# CALIFORNIA COASTAL COMMISSION

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## STAFF REPORT: REGULAR CALENDAR

**APPLICATION NUMBER:** **5-99-089**

**APPLICANTS:** University of California Irvine
California Coastal Conservancy

**AGENT:** Wetlands Research

**PROJECT LOCATION:** San Joaquin Freshwater Marsh Reserve,
City of Irvine, County of Orange

**PROJECT DESCRIPTION:** Freshwater marsh restoration project involving land within and outside the Coastal Zone. The area within the coastal zone is 50 acres (all of five and a portion of two other duck ponds) and involves 23,000 cubic yards of cut. The project involves the grading and excavation of existing seasonal wetland duck ponds, re-contouring the pond floors to provide a diversity of open water and freshwater marsh habitat, regrading the levees to impound water at specific depths and improve the existing hydrology by pumping water from San Diego Creek. Terrestrial areas will be revegetated with coastal sage scrub. Wetland areas will be revegetated with native wetland vegetation. All excavated material will be used on site to raise the levees or to create islands in the duck ponds.

## SUMMARY OF STAFF RECOMMENDATION:

Staff recommends the Commission approve the proposed development with special conditions regarding submittal of an erosion control plan, trail closure, submittal of Army Corps of Engineers approval, measures to protect sensitive bird species, submittal of a revegetation plan including monitoring and maintenance, submittal of Regional Water Quality Control Board approval, and archaeology.

The primary purpose of the proposed development is wetland restoration and revegetation of native wetlands plants and coastal sage scrub plants. There is no net

loss of total acreage of wetlands. The project will result in an increase in the quality of wetland habitat, an increase in open water habitat, an increase in riparian habitat, and an increase in the quantity and quality of coastal sage scrub habitat. There are no known issues of controversy at this time.

**STAFF NOTE:**

The proposed project is located in the City of Irvine. However, University of California lands within the coastal zone were excluded from the City of Irvine's Local Coastal Program pending submittal, approval and certification of a long-range development plan. The University does not have a certified long-range development plan. In the absence of a certified long-range development plan, the standard of review for University of California lands within the coastal zone is the Chapter 3 resource protection policies of the Coastal Act.

Additionally, the San Joaquin Freshwater Marsh is part of the University of California Natural Reserve System. Therefore, the Marsh is dedicated in perpetuity as a public trust for nature preservation, restoration, nature study and research.

This project is jointly funded by the University of California, the State of California Coastal Conservancy, the Irvine and Clarke Foundation, and the San Joaquin Hills Transportation Corridor Authority. Additional support is provided by the Huntington Beach Wetland Conservancy.

The project occurs both within and outside the coastal zone boundary. The project requires permits from the Army Corps of Engineers and thus requires either a consistency certification or a waiver of consistency certification from the Coastal Commission. Section "B" of this staff report includes a finding for a waiver of consistency certification.

The existing wetland acreage in the project site is 28.4 acres of vegetated wetlands and 9.4 acres of open water habitat, for a total of 37.8 acres. At the conclusion of the project there will be 24.4 acres of vegetated wetlands and 14.5 acres of open water habitat for a total of 38.9 acres. The reduction in wetland vegetation results from the removal of cattails. However, open water habitat increases by 5 acres. Over time it is expected that native wetland plants will expand and compensate for the loss of the cattails. Native wetland and coastal sage scrub plants will be salvaged and planted at the conclusion of grading operations. The project will result in an increase in riparian habitat, and 5-20 acres of new coastal sage scrub habitat.

**LOCAL APPROVALS RECEIVED**: Approval in concept from the University of California Irvine

**SUBSTANTIVE FILE DOCUMENTS**:

1. San Joaquin Freshwater Marsh Enhancement Plan (1991)
2. Pre-Construction Notification for Nationwide Permit 27 (1998)
3. Conceptual Mitigation Plan – Hoag Memorial Hospital (1993)
4. Geotechnical Investigation for Proposed Grading and Pump Station Foundation Design, San Joaquin Marsh Habitat Restoration (1998)
5. San Joaquin Marsh Enhancement Plan – Revised Plan – 1997
6. Cultural Resources Survey of a 46-Acre Portion of the San Joaquin Freshwater Marsh Reserve (1998)
7. Draft Negative Declaration – San Joaquin Reserve Enhancement Phase I State Coastal Conservancy (1997)
8. California Regional Water Quality Control Board Waiver of Discharge Requirements and Water Quality Certification (1998)
9. Coastal Development Permit P-2-1-77-59 (U.C. Irvine)
10. Coastal Development Permit 5-87-644 (U.C. Irvine)
11. Coastal Development Permit 5-93-253 (Hoag Memorial Hospital)

## LIST OF EXHIBITS

1. Area Map
2. Vicinity Map
3. Coastal Zone Boundary
4. Project Phase I
5. Habitats
6. Ponds Cross Section
7. Water Intake System
8. Water Distribution System
9. Hoag Mitigation Site
10. Hoag Mitigation Site Plan
11. Proposed Habitat Plan

## RECOMMENDATION:

The staff recommends that the Commission adopt the following resolution:

### I. Approval with Conditions

The Commission hereby **grants** a permit, subject to the conditions below, for the proposed development on the grounds that the development will be in conformity with the provisions of Chapter 3 of the California Coastal Act of 1976, will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3 of the Coastal Act and will not have any significant adverse impacts on the environment within the meaning of the California Environmental Quality Act.

## II. Standard Conditions:

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. Expiration. If development has not commenced, the permit will expire two years from the date this permit is reported to the Commission. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. Compliance. All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.

4. interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.

5. Inspections. The Commission staff shall be allowed to inspect the site and the project during its development, subject to 24-hour advance notice.

6. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

7. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

## III. SPECIAL CONDITIONS

### 1. Erosion Control Plan

**Prior to the issuance of a coastal development permit** the applicant shall submit, for the review and approval of the Executive Director, a plan to minimize construction impacts. The plan shall include the following:

a. Should grading take place during the rainy season (November 1-March 31), sediment basins, (including debris basins, desilting basins, or silt traps) shall be required on the project site prior to or concurrent with the initial grading operations and maintained throughout the construction

process to minimize sediment inflow into runoff waters during construction. All sediment should be retained on-site unless removed to an appropriate approved dumping location.

b. The Permittee shall submit a list of Best Management Practices (BMPs) which the Permittee shall utilize during construction to ensure that all exposed soil will be permanently stabilized at the earliest practicable date.

c. The plan shall include, at a minimum, the following components:

1. A narrative report describing all temporary run-off and erosion control measures to be used during construction and all permanent erosion control measures to be installed for permanent erosion control, if applicable.

2. A site plan showing the location of all temporary erosion control measures.

3. A schedule for installation and removal of the temporary erosion control measures.

d. Silt fencing and construction fencing will be placed between the Hoag Hospital mitigation site and the construction area. No construction nor water level alteration shall occur within the Hoag Hospital mitigation site.

e. The Permittee shall undertake development in accordance with the final approved erosion control plan. Any proposed changes to the approved final erosion control plan shall be reported to the Executive Director. No changes to said plans shall occur without a Coastal Commission-approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is required.

**2. Trail Closure**

**The permittee shall agree** that closure of the County of Orange's Regional Santa Ana Heights Riding and Hiking Trail shall be minimized. In the event that closure is necessary due to construction the following measures will be implemented:

a. barriers will be placed on both eastern and western approaches to the trail to prevent users from entering the construction zone,

b. if consistent with public safety and protection of sensitive resources, a detour will be devised and the route posted during the construction phase of the project,

c. the closure periods shall be posted with signs visible from both east and west approaches to the affected segment of the trail,

d. any damage to the levee surface caused by project construction activities will be repaired to restore the trail to its condition prior to construction .

**3. U.S. Army Corps of Engineers Permit**

**Prior to commencement of construction**, the permittee shall provide to the Executive Director a copy of any U.S. Army Corps of Engineers or California Department of Fish and Game permit, letter of permission, or evidence that no Corps or Fish and Game permit is necessary. Any mitigation measures or other changes to the project required through said permit shall be reported to the Executive Director. Project changes required by the Corps or Fish and Game shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is required.

**4. Protection of Sensitive Bird Species**

**Prior to commencement of construction** the permittee shall:

a. conduct surveys, in compliance with United States Fish and Wildlife Service guidelines, to identify the presence of the:

i. California least tern (*Sterna antillarum brownii*),
ii. light-footed clapper rail (*Ralus longirostris levipes*),
iii. California black rail (*Laterallus jamaicensis coturniculus*),
iv. least bell's vireo (*Vireo bellii pusillus*), and the
v. California gnatcatcher (*Polioptila californica*).

b. A qualified biologist will be present during construction to monitor activity of California Least Terns or other sensitive bird species and will advise the contractor of all appropriate measures to avoid impacts to least tern foraging and nesting habitat.

c. Project construction shall be avoided during the avian breeding season, between the months of March 15 and July 15. However, the permittee may undertake construction during this period upon obtaining a written statement of the Executive Director authorizing construction on specified dates. To obtain such a determination, the permittee must submit a declaration from the Army Corps of Engineers stating that the construction on the specific dates proposed will not cause adverse impacts to any sensitive or endangered species. The declaration must contain an assessment of the foraging and nesting activities of the California Least Tern, found in the area and a statement that the construction activity on

the specific dates proposed will not interfere with the foraging or nesting activities of the California Least Tern.

**5. Monitoring**

**Prior to the issuance of a coastal development permit** the applicant shall submit, for the review and approval of the Executive Director, a 10 year monitoring plan that includes the following components and shall be implemented as approved by the Executive Director :

a. Project Oversight

A project biologist shall be on site during excavation and grading and revegetation in order to monitor and minimize the potential impacts from construction on native vegetation. Existing native vegetation outside the construction limits shall be flagged and construction personnel shall be instructed to avoid flagged areas.

b. Monitoring Reports

The applicant shall supply mitigation and monitoring reports yearly (by September 1) for five years after planting. The applicant shall include information on the success criteria, number of plants planted, number of plants replaced, lists of plants used, and an assessment of plant coverage. If the plan is less than successful, the report should include recommendations for action to identify and remedy the situation.

c. The permittee shall undertake development in accordance with the final approved monitoring plan. Any proposed changes to the approved final monitoring plan shall be reported to the Executive Director. No changes to said plans shall occur without a Coastal Commission-approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is required.

**6. Maintenance**

**Prior to the issuance of a coastal development permit** the applicant shall submit, for the review and approval of the Executive Director, a 10 year maintenance plan that includes the following components and shall be implemented as approved by the Executive Director :

a. Time Period

Maintenance shall occur over a ten year period commencing at the end of project revegetation.

b. Removal of Non-Native Exotics

On-site removal of exotics and non-native invasive plants shall occur in graded and revegetated areas on a weekly basis during the first 6 months following the conclusion of project revegetation and on a monthly basis thereafter.

c. The permittee shall undertake development in accordance with the final approved maintenance plan. Any proposed changes to the approved final maintenance plan shall be reported to the Executive Director. No changes to said plans shall occur without a Coastal Commission-approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is required.

**7. Revegetation Plan**

**Prior to the issuance of the coastal development permit** the applicant shall submit, for the review and approval of the Executive Director, a landscaping and revegetation plan. This plan shall include the following elements and shall be implemented as approved by the Executive Director:

a. Salvage of Native Plants and Soil

The applicant shall, wherever possible, salvage existing native coastal sage scrub and wetland plants from the graded areas prior to construction and set them aside to be re-planted once the construction is complete. In addition, the applicant shall remove the top soil layer and keep it separate for placement as top soil once the project is complete, wherever possible. If the top soil is not salvaged and replaced, the applicant shall conduct soil tests prior to the placement of plants to ensure that the soil regime is adequate for native coastal sage scrub and wetland plants.

b. List of Native Plants

The applicant shall supply a list of the quantity and types of native plants to be placed in all of the ponds and levee banks disturbed by construction. The plants to be placed in the ponds shall consist entirely of native, wetland plants common to the San Joaquin Marsh, as identified in the San Joaquin Marsh Enhancement Plan dated July 1997. Any plants on the pond levees and buffer zones shall consist of native, coastal sage scrub and upland plants. No non-native plants shall be planted in the ponds or levees.

c. Detailed Revegetation Map

The applicant shall provide representative revegetation plans showing the type, location, quantity and size of plants to be installed. Any invasive, non-indigenous plants within and immediately adjacent to the construction zone area shall be removed and replaced with native wetland or coastal sage scrub plants.

d. Removal of Exotics

All non-native wetland and upland plants in graded areas of the construction zone shall be removed.

e. The Permittee shall undertake development in accordance with the final approved revegetation plan. Any proposed changes to the approved revegetation plan shall be reported to the Executive Director. No changes to said plans shall occur without a Coastal Commission-approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is required.

**8. Regional Water Quality Control Board Review**

**Prior to Commencement of Construction,** permittee shall provide to the Executive Director a copy of a permit issued by the Regional Water Quality Control Board, or letter of permission, or evidence that no permit or permission is required. The applicant shall inform the Executive Director of any changes to the project required by the Regional Water Quality Control Board. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is required.

**9. Archaeological Resources**

**Prior to issuance of the coastal development permit,** the applicant shall agree in writing that a qualified archaeologist shall be present on-site during all grading and/or excavation and that should archeological resources be discovered, all activity which could damage or destroy these resources shall be temporarily suspended until the site has been examined by a qualified archaeologist and mitigation measures have been developed and implemented to address the impacts of the project on archaeological resources.

## IV. Findings and Declarations

The Commission hereby finds and declares:

### A. Project Location and Description

The San Joaquin Freshwater Marsh encompasses 580 acres (see Exhibit 1 and 9). Of this 580 acres, 202 acres constitute the University of California Natural Reserve and the remaining acreage is controlled by the Irvine Ranch Water District (see Exhibit 9). The proposed development is a freshwater marsh restoration and nature study project involving land within and outside the Coastal Zone (see Exhibits 2 and 3). Exhibit 11 shows the entire coastal zone boundary in this area.

Exhibit 3 shows the entirety of the 202 acre University of California San Joaquin Freshwater Marsh Reserve. This exhibit shows that the coastal zone boundary splits the 202 acre marsh. Phase 1 of this restoration plan includes 75 acres of the 202-acre marsh, 50 of which are within the coastal zone. Exhibit 4 shows that there are 11 ponds in the 75 acres and 18 ponds within the 202 acres of the marsh. Exhibit 4 shows the entire 202 acres broken down into habitat types. This exhibit shows that the proposed development involves the "managed" ponds, while the portion of the Reserve outside the development area includes permanent ponds and seasonal wetlands.

San Diego Creek was channelized in 1968 and this resulted in the separation of the San Joaquin Freshwater Marsh from its primary source of water. The property to the west is an old landfill. The freshwater marsh is split by Campus Drive. To the north is commercial development and to the south is the San Diego Creek and then the University of California at Irvine.

The Phase I portion of the project consists of the following:

1. grading and excavation of existing seasons wetland ponds,
   re-contouring the pond floors to provide diversity of open water and of freshwater marsh habitat,
   regrading levees to impound water at specific depths,
   removal of sediment to improve inflow/outflow during flooding

2. supplement existing water sources by a combination of gravity-fed water diversion during periods of high creek flow (15 cubic feet per second) and pumped water from San Diego Creek during low flows (2 cubic feet per second),

3. plantings of coastal sage scrub along upland buffer zones and possibly levees

4. planting of wetland habitat in the graded ponds

The terms of the Conservancy grant require that the applicant include provision for 10 years of monitoring and that the site be operated and maintained for at least 20 years.

The existing wetland acreage in the project site is 28.4 acres of vegetated wetlands and 9.4 acres of open water habitat, for a total of 37.8 acres. At the conclusion of the project there will be 24.4 acres of vegetated wetlands and 14.5 acres of open water habitat for a total of 38.9 acres. The reduction in wetland vegetation results from the removal of cattails. However, open water habitat increases by 5 acres. Over time it is expected that native wetland plants will expand and compensate for the loss of the cattails. Native wetland and coastal sage scrub plants will be salvaged and planted at the conclusion of grading operations. The project will result in an increase in riparian habitat, and 5-20 acres of new coastal sage scrub habitat.

The project is funded by the Coastal Conservancy, the U.C. Reserve System, the Irvine and Clarke Foundation, and the San Joaquin Hills Transportation Corridor Authority. The Huntington Beach Wetlands Conservancy will provide technical support.

## 1. Project Within the Coastal Zone

The area within the coastal zone is 50 acres (all of five duck ponds and a portion of a two other duck ponds). In this staff report the terms "seasonal ponds", "managed ponds" and "duck ponds" are used interchangeably. The ponds within the project area are all duck ponds. Exhibit 3 shows the site plan with a dash line indicating the coastal zone boundary. The Phase I portion of the restoration plan. The Phase I portion (see Exhibit 4) includes the seasonal stream and the managed pond. Grading consists of 23,000 cubic yards of cut. The project involves the grading and excavation of existing seasonal wetland ponds, re-contouring the pond floors to provide a diversity of open water and freshwater marsh habitat, regrading the levees to impound water at specific depths and improve the existing hydrology by pumping water from San Diego Creek. In addition, accumulated sediment will be removed which currently blocks culverts which discharge water from the ponds to San Diego Creek.

Upland areas will be revegetated with new and salvaged coastal sage scrub. Wetland areas will be revegetated with native wetland vegetation salvaged prior to the grading commences. Approximately 6 acres of CSS will be replanted. Exhibit 4 shows the proposed habitat restoration plan. The 23,000 cubic yards of cut dirt will be used on-site to restore and raise the levees and to create islands in the ponds.

Exhibit 5 shows the existing vegetation pattern for the entire UC Reserve portion of the San Joaquin Marsh. The landfill is shown as number 9 on this exhibit. The phase I portion of the project is located between the landfill (9) and the IRWD lands (12). The existing habitat extending inland from the landfill consists of coastal sage scrub, scirpus/cattail habitat, riparian habitat and then the managed ponds. Three of the existing ponds are shown as managed ponds with seasonal grasses/herbs.

The proposed plan is shown as Exhibit 3 and 4. This exhibit shows that the south and east boundaries of the landfill are used for experimental coastal sage scrub restoration. Coastal sage scrub is being proposed as a buffer along the north, south and western boundaries of the marsh. On the marsh adjacent to the landfill (Phase I) the applicant is proposing to plant coastal sage scrub. The applicants are also proposing coastal sage scrub along the levee separating the marsh from San Diego Creek.

No development is proposed for the Hoag Restoration Site, which is the pond adjacent to San Diego Creek and the landfill (see Exhibit 3).

## 2. Project Outside the Coastal Zone Boundary

The project outside of the coastal zone boundary, for which a consistency determination is required, consists of 22,000 cubic yards of grading including three entire duck ponds, a small portion of two other duck ponds and a little over half of one duck pond (see Exhibit 3). The development in ponds outside of the coastal zone is similar to that inside the coastal zone. The development outside the coastal zone also includes the water delivery system which consists of the fixed gravity and pump intake lines, a pump station and outlet, a sedimentation basin and a main drainage distribution conduit (see Exhibit 7).

The development plan calls for the potential diversion of water from San Diego Creek during periods of high flows (up to 15 cfs) and low flows (up to 2 cfs). If water is required in periods of dry months, water can be pumped from the creek. The applicants are proposing that during high flows of San Diego Creek, water be siphoned off by gravity flow via a new inlet structure with a 36 inch diameter pipe. The diverted water would be taken to a sedimentation basin and then would be distributed along the easterly edge of the seasonal or managed ponds by a 36 inch pipe which would be buried in the levee. Control structures and drop gates would be located at each pond to regulate the flow of water into the ponds. Once the seasonal ponds are brought to the desired elevation, excess water would be taken by culvert to the permanent pond marsh (see Exhibit 8). Approximately 3 acres of CSS will be planted along the boundary of San Diego Creek (see Exhibit 4).

## 3. Project Purpose

The San Joaquin Freshwater Marsh (SJFM) was established in 1969. A system of earth-fill dikes separate the marsh's 18 ponds. The five largest ponds are the last vestiges of the natural freshwater wetlands. The remaining 13 ponds were created by a local gun club to attract waterfowl. The San Joaquin Freshwater Marsh ( also referred to as "Marsh") is a critical site for birds on the Pacific Flyway. There are 212 bird species recorded at the site, 50 % of which are migratory.

The purpose of the project is to restore the site hydrology by deepening the ponds, removing accumulated sediment and emergent vegetation, providing an ongoing source

of water to keep emergent vegetation from taking over the site, and revegetating selected areas with native wetland vegetation and coastal sage scrub.

The proposed development is for nature study and wetland restoration only. The proposed project is not tied to any commercial or residential development and is not being implemented as mitigation for another project. As stated in the Pre-Construction Notification for Nationwide Permit 27 for the San Joaquin Freshwater Marsh Reserve: "No compensatory mitigation is planned for this project nor is this project a mitigation bank for any other operation."

Implementation of the project will result in the removal of non-native, exotic vegetation and the planting of 1-3 acres of riparian vegetation. Over time the open water area of the ponds has been converted to emergent vegetation such as Scirpus and Typha. Excavation of the ponds will result in the removal of 25 years of emergent vegetation to restore open water and mudflat habitat. Water levels which exceed 3 to 4 feet discourage the growth of emergent plants. Past efforts to control emergent growth and restore open water have not been successful because there has not been a source of water to keep the water levels in the ponds high enough to keep out emergent vegetation and because the ponds have filled with sediment.

## B. Consistency Certification/Waiver

The proposed wetland restoration plan (Phase I) involves 75 acres, 50 of which are in the coastal zone and 25 of which are outside the coastal zone. A complete description of the proposed development inside and outside the coastal zone is included in Section "A" of this staff report.

The project requires a Nationwide permit from the Army Corps of Engineers. The Army Corps of Engineers, in a letter dated January 14, 1999, states that a Nationwide Permit cannot be granted until the applicants receive either a consistency certification or a waiver of consistency certification from the Coastal Commission.

The Coastal Conservancy prepared a project summary staff report for consideration by the Coastal Conservancy Board. In this summary report Coastal Conservancy staff includes findings that the proposed development is consistent with Sections 30210, 30231, 30233 and 30240 of the Coastal Act.

The goals of the proposed development are wetland restoration and nature study. The restoration of the ponds outside of the coastal zone is identical to the restoration of the ponds within the coastal zone. One issue of concern to the Commission is the diversion of water from San Diego Creek. This issue is addressed in the "water quality" section of this staff report. However, the greatest volume of water would be diverted during the winter months in times of peak flow of San Diego Creek. Water diverted during the summer months would be the minimum required to maintain the water levels in the ponds due to water loss by evaporation. In fact the water diversion would be beneficial

because it would improve water quality by removing sediment. In addition, any excess water which is released back into San Diego Creek would be purer through the filtration process of the ponds.

The Commission finds that the proposed development outside of the coastal zone boundary does not present any adverse environmental impacts to resources within the coastal zone. The Commission, therefore, waives the requirement for a formal Coastal Zone Management Act consistency certification for this portion of the project.

## C. San Joaquin Marsh History

### 1. Site History

The San Joaquin Marsh is historically a part of the flood plain for San Diego Creek, but was also subject to tidal inundation from Upper Newport Bay. San Diego Creek was a tributary of the Santa Ana River delta system. In 1825 a large flood shifted the course of the Santa Ana River northwest and San Diego Creek became the sole drainage feeding Upper Newport Bay. Up until the 1800's the San Joaquin Marsh was a part of an extensive wetland complex. The Spanish brought agriculture and cattle grazing. In this century, agricultural uses have been replaced with industry, retail and residential uses. In the early 1900's gun clubs leased the San Joaquin Marsh area for hunting. The San Joaquin Gun Club installed a system of dikes, ditches and pipes to divert water from San Diego Creek. In 1934 the Irvine Company built a saltworks in Upper Newport Bay and constructed a dam across San Diego Creek to protect the salt-evaporation ponds from sedimentation. The Marsh also served as a dumping grounds for fill from access roads and the area west of the Marsh became a community dump. The gun club ponds at San Joaquin were purchased for inclusion into the Natural Reserve System in 1970.

In 1968 the San Diego Creek flood control channel was constructed. The flood control channel had the effect of isolating the San Joaquin Marsh from its source of freshwater (San Diego Creek) and tidal influences from Upper Newport Bay. Currently the ponds obtain water from direct precipitation, runoff from surrounding areas, and back flooding from an outlet pipe from San Diego Creek during flood events. Local surface runoff enters the marsh via a drainage channel that runs under Campus Drive and flows through the adjacent riparian complex owned by the Irvine Ranch Water District. There is an aquifer located beneath the marsh and water from this aquifer has been pumped from wells at depths of 250 and 400 feet. However, this method is expensive and is not good quality water.

### 2. U.C. Reserve System

The San Joaquin Marsh is a part of the University of California Natural Reserve System (UCNRS). The Regents of the University established the reserve system in 1965 to set aside representative ecologically diverse habitats and manage them in perpetuity as

outdoor classrooms and outdoor laboratories for ecological study. The UCNRS functions as a Trustee Agency of the State, mandated by the California Environmental Quality Act to protect and steward the natural resources of its reserves to serve the public interest. Today the reserve system encompasses 33 sites, six of which are coastal zone reserves (Bodega Marine Reserve, Carpinteria Salt Marsh Reserve, Coal Oil Point Natural Reserve, Kendall-Frost Mission Bay Reserve, San Joaquin Freshwater Marsh Reserve, and the Younger Lagoon Reserve. Traditionally, NRS lands are reserved for research and educational activities and are off-limits to the public except by appointment.

The educational opportunities at the Marsh include a recording weather station and observation blinds. The Museum of Systematic Biology houses collections of representative plants and insects of the Reserve and publishes articles about the Reserve ecology. Each year 50-75 people receive permits to use the Reserve. There are public access opportunities as well. An average of two formal tours per month for local school and community groups are taken into the Reserve. The Reserve also has a website on the internet which includes information which can be used in conjunction with site visits or as general wetlands teaching guides. The website has educational information on: cattails, halophytes, plant galls, Native American use of native plants, coastal sage restoration and marsh restoration.

## 3. Permit History

There have been several permits issued for the Marsh: P-2-1-77-59 (University of California Irvine), 5-87-644 (University of California Irvine), and 5-93-253 (Hoag Memorial Hospital). CDP P-2-1-77-59 was approved for the construction of a 30 foot wide by-pass channel, vegetation clearance, installation of culverts, and removal of sediment to deepen existing ponds. CDP 5-87-644 was approved for the renovation of Pond No. 4 and involved the removal of excessive overgrowth of marsh vegetation to enhance habitat value. There were no special conditions. CDP 5-93-253 was approved for an expansion of Hoag Memorial Hospital which involved the removal of 1.52 acres of wetlands. Mitigation for the wetland removal involved the restoration of 4.56 acres of freshwater marsh within the San Joaquin Freshwater Marsh Reserve (see Exhibits 9 and 10). The mitigation site consists of a 3.0 acre seasonal pond, a 0.75 acre portion of upland and a 0.81 acre portion of an adjoining seasonal pond.

The mitigation proposal (prepared by Glenn Lukos Associates) involved the eradication of tamarisk and other non-native plant species, grading to deepen the pond floor, and revegetation with wetland and terrestrial plants according to the existing on-site native plant distribution. Water was to be provided via deep wells at the site. The conceptual mitigation plan for Hoag Hospital was designed to conform to the guidelines established in the "San Joaquin Freshwater Marsh Enhancement Plan" of 1991.

On a recent site visit to the San Joaquin Marsh, Reserve stewards indicated that the mitigation site was performing very successfully. The Hoag site serves as a model for the proposed project. No development is proposed for the Hoag mitigation site.

## D. Wetland Restoration

### 1. Section 30233

Section 30233 of the Coastal Act strongly limits the fill of wetlands. The diking, filling or dredging of open coastal waters, wetlands, estuaries, and lakes is permitted only where there is no feasible less environmentally damaging alternative, where feasible mitigation measures have been provided to minimize adverse environmental effects, and if limited to one of the delineated allowable uses in Section 30233 (a)(1-8). The proposed development does not involve filling or diking of wetlands but does involve dredging (excavation). Section (a) numbers 1-6 detail allowable uses for filling, diking or dredging which are not applicable to this project and are omitted from the analysis. Section 30233 states in part:

> (a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:
>
> (7) Restoration purposes.
>
> (8) Nature study, aquaculture, or similar resource dependent activities.
>
> (b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.
>
> (c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. ...

### 2. 30233 Analysis

#### a. Allowable Use

Among the allowable uses listed in Section 30233 are numbers 7 (restoration) and number 8 (nature study). The stated purpose of this development project restoration and nature study.

i. **Restoration** The proposed design for the San Joaquin Marsh is to recreate the natural transition from upland coastal sage, to riparian woodlands, to freshwater marsh that existed in southern California. In the 1997 San Joaquin Marsh Enhancement Plan prepared for the Coastal Conservancy by Michael Josselyn, Ph.D., William Martin, Peter Goodwin, Ph.D. and Larry Fishbain.

Aerial maps from 1990 and 1995 were compared to assess vegetation changes. The aerial maps showed that there was a decrease in open water in the seasonal ponds and an increase in the number of cattails, willow and cottonwood trees due to siltation. In addition, culverts which exchanged water between ponds have failed, resulting in a further decrease in open water habitat. The Pre-Construction Notification for Nationwide Permit 27 states:

> The existing levees and water control structures need repair and rehabilitation. The current facilities were constructed over 40 years ago and have fallen into disrepair. It is necessary to excavate the ponds in order to produce a more diverse habitat and improve wetland quality.

The increase in emergent vegetation has led to a corresponding decrease in habitat diversity and a loss of waterfowl and shorebird habitat. The seasonal ponds were formerly maintained as open water habitat for ducks. The seasonal ponds have accumulated sediment so that the bottom elevations do not provide for the design depth of 3 feet during winter.

The applicants are proposing to restore the site hydrology by deepening the ponds, removing accumulated sediment and vegetation, provide an ongoing source of water to keep emergent vegetation from taking over the site, and revegetate with native wetland vegetation and coastal sage scrub. Native wetland and coastal sage scrub plants will be salvaged and replanted when the grading is completed. Non-native exotic vegetation in graded areas will be removed.

Some of the seasonal ponds would be allowed to dry out to mud flats during the summer and fall months and then fill to a depth of 3+ feet during the winter months. Water will be diverted from San Diego Creek, if needed, during the winter months when Creek flows exceed 15cfs and to divert 2 cfs from the Creek during the months of April to June, if necessary.

The proposed development is not being undertaken as mitigation for an associated development project, nor is it a mitigation banking project. It is not tied to any development. No development is proposed which is not restoration or nature study related.

Among the stated goals of the project are to:

1. provide enhanced foraging areas for shorebird and wading birds

2. establish areas with emergent vegetation to provide increased plant cover, diversity and habit for nesting waterfowl and perching birds,

3. improve overall water quality on the site and in San Diego Creek

4. establish habitat for specific sensitive species (California least tern, light -footed clapper rail, California gnatcatcher and coastal cactus wren

5. provide research areas that can be manipulated for study,

6. provide perimeter site resources for public usage and enjoyment.

Statistics provided by Wetlands Research Associates, Inc. show that there are 28.4 acres of vegetated wetlands and 9.4 acres of open water currently in the project area. The post-construction figures will be 24.4 acres of vegetated wetlands and 14.5 acres of open water.

The quality of the wetland and upland habitats has deteriorated over time. Once the wetlands were separated from San Diego Creek, their main source of water, the ponds began to convert to terrestrial and emergent habitat. The wetland habitat primarily consists of dense, homogeneous stands of cattails with areas of open water. The diked seasonal ponds are flooded in the winter. Upland vegetation in the reserve consists primarily of introduced grasses, forbs and shrubs. The lack of a dependable water supply is the primary reason for the site degradation. Once the ponds are deepened and the water level is maintained, the ponds will stabilize.

The Hoag mitigation site serves as a model for this project. The site restoration there has been successful. In 1997 native plant species covered approximately 67 percent of the non-open water portions of the project site, which is dominated by California bulrush (Scirpus californicus), alkali bulrush (S. maritimus), and aster (Aster subulatus var. ligulatus). 1997 surveys have documented the presence of over 90 species of native terrestrial vertebrates, including special status species such as the Double-crested Cormorant, Osprey, White-tailed Kite, Northern Harrier, Cooper's Hawk, California Gull, California Least Tern and Loggerhead Shrike. Seven species of birds were nesting on the project site.

Therefore, the Commission finds that the purpose of the proposed project is habitat restoration, which is an allowable use under Section 30233(a)(7) of the Coastal Act.

ii. **Nature Study** The proposed development comprises 75 acres of duck ponds in the San Joaquin Freshwater Marsh. The San Joaquin Freshwater Marsh is a part of the University of California Reserve System. The purpose of the UC Reserve System is to set aside representative ecologically diverse habitats and manage them in perpetuity as outdoor classrooms and outdoor laboratories for ecological study. The primary objectives of the UCNRS are to teach and do research, provide site use to public and private organizations, answer inquiries, hold open houses and network with federal and state agencies. A UCNRS publication on the internet discusses the public education and outreach function of the NRS. It states:

> The NRS serves the public directly by making its reserves and facilities available to government agencies, conservation groups, and other appropriate organizations and by collaborating with these entities to protect the state's natural resources. Many reserves also support visits from elementary and secondary schools.
>
> Reserve managers are on hand to answer questions from the public regarding wildlife and conservation issues, and NRS personnel regularly provide technical consultation on such important issues as watershed protection, flood warning services, regional resource management, and land-use impacts.

The San Joaquin Freshwater Marsh Reserve internet site discusses the stated purpose of the reserve:

> Unlike wilderness areas that are available for recreation, the University reserves are devoted entirely to teaching and research. Qualified students and faculty from an institution of higher education may use the reserves as outdoor classrooms for studying natural processes directly from nature. The reserves also serve as living laboratories, where researchers can pose questions of the natural work that can only be answered by intensive field study.
>
> As part of the NRS, the San Joaquin Freshwater Marsh Reserve provides field scientists with a protected sample of coastal wetlands where they can undertake long-term teaching and research projects with the confidence that their field site will remain undisturbed for years to come.

The San Joaquin Freshwater Marsh Reserve internet web site includes a history of the Reserve and on-line teaching guides. The web site includes six (6) comprehensive teaching guides on the following topics: cattails, halophytes, plant galls, Native American use of native plants, coastal sage restoration, and marsh restoration. These teaching guides can be used alone or in conjunction with a site visit to the marsh. The teaching guides use data from ongoing site restoration efforts to illustrate coastal sage scrub restoration and marsh restoration. For instance, the teaching guide on coastal sage scrub restoration follows the transformation of an existing degraded upland site to a restored coastal sage scrub community.

Therefore, the Commission finds that the proposed development is for the purpose of nature study and is an allowable use under Section 30233(a)(8) of the Coastal Act.

**b. Feasible Mitigation Measures**

Section 30233 also requires that development involving the diking, dredging or filling of coastal wetlands be accompanied by the best feasible mitigation measures. As was stated in the Pre-Construction Notification for Nationwide Permit 27 for the San Joaquin Freshwater Marsh Reserve: "No compensatory mitigation is planned for this project nor is this project a mitigation bank for any other operation." As stated in the draft negative declaration:

> The SCC and UCNRS are seeking to restore or enhance upland, wetland and aquatic habitats on sites within the project area that now support degraded wildlife habitats due to previous human impacts to the natural environment of the Marsh. This habitat improvement project is voluntarily undertaken by the SCC and the UCNRS entirely upon University of California property. It is not a required mitigation project, necessary to compensate for significant adverse impacts caused by some other project elsewhere, and it is not a project to establish a "mitigation bank."
>
> The marsh management plan is being implemented to control invasion of cattail and tule growth into open water areas and to maintain habitat diversity within the UCNR marsh system.

The development is not a typical wetland restoration project. For instance, the site is already dedicated as a natural habitat area in perpetuity, as part of the University of California Natural Reserve System. In addition, most restoration sites include a 5 year monitoring and maintenance period. The contract with the Coastal Conservancy requires that the maintenance and monitoring period lasts from 10 to 20 years.

It is difficult to assess specific monitoring and maintenance criteria because the marsh is an area used for nature research and teaching. As is stated in the negative declaration:

> It is the intent of the UCNRS to monitor various aspects of the project to help evaluate its success over the long-term, as well as to provide specific information for guiding routine internal management decisions about water levels, water quality, vegetation control, etc. In addition, the UCNRS Marsh is a teaching, study, and research natural area functioning as an outdoor classroom and laboratory, so data is often collected during the course of academic teaching and research activities in the project area that can provide monitoring information about the effects of the restoration project on the plant and animal communities of the Marsh.

For this reason, the UCNRS does not want to be tied to a specific revegetation maintenance and monitoring plan, but instead wishes to operate within general guidelines which allow for future research projects. Applying fixed specific criteria for amounts of vegetation to be replaced, replacement criteria, and success criteria does not allow the UCNRS the flexibility it requires as a teaching and research facility.

However, when Phase I is complete, there will be no decrease in the total amount of jurisdictional wetland area on the site, and the quality and the function of the wetlands will be improved.

The existing wetland acreage in the project site is 28.4 acres of vegetated wetlands and 9.4 acres of open water habitat, for a total of 37.8 acres. At the conclusion of the project there will be 24.4 acres of vegetated wetlands and 14.5 acres of open water habitat for a total of 38.9 acres. Native wetland and coastal sage scrub plants will be salvaged and planted at the conclusion of grading operations. The reduction in wetland vegetation results from the removal of cattail habitat. Over time it is expected that native wetland plants will expand and compensate for the loss of the cattails. The project will result in an increase in riparian habitat, and 5-20 acres of new coastal sage scrub habitat.

The stated purpose of the proposed development is to restore the hydrological regime to the existing ponds. Currently the ponds are maintained by rain runoff and deep well water. The lack of an ongoing source of water has caused the duck ponds to transition from wetland to terrestrial habitat. By deepening the ponds and providing and ongoing source of water, the applicants are restoring the site to its previous condition, freshwater marsh.

Exotic, non-native vegetation such as tamarisk will be removed from graded areas. Any native coastal sage scrub and wetland vegetation which is removed will be temporarily stored and replanted. In addition, other wetland plants and trees such as sycamores, cottonwoods, etc. will be planted on appropriate areas of the site. Existing riparian vegetation will remain undisturbed. The end result will be a native wetland habitat with associated upland habitat.

Therefore, the Commission finds that the proposed development conforms with Section 30233(a) of the Coastal Act in that the wetland acreage will increase and no mitigation is required.

**c. Alternatives Analysis**

Section 30233(a) also requires that the project be the least environmentally damaging alternative.

i. **No Project Alternative** Under the no project alternative, the ponds would continue to accumulate sediment, the levees would subside and the site would continue to transition from wetland to terrestrial habitat. There would continue to be less open water habitat for wildlife and the wildlife habitat would decrease in quality as well as quantity. Upland vegetation would increasingly become non-natives. Cattails would remain a dominant wetland plant. The utility of the site for foraging and nesting by wildlife would be diminished.

ii. **No Fill Project with Supplemental Water** Under this scenario, the applicant would not excavate in the ponds and would bring in supplemental water in trucks from off-site. This alternative would not address the continuing sedimentation of the ponds and open water would continue to diminish over time along with the quality and quantity of wildlife habitat. Trucking in water would be expensive and would result in increase noise, pollution and disturbance to the wildlife habitat. Additionally, there would be no way to get water to the interior ponds because there is no existing water delivery system and the levees cannot support the weight of trucks.

iii. **Proposed Project Alternative** The Pre-Construction Notification for Nationwide Permit 27 for the San Joaquin Marsh states that there are no practicable alternatives to the proposed development. The current ponds were constructed over 40 years ago and have fallen into disrepair. The existing levees and water control structures need repair and rehabilitation. Over time the seasonal ponds have accumulated sediment and the levees have subsided. As a result, the bottom elevation of the ponds will not support the design depth of a minimum of three feet. The project specifications call for excavating the bottom of the seasonal ponds to accommodate three to five feet of open water and to raise the levees with the excavated dirt. The existing water control structures to facilitate water flow between ponds are not working either.

Past efforts to control emergent growth and restore open water have not been successful because there has not been a source of water to keep the water levels in the ponds high enough to keep out emergent vegetation and because the ponds have filled with sediment.

The proposed development minimizes potential adverse impacts. Excavated materials will be kept on site and used to raise the height of the existing levees. As part of the proposed project, existing native wetland and upland plants will be set aside and replanted at the conclusion of grading. Other native wetland and upland plants will be introduced. Non-native exotics will be eradicated. The levees and buffer areas will be replanted with coastal sage scrub. The Hoag mitigation site will be fenced and insulated from project impacts. The applicant will work with the Army Corps of Engineers to minimize impacts to sensitive avian resources. Construction may take place during the summer, the non-breeding/nesting season of the critical bird species which utilize the site. The UCNRS will maintain and monitor the site for 10-20 years.

Therefore, the Commission finds that the proposed development is the environmentally superior alternative and is consistent with Section 30233(a) of the Coastal Act.

## D. Environmentally Sensitive Habitat

Section 30240 of the Coastal Act contains provisions for the protection of environmentally sensitive habitat areas. It states in part:

> (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

The proposed development is located in the San Joaquin Freshwater Marsh adjacent to San Diego Creek and the Upper Newport Bay Ecological Reserve. The Reserve is a vital stopover and wintering ground for migratory birds and waterfowl on the Pacific Flyway. More than 200 species of birds have been sighted in the Reserve.

The quality of the wetland and upland habitats has deteriorated over time. The wetland habitat primarily consists of dense, homogeneous stands of cattails with areas of open water. The diked seasonal ponds are flooded in the winter. Upland vegetation in the reserve consists primarily of introduced grasses, forbs and shrubs. The proposed development is a wetland and coastal sage scrub restoration project

The existing wetland acreage in the project site is 28.4 acres of vegetated wetlands and 9.4 acres of open water habitat, for a total of 37.8 acres. At the conclusion of the project there will be 24.4 acres of vegetated wetlands and 14.5 acres of open water habitat for a total of 38.9 acres. The reduction in wetland vegetation results from the removal of cattails. However, open water habitat increases by 5 acres. Over time it is expected that native wetland plants will expand and compensate for the loss of the cattails. Native wetland and coastal sage scrub plants will be salvaged and planted at the conclusion of grading operations. The project will result in an increase in riparian habitat, and 5-20 acres of new coastal sage scrub habitat.

**i. Sensitive Bird Species** Among the bird species found on site are the Light-footed clapper rail, the California least tern, the Coastal cactus wren, the California gnatcatcher, and the Least Bell's vireo. Other resident birds include coots, red-winged blackbirds, grebes, least bitterns, American avocets, black-necked stilts, roadrunners, black phoebes, marsh wrens, warblers, red-shouldered hawks and burrowing owls. and the Amphibians include the California slender salamander (*Batrachoseps attenuatus*), western toads (*Bufo boreas*), Pacific tree frogs (*Hyla regilla*) and bullfrogs (*Rana catesbeiana*). Nine snakes, four lizard and one turtle species inhabit the Marsh, including: king snakes (*Lampropeltis getulus*), gopher snakes (*Pituophis melanoleucus*), red racers (*Masticophis flagellum*), Pacific rattlesnakes (*Crotalus viridus*), the Pacific ringed-neck snakes (*Diadophis punctatus)*, the southwestern pond turtle (*Clemmys marmorata*), side-blotched lizards (*Uta stansburiana*), western fence

lizards (*Sceloporus occidentalis*) southern aligator lizards (*Gerrhonotus multicarinatus*) and western skinks (*Eumeces skiltonianus*).

Among the measures included in mitigation/monitoring elements of the plan are measures to protect nesting/breeding birds and the southwestern pond turtle. The applicant has indicated that prior to commencement of construction the ponds will be surveyed for the southwestern pond turtle. If the surveys reveal the presence of pond turtles, then the UCNRS shall consult with the Department of Fish and Game to devise a mitigation plan.

In addition, prior to construction, the applicant will conduct surveys to determine if sensitive bird species, including the California least tern and the California gnatcatcher, are present on the site. The survey results will be submitted to the Department of Fish and Game and Army Corps of Engineers to determine if mitigation measures to protect these sensitive resources are required.

This staff report includes several special conditions regarding protection of sensitive bird species. Special Condition No. 4 requires that: a) the applicant conduct surveys for specific birds; b) that a qualified biologist be present during construction to monitor bird activity and recommend measures to mitigate potential impacts; c) that construction may take place between March 15 and July 15, and d) that if construction does take place during this time period the applicant must submit a declaration from the Army Corps of Engineers stating that the construction during a specified time period will not adversely impact sensitive birds.

In addition, Special Condition No. 3 requires the applicant to submit to the Executive Director any letters of permission or permits from the Army Corps of Engineers or California Department of Fish and Game or evidence that permits are not required. In the event that subsequent permits involve changes to the project approved by the Commission, the applicant shall obtain an amendment to the coastal development permit or a determination from the Executive Director that a permit amendment is not required.

Only as conditioned does the Commission find that the proposed development is protective of sensitive biological resources and consistent with Section 30240 of the Coastal Act.

**ii. Upland Habitat** Existing upland vegetation is primarily non-native and consists of: wild mustard (*Brassica,* sp.), ripgut brome (*Bromus diandrus*), artichoke thistle (*Cynara cardunculus*), and fennel (*Foeniculum vulgare*).

Implementation of the project will result in the removal of non-native, exotic vegetation from graded areas and the planting of 5-20 acres (inside and outside the coastal zone) of propagated and salvaged species of coastal sage scrub vegetation. The proposed development provides for the creation of approximately 19 acres of coastal sage scrub

throughout the phase I area of the project. Of this 19 acres, approximately 13 acres are in the coastal zone. The coastal sage scrub will serve as an upland buffer zone surrounding the San Joaquin Marsh and will be installed on the north-western face of the San Diego Creek dike facing the marsh. The CSS buffer zone will be 150 feet and will be managed by the Natural Reserve System. The composition, density, and exposure of the plants will be based upon studies which have been conducted on coastal sage scrub communities in Buck Gully, a local site of similar exposure. The revegetation plan will also be based upon slope revegetation conducted in the area for the San Joaquin Hills Transportation Corridor and the landfill adjacent to the Reserve.

The revegetation will include coastal sagebrush (*Artemesia californica*), California buckwheat (*Eriogonum fasciculatum*), lemonadeberry (*Rhus integrifolia*), black sage (*Salvia mellifera*), California Encelia (*Encelia californica*), laurel sumac (*Malosma laurina*), bladderpod (*Isomeris arborea*), coastal deerweed (*Lotus scoparius*), coastal goldenbush (*Isocoma menziesii*), toyon (*Heteromeles arbutifolia*), southern California black walnut (*Juglans californica*) and California scrub oak (*Quercus herberidifolia*).

This staff report includes special conditions regarding sensitive plant resources. Special Condition No. 5 requires that the applicant submit a 10 year monitoring plan which includes the following elements: a) a biologist be on site during construction to monitor and minimize the potential impacts of grading and excavation on native plants; b) native vegetation outside the project limits be flagged and construction personnel instructed to avoid these areas; c) survey usage by fauna, and d) monitoring reports be provided on an annual basis for five years and shall discuss the quantity, type and location of plants, the degree of success, amount of expansion of native plants, an assessment of plant coverage, and control of exotics.

Therefore, the Commission finds that the proposed development, as conditioned, will preserve and enhance existing environmentally sensitive habitat and is consistent with Section 30240(a) of the Coastal Act.

**iii. Wetland Habitat** The seasonally wet ponds contain a mix of unvegetated open water areas and vegetated freshwater marsh dominated by: three square (*Scirpus americanus*), California bulrush (*Scirpus californicus*), alkali bulrush (*Scirpus robustus*), and broad-leaf cattail (*Typha latifolia*).

In higher elevation wetland areas plants include: saltmarsh aster (*Aster subulatus* var. *ligulatus*), saltgrass (*Distichlis spicata*), curly dock (*Rumex crispus*), rabbitfoot grass (*Polypogon monspeliensis*), common pickleweed (*Salicornia virginica*)

Implementation of the project will result in the removal of non-native, exotic vegetation such as tamarisk, wild mustard, artichoke thistle and fennel. Excavation of the ponds will result in the removal of 25 years of emergent vegetation to restore open water and mudflat habitat. Over time the open water area of the ponds has been converted to emergent vegetation such as Scirpus and Typha. Water levels which exceed 3 to 4

feet discourage the growth of emergent plants. Past efforts to control emergent growth and restore open water have not been successful because there has not been a source of water to keep the water levels in the ponds high enough to keep out emergent vegetation and because the ponds have filled with sediment. Twenty-five (25) acres of emergent vegetation will be removed as part of the proposed development.

Rootstock of bulrush (three-square, alkali bulrush and California bulrush) will be salvaged, stored, and then replanted on ten-foot centers along the edges of newly graded wetland ponds and on islands within these ponds. In addition, mule fat (*Baccharis viminea*) and willow (*Salix* sp.) will be planted on five-foot centers on select locations at the site. The applicant is proposing a one-three acre riparian element along the base of the slopes of the ponds. The wetland edge will include plants such as western sycamore (*Platanus racemosa*), cottonwood (*Populus* sp.), California wild rose (*Rosa californica*), mulefat (*Baccharis salicifolia*), *Salix* spp., fuschia flowered gooseberry (*Ribes speciosum*) and others.

The project proponents will salvage rootstock from existing native wetland plants. These plants will be stored on site and then replanted. In addition, mule fat and willow will be planted on the site. The result will be seasonally wet ponds containing a mix of unvegetated open water areas and vegetated freshwater marsh dominated by:

Three square (*Scirpus americanus*)
California bulrush (*Scirpus californicus*)
Alkali bulrush (*Scirpus robustus*)
Broad-leaf cattail (*Typha latifolia*)

in low wetland areas and by:

Saltmarsh aster (*Aster subulatus* var. *ligulatus*)
Saltgrass (*Distichlis spicata*),
Curly dock (*Rumex crispus*)
Rabbitfoot grass (*Polypogon monspeliensis*)
Common pickleweed (*Salicornia virginica*)

in higher wetland areas.

Existing emergent vegetation (scirpus and typha) is used by birds for nesting, foraging, and cover. A letter submitted by Peter Bowler, an Associate Adjunct Professor of the Dept. of Ecology and Evolutionary Biology, states that the habitat creation will occur over a five year period. The initial planting phase will occur along the levee face of San Diego Creek. This letter also notes that an annual report will be prepared each year which will include the results of ongoing monitoring, plant growth, plant success, and other data by way of quadrants and transects.

The existing wetland acreage in the project site is 28.4 acres of vegetated wetlands and 9.4 acres of open water habitat, for a total of 37.8 acres. At the conclusion of the project there will be 24.4 acres of vegetated wetlands and 14.5 acres of open water habitat for a total of 38.9 acres. The reduction in wetland vegetation results from the removal of cattails. However, open water habitat increases by 5 acres. Over time it is expected that native wetland plants will expand and compensate for the loss of the cattails. Native wetland and coastal sage scrub plants will be salvaged and planted at the conclusion of grading operations. The project will result in an increase in riparian habitat, and 5-20 acres of new coastal sage scrub habitat.

This staff report includes special conditions regarding sensitive plant resources. Special Condition No. 5 requires that the applicant submit a 10 year monitoring plan which includes the following elements: a) a biologist be on site during construction to monitor and minimize the potential impacts of grading and excavation on native plants; b) native vegetation outside the project limits be flagged and construction personnel instructed to avoid these areas; c) survey usage by fauna, and d) monitoring reports be provided on an annual basis for five years and shall discuss the quantity, type and location of plants, the degree of success, amount of expansion of native plants, an assessment of plant coverage, and control of exotics.

Therefore, the Commission finds that the proposed development, as conditioned, will preserve and enhance existing environmentally sensitive habitat and is consistent with Section 30240(a) of the Coastal Act.

**E. Access**

Section 30210 of the Coastal Act states:

> In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

There are no existing public trails within the Reserve. The Reserve is currently fenced with signage. The signs identify the site as a U.C. Reserve area and excludes public access for natural resource protection, except for research purposes or visits arranged with the Reserve Management. However, the site is contiguous to the County of Orange's Regional Santa Ana Heights Riding and Hiking Trail. Reserve fencing does not interfere with the trail. The trail utilizes the northern levee bank of San Diego Creek (see Exhibit 12). The trail is a maintenance road for the Orange County Flood Control District.

The purpose of the UC Reserve System is to set aside representative ecologically diverse habitats and manage them in perpetuity as outdoor classrooms and outdoor

laboratories for ecological study. The primary objectives of the NRS are to teach and do research, provide site use to public and private organizations, answer inquiries, hold open houses and network with federal and state agencies. A NRS publication on the internet discusses the public education and outreach function of the NRS. It states:

> The NRS serves the public directly by making its reserves and facilities available to government agencies, conservation groups, and other appropriate organizations and by collaborating with these entities to protect the state's natural resources. Many reserves also support visits from elementary and secondary schools.
>
> Reserve managers are on hand to answer questions from the public regarding wildlife and conservation issues, and NRS personnel regularly provide technical consultation on such important issues as watershed protection, flood warning services, regional resource management, and land-use impacts.

Another document on the internet concerning the San Joaquin Freshwater Marsh Reserve discusses the stated purpose of the reserve:

> Unlike wilderness areas that are available for recreation, the University reserves are devoted entirely to teaching and research. Qualified students and faculty from an institution of higher education may use the reserves as outdoor classrooms for studying natural processes directly from nature. The reserves also serve as living laboratories, where researchers can pose questions of the natural work that can only be answered by intensive field study.
>
> As part of the NRS, the San Joaquin Freshwater Marsh Reserve provides field scientists with a protected sample of coastal wetlands where they can undertake long-term teaching and research projects with the confidence that their field site will remain undisturbed for years to come.

The San Joaquin Freshwater Marsh Reserve has a web site on the internet, which includes a history of the Reserve and on-line teaching guides. The web site includes six (6) comprehensive teaching guides on the following topics: cattails, halophytes, plant galls, Native American use of native plants, coastal sage restoration, and marsh restoration. These teaching guides can be used alone or in conjunction with a site visit to the marsh. The teaching guides use data from ongoing site restoration efforts to illustrate coastal sage scrub restoration and marsh restoration. For instance, the teaching guide on coastal sage scrub restoration follows the transformation of an existing degraded upland site to a restored coastal sage scrub community.

The Commission finds that the proposed development includes provisions for public access consistent with the goals and purposes of the San Joaquin Freshwater Marsh Reserve for restoration and nature study and the need to protect the sensitive natural resources from human intrusion.

Implementation of the proposed development may cause the temporary closure of the County-maintained Santa Ana Heights Trail which is located on an Orange County Flood Control maintenance road situated between the marsh and San Diego Creek. Special Condition No. 2 of this staff report requires that the applicant agree that in the event the trail is closed the applicant will: 1) minimize the length of the closure, 2) place barriers for safety purposes, 3) implement a detour, if possible, 4) post signage of the closure periods, and, 5) restore the trail to its condition prior to construction. Only as conditioned does the Commission find that the proposed development is consistent with Section 30210 of the Coastal Act regarding provision of public access.

## F. Water Quality

Section 30231 of the Coastal Act contains provisions concerning the biological productivity of coastal waters. It states:

> The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

There are three areas of concern regarding the proposed development's potential impact on biological productivity and the quality of coastal wetlands. First, there is the potential temporary impacts of the grading and excavation aspects of construction. Second, there is the potential adverse impact of diverting freshwater from San Diego Creek and the Upper Newport Bay Ecological Reserve. Third, there are the biological productivity and water quality issues regarding implementation of the project on the San Joaquin Freshwater Marsh Reserve.

### 1. Construction Controls

The grading portion of this development consists of a total of 45,000 cubic yards of grading (23,000 cubic yards in the coastal zone and 22,000 cubic yards outside the coastal zone boundary).

Grading will be conducted in three areas. First, the sedimentation basins adjacent to San Diego Creek will be excavated to make room for future sedimentation in the event that water is diverted from San Diego Creek. Second, the seasonal or managed ponds will be excavated to remove accumulated sediment. Ponds will be excavated from one to three feet to establish a winter high water level approximately 1 to 1.5 feet below flood level at Campus Drive (+9.2 feet NGVD). Final depths in the ponds will be

between +3.0 to +6.0 NGTVD so that three to five feet of water will be held in the ponds. Sediment excavated from the ponds will be used to build up the levees or construct islands in the ponds. Most levees will be raised to +12.0 feet NGVD. Third, sediment which has accumulated in existing culverts in the southwest corner of the project area will be excavated to improve drainage. Currently, the culvert which takes overflow water from the ponds to San Diego Creek is filled with sediment.

Section 30231 of the Coastal Act requires that development minimize the impacts of runoff into coastal waters. Construction will be occurring in the San Joaquin Freshwater Marsh which is adjacent to San Diego Creek. There is an existing culvert in the southwestern portion of the site which takes excess water from the ponds and directs it back into San Diego Creek. This culvert is approximately one-quarter mile from where San Diego Creek enters into the Upper Newport Bay Ecological Reserve.

There are in-channel sediment basins in San Diego Creek adjacent to the Marsh. These sediment basins are designed to prevent sediment from entering and accumulating in the Upper Newport Bay Ecological Reserve.

During construction and grading there is the potential for sediment to enter San Diego Creek in the event of a storm. Therefore, this staff report includes special conditions designed to mitigate these potential impacts. Special Condition No. 1 requires the applicant to submit an erosion control plan for the review and approval of the Executive Director. The erosion control plan includes provisions for: 1) the timing of grading and construction, 2) provision for silt fences and other measures to prevent silt from going off-site, 3) submitting a list of Best Management Practices to be used on-site, 4) a site plan showing temporary and permanent erosion control measures, and 5) a schedule for the installation and removal of erosion control measures.

In addition, special condition no. 6 requires the applicant submit evidence of approval from the Regional Water Quality Control Board. Finally, the applicant is being conditioned to place silt fencing and construction fencing between the project site and the Hoag Hospital mitigation pond.

Only as conditioned does the Commission find that the proposed development is consistent with the water quality provisions of Section 30231 of the Coastal Act.

2. Water Diversion

The proposed development includes provision for the diversion of water from San Diego Creek, if necessary, during periods of high flow (winter months) and for low flow during summer months. The question this poses for the Commission is whether the diversion of water will have an adverse impact on coastal resources in San Diego Creek or in Upper Newport Bay.

The development outside the coastal zone includes the water delivery system which consists of the fixed gravity and pump intake lines, a pump station and outlet, a sedimentation basin and a main drainage distribution conduit (see Exhibit 7).

The development plan calls for the potential diversion of water from San Diego Creek during periods of high flows (up to 15 cfs) and low flows (up to 2 cfs). If water is required in periods of dry months, water can be pumped from the creek. The applicants are proposing that during high flows of San Diego Creek, water be siphoned off by gravity flow via a new inlet structure with a 36 inch diameter pipe. The diverted water would be taken to a sedimentation basin and then would be distributed along the easterly edge of the seasonal or managed ponds by a 36 inch pipe which would be buried in the levee. Control structures and drop gates would be located at each pond to regulate the flow of water into the ponds. Once the seasonal ponds are brought to the desired elevation, excess water would be taken by culvert to the permanent pond marsh (see Exhibit 8).

The issue of potential adverse impacts from water diversion was raised and addressed in the negative declaration, which states:

> The proposed project will involve the diversions of relatively minor amounts of water to supplement the managed seasonal pond/mudflat habitats within the project area. The amount of water diverted from San Diego Creek is not expected to significantly impact the existing creek habitats and their values as movement corridors and foraging territories for the existing wildlife, including all sensitive and endangered species.
>
> The existing cross-section of the flood control channel will not be altered by the water intake structure, and the proposed project will not alter the existing flood carrying capacity or sediment retention capacity of the creek, and it will not interfere with the free movement of aquatic animals.

In addition, there is the question of whether water diverted from San Diego Creek will adversely impact the existing and restored resources of the Marsh. The negative declaration addresses this and states:

> Because of the relatively small volumes to be diverted, and because the project will result in a capacity to flush the marsh which is not possible now, it is not expected that the project will cause a long-term accumulation of contaminants in the Marsh.

Therefore, the diversion of water from San Diego Creek is not expected to pose adverse impacts to San Diego Creek, the Marsh or the Upper Newport Bay. Therefore, the Commission finds that the proposed development is consistent with Section 30231 of the Coastal Act.

3. Water Quality & Biological Productivity

The proposed development will be beneficial for water quality and biological productivity. Water diverted from San Diego Creek will be taken through sedimentation basins prior to entry into the Marsh. Likewise, any water exiting the marsh back into San Diego Creek will have been filtered while moving through the Marsh and will be higher quality water than water entering the Marsh. Sedimentation is a major problem in the Upper Newport Bay, and therefore, any project which removes sediment from entering the Bay benefits water quality in Upper Newport Bay. Finally, the project will improve water quality in the Marsh by increasing the amount of water entering the Marsh and by facilitating the flow of water into and between the ponds, thereby improving water circulation.

The proposed development will also increase biological productivity in the following ways: 1) by increasing the variety of habitats, 2) by increasing the quality of upland CSS and wetland habitat, 3) by increasing water quality in the ponds, 4) by removing emergent vegetation and non-native exotic vegetation, and 5) increasing the amount of waterfowl and shorebird habitat.

In a letter dated April 9, 1999, Wetlands Research Associates, Inc., discussed the success of the Hoag Hospital Mitigation site. The Hoag Hospital site is serving as a model for the proposed development. This letter states:

> The Hoag mitigation site has achieved considerable success since the restoration plan was implemented. In 1997, native plant species covered approximately 67 percent of the non-open water portions of the project site (Glenn Lukos Associates). This site is dominated by California bulrush (*Scirpus californicus*), alkali bulrush (*S. maritimus*), and aster (*Aster subulatus* var. *ligulatus*). Over 90 species of native terrestrial vertebrates have been documented within the project site in 1996 and 1997 surveys, including special status species such as the Double-crested Cormorant, Osprey, White-tailed Kite, Northern Harrier, Cooper's Hawk, California gull, California Least Tern (federal endangered), and Loggerhead Shrike (Glenn Lukos Associates).

In previous sections of this staff report are discussed the beneficial aspects of the proposed development. The improvements will increase the foraging and nesting habitat for waterfowl and other birds by increasing the amount of open water and native habitat. The Hoag site is functioning as a working model for the restoration of the rest of the San Joaquin Marsh. As has been reported, the Hoag site is successful in stabilizing native vegetation and attracting native fauna, particularly birds.

For these reasons, the Commission finds that the proposed project will be beneficial for both water quality and biological productivity. Therefore, the Commission finds that the proposed development is consistent with Section 30231 of the Coastal Act.

## G. Archaeological Resources

Section 30244 of the Coastal Act contains provisions regarding the protection of cultural resources. It states:

> Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

An archaeological investigation was conducted by Pacific Archaeological Sciences Team and a report was issued in November 1998. An archaeological investigation was required because the project area encompasses a known archaeological site and is within an extremely sensitive area. There are approximately 10 known archaeological sites within one-half mile of the project site. In the summary and discussion portion of the archaeological report the consultant states:

> The Phase I archaeological survey of the San Joaquin Marsh Reserve conducted by PAST yielded little evidence of prehistoric use of the area. Likewise, no historic materials associated with the former San Joaquin Gun Club could be located; the only cultural materials noted during the investigation were limited to a light scattering of recent trash throughout the subject area.
>
> Overall, it is considered unlikely that the planned grading and excavation activities within the existing seasonal wetland ponds will have a negative impact on site CA-ORA-57/H Locus B.

However, the archaeological consultants do include recommendations in their report. The recommendations include: 1) having a qualified archaeologist on site during the construction phase to review specific project plans, ensure that staging areas do not encroach on any archaeological sites and conduct spot checks during field operations to see if cultural resources are uncovered.

Therefore, the Commission finds that the applicant shall comply with a special condition which ensures that the above recommendations are followed. Only as conditioned does the Commission find that the proposed development is consistent with Section 30244 of the Coastal Act.

## H. Land Use Plan

The City of Irvine LCP was certified by the Commission on 5-22-80. The City of Irvine coastal zone covers approximately 250 acres northeast of the Upper Newport Bay. Only a 40 acre existing industrial park area is covered by the LCP. The remaining 210 acres are owned by the University of California and excluded from the LCP.

Pursuant to Section 30519 of the Coastal Act of 1976 development review authority is delegated to the local government for the areas of their jurisdiction covered by the certified LCP, but such delegation does not apply to any development within any state university or college within the coastal zone.

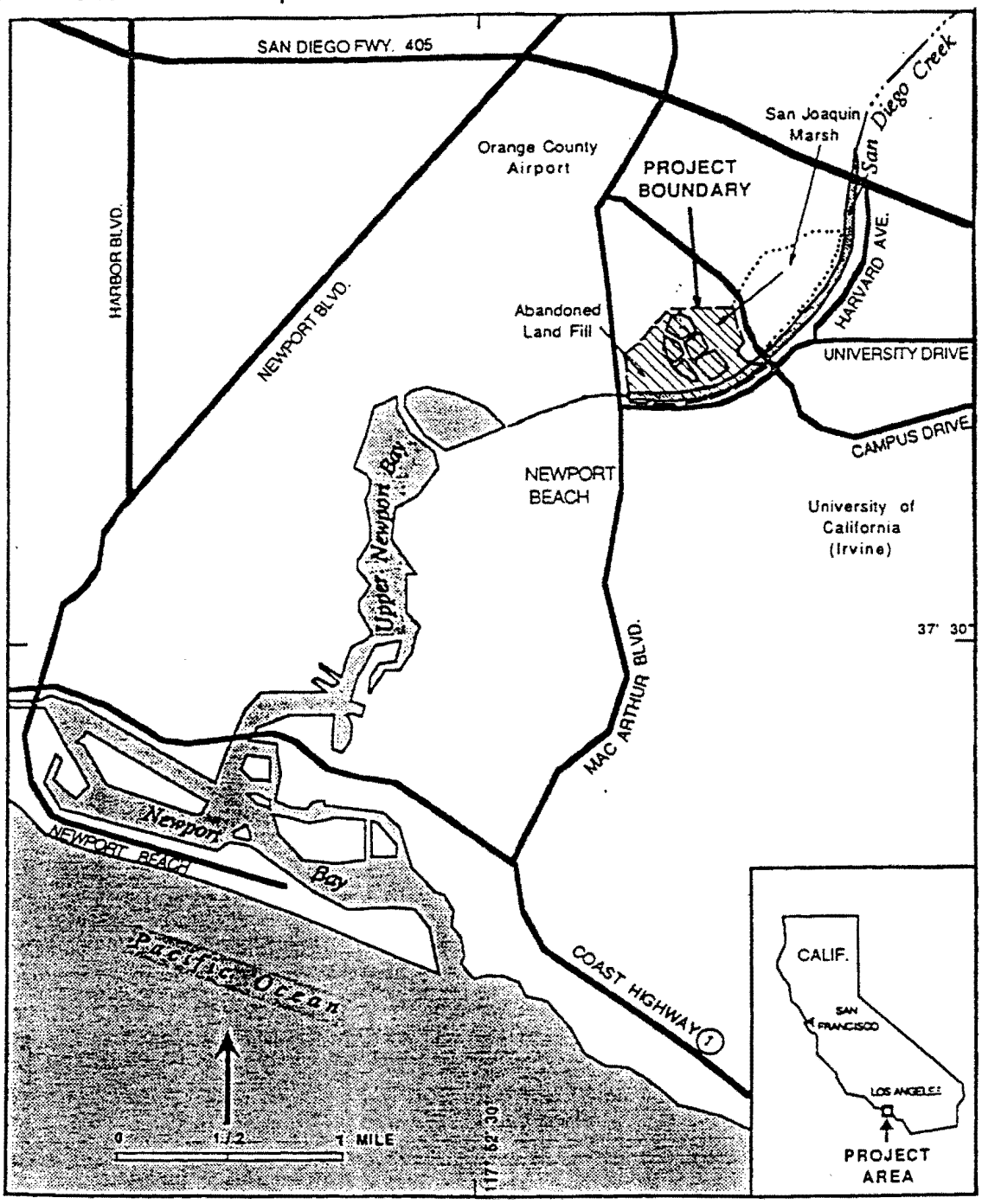
The University is not, therefore, covered by the City's LCP. Neither has the University of California applied for certification of a long range development plan as provided for in Section 30605 of the Coastal Act. Therefore, in the absence of a certified long range development plan, the university lands and any proposed development within the coastal zone are subject to the permit requirements of the Coastal Act.

## I. CONSISTENCY WITH CEQA (California Environmental Quality Act)

Section 13096 of Title 14 of the California Code of Regulations requires Commission approval of Coastal Development Permits to be supported by a finding showing the permit, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.

The proposed project has been conditioned in order to be found consistent with the water quality, environmentally sensitive habitat, wetland protection, and archaeological protection policies of the Coastal Act. Mitigation measures; special conditions requiring, submittal of an erosion control plan, trail closure, U.S. Army Corps of Engineers approval, protection of sensitive bird species, provision of a monitoring plan, provision of a maintenance plan, provision of a revegetation plan Regional Water Quality Control Board approval, and conformance with archaeological recommendations will minimize all adverse effects. As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse effect which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified effects, is the least environmentally damaging feasible alternative and can be found consistent with the requirements of the Coastal Act to conform to CEQA.

Figure 1: Site Location Map




Philip Williams & Associates, Ltd.
Consultants in Hydrology

Romberg Tiburon Centers for Environmental Studies

San Joaquin Marsh Enhancement Plan
State Coastal Conservancy

**EXHIBIT No. 1**

Application Number:
**5-99-089**

**Area Map**

California Coastal Commission

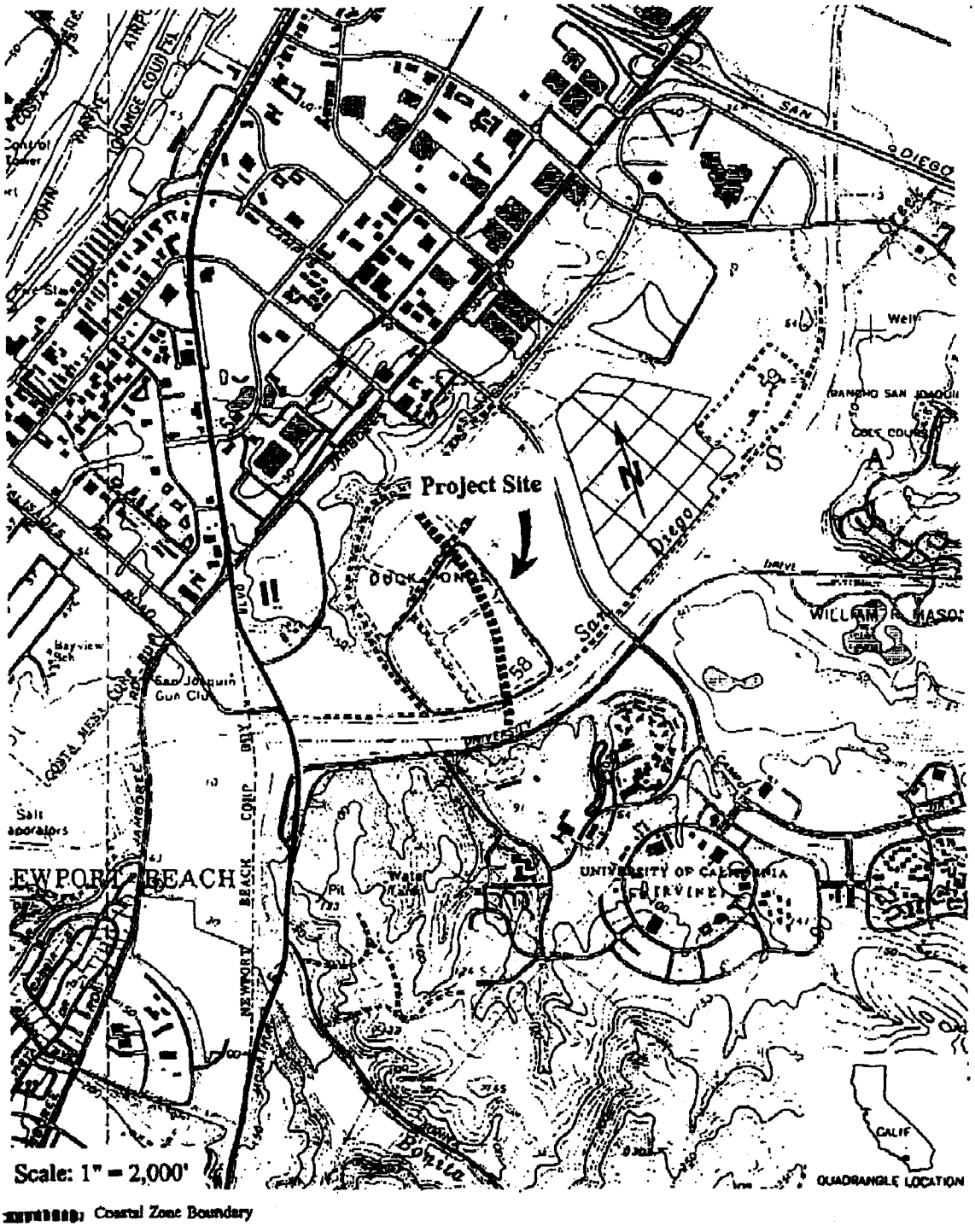



Figure 1. Project vicinity map

Wetlands Research A

EXHIBIT No. 2
Application Number: 5-99-089
Vicinity Map
California Coastal Commission

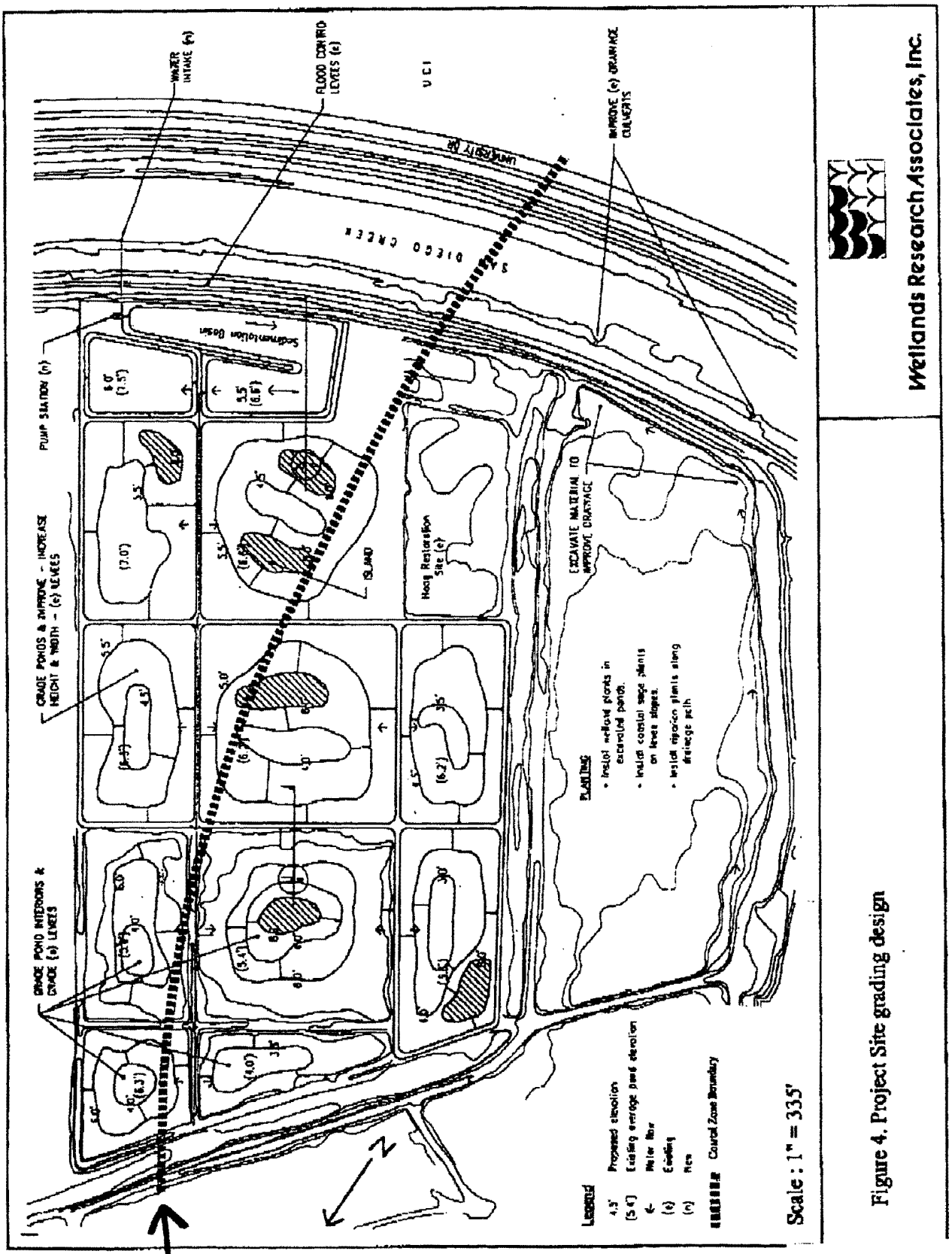


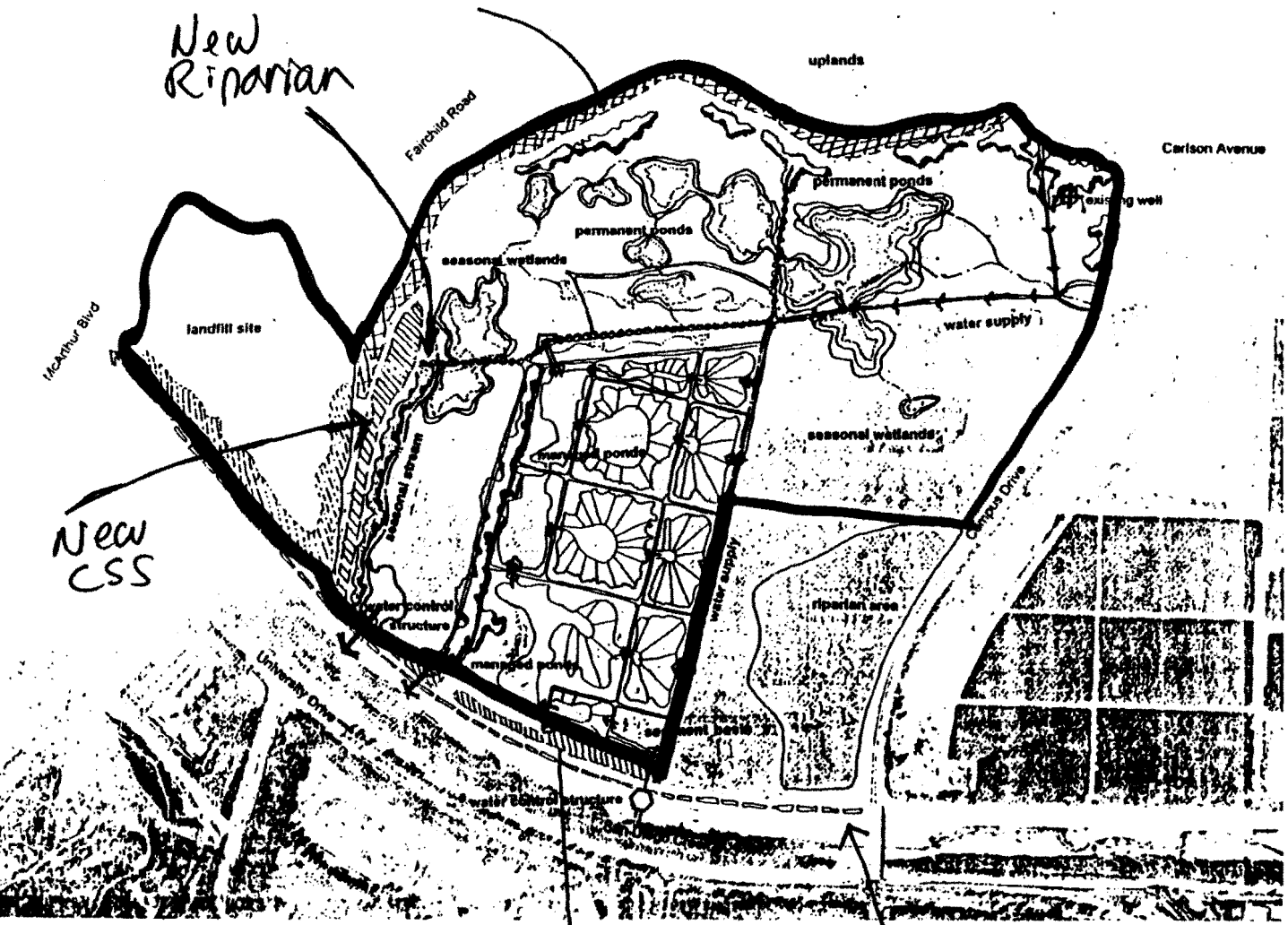

Figure 4. Project Site grading design

Coastal Zone Boundary

| EXHIBIT No. 3 |
| --- |
| Application Number: 5-99-109 |
| C.Z. Boundary |
| California Coastal Commission |

**Figure 5:**

SEASONAL WATER SUPPLY ALTERNATIVE




**LEGEND**

- WATER COURSE
- SUPPLY PIPE FROM DEEP WELL
- CONTROLLED DRAINAGE OUTLET
- FREE FLOW DRAINAGE
- EXISTING PERMANENT PONDS AREA OF INCREASE
- MANAGED SEASONAL POND / MUD FLA
- EXISTING RIPARIAN
- PROPOSED RIPARIAN
- COASTAL SAGE PLANTING
- EXPERIMENTAL COASTAL SAGE PLANTING AREA
- BUFFER ZONE
- PROJECT BOUNDARY

Ltd.

Romberg Tiburon Centers for Environmental Studies

REVISED ENHANCEMENT PLAN FOR THE

**SAN JOAQUIN FRESHWATER MARSH**

PREPARED FOR THE UNIVERSITY OF CALIFORNIA NATURAL RESERVE SYSTEM

**EXHIBIT No. 4**
Application Number:
**5-99-089**
**Phase I**
California Coastal Commission

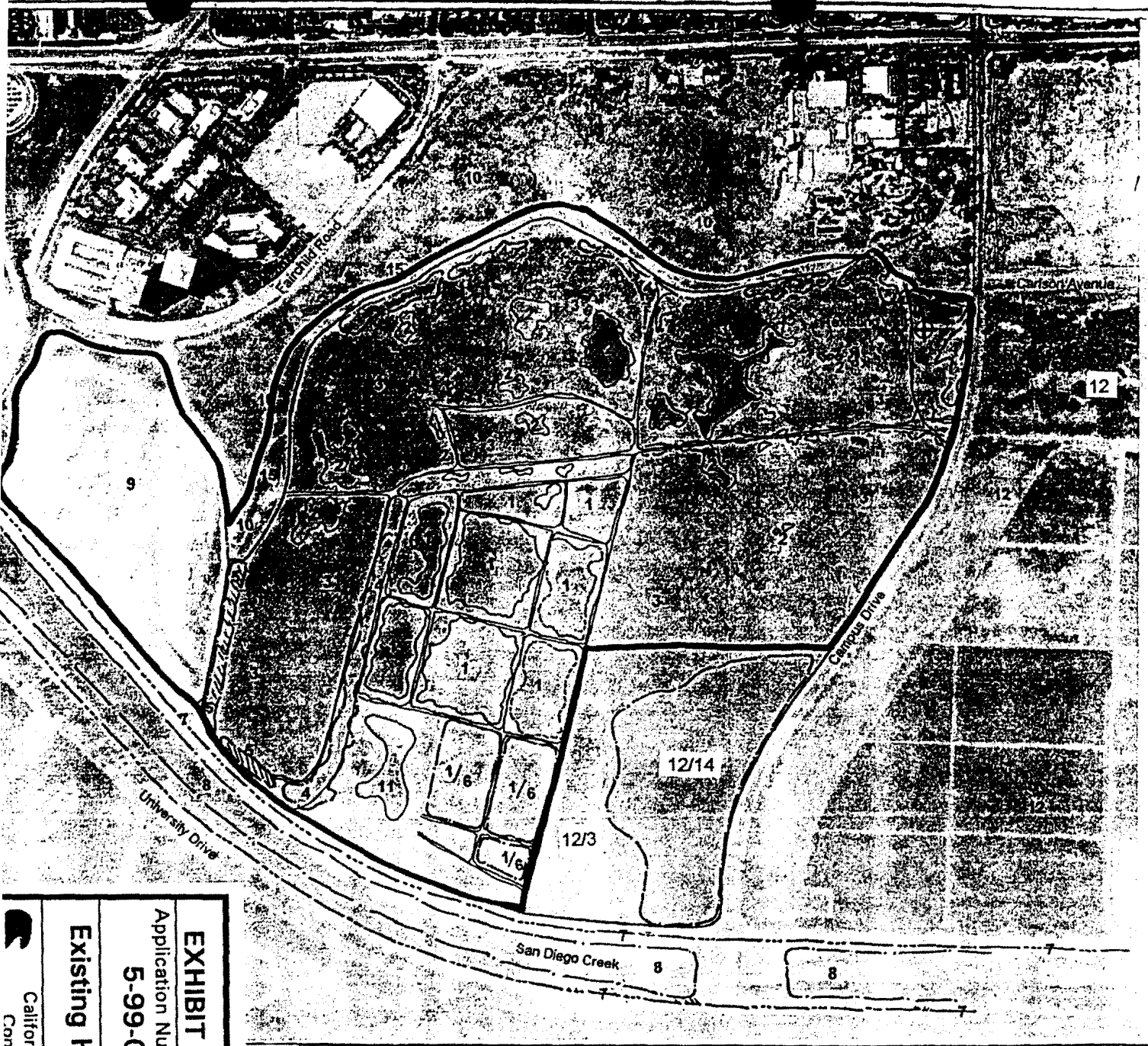



Figure 3: Vegetation Map

HABITAT TYPE / LAND USE: OCTOBER 1995

## LEGEND

1 - 'MANAGED' SEASONAL PONDS
2 - PERMANENT PONDS
3 - SCIRPUS / CATTAIL
4 - RIPARIAN
5 - COASTAL SAGE PLANTING
6 - SEASONAL GRASSES / HERBS
7 - SAN DIEGO CREEK LEVEE
8 - SAN DIEGO CREEK BED
9 - LANDFILL SITE
10 - UPLANDS
11 - HOAG MITIGATION SITE
12 - IRWD LANDS

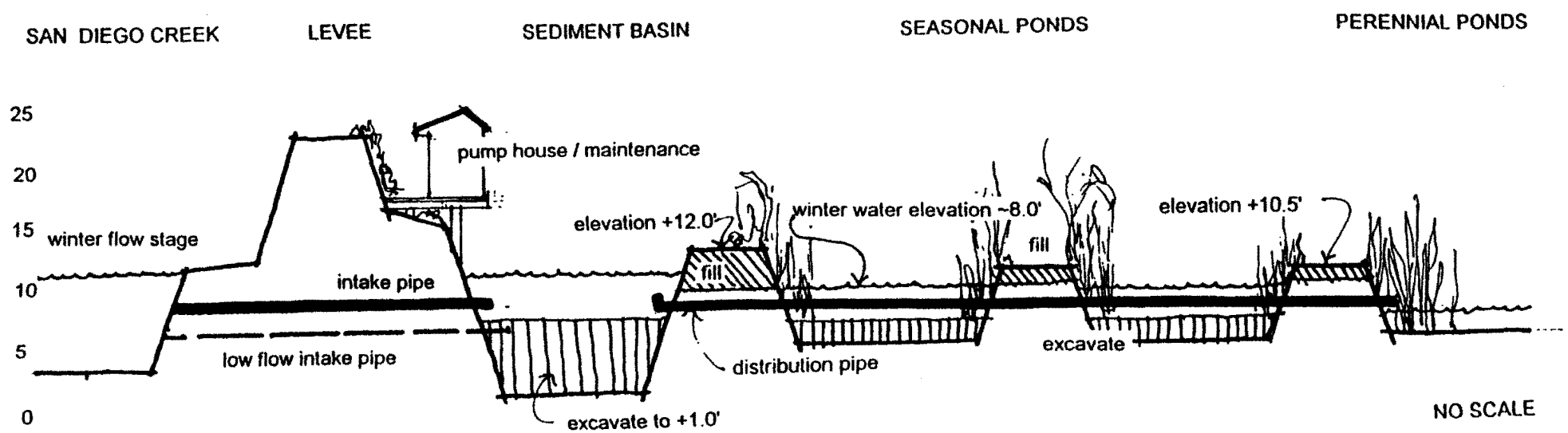
14 - RIPARIAN MITIGATION AREA
15 - BUFFER ZONE
16 - S.D. CREEK PLANK DAM
PROJECT BOUNDARY

**EXHIBIT No. 5**
Application Number:
**5-99-089**
**Existing Habitat**
California Coastal Commission

Romberg Tiburon Centers for Environmental Studies

REVISED ENHANCEMENT PLAN FOR THE
**SAN JOAQUIN FRESHWATER MARSH**
PREPARED FOR THE UNIVERSITY OF CALIFORNIA NATURAL RESERVE SYSTEM

Figure 6: North-South Section of Water Distribution




Enhancement Plan
servancy

Revised Plan

EXHIBIT No. 6
Application Number
5-99-085
Cross-Section
California Coastal Commission

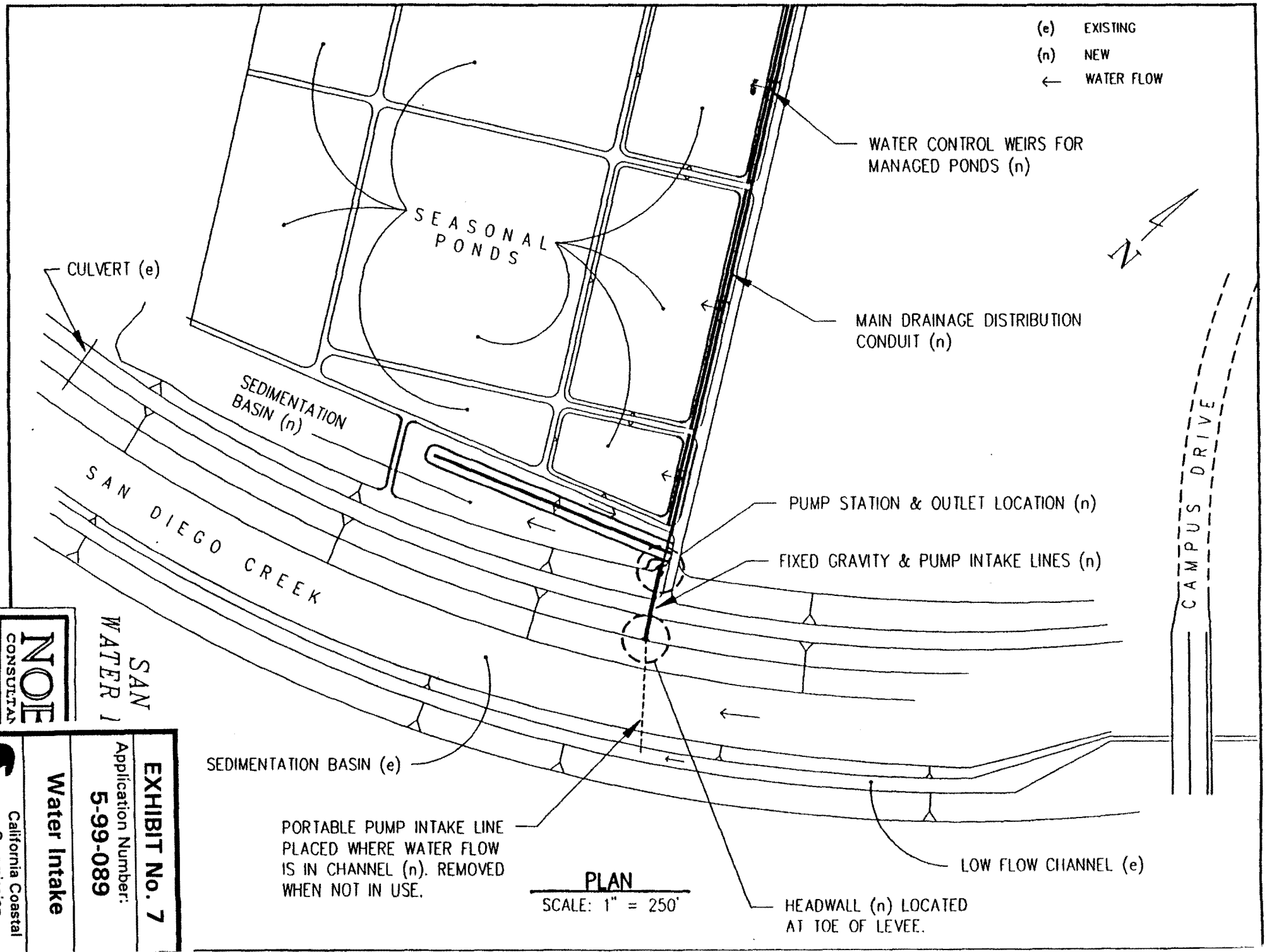
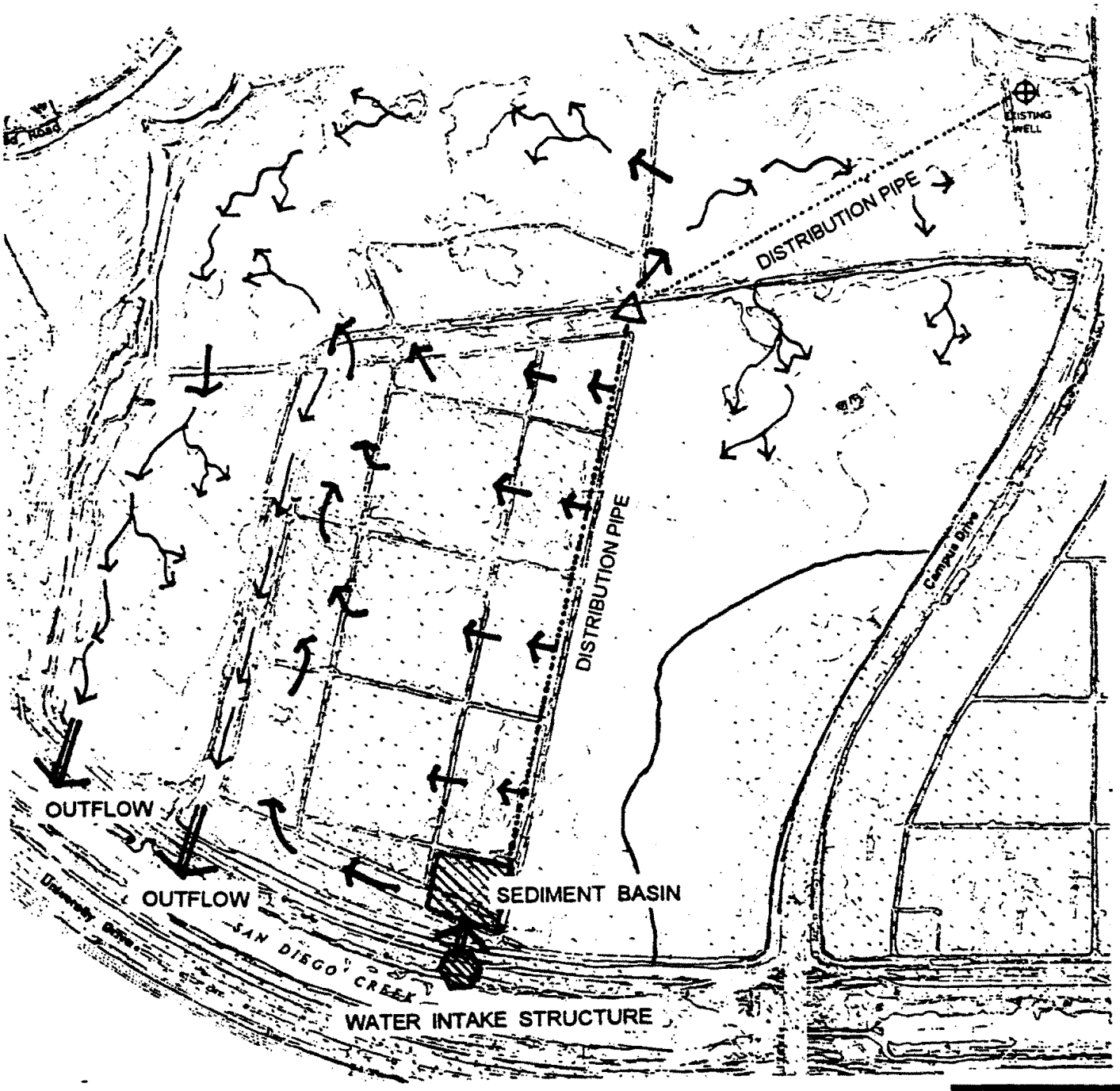
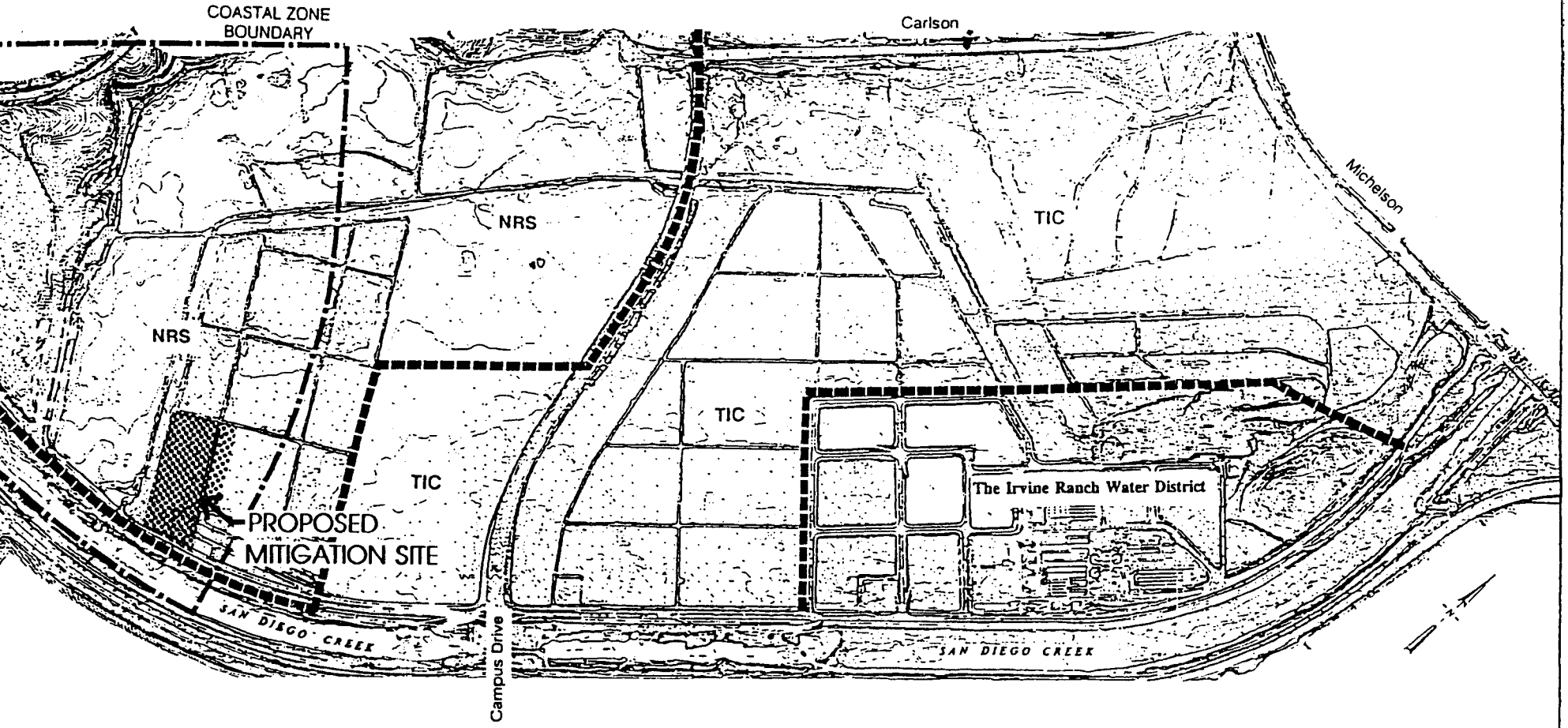

(e) EXISTING
(n) NEW
← WATER FLOW
WATER CONTROL WEIRS FOR MANAGED PONDS (n)
SEASONAL PONDS
N
CULVERT (e)
MAIN DRAINAGE DISTRIBUTION CONDUIT (n)
SEDIMENTATION BASIN (n)
SAN DIEGO CREEK
PUMP STATION & OUTLET LOCATION (n)
FIXED GRAVITY & PUMP INTAKE LINES (n)
CAMPUS DRIVE
SAN WATER I
SEDIMENTATION BASIN (e)
PORTABLE PUMP INTAKE LINE PLACED WHERE WATER FLOW IS IN CHANNEL (n). REMOVED WHEN NOT IN USE.
LOW FLOW CHANNEL (e)
HEADWALL (n) LOCATED AT TOE OF LEVEE.
PLAN
SCALE: 1" = 250'
NOE CONSULTAN
EXHIBIT No. 7
Application Number:
5-99-089
Water Intake
California Coastal Commission

Figure 7: Water Distribution Plan




San Joaquin Marsh Enhancement Plan
State Coastal Conservancy

**EXHIBIT No. 8**
Application Number:
**5-99-089**
**Water Flow**
California Coastal Commission




NRS - Natural Reserve System (University of California)

TIC - Irvine Company

NOT TO SCALE

pus Drive is Irvine Company, except for IRWD

Philip Williams & Associates, Ltd.
Consultants in Hydrology

Ownership of the San Joaquin Marsh

EXHIBIT No. 9
Application Number:
5-99-089
Hoag Location

California Coastal Commission

## N MARSH MITIGATION PLAN

lp and Location of Mitigation Site
aquin Freshwater Marsh Enhancement Plan", 1991)

GLENN LUKOS ASSOCIATES

EXHIBIT 4

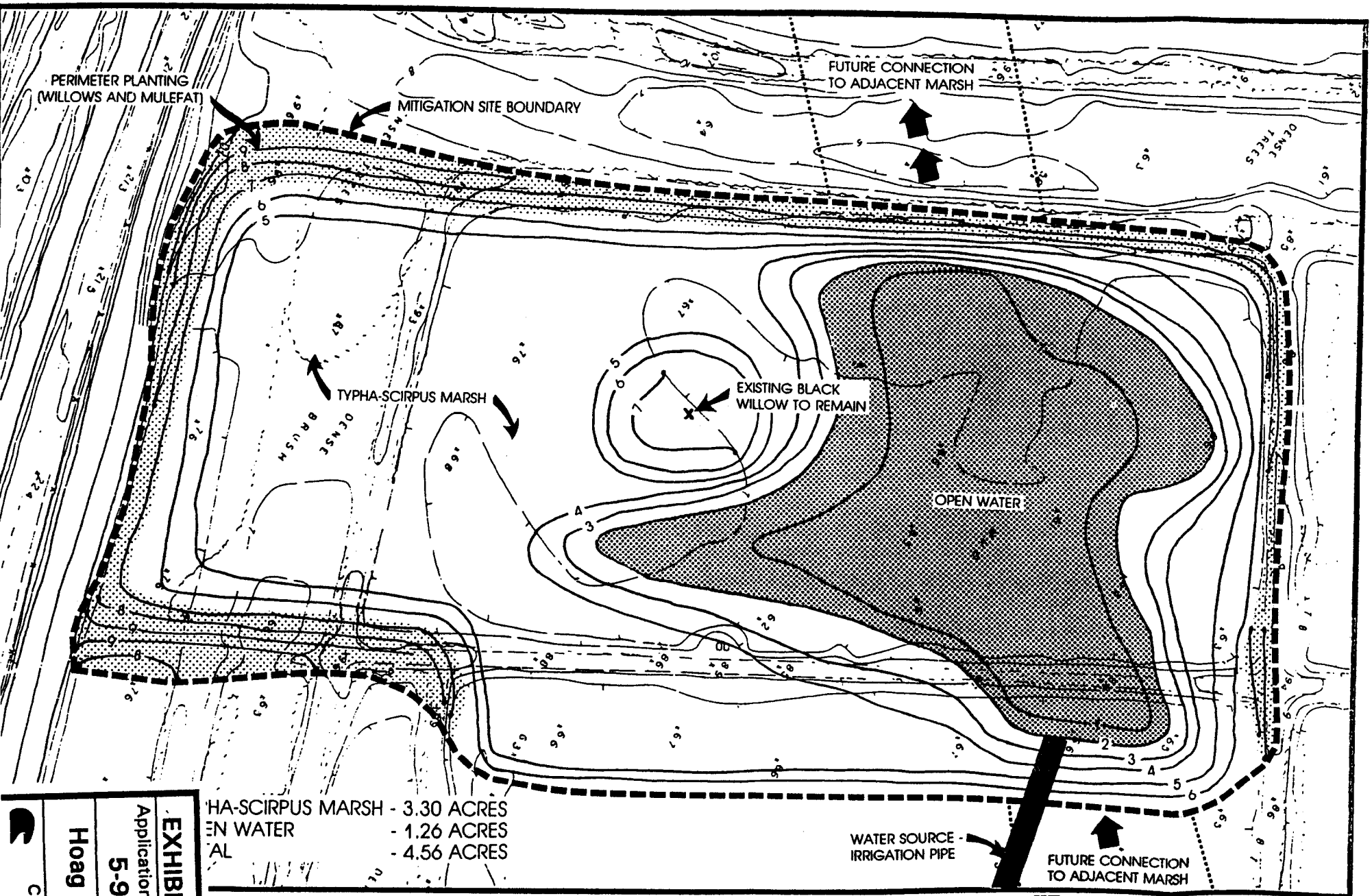



**EXHIBIT No.**

Application Number:

**5-99-089**

**Hoag Site Plan**

California Coastal Commission

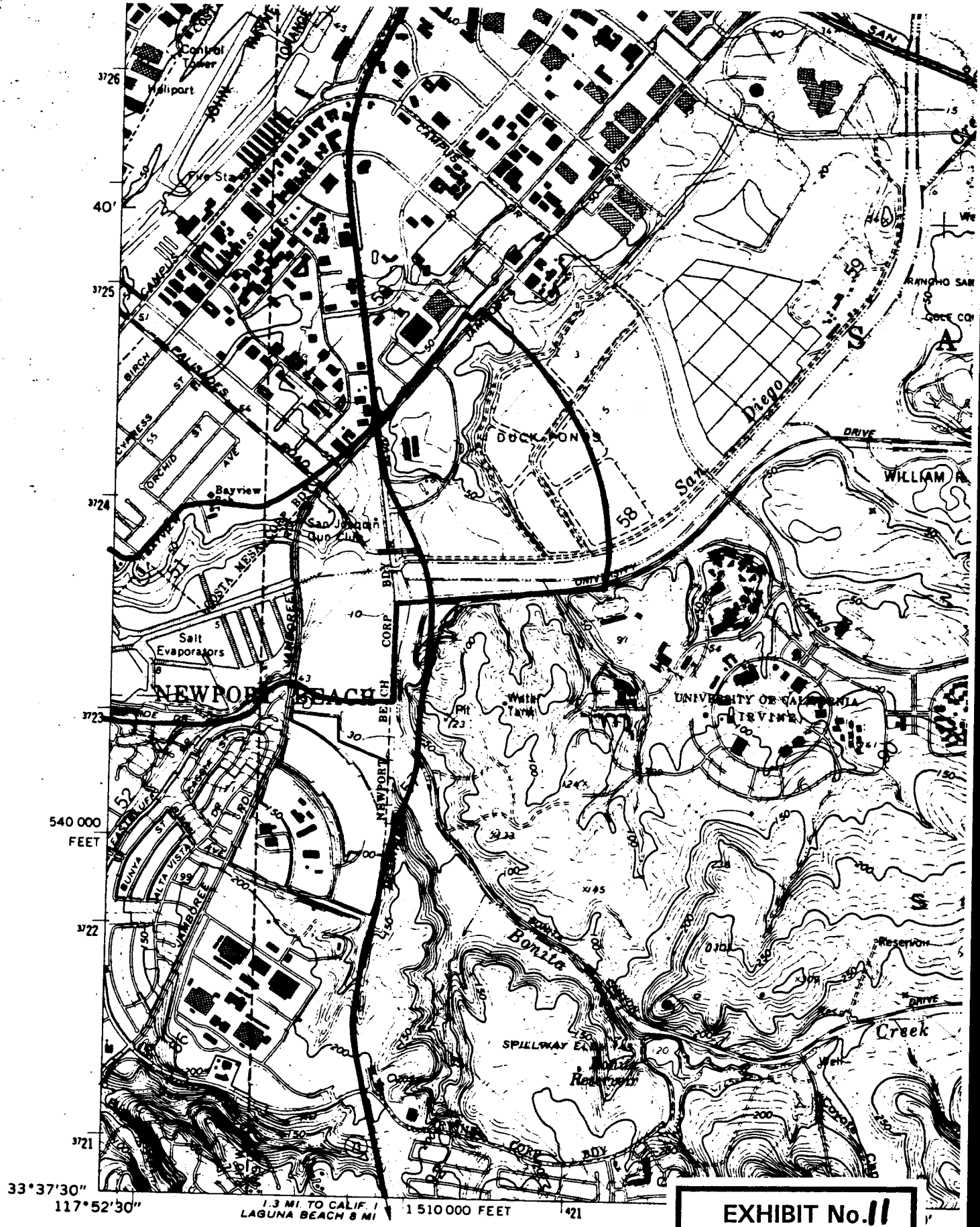



EXHIBIT No. 11

Application Number:
5-99-089

Coastal Zone

California Coastal Commission

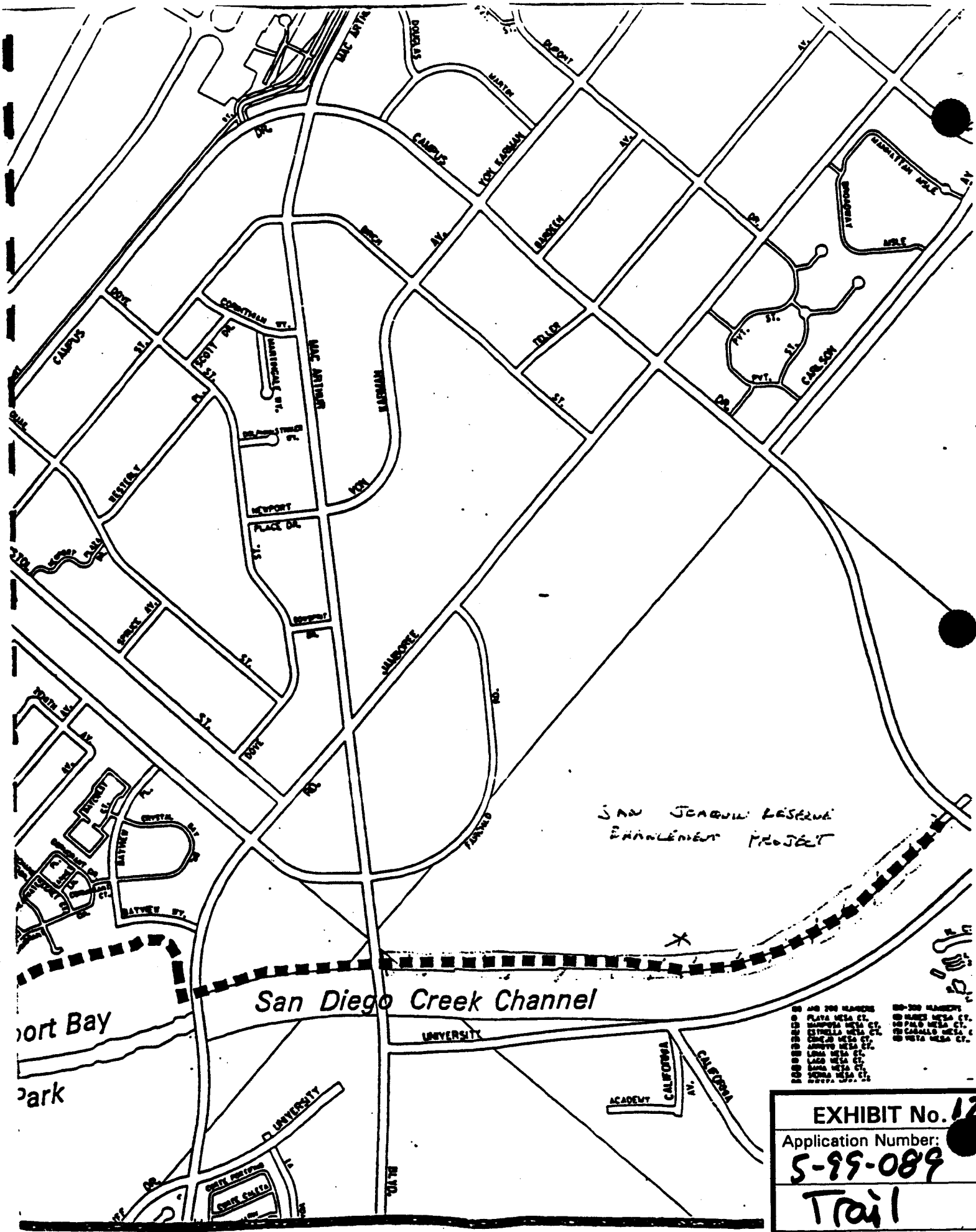



EXHIBIT No. 12

Application Number: 5-99-089

Trail

California Coastal Commission