1 Fragment |

There were no concentrations of shell at the site; rather, the fragments were scattered and not associated with any detectable cluster. Interestingly, the shell species recovered represent a variety of marine environments, such as bays/lagoons (Pecten/Chione), sandy beaches (Tivela), and rocky foreshores (Mytilus, Haliotis).

TABLE 18 - Metates R. overed From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 470 | W-3861 | Ground Stone Tools | E35/S72 | Metates | | Basalt | 1 | Fragment |
| | | | | | | | 1 | |
| 83 | W-3861 | Ground Stone Tools | E76/S37 | Metates | | Granite | 1 | |
| 750 | W-3861 | Ground Stone Tools | E88/S39 | Metates | | Granite | 1 | Fragment |
| | | | | | | | 2 | |
| | | | | | | | 3 | |

TABLE 19 - Bone and Shell Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 130 | W-3861 | Shell | E78/S41 | | | Chione | 1 | |
| 144 | W-3861 | Shell | E79/S36 | | | Chione | 1 | |
| 210 | W-3861 | Shell | E82/S37 | | | Chione | 1 | |
| 477 | W-3861 | Shell | E92/S43 | | | Chione | 1 | |
| 478 | W-3861 | Shell | E92/S44 | | | Chione | 1 | |
| 479 | W-3861 | Shell | E92/S47 | | | Chione | 1 | |
| 481 | W-3861 | Shell | E91/S60 | | | Chione | 1 | |
| 485 | W-3861 | Shell | E97/S40 | | | Chione | 1 | |
| 541 | W-3861 | Shell | E96/S30 | | | Chione | 1 | |
| 554 | W-3861 | Shell | E139/S151 | | | Chione | 1 | |
| 608 | W-3861 | Shell | E155/S46 | | | Chione | 1 | |
| 612 | W-3861 | Shell | E155/S89 | | | Chione | 1 | |
| 626 | W-3861 | Shell | E158/S27 | | | Chione | 1 | |
| 660 | W-3861 | Shell | E175/S35 | | | Chione | 1 | |
| 815 | W-3861 | Shell | E134/S150 | | | Chione | 1 | |
| 849 | W-3861 | Shell | E128/S29 | | | Chione | 1 | |
| 990 | W-3861 | Shell | E142/S43 | | | Chione | 1 | |
| 1007 | W-3861 | Shell | E148/S82 | | | Chione | 1 | |
| 1107 | W-3861 | Shell | E159/S34 | | | Chione | 1 | |
| 1116 | W-3861 | Shell | E157/S28 | | | Chione | 1 | |
| | | | | | | | 20 | |
| 907 | W-3861 | Shell | E226/S132 | | | Haliotis | 1 | |
| | | | | | | | 1 | |
| 575 | W-3861 | Shell | E149/S23 | | | Mytilus | 1 | |
| 802 | W-3861 | Shell | E129/S28 | | | Mytilus | 1 | |
| 884 | W-3861 | Shell | E136/S150 | | | Mytilus | 1 | |
| | | | | | | | 3 | |
| 825 | W-3861 | Shell | E129/S84 | | | Pecten | 1 | |
| | | | | | | | 1 | |

TABLE 19 - Bone and Shell Recovered From Site W-3861

| Cat # | Site # | Tool Category | Location | Artifact Type | Subtype | Material | Quantity | Condition |
|---|---|---|---|---|---|---|---|---|
| 27 | W-3861 | Shell | E75/S19 | | | Pismo | 1 | Fragment |
| 480 | W-3861 | Shell | E92/S57 | | | Pismo | 1 | |
| 486 | W-3861 | Shell | E97/S26 | | | Pismo | 1 | |
| 590 | W-3861 | Shell | E152/S88 | | | Pismo | 1 | |
| 602 | W-3861 | Shell | E154/S68 | | | Pismo | 1 | |
| 689 | W-3861 | Shell | E225/S129 | | | Pismo | 1 | |
| 955 | W-3861 | Shell | E244/S127 | | | Pismo | 1 | |
| | | | | | | | 7 | |
| 853 | W-3861 | Shell | E134/S150 | | | Tagelus | 1 | |
| | | | | | | | 1 | |
| 615 | W-3861 | Shell | E156/S31 | | | Whelk | 1 | |
| | | | | | | | 1 | |
| 332 | W-3861 | VBone | E88/S36 | | | | 1 | |
| | | | | | | | 1 | |
| | | | | | | | 35 | |

## 7.0 DISCUSSION AND EVALUATION OF SIGNIFICANCE OF W-3861

The scope of work established for the present archaeological program required the detailed recordation of the components of Site W-3861 and the evaluation of the significance of the site, its potential for further research, and the analysis of possible adverse impacts which may result from from the proposed development. The first six sections of this report have provided detailed information pertaining to the inventory of W-3861, including recovery locations, artifact types, distribution patterns, and lithic data. In summary, the surface recordation process provided data which delineated W-3861 into five loci. While each locus exhibited individual characteristics (variations in artifact densities, artifact types, and topographical characteristics), they all conformed to a pattern of dispersed artifact scatters of varying density, wherein the artifact typology consistently included well-made scrapers, utilized/retouched flakes, and milling tools.

The function of Site W-3861 appears to have been that of a multiple-locus, food collection site located primarily along the flood plain of the Otay River. The nature of the food collecting aspect is unknown. The lack of hunting tools or food bone indicates that animals were not a primary element of the food collection process. The absence of any shell deposits reflects a subsistence pattern that was not marine-oriented. Based upon these observations and a review of the artifact distribution pattern across the 70 to 80 acres of Site W-3861, it may be interpreted that the site served as base for the collection of plant products.

Since plant products such as roots, berries, seeds, and greens would not necessarily have been concentrated in one area, the collection of such food resources would have required a wide-ranging foraging subsistence pattern. Most such patterns which have previously been studied in San Diego County have typically included numerous small sites located in various ecological niches that were temporarily occupied while the occupants collected the resources from the areas immediately adjacent to the sites. In a process of seasonal rounds, several sites would have been visited by small groups who would periodically aggregate with clan members as food and water needs and custom dictated. At Otay Valley and Otay Mesa, the pattern of large, shallow, widely dispersed sites does not conform to the previously mentioned pattern (small, scattered sites for food collection) which is dominant elsewhere in the county. Thus, the environmental factors within Otay Valley/Otay Mesa apparently caused an adaptation of the basic subsistence pattern to permit the exploitation of the food resources which were particular to the area.

The environmental components that could have caused the subsistence adaptation were likely localized ecological/climatological factors. Considering the relatively flat nature of Otay Mesa and the narrow flood plain of Otay Valley, the most likely interpretation of plant productivity is that of a short growing season in the winter/spring, with water sources dissipating quickly in the summer. If this were the case, then a short, but substantial, growing season would have required a homeostatic response of wide-ranging, dispersed collecting forays to maximize productivity. This seems to depict the pattern of artifact recovery at W-3861 and at most sites studied in the general vicinity of W-3861 (Smith and Moriarty 1984; Berryman 1987; CSRI 1983).

The artifacts discovered at W-3861 are interpreted as being attributable to the La Jolla Complex. The only radiocarbon dates for other sites within the general area of the site have fallen within the range between 6,000 and 5,000 years before the present. These dates, coupled with the absence of pottery and late period points at sites near W-3861, support the projection that the subject site and those near it comprise elements of the La Jolla Complex occupation pattern. If W-3861 is affiliated with the La Jolla Complex, then a recent finding may explain the subsistence pattern and site characteristics (i.e., widely dispersed artifact scatters) recorded on and near the property.

A study of coastal and inland sites of the La Jolla Complex throughout San Diego County was recently completed as part of a data recovery program at Site SDi-5594 in San Dieguito Valley. This extensive study combined oxygen isotopic profiles of shells from coastal and inland sites to demonstrate that sites dated by radiocarbon analysis to the period of the La Jolla Complex had been seasonally occupied. Sites on the coast were primarily summer/fall occupation areas where shellfish/marine resources were capable of supporting large populations when plant resources inland had diminished. Inland sites were found to be occupied during the winter and spring seasons, when the growing season produced large quantities of plant foods (Smith 1987: 220-230; Binford 1980: 13).

The projections of seasonality were combined with food refuse data and artifact patterns from coastal and inland sites to create a proposed dietary triad which was representative of the seasonal subsistence pattern for the La Jolla Complex (Smith 1987: 220-230). This triad was extrapolated from data recorded in numerous excavation reports, and essentially was projected as a seasonal alternation between a predominance of marine-related foods gathered along the coast in the summer and fall and a secondary predominance of plant foods at inland sites during the winter and spring when plants were abundant.

At W-3861 and adjacent sites, the lack of shell deposits, the absence of faunal remains (animal bone), and the sparcity of hearths and major aggregation areas appear to indicate that the widespread, dispersed sites were representative of the collecting of plant food resources by prehistoric occupants. If this is considered as part of the dietary triad and seasonal subsistence pattern identified for the La Jolla Complex in other areas of San Diego County, then it could be projected that the site had been occupied in the spring for short periods of time. The brief site occupation combined with dispersed gathering activities would explain the lack of subsurface deposits at W-3861 and most other sites in the vicinity.

## 7.1 EVALUATION OF SIGNIFICANCE - SITE W-3861

Site W-3861 represents a major site of food collecting activities for the La Jolla Complex. The site appears to be one of the two largest such scatters of artifacts in the western area of Otay Valley. The other is Site SDi-10452, located just to the east of W-3861 on the flood plain at the Bird Ranch. While the site should be considered significant, the primary element of that significance consists of the surface artifacts and their spatial distribution. The surface collection program has effectively removed and recorded the significant aspects of the resource. Therefore, the site no longer retains any in situ research potential. Based upon the data collected during this research and field study, Site W-3861 is evaluated as a significant resource with no further research potential aside from that represented by the collected artifact assemblage.

### 7.2 EVALUATION OF IMPACT POTENTIAL AT SITE W-3861

The proposed development of the Otay Rio Business Park project will include grading and building upon nearly all of the area of W-3861. This will represent a direct impact to the site. However, since the site no longer retains any research potential, subsurface deposits, or major features, the adverse impacts to the site from the development are not considered significant.

### 7.3 EVALUATION OF HISTORIC RESOURCES

The historic research pertaining to the two farmhouses which was conducted as part of the present study defined one structure as an 1870s redwood bungalow and the other as a post-1930 rural farmhouse. The redwood bungalow is approximately 110 years old and is in poor but stable condition. The post-1930 structure is in very good condition, but is of questionable historic significance since it is only between 40 and 60 years old.

The 1870s redwood bungalow has been evaluated as only minimally significant. It lacks historical sensitivity due to architectural features or association with persons of historical note or with any historical district of similar structures recognized as sensitive features. The structure has been thoroughly recorded, mapped and measured, and photographed. Since it does not meet any criteria for requesting preservation at a secure location (aside from its age), and since it has been fully documented, no further study is necessary or recommended. The trash dump, however, is potentially significant and should be closely monitored during grading in the future.

## 7.4 IMPACT ANALYSIS FOR HISTORIC RESOURCES

The only potentially sensitive historic resource at the Otay Rio Business Park project is the 1870s redwood bungalow. Research has provided data which documents the lack of sufficient historical merit to designate the structure as a significant historic site. The proposed project will eventually disturb this structure and its surrounding area, and therefore represents a potential adverse impact to the resource. However, since the historic research conducted during the present study resulted in the evaluation of the resource as only a minimally significant site, the potential impacts are not considered significant.

## 8.0 MITIGATION MEASURES

In accordance with the California Public Resources Code (Section 21083.2) and the environmental ordinances of the City of Chula Vista, the cultural resources within the proposed Otay Rio Business Park project have been evaluated and were found to be significant. The potential adverse impacts to Site W-3861, however, are not significant since the site no longer retains any research potential or unique deposits. Therefore, no measures are proposed for the mitigation of impacts to W-3861. No further studies or excavations are recommended prior to the initiation of grading.

At present, indirect impacts have not been assessed. These are impacts to sites in the immediate area which might result from off-site improvements. Because of the large number of sites close to the Otay Rio Business Park project, any off-site improvements should be reviewed by an archaeologist to evaluate potential impacts before the project is initiated.

The historic redwood bungalow will likely be impacted by the development. The historical research completed during the present study has essentially mitigated the potential impacts to make them less significant. The only recommended mitigation measure will consist of the close monitoring of the grading of the trash dump associated with the bungalow in order to salvage any sensitive historic artifacts which might be unearthed. A report would then be generated to provide an analysis of the historic artifacts in relation to the early homesteads and farms in Otay Valley.

## 9.0 PERSONNEL

This archaeological investigation was completed in a very short period of time, thanks to the long hours worked by the field and laboratory archaeologists and assistants. The entire project was designed and directed by Brian F. Smith. Assistance in the interpretation of field data and the evaluation of historic structures was provided by Dr. James R. Moriarty, III. The archaeological field workers and laboratory assistants who participated in the study included:

Stephen Burke
Dennis Fischer
James Hall
Larry Pierson
William Shea, Jr.
Marilyn Colombo
Greg Hendrickson
Patrick Casinelli
Norma Moriarty
Kathryn Smith

This report was written by Brian Smith. The graphics and production staff consisted of Brian Smith, Kathryn Smith, and Stephen Burke.

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# APPENDIX D

# PALEONTOLOGICAL SURVEY REPORT

12 January 1987

Ms. Diana Richardson
Keller Environmental Associates
964 Fifth Avenue, Suite 535
San Diego, CA 92101

RE: Paleontological Resources; Otay Rio Business Park

Dear Diana:

This letter report represents a summary of my findings concerning the paleontological resource potential of the Otay Rio Business Park project site, San Diego, California. This assessment is based upon a review of available EIR documents (Demere, 1981, 1984), published geological reports (Kuper 1977; Kennedy and Tan 1977), published paleontological reports (Demere 1986), and museum paleontological locality records (U.C. Berkeley-Museum of Paleontology, and San Diego Natural History Museum-Department of Paleontology). In addition, an in-field survey of the project site was carried out on 28 November 1986 by Richard A. Cerutti and Mark A. Roeder of PaleoServices.

## Existing Conditions

Physiography- The Otay Rio Business Park project site is located in an undeveloped portion of Otay Valley bounded on the north and east by Otay Valley Road, on the south by Otay Mesa, and on the west by the survey line dividing sections 19 and 20, T. 18 S., R. 1 W. Elevations range from 140 feet above sea level in Otay Valley to over 440 feet on the north rim of Otay Mesa. Erosion has carved a series of small north trending canyons into the northern slope of the mesa. Vegetation and recent colluvium combine to effectively cover much of the slope areas making it difficult to view the underlying bedrock geology. I addirion, the majority of the project site lies within the alluvial portion of the Otay Valley. The best exposures of bedrock are available just to the east of the project site along Chester Grade where roadcuts offer a good view of the local stratigraphy.

Geology- As summarized on the Imperial Beach, CA, 7.5' USGS quadrangle geologic map of Kuper (1977) the general geology of the project site consists of a "layer cake" series of marine and terrestrial sedimentary formations.

From oldest to youngest this geologic series consists of Oligocene (approximately 27 million years old) river and lake deposits of the Sweetwater Formation (between elevations 200 and 300 feet) and Otay Formation (elevations 300 to 420 feet) and Pliocene (approximately 3 million years old) marine deposits of the San Diego Formation (above elevation 420 feet).

The spacial distribution of these various geologic "layers" as plotted on the geologic map of Kuper (1977) is generally correct and can be used to determine the bedrock geology of particular areas within the project site. This becomes important from a planning stand point when it is realized that the distribution of paleontological resources (fossils) in an area is directly related to the distribution of the geologic layers within which the fossils are buried.

Paleontology- Museum locality records do not document any known fossil localities within the project site and none where found during the field walkover. However, it is important to point out that many fossil sites presently on record in San Diego have been discovered only during residential development activities or during highway and freeway construction projects. This close correlation between fossil sites and construction is due to the fact that surface weathering quickly destroys most fossil materials. It is not until fresh unweathered exposures are made by grading that well preserved fossils can often be recovered. Also because of the amount of grading proposed for some sites, odds are increased that this grading will unearth rich fossil horizons.

In addition to this, knowing the past fossil potential of a particular geological "layer" in one area is a reliable method for determining the resource potential of that "layer" in other perhaps <u>unexplored</u> areas.

The Otay Formation at EastLake (near Southwestern Junior College) has recently been shown (Demere 1986) to contain significant paleontological resources including well preserved remains of fossil land vertebrates such as lizards, turtles, birds, hedgehogs, rabbits, rodents, carnivores, camels, mouse-deer, and oreodonts (extinct pig-like grazing animals). Together these previously reported fossil occurrences point to the high paleontological resource potential of the Otay Formation.

The San Diego Formation has been known for a long time to possess a high paleontological resource potential (Domning and Demere, 1984) and has produced large and well preserved assemblages of fossil marine vertebrates inluding sharks, rays, bony fish, sea birds, fur seals, walrus',

dolphins, baleen whales, and sea cows. Demere (1984) reported on the occurrence of fossiliferous exposures of the San Diego Formation at two sites within 1.5 miles of the project site (NW 1/4 of Sec. 31, T. 18 S., R. 1 W.). One of these sites (San Diego Society of Natural History Locality 3076) has produced remains of shark, ray, bony fish, albatross, fur seal, dolphin, and baleen whale.

The Sweetwater Formation is sparsely fossiliferous and has produced only a few rare remains of fossil land mammals. Because of this low fossil productivity the Sweetwater Formation is considered to possess a low to moderate paleontological resource potential

Impact Analysis

With these basic assumptions in mind concerning the paleontological resource potential of the geological rock units (formations) discussed above, it is suggested that development of the project site will result in impacts to significant paleontological resources (principally the potentially fossiliferous deposits of the Otay and San Diego formations). These impacts will occur when mass grading operations cut into the fossil-bearing layers in these two formations.

Mitigation Measures

Mitigation of the impacts discussed above can be insured by implementing the following measures:

[1] Prior to issuance of a mass-grading permit the developer should present a letter to the City of San Diego indicating that a qualified paleontologist has been retained to carry out the resource mitigation. (A qualified paleontologist is defined as an individual with a MS or Phd in paleontology or geology who is familiar with paleontological procedures and techniques.)

[2] A qualified paleontologist should be at the pre-grade meeting to consult with the grading and excavation contractors.

[3] A paleontological monitor should be onsite at all times during the original cutting of previously undisturbed sediments of the Otay (between elevations 300 and 420 feet) and San Diego (above elevation 420 feet) formations to inspect cuts for contained fossils. (The areal distribution of these formations is summarized on the geological map of

Kuper 1977.) Periodic inspections of cuts involving the Sweetwater Formation ( between elevations 200 and 300 feet) is also recommended. (A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials. The paleontological monitor should work under the direction of a qualified paleontologist.)

[4] In the event that well-preserved fossils are discovered, the paleontologist (or paleontological monitor) should be allowed to temporarily direct, divert, or halt grading to allow recovery of fossil remains in a timely manner. Because of the potential for the recovering of small fossil remains such as isolated mammal teeth, it may be necessary to set up a screen-washing operation on the site.

[5] Fossil remains collected during this salvage program should be cleaned, sorted, and cataloged and then with the owner's permission, deposited in a scientific institution with paleontological collections such as the San Diego Natural History Museum.

In summary, the project site possesses a high paleontological resource potential. Development of the site will result in impacts to these resources. The measures proposed above will insure proper mitigation of these impacts. Please feel free to contact me if you have any questions concerning my findings.

Sincerely yours,

Thomas A. Demere

Thomas A. Demere
PaleoServices
(619)232-0625

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# APPENDIX E

# TRANSPORTATION/ACCESS

# TRAFFIC STUDY
# FOR
# OTAY RIO BUSINESS PARK
Chula Vista, California

Prepared by:

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964 Fifth Avenue
San Diego California 92101
(619) 544-1488

January 1987
(Revised March 1987)

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# FOR
# OTAY RIO BUSINESS PARK
# Chula Vista, California

## INTRODUCTION

The planned Otay Rio Business Park development is located in the southeast corner of the City of Chula Vista. Just east of the site is the San Diego County boundary, and to the south is the City of San Diego's Otay Mesa Community Planning area. The site is bounded on the north by the Otay River floodway. The major streets in the vicinity of the project include Otay Valley Road to the north and east, the future extension of Palm Avenue to the south, and I-805 to the west (see Figure 1).

As shown in Figure 2, the project proposes to subdivide the approximately 211 acres into 78 industrial lots (IL-P), 49 single family residential lots (R-1), and one thoroughfare commercial lot (4.45 acres, CT). The single family residential lots are planned to take access from the roadway system of an adjacent development to the south (Robinhood Ridge) via extensions of "J" Street and "K" Street. These lots are identified as "Units 2 and 3", since they are not planned to be developed until access is available through Robinhood Ridge.

The existing General Plan land use designation for the site is low density residential (0-3 DU/acre) and open space. The open space designation exists on the southerly portion of the site (approximately 31% of the site).

Basmaciyan-Darnell, Inc. (BDI) has been retained to evaluate the potential transportation impacts which may be associated with the development of the Otay Rio Business Park. This analysis describes the existing and planned roadway conditions in the vicinity of the site, generates expected project traffic, assigns project traffic to the street system, and identifies project-related traffic impacts.

## EXISTING ROADWAY CONDITIONS AND FUTURE CLASSIFICATIONS

Regional access to the Otay Rio Business Park is provided by I-805 via Otay Valley Road. In the future, the easterly extension of Palm Avenue will provide secondary access to the site, via the off-site extension of the project's proposed "A" Street. Access to I-805 via Otay Valley Road is a convenient route to the project site. Access to I-805 via "A" Street will require traversing adjacent developments before reaching Palm Avenue.

### Otay Valley Road

Otay Valley Road runs easterly from I-805 for approximately 2 miles, where it heads in a southerly direction to its junction with Heritage Road. West of I-805, Otay Valley Road merges with

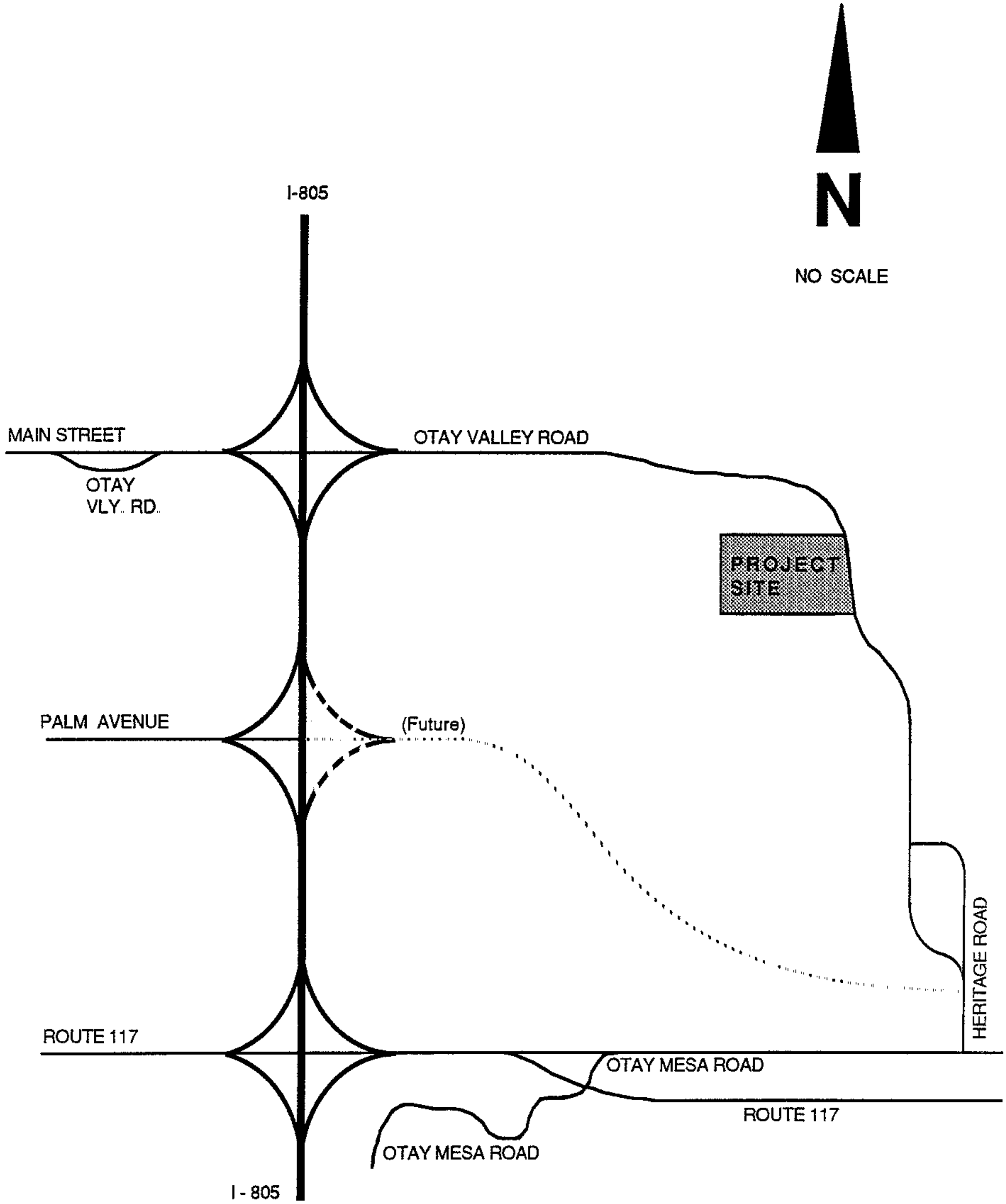


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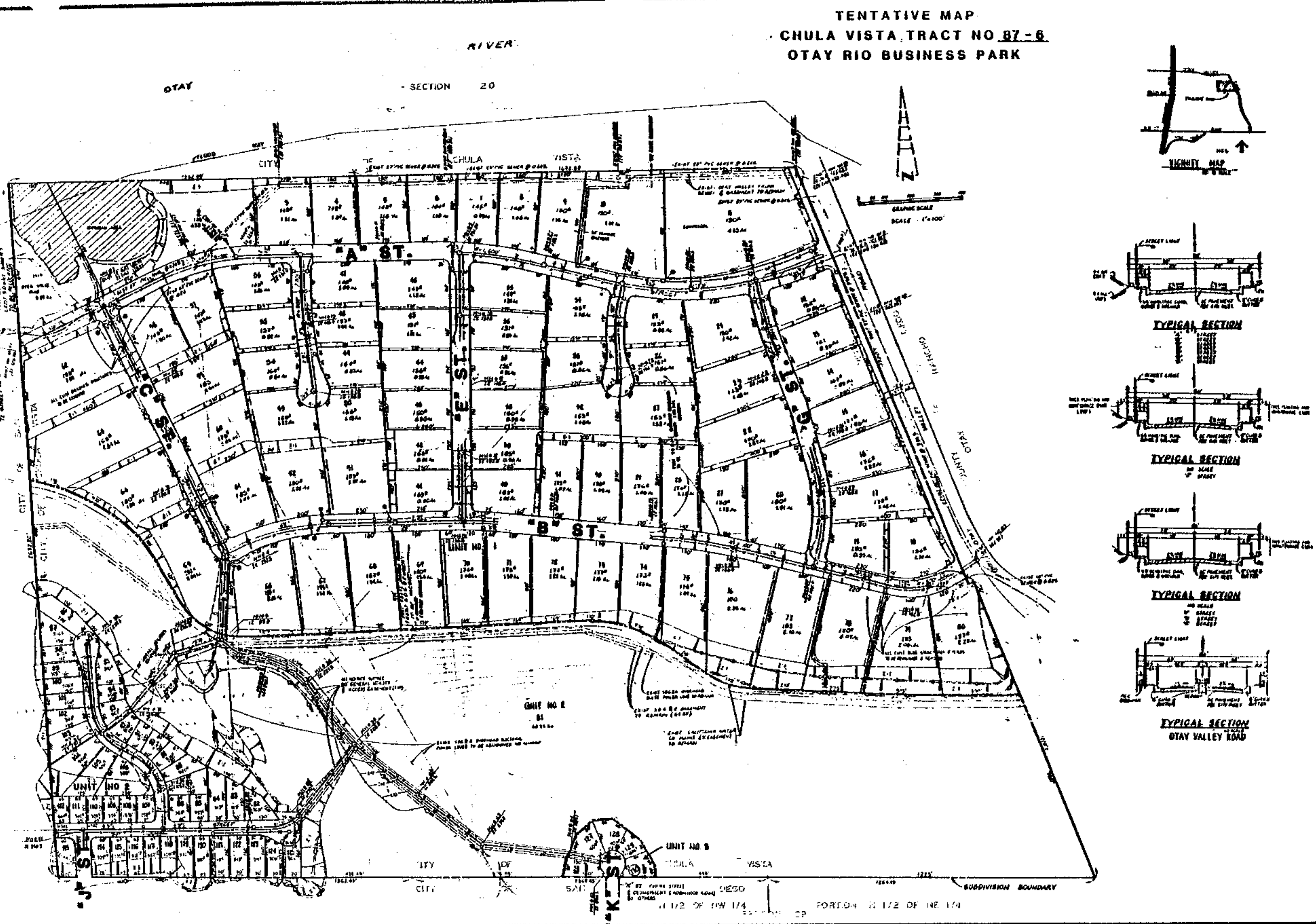
**Figure 1**
**VICINITY MAP**

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# Figure 2
## SITE PLAN

Main Street which traverses Chula Vista, accessing the city's major north/south streets (Hilltop Drive, 3rd Avenue, 4th Avenue, and Broadway) as well as I-5.

Between I-805 and Oleander Avenue, Otay Valley Road is currently a four lane roadway with two travel lanes in each direction, and left turn pockets at major intersections (essentially a four lane major street, lacking a raised median). When it was last counted, in 1983, this segment of Otay Valley Road was carrying 10,425 average daily trips (ADT). Figure 3 summarizes the available daily traffic counts for the streets in the vicinity of the project.

Between Oleander (from approximately 150' east of Oleander) and its juncture with Heritage Road, Otay Valley Road is currently a two-way, two lane roadway, approximately 28 feet wide with limited shoulder area. Just south of the river, Otay Valley Road is currently carrying 1,400 ADT (count taken by BDI 3/87).

According to the City of Chula Vista, Otay Valley Road is currently planned to be realigned to extend east to the future State Route 125 as a six lane primary arterial. The existing north/south segment of Otay Valley Road would be realigned and renamed (part of the northerly extension of Heritage Road). This segment is also currently planned as a six lane primary arterial. The first stage of constructing Heritage Road will take it to Otay Valley Road, forming a "T" intersection. Ultimately, it will extend northerly to Telegraph Canyon Road. This north/south segment on the east side of the project site has existing substandard curvature. At the Tentative Map stage, additional right of way may be required of the development to straighten the alignment. This could affect some lots on the southeasterly side of the site. In the future, an alignment study may need to be done.

It should be noted that an updated travel forecast and circulation study for the City of Chula Vista is being conducted. This effort will not be completed for approximately another six months. The classifications given by the City of Chula Vista are based on their expectation of what will be required.

The County of San Diego's Circulation Element Map (Figure 4) shows the same alignment plans for Otay Valley Road and Heritage Road, but the classifications are different. As shown, Otay Valley Road was classified as a four lane major road. Heritage Road is shown as a four lane major south of Otay Valley Road to Palm Avenue where it is shown to be a six lane prime arterial.

The City of San Diego's Otay Mesa Community Plan (Figure 5) shows Otay Valley Road in its existing alignment as a six lane major street near I-805 and a four lane primary arterial to Heritage Road. Heritage Road is also shown as a six lane major street near Otay Mesa Road and a four lane primary arterial near Otay Valley Road.

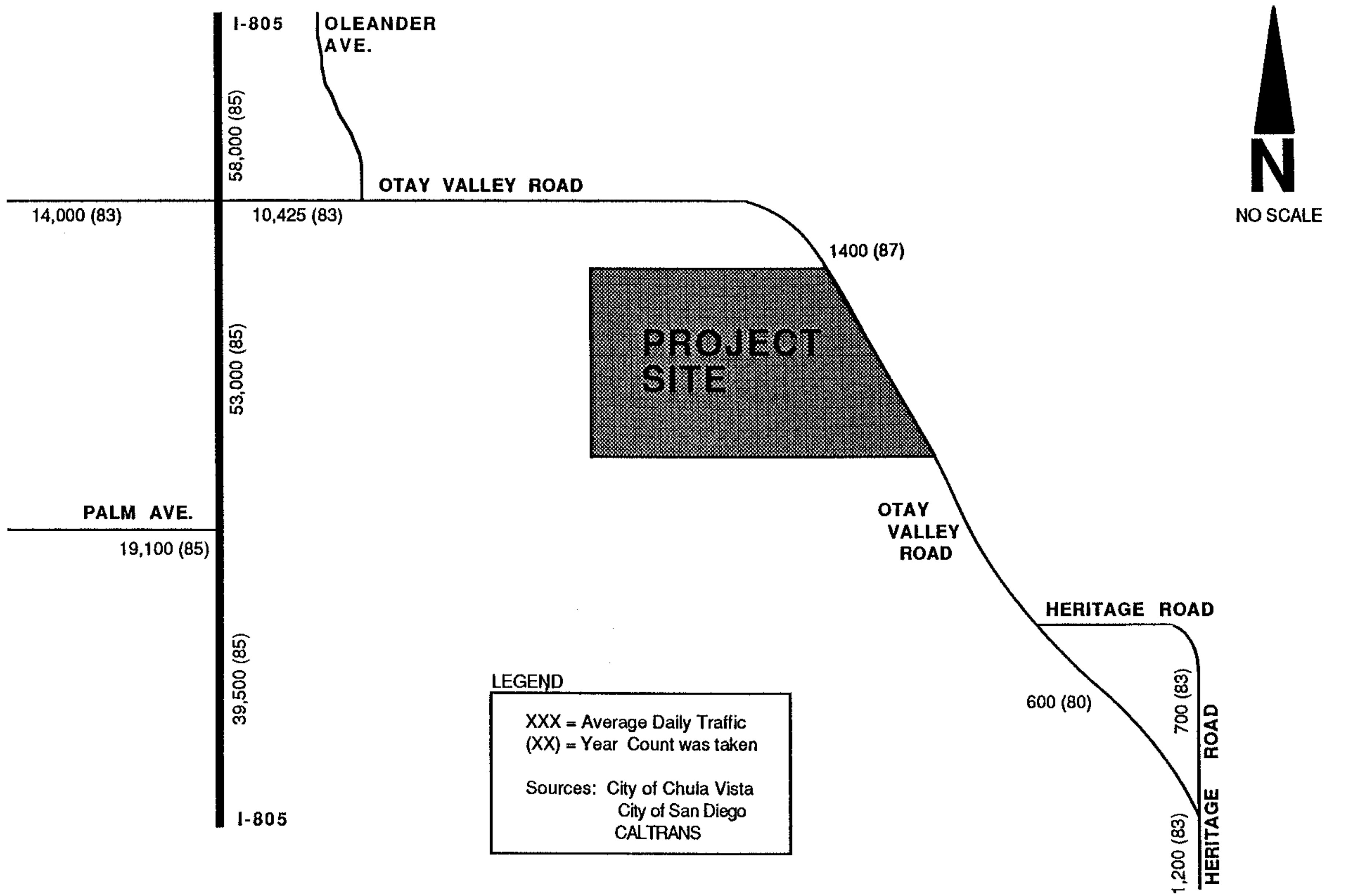


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**Figure 3**
**EXISTING ADT IN THE VICINITY OF THE PROJECT**

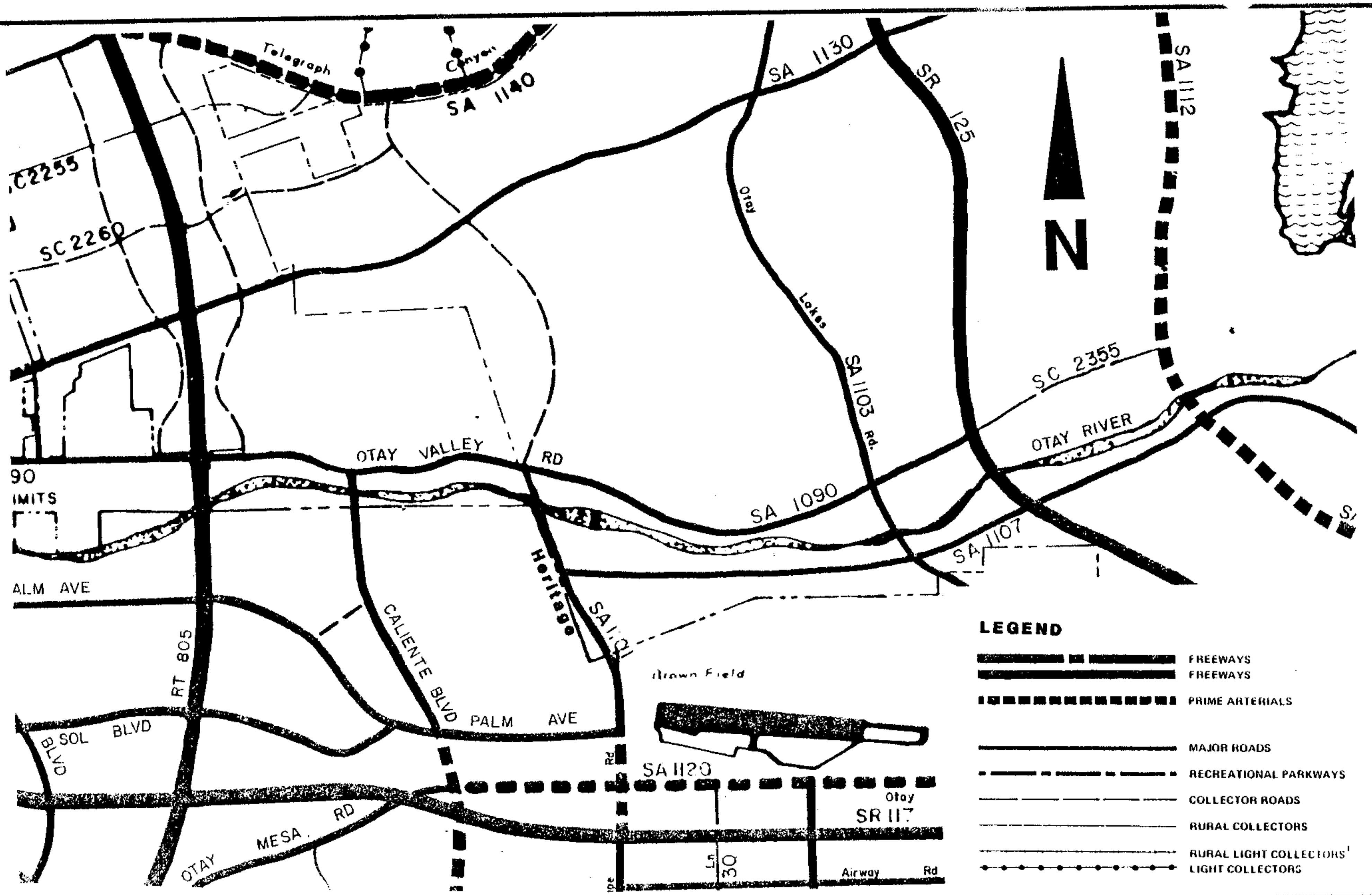


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**Figure 4**
**SAN DIEGO COUNTY CIRCULATION ELEMENT**

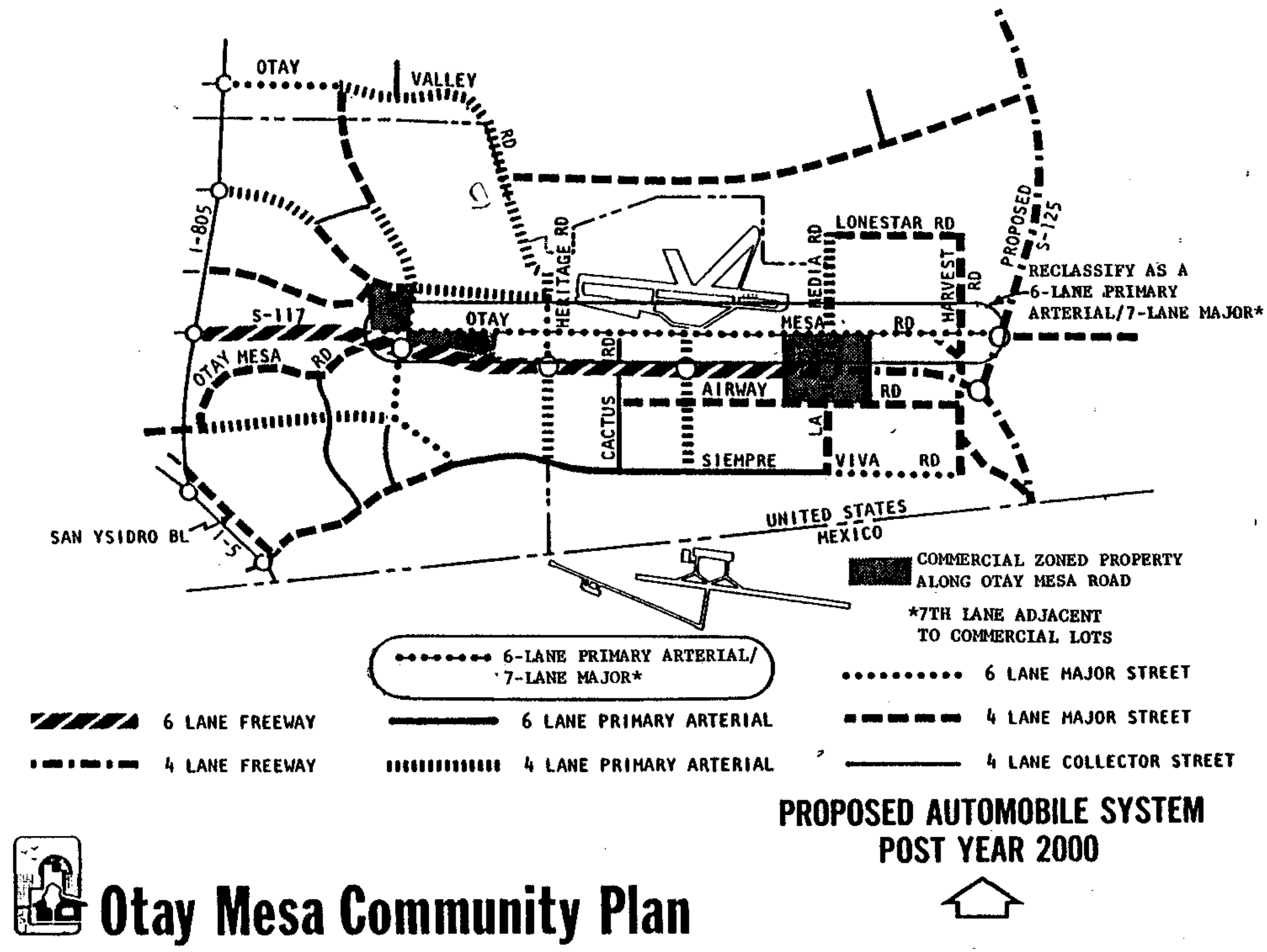


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**Figure 5**
**CITY OF SAN DIEGO OTAY MESA COMMUNITY PLAN**
**STREET SYSTEM**

## Palm Avenue

Palm Avenue currently does not exist east of its interchange with I-805. To the west, Palm Avenue traverses the City of San Diego's Otay Mesa/Nestor community and provides access to I-5. Palm Avenue has a juncture with Route 75 which provides access to the City of Coronado.

In the future, Palm Avenue will extend easterly to Heritage Road (within the City of San Diego's jurisdiction). The City of San Diego classifies Palm Avenue as a four lane primary arterial east of I-805 and west of Heritage Road (there is a segment classified as a four lane major between I-805 and Heritage Road).

The County of San Diego's Circulation Element Map shows Palm Avenue as a four lane major roadway, with the same alignment as planned by the City of San Diego.

## Local Streets

HCH & Associates prepared an area-wide circulation and land use study in conjunction with its planning efforts for the Otay Rio Business Park (see Figure 6). On this plan, the project's proposed "A" Street would be extended westerly with the development of adjacent projects. This roadway is shown to turn south and extend to a "T" intersection with the future extension of Palm Avenue.

The project's proposed "J" Street is shown to be extended (with the development of adjacent projects) southerly, then turn easterly and extend to "T" intersect with the north/south segment of Otay Valley Road.

## FUTURE TRAFFIC VOLUMES

The City of San Diego's Otay Mesa Community Plan included traffic projections for the area. These projections are included as Figure 7.

The County of San Diego, as part of General Plan Amendment 84-02 also projected future traffic volumes for the Otay region. These are included as Figure 8.

The City of Chula Vista, the City of San Diego, and the County of San Diego, in cooperation with SANDAG, prepared a subregional travel forecast for the buildout of the Otay Mesa area. Figure 9 summarizes Alternative #5 of that forecast (which is the generally accepted alternative at this time).

As shown on Figure 9, the projected average daily traffic on Otay Valley Road, between I-805 and Oleander Avenue, is 47,100. East and West of Heritage Road, Otay Valley Road is projected to carry 43,100 ADT and 31,200 ADT, respectively. Heritage Road is projected to carry 44,400 ADT south of Otay Valley Road. North of Palm Avenue, Heritage Road is projected to carry 48,700 ADT.

# OTAY RIO BUSINESS PARK

CIRCULATION & LAND USE STUDY

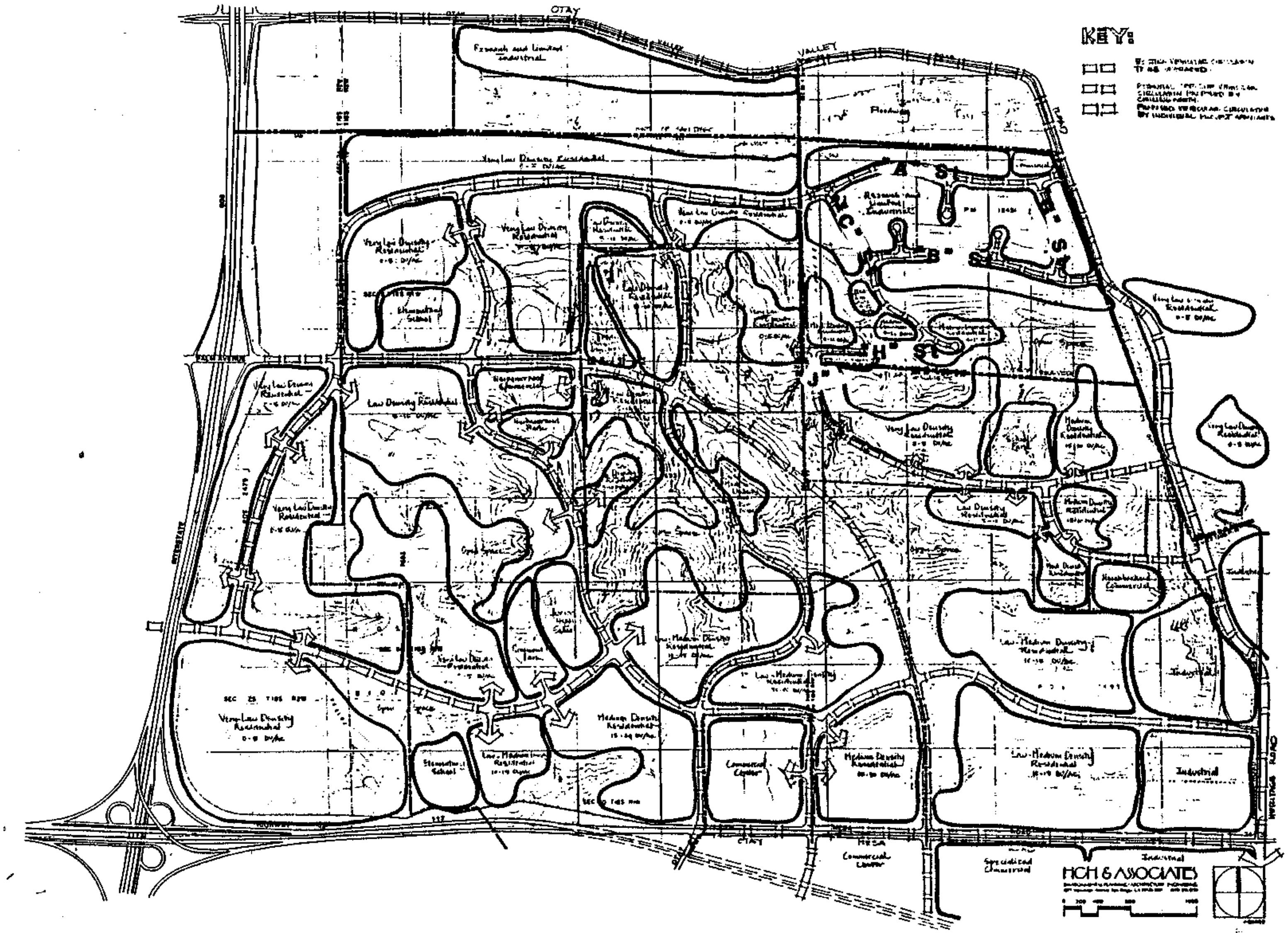


**Figure 6**
**AREA CIRCULATION AND LAND USE**
(PREPARED BY HCH & ASSOC.)

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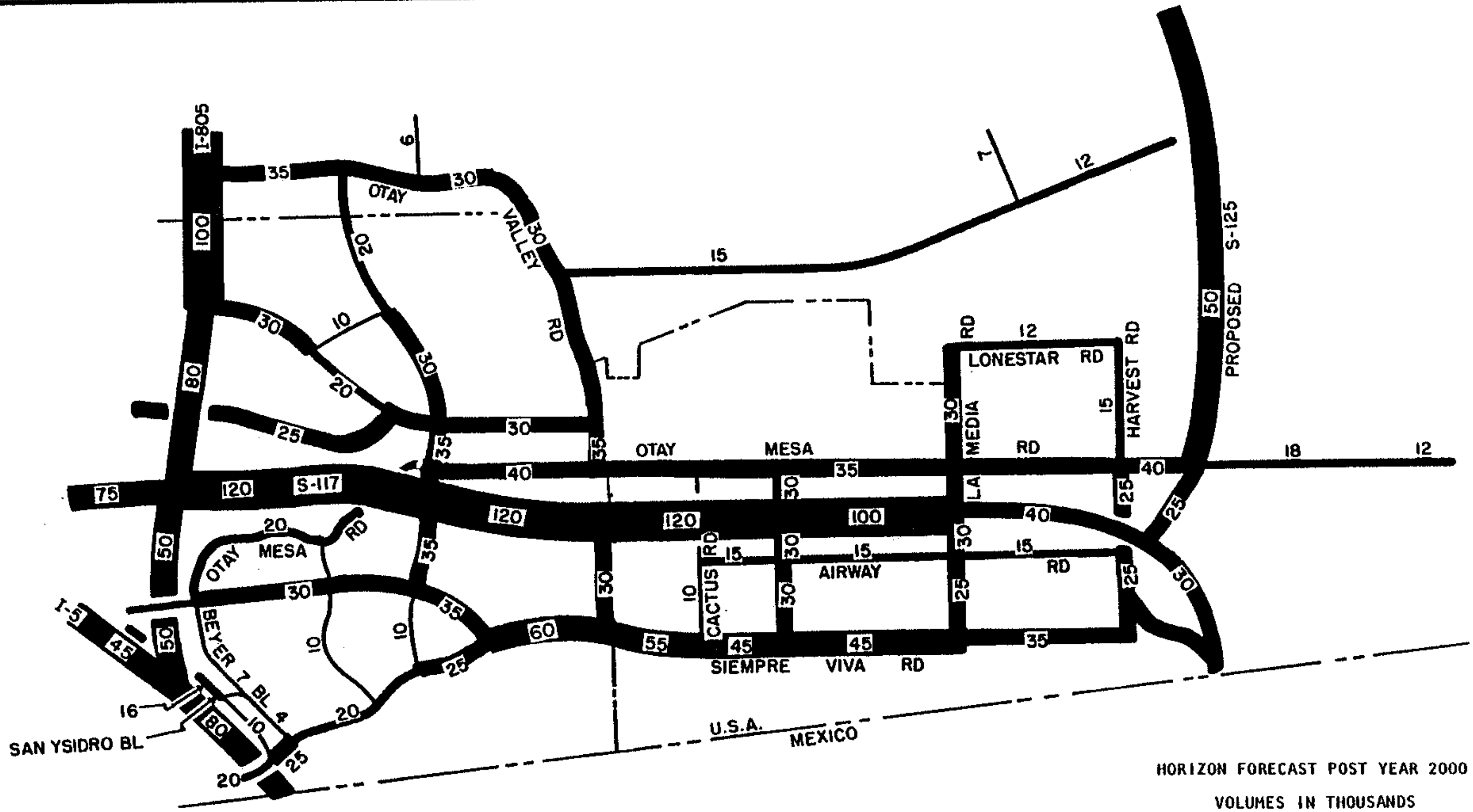


HORIZON FORECAST POST YEAR 2000

VOLUMES IN THOUSANDS

TRAFFIC PROJECTIONS

**Otay Mesa Community Plan**

PLANNING DEPARTMENT • CITY OF SAN DIEGO

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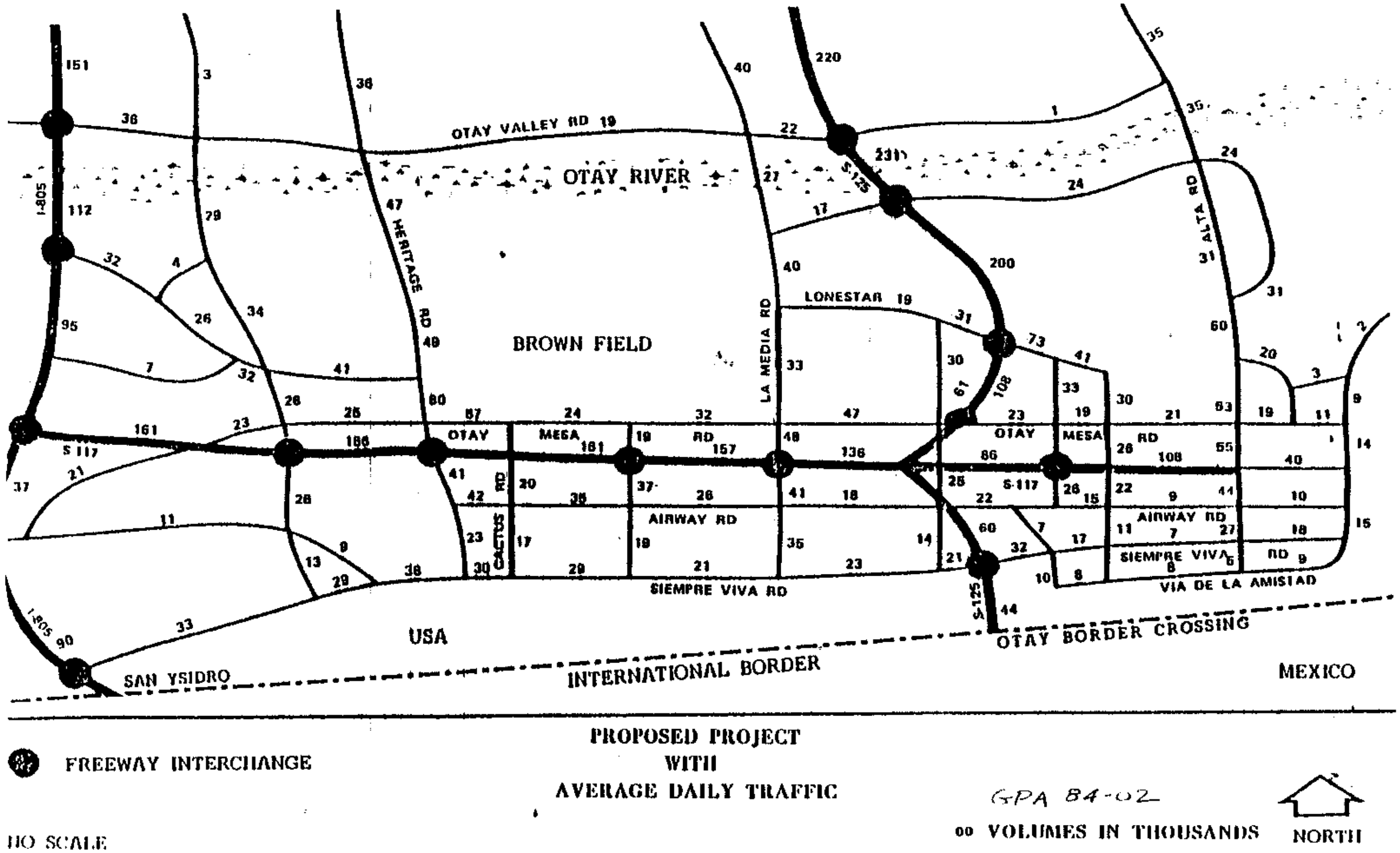
# Figure 7
## CITY OF SAN DIEGO OTAY MESA COMMUNITY PLAN TRAFFIC PROJECTIONS

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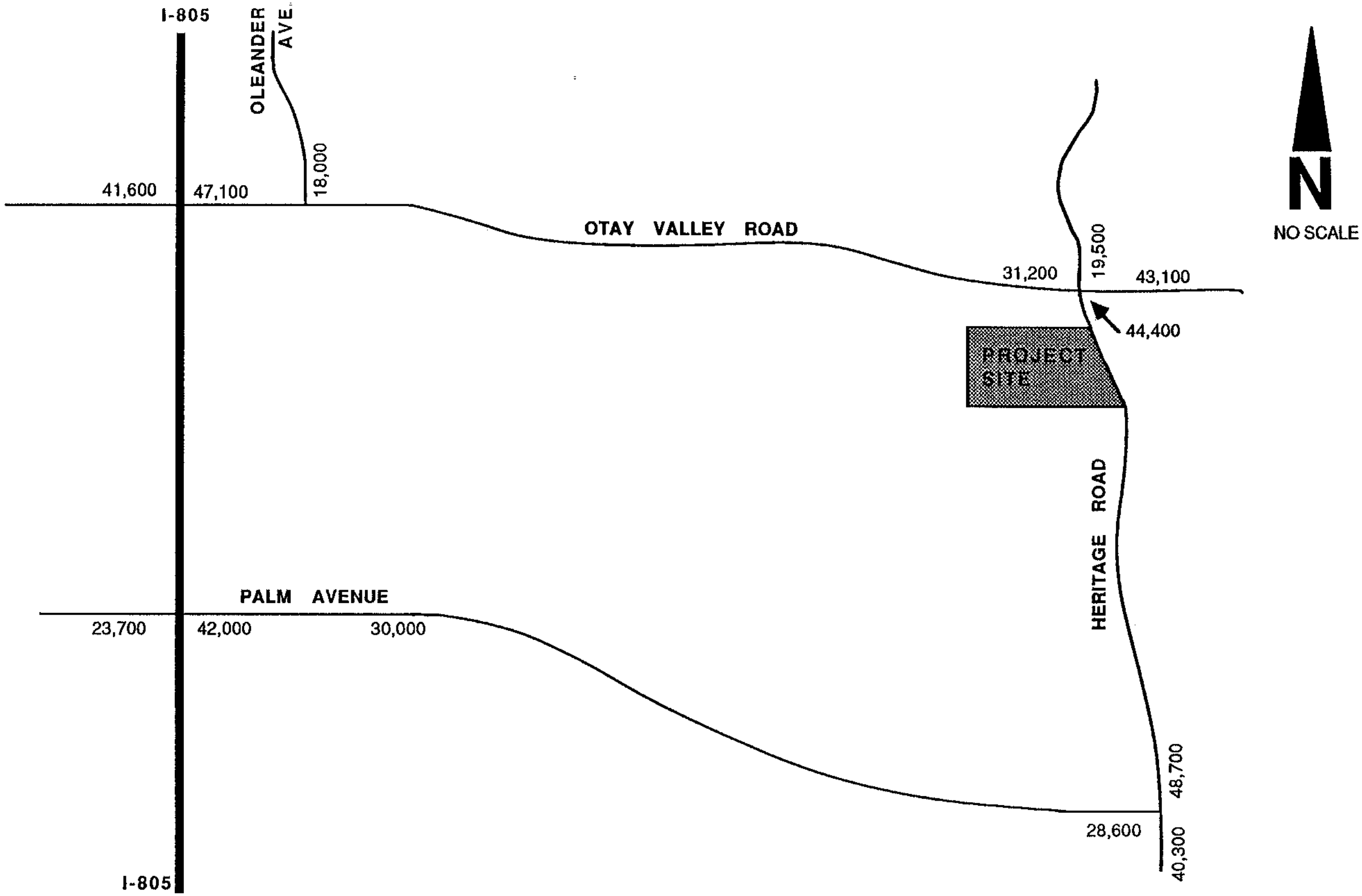
# Figure 8
## SAN DIEGO COUNTY GPA 84-02
## TRAFFIC PROJECTIONS

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# Figure 9
## SANDAG ALTERNATIVE #5 TRAFFIC PROJECTIONS

Palm Avenue is projected to carry 42,000 ADT east of I-805. West of Heritage Road, Palm Avenue is projected to carry 28,600 ADT.

As mentioned previously, the City of Chula Vista is in the process of preparing a travel forecast to reflect recent changes in assumed land uses. In conjunction with the travel forecast, the circulation for the area is being studied.

PUBLIC TRANSPORTATION SERVICES

Public transportation services for the area are provided by Chula Vista Transit. The only bus route serving the area is Route 703, which does provide a connection with the San Diego Trolley at the Chula Vista H Street Trolley Station. However, the stop location for Route #703 closest to the project site is just north of Otay Valley Road, on Oleander Avenue. Therefore, the project site is not well served by transit.

As the surrounding area develops, it may become feasible for the transit agency to expand bus routes to the east. However, under the assumption that the project is built immediately, no convenient transit service would be available.

PROJECT TRAFFIC

In order to assess the traffic related impacts of the project on the surrounding street system, the expected traffic which would result from the development of the site is estimated. The project traffic is then distributed and assigned to the street system and added to the existing traffic to evaluate the potential impacts.

Trip Generation

The traffic which would be expected to result from the proposed project, as well as development at the General Plan designation for the site is estimated using trip generation rates and peak hour factors which have been developed by various agencies. These rates are published by SANDAG in their report entitled "San Diego Traffic Generators", and are accepted by the City of Chula Vista. Table 2 summarizes the trip rates and peak hour factors used. Table 3 summarizes the expected trips that would be generated by the development of the proposed project and by developing the site under the existing general plan land use designation.

As shown in Table 2, the proposed project would be expected to add 15,216 ADT to the street system, of which 1,905 and 2,151 are assigned to the morning and evening peak hours, respectively. The existing General Plan land use designation for the site would be expected to result in 4,240 ADT of which 339 and 424 are assigned to the morning and evening peak hours, respectively.

Comparing the expected trips due to the proposed project to the trips which would be expected due to developing the site at the

TABLE 1

TRIP GENERATION CHARACTERISTICS

| Use | Daily Trip Rate | AM Peak Hour In* | AM Peak Hour Out* | PM Peak Hour In* | PM Peak Hour Out* |
|---|---|---|---|---|---|
| Industrial | 120 trips/acre | 11.2% | 2.8% | 3.0% | 12.0% |
| Thoroughfare Commercial | 400 trips/acre | 1.8% | 1.2% | 4.5% | 4.5% |
| Single Family Residential | 10 trips/DU | 1.6% | 6.4% | 7.0% | 3.0% |

* Shown as a percentage of the daily trips

TABLE 2

TRIP GENERATION SUMMARY

| Use | Intensity | ADT | AM Peak In | AM Peak Out | PM Peak In | PM Peak Out |
|---|---|---|---|---|---|---|
| PROPOSED PROJECT: | | | | | | |
| Industrial (78 lots) | 107.88 ac. | 12,946 | 1,450 | 362 | 388 | 1,554 |
| Thoroughfare Commercial | 4.45 ac. | 1,780 | 32 | 22 | 80 | 80 |
| Single Family Res. | 49 DU | 490 | 8 | 31 | 34 | 15 |
| Total: | | 15,216 | 1,490 | 415 | 502 | 1,649 |
| EXISTING GENERAL PLAN DESIGNATION: | | | | | | |
| Single Family Residential @ 3 DU/ac. *** | 424 DU | 4,240 | 68 | 271 | 297 | 127 |
| Net Increase due to Proposed Project: | | 10,976 | 1,422 | 144 | 205 | 1,522 |

*** Estimated dwelling units based on 69% of the 205 acre site being developable and using 3 dwelling units/acre (low density residential designation).

existing General Plan designation, shows the proposed project would generate 10,976 more average daily trips. Of these, 1,566 and 1,727 more trips would be expected due to the proposed project during the morning and evening peak hours, respectively.

Trip Distribution

The allocation of trips to the street system is made on the basis of an estimate of likely ultimate travel destinations and the streets that would be used to reach those destinations. The basis for this is recognition of the driver's consideration of time, distance, comfort, and convenience in choosing a route. Major factors include major attractors in the area, and the roadway network itself.

The directional distribution estimated for traffic to and from the project is summarized in Table 3. As shown, the industrial and commercial tripmaking patterns were assumed to be oriented slightly differently than the residential tripmaking pattern. The difference was assumed to account for residential trips seeking services, schools, etc. within the area. Most notably, it was assumed that 10% of the residential trips utilize the thoroughfare commercial development within the site.

TABLE 3

Trip Distribution for Project Site

| To and From | Roadway | Percent of Project Trips Ind./Comm. | Residential |
|---|---|---|---|
| North | I-805 | 65% | 55% |
| South | I-805 | 10% | 10% |
| South | Otay Valley Road | 10% | 10% |
| West | Otay Valley Road | 15% | 15% |
| | Total: | 100% | 90% (a) |

(a) 10% of the residential trips were assumed to be attracted to the thoroughfare commercial development on the site.

Assignment of Project Trips

The percentages of trip orientation (Table 3) were applied to the estimated trip generation for the project site for two scenarios of available access. The first assumed that only Otay Valley Road would be available for access to and from the proposed project. The second assumed that the extension of "A" Street was in place providing secondary access for the industrial lots within the site. For this assignment, the project site was

sectioned to estimate the logical pattern for trips to achieve the direction of travel desired. Primarily distance and convenience were accounted for in this assignment of the project trips. Note that the residential units only take access from the extension of "J" Street. There is no internal connection to "A" Street, so the residential units were assumed to use only Otay Valley Road (no secondary access assumed).

Figures 10 and 11 summarize the assignment of project trips under the two assumptions of access. The residential trip assignment is shown separately from the industrial and commercial trips. Figures 12 and 13 show the existing ADT plus the assigned trips due to the project site, for the assumptions of only Otay Valley Road available for access and secondary access available, respectively.

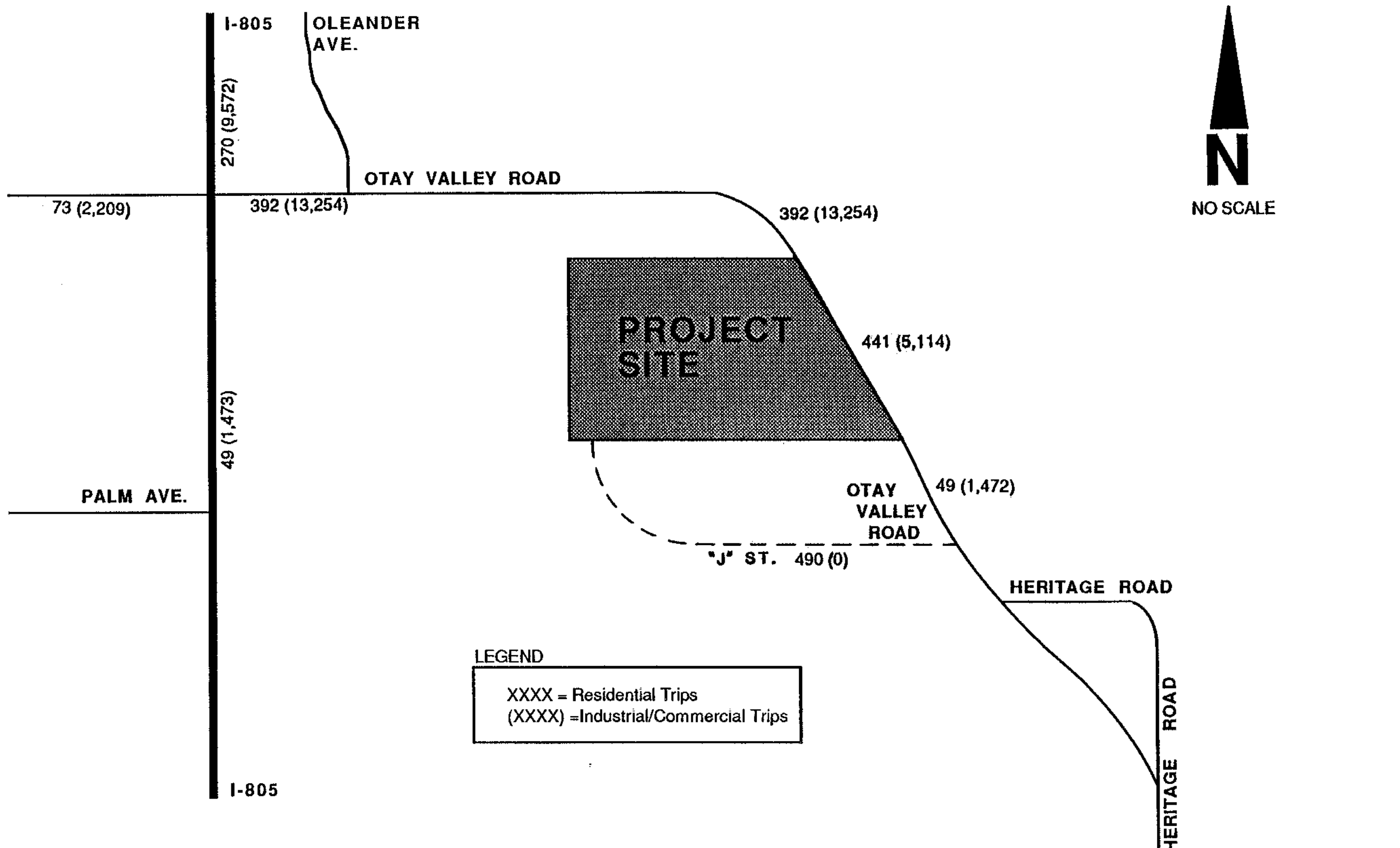
To compare the effects of the project on the surrounding street system to what would occur if the site is developed under the existing General Plan land use designations, the low density residential estimated trip generation (Table 2) was also assigned. Figures 14 and 15 show the assigned General Plan designation trips as well as the existing ADT plus the assigned General Plan designation trips for the two scenarios of available access.

Project Impact on Surrounding Street System

Table 4 summarizes Figure 3 and Figures 12 through 15. Table 5 summarizes the comparison of the roadway segment volume to capacity ratios for the existing traffic and with the addition of project traffic (as proposed and at the General Plan designation).

As shown in Table 5, developing the property under the General Plan land use designation of low density residential does not significantly impact Otay Valley Road. The volume to capacity (V/C) ratios for the segments do not exceed 1.0 for either assumption of access with the exception that it slightly exceeds 1.0 just north of the site (it is 1.04 on this segment) assuming no secondary access is available. The project's most significant increase in V/C occurs, as expected, on the two lane segment of Otay Valley Road north of the project site, where the existing V/C is 0.28 and the General Plan development of the site raises it to 1.04 with only Otay Valley Road for access.

Table 5 also shows that developing the property as proposed has significant impact on the two lane segment of Otay Valley Road north of the project site. The existing V/C is 0.28 (1,400 ADT), and the project would raise it to 3.01 (15,046 ADT) assuming Otay Valley Road is the only access. The other segment where the project would cause the V/C to approach 1.0, is Otay Valley Road just east of I-805. With Otay Valley Road as the only access, the V/C ratio would be 0.96. However, this is not unexpected near a freeway access.

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# Figure 10
## ASSIGNMENT OF PROJECT TRIPS
(ONLY OTAY VALLEY ROAD FOR ACCESS)

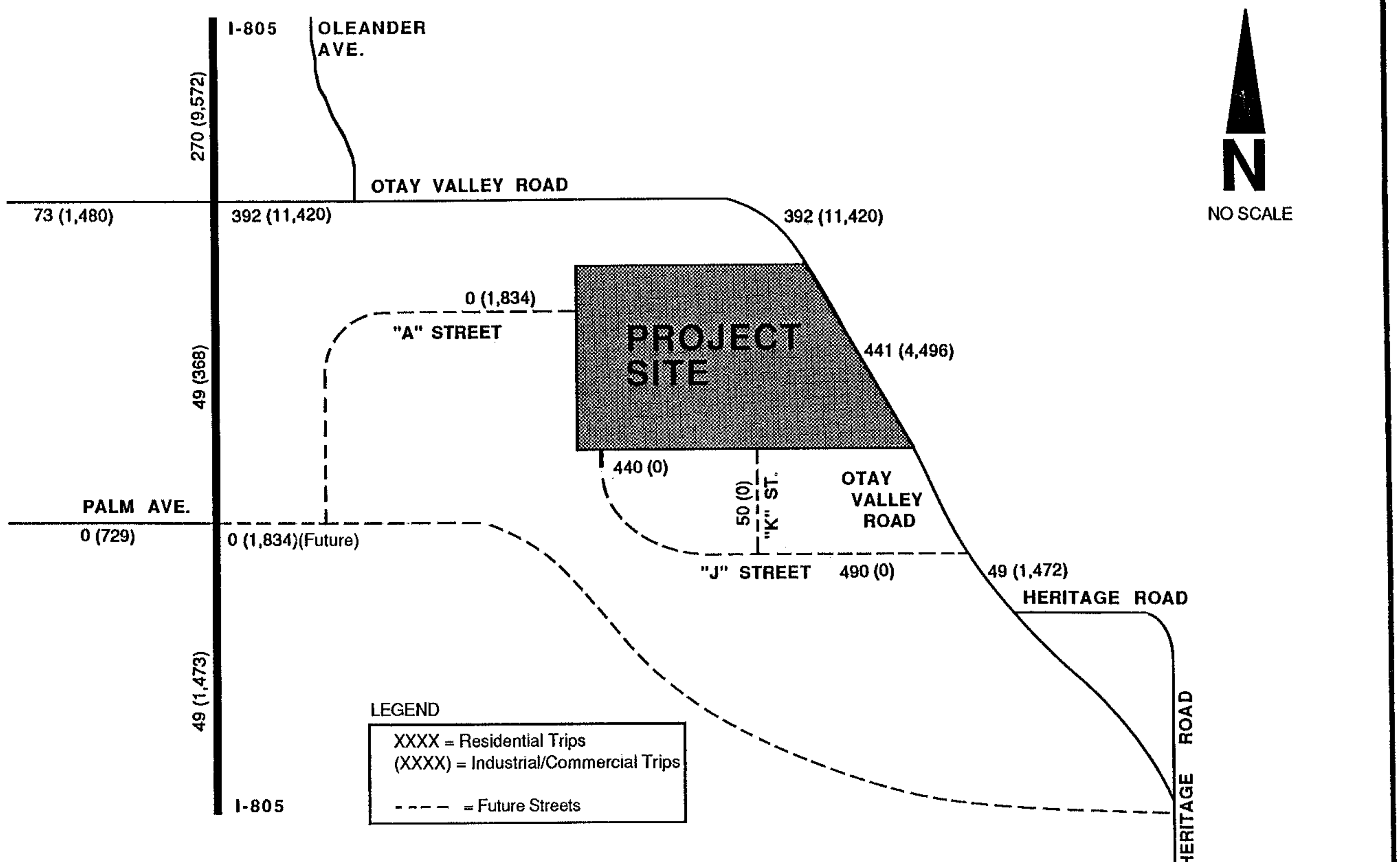


**Figure 11**
**ASSIGNMENT OF PROJECT TRIPS**
(SECONDARY ACCESS FROM FUTURE STREETS)

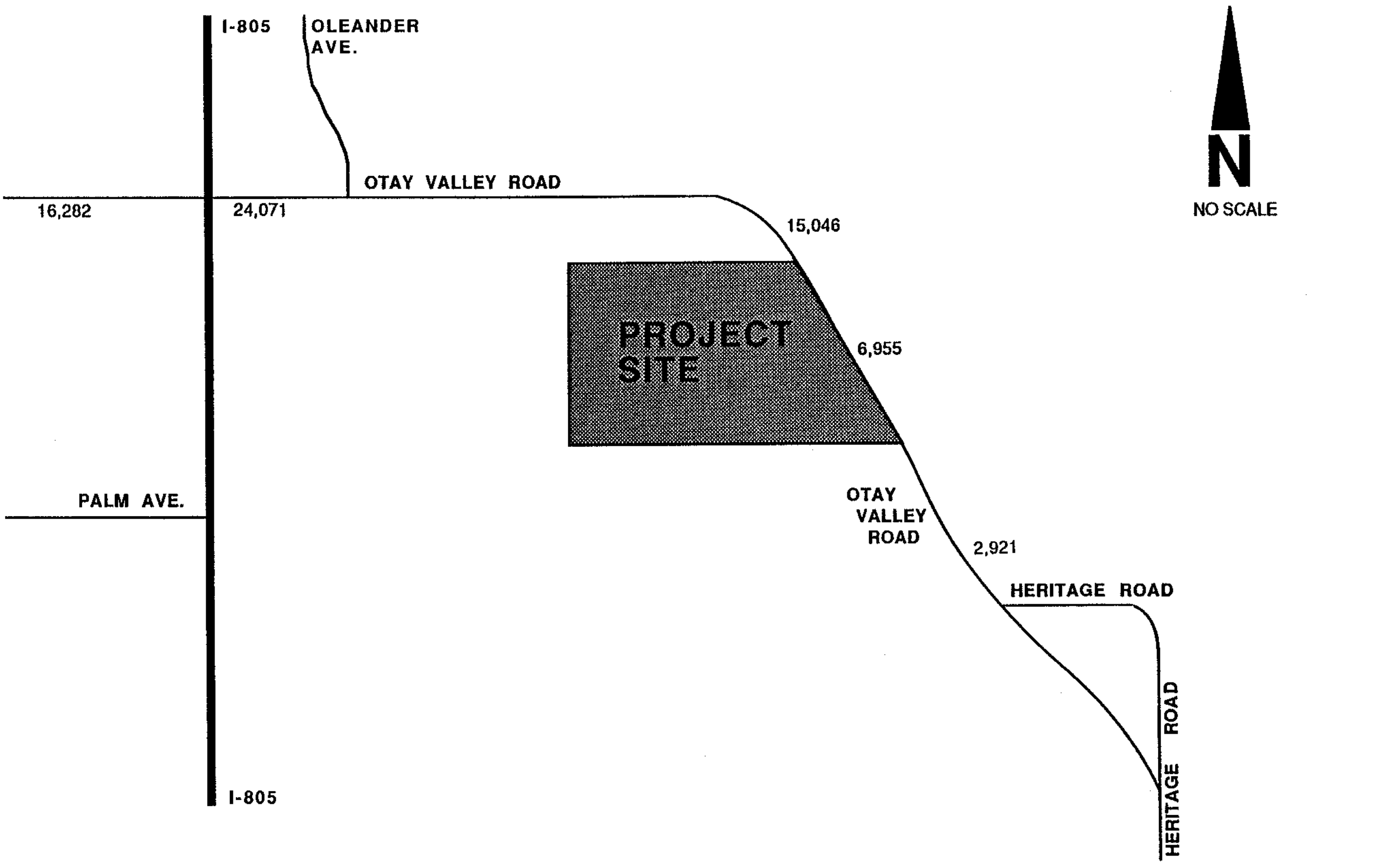


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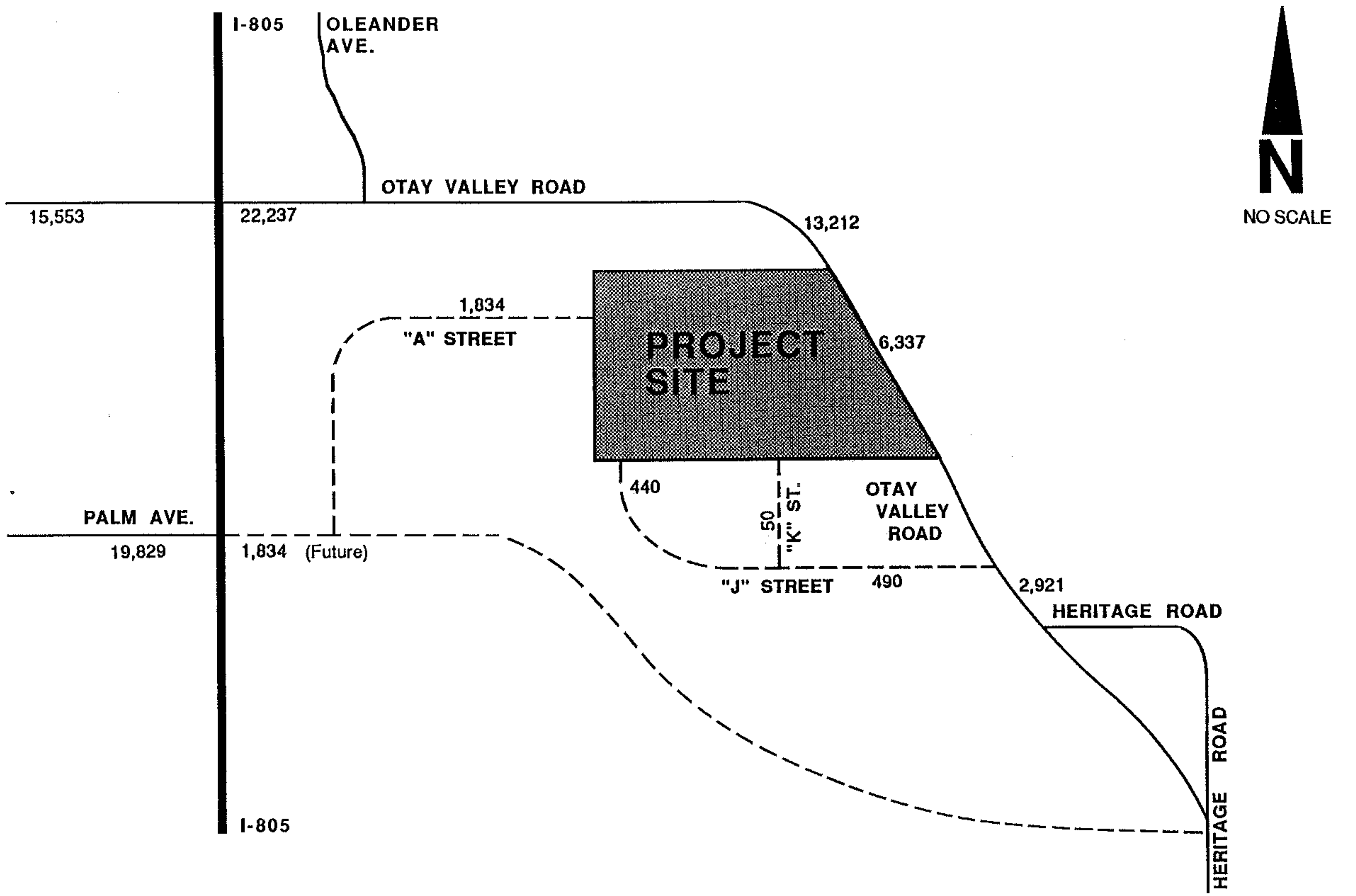
**Figure 12**
**EXISTING ADT + ASSIGNED PROJECT TRIPS**
(ONLY OTAY VALLEY ROAD FOR ACCESS)

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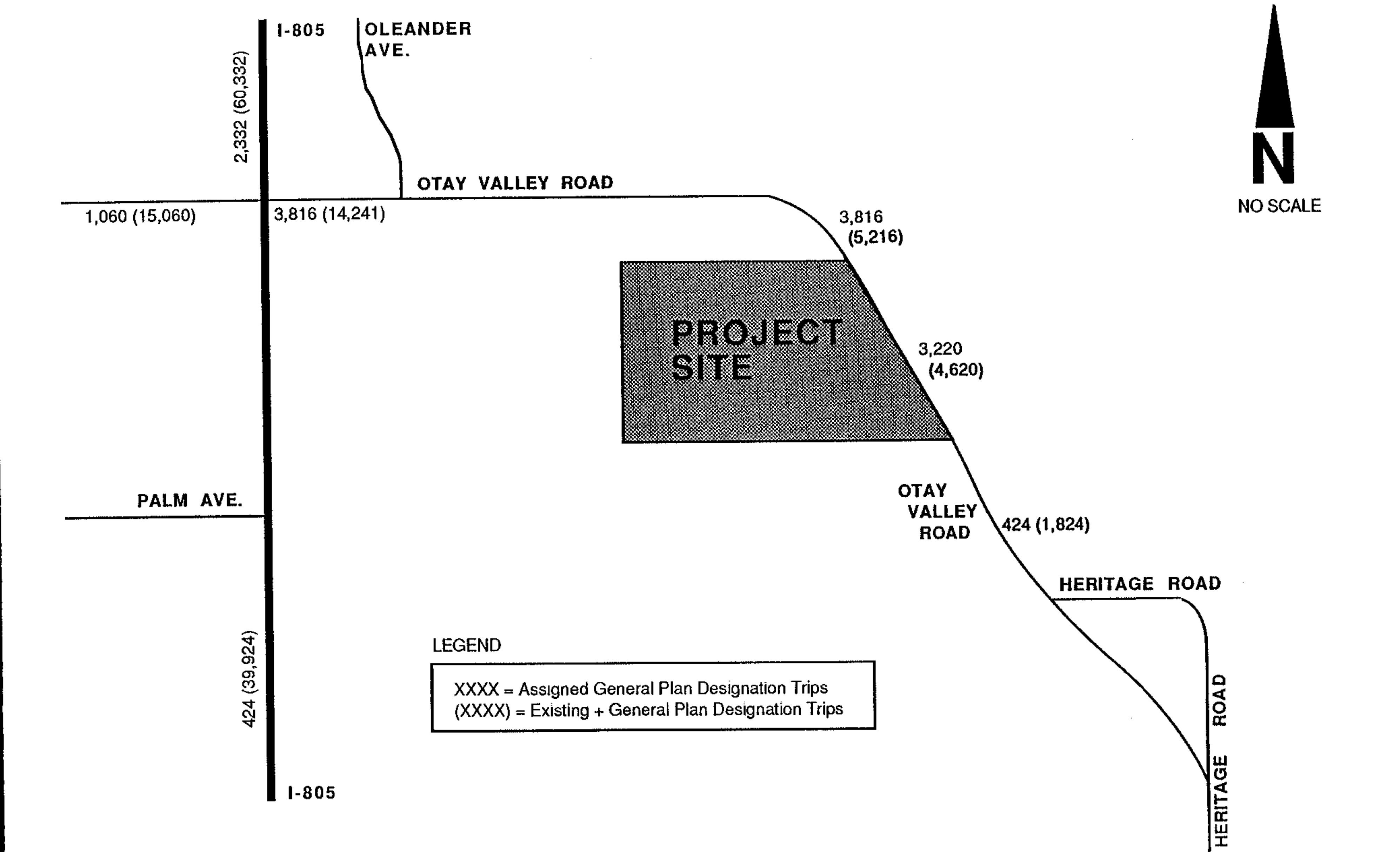
# Figure 13
## EXISTING ADT + ASSIGNED PROJECT TRIPS
## (SECONDARY ACCESS FROM FUTURE STREETS)

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# Figure 14
## EXISTING + ASSIGNED GENERAL PLAN DESIGNATION TRIPS
(ONLY OTAY VALLEY ROAD FOR ACCESS)

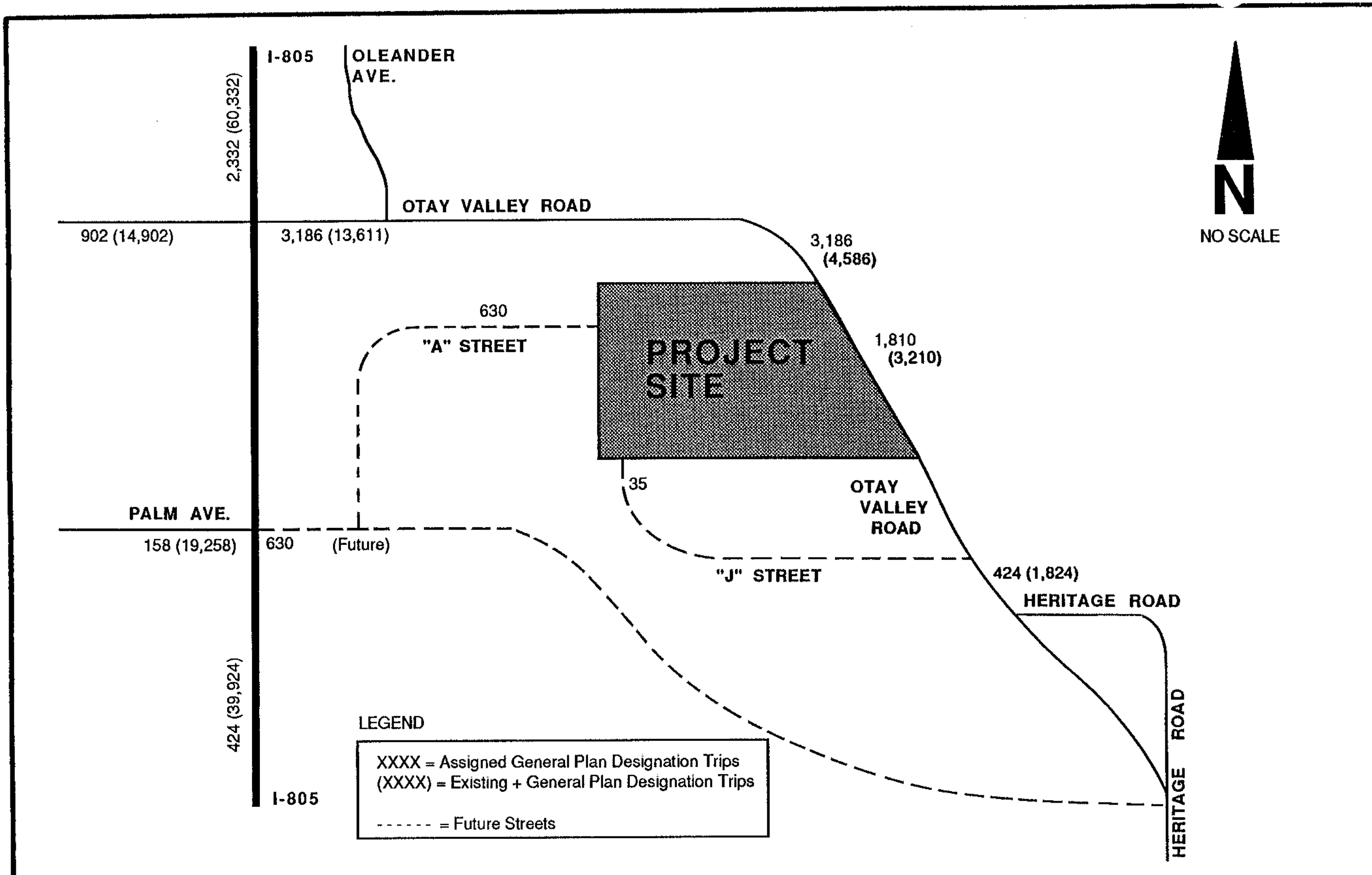


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**Figure 15**
**EXISTING + GENERAL PLAN DESIGNATION TRIPS**
(SECONDARY ACCESS FROM FUTURE STREETS)

TABLE 4

Roadway Segment Daily Traffic Volumes
Existing and with Project

| Roadway Segment | Existing ADT | Existing + Project ADT | Existing + Gen'l Plan Use ADT |
| --- | --- | --- | --- |
| ASSUMING ONLY OTAY VALLEY ROAD AVAILABLE FOR ACCESS: | | | |
| Otay Valley Rd. w/o I-805 | 14,000 | 16,282 | 15,060 |
| Otay Valley Rd. I-805 to Oleander | 10,425 | 24,071 | 14,241 |
| Otay Valley Rd. n/o site | 1,400 | 15,046 | 5,216 |
| Otay Valley Rd. s/o site | 1,400 | 2,921 | 1,824 |
| ASSUMING SECONDARY ACCESS AVAILABLE: | | | |
| Otay Valley Rd. w/o I-805 | 14,000 | 15,553 | 14,902 |
| Otay Valley Rd. I-805 to Oleander | 10,425 | 22,237 | 13,611 |
| Otay Valley Rd. n/o site | 1,400 | 13,212 | 4,586 |
| Otay Valley Rd. s/o site | 1,400 | 2,921 | 1,824 |
| Palm Avenue w/o I-805 | 19,100 | 19,829 | 19,258 |

TABLE 5

Roadway Segment Volume to Capacity Ratio Comparisons (a)

| Segment | Class | Capacity | Existing V/C | Existing + Proj. V/C | Existing + GP Use V/C |
|---|---|---|---|---|---|
| ASSUMING ONLY OTAY VALLEY ROAD AVAILABLE FOR ACCESS: | | | | | |
| Otay Vly. w/o I-805 | Major | 25,000 | 0.56 | 0.65 | 0.60 |
| Otay Vly. I-805 to Oleander | Major | 25,000 | 0.42 | 0.96 | 0.57 |
| Otay Vly. n/o site | 2 Lane Coll. | 5,000 | 0.28 | 3.01 | 1.04 |
| Otay Vly. s/o site | 2 Lane Coll. | 5,000 | 0.28 | 0.58 | 0.36 |
| ASSUMING SECONDARY ACCESS AVAILABLE: | | | | | |
| Otay Vly. w/o I-805 | Major | 25,000 | 0.56 | 0.62 | 0.60 |
| Otay Vly. I-805 to Oleander | Major | 25,000 | 0.42 | 0.89 | 0.54 |
| Otay Vly. n/o site | 2 Lane Coll. | 5,000 | 0.28 | 2.64 | 0.92 |
| Otay Vly. n/o site | 2 Lane Coll. | 5,000 | 0.28 | 0.58 | 0.36 |
| Palm Avenue w/o I-805 | Major | 20,000 | 0.96 | 0.99 | 0.96 |

(a) Classifications and associated capacities for Otay Valley Road per City of Chula Vista Design Standards. Classification and capacity for Palm Avenue per City of San Diego Design Standards. Copies of these design standards are included in the Appendix.

As the proposed project is developed in a phased program, traffic will be added to the existing traffic on the two-lane section of the Otay Valley Road (between Oleander Avenue and the project site. At some point in the phased development, the capacity of the two-lane section will be exceeded. To continue development, it will be necessary to upgrade the roadway to four lanes.

The City of Chula Vista's design ADT for a two lane local collector is 5,000. This is a somewhat low figure for the capacity of a two lane roadway with little to no side friction and no intersection delays along it. This roadway compares to the County of San Diego's two-lane light collector road classification. The County's table which relates ADT to levels of service (LOS) for various road classifications, shows a LOS C of 7,100 ADT for a two-lane light collector (this table is included in the Appendix).

Assuming the LOS C for this roadway to be 7,100 ADT and an existing traffic volume of 1,400 ADT, the remaining volume to still maintain a level of service of C would be 5,700 ADT. The two lane segment north of the site was assumed to have 80% of the residential trips assigned to it, and 90% of the industrial and commercial trips assigned to it (under the worst case assumption of only Otay Valley Road for access).

Possible phase one development of the site could include combinations of residential, the commercial lot, and industrial lots as follows:

| Land Use | ADT | % on Otay Valley Rd. n/o Site | | Contributing ADT |
|---|---|---|---|---|
| **Assuming Residential, Commercial, and some Industrial:** | | | | |
| 49 SF Lots | 490 | 80% | | 392 |
| Commercial Lot 4.45 acres | 1,780 | 90% | | 1,602 |
| Industrial 34.3 acres | 4,116 | 90% | | 3,704 |
| | | | TOTAL: | 5,698 |
| **Assuming Only Industrial Lots:** | | | | |
| Industrial 52.7 acres | 6,324 | 90% | TOTAL: | 5,692 |
| **Assuming the Commercial Lot and some Industrial:** | | | | |
| Commercial 4.45 acres | 1,780 | 90% | | 1,602 |
| Industrial 37.9 acres | 4,548 | 90% | | 4,093 |
| | | | TOTAL: | 5,695 |

## Site Plan

The site plan shows Otay Valley Road (future Heritage Road) dedicated for half width six lane prime arterial standards along the project's frontage. This is appropriate for the ultimate classification expected for this roadway (according to SANDAG's forecast and in anticipation of the new study to be completed in six months). However, the roadway has a substandard alignment near the southerly portion of the site. At the Tentative Map stage, additional right of way may be required to straighten the alignment. This could affect lots on the southeasterly side of the site. In the future, an alignment study may need to be done.

The assignment of project trips within the site results in a volume at the southerly entrance/exit ("B" Street) exceeding the design standards of the proposed 52 foot roadway cross section. However, since this occurs near the intersection with Otay Valley Road, it will require special treatment at the intersection, rather than a larger cross section for the entire roadway.

The northerly project entrance/exit is already shown to have a four lane major street cross section near the intersection with Otay Valley Road. However, between Otay Valley Road and "G" Street, there is a median shown which does not provide left turn storage for vehicles westbound on "A" Street turning southbound onto "G" Street. The highest demand for this turning movement is approximately 100/hour in the morning peak hour, so provision for a left turn lane may not be necessary, especially since two westbound lanes would be available.

Finally, "C" Street and "E" Street have straight-away sections of approximately 1,000 feet. This can lead to a speed enforcement problem. Consideration should be given to realigning these sections of roadway to include curvature.

## CONCLUSIONS

The proposed Otay Rio Business Park project, which includes 78 industrial lots (107.88 acres), one 4.45 acre thoroughfare commercial lot, and 49 single family residential dwelling units, would be expected to generate 15,216 average daily trips. Of these, 1,905 and 2,151 are assigned to the morning and evening peak hours, respectively.

Otay Valley Road is built as a four lane major street between I-805 and Oleander Avenue. East of Oleander Avenue, Otay Valley Road is a two lane facility. The project traffic impacts the two lane segment north of the site by raising the volume to capacity ratio for this segment from 0.28 to 3.01 (1,400 ADT to 15,046 ADT) for the worst case of all access taken from Otay Valley Road. For the same access consideration, the General Plan land use designation for the site would raise the volume to capacity ratio for this segment from 0.28 to 1.04 (1,400 ADT to 5,216 ADT).

Therefore, the existing traffic plus the traffic from the first phase of the project should not exceed the capacity of the roadway. The City of Chula Vista's design ADT for a two lane local collector is 5,000. Since there is little or no side friction and no intersection delays along this portion of Otay Valley Road, this design ADT is considered low as a capacity value. The County's light collector classification (which has characteristics comparable to Otay Valley Road) has a level of service C of 7,100 ADT. The existing ADT is 1,400 for this segment. In order not to exceed a reasonable operating condition for Otay Valley Road (using LOS C as 7,100 ADT), the phase one portion of this project should not generate average daily traffic exceeding 5,700 trips along this segment.

Appropriately, the project will dedicate property along its frontage with Otay Valley Road (future Heritage Road) providing the half width cross section required for a six lane prime arterial. Due to the substandard alignment near the southerly portion of hte site, the Tentative Map stage may require additional right of way from the project. Additionally, if the half width improvements are not required to be constructed with the project, guaranty that such improvements will be constructed at the appropriate time should be provided.

Special intersection treatment may be required on "B" Street near its intersection with Otay Valley Road to accommodate expected traffic volumes. Such treatment may include additional width for turn lanes.

"C" Street and "E" Street have relatively long straight-away sections which could lead to a speed enforcement problem. Consideration should be given to realigning these sections of roadway to include some curvature.

# APPENDIX

# CITY OF CHULA VISTA STREET STANDARDS

| | CVDS STD. DWG. | DESIGN A.D.T. | DESIGN SPEED | STREET CHARACTERISTICS: TRAVEL LANES NO. | TRAVEL LANES WIDTH (EA) | PARKING LANES NO. | PARKING LANES WIDTH (EA) | MEDIAN WIDTH | CB. TO CB. WIDTH | R.O.W. WIDTH | MIN. RADII: ROUGH TERRAIN (a) | MIN. RADII: MODERATE TERRAIN (a) | MAX GRAD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RIME ARTERIAL | 4 | 50,000 | 70 | 6 | 12'-16' | 0 | (d) | 16' | 98' | CVDS4 | 1000' | 1500' | 7% |
| AJOR | 1 | 25,000 | 50 | 4 | 12' | 2 | 8' | 16' | 80' | CVDS1 | 750' | 1000' | 7% |
| OLLECTOR | 1 | 10,000 | 40 | 4 | 12' | 2 | 8' | 0 | 64' | CVDS1 | 300' | 500' | 10% |
| ESIDENTIAL COLLECTOR | 1 | 5,000 | 30 | 2 | 12' | 2 | 8' | 0 | 40' | CVDS1 | 200' | 300' | (b) 12% |
| ESIDENTIAL | 1 | 1,400 | 25 | 2 | 10' | 2 | 8' | 0 | 36' | CVDS1 | 100' | 200' | 15% |
| OMMERCIAL/ INDUSTRIAL | 2 | 5,000 | 30 | 2 | 14' | 2 | 12' | 0 | 52' | CVDS2 | - | 200' | 8% |
| RONTAGE ROAD | 2 | - | 25 | 2 | 11' | 1 | 8' | 0 | 30' | CVDS2 | - | 100' | 15% |
| -WAY HILLSIDE LOCAL | 3 | - | 25 | 2 | 12' | 1 | 8' | 0 | 32' | CVDS3 | 100' | - | (c) 20% |
| -WAY HILLSIDE LOCAL | 3 | - | 25 | 1 | 16' | 1 | 8' | 0 | 24' | CVDS3 | 100' | - | (c) 20% |
| ESIDENTIAL CUL-DE-SAC | | - | 25 | 2 | 10' | 2 | 8' | 0 | 36' | | 100' | 200' | 15% |
| LLEY | | - | 15 | 2 | 10' | 0 | 0 | 0 | N/A | | - | - | 15% |

(a) TOPOGRAPHIC CLASSIFICATION TO BE DETERMINED BY CITY ENGINEER.

(b) 8% IN COMMERCIAL AREAS.

(c) GRADE SEGMENTS IN EXCESS OF 12% SHALL NOT EXCEED 300 FEET IN LENGTH. SUSTAINED GRADES AND AVERAGE GRADE OVER ANY 1000 FOOT LENGTH SEGMENT SHALL NOT EXCEED 10%.

(d) EMERGENCY PARKING TO BE ALLOWED IN OUTER 16' TRAVEL LANES.

## GENERAL NOTES

1. CITY'S RESPONSIBILITY FOR CONSTRUCTION SHALL BE GENERALLY LIMITED TO MEDIAN CONSTRUCTION FOR ARTERIALS AND MAJORS TO INCLUDE CURB, GUTTER, LANDSCAPING, IRRIGATION AND STREET LIGHTS WITHIN MEDIAN, AND FOR ONE 12' TRAVEL LANE ON EACH SIDE OF ARTERIAL MEDIANS.

2. PORTLAND CEMENT CONCRETE PAVEMENT SHALL BE REQUIRED FOR GRADES IN EXCESS OF 12%.

3. THE CITY ENGINEER MAY APPROVE REDUCTION OF PARKING, SIDEWALKS AND RIGHT OF WAY FOR STREETS WHERE DEEMED APPROPRIATE, HOWEVER, THE MINIMUM PAVEMENT WIDTH EXCLUDING CURB AND GUTTER SHALL BE 24'. IF SIDEWALK IS DELETED, THE MINIMUM DISTANCE FROM THE FACE OF CURB TO PROPERTY LINE SHALL BE 5'.

# STREET DESIGN STANDARDS*
# 1980

APPENDIX I
(To Council Policy 600-4)

| Functional Street Classification | Number of Lanes | Approx. Max. ADT | R.O.W. Widths | Curb-to-Curb (or Other) Width | Median Width | Shoulder Width | Minimum Radius of Curve | Maximum Grade | Minimum Design Speed (1) |
|---|---|---|---|---|---|---|---|---|---|
| Primary Arterial | 6 | 50,000 | 122' (2) | 102' | 14' | 8' | 1,000' | 7% | 55 |
| | 4 | 30,000 | 98' (2) | 78' | 14' | 8' | 1,000' | 7% | 55 |
| Major Street | 6 (3) | 40,000 | 122' (4) | 102' | 14' | 8' | 850' | 7% | 50 |
| | 4 | 25,000 | 98' (4) | 78' | 14' | 8' | 850' | 7% | 50 |
| | 4 | 20,000 | 92' | 72' (5) | 12' | 8' | 850' | 7% | 50 |
| Collector Street | 4 | 10,000 | 84-92' (6) | 64'-72' (7) | 0-12' | 8' | 500' | 12% (8) | 35 |
| | 2 | 5,000 | 60-70' (9) | 40-50' (9) | 0' | 8'-13' | 500 (10) | 12% (8) | 30 |
| Local Street (11) | | | | | | | | | |
| Industrial | 2 | 2,000 | 64' | 44' | 0' | 10' | 200' | 8% | |
| Residential | 2 | 2,000 | 60' | 40' | 0' | 8' | 100' | 15% | |
| | 2 | 1,200 | 56' | 36' | 0' | 8' | 100' | 15% | |
| | 2 | 700 | 52' (12) | 32' (12) | 0' | 8' | 100' | 15% | |
| | 2 | 200 | 50' (12) | 30' (12) | 0' | 8' | 100' | 15% | |
| Bikeways | | | | | | | | | |
| Separated Facility | 2 | — | 14' to 16' | 8'-12' (13) | 0' | 2-3' | 15' | 7% | |
| In Roadway—Painted (14) | 2 | — | — (15) | 5'-8' | 0' | — | 15' | Grade of St. | |
| Alley | 2 | — | 20' | 20' | 0' | — | 100' | 15% | |
| Sidewalk | 2 (16) | — | — | 4'-5' (17) | 0' | — | — | Grade of St. | |

1. Includes, but not limited to, horizontal and vertical curves, intersection and driveway sight distance. Design practice shall be in accordance with current CALTRANS Design Manual.
2. Full control of access from abutting property.
3. Can be used where property owners elect and are authorized to construct additional lanes to convert a four-lane primary arterial to a major street in order to gain access.
4. Access and parking control at critical locations. Additional width required for double left-turn lanes.
5. Travel lanes are 11'.
6. Ninety-two feet (92') required where left-turn lanes are needed.
7. Travel lanes 12', except at locations with left-turn lanes where travel lanes are 11'.
8. Eight percent (8%) in commercial and industrial areas. No fronting residential property permitted in areas where the grade is more than 10%.
9. Seventy foot (70') R.O.W. and 50' curb width in industrial area.
10. If the grade is 10% or less, a minimum curve radius of 375 feet may be used if there are no fronting residences in the area. If the grade is 6% or less, the minimum curve radius is 375 feet, or 300 feet if superelevation is provided.
11. Frontage roads or other single loaded streets: R.O.W. and curb widths may be reduced in residential areas to provide streets of 47/32' (5,000 ADT), 43/28' (1,200 ADT) and 41/26' (700 and 200 ADT). R.O.W. may be reduced 5' in commercial or industrial areas with no decrease in curb width.
12. Where no parking will be allowed, curb to curb width may be reduced to 24' with right-of-way width of 44' (R.O.W. 34' sidewalks are provided separately from streets).
13. Twelve foot (12') facility where substantial amount of traffic volume is anticipated (e.g., near schools).
14. One-way traffic on each shoulder, no parking. Separation from traffic lane consists of 6" white line.
15. Requires either parking prohibition or additional 5' R.O.W. and 5' paving for each lane, with parking retained. Normally, parking prohibition option will be used only when abutting property is either not developable or does not front on street.
16. Sidewalk on each side except on single loaded streets.
17. Minimum clear unobstructed width - 4' residential areas, 5' in commercial and industrial areas and on all four or six lane streets (excludes curb top width, fire hydrants, light poles, transformers, etc.).

*NOTE — *These are standards applicable primarily to newly developing areas without unusual terrain problems. In difficult terrain and in older developed areas where flexibility is required, deviations may be approved by the City Engineer.*

SAN DIEGO COUNTY
ADT vs. LEVEL OF SERVICE

| AVERAGE DAILY VEHICLE TRIPS | | | | | | |
|---|---|---|---|---|---|---|
| ROAD | | LEVEL OF SERVICE | | | | |
| CLASS | X-SECTION | A | B | C | D | E |
| Prime Arterial | 106/126 | < 22,200 | 37,000 | 44,600 | 50,000 | 57,000 |
| Major Road | 82/102 | < 14,800 | 24,700 | 29,600 | 33,400 | 37,000 |
| Collector | 64/84 | < 13,700 | 22,800 | 27,400 | 30,800 | 34,200 |
| Light Collector | 40/60 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Rural Collector | 40/84 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Rural Light Collector | 40/100 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Rural Mountain | 40/100 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Recreational Parkway | 42/100 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Residential Collector | 40/60 | * | * | 7,000 | * | * |
| Residential Street | 36/56 | * | * | 1,500 | * | * |
| Residential Cul-de-Sac or Loop Street | 32/52 | * | * | 200 | * | * |
| Interim Road | 28/40 or 60 | * | * | 2,800 | * | * |

*Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

**BASMACIYAN-DARNELL, INC.**

*ENGINEERING AND PLANNING*
*Transportation, Traffic, Municipal, Transit*

964 Fifth Avenue San Diego, California 92101 (619) 544-1488

April 10, 1987

Ms. Diana Richardson
Keller Environmental Associates, Inc.
964 Fifth Avenue, Suite 535
San Diego, CA 92101

Regarding: Checkprint EIR for Otay Rio Business Park

Dear Diana:

This letter is in response to the City' checkprint comments on the traffic section of the EIR for Otay Rio Business Park.

The primary concern of the City of Chula Vista seems to be related to a traffic study prepared by Willdan Associates for the Robinhood Ridge Precise Plan proposed south of Otay Rio, but in the City of San Diego. Specifically, concern has been expressed regarding the traffic volume quoted on Otay Valley Road in the Robinhood Ridge report versus the volume quoted in the Otay Rio report.

The volume used by Willdan, 4,300 ADT, was taken from the SANDAG "San Diego Region Average Weekday Traffic Volumes 1981-1985" publication in which the County showed a count on Otay Valley Road between I-805 and Heritage Road of 4,300 in 1984. The location of this count is the question as the limits shown are for an approximate 3.5 mile stretch of roadway. In a telephone conversation with the traffic section of the County of San Diego, I was given the most recent count taken by the County on Otay Valley Road in the vicinity of the project. This count was taken in March of 1986 just east of the Chula Vista City limits and was 1,130 ADT.

In response to preliminary comments by the City of Chula Vista (following submittal of the first EIR document) BDI contracted

Newport Traffic Studies to perform machine (road tube) counts on Otay Valley Road south of the river. Two day counts were taken on a Wednesday and a Thursday in March 1987. The 1,400 ADT used in the draft EIR was the highest count rounded up, and was considered to be a conservative approach. It is not conceivable that there would be 4,300 ADT on Otay Valley Road adjacent to the project site currently.

The second major concern is that the phasing analysis for the project used up the remaining capacity of Otay Valley Road (when superimposed upon the existing traffic). The "threshold" the City quotes in their letter was not intended to be taken as the capacity of Otay Valley Road. In our analysis, we felt that the project's development should be phased so that existing plus project traffic would not result in a level of service on Otay Valley Road north of the site lower than LOS C (according to the County of San Diego's Table relating ADT to levels of service for a Light Collector, attached). Capacity of a Light Collector would relate to LOS E, or 16,200 ADT.

More appropriately, at LOS D (10,900 ADT) there would be 3,800 ADT remaining if the threshold for the project's first phase plus the existing traffic was 7,100 ADT. This margin should be adequate to accomodate background growth.

It had been our understanding that Robinhood Ridge was not far enough along in the planning process through the City of San Diego to include in the analysis for Otay Rio.

We have, however, read the draft traffic study for Robinhood Ridge. In this study, Robinhood Ridge is presumed to develop over three years' time. It is unknown whether or not Robinhood Ridge and Otay Rio are on concurrent schedules. However, presuming they are on concurrent schedules and both first phases develop over the next year, existing traffic plus both first phases would result in 8,100 ADT on this section of Otay Valley Road. The Robinhood Ridge traffic study places 1,000 ADT on this section of Otay Valley Road with their first phase. This amount of traffic is not considered significant enough to change the conclusion that the Otay Rio project could be phased as shown in the draft EIR. The pavement does need improvement, but four travel lanes are not required for this first phase.

This section of Otay Valley Road will need to be upgraded to accomodate future traffic volumes. As noted in the Robinhood Ridge report (in which they were working off an invalid ADT for

SAN DIEGO COUNTY
ADT vs. LEVEL OF SERVICE

| AVERAGE DAILY VEHICLE TRIPS | | | | | | |
|---|---|---|---|---|---|---|
| ROAD | | LEVEL OF SERVICE | | | | |
| CLASS | X-SECTION | A | B | C | D | E |
| Prime Arterial | 106/126 | < 22,200 | 37,000 | 44,600 | 50,000 | 57,000 |
| Major Road | 82/102 | < 14,800 | 24,700 | 29,600 | 33,400 | 37,000 |
| Collector | 64/84 | < 13,700 | 22,800 | 27,400 | 30,800 | 34,200 |
| Light Collector | 40/60 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Rural Collector | 40/84 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Rural Light Collector | 40/100 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Rural Mountain | 40/100 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Recreational Parkway | 42/100 | < 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Residential Collector | 40/60 | * | * | 7,000 | * | * |
| Residential Street | 36/56 | * | * | 1,500 | * | * |
| Residential Cul-de-Sac or Loop Street | 32/52 | * | * | 200 | * | * |
| Interim Road | 28/40 or 60 | * | * | 2,800 | * | * |

*Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

# APPENDIX F

# AIR QUALITY COMPUTER RESULTS

# A P P E N D I X

## URBEMIS#1 Computer Model Results

Otay Rio Business Park

- Proposed Project - 1990
- Proposed Project - 1995
- Proposed Project - 2000

- Existing General Plan - 2000

PROJECT :OTAY RIO BUSINESS PARK
PREPARED FOR :KELLER ENVIRONMENTAL ASSOCIATES
CLIENT CONTACT :DIANA RICHARDSON
PREPARED BY :HANS GIROUX
PROJECTION YEAR :1990
DATE :03/23/87

| TYPE OF UNIT | SIZE |
|---|---|
| INDUSTRIAL | 107.88 /ACRES |
| THOROUGHFARE COMMERCIAL | 4.45 /ACRES |
| SINGLE FAMILY RESIDENTIAL | 49 /UNITS |

NONHOME BASED

| | TRIPS | VMT |
|---|---|---|
| NONWORK | 2557 | 12554 |
| WORK | 12167 | 99039 |
| TOTAL | 14724 | 111594 |

HOME BASED

| | TRIPS | VMT |
|---|---|---|
| HOME WORK | 134 | 1210 |
| HOME-SHOP | 103 | 360 |
| HOME-OTHER | 252 | 1325 |
| TOTAL | 489 | 2896 |

NONHOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 555.8
HYDROCARBONS (T/Y)= 52.8
NITROGEN OXIDES (T/Y)= 37.5

FUEL CONSUMPTION (GAL/YEAR)= 1131565

HOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 21.2
HYDROCARBONS (T/Y)= 1.8
NITROGEN OXIDES (T/Y)= 1.3

FUEL CONSUMPTION (GAL/YEAR)= 38270

ASSUMES TEMPERATURE = 55

PROJECT :OTAY RIO BUSINESS PARK
PREPARED FOR :KELLER ENVIRONMENTAL ASSOCIATES
CLIENT CONTACT :DIANA RICHARDSON
PREPARED BY :HANS GIROUX
PROJECTION YEAR :1995
DATE :03/23/87

| TYPE OF UNIT | SIZE |
|---|---|
| INDUSTRIAL | 107.88 /ACRES |
| THOROUGHFARE COMMERCIAL | 4.45 /ACRES |
| SINGLE FAMILY RESIDENTIAL | 49 /UNITS |

NONHOME BASED

| | TRIPS | VMT |
|---|---|---|
| NONWORK | 2557 | 12554 |
| WORK | 12167 | 99039 |
| TOTAL | 14724 | 111594 |

HOME BASED

| | TRIPS | VMT |
|---|---|---|
| HOME WORK | 134 | 1210 |
| HOME-SHOP | 103 | 360 |
| HOME-OTHER | 252 | 1325 |
| TOTAL | 489 | 2896 |

NONHOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 495.4
HYDROCARBONS (T/Y)= 46.3
NITROGEN OXIDES (T/Y)= 32.1

FUEL CONSUMPTION (GAL/YEAR)= 1094605

HOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 19.0
HYDROCARBONS (T/Y)= 1.5
NITROGEN OXIDES (T/Y)= 1.1

FUEL CONSUMPTION (GAL/YEAR)= 37020

ASSUMES TEMPERATURE = 55

PROJECT :OTAY RIO BUSINESS PARK
PREPARED FOR :KELLER ENVIRONMENTAL ASSOCIATES
CLIENT CONTACT :DIANA RICHARDSON
PREPARED BY :HANS GIROUX
PROJECTION YEAR :2000
DATE :03/23/87

| TYPE OF UNIT | SIZE |
|---|---|
| INDUSTRIAL | 107.88 /ACRES |
| THOROUGHFARE COMMERCIAL | 4.45 /ACRES |
| SINGLE FAMILY RESIDENTIAL | 49 /UNITS |

NONHOME BASED

| | TRIPS | VMT |
|---|---|---|
| NONWORK | 2557 | 12554 |
| WORK | 12167 | 99039 |
| TOTAL | 14724 | 111594 |

HOME BASED

| | TRIPS | VMT |
|---|---|---|
| HOME WORK | 134 | 1210 |
| HOME-SHOP | 103 | 360 |
| HOME-OTHER | 252 | 1325 |
| TOTAL | 489 | 2896 |

NONHOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 447.7
HYDROCARBONS (T/Y)= 42.3
NITROGEN OXIDES (T/Y)= 30.6

FUEL CONSUMPTION (GAL/YEAR)= 1085231

HOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 17.1
HYDROCARBONS (T/Y)= 1.4
NITROGEN OXIDES (T/Y)= 1.0

FUEL CONSUMPTION (GAL/YEAR)= 36703

ASSUMES TEMPERATURE = 55

PROJECT :EXISTING GENERAL PLAN
PREPARED FOR :KELLER ENVIRONMENTAL ASSOCIATES
CLIENT CONTACT :DIANA RICHARDSON
PREPARED BY :HANS GIROUX
PROJECTION YEAR :2000
DATE :03/23/87

| TYPE OF UNIT | SIZE |
|---|---|
| INDUSTRIAL | 424 /UNITS |

NONHOME BASED

| | TRIPS | VMT |
|---|---|---|
| NONWORK | 0 | 0 |
| WORK | 0 | 0 |
| TOTAL | 0 | 0 |

HOME BASED

| | TRIPS | VMT |
|---|---|---|
| HOME WORK | 1161 | 10483 |
| HOME-SHOP | 894 | 3129 |
| HOME-OTHER | 2183 | 11482 |
| TOTAL | 4238 | 25095 |

NONHOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 0
HYDROCARBONS (T/Y)= 0
NITROGEN OXIDES (T/Y)= 0

FUEL CONSUMPTION (GAL/YEAR)= 0

HOME BASED EMISSIONS

CARBON MONOXIDE (T/Y)= 148.7
HYDROCARBONS (T/Y)= 12.7
NITROGEN OXIDES (T/Y)= 9.2

FUEL CONSUMPTION (GAL/YEAR)= 318055

ASSUMES TEMPERATURE = 55