CALIFORNIA COASTAL COMMISSION
South Coast Area Office
200 Oceangate, 10th Floor
Long Beach, CA 90802-4302
(562) 590-5071

W. 9. b.

RECORD PACKET COPY

Filed: December 16, 1997
49th Day: February 3, 1998
180th Day: June 14, 1998
Staff: John T. Auyong John
Staff Report: May 26, 1998
Hearing Date: June 10, 1998
Commission Action:

STAFF REPORT: REGULAR CALENDAR

APPLICATION NO.: **5-97-367**

APPLICANT: Hellman Properties (LLC) AGENT: Dave Bartlett

PROJECT LOCATION: Northeast of Pacific Coast Highway (State Route 1), Southeast of the San Gabriel River, South of Adolfo Lopez Drive, West of Seal Beach Boulevard, and North of Marina Hill; City of Seal Beach; County of Orange

PROJECT DESCRIPTION: Subdivision of 196 acre site into 9 parcels, including further subdivision of one of the parcels into 70 single-family residential lots in a private community; fill of 27 acres of degraded and severely degraded wetlands to construct 28.1 acres for a salt marsh restoration project and an 18 hole public golf course including 6.8 acres of freshwater marsh integrated into the golf course and reservation of 16.2 acres of existing oil production areas for future wetland restoration; dedication of Gum Grove Park to the City of Seal Beach; construction of interpretive areas, visitor-serving recreation facilities, and a golf clubhouse; dedication of public access trails; extension of Adolfo Lopez Drive; excavation of test pits for an archaeological testing program; and 1,600,000 cubic yards of grading.

LOCAL APPROVALS RECEIVED and SUBSTANTIVE FILE DOCUMENTS: See Appendices

STAFF NOTE FROM THE EXECUTIVE DIRECTOR

Staff is modifying its March 19, 1998, report and now recommends approval of the residential housing component of the project, approval of land divisions as modified by conditions, and deletion of the proposed golf course. Staff no longer recommends approval of the proposed golf course because filling wetlands to build a golf course is not consistent with Coastal Act wetlands protection policies. It is not often that staff reverses a previous recommendation (i.e., in this case, relative to the golf course). While staff takes great pride in its professionalism and high quality work, staff also takes

responsibility and is accountable for its action and when in error will not hesitate to say so.

During the presentation of the March 19 report at the April Commission meeting, staff attempted to make clear that in arriving at the recommendation of approval with conditions, judgments were made relative to potential consistency with Coastal Act wetlands policies that involved interpretations and matters of opinion. The public hearing on this matter in April was illuminating and instructive. The Chief Counsel's very thorough review of the legal theories that must be applied to ensure a firm legal basis for approval of wetland fill for a golf course contributed to staff's reevaluation of its recommendation. Additionally, public testimony (i.e., both urging that the golf course not be reduced to accommodate wetland restoration and opposition to staff characterizing the project as being for "restoration purposes" within the meaning of Coastal Act section 30233(a)(7)), discussion and expressions of concern by commissioners, and further internal discussion among staff, resulted in staff concluding that the March 19 recommendation should be changed.

Of the three possible legal theories on which a finding to support approval of wetland fill for a golf course could be based, staff now is of the opinion none is applicable here.

The applicant urges the Commission to rely on section 30007.5 which directs the Commission to resolve conflicts between Coastal Act policies "...in a manner which on balance is the most protective of significant coastal resources." However, in staff's opinion there is no direct conflict here between two or more specific chapter three Coastal Act policies; instead, section 30233 expressly limits the filling of wetlands to eight enumerated uses and development of a golf course is not one of them. The staff strongly urges the Commission to reject the applicant's proposed theory to rely on section 30007.5 because the Commission has consistently rejected an expansive interpretation of section 30007.5 that would balance general goals against specific wetlands policies. Were the Commission to begin using the section contrary to its long-standing position on this issue (i.e., to only use the section when two or more specific chapter three policies are in direct conflict), the result would be to render meaningless specific chapter three Coastal Act policies since any project can be said to raise conflicts between general goals and specific policies. It would be up to any then-sitting Commission to decide what "on balance is the most protective of significant coastal resources" in any matter to come before it. The result would be confusion and inconsistent, haphazard application of Coastal Act policies.

The second theory was presented by staff in the March 19 report and attempted to fit the proposed project into section 30233 (a)(7) by characterizing it as being a development for "restoration purposes." Recall, however, that this approach could, in staff's view, only have worked if the golf course were made smaller and the wetland acreage for restoration were increased. The applicant, the City of Seal Beach and many local residents who testified at the hearing objected to these proposed staff modifications because they felt it

would compromise the viability of the golf course as an eighteen-hole regulation-size course. Information was also presented to staff that the City looks to the golf course as being the source of new funds to defray costs of providing public services (i.e., police and fire protection) to the new residential community proposed as part of this overall project. Irrespective of how the Commission may have acted on staff's recommendation relative to increasing the wetland acreage for restoration, it became abundantly clear during the hearing that the relevant part of the project is a golf course accompanied by wetland restoration as mitigation and not a restoration project first with a golf course then added into the equation to enhance overall project feasibility. Staff now is of the opinion that in light of applicable facts and circumstances, the golf course should not and ought not be characterized as a development intended for "restoration purposes" pursuant to section 30233(a)(7). The lowlands portion of the project is clearly a golf course first and a restoration project second and not the other way around. Accordingly, staff recommends that the Commission not step onto the precedential slippery slope it would have been on had it followed the staff's prior recommendation.

The third theory explained by Mr. Faust at the April hearing, would apply sections 30233(a) and 30411(b) in combination to justify wetland fill because the Department of Fish and Game had previously concluded that the subject wetlands are severely degraded and cannot feasibly be restored in conjunction with a boating facility. This theory relies on non-binding Commission "guidelines" to suggest that if there are other feasible ways to accomplish restoration of the severely degraded wetlands (i.e., a golf course, residential development) those other uses are permissible in such a wetland. The rub here is that this theory has been specifically rejected by a Superior court. In *Bolsa Chica Land Trust v. CCC,* the court addressed this theory and said: "...the Commission's conclusion is simply inconsistent with the clear language of section 30233 which expressly limits the filling of wetlands to eight enumerated uses, of which residential development [read, golf course] is not one." The court then went on to say: "The Commission's interpretation would open the door to any type of development in a wetland whenever a finding could be made that funds were otherwise unavailable to restore degraded wetlands. It is for the Legislature to establish such a policy, not the Commission." The court also held that other feasible ways to achieve restoration must be less intrusive than a boating facility. Section 30233 requires that a boating facility not exceed 25% of the degraded wetlands and section 30411 requires that not less than 75% of the degraded wetlands be restored. An "other feasible way" of restoring wetlands should occupy less than 25% of the wetlands and should restore more than 75% of the wetlands in order to be less intrusive than a boating facility. An "other feasible way" should also be the least environmentally damaging alternative. The proposed golf course is not less intrusive than a boating facility nor is it the least environmentally damaging alternative to achieve restoration.

Accordingly, staff sees no legal basis under the Coastal Act for approval of a project that allows the fill of 17.9 acres of wetlands for development of a golf course.

There are several additional reasons that explain staff's change in recommendation. At the time this project was reviewed with the Executive Director, it was not entirely clear to the Executive Director how many legal parcels exist within the 196.6 acre project site and whether the portion of the overall site on which the public golf course, mineral production and wetland restoration would occur (much of the lowlands) constituted separate legal parcels. The concern was that if each area constituted a separate legal parcel, pursuant to regulatory takings rulings of the courts, the owner of each legal parcel would be entitled to approval of an economically viable use.

Since that time, the applicant has confirmed that there is no existing subdivision of the Hellman Ranch property. Although the project site may be composed of several parcels for tax assessment purposes, it constitutes only one single legal lot for purposes of alienation and development. This parcel is currently utilized for mineral production, of which Hellman owns the entire operating interest. The applicant is thus requesting Commission approval of a subdivision of this one legal parcel in a configuration the Commission has no legal obligation to approve.

Accordingly, staff recommends that the Commission approve a revised land division configuration that maintains in single parcel ownership and usage the land areas proposed for the golf course and wetland restoration as well as the area currently used for oil production which provides an economically viable use of the property. This means that should the owner of the separate lowlands parcel the Commission would be approving (assuming the permit is accepted and all other steps necessary to create the new subdivision and parcel are taken) at some time in the future come forward with a new development proposal in the lowlands portion of the project site now before the Commission, that owner would already have an economically viable use of the property (assuming mineral production is ongoing). Alternative uses consistent with Coastal Act policies could be considered on the mineral production parcel which might augment its economic use. Only by keeping the mineral production sites combined with the remainder of the lowlands area as one parcel can the Commission allow the subdivision of the remainder of the project site and ensure that future development proposals will not compel the Commission to allow uses in the lowlands solely to avoid a takings claim.

Another reason staff is changing its recommendation is based on the long view of the environmental future of Southern California's human and natural communities. California has lost the vast majority of its coastal wetlands, especially in the southern portion of the state. What few historic coastal wetlands remain are generally in a fairly degraded condition -- a condition of reduced habitat vitality and species diversity resulting from past human activity. As a matter of general environmental direction it is state and federal policy to promote habitat, and especially wetland restoration wherever possible. As the staff report points out, this project site is a part of an historic wetlands complex in excess of 2,400 acres. Development has reduced this wetlands complex to a fraction of its historic size. Staff is aware of the long, and often tortured history

associated with the project site. In fact, staff was deliberate about and tried to be creative in crafting a resolution to the long-standing controversy over what should be done on this land. On reflection and reconsideration, it is not unreasonable to anticipate future restoration of much if not most of the project site for viable wetland habitat purposes. The industrial ports of Los Angeles and Long Beach will most likely expand in the future and will need additional mitigation credits -- credits that can be earned through wetland restoration projects. The opportunities for mitigation restoration projects in proximity to the two ports are extremely constrained. The lowlands of this project site are former wetlands and clearly offer a viable venue for such restoration in the future. A major function and purpose of the Coastal Commission is to manage and plan coastal land uses, in partnership with local government, in a manner that preserves future options for improvement of environmental resources and conditions in the coastal zone. Staff believes the Commission has the opportunity to do exactly that in this case and in this area of southern California and it can do so while at the same time protecting the private property owner's right to economic use of the property. It should be noted that an existing and continuing potential use of the lowlands area is for mitigation restoration credits. Keeping the lowlands and the mineral production sites combined does not lessen the potential use of the area for mitigation credit. Indeed, the proposal is to ultimately use production site lands for restoration purposes. Staff concludes that this lowland area is the type of land area the ports, or another entity in need of mitigation credits, could feasibly restore.

A final note is in order relative to representations made to the applicant and city representatives prior to formal submittal of this application. The applicant's representatives believe they were encouraged to proceed with their project as a result of a preliminary meeting with the Executive Director. When the Executive Director met with the project proponents, at their request, before formal submittal of the application, he expressed the affirmative opinion the project appeared to be a vast improvement over past development proposals for the site. That is still the staff's opinion. However, at the time of the meeting no specific analysis evaluating the proposed development project's impacts and application of Coastal Act policies had been conducted by Commission staff. Everyone present at that meeting knew this. While an overall impression and a preliminary reaction was provided, it was not intended to be nor could such a superficial evaluation be considered legally adequate and conclusive.

The Executive Director regrets any misimpressions that may have resulted from the preliminary meeting on this matter. Indeed, the Executive Director acknowledged to other staff and the public his commitment to make extra efforts to attempt to arrive at a workable and acceptable resolution as a result of early communications with representatives of the city and the applicant. Notwithstanding staff's efforts to find a resolution in this matter, in the end, Coastal Act policies are the governing standards of law that must prevail.

SUMMARY OF STAFF RECOMMENDATION:

Staff is recommending approval of the project with special conditions requiring: 1) elimination of the golf course proposed within existing wetlands; 2) a revised land division configuration that maintains in single parcel ownership and usage the land areas proposed for the golf course and restoration as well as the area currently used for mineral production; 3) confirmation that the proposed dedication of Gum Grove Park has occurred prior to permit issuance; 4) final plans for the structural designs of the proposed visitor-serving uses; 5) reasonable mitigation measures for impacts to archaeological resources; and 6) incorporation of City water quality and hazards mitigation measures.

TABLE OF CONTENTS

I. APPROVAL WITH CONDITIONS 8

II. STANDARD CONDITIONS. 8

III. SPECIAL CONDITIONS. 9

1. ELIMINATION OF GOLF COURSE/LOWLAND DEVELOPMENT 9
2. REVISED VESTING TENTATIVE TRACT MAP NO. 15381. 9
3. STATE LANDS PARCEL. 9
4. GUM GROVE PARK 10
5. ARCHAEOLOGY 11
6. WATER QUALITY. 13
7. HAZARDS 14
8. LEGAL INTEREST. 14

IV. FINDINGS AND DECLARATIONS 14

A. DETAILED SITE AND PROJECT DESCRIPTION 14
B. OWNERSHIP AND EXISTING LEGAL PARCELS 18
C. CHAPTER 3 COASTAL ACT POLICY ANALYSIS 19
1. Wetlands *19*
2. Environmentally Sensitive Habitat Area ("ESHA") *44*
3. Archaeological Resources *45*
4. Public Access and Recreation *46*
5. Flood Hazards *49*
6. Water Quality *49*
7. New Development *50*
8. Other Conditions *50*
D. DEVELOPMENT AGREEMENT 50
E. LOCAL COASTAL PROGRAM. 51
F. CALIFORNIA ENVIRONMENTAL QUALITY ACT. 51

APPENDIX A: PREVIOUSLY RECOMMENDED SPECIAL CONDITIONS OF APPROVAL (FROM MARCH 19, 1998 STAFF REPORT AND ADDENDUM FOR THE APRIL 7, 1998 COASTAL COMMISSION HEARING) 53

WETLANDS RESTORATION AREA / CONSERVATION. 53
FINAL WETLAND RESTORATION PROGRAM. 54
REVISED VESTING TENTATIVE TRACT MAP NO. 15381. 57
GOLF COURSE OPERATIONS AND GOLFER WETLAND EDUCATION PROGRAM 57
PUBLIC ACCESS PROGRAM 59
RESIDENTIAL DEVELOPMENT 60

APPENDIX B: SUBSTANTIVE FILE DOCUMENTS 61

APPENDIX C: LOCAL APPROVALS 62

APPENDICES SENT UNDER SEPARATE COVER 62

LIST OF EXHIBITS 63

STAFF 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. *Elimination of Golf Course/Lowland Development.*

This coastal development permit 5-97-367 does not approve the proposed golf course, nor does it approve any of the proposed development in the areas covered by proposed Lots 4, 6, 7 and 8 of proposed Tentative Tract Map 15381 except for the proposed archaeological investigation.

2. *Revised Vesting Tentative Tract Map No. 15381.*

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, two copies of a revised vesting tentative map for Tract No. 15381. The revised map shall show only five legal lots as generally depicted in Exhibit B; namely, 1) the lot currently owned by the California State Lands Commission, 2) the lot currently owned by the City of Seal Beach Redevelopment Agency, 3) proposed Lot 2 which is proposed to be further subdivided into seventy residential lots pursuant to proposed Tentative Tract Map 15402, 4) proposed Lot 3 for the proposed dedication of Gum Grove Park, and 5) a lot consisting of the remainder of the subject site owned by the applicant. The applicant shall record the revised map approved by the Executive Director.

3. *State Lands Parcel.*

A. Lease Restriction. Prior to the issuance of the coastal development permit, the applicant shall execute and record a lease restriction, subject to the review and approval of the Executive Director, over the property commonly known as the California State Lands Commission parcel, situated northeasterly of Pacific Coast Highway at its intersection with First Street in the City of Seal Beach, which provides that:

(1) This coastal development permit approves only the construction of: a) an interpretive center consisting of a raised, handicap-accessible platform with information panels containing photographs, maps, exhibits, etc., overlooking the proposed salt marsh, b) the placement only of the Krenwinkle House on the site (no uses are established), c) the construction of public parking spaces, and d) construction of a structure or structures containing a maximum of 10,000 square feet of visitor-serving uses on the State Lands parcel; provided that adequate parking is supplied.

(2) Any modifications to the development described in this condition shall require an amendment to the permit from the Coastal Commission.

(3) An approved coastal development permit from the Coastal Commission shall be obtained prior to the establishment of uses to be contained in the Krenwinkle House after it is located on the State Lands parcel.

(4) Only public access, public recreation, public education, and lower-cost visitor-serving commercial facilities, which are consistent with the Chapter 3 policies of the Coastal Act and with the requirements established by the California State Lands Commission for use of public lands, shall be permitted on the State Lands parcel.

(5) All office uses are prohibited on the State Lands parcel (excepting offices which are necessary for the administration of, and are adjunct to, the public access and approved visitor-serving uses).

(6) Parking for the visitor-serving uses on the State Lands parcel shall be provided based on the standards contained in the Hellman Ranch Specific Plan, as adopted by City of Seal Ordinance 97-2 on September 27, 1997. A minimum of sixty-two (62) parking spaces, as depicted on Figure 5-4, Page 5-21 of the coastal development permit application, shall be provided and maintained on-site.

(7) Consistent with Mitigation Measure *R-5* of Seal Beach City Council Resolution No. 4562, the permittee or lessee shall install a bicycle rack near the entrance to the proposed pedestrian trail for the saltwater wetland. The bicycle rack shall; 1) be public, 2) be maintained by the permittee, and 3) accommodate a minimum of twenty (20) bicycles.

The document shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This lease restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

B. **Agreement to be bound**. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall obtain a written agreement from the owner of the State Lands parcel, subject to the review and approval of the executive director, stating that in the event of termination of the lease, and for so long as the building and facilities constructed pursuant to permit 5-97-367, the owner of the state lands parcel will agree to require each new or different tenant, occupant or operator, including itself, to sign a lease restriction or other appropriate instrument agreeing to comply with the conditions set forth in Special Condition 6.a. Above.

C. **Final Plans**. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, plans for the proposed interpretive center and visitor-serving commercial building which are consistent with the requirements of this permit. The applicant shall comply with the plans approved by the Executive Director.

4. Gum Grove Park

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, written evidence that the area known as Gum Grove Nature Park and as delineated as Lot 3 of proposed Vesting Tentative Tract Map 15381, as shown on Page 1 of Exhibit D of the staff report has been dedicated in fee to the City of Seal Beach, as proposed by the applicant and as approved by City of Seal Beach City Council Resolution No. 4562. The dedication documents shall provide that:

(1) The park shall be preserved in perpetuity as a passive recreational nature park open to the public. Active recreational activities or commercial facilities shall be prohibited.

(2) Necessary parking facilities which are the minimum necessary to serve the park and which meets Americans with Disabilities Act requirements shall be provided. The existing twenty (20) striped parking spaces for Gum Grove Park shall be maintained.

(3) New or upgraded trails within the dedicated park area shall be provided consistent with Americans with Disabilities Act requirements.

(4) Small scale interpretive signage which describes the Monarch Butterfly may be permitted if approved by an amendment to this permit.

(5) Gum Grove Park shall be open from dawn to dusk on a daily basis. Changes in hours of operation of Gum Grove Park shall require an amendment to this permit unless the Executive Director determines that an amendment is not required.

(6) Signage shall be conspicuously posted which states that the park is open to the general public.

5. Archaeology

For purposes of this condition, "OHP" shall mean the State Office of Historic Preservation, and "NAHC" shall mean the state Native American Heritage Commission.

A. The permittee shall undertake the proposed archaeological investigation in conformance with the proposed archaeological research design entitled A Research Design for the Evaluation of Archaeological Sites within the Hellman Ranch Specific Plan Area dated November 1997 prepared by KEA Environmental, Inc. for the City of Seal Beach. Prior to issuance of the coastal development permit, the applicant shall submit written evidence, subject to the review and approval of the Executive Director, that a copy of the archaeological research design has been submitted to the OHP, the NAHC, and the Native American group/person deemed appropriate deemed acceptable by the NAHC, for their review and comment. An amendment to this permit shall be required for any changes to the research design suggested by OHP, NAHC, or the Native American group/person unless the Executive Director determines that an amendment is not required.

B. Selection of Archaeologist(s) and Native American Monitor(s). The archaeologist(s) selected by the City shall meet the United States Department of Interior minimum standards for archaeological consultants, as also endorsed by the OHP. The City shall select the Native American monitor(s) in compliance with the "Guidelines for monitors/consultants of Native American cultural, religious and burial sites" issued by the NAHC, and in consultation with the appropriate Native American person/group deemed acceptable by the NAHC.

C. Post-Investigation Mitigation Measures. Upon completion of the archaeological investigation, and prior to the commencement of construction of any development (other than archaeological investigation activities or subdivision) located within proposed Lot 2 of proposed Vesting Tentative Tract Map 15381, the applicant shall submit, for the review and approval of the Executive Director, a written report regarding the following: 1) a summary of the findings of the archaeological investigation, and 2) a final written mitigation plan which shall identify recommended mitigation measures, including capping of archaeological sites, data recovery and curation of important archaeological resources as defined by the California Environmental Quality Act, and detailed additional mitigation measures which need to be implemented. The applicant shall also submit for review and approval of the executive director, a signed contract with a City-selected archaeological consultant that provides for archaeological salvage that follows current accepted professional practice, if additional archaeological data recovery measures are determined appropriate. The written report and additional mitigation measures shall also be submitted to the OHP and the appropriate Native American person/group designated or deemed acceptable by the NAHC. An amendment to this permit shall be required to implement any additional mitigation measures unless the executive director determines a permit amendment is not required.

D. Implementation of mitigation measures and summary of fieldwork. Prior to commencement of site preparation, grading, and construction activities for any development (other than archaeological investigation activities) located within a fifty foot (50") radius of the furthest boundary of each state-identified archaeological site as delineated in the archaeological research design, all of the requirements of special conditions 5.A., 5B., and 5.C. shall have been met. All development shall occur consistent with the final plan required by special condition 5.C. A written synopsis report summarizing all work performed in compliance with special conditions 5.A, 5.B, and 5.C shall be submitted to the executive director, OHP, and NAHC within six (6) weeks of the conclusion of field work. No later than six months after completion of field work a final report on the excavation and analysis shall be submitted to OHP and the commission.

E. Monitoring of Construction Activities. All site preparation, grading and construction activities for the proposed development shall be monitored on-site by a qualified archaeologist and Native American monitor. The archaeologist and Native American monitor shall have the express authority to temporarily halt all work should significant cultural resources be discovered. This requirement shall be incorporated into the construction documents which will be used by construction workers during the course of their work.

F. Discovery of Cultural Resources / Human Remains During Post-Archaeological Testing Construction Activities.

(1) If additional or unexpected archaeological features are discovered during site preparation, grading, and construction activities for approved development other than the archaeological investigation, all work shall be temporarily halted while the permittee complies with the following:

The archaeologist, in consultation with the Native American monitor, shall sample, identify and evaluate the artifacts as appropriate and shall report such findings to the permittee, the city and the Executive Director. If the archaeological resources are found to be significant, the archaeologist, in consultation with the Native American monitor, shall determine appropriate actions, and shall submit those recommendations in writing to the Executive Director, the applicant and the city. The archaeologist shall also submit the recommendations for the review and approval of the Executive Director and shall be prepared in accordance with the provisions outlined in Special Condition 5.C above. Any recommended changes to the proposed development or the mitigation measures identified in the final plan required by Special Condition 5.C. shall require a permit amendment unless the executive director determines that a permit amendment is not required.

(2) Should human remains be discovered on-site during the course of site preparation, grading, and construction activities, immediately after such discovery, the on-site City-selected archaeologist and Native American monitor shall notify the City of Seal Beach, Director of Development Services and the County Coroner within 24 hours of such discovery, and all construction activities shall be temporarily halted until the remains can be identified. The Native American group/person deemed acceptable by the NAHC shall participate in the identification process. Should the human remains be determined to be that of a Native American, the permittee shall comply with the requirements of Section 5097.98 of the Public Resources Code. Within five (5) calendar days of such notification, the director of development services shall notify the Executive Director of the discovery of human remains.

G. Incorporation of Archaeology Requirements into Construction Documents. Special Condition No. 5 of coastal development permit 5-97-367 shall be incorporated in its entirety into all the construction documents which will be used by construction workers during the course of their work as well as all construction bid documents.

6. *Water Quality.*

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a National Pollutant Discharge Elimination System permit ("NPDES"), Storm Water Pollution Prevention Plan, and Structural and Non-structural Best Management Practices for the proposed project, in compliance with the standards and requirements of the California Regional Water Quality Control Board. The

and would be contiguous with the proposed salt marsh. Phase 3 would consist of the westernmost portion of a 19.28 acre mineral production area towards the center of the site. The applicant proposes to set aside a combined total of 16.2 acres of existing mineral production area for potential future expansion of the Phase 1 salt marsh. If all three phases are completed, the entire salt marsh (including buffers) would be 43.5 acres.

The proposed 28.1 Phase 1 salt marsh is comprised of approximately; 1) 9.5 acres of subtidal basin and channels, 2.6 acres of unvegetated mudflat, 2.9 acres of low marsh pickleweed, 8.8 acres of high marsh pickleweed, and between 2 and 5 acres of transition zone/buffers. The buffer areas form an elevated ring around the proposed salt marsh to ensure that potentially contaminated runoff from the golf course does not enter the salt marsh. The buffer areas will also serve as the location of Coulter's Goldfield plants transplanted from existing locations which will be impacted by fill. The proposed Phase 1 salt marsh would be connected by an existing culvert to the San Gabriel River. The river water would provide the source of water for the salt marsh.

The maximum tidal range would be approximately 1.5 feet, with a spring low tide at +0.6 feet Mean Sea Level and a spring high tide at +2.1 feet Mean Sea Level. The residence time (i.e., the relative frequency of tidal flushing) would be a maximum of approximately 1.3 days. Proposed tidal zones include Shallow Subtidal (-4.0' to +0.1' relative to Mean Sea Level ("MSL") and is always underwater), Occasionally Exposed-Subtidal (+0.1' to +0.3" MSL), Lower Intertidal (Mudflat; +0.3' to +1.3' MSL), Upper Intertidal (Low Marsh; +1.3' to +1.9' MSL), Super Tidal (High Marsh; +1.9' to +4.5' MSL, the zone above Mean Higher High Water level). Transition areas consisting of a densely vegetated berm to keep out golf course runoff and errant golf balls would serve as a buffer and would be upland areas never subjected to tidal influence.

5. Freshwater Marsh

The applicant is proposing 6.8 acres of freshwater marsh wetlands consisting of a system of five basins connected by pipes. The center of each basin will be open water (10.0 foot depth) and the edges will consist of shallow shelves (0.5 to 1.5 feet deep) providing shallow water habitat. The water sources will consist of an onsite groundwater well and precipitation. The freshwater marsh would be integrated into the middle of the proposed golf course and also serve as a golf course water feature/hazard.

6. Grading

A total of one million, six hundred thousand (1,600,000) cubic yards of grading are proposed. Eight hundred thousand (800,000) cubic yards of grading (cut) would be excavated to construct the salt marsh and freshwater marsh. The 800,000 cubic yards of excavated material would be used for fill for the proposed golf course and clubhouse.

7. State Lands Parcel

The parcel of land adjacent to Pacific Coast Highway currently owned by the California State Lands Commission is contemplated for visitor-serving uses. A City historic building, the Krenwinkle House, may be moved to the site to be used as a historical museum and or interpretive center for the adjacent proposed salt marsh. Also contemplated are 10,000 square feet of visitor-serving commercial uses. Sixty-two (62) parking spaces are shown on the conceptual site plan. A simple interpretive center consisting of a raised platform with displays overlooking the proposed salt marsh is also proposed.

8. Archaeology

The applicant is proposing an archaeological investigation to document the existence of cultural resources in the eleven cultural resources sites identified on the development property. The eleven State-identified cultural resources sites are CA-ORA-256, CA-ORA-260, CA-ORA-261, CA-ORA-262, CA-ORA-263/852, CA-ORA-264, CA-ORA-850, CA-ORA-851, CA-ORA-1472, CA-ORA-1473, and Area D.

The archaeological investigation consists in part of digging 30x30 centimeter square shovel test pits ("STPs") to a maximum depth of 50 centimeters. STPs will be placed at 20 meter intervals on each cultural resource site, resulting in approximately 91 STPs. An additional 19 STPs will be dug on selected sites to supplement the sampling of the 91 STPs.

In addition, the proposed archaeological investigation will consist of digging Test Excavation Units ("TEUs"). The proposed TEUs are 1x1 meter square and will be hand excavated at 10 centimeter intervals. A total of 45 TEUs (between 2 and 8 per site) are expected to be dug. The TEUs will be placed on each site based on the results of both the STPs and a ground penetrating radar survey of each site.

9. Golf Course and Clubhouse

The applicant is also proposing a 110.1 acre (excluding the freshwater marsh wetland complex) 18 hole golf course open to the public. The golf course is intended to be of the caliber that could host a Professional Golf Association tournament and charge green fees in the mid-range of fifty dollars ($50) or so. A golf clubhouse, also to be open to the public, is also contemplated. An extension of Adolfo Lopez Drive across land owned by the City of Seal Beach is also contemplated.

10. Parks and Trails

The applicant is also proposing to dedicate the 11.1 acre Gum Grove Park to the City of Seal Beach. The City currently leases the park, an unimproved nature park with a eucalyptus tree grove, from the applicant. The applicant also proposes to dedicate public trails which would extend from the State Lands parcel to the north and south of the Phase 1 salt marsh and end at viewing nodes along the salt marsh.

B. *Ownership and Existing Legal Parcels*

As stated above in the Executive Director's note, the applicant has confirmed that there is no existing subdivision of the Hellman Ranch property. (Exhibit B) In addition, this parcel is currently utilized for mineral production, of which Hellman Properties owns the entire operating interest. (Exhibit B) Further, although Shell Oil (now Signal Hill Petroleum) has a 50% producing interest in APN 980-36-605, Signal Hill Petroleum has no land rights. (Exhibit B)

There are several assessor's tax parcels within the Hellman ownership, including assessor's tax parcels for mineral rights. However, County of Orange Assessor's parcels which are utilized for tax purposes are not necessarily the same as legal lots for purposes of the Subdivision Map Act.

While the City has approved Tentative Tract Map 15381 which subdivides the applicant's lot into several lots, this subdivision of the land is not valid until approved by the Commission. The applicant is thus requesting Commission approval of a subdivision of one 196.6 acre parcel in a configuration that would separate the existing mineral production areas from the proposed golf course, wetland and residential areas.

The applicant's ownership interest comes about as the result of a decree of partition filed in Los Angeles Superior Court Case 13527 (Bixby, et. al. vs. Hellman, et.al.). The applicant's ownership should not be confused with the areas of the subject site owned by the California State Lands Commission, the City of Seal Beach Redevelopment Agency, and an easement owned by the Southern California Edison electric utility.

The southerly boundary of the Hellman property is fixed by the subdivisions that created the existing residential neighborhood of the City of Seal Beach commonly known as Marina Hill. Tracts 1817 and 2590 creating Marina Hill were recorded on December 15, 1955 in Book 82, pages 26-38 (for both tracts) of the Miscellaneous Maps of Orange County. The easterly boundary of the Hellman property is fixed by Seal Beach Boulevard (formerly known as Bay Boulevard, as described in the legal description).

The eastern half of the northeasterly Hellman property line is described in a 1965 record of survey which generally describes the property now occupied by Boeing Company (formerly Rockwell International), except that the southerly portion of this land shown in the record of survey which immediately borders the Hellman property is developed with the City of Seal Beach Police Department, City of Seal Beach Public Works Department, and other City facilities. The western half of the northeasterly Hellman property line is described in the deed from the Lloyd Dinkelspiel estate to the Orange County Flood Control District.

The northwesterly Hellman property line is generally described in the deed from the Hellman family to the City of Los Angeles recorded February 15, 1961 in Book 5629, beginning with page 527, of the Official Records of Orange County.

C. *Chapter 3 Coastal Act Policy Analysis*

1. Wetlands

Section 30108.2 of the Coastal Act states:

> *"Fill" means earth or any other substance or material, including pilings placed for the purposes of erecting structures thereon, placed in a submerged area.*

Section 30121 of the Coastal Act states:

> *"Wetland" means lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.*

The subject site contains 27.087 acres of scattered wetlands according to a recent wetlands assessment of the site (Coastal Resources Management & Chambers Group, 1996). According to the assessment, the existing wetlands are comprised of 15.91 acres of salt marsh vegetation, 2.026 acres of seasonally ponded water, 7.0059 acres of alkaline flat, and 3.146 acres of tidal channel. The majority of the wetlands are clustered: 1) around the tidal channel which runs through the middle of the property and delivers site runoff to a culvert which connects to the San Gabriel River, or 2) adjacent to the Haynes Cooling Channel at the north edge of the property. (see Exhibit B) The applicant is proposing to fill all of the existing wetlands. The proposed project involves fill of 17.9 acres of the existing wetlands for a golf course, and fill of the remaining 9.1 acres of existing wetlands for wetlands restoration.

a. Background on On-site Wetlands

The Commission found previously in its approval of coastal development permit 5-89-1087 that, historically (and as recently as the late 1890's), all of the lowland areas of the subject site were part of the 2,400 acre Alamitos Bay wetland complex at the mouth of the San Gabriel River. Over time, however, man-made alterations reduced the size and quality of the wetlands.

Substantial degradation of the wetlands on the Hellman property began with oil production in the 1920's, which resulted in the fill of wetlands for access roads and production facilities. The wetlands were further altered following the rerouting and channelization of the San Gabriel River from 1930-34. Marsh land receded further as canals and levees were built to control water on the property. The construction from 1961-63 of the adjacent Los Angeles Department of Water and

Power cooling channel for the upriver Haynes power plant resulted in the deposition of large quantities of fill on the site and additional fill of wetlands.

The City of Seal Beach also allowed fill to be placed on the property during the 1960's and early 1970's, and the Commission's predecessor Coastal Zone Conservation Commission also approved fill activity between 1972-75. Continued oil production and off-road vehicle use on the site currently contributes to the degradation of the wetland.

(1) Previous California Department of Fish and Game Review

In June 1980, Bob Radovich of the California Department of Fish and Game ("CDFG") prepared "An Assessment of Wetland Resources Within the City of Seal Beach South of the San Gabriel River" at the request of the South Coast Regional Commission (predecessor to the current Coastal Commission). The assessment described existing vegetation and wetland values and possible issues regarding restoring the wetlands. The assessment indicates that "[i]n general, existing wetland values are quite poor." The assessment concludes, in part, that "[t]he primary value of the subject wetlands lies primarily in terms of what it can be."

Subsequent to this, at the request of the Commission, the CDFG prepared a formal wetlands determination of the subject site ("Determination of the Status for Wetlands Within the City of Seal Beach, Immediately South and East of the San Gabriel River Channel (Ponderosa Seal Beach Wetlands)" dated January 13, 1982) pursuant to Section 30411(b) of the Coastal Act.

The 1982 determination concluded that approximately 25 acres (+ or - 0.5 acres) existed on the site at the time. The 25 acres were comprised of 3.4 acres of brackish water marsh, 18.0 acres of salt flat, and 3.3 acres of open water/estuarine wetland. CDFG determined that all of the on-site wetlands were degraded. Of these, CDFG determined that approximately 23 acres were severely degraded. While Section 30121 of the Coastal Act defines a wetland, the Coastal Act does not define a "degraded" wetland. In its determination, CDFG defined a "degraded" wetland, based on ecological factors, as:

> *Degraded Wetlands: A wetland which has been altered by man through impairment of some physical property and in which the alteration has resulted in a reduction of biological complexity in terms of species diversity of wetland-associated species which previously existed in wetland areas.*

The determination noted, for instance, that bird use of the wetlands was consistently low, even after taking into account the possibility of influence by variations in tidal and weather conditions. The CDFG went on to describe the feasibility of restoring the on-site wetlands. This is discussed below in the section under "Wetland Alternatives".

(2) Previous Commission Actions

(A) 1982 Commission Actions

Ponderosa Homes applied for coastal development permit application 5-82-221 for the construction of 1,000 homes and parks and fill of all the existing on-site wetlands. Staff recommended that the Commission hold a hearing (May 18, 1982) to discuss the proposed development in light of the wetland and seismic hazards constraints. District log book records indicate that the application ended up being withdrawn (Nov. 17, 1982).

The California Department of Fish and Game prepared the previously described 1982 wetlands determination of the site in conjunction with the Ponderosa project,. In addition, the Coastal Conservancy developed a wetlands enhancement plan for the on-site wetlands. The Conservancy plan evaluated several wetland restoration alternatives, also starting with the implicit premise that restoration would work around the development proposed under coastal development permit application 5-82-221.

The consolidation of the on-site wetlands into either an on-site tidal salt marsh or an on-site brackish water marsh near the culvert leading to the San Gabriel River was deemed to be technically feasible. Ultimately, however, the Conservancy determined that these alternatives presented significant problems regarding cost of wetland construction, required changes to the then-proposed Ponderosa Homes project to accommodate the wetlands, and long-term maintenance of the culvert linking the wetland with the salt marsh site.

The consolidation of the on-site wetlands into a brackish water marsh near the Los Alamitos Retarding Basin was considered to be technically feasible. This marsh would essentially be an extension of the seasonal wetland created when the flood control basin is full of winter storm runoff. This wetland alternative would be dependent on runoff, ground-water pumping, and diversion of runoff from the flood control basin for its water supply. Again, however, the Conservancy determined that this alternative would present problems regarding the redesign of the then-proposed Ponderosa Homes project.

The Conservancy concluded that off-site restoration would provide the best chance for creation of a long-term viable and regionally significant wetland in the area. The Conservancy recommended three preferred off-site areas: the Talbert Marsh and Fairview areas of the Santa Ana River, and uplands areas next to and within the Seal Beach National Wildlife Refuge (Anaheim Bay wetlands).

The Conservancy presented these wetland alternatives to the Commission as Coastal Conservancy Project #1-82. The Commission approved the Conservancy project in concept with conditions requiring: 1) further study of all alternatives, that data from which was to be presented to the Commission along with the selection of a final site, and 2) conditions addressing the specific alternatives of the on-site wetlands near the culvert, on-site wetlands near the flood control basin, and the Seal Beach wildlife refuge site. Since the Ponderosa Homes project was never undertaken, neither were any of the Conservancy project wetland restoration alternatives.

(B) 1989-1990 Commission Actions (MOLA)

On November 14, 1989, the Commission denied permit application 5-89-514 by the MOLA Corporation to construct 355 homes with both wetland fill and wetland restoration. The Commission then waived the 6 month period required by the Regulations to rehear a denied project. On January 12, 1990, the Commission approved coastal development permit 5-89-1087 in part for construction of 355 homes, 4 acres of wetland fill, 36.8 acres of wetland habitat, and 1.3 million cubic yards of cut and 1.4 million cubic yards of fill.

As a condition of approval, the Commission required the proposed wetland restoration area to be expanded by four acres to further mitigate the four acres of fill. The four acre expansion would have; 1) removed planned homes that would have intruded into planned wetland, 2) removed structural development from a highly liquefiable site, 3) further ensured the success of the planned wetland by creating additional wetland and buffer area, and 4) allowed the Port of Long Beach to use the site for mitigation credits. The MOLA project was also never undertaken.

b. Importance of Wetlands

One of the main reasons for preserving, expanding, and enhancing Southern California's remaining wetlands is because of their functions. First and foremost, wetlands provide critical habitat, nesting sites, and foraging areas for threatened or endangered species. Wetlands also serve as migratory resting spots on the Pacific Flyway, a route in which birds travel from Canada and points north to Mexico and points south. In addition, wetlands also serve as natural filtering mechanisms to help remove pollutants from storm runoff before the runoff enters into streams and rivers leading to the ocean. Further, wetlands also serve as natural flood retention areas.

Another critical reason for preserving, expanding, and enhancing Southern California's remaining wetlands is because of their scarcity. As much as 75% of coastal wetlands have been lost. As described earlier, the 27 acres of existing on-site wetlands are part of only 150+ acres which remain of the former 2,400 acre Alamitos Bay wetland complex. Therefore, it is critical to maintain and enhance the remaining wetlands to ensure that wetlands exist to carry out the functions described above.

c. 30233(a) Analysis

Section 30233 of the Coastal Act states, in relevant 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:*

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

(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. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

Section 30233 of the Coastal Act regulates the proposed fill of wetlands. The fill of wetlands may only be approved if: (1) the proposed fill is for one of the eight allowable uses delineated in Section 30233; (2) there is no feasible less environmentally damaging alternative; and (3) all feasible mitigation measures have been provided to minimize adverse environmental effects.. The consistency of the proposed project with these 3 standards for wetland fill will be discussed below.

(1) Proposed Development is Not an Allowable Use

Allowable development within wetlands is governed by Section 30233(a) of the Coastal Act. Section 30233(a) limits development in wetlands, including diking, filling or dredging, to eight allowable uses. Since a golf course is not expressly listed as one of the eight allowable uses under Section 30233(a), the proposed fill of 17.9 acres of existing wetlands to construct the proposed golf is not allowable.

(A) Section 30233(a)(7) - Restoration

Section 30233(a)(7) of the Coastal Act allows fill of existing wetlands for wetland restoration purposes. The applicant contends that the revenue generated by the proposed golf course is needed to fund the construction of the proposed wetland restoration.

The proposed lowland development, specifically the golf course and the wetlands restoration, involves fill of all 27 acres of on-site wetlands. Of the total 27 acres of wetland fill, 17.9 acres of fill would result from the proposed golf course, and 9.1 acres of fill would result from the enhancement of the proposed salt marsh and freshwater marsh wetlands. The applicant is proposing to construct a total of 44.3 acres of restored wetlands. 28.1 acres would be proposed in Phase 1 (at the same time as the construction of the proposed golf course) and the remaining 16.2 acres, which will be located in areas where there is currently active oil activity, may be constructed at some undetermined point in the future once the oil activity has ceased. Of the 28.1 acres of Phase 1 wetland creation, some 2 to 5 acres is upland/transition/berm areas not periodically covered by water through tidal action and thus is not actual wetlands. Therefore, only approximately 23 to 25 acres of actual tidally influenced wetlands would be created.

Although the applicant contends that the purpose of the proposed wetland fill is for wetlands restoration purposes, 17.9 acres of fill would result from the proposed golf course. Only 9.1 acres of the wetlands fill is to enhance salt marsh and freshwater marsh wetlands and allow for approximately 2 to 5 acres of non-wetland buffer area.

The Commission finds that to allow the ultimate conversion of the site's existing wetlands to other uses by approving fill as fill for restoration purposes, the proposed fill must: (1) be necessary to accomplish the wetland restoration goals and objectives, and (2) result in substantially greater habitat values than exist at present.

These two factors were integral to the Commission's action approving the restoration and enhancement of Batiquitos Lagoon in the City of Carlsbad in San Diego County (CDP 6–90–219). The Commission utilized these factors to ensure that the restoration and enhancement project was responsive solely to the needs of the lagoon.

(i) Necessity of the Project for Restoration

The applicant contends that the proposed public golf course configuration and size is specifically required to generate a sufficient level of greens fees to allow for the funding of the construction, establishment, and maintenance of the proposed wetlands. The proposed public golf course, at approximately 6,000+ yards in length, is intended to be a regulation length golf course which can justify charging mid-range green fees (about $50 or so) which are necessary to provide revenue for the proposed wetlands construction.

The applicant further contends that the amount of Phase 1 wetlands creation cannot be increased because it would reduce the size of the proposed golf course to a point at which the golf course can no longer charge adequate green fees to pay for wetlands creation and maintenance.

The alternatives evaluated in the final environmental impact report ("FEIR") certified by the City[1] for the proposed project demonstrate that the proposed project is driven by the needs of the golf course and housing rather than the needs of the wetland. As described in the FEIR, the proposed project is neither physically nor financially necessary to accomplish defined wetland restoration goals and objectives. According to the FEIR, it is the residential component rather than the golf course which generates the revenue necessary to meet the conservation goals and objectives. Moreover, the FEIR discussion admits that the overall project is envisioned primarily to meet the local need for a golf course, with the restoration being a secondary purpose.

The FEIR for the proposed project did not even consider an evaluation of feasibility of an alternative that would have fewer homes than the proposed 70 homes. Page 7-2 of the FEIR, Volume I, Section 7.0 - Project Alternatives, states:

> *The creation and restoration of the wetlands will involve construction and engineering costs totaling approximately $3,000,000* [three million dollars]. *At the same time, the remaining areas of the property provide limited opportunities for revenue generation. Gum Grove Nature Park would be dedicated to the City for preservation in perpetuity. The proposed public golf course alone would not be capable of generating sufficient revenue to fund the wetland creation/restoration. Golf courses of this type are generally unable to produce a surplus of revenue after accounting for the costs of constructing improvements, on-going maintenance and*

[1] The FEIR in question was certified on September 22, 1997 pursuant to City of Seal Beach City Council Resolution 4562. The referenced sections of the FEIR regarding project alternatives were utilized by the City in order to certify the FEIR. Therefore, the Commission may rely on this information in choosing among alternatives.

> *operations costs, and a reasonable rate of return on investment, even without calculating land costs. A residential component is therefore required for the project to generate the revenue necessary to meet its conservation goals and objectives. Based on projected costs and returns, it was determined that development of 70 single-family units represents the minimum number of units feasible that would allow for both a reasonable return and the attainment of the conservation/recreation uses contemplated in the proposed Hellman Ranch Specific Plan.* [emphasis added]

In FEIR Volume II - Technical Appendices, Page 3 of Appendix D (the Final Conceptual Wetland Restoration Plan for the Hellman Ranch Specific Plan, dated November, 1996) states that:

> *The overall project is envisioned to meet the local need for a golf course, which will help to make the project economically viable while minimizing impacts to the existing degraded wetlands. The golf course will also serve as the "economic engine" to fund restoration of wetlands at the site.* [emphasis added]

On Page 3 of its May 27, 1997 letter to the City of Seal Beach commenting on the contradictory nature of these two statements in the FEIR, staff stated that ". . . the FEIR should clarify which development component, if any, of the proposed specific plan is necessary for the proposed restoration of the on-site wetlands to occur". In responding to staff's comment, Page 3-4 of the FEIR Volume V, in Response to Comments S3-4, states:

> *The Hellman Ranch Specific Plan provides for comprehensive planning of the Hellman Ranch property.. With that in mind, the Development Plan includes a public golf course and associated residential development which together provide the economic framework to fund the wetlands restoration project and dedication of open space and conservation areas for public use.*

Thus, although both development components may provide a source of revenue, because the proposed golf course itself will not generate sufficient revenue, it is the 70 houses and not the proposed golf course that is necessary to fund the restoration. Therefore, because the proposed golf course is in no way necessary to fund the restoration, it cannot be considered as part of a "restoration project" or financially or physically necessary to fund restoration.

(ii) Increase in Habitat Values

In order for the wetland fill to be consistent with Section 30233(a)(7) of the Coastal Act, a wetlands restoration project must be the primary purpose for the fill and must result in a significant amount of wetlands being created upfront in conjunction with the fill of existing wetlands. As proposed, the ratio of wetland fill to wetlands creation is actually less than 1:1 because up to 2 to 5 acres of the proposed 28.1 acres of wetlands is non-wetland buffer area which cannot be included in the proposed wetland acreage.

Another reason the wetlands acreage proposed by the applicant cannot be considered wetlands restoration which results in substantially greater habitat values is that the track record of past wetland creation projects indicates a less than optimum success rate. The success rate of wetlands restoration is less than 100%. A created wetland that never establishes itself cannot be considered wetlands restoration. If an existing wetland, even though it may be degraded, is filled and therefore permanently lost and its replacement wetland never establishes, then there is a net loss of wetlands. In addition, given the less than 100% success rate of wetland restoration projects, the proposed project cannot assure that it will result in the proposed 3.6:1 increase in habitat values over presently existing values.

To compensate for the potential that a wetlands creation or restoration project is not successful, the Commission has traditionally required a 4:1 mitigation ratio; i.e., the creation of four acres of wetlands for every one acre of wetland which is filled. Creating more wetlands than would be lost increases the potential that the number of acres of created wetlands which successfully establish , in the end, is at least equal to the number of wetlands filled. However, the applicant's proposal for 28.1 acres of Phase 1 upfront salt marsh creation, minus 2-5 acres of buffer area, results in barely a 1:1 mitigation ratio. Therefore, if less than 100% of the 23-25 acres of actual salt marsh successfully establishes, there will be a net loss of wetlands. Additionally, if the proposed 3.6:1 increase in habitat values turns out to be less, then the additional acreage provided by a higher acreage ratio would offset the less than expected increase in habitat values.

The applicant is also proposing at some future point in time to make available existing mineral production areas near the proposed wetlands as additional area for potential future wetland restoration once mineral production ends. The applicant proposes this potential future wetland expansion as mitigation, as opposed to decreasing the size of the proposed golf course in order to avoid wetland fill. However, the availability of a potential mitigation site in no way assures that the project will result in substantially greater habitat values than exist at present.

Also, to wait at some future point in time for potential wetland restoration on the mineral production area would result in an indefinite temporal loss of wetlands that would preclude wetland functions from occurring during the indefinite period of time. Temporal loss of wetland resources, for example, would result in adverse effects on the wildlife which use the existing wetlands for foraging and habitat purposes.

Therefore, the Commission finds that the proposed fill is inconsistent with Section 30233(a)(7) because the project proposed by the applicant is not a restoration project per se; it is a multiple-use residential recreational development with a mitigation component.

The Commission finds that, for all of the reasons discussed above, rather than proposing a restoration project, the applicant is instead proposing to provide mitigation for the fill of a golf course. The 17.9 acres of fill at issue here results from a golf course, not from wetland restoration. Recharacterizing mitigation as "fill for restoration purposes" can not be used as a means to circumvent the strict limits in Section 30233(a) on the purposes for which fill may be placed in a

wetland. It is not enough for an otherwise impermissible use of proposed fill to be allowed as fill for restoration purposes simply because an applicant may provide a substantial amount of mitigation. Otherwise, the limits of Section 30233(a) on the uses of fill would have little meaning and the limited amount of wetland acreage that remains in the coastal zone would be viewed as developable for any use so long as mitigation is provided. The result would likely be the rapid diminishment of the remaining wetlands in the coastal zone.

(iii) Conclusion - Proposed Project is Not Restoration

Therefore, the Commission finds that the fill of 17.9 acres of existing wetlands for the proposed golf course cannot be considered allowable under Section 30233(a)(7) because: (1) the proposed fill of wetlands for a golf course is not physically or financially necessary to accomplish wetland restoration goals and objectives; (2) the wetland acreage proposed constitutes mitigation rather than restoration because the proposed 17.9 acres of fill at issue results from fill for the golf course and not from fill for restoration purposes; and (3) the proposed wetland acreage will not result in substantially greater habitat values than exist at present.

Therefore, the Commission attaches Special Condition No. 1 which eliminates the portion of the proposed project involving the fill of wetlands for a golf course.

(B) Section 30233(a)(3) and 30411(b) - Boating Facilities

Section 30233(a)(3) of the Coastal Act allows wetland fill in accordance with the following:

> *(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.*

Section 30411 of the Coastal Act states, in relevant part:

> *(b) The Department of Fish and Game, in consultation with the commission and the Department of Boating and Waterways, may study degraded wetlands and identify those which can most feasibly be restored in conjunction with development of a boating facility as provided in subdivision (a) Section 30233. Any such study shall include consideration of all the following:*

(1) Whether the wetland is so severely degraded and its natural processes so substantially impaired that it is not capable of recovering and maintaining a high level of biological productivity without major restoration activities.

(2) Whether a substantial portion of the degraded wetland, but in no event less than 75 percent, can be restored and maintained as a highly productive wetland in conjunction with a boating facilities project.

(3) Whether restoration of the wetland's natural values, including its biological productivity and wildlife habitat features, can most feasibly be achieved and maintained in conjunction with a boating facility or whether there are other feasible ways to achieve such values.

Section 30233(a)(3) provides that if a wetland is identified as degraded by the Department of Fish and Game pursuant to Section 30411(b), boating facilities may be allowed if in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. Further, the boating facility is limited to 25 percent of the degraded wetland.

At the outset, the Commission notes that Section 30411 of the Coastal Act is not itself a basis for approval; Section 30411 merely authorizes a study by the Department of Fish and Game, with reference to a possible approval of a boating facility under Section 30233(a)(3) of the Coastal Act.

As described previously, at the request of the Commission and pursuant to Section 30411(b) of the Coastal Act, the California Department of Fish and Game ("CDFG") studied the on-site wetlands in the early 1980's, in conjunction with the development proposed under coastal development permit application 5-82-221 (Ponderosa Homes). CDFG's final January 13, 1982 report analyzes the three factors as required by Section 30411(b) in the determination if the degraded wetlands can most feasibly be restored in conjunction with the development of a boating facility.

The first factor, as required by Section 30411(b)(1), requires CDFG to consider whether the studied wetland is so severely degraded that the wetland cannot recover and maintain a high level of biological productivity without major restoration activities. CDFG determined that:

It is our position that restoration and enhancement may be accomplished through development of adjacent property and through a consolidation project involving that wetland area south of the tidal channel. It appears that such a project may not entail a relatively major expenditure of funds nor would it require major restoration since it could be accomplished by merely designating strategically located fill borrow sites for fill which would be required in certain developable areas.

The second factor, as stipulated in Section 30411(b)(2), asks whether no less than 75% of the wetland can be restored and maintained as a highly productive wetland in conjunction with a

boating facility. CDFG concluded that a boating facility is not a viable option. The first obstacle to constructing a boating facility is the fact that the subject site is not immediately adjacent to the San Gabriel River. Therefore, a boat passage cannot simply be cut into the San Gabriel River levee, as would be the case if the site was immediately adjacent to the river.

Instead, a channel would have to be dug across the Haynes Cooling Channel which is located between the project site and the San Gabriel River. A channel to provide an entrance to a boating facility on the project site would involve both major construction costs and alteration of the cooling channel. As long as the power plant served by the cooling channel remains in operation, it is unlikely that the Los Angeles Department of Water and Power would allow the channel to be altered for construction of a boat access channel to the subject site.

Another obstacle to constructing a boating facility on the subject site involves the bridges which cross the San Gabriel River. Heading south on the river from the subject site leads directly to the ocean at the river's mouth. However, south of the subject site, the Pacific Coast Highway (State Route 1) bridge and, further south, the Marina Drive bridge cross the river. Both are too low in their current configurations to allow most boats to pass underneath.

A connection to the ocean from the San Gabriel River through Alamitos Bay is also not feasible. This would involve heading north on the river and cutting a connecting channel to Alamitos Bay. In addition, the Westminster Avenue bridge across the river north of the subject site would block boat traffic. Studebaker Road would block any connection between the river and Alamitos Bay.

As described in Section 30411(b)(3), the third factor in determining whether a degraded wetland can most feasibly be restored in conjunction with a boating facility is whether restoration of the wetland values can most feasibly be achieved in conjunction with a boating facility or whether there are other feasible ways to achieve such values. Since the CDFG concluded that a boating facility was not a feasible option, it evaluated other means to achieve restoration.

The specific restoration proposal of CDFG involved the filling of an 8.1 acre wetland area located southeast of the on-site tidal channel and the creation of an 8.1 acre wetland northwest of the tidal channel. The CDFG concluded that the existing 8.1 acre wetland southeast of the tidal channel would continue to be degraded if the then-proposed adjacent development were constructed.

However, caution should be used in relying on the 1982 CDFG determination that the existing on-wetlands are degraded and the alternatives contained in the determination because: (1) the wetlands consolidation advocated by the CDFG would still have resulted in fill of wetlands for a non-allowable use (i.e., homes); and (2) the determination is more than fifteen years old.

Further, the use of Section 30411 to justify the fill of wetlands for uses other than those permitted under Section 30233 of the Coastal Act was specifically rejected by a San Diego Superior Court in *Bolsa Chica Land Trust v. CCC*. In that discussion, the court specifically rejected the Commission's conclusion that Sections 30233(a) and 30411(b), read conjunctively, allowed a use

that is not one of the eight enumerated uses in Section 30233(a). In that case, the Bolsa Chica applicant was proposing homes in wetlands.

The trial court in *Bolsa Chica Land Trust v. CCC* held that only uses enumerated under Section 30233(a) are allowable uses in wetlands. The court reasoned that Section 30233(a) limits filling of wetlands to eight enumerated uses and residential use (in this case a golf course) is not one of them. Section 30411 authorizes a study evaluating the restoration of degraded wetlands in conjunction with a boating facility or, where a boating facility is not feasible, in conjunction with other feasible ways to achieve such values. However, these "other feasible ways" to restore degraded wetlands must also be one of the specific uses enumerated under Section 30233(a).

The court also held that other feasible ways to achieve restoration must be less intrusive than a boating facility. Section 30233(a)(3) requires that a boating facility not exceed twenty-five percent (25%) of the degraded wetlands and Section 30411(b)(2) requires that not less than seventy-five percent (75%) of the degraded wetlands be restored. An "other feasible way" of restoring degraded wetlands thus should occupy less than 25% of the wetlands and should restore more than 75% of the wetlands in order to be less intrusive than a boating facility. Further, an "other feasible way" of restoring degraded wetlands should also be the least environmentally damaging alternative. As discussed herein, the proposed golf course is not less intrusive than a boating facility nor it is the least environmentally damaging feasible alternative to achieve restoration of the existing degraded wetlands on the Hellman Ranch.

Finally, the Commission acknowledges that the Commission's Interpretive Wetland Guidelines, adopted in 1981, allow for other feasible ways of restoration if a boating facility is not feasible. However, the Commission finds that the Commission's guidelines do not legally bind the Commission and serve only to indicate what a previous Commission thought in 1981.

Therefore, the Commission finds that the proposed project cannot be considered an allowable use under Sections 30233(a)(3) and 30411 of the Coastal Act simply because a boating facility on the subject site is considered infeasible. Thus, the Commission attaches Special Condition No. 1 which eliminates the portion of the proposed project involving the fill of wetlands for a golf course.

(2) Feasible Project Alternatives

Section 30233(a) also requires a determination that there is no feasible less environmentally damaging alternative to the proposed wetland fill. Coastal Act section 30108 defines "feasible" as:

> *Feasible: Capable of being accomplished in a successful manner within a reasonable period of time taking into account economic, environmental, social, and technological factors.*

(A) FEIR Alternatives Considered Feasible but Not Selected

The Final Environmental Impact Report ("FEIR") evaluated the following five alternatives to the proposed project after dismissing several others: (see Appendix D of this staff report for FEIR Volume I, Section 7.0 which contains maps of Alternatives 1, 2, and 3)

1) Development of 86 acres of wetlands for a wetland mitigation bank, construction of 250 residential units in both single-family and multi-family configurations mostly on the mesa and the immediately adjacent lowlands, a 16,100 square foot visitor/recreational commercial center on the State Lands Parcel and a 3,900 square foot interpretive center, and mineral-production on 46.6 acres,

2) A 65.6 acre 9-hole golf course, 150 single-family and multi-family residential units, a 16,100 square foot visitor/recreational commercial center, 43 acres of wetlands, and mineral production on 47.2 acres,

3) A 96.5 acre 18-hole golf course, 150 single-family residential units, a 16,100 square foot visitor/recreational commercial center, and off-site wetlands,

4) A no project alternative, and

5) Development consistent with existing City land use designations,

The FEIR (Volume I., Page 3.2) states that the proposed project is based on the following underlying principle:

> *To create a project that will balance the land use, environmental benefits and ownership economics of the property, while meeting or exceeding all applicable federal, state and local plans and regulations.*

The alternatives were evaluated based on the project's goals and the City's objectives as stated in Section 3.0, Volume I of the FEIR. These goals and objectives are also echoed in Exhibit B (starting on Page 14) of the City of Seal Beach City Council's Resolution 4562 approval certifying the FEIR (see Appendix D of this staff report) The project's goals are:

- *Maintain significant acreage for restoration/creation of wetlands and plan for long-term retention of viable wildlife habitat and biological diversity on the site.*
- *Create/restore a wetlands ecosystem that provides a meaningful contribution to the regional system of coastal wetlands and open space along the Pacific* [Flyway].
- *Protect and improve water quality of the wetlands by redirecting existing urban runoff and utilizing the golf course as a filtration system, detention area and buffer between the wetlands and the urban environment.*
- *Respect the property's physical constraints.*
- *Preserve and enhance the open space and create public access opportunities.*
- *Provide visitor-serving recreational opportunities within the coastal zone that will contribute to the economic base of the City of Seal Beach.*
- *Create an effective system of open space, trails, and parks.*

- *Reduce the acreage designated for residential use and reduce the number of units as currently designated in the City's existing Specific Plan.*
- *Provide for comprehensive planning of the Hellman Ranch and surrounding properties to ensure land use compatibility.*
- *Develop a plan that is responsive to community priorities and concerns, consistent with the California Coastal Act and that can be supported by local, state and federal regulatory agencies.*

Volume I, Section 3.0 of the FEIR also lists the following objectives the City wished to achieve through the project:

- *Wetland Restoration*
- *Preservation of Gum Grove Nature Park and dedication to the City*
- *Preservation of cultural resource sites, to the extent feasible*
- *Preservation of open space, to the extent feasible*
- *Minimal traffic and air quality impacts*
- *Development of visitor-serving commercial and recreation facilities*

The five alternatives to the proposed project were evaluated by the FEIR based on how well the alternatives met these goals and objectives. It should be noted that some of the goals (for example; visitor-serving uses that contribute to the City's economic base, or focusing on community priorities and concerns), while valid, are not necessarily required to find a proposed coastal development permit consistent with the goals and policies of the Coastal Act.

(i) FEIR Alternative 1 (Mitigation Bank, etc.)

Alternative 1 is comprised of both an 86 acre wetland mitigation bank and 250 residential units clustered mostly on the mesa and immediately adjacent lowlands. In certifying the FEIR, the City rejected this alternative because it would meet most, but not all, project goals and objectives, and the City believed the benefits were outweighed by several factors. For instance, Alternative 1 would not meet the goal of reducing residential density, it would require approximately three times the amount of services utilities and natural resources to construct and operate compared to the proposed project, and it would preclude development of the golf course.

The technological infeasibilty of constructing the 86 acre Alternative 1 mitigation bank, including the issues of tidal connection, tidal range and residence times, is not discussed in the FEIR or City's resolution of approval nor listed as one of the reasons the City rejected this alternative in its resolution certifying the FEIR.

However, in its resolution of approval, the City acknowledges that "[t]his alternative would provide for the greatest amount of land to be left in its existing condition and would have the potential to restore the largest acreage of saltwater marsh wetlands (Page 62 of Exhibit B of City

Resolution 4562). Further, the FEIR concluded that Alternative 1 provides ". . . greater opportunities for area residents to enjoy the benefits of these wetlands would be created by this Alternative than by the proposed project." (Volume I, Page 7-16) Further, specifically regarding Biological Resources, Page 7-17 of Volume I of the FEIR states that:

> *Assuming successful wetland restoration, this Alternative provides the largest increase in saltwater marsh restoration, which is anticipated to provide improved habitat for the Belding's savannah sparrow and potential foraging habitat for the California least tern. The overall benefits to wildlife habitat under this Alternative are considered superior to the proposed project.*

The FEIR did not state whether any wetlands would be filled for non-allowable uses under Alternative 1. The map of Alternative 1 appears to show that the non-wetland development (i.e., the 250 homes), would be clustered away from the existing on-site wetlands. Given that a primary goal of Alternative 1 is a mitigation bank, and that the residential configuration can feasibly be clustered away from the existing wetland area, the Commission finds it is feasible for Alternative 1 to avoid wetland fill for residential purposes.

In addition, the Commission also finds that the Mitigation Bank proposed under Alternative 1 is also feasible because the lowland areas at the Hellman Ranch site that historically were wetlands are feasibly restorable. The fact the most of the fill that destroyed the natural wetlands apparently was the result of dredging existing wetlands and tidal portions of the San Gabriel stream bed means that after appropriate grading, the surficial sediments will have a high proportion of fine particles. Much of the fill that will have to be removed can probably be disposed of on-site to create a gradual transition to upland. Also, according to staff communications with the applicant's engineering consultants during a site visit, a larger culvert than proposed to connect the San Gabriel River with the proposed wetlands will result in even more flow and a greater tidal range, providing increased wetland values.

The Commission acknowledges that providing a suitable tidal connection to the San Gabriel River (and ultimately the ocean) is a key issue in determining feasibility. The applicant's February 1998 addendum to its November 1997 wetland restoration plan states that the existing culvert, which is the proposed tidal connection between the San Gabriel River and the proposed wetlands, may not be completely adequate for the proposed ultimate restoration of 44.5 acres (including both the proposed upfront 28.1 acres and 16.2 acres of mineral production area for future wetland expansion) in terms of tidal flushing. However, the Commission finds that the adequacy and use of the existing culvert is constrained only because (1) the proposed golf course design, which the applicant contends is not feasible to change, results in the Phase 2 and Phase 3 potential future wetland creation areas being located further from the culvert, forcing the water to travel a longer distance, and (2) the connection between Phase 2 and Phase 3 is constricted by the proposed golf course design, creating a bottle-neck which restricts

water flow. Further, the applicant's restoration plan addendum discusses the option of multiple connections to the San Gabriel River, and the wetland restoration plan in Volume II, Appendix D, Page 17 states that an optional connection is via the Haynes Cooling Channel. Additional tidal connections would increase tidal flushing.

Greater flow and tidal range, and reduced residence times (the time it takes for water to travel from the source to the point furthest from the source and back to the source) through adequate tidal flushing are important to the functioning of tidal wetlands. The existing degraded wetlands have a tidal range of about 1 foot and a residence time of 4 days. The proposed wetlands, if future build-out of Phase 2 and Phase 3 occurs, are predicted to have a 1 foot tidal range, and the residence time would be reduced to 2.8 days. The applicant's concept wetlands plan (page 17) indicates that residence times of less than 7 days are considered acceptable. Therefore, at full build-out with Phase 2 and Phase 3, the wetlands would be of higher quality that the existing wetlands, because residence times will be reduced and within the time considered acceptable.

In comparison, the existing Bolsa Chica Ecological Reserve, a wetland managed by the California Department of Fish and Game considered to be of great importance, has only a slightly larger tidal range of 1.5 feet, and a much longer residence times of over 20 days, according to the National Marine Fisheries Service. The extremely long residence time is due to the fact that (1) the ecological reserve is long and narrow, and (2) the closest point of the reserve to the ocean is well over a mile away because water has to travel from the reserve through Huntington Harbour, Sunset Aquatic Park, and the mouth of Anaheim Bay before it reaches the ocean. Nevertheless, the ecological reserve functions well and is considered to be an important wetland. Further, by way of comparison, the proposed Bolsa Chica wetland restoration project, which is a large scale full tidal restoration effort intended to create a major wetland with significant habitat values, is expected to have residence times up to 5 days, with an average residence time of three days.

Therefore, compared to the two Bolsa Chica wetlands restoration efforts, the ultimate wetland area proposed by the applicant (including Phase 2 and Phase 3) would still have acceptable residence times and tidal range. Further, without the constraints imposed by the proposed golf course design, the proposed wetlands could be redesigned to further increase tidal range and decrease residence times. In addition, if additional tidal connections were created to connect different areas of the proposed wetlands to the San Gabriel River, tidal range would also be increased and residence time decreased.

Finally, the FEIR indicated that, under Alternative 1, "[s]ince no golf course would be constructed to serve as a filter for runoff water, the wetlands to be constructed may receive urban runoff, adversely impacting these wetlands." (Volume I, Page 7-23) However, the Commission finds that it is feasible for the wetland mitigation area proposed under Alternative 1 to include a berm constructed around it, similar to the berm around the salt marsh proposed by the applicant, to prevent runoff from entering the wetlands. Also, unlike the proposed golf course, Alternative 1

would not contribute additional pollutants in the form of pesticides which the runoff flowing over the golf course would collect.

Therefore, the Commission finds that, for all of the reasons discussed above, and in view of the fact that the proposed golf course design would no longer be a design constraint, it is feasible to provide a suitable tidal connection under Alternative 1 to create a quality wetland restoration mitigation site.

The FEIR identifies other non-wetland adverse impacts which would result from Alternative 1, including traffic and attendant air quality impacts, noise impacts, archaeological impacts, seismic impacts, and increased burdens on services. The FEIR indicates that noise impacts would be significant and unavoidable, similar however to the proposed project. Likewise, while the homes in the lowlands under Alternative 2 would subject to potential seismic hazards, so would the proposed golf clubhouse; mitigation measures similar in nature to those required for the proposed golf clubhouse would similarly be feasible for homes. Archaeological impacts would be similar to the proposed project and can be mitigated, as evidenced by the conditions of approval of this permit.

The homes would be close to mineral production facilities; however, the FEIR simply states that additional setbacks and safety protection measures would be required and does not state that it would be infeasible to do so or result in significant adverse effects. The FEIR indicates that traffic would increase under Alternative 1 more than it would under the proposed project. However, while the City rejected Alternative 1 in part based on increased traffic, neither the FEIR nor the City's certification resolution makes clear if these increases would result in significant adverse effects, or whether the impacts can be mitigated below a level of significance.

Further, from a Coastal Act standpoint, the area of the homes is located well inland from the beach and the primary visitor-serving areas of the City, a little closer to the inland edge of the coastal zone boundary than to the shoreline. Higher density may increase the potential for use of public transportation (a bus stop exists near the entrance to the homes), and the homes are located next to an arterial road. Thus, public access impacts would likely not differ between the 70 homes of the proposed project and the 250 homes of Alternative 1.

The air pollution increases attendant with the increased traffic of Alternative 1 would also be significant, according to the FEIR. However, because the site is in a non-attainment area, the FEIR indicates that any additional contribution of new emissions to the region would be considered significant. Therefore, any project involving increases in emission would have air quality impacts - only the "No Project" alternative would avoid air quality impacts.

Finally, the FEIR concluded that Alternative 1's dedication of Gum Grove Park would result in less than significant impacts to recreation. The FEIR also concluded that the Population/Housing impacts of Alternative 1 would be less than significant.

Therefore, the Commission finds that Alternative 1 is a less environmentally damaging feasible alternative. Therefore, the Commission finds that even if the proposed golf course fill could be considered an allowable use under Section 30233 of the Coastal Act, the proposed project is not the least environmentally damaging alternative consistent with the other provisions of Section 30233. Therefore, the Commission attaches Special Condition No. 1 which eliminates the portion of the project involving the fill of wetlands for a golf course.

In many ways, the proposed project as conditioned by the Commission is a modified version of Alternative 1, in that; (1) it eliminates development in the lowland to allow for the potential of large wetland restoration area in the lowlands, (2) approves homes on the mesa, and (3) approves a visitor-serving development on the State Lands Parcel. Further, the proposed project as conditioned by the Commission would be less environmentally damaging than Alternative 1 because: (1) it would result in far fewer homes being built, which reduces the adverse traffic impacts of Alternative 1, and (2) does not include structural development in liquefiable or flood-prone areas of the lowlands, reducing the seismic and flooding hazard potential.

(ii) FEIR Alternative 2 (9-hole golf course, etc.)

Alternative 2 was not selected because it meets most but not all project goals and City objectives. Based on the FEIR map for Alternative 2, there appears to be fill of existing wetlands for the specific 9-hole golf course, but the exact amount is unclear from the map of Alternative 2. No detailed analysis of wetland fill was provided. Therefore, the Commission finds that Alternative 2, as specifically described in the FEIR, is not a less environmentally damaging alternative.

However, the Commission also finds that other 9-hole golf course design options were not fully explored in Alternative 2. There might be a way to design a playable 9-hole golf course which does not result in any fill of on-site wetlands and provides a one hundred foot buffer surrounding the existing wetlands. Thus, it may be possible to modify Alternative 2 in an manner so that it is a less environmentally damaging alternative.

(iii) FEIR Alternative 3 (Off-Site Wetland Mitigation)

Alternative 3 was not selected because it met only some, not even most, of the project objectives. Also, since Alternative 3 would result in all existing wetlands being filled for a golf course and no on-site wetlands creation, this alternative does not constitute a feasible less environmentally damaging alternative. Therefore, the Commission finds that Alternative 3 is not a less environmentally damaging alternative.

(iv) "No Project" FEIR Alternative

The fourth alternative considered feasible by the FEIR, the "No Project" alternative, was not selected because it would not be able to meet the project goals. The FEIR concludes that "[t]he overall benefits to wildlife habitat from the proposed project are considered superior to the No Project Alternative." However, the FEIR also acknowledges that "[u]nder the No Project Alternative, existing biological resources would remain undisturbed." Further, the FEIR also acknowledges that "[i]mplementation of the No Project Alternative would not have a significant effect on the environment."

Deleting the proposed golf course would not result in the existing degraded and severely degraded wetlands from being restored. While leaving the wetlands in their existing state may, as indicated in the March 19, 1998 staff report for this permit, not be an environmentally preferable alternative vis-a-vis restoring wetlands values, neither will the "No Project" alternative result in any wetland fill. Even degraded and severely degraded wetlands have some function. As the 1989 staff report for the MOLA project indicates as described above, the two acre existing tidal channel is productive and winter rains increase the productivity of the non-tidal wetlands.

Finally, any alternative which proposes no development whatsoever in the 100+ acre lowlands area would leave open the possibility of an entity, such as the Port of Long Beach, which needs wetland mitigation sites to acquire part or all of the lowlands for off-site mitigation for wetland impacts on other sites. During the 1989 MOLA project, the Port of Long Beach explored the idea of using the subject site for mitigation for its future harbor fill projects. However, since there was no interest on the part of the MOLA group and the City at that time, the Port of Long Beach interest never went beyond the exploratory stage.

The "No Project" alternative would not result in any wetland fill and preserve the possibility of wetland restoration on a larger portion of the subject site than proposed. Therefore, the Commission finds that the "No Project" alternative is a less environmentally damaging feasible alternative.

(v) Development Consistent with Existing Land Use Designations

The fifth FEIR alternative involves constructing development consistent with the existing City land use designations. In effect, this means building development similar to the MOLA project approved by the Commission in 1990. However, this alternative involves structural development across a major fault zone which crosses the middle of the subject site. Pursuant to the Alquist-Priolo Act provisions, habitable human development cannot occur near the earthquake fault. Thus, this alternative, or any other project which involves structural development for human occupation across or near the earthquake fault, is not feasible. Therefore, the Commission finds that this alternative is not a less environmentally damaging feasible alternative.

(vi) Conclusion (FEIR Feasible Alternatives)

Thus, Alternative 1 (i.e., the wetland mitigation bank plus 250 houses) and the "No Project" Alternative identified in the FEIR are feasible alternatives that would result in less environmental damage than the proposed project. The Commission further finds that, without the design constraints posed by the golf course, it is feasible to provide a suitable tidal connection under Alternative 1. Therefore, the Commission finds that even if the proposed golf course fill could be considered an allowable use under Section 30233 of the Coastal Act, the proposed project is not the least environmentally damaging alternative consistent with the other provisions of Section 30233. Therefore, the Commission attaches Special Condition No. 1 which eliminates the portion of the project involving the fill of wetlands for a golf course.

As stated above, in many ways, the project as conditioned by the Commission is a modified version of Alternative 1, in that; (1) it eliminates development in the lowland to allow for the potential of large wetland restoration area in the lowlands, (2) approves the 70 homes on the mesa, rather than 250, and (3) approves a visitor-serving development on the State Lands Parcel. The Commission notes that without the golf course fill, the wetland mitigation will no longer be required. Therefore, the Commission finds that under the approved alternative, the applicant is left in a more economically viable position because the revenue from the residential component will no longer be needed to fund wetland mitigation.

(B) Development in General Which Avoids Wetland

In general terms, development, whether a golf course, houses, or other uses, could be proposed in the lowlands so as to avoid the existing wetlands by siting development on non-wetland areas. Since the existing wetlands on-site are scattered and fragmented, it may not be feasible to develop the site in a manner that intersperses development between the wetlands fragments. In other words, any development proposal which avoids filling any of the wetlands for non-restoration purposes would likely have to avoid some of the surrounding adjacent non-wetland areas as well, preserving the ability to connect the fragmented wetlands into a better functioning wetlands with adequate wetland buffers.

As stated above, the applicant has confirmed that there is no existing subdivision of the Hellman Ranch property. (Exhibit B) In addition, this parcel is currently utilized for mineral production, of which Hellman Properties owns the entire operating interest. (Exhibit B) Further, although Shell Oil (now Signal Hill Petroleum) has a 50% producing interest in APN 980-36-605, Signal Hill Petroleum has no land rights. (Exhibit B)

The applicant is requesting approval of a subdivision of one 196.6 acre parcel in a configuration that would separate the existing mineral production areas from the proposed golf course, wetland and residential areas.

The Commission finds it necessary to approve a revised land division configuration that maintains in single parcel ownership and usage the land areas proposed for the golf course and wetland restoration as well as the area currently used for oil production which provides an economically viable use of the property. This means that should the owner of the separate lowlands parcel the Commission would be approving (assuming the permit is accepted and all other steps necessary to create the new subdivision and parcel are taken) at some time in the future come forward with a new development proposal in the lowlands portion of the project site now before the Commission, that owner would already have an economically viable use of the property (assuming mineral production is ongoing).

At such a point as mineral production ceases and development is proposed within the lowland area, the Commission finds it may be appropriate to impose a deed restriction over the lowland area to ensure the lowlands are developed consistent with Sections 30233 and 30240 of the Coastal Act. However, alternative uses consistent with Coastal Act policies could be considered on the mineral production parcel which might augment its economic use. Only by keeping the mineral production sites combined with the remainder of the lowlands area as one parcel can the Commission allow the subdivision of the remainder of the project site and ensure that future development proposals will not compel the Commission to allow uses in the lowlands solely to avoid a takings claim.

The Commission therefore attaches Special Condition 2 for revision of the proposed Tentative Tract Map 15381. Only as conditioned, can the Commission find the proposed project consistent with the Coastal Act.

(3) Adequacy of Wetland Mitigation Measures

After requiring that the proposed project be the least environmentally damaging feasible alternative, Section 30233(a) also requires the provision of feasible mitigation measures to minimize adverse environmental effects of fill. Besides not being an allowable use in wetlands, or the least environmentally damaging alternative, the proposed golf course would have significant adverse environmental effects on the adjacent wetlands proposed to be created.

(A) Pesticides

The Commission finds that use of pesticides for the proposed golf course would have significant adverse environmental effects on the proposed wetlands. While the applicant has developed a general plan for developing and managing the proposed golf course in an environmentally friendly way, no detailed, final pesticide management program has been prepared which includes a list of prohibited chemicals and assures that permitted chemicals would biodegrade quickly and not have adverse impacts on wildlife, thus mitigating impacts from pesticide use on wildlife using the wetlands.

Nor have detailed methods for pesticide use been developed. The City requires spraying of chemicals to be directed away from Gum Grove Park to eliminate possible adverse effects on the Monarch Butterfly. However, no prohibition on spraying is proposed around the wetlands. Airborne particles of pesticides could land in the wetlands and contaminate the water and plant life. Also, while proposed berms surrounding the wetlands prevent runoff from flowing into the proposed wetlands, would not adequately prevent pesticides placed directly on the ground from leaching through the berms into the wetlands. Without an impermeable barrier to prevent this type of chemical leaching, adverse impacts will occur to the proposed wetlands. The applicant has not demonstrated how the proposed berms would prevent leaching of pesticides into the wetlands.

(B) Remediation of Mineral Production Sites

In addition, the Commission finds that remediation of the mineral production areas proposed by the applicant for potential future wetland restoration may preclude the ability to use those sites for wetland restoration. The proposed golf course layout also forces the future expansion of the wetlands on the mineral production areas away from the tidal inlet which is the source of the water. As discussed above, no detailed, final remediation plan, including costs and the extent of contamination has been prepared. Without a detailed final remediation plan, including the extent of the contamination, the Commission cannot determine whether construction of wetlands on the mineral production areas would be safe for wetland plants and wildlife. It is likely that the mineral production areas contain soils contaminated with substances toxic to wetland plant and wildlife. If this is the case, it may be cost-prohibitive to create wetlands on the mineral production sites in the future. If wetlands cannot be built on the mineral production site in the future, this defeats the purpose of using the mineral production areas for potential future wetland creation as mitigation for filling of existing on-site wetlands.

Until such time as a specific plan is prepared, the Commission finds that it is purely speculative whether any such potential future wetland restoration will occur on the mineral production areas.

(C) Monitoring

Further, the Commission finds that the proposed monitoring period of five years is not adequate. Because wetlands restoration projects are not always successful, and the proposed project would result in all existing wetlands being filled, it is necessary to ensure that any proposed created wetland become successfully established and fully functional. As described above, the track record of past wetland creation projects indicates a less than optimum success rate. The success rate of wetlands restoration is less than 100%. A created wetland that never establishes itself cannot be considered wetlands restoration. If an existing wetland, even though it may be degraded, is filled and therefore permanently lost and its replacement wetland never establishes, then there is a net loss of wetlands. The time between the filling of an existing wetland and the point at which the compensatory created wetland becomes successfully established and fully functional results in a temporal loss of wetlands functions. Thus, stringent monitoring is needed

to guarantee that the created wetlands become fully functional in order to truly mitigate for the loss of existing wetlands due to fill.

(D) Tidal Flushing and Wildlife Harassment

The Commission also finds that the proposed golf course design which forces the Phase 2 and Phase 3 potential future expansion of the Phase 1 wetlands away from the tidal inlet, and necessitates a narrow connection between Phase 2 and Phase 3, would decrease residence times and result in inadequate tidal flushing. Further, the Commission finds that the proposed golf design does not provide an adequate buffer between the human activity on the golf course and the proposed wetlands, leading to potential harassment (i.e., disturbance due to proximity to human activity, not deliberate malicious human acts directed at the wildlife) of the wetland wildlife by human activity. In order for the proposed wetlands to serve as compensatory mitigation for fill of the existing wetlands due to the golf course, the propose wetlands must have high values that cannot be compromised due to decreased residence times or wildlife harassment. Since the applicant contends that the proposed golf course layout cannot be changed, there are no feasible measures to mitigate for adverse impacts resulting from errant golf balls harassing wildlife or decreased residence times.

(E) Conclusion (Mitigation)

Therefore, even if (1) the proposed golf course fill could be considered an allowable use under Section 30233 of the Coastal Act, or (2) the proposed project could be found to be the least environmentally damaging alternative, the proposed project does not provide all feasible mitigation measures to assure that all adverse effects are minimized, consistent with the other applicable provision of Section 30233. Thus, the Commission attaches Special Condition No. 1 which eliminates the portion of the proposed project involving the fill of wetlands for a golf course.

d. Use of Section 30007.5 to Balance Conflicting Chapter 3 Policies

The applicants urge the Commission to utilize section 30007.5 of the Coastal Act to approve the proposed wetland fill if it finds that the fill proposed for the golf course is not allowable under section 30233 of the Coastal Act.

The text of section 30007.5 directs that in carrying out the provisions of this division, conflicts be resolved in a manner which on balance is the most protective of significant coastal resources. Thus, even if a conflict can be identified in the matter now before the Commission, given the existing provisions of section 30233, such a conflict would necessarily be resolved in favor of wetland resources. However, whether a conflict exists which must then be balanced can be decided by interpreting the first sentence of section 30007.5 which states that "conflicts may occur between one or more policies of the division." (emphasis added).

The Commission finds that the phrase "policies of the division" only includes the policies contained within chapter 3, the chapter which contains the standards by which the adequacy of Local Coastal Programs and proposed developments are determined. Support for this finding is found in Chapter 3, Article 1, section 30200 which is entitled "Policies as standards; resolution of policy conflicts. Section 30200 reads as follows:

> *(a) Consistent with the coastal zone values cited in section 30001 and the basic goals set forth in section 30001.5, and except as may be otherwise specifically provided in this division, the policies of this chapter shall constitute the standards by which the adequacy of local coastal programs, as provided in Chapter 6 (commencing with section 30500), and, the permissibility of proposed development subject to the provisions of this division are determined. All public agencies carrying out or supporting activities outside the coastal zone that could have a direct impact on resources within the coastal zone shall consider the effect of such actions on coastal zone resources in order to assure that these policies are achieved.*
>
> *(b) Where the commission or any local government in implementing the provisions of this division identifies a conflict between the policies of this chapter, section 30007.5 shall be utilized to resolve the conflict and the resolution of such conflicts shall be supported by appropriate findings setting forth the basis for the resolution of identified policy conflicts.*

(emphasis added.)

In this case, the Commission finds there is no conflict between two or more Chapter 3 policies that must be resolved pursuant to section 30007.5 of the Coastal Act. There is no specific policy requiring a golf course which would be in conflict with the allowable use prohibitions contained in section 30233. Moreover, section 30233 already requires that a project involving fill be the least environmentally damaging alternative. Since the Commission has identified a less environmentally damaging alternative than the proposed wetland fill, it is clear that no conflict between applicable Coastal Act policies need be resolved.

e. Conclusion (Wetlands)

Therefore, the Commission finds that the proposed golf course would not be consistent with Section 30233 of the Coastal Act because; 1) the proposed fill of the wetlands is not one of the eight allowable uses, 2) the feasible mitigation measures provided would not minimize significant adverse environmental effects, and 3) there are feasible less environmentally damaging alternative. Thus, the Commission attaches Special Condition No. 1 which eliminates the portion of the proposed project involving a golf course.

2. Environmentally Sensitive Habitat Area ("ESHA")

Section 30240 of the Coastal Act 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 golf course would eliminate a significant amount of grasslands. The environmental impact report ("EIR") for the proposed project indicates that there are 137 acres of ruderal grasslands on the subject site, 48.7 acres of which would be eliminated by the proposed golf course. Most of the grasslands are non-native species. However, the California Department of Fish and Game ("CDFG") in their May 21, 1997 letter to the City commenting on the EIR indicates that the grasslands nevertheless contain value as foraging area for a variety of species, such as the Western Burrowing Owl, listed as California Species of Special Concern. The U.S. Fish and Wildlife also concurs with this. (see Exhibit E) Since the site provides foraging and habitat for species of special concern, the Commission finds that it is ESHA under Section 30107.5 of the Coastal Act.

Further, a burrowing owl was observed on the site in December of 1996 and January of 1997. The presence of an owl on a site within a three year period on a site is considered by the CDFG to be assumed to be occupied. Therefore, the habitat would also be considered ESHA because the species which rely on the habitat was observed as recently as January 1997. In addition, the CDFG expressed reservations about the suitability of the types of habitat for the owl which would be provided in the proposed wetlands. The CDFG also recommends avoidance or enhancement of open space areas.

The proposed golf course will disrupt the habitat values of the grasslands by completely eliminating those ESHA. The applicant is proposing that some of the mineral production areas would be suitable for replacement owl habitat. However, the FEIR did not evaluate the potential for contaminants in the soil of the mineral production areas would result in adverse effects on the owls. In addition, the burrowing owl guidelines referred to by the CDFG state that owl impacts include disturbance or harassment within 160 feet of occupied burrows. The proposed artificial burrows to be created for replacement habitat would likely be within 160 feet of either mineral production facilities or, if in the wetland restoration area, the golf course. In addition, while the proposed golf course would also provide a great amount of grass area in the form of fairways, tees, and greens, these grass areas would not be suitable for foraging because of pesticide use associated with maintenance of the grass areas and because of human activity which will occur on the golf course.

The cumulative loss of open space grasslands in Southern California is also a significant adverse impact. Part of the value of the subject site's grasslands, like wetlands, is that their value

increases with scarcity. The applicant contends that adequate open space area is still available at the nearby U.S. Naval Weapons Station. However, while the Weapons Station is located directly across Seal Beach Boulevard from the mesa area of the subject site and contains a significant amount of open area, the grassland areas of the Weapons Station is separated from the subject site by development on the Weapons Station, as well as by Seal Beach Boulevard, a major arterial. Further, the Weapons Station has been considered for closure. There is no guarantee that reuse of the Weapons Station for civilian use would preserve the grasslands.

Therefore, the Commission finds that the proposed golf course would disrupt ESHA values and is not a use dependent on ESHA. Thus, the Commission finds the proposed golf course is inconsistent with Section 30240 of the Coastal Act. Thus, the Commission attaches Special Condition No. 1 which eliminates the portion of the proposed project involving the golf course.

3. Archaeological Resources

Section 30244 of the Coastal Act states:

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

The subject site contains eleven State-identified cultural resources sites. Five of the sites would be left untouched in their current location in Gum Grove Park. However, the proposed development would impact the other designated archaeological sites.

The sites have been documented during the course of previous archaeological investigations. However, because of differences in the methodologies of the previous investigations, the precise location of each archaeological site is uncertain. Therefore, the applicant is proposing to undertake an archaeological investigation prior to the commencement of development of the other proposed components (i.e., construction of the wetlands, golf course, and homes) to document the extent of cultural resources on-site.

The applicant has prepared an archaeological research design that attempts to reconcile as best as possible the uncertain locations of the identified cultural resources sites using the best information and methods available. The research design will guide the proposed archaeological investigation. The proposed investigation will consist of excavation of small sections within the areas of the overall development site thought to contain the identified cultural resources sites.

The Commission finds that the following reasonable mitigation measures shall be required. The State Office of Historic Preservation ("SHPO"), the state Native American Heritage Commission ("NAHC"), and the Native American group/person deemed acceptable by NAHC, shall have the opportunity to review and comment on the peer review. To minimize impacts to cultural

resources, the archaeological testing program must be done in accordance with the approved research design.

Further, selection of the archaeologist must be in accordance with accepted guidelines endorsed by the OHP. Also, because of the likelihood of Native American remains being found, a Native American monitor must monitor the archaeological activities. The Native American monitor shall be selected by the City in accordance with NAHC guidelines in consultation with the Native American group/person deemed acceptable by the NAHC.

To ensure the least impacts to cultural resources, before any other development besides the archaeological testing can take place, the testing must have first been completed as well as implementation of mitigation measures for impacts to the cultural resources. However, since the locations of many of the cultural resources sites are in dispute and not precisely known, it is possible that the archaeological test program may miss cultural resources that are then discovered during development activities for the golf course and other proposed development. Therefore, the Commission finds that the permit must require that development be temporarily halted until appropriate mitigation measures are developed for resources discovered during the course of post-investigation construction activities.

In addition, the Commission finds that all mitigation measures must comply with the requirements of the State Office of Historic Preservation and the Native American Heritage Commission. A qualified Native American monitor shall also be present during construction activities to ensure sensitive treatment of Native American cultural resources. Should human remains be found, the Commission finds that construction shall be temporarily halted and the County Coroner notified to initiate identification proceedings. The Native American group/person shall participate in the identification process. Should the remains be determined to be that of a Native American, the applicant must comply with the provisions of Public Resources Code Section 5097.98. However, the Commission notes that PRC Section 5097.98, which governs procedures when human remains of a Native American are found, exempts these procedures from the requirements of the Coastal Act.

Further, by deleting the proposed golf course, as per Special Condition No. 1, the few archaeological sites which are located in the area to be developed with the golf course would be preserved. Therefore, as conditioned, the Commission finds that the proposed project is consistent with Section 30244 of the Coastal Act.

4. Public Access and Recreation

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.

Section 30213 of the Coastal Act states:

Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

a) Trails

The applicant is proposing trails around the proposed salt marsh. One trail would extend from the proposed interpretive area along the north side of the marsh and end in a viewing point. The other trail would be similar except it would be on the south side of the marsh. As discussed above under wetland resources, the Commission finds that the proposed golf course cannot be allowed. Without the proposed golf course, it is doubtful if the applicant will construct the proposed salt marsh. If the applicant were to construct a salt marsh restoration, revised plans would be required. Public access trails would be evaluated at that time.

b) Gum Grove Park

The applicant proposes to dedicate Gum Grove Park to the City of Seal Beach. The applicant currently leases the park to the City. Therefore, the Commission finds that the applicant must submit evidence that they have dedicated the park to the City for passive recreation, as proposed, to ensure maximum public recreation, as proposed. Further, to provide maximum public access and recreation opportunities, the Commission finds that the dedication documents must ensure that; 1) new and upgraded trails meet Americans with Disabilities Act requirements to provide access to physically challenged persons, 2) the existing number of parking spaces must be maintained, 3) signage informing the general public of the park's public nature must be maintained, and 4) changes in the hours of which adversely affect public access shall be limited to demonstrated public safety concerns and must require an amendment to this permit.

c) State Lands Parcel

1) Visitor Serving Uses

Section 30222 of the Coastal Act states:

The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal-dependent industry.

Section 30213 of the Coastal Act also encourages the provision of lower-cost visitor-serving uses. The applicant is proposing visitor-serving uses and an interpretive center at the parcel of land owned by the California State Lands Commission ("CSLC"). The CSLC is restricted to the types of uses that it can allow on land it owns. Such uses are generally for the public benefit and generally are consistent with the visitor-serving uses required under the Coastal Act.

However, to ensure that the subject site is used for visitor-serving uses as proposed, especially in the event that the CSLC sells the land, the Commission finds that a lease restriction must be recorded, as well as an owner's agreement-to-be-bound to the special conditions of this permit, to notify the applicant and future owners of the limitation on use of the site, including that the site be limited to lower-cost visitor-serving commercial uses and public access and recreation uses consistent with the Chapter 3 policies of the Coastal Act. Further, since the applicant has not proposed detailed plans for the proposed visitor-serving uses, the Commission finds that final plans must be submitted to the Executive Director for review. In addition, offices uses (a low-priority use under the Coastal Act) cannot be allowed unless those office uses are adjunct to, and the minimum necessary for the administration of on-site visitor-serving commercial uses (e.g., the manager's office in the non-customer areas of a restaurant).

2) Parking

Section 30252 of the Coastal Act states, in relevant part:

> *The location and amount of new development should maintain and enhance public access to the coast by . . . (4) providing adequate parking facilities or providing substitute means of serving the development with public transportation . . .*

When a development does not provide adequate on-site parking, users of that development who cannot find an on-site parking space are forced to occupy off-site public parking that could be used by visitors to the coastal zone. A lack of public parking discourages visitors from coming to the beach and other visitor-serving areas, resulting in adverse public access impacts. Thus, all development must provide adequate on-site parking to minimize adverse impacts on public access. The proposed project involves the provision of public access opportunities such as trails and parks. The subject site is a large site that offers the opportunity to spread public parking facilities throughout the area.

As mentioned above, the applicant has not submitted detailed plans for the State Lands parcel, although up to 10,000 square feet of visitor-serving uses are proposed. Therefore, the Commission finds that only the amount of visitor-serving commercial use which can be satisfied by on-site parking shall be allowed. Thus, the Commission finds that, to provide adequate parking and minimize adverse impacts to public access, the visitor-serving uses must provide parking according to the standards in the Hellman Ranch Specific Plan as amended by the City of Seal Beach on August 26, 1997 in conjunction with its approval of the proposed project.

The conceptual plan indicates approximately sixty-two on-site parking spaces. To ensure that the site provides adequate parking to serve both the future visitor-serving uses, the Commission finds that at least sixty-two parking spaces must be provided on-site to minimize adverse coastal access impacts resulting from the lack of adequate on-site parking.

Also, given the proximity of the site to the heavily used San Gabriel River bike trail and to encourage non-automobile access, the Commission finds that the City requirement for a bike rack shall also be a Commission requirement. Further, a minimum of twenty bicycles shall be accommodated, and the bike rack shall be clearly signed as being available to the general public.

d) Conclusion (Public Access and Recreation)

Therefore, as conditioned, the Commission finds that the proposed project is consistent with the public access and recreation policies of the Coastal Act.

5. Flood Hazards

Section 30253 of the Coastal Act requires development to minimize risks from flood hazard. The subject site is located near a major river and a flood control basin. Most of the structural development will be located on an upland mesa well above flood level. However, to minimize flood hazards, the Commission finds that the City's hydrology mitigation measures must be incorporated by reference as conditions of approval. These measures include conformance to floodplain elevation standards and compliance with requirements for the adjacent flood control basin. Therefore, as conditioned, the Commission finds that the proposed project is consistent with Section 30253 of the Coastal Act.

6. Water Quality

Section 30231 of the Coastal Act 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.*

The subject site drains into the San Gabriel River through the proposed salt marsh and the adjacent Los Alamitos Retarding Basin. Polluted runoff generated by development of the site which enters the San Gabriel River would result in adverse impacts to the river's water. Therefore, the Commission finds that National Pollutant Discharge Elimination System ("NPDES") requirements

must be met. The Commission finds that approved NPDES permits, Storm Water Pollution Prevention Plans, and Best Management Practices in compliance with California Regional Water Quality Control Board mandates must be submitted and reviewed and approved by the Executive Director. In addition, the Commission finds that runoff from the future residential development shall be directed ultimately into sewage treatment facilities rather than into storm drains which lead into the San Gabriel River or the ocean. Thus, as conditioned, the Commission finds that the proposed development would be consistent with Section 30231 of the Coastal Act.

7. New Development

Section 30250 of the Coastal Act states, in relevant part:

> *(a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.*

The subject site is approximately 196.6 acres in size and is essentially undeveloped except for about 28.2 acres of oil production facilities and small structures housing the property owner's offices. Thus, the subject site is one of a few remaining, non-public park vacant pieces of land along the Southern California coast. The proposed development involves subdivision for 70 homes, an 18 hole golf course and clubhouse, 10,000 square feet of visitor-serving uses, and park uses, wetlands, and public access trails. The proposed development is less dense and intense than previously development proposals for the subject site. In addition, the Commission finds that the golf course must be eliminated, further deintensifying the use. Further, the subject site is completely surrounded by urban development. Infrastructure to serve the proposed development exists in the area. Thus, the proposed development is located within an existing developed area able to accommodate it. Therefore, the Commission finds that the proposed development, as conditioned, is consistent with Section 30250 of the Coastal Act.

8. Other Conditions

Since the applicant has not proposed specific homes in conjunction with the 70 lot residential subdivision, the Commission finds that a separate permit must be required for the homes to allow the Commission to review the proposed homes for consistency with Chapter 3.

D. Development Agreement

The applicant has entered into a development agreement with the City of Seal Beach for the proposed development. California Government Code Section 65869 stipulates that development agreements shall not be applicable to development in the coastal zone unless, prior to certification

of the local coastal program ("LCP")for the jurisdiction in which the development is located, the Commission, through formal action, approves the development agreement.

Since the LCP for the City of Seal Beach has not been certified, the Commission will have to approve the development agreement before the agreement can be effective. The development agreement will be acted on by the Commission as a separate hearing item.

E. Local Coastal Program.

Section 30604(a) of the Coastal Act provides that the Commission shall issue a Coastal Development Permit only if the project will not prejudice the ability of the local government having jurisdiction to prepare a Local Coastal Program which conforms with the Chapter Three policies of the Coastal Act.

On July 28, 1983, the Commission denied the City of Seal Beach Land Use Plan (LUP) as submitted and certified it with suggested modifications. The City did not act on the suggested modifications within six months from the date of Commission action. Therefore, pursuant to Section 13537(b) of the California Code of Regulations, the Commission's certification of the land use plan with suggested modifications expired. The LUP has not been resubmitted for certification since that time.

The proposed development, as conditioned, is consistent with the Chapter Three policies of the Coastal Act. Therefore, the Commission finds that the proposed development would not prejudice the ability of the City to prepare a certified local coastal program consistent with the Chapter Three policies of the Coastal Act.

F. 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, 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.

As discussed further herein, development, whether a golf course, houses, or other uses, alternatively could be proposed in the lowlands so as to avoid the existing wetlands by siting development on non-wetland areas. An alternative which proposes no development whatsoever in the 100+ acre lowlands area would leave open the possibility of an entity to acquire all of the lowlands for restoration or off-site mitigation for wetland impacts on other sites.

The proposed development is located in an urban area. All infrastructure necessary to serve the site exist in the area. The proposed project has been conditioned in order to be found consistent

with the wetlands, public access, ESHA, natural hazards, water quality, and archaeology policies of Chapter Three of the Coastal Act. The required mitigation measures, particularly elimination of the proposed golf course and reconfiguration of the proposed subdivision, will minimize all significant adverse effects which the activity will have on the environment.

As conditioned, there are no feasible alternatives or feasible mitigation measures available 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, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A: Previously Recommended Special Conditions of Approval (from March 19, 1998 staff report and addendum for the April 7, 1998 Coastal Commission hearing)

WETLANDS RESTORATION AREA / CONSERVATION.

A. "Phase 1" Initial Proposed Salt Marsh Wetland Restoration Area. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall execute and record a document in a form and content acceptable to the Executive Director, irrevocably offering to dedicate to a public agency, private association, or non-profit association approved by the Executive Director an open space and conservation easement, as proposed by the applicant, for the purpose of creating and maintaining a minimum thirty-six (36) acre salt marsh wetland (Phase 1 of the overall salt marsh wetland creation) surrounded by a buffer area consistent with the transition zone/densely vegetated berms (minimum five feet high above the adjacent golf course grade)/upland areas described in the conceptual wetlands restoration plan (the 36 acre figure shall only include shallow subtidal, occasionally exposed-subtidal, lower intertidal, upper intertidal, and super tidal habitats and shall not include transition/buffer/upland areas described in the conceptual wetlands restoration plan). Such easement shall be over the area of the site located adjacent to the Haynes Cooling Channel and connected to the San Gabriel River by a culvert, including areas in the general vicinity of the green for the 12th hole and the tee for the 13th hole and in the general vicinity of the green for 5th hole and the tee for the 6th hole, as generally depicted on Page 1 of Exhibit B of the staff report for this permit. The easement shall:

(1) Permit the applicant, its agents, and/or the accepting agency or non-profit organization to enter the property, create and maintain habitat, revegetate portions of the area, and fence the newly created/revegetated area in order to protect such habitats.

(2) Restrict all development, vegetation clearance, fuel modification and grading within the easement except that necessary to establish/maintain the habitat.

(3) Permit staff of the Coastal Commission and other resources agencies (e.g., California Department of Fish and Game, U.S. Fish and Wildlife Service, etc.) to enter and inspect for purposes of determining compliance with coastal development permit 5-97-367 and other agency approvals.

(4) No development, as defined in Section 30106 of the Coastal Act shall occur in wetland creation areas and wetland buffer areas except for the creation and maintenance of habitat and fencing of the created habitat in order to protect such habitats.

The easement area shall be described in metes and bounds. The recorded document shall include legal descriptions of both the applicant's entire parcel and the easement area. The recorded document shall also reflect that development in the easement area is restricted as set forth in this permit condition. The offer shall be recorded free of prior liens which the Executive Director determines may affect the interest being conveyed. The offer shall run with the land in favor of the People of the State of California, binding all successors and assigns, and shall be irrevocable for a period of 21 years, such period running from the date of recording.

B. Reservation of Oil Production Area for Phase 2 and Phase 3 Wetland Creation. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that the allowable uses and allowable development on both the entire 7.5 acre area of oil-production facilities immediately to the southeast of the Haynes Cooling Channel (Lot 7 of Vesting Tentative Tract Map 15381) and the 8.7 westernmost acres of oil-production facilities immediately to the southeast of the Haynes Cooling Channel (Lot 6 of Vesting Tentative Tract

Map 15381) shall, either at the time the on-site oil production ceases or on April 15, 2018 (whichever occurs earlier), be restricted to; 1) the removal of the existing oil-production facilities, 2) removal of contaminants and remediation of the site, and 3) wetland habitat creation/restoration and conservation/open space. The deed restriction shall be recorded over the revised lot of Vesting Tentative Tract Map 15381 which contains the wetlands, golf course, and oil production facilities, and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

C. Freshwater Marsh Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that: no development, as defined in Section 30106 of the Coastal Act, shall occur in the freshwater marsh wetlands consisting of five interconnecting ponds within the golf course as shown on Exhibit C, except development necessary for purposes of enhancement and restoration of the wetlands. The deed restriction shall be recorded over the revised lot, which contains the freshwater wetlands, golf course, and oil production facilities, of Vesting Tentative Tract Map 15381 and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

FINAL WETLAND RESTORATION PROGRAM.

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a final wetland restoration program for the proposed project. The program shall be developed in consultation with the Commission, California Department of Fish and Game, and U.S. Fish and Wildlife Service and at a minimum shall include:

A. A detailed final site plan of the existing degraded and severely degraded wetlands and a detailed final site plan of the wetland creation restored sites that substantially conform with the plans contained in the Addendum to Concept Wetlands Restoration Plan for the Hellman Ranch ("Addendum") dated February, 1998 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management (M&N File: 3693) and the Concept Wetlands Restoration Plan for the Hellman Ranch ("Concept Plan") revised November, 1997 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management, as revised as follows:

(1) The proposed initial "Phase 1" Salt Marsh Wetland shall be a minimum thirty-six (36) acre salt marsh wetland (Phase 1 of the overall salt marsh wetland creation) surrounded by a buffer area consistent with the transition zone/densely vegetated berms (minimum five feet high above the adjacent golf course grade)/upland areas described in the conceptual wetlands restoration plan (the 36 acre figure shall only include shallow subtidal, occasionally exposed-subtidal, lower intertidal, upper intertidal, and super tidal habitats and shall not include transition/buffer/upland areas described in the conceptual wetlands restoration plan).

(2) Revise Figures A1, A4, and A7 of the Addendum to reflect that the Phase 1 Salt Marsh Wetland has been expanded, to a minimum 36 acres, in the general vicinity of the green for the 12th hole and the tee for the 13th hole and in the general vicinity of the green for 5th hole and the tee for the 6th hole, as generally depicted on Page 1 of Exhibit B to the staff report for coastal development permit application 5-97-367.

(3) Describe the final acreage (minimum 6.8 acres) and locations of the freshwater marsh wetland areas.

(4) The final acreages of the freshwater marshes and all phases of the salt marsh shall not include the acreage of Transition/Buffer areas (i.e., the saltwater marsh areas which are never subject to the influence of tides, and the freshwater marsh areas not covered by water).

B. The baseline ecological assessment of the existing degraded and severely degraded wetland area submitted with the coastal development permit application.

C. A final overlay map (if a large scale map is produced, a reduced 8 1/2"x11" or 11"x17" copy shall be included in the program) which superimposes the following:

(1) The twenty-five (25) acres of degraded wetland as mapped by the California Department of Fish and Game in its January 13, 1982 Determination of the Status of Wetlands Within the City of Seal Beach, Immediately South and East of the San Gabriel River Channel (Ponderosa Seal Beach Wetlands);

(2) The current 1996 wetlands delineation (27 acres) of the project site prepared by Coastal Resources Management & Chambers Group as shown on Figure 4-7, Page No. 4-13 of the application for coastal development permit 5-97-367;

(3) The proposed areas of wetland fill resulting from the golf course and resulting from creation of the required minimum 36 acres of salt marsh (excluding buffers) and minimum 6.8 acres of freshwater marsh; and

(4) The proposed required minimum 6.8 acres of freshwater marsh and required minimum 36 acres (excluding buffers) of Phase 1 (initial creation) salt marsh areas.

D. Monitoring and Remediation

(1) An independent biologist to monitor the establishment and success of the salt marsh shall be selected by the applicant and approved by the Executive Director, and funding for the monitor biologist shall be provided by the applicant for a period of ten (10) years.

(2) Reference sites must be accessible to the independent monitor and shall contain habitat of interest and shall be characterized by a muted tidal regime similar to the proposed salt marsh.

(3) Success Criteria

The monitoring of the salt marsh shall be in compliance with the standards and criteria contained in the Concept Plan, except that: 1) exotic, invasive, and non-native species shall be excluded from any assessment of performance standards, and 2) the proposed performance standards shall be modified as follows for the various proposed habitat zones (the performance standards and success criteria shall be met within the first five years after completion of construction of the Phase 1 salt marsh):

a. Transition Zones

The management plan for the proposed berm ringing the salt marsh which serves as transition/buffer area shall be applied to all native species, not just sensitive species.

b. High Salt Marsh

Vegetation in the High Salt Marsh shall contain at least as many of the same native species (both in quantity and type) as the least speciose reference site. The average total (all species combined) percent cover shall be a least eighty

percent (80%). The average plant height for each species shall be at least seventy-five percent (75%) of that of the same species at the reference site, except that pickleweed shall be no less than twenty centimeters (20 cm) in average height.

c. Low Salt Marsh

The average percent cover of pickleweed shall be at least eighty percent (80%), and the average height should be either seventy-five percent (75%) of pickleweed height at reference sites or twenty centimeters (20 cm), whichever is greater.

d. Mud Flat

Infauna shall be monitored and documented at both the project and reference sites. Avifauna at the proposed salt marsh shall be similar in type and number to the species and foraging use of the habitat at reference sites. The field methods for monitoring mud flat shall be approved by the Executive Director.

e. Subtidal basin and channels

There shall be a similar number and type of species and individuals as at the reference sites. Demersal fishes and water column fishes shall be evaluated separately. Adult and juvenile fishes shall be counted separately and performance standards applied to adults.

E. The final design and construction methods that will be used to ensure the mitigation site achieves the defined goals, objectives, and performance standards, and final construction plans.

F. Preliminary remedial measures and provisions which require the final remedial measures to be determined in consultation with the Coastal Commission ("CCC"), California Department of Fish and Game ("CDFG"), and the U.S. Fish and Wildlife Service ("USFWS"). The determination that the wetlands have established and are functioning at a level where they no longer require remediation shall be made by the CCC, CDFG, and USFWS.

G. Provisions for submittal, within thirty (30) days of completion of initial restoration work, of "as built" plans demonstrating that the freshwater and Phase 1 saltwater marsh wetlands have been constructed in accordance with the approved design and construction methods.

H. A written final detailed plan for financing the actual cost of constructing, establishing, and maintaining in perpetuity all approved wetlands. The plan shall provide that the landowner, property manager, and golf course owner/operator are ultimately responsible in perpetuity for freshwater wetland maintenance, as proposed in Sections 5.5.1 and 6.5.1 of the "Concept Wetlands Restoration Plan for the Hellman Ranch" revised November, 1997 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management. the applicant shall be responsible for maintenance of the phase 1 (initial construction) of the required minimum 36 acre (excluding buffers) salt marsh for a period of ten (10) years commencing with the start of construction of the wetlands or until the conservation easement over the salt marsh is accepted, whichever occurs sooner. if the conservation easement is accepted, the accepting agency shall be responsible for maintenance of the salt marsh. The plan shall indicate, at a minimum; 1) the sources of funding, and 2) projected costs of constructing, establishing, and maintaining in perpetuity all approved wetlands, and 3) require that costs of on-going maintenance of the wetlands, including monitoring by the independent biologist, shall be paid out of the golf course revenue before any other costs incrued by the golf course, landowner, and its owner/operator.

I. Periodic cleaning and maintenance of the culvert connecting the salt marsh to the San Gabriel River.

J. Periodic removal of invasive, non-native plants shall be removed periodically from both the saltwater and freshwater marsh wetland areas in perpetuity to ensure maintenance of wetland habitat values.

K. Invasive, exotic, non-native plants shall not be used anywhere in the golf course, with the exception of grasses for fairway, green, and tee turf.

L. All construction activities for the golf course and the wetlands, shall not occur during the nesting seasons of sensitive species unless the California department of fish and game provides a written determination to the executive director that construction during a particular nesting season will not result in harm to the nesting species, and the determination is accepted by the executive director.

M. Prior to commencement of construction of the golf course, the proposed wetland areas (salt marsh, buffers, and freshwater marsh), shall be staked and signed in a manner which clearly demonstrates to construction crews that the wetland areas are not to be entered for any reason.

The permittee shall undertake development in accordance with the final wetland restoration program approved by the Executive Director. Any proposed changes to the approved final program shall be reported to the Executive Director. No changes to the approved final program shall occur without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

REVISED VESTING TENTATIVE TRACT MAP NO. 15381.

The applicant shall submit, for the review and approval of the Executive Director, two copies of a final revised vesting tentative map for Tract No. 15381. The final revised map shall not allow the subdivision of proposed Lots 4, 6, and 7 and show that proposed Lots 4, 6 and 7 (i.e., the proposed lots for the golf course and two oil-production areas) are a single legal lot. The applicant shall record the revised map approved by the Executive Director.

GOLF COURSE OPERATIONS AND GOLFER WETLAND EDUCATION PROGRAM

A. Timing of Golf Course Construction. Prior to commencement of construction of the golf course, the proposed archaeological test program (including all required excavation and development of reasonable mitigation measures) shall have been completed.

B. Timing of Golf Course Opening. The golf course shall not be opened for use until both the freshwater and Phase 1 saltwater marsh wetlands have been constructed in accordance with the final wetlands restoration program approved by the executive director, as required in special condition no. 2.

C. Golf ball retrieval. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit, for the review and approval of the Executive Director, a written plan which describes in detail the proposed method for retrieving golf balls from wetland: 1) a controlled program for golf ball retrieval which minimizes impacts to the wetlands, and 2) golf balls shall not be retrieved from the wetlands by golfers themselves under any circumstances. The golf course operator shall comply with the plan approved by the Executive Director.

D. Golfer education on wetlands. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit, for the review and approval of the Executive Director, a detailed written plan which describes the methods by which users of the golf course will be informed of the wetlands

areas (e.g., signage, brochures, instructions printed on score cards, etc., which instruct golfers not to enter wetland or wetland buffer areas).

E. Golf Course Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(1) The applicant, golf course owner/operator and/or wetlands manager/owner shall implement and comply with the final wetland restoration program approved by the Executive Director.

(2) Development and management of the golf course shall be in compliance with the documentAn Environmental Approach to Golf Course Development & Managementprepared for Hellman Properties LLC by Siena College-Audubon International Institute dated December 1996 as proposed by the applicant.

(3) Invasive, exotic, non-native plants shall not be used anywhere in the golf course, with the exception of grasses for fairway, green, and tee turf.

(4) The applicant and golf course owner/operator shall implement and comply with the final golf ball retrieval plan approved by the Executive Director.

(5) The golf course shall not be lighted nor shall it be open for night play.

(6) The golfer education program approved by the Executive Director shall be complied with and implemented.

(7) Both saltwater and freshwater marsh wetlands areas shall be designated as lateral hazards, so indicated by red stakes or lines in accordance with the provisions of "the U.S.G.A. 1998 official rules of golf", in which golfers shall not enter and over which golfers shall not hit a penalty shot resulting from hitting a ball into the wetlands.

(8) The golf course shall be open to the general public during all hours of operation.

(9) The golf course shall not be converted to a private membership course.

(10) Signs shall be installed which are clearly visible to the general public which inform the general public that the golf course is open for play to the public.

(11) Public parking for the golf course shall be provided at all times based on eight spaces for each hole, plus one space for each employee.

The deed restriction shall be recorded over the revised lot, containing the golf course, wetlands, and oil production facilities, of Vesting Tentative Tract Map 15381 and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

F. Golf Course Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(11) Public parking for the golf course shall be provided at all times based on the standards contained in the Hellman Ranch Specific plan adopted by City of Seal Beach City Council ordinance no. 1420 on October 27, 1997 (Hellman ranch Specific plan Amendment 97-1).

G. Final Plans for the Golf Clubhouse. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, final plans for the golf clubhouse. Public access shall be maintained to all common areas of the public golf clubhouse. Public parking for the golf clubhouse shall be provided at all times based on the standards contained in the Hellman Ranch Specific plan adopted by City of Seal Beach City Council ordinance no. 1420 on October 27, 1997 (Hellman ranch Specific plan Amendment 97-1).

PUBLIC ACCESS PROGRAM

A. Public Trails Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(1) Uses within the delineated trail over the proposed trail area generally depicted on exhibit 1 of the staff report for this permit shall be limited to public access, trail maintenance, emergency access to and from the existing mineral production facilities, and construction and maintenance of utilities and oil and gas pipelines. Any construction or maintenance activities for utilities and oil and gas pipelines, and emergency access to and from existing mineral production facilities, within the proposed trails, shall be carried out in a manner which minimizes any impact on the use of the surface area of the proposed trails for public access purposes.

(2) The design of the proposed and required trails and access to the proposed and required trails shall meet the requirements of the Americans with Disabilities Act.

(3) The proposed and required trails shall be described in metes and bounds and shall be a minimum of twenty-five feet (25') wide with the paved portion being a minimum of ten (10) feet wide.

(4) The trails shall not be lighted in order to minimize impacts to the wetlands.

(5) The trails shall be open to the public from dawn to dusk and shall not be gated. Any changes to the hours of operation of the trails shall require an amendment to this permit unless the Executive Director determines that no amendment is required.

(6) The proposed view overlooks at the ends of the trails shall contain handicap accessible seating.

(7) The trails shall be, as necessary, partially or fully enclosed with see-through structures, such as cages or arched fences, which protect trail users from errant golf balls.

The deed restriction shall be recorded over the public access trail area as generally depicted on Exhibit 1 of the staff report for this permit and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

B. Trail Linking Gum Grove Park with the State Lands Parcel and Seal Beach Boulevard. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(1) A twenty-five (25) foot wide strip of land, at the base of the bluff below Surf Place and Catalina Avenue, which connects the proposed public trail emanating from the State Lands parcel and runs part of the way along the southerly edge of the proposed salt marsh restoration area shall be exclusively reserved for a public trail connecting Gum Grove Park with the State Lands parcel, as generally depicted on Exhibit L of the staff report for this permit.

(2) Structures such as partial arched fence enclosures or retaining walls necessary to protect trail users from errant golf balls and potential bluff failure shall be allowed in this area.

(3) A trail accessible to the general public shall be built between Gum Grove Park and Seal Beach Boulevard, as generally depicted on Exhibit L of the staff report for this permit. Said trail shall be accessible from the proposed residential development as well as from Seal Beach Boulevard.

(4) These required trails shall be constructed in accordance with the requirements set forth in special condition 5.A. above.

The deed restriction shall be recorded over the trail as generally depicted on Exhibit L of the staff report for this permit and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

RESIDENTIAL DEVELOPMENT

A. Residential Community Streets PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that; 1) the streets shown Vesting Tentative Tract Map No. 15402 shall be public and provide public on-street parking, 2) preferential parking shall not be established in the subdivision, 3) public parking shall not be prohibited via "red-curbing" or other means, and 4) the width and numbers of curb cuts shall be minimized. The deed restriction shall be recorded over Street A, Street B, and Street C of Vesting Tentative Tract Map No. 15402 and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

B. Future Coastal Development Permit for Development of the Residential Community This coastal development permit does not approve development on the lots created by Vesting Tentative Tract Map No. 15402. A future coastal development permit(s) is required for development, such as site preparation, construction of streets, common walls and landscaping, and construction of the actual homes, etc. on the site.

C. Timing of Construction. Residential development, including subdivision improvements and home construction, shall not commence until construction of the Phase 1 initial salt marsh wetlands and the freshwater marsh wetlands has commenced. The homes shall not be occupied until all the following occur: 1) construction of the freshwater wetlands and the phase 1 initial salt marsh wetlands has been completed, and 2) Gum Grove Park has been dedicated to the City of Seal Beach.

APPENDIX B: Substantive File Documents

1. COASTAL DEVELOPMENT PERMITS AND COMMISSION ACTIONS

A. Coastal Conservancy Project #1-82; Approved 4/22/82
B. 5-82-221 (Ponderosa Homes); withdrawn 11/17/82
C. 5-89-514 (MOLA Development Corporation); denied 11/14/89
D. 5-89-1087 (MOLA Development Corporation); approved 1/12/90
E 6-90-219 [Batiquitos Lagoon restoration and enhancement]

2. WETLAND DOCUMENTS

A. An Assessment of Wetland Resources Within the City of Seal Beach South of the San Gabriel River, prepared by Bob Radovich of the California Department of Fish and Game, June 1980.

B. Determination of the Status of Wetlands Within the City of Seal Beach, Immediately South and East of the San Gabriel River Channel (Ponderosa Seal Beach Wetlands), prepared by the California Department of Fish and Game, January 13, 1982.

C. Conceptual Wetlands Restoration Plan for the Hellman Ranch dated November 1997 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management.

D. Addendum to Concept Wetlands Restoration Plan for the Hellman Ranch dated February, 1998 prepared for Hellman Properties LLC by Moffatt & Nichol Engineers (M&N) File: 3693) in association with Coastal Resources Management

3. OTHER DOCUMENTS

A. Final Environmental Impact Report for the Hellman Ranch Specific Plan dated August 1997 prepared by P&D Consultants for the City of Seal Beach (State Clearinghouse No. 96121009) and certified by City of Seal Beach City Council Resolution 4562 on September 19, 1997.

B. "Development Agreement by and Between the City of Seal Beach and Hellman Properties, LLC Relative to the Development known as the Hellman Ranch" dated October 27, 1997

C. An Environmental Approach to Golf Course Development & Management prepared for Hellman Properties LLC by Siena College-Audubon International Institute dated December 1996

D. A Research Design for the Evaluation of Archaeological Sites within the Hellman Ranch Specific Plan Area dated November 1997 prepared by KEA Environmental, Inc. for the City of Seal Beach

APPENDIX C: Local Approvals

1) City of Seal Beach City Council Resolution 4570 approving Tentative Tract Map No. 15381 (subdivision of site into 9 lots)

2) City of Seal Beach City Council Resolution 4571 approving Tentative Tract Map No. 15402 (Residential subdivision);

3) City of Seal Beach Ordinance 1420 adopting the Hellman Ranch Specific Plan

4) City of Seal Beach Resolution 4562 approving the Final Environmental Impact Report for the Hellman Ranch Specific Plan; October 27, 1997

5) Development Agreement

APPENDICES SENT UNDER SEPARATE COVER

Appendix D: Documentation regarding the project Final Environmental Impact Report

1) City of Seal Beach City Council Resolution 4562
2) FEIR Volume I, Section 7.0 - Project Alternatives
3) Selected Response to Comments, FEIR Volume V

Appendix E: Wetlands Information

1) Coastal salt marsh wetland functional assessment
2) February 1998 addendum to the concept wetlands plan
3) November 1997 concept wetlands plans

Appendix F: Pesticide Information

1) Applicant's May 11, 1998 letter to the Coastal Commission
2) May 11, 1998 memo from Audubon International to the applicant, with the UC-IPM Pest Management Guidelines attached
3) "An Environmental Approach to Golf Course Development and Management," December 1996 prepared by Audubon International

Appendix G: Correspondence

1) Letters of Support and Opposition received at and after the April 7, 1998 hearing, including letters regarding archaeology;
2) Hard copy of applicant's visual presentation at the April 7, 1998 hearing.

List of Exhibits

A. Vicinity and Location Maps

B. Property Ownership/Subdivision

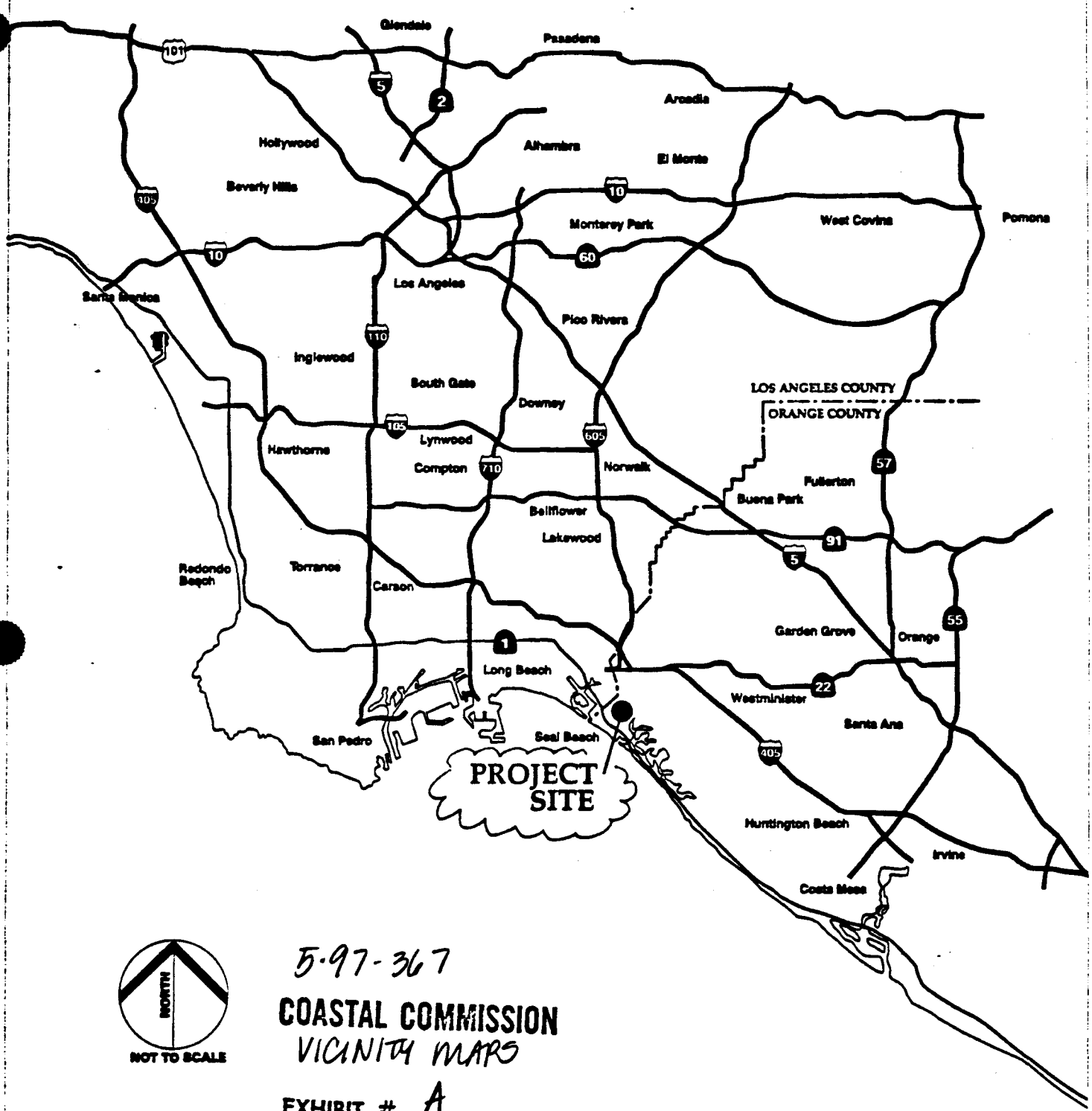
C. Wetlands Maps/Information

D. U.S. Fish and Wildlife Service ("USFWS") Correspondence:
D-1 March 13, 1998 letter from the USFWS to the Coastal Commission
D-5 Applicant's March 17, 1998 letter to the USFWS
D-13 March 30, 1998 letter from the USFWS to the applicant
D-15 Chronology of applicant's communications with the USFWS

E. Other correspondence:
E-1 May 21, 1997 letter from the California Department of Fish and Game to the City of Seal Beach
E-12 March 16, 1998 letter from the California Department of Fish and Game to the Coastal Commission
E-14 March 23, 1998 letter from the U.S. Army Corps of Engineers to the Coastal Commission
E-17 April 7, 1998 memorandum from Victor Leipzig to Dave Bartlett

F. Applicant's preferred special conditions
F-1 Response to April staff report addendum (matrix form)
F-4 Response to March 19, 1998 staff report (~~Strikethrough~~ and underline form)

G. Project Plans and description



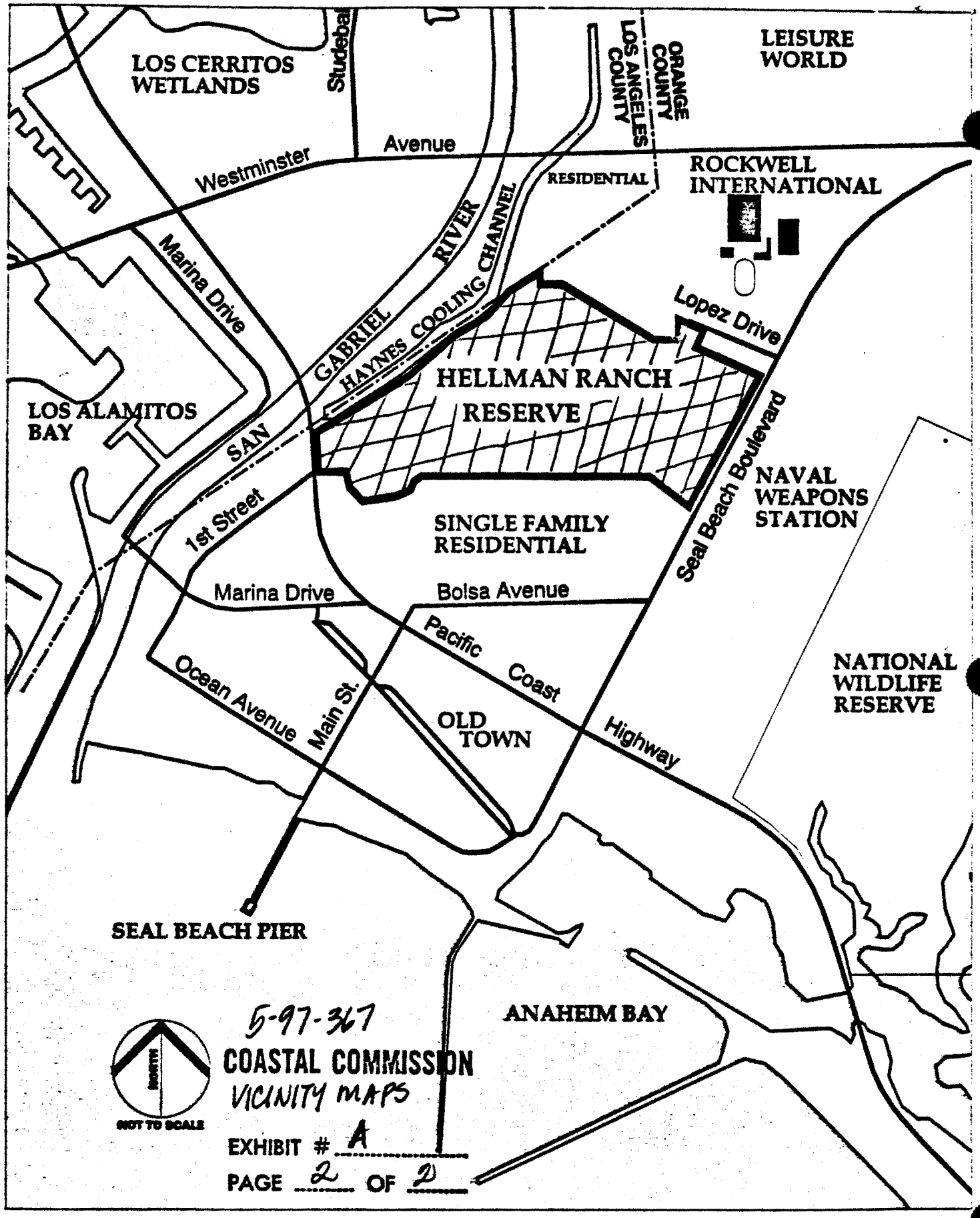
5-97-367

COASTAL COMMISSION
VICINITY MAPS

EXHIBIT # A
PAGE 1 OF 2

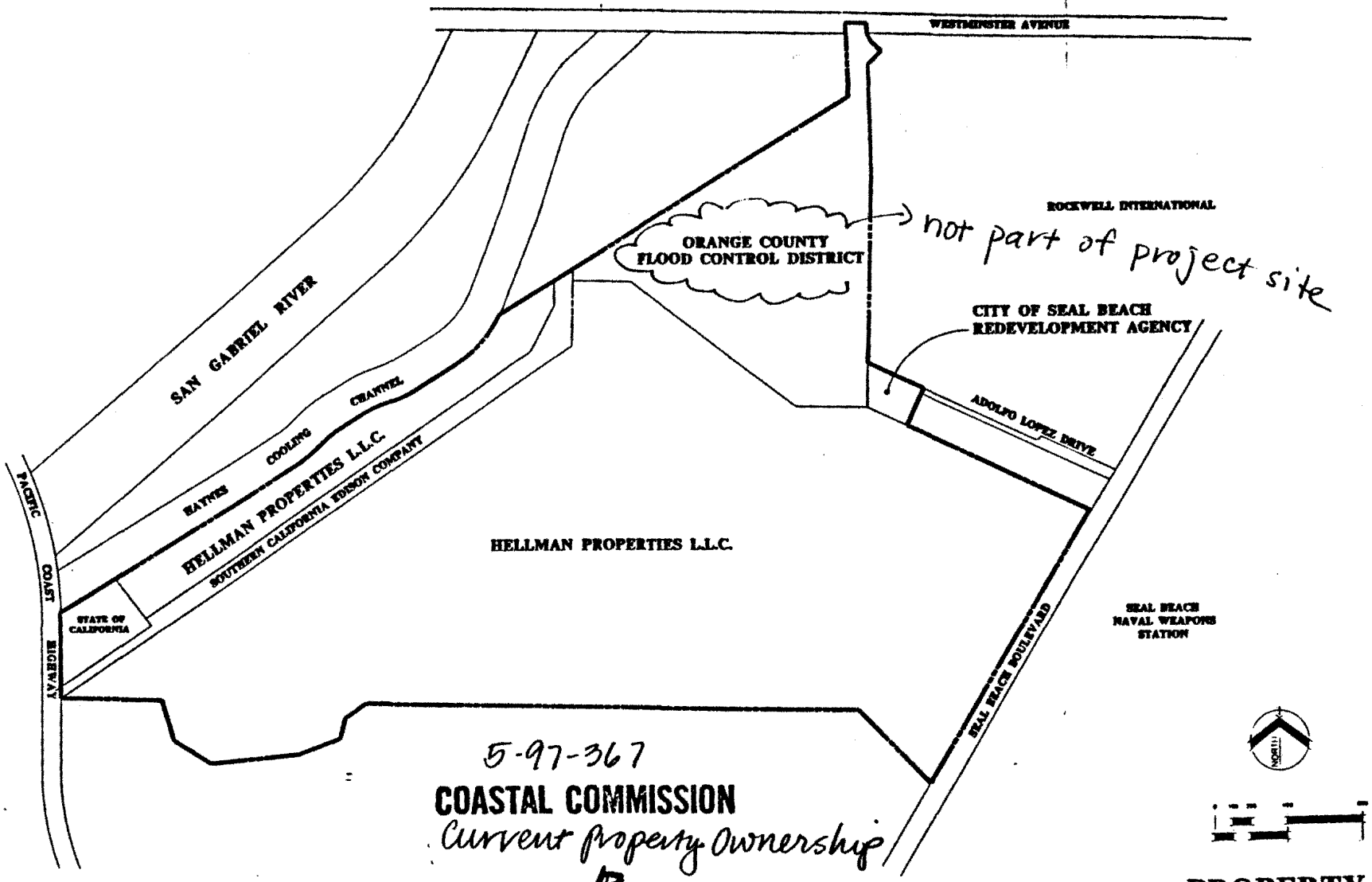
REGIONAL LOCATION MAP

HELLMAN RANCH RESERVE
COASTAL DEVELOPMENT PERMIT
FIGURE NO. 4-1
PAGE NO. 4-2



LOCATION MAP

HELLMAN RANCH RESERVE
COASTAL DEVELOPMENT PERMIT
FIGURE NO. 4-2
PAGE NO. 4-3



5-97-367

COASTAL COMMISSION

Current Property Ownership

EXHIBIT # B

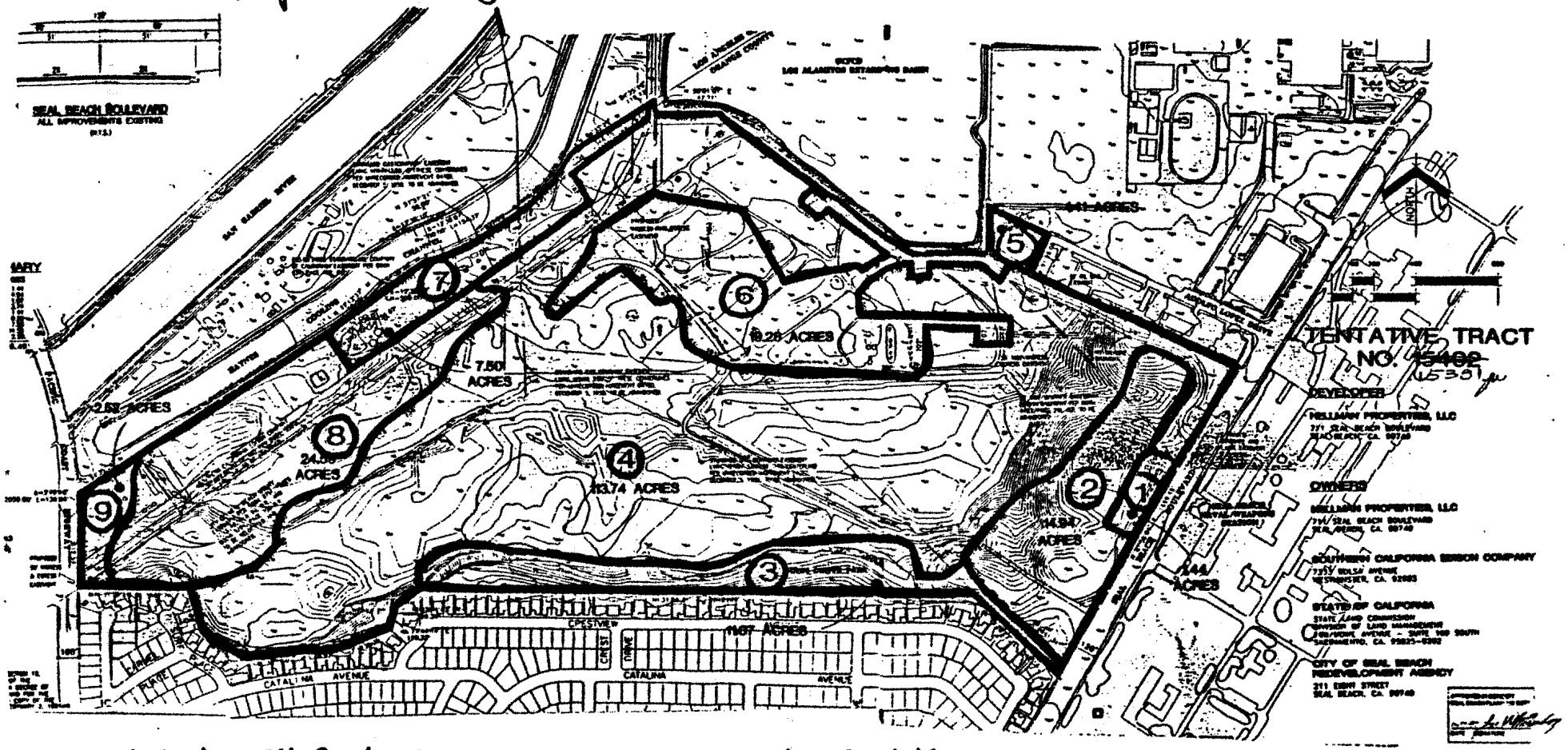
PAGE 1 OF 8

PROPERTY OWNERSHIP MAP

HELLMAN RANCH SPECIFIC PLAN

FIGURE NO. 3-
PAGE NO. 3-

Proposed Vesting Tentative Tract Map 15381



Lot 1: Oil Production
Lot 2: Residential (to be further subdivided)
Lot 3: Gum Grove Park
Lot 4: Golf Course and Freshwater wetlands
Lot 5: Extension of Adolfo Lopez Drive
Lot 6: Oil Production
Lot 7: Oil Production
(future salt marsh expansion)
Lot 8: Upfront Salt Marsh (Phase 1)
Lot 9: State Lands Parcel

5-97-367

COASTAL COMMISSION
Proposed Project

EXHIBIT # B

PAGE 2 OF 8

HELLMAN PROPERTIES LLC
POST OFFICE BOX 2398
711 SEAL BEACH BOULEVARD
SEAL BEACH, CALIFORNIA 90740
(562) 431-6022 FAX: (562) 493-3130

RECEIVED
MAY 14 1998
CALIFORNIA
COASTAL COMMISSION

May 11, 1998

Mr. John T. Auyong
Staff Analyst
CALIFORNIA COASTAL COMMISSION
200 Oceangate • 10th Floor
Long Beach, CA 90802-4302

Re: CDP 5-97-367 • Request for Additional Information

Dear John:

This letter will address your comments in your April 30 and May 4 letter regarding the above referenced project.

A. April 30th Letter

1. Hellman Land Ownership

- There is no existing subdivision on the Hellman Ranch property.
- Attached is ownership documentation we provided to the City of Seal Beach for the proposed Tract Map.
- Shell Oil (now Signal Hill Petroleum) has a 50% producing interest in APN 980-36-605. Signal Hill Petroleum has no land rights.
- Hellman Properties LLC owns the entire operating interest for the mineral rights.
- APN 043-160-31 is owned by Southern California Edison.
- APN 043-160-54 is owned by Southern California Edison.
- APN 095-010-25 is owned by Southern California Edison.
- The grant deed, presumably, is on file at the Orange or Los Angeles County Recorder's office.

2. Pesticides

- The information regarding pesticides is attached. Of the 110 acres planned for the golf course, less than 10% of the property will use pesticides. As part of the environmental golf course management plan, pesticides will be selected using a risk-based assessment protocol, that will ensure materials to be used will act quickly, degrade quickly, are non-toxic and non-mobile. A monitoring program will also be established.

B-3 of 8

5-97-367 Exhibit B – Ownership

6. **Proposed Use of Property:** Land uses include: Low density residential: 70 single family residential units; restored wetlands and public trails; 18 hole public access golf course; community park; oil production and facilities; flood control; public land use (for details, please refer to the Hellman Ranch Specific Plan, Seal Beach, California, October 1996).

7. **Request For:** Amendments to the City of Seal Beach General Plan and Amendments to the Hellman Ranch Specific Plan.

8. **Describe the Proposed Improvements:** See attached Hellman Ranch Specific Plan, Seal Beach, California, October 1996.

9. **Describe how and if the proposed improvements are appropriate for the character of the surrounding neighborhood:** The project reflects the community character of Seal Beach by limiting the amount of residential units, preserving the majority of the property as open space and creating public accessibility to the property.

10. **Describe how and if the approval of this request would be detrimental in any way to other property in the vicinity:** The proposed improvements will not be detrimental in any way to surrounding properties. However, the improvements will enhance adjacent property values and the property will become both and an ecological and community asset.

11. **Proof of Ownership**

Staff is to attach here a photocopy of a picture I.D. and a photocopy of the Grant Deed provided by the applicant
-or-
signed and notarized "Owner's Affidavit" form to be completed and attached to application

12. **Legal Description (or attach description from Title or Grant Deed):** Title Report attached.

By: _____ (Signature of Applicant)

F. JEROME TONÉ (Print Name)

10/28/96 (Date)

By: _____ (Signature of Applicant)

DAVE BARTLETT (Print Name)

10/24/96 (Date)

By: _____ (Signature of Property Owner)

Anne Heller-Anderson (Print Name)

10-31-96 (Date)

MARCO HELLMAN
10-31-96

THOMAS A. COX
11-21-96

CITY OF SEAL BEACH
PROPERTY OWNER'S AFFIDAVIT

STATE OF CALIFORNIA }
CITY OF SEAL BEACH }
COUNTY OF ORANGE }

We, Hellman Properties LLC, swear that we are the owner of the property at 711 Seal Beach Boulevard, Seal Beach, CA 90740, more commonly referred to as the Hellman Ranch.

We are familiar with the rules of the City of Seal Beach for preparing and filing a Public Hearing Application. The information contained in the attached Public Hearing application is correct to the best of our knowledge and we approve of the filing of an application for General Plan Amendments; Amendments to the Hellman Ranch Specific Plan; Tentative Tract Maps; Development Agreement and all other associated entitlements required or requested for the project.

Anne Hellman-Andersen — Anne Hellman Andersen — 10-31-96
(Print Name) **(Signature)** **(Date)**

415-361-8980 — 6 BRAGSEN CT, ATHERTON, 94027
(Telephone) **(Address- please print)**

MARCO F. HELLMAN — [signature] — 10-31-96
(Print Name) **(Signature)** **(Date)**

415-788-5111 — ONE MARITIME PLAZA #1100, SF CA 94111
(Telephone) **(Address- please print)**

SUBSCRIBED AND SWORN TO BEFORE ME
THIS_____ DAY OF _____ 1996.

_____
Notary Public

5-97-367 Exhibit B p.5 of 8

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

No. 5807

State of California

County of San Francisco

On 10/31/96 (DATE) before me, Jane D. Kilpatrick, Notary Public (NAME, TITLE OF OFFICER - E.G., "JANE DOE, NOTARY PUBLIC")

personally appeared Anne Heller Anderson and Marco W. Hellman (NAME(S) OF SIGNER(S))

☑ personally known to me - OR - ☐ proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) ~~is~~/are subscribed to the within instrument and acknowledged to me that ~~he/she~~/they executed the same in ~~his/her~~/their authorized capacity(ies), and that by ~~his/her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

JANE D. KILPATRICK
Comm. # 1059142
NOTARY PUBLIC - CALIFORNIA
City and County of San Francisco
My Comm. Expires May 18, 1999

WITNESS my hand and official seal.

SIGNATURE OF NOTARY

OPTIONAL

Though the data below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent reattachment of this form.

CAPACITY CLAIMED BY SIGNER

☐ INDIVIDUAL
☐ CORPORATE OFFICER

TITLE(S)

☐ PARTNER(S) ☐ LIMITED ☐ GENERAL
☐ ATTORNEY-IN-FACT
☐ TRUSTEE(S)
☐ GUARDIAN/CONSERVATOR
☑ OTHER: Managers

SIGNER IS REPRESENTING:
NAME OF PERSON(S) OR ENTITY(IES)
Hellman Properties LLC

DESCRIPTION OF ATTACHED DOCUMENT

City of Seal Beach Property Owner's Affidavit
TITLE OR TYPE OF DOCUMENT

1
NUMBER OF PAGES

10/31/96
DATE OF DOCUMENT

None
SIGNER(S) OTHER THAN NAMED ABOVE

5-97-367 Exhibit B p. 6 of 8

©1993 NATIONAL NOTARY ASSOCIATION • 8236 Remmet Ave., P.O. Box 7184 • Canoga Park, CA 91309-7184

STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
200 Oceangate, 10th Floor
Long Beach, CA 90802-4302
(562) 590-5071

April 30, 1998

Via Facsimile and U.S. Mail

Dave Bartlett
6082 Jade Circle
Huntington Beach, CA 92647

SUBJECT: Coastal development permit application 5-97-367 (Hellman Ranch); Additional information needed

Dear Dave:

I apologize but I still have not listened to the tapes of the April Coastal Commission hearing regarding the above referenced permit application. However, I did want to follow up on our previous phone conversations regarding the land ownership and pesticides issues. I also wanted to touch base with you regarding the wetland buffer/transition zone issue.

1. Hellman Land Ownership. Please provide documentation, including a tentative or parcel map and certificate of compliance, substantiating the number of legal lots which the Hellman family and its affiliated entities now own within the subject site. Please do not include the lots proposed under Vesting Tentative Tract Maps 15381 and 15402, as these locally approved subdivisions have not yet received a coastal development permit from the Coastal Commission. Also note that although there are several assessor's parcels, including several assessor's parcels for mineral rights, associated with the subject site for tax purposes, the number of assessor's parcels does not establish the number of legal lots. Also, given that mineral leases are exempted from the provisions of the Subdivision Map Act, the existence of such leases also does not establish the number of legal lots. Finally, please provide a copy of the information you provided the City of Seal Beach in support of your application for vesting tentative map approvals on the subject site.

As for the assessor's parcels, we note that Assessor's Parcel 980-36-605 indicates that Shell Oil Company also has an interest in this assessor's parcel along with Hellman Properties. Please explain the exact nature of the Shell Oil Company's interest in this parcel. Also, you indicated verbally that there are no leases for the existing mineral production--that the Hellman family through Hellman Properties operates the mineral production itself. Please confirm this in writing.

Also, please indicate in writing who owns the following land parcels which appear to be a part of the subject site, according to the assessor's maps:

043-160-31, 043-160-54, and 095-010-25

5-97-367
Exhibit B
p. 7 of 8

If these assessor's parcels are not in fact part of the subject site, please indicate this in writing.

Finally, please ensure that we have all the assessor's parcels owned by the Hellman family. We have tax bills for the following:

Land. 043-160-32, 043-160-33, 043-160-55, 043-160-56, 095-010-26, and 095-010-55.

Mineral Rights. 980-36-505, 980-36-515, 980-36-530, 980-36-531, 980-36-532, 980-36-533, 980-36-534, 980-36-535, and 980-36-605.

Please submit any tax bills for assessor's parcels located within the subject site which are not listed above but which are owned by the Hellman family directly or through other entities controlled by the Hellman family. In addition, please submit a copy of the grant deed for the land owned by the Hellman family. If none can be provided, please explain why in writing.

2. Pesticides. Although Coastal Commission staff recommended that the golf course management plan prepared by Audubon International be implemented in its entirety including pesticide use, some Commissioners had specific concerns with the use of pesticides on the golf course. Therefore, please submit a brief written document which summarizes the pesticide practices proposed, including a list of proposed pesticides to be used.

3. Transition Zones. Please have Tony Bomkamp submit a written revised total for the proposed berms/transition zones. My recollection from one of our meetings was that part of the wetland-side of these berms would be periodically inundated. Therefore, please submit the exact area of the berms which would not be periodically inundated and thus would be permanent uplands, based on the most recent 28.1 acre salt marsh proposal.

* * * *

Also, I recall seeing at the hearing that you provided Chuck with a matrix that responded to our addendum changes to the special conditions, such as the revised success criteria. I don't have a copy of this matrix. Please submit a copy of this matrix as Chuck has not yet had a chance to provide me with a copy. As for a meeting next Tuesday, May 5, 1998, let me check with Steve and Teresa and I'll get back to you.

Please do not hesitate to contact me with any questions you may have regarding these matters.

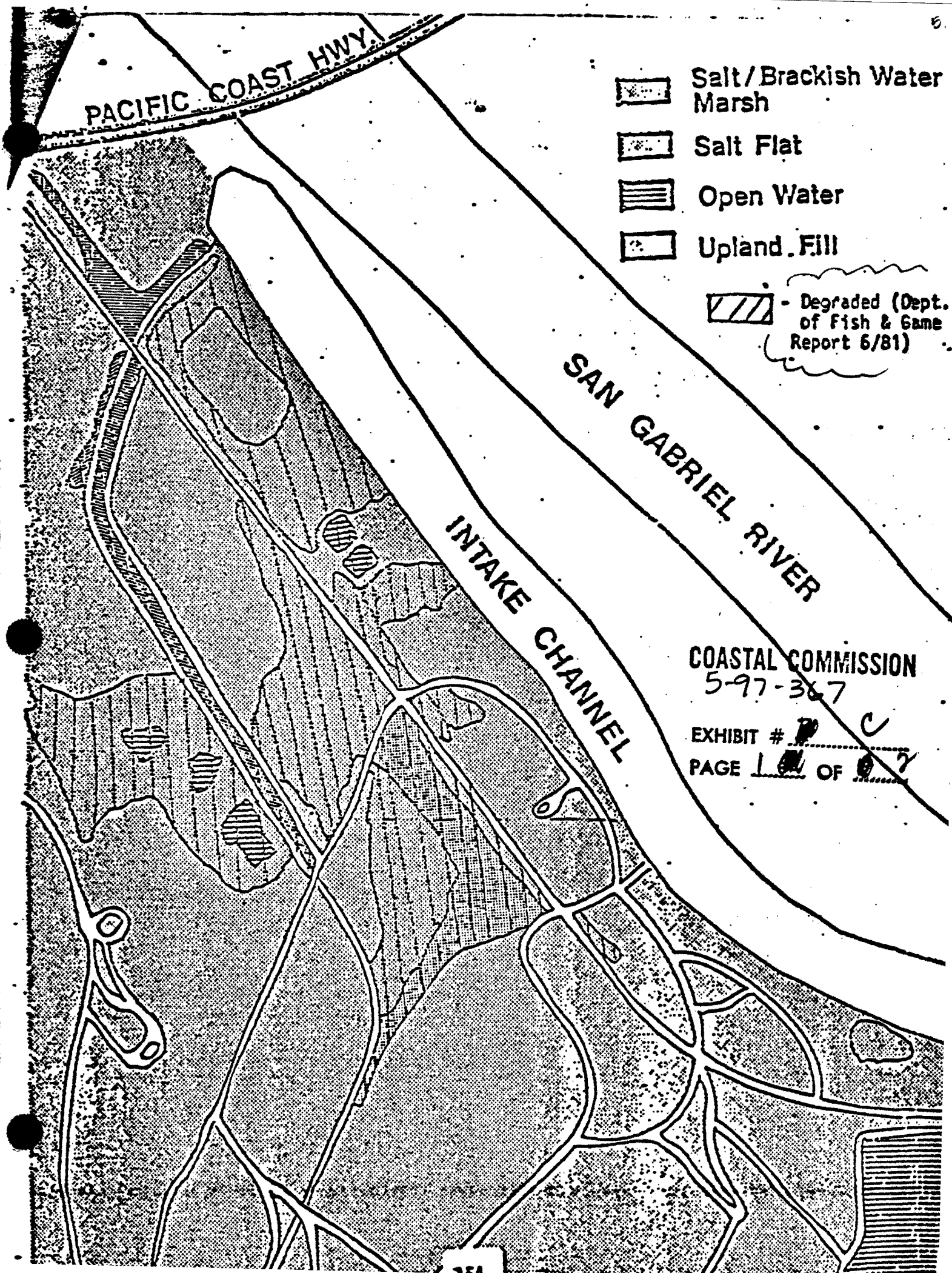
Sincerely,

John T. Auyong

John T. Auyong
Staff Analyst

5-97-367
Exhibit B
p.8 of 8

9766F:jta


PACIFIC COAST HWY.
Salt/Brackish Water Marsh
Salt Flat
Open Water
Upland Fill
- Degraded (Dept. of Fish & Game Report 6/81)
SAN GABRIEL RIVER
INTAKE CHANNEL
COASTAL COMMISSION
5-97-367
EXHIBIT # C
PAGE 1 OF 7

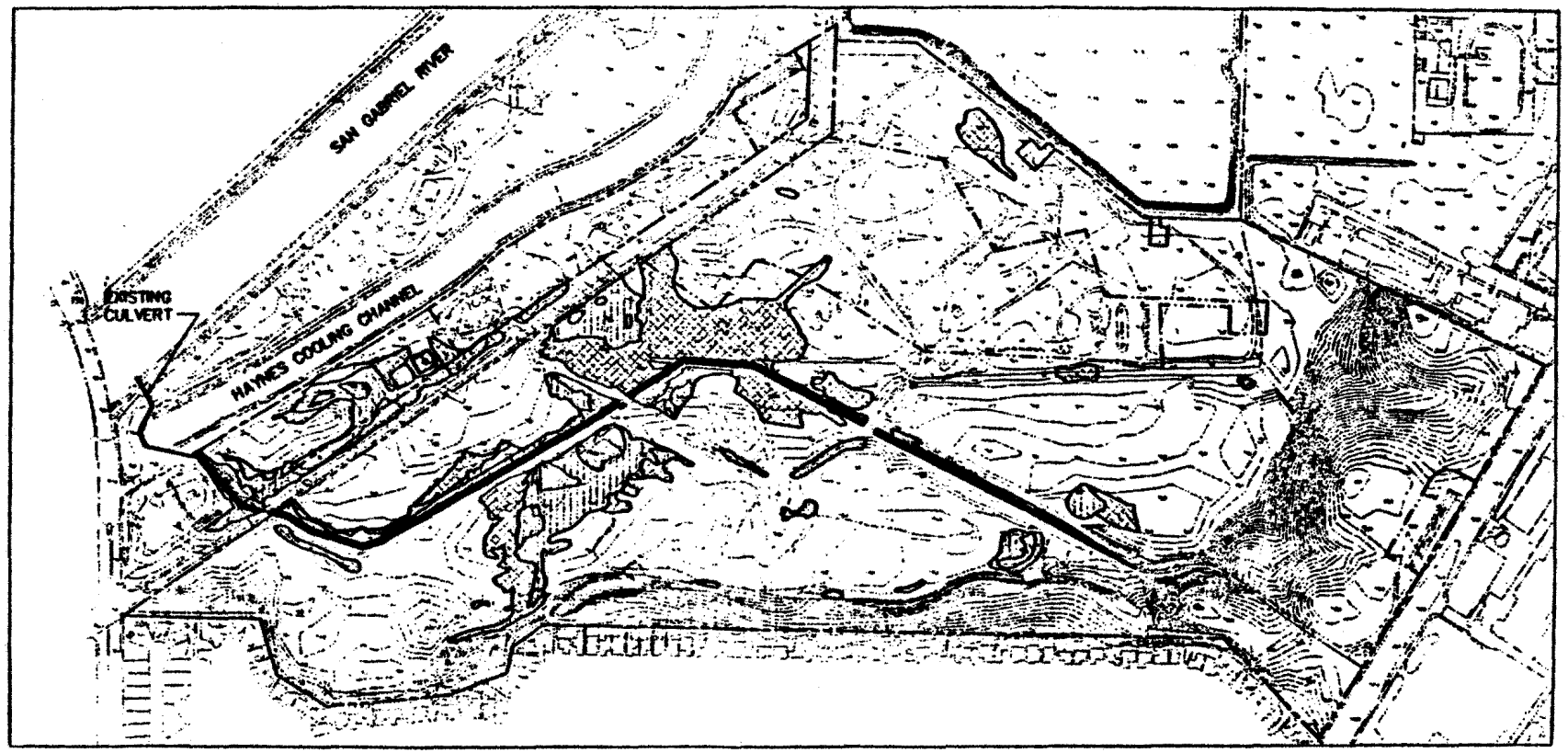
LEGEND

- TIDAL CHANNEL
- SEASONALLY PONDED WATER
- ALKALINE FLAT
- SALT MARSH VEGETATION
- HELLMAN PROPERTY BOUNDARY
- OIL PRODUCTION AREA

COASTAL COMMISSION
5-97-367

EXHIBIT # C
PAGE 02 OF 03

1996 Wetlands Delineation



SOURCE: MOFFATT & NICHOL ENGINEERS

EXISTING WETLANDS DELINEATION
HELLMAN RANCH RESERVE
COASTAL DEVELOPMENT PERMIT
FIGURE NO. 4-7
PAGE NO. 4-13

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

MAR 13 1998

RECEIVED
MAR 19 1998
CALIFORNIA
COASTAL COMMISSION

Mr. John T. Auyong
Staff Analyst
California Coastal Commission
South Coast Area Office
200 Oceangate, 10th floor
Long Beach, California 90802-4302

Re: Hellman Ranch Development, City of Seal Beach, California (Coastal Development Permit Application 5-97-367)

Dear Mr. Auyong:

The purpose of this letter is to respond to your request for written comments on the referenced project proposal. We understand the hearing before the California Coastal Commission (Commission) is scheduled between April 7 and April 10, 1998, in Long Beach. Our comments and recommendations are based on the *Pacific Pocket Mouse Assessment for the Hellman Ranch*, prepared by Dudek & Associates, dated August 1995; a letter of Mr. Lee Whittenberg, City of Seal Beach, regarding the Notice of Preparation for the Draft Environmental Impact Report for the Hellman Ranch Specific Plan, dated December 30, 1996; *Hellman Ranch Specific Plan Revised Draft Environmental Impact Report,* dated June 1997; *Conceptual Wetlands Restoration Plan for the Hellman Ranch*, prepared by Moffatt & Nichol Engineers, revised November 1997; *Addendum to the Concept Wetlands Restoration Plan for the Hellman Ranch*, prepared by Moffatt & Nichol Engineers, dated February 1998; *Hellman Wetlands/Seal Beach Coastal Salt Marsh Wetland Functional Assessment*, prepared by Glenn Lukos Associates and Coastal Resources Management, dated February 1998; a letter from yourself, dated February 24, 1998; a telephone conference with yourself and Bob James of my staff, on March 2, 1998; and other information available to the U.S. Fish and Wildlife Service (Service).

The primary concern and mandate of the Service is the conservation, protection, and enhancement of fish and wildlife resources and their habitats for the benefit of people. Our mandates further require that we provide comments on any public notice issued for a Federal permit or license affecting the Nation's waters (e.g., Clean Water Act, Federal Coastal Zone Management Act). We also provide technical assistance on matters within our purview and expertise. The Service is particularly interested in the arena of southern California coastal wetland biological resource conservation, impact assessment, restoration, and mitigation. The Service is also responsible for administering the Endangered Species Act of 1973, as amended.

5-97-367 Exhibit D

D1

The original extent of coastal wetlands along the Los Angeles-Orange County coastline has been estimated at over 17,300 acres. River channelization, marina development, roads and urbanizing developments have reduced and fragmented these wetlands to a few remaining salt marshes. Several of the species first added to the list of species endangered with extinction 28 years ago, are dependent upon this habitat type. The surviving wetlands on the applicant's property are an historic remnant, along with the Los Cerritos wetlands just to the north, of the historic Alamitos Bay ecosystem once spanning 2,400 acres. Although battered and ill-cared for, these remnant wetlands are all that remains of those once biologically diverse and productive ecosystems. Protecting these remnants from further loss or degradation and restoring them to their maximum possible biological integrity and productivity should a high priority.

The proposed action involves the development of a master-planned community within about a 231-acre area of the City of Seal Beach, just south of the San Gabriel River channel and the boundary line between Orange and Los Angeles Counties. Features of the proposed development include an 18-hole golf course (107.5 acres), retention of the existing Los Alamitos Retarding Basin (34.7 acres), mineral production (28.2 acres), wetland restoration (26.0 acre salt marsh and 6.8 acre freshwater marsh, for a total of 32.8 acres), single-family residential (14.7 acres), and Gum Grove Park (10.2 acres). The existing wetlands consist of 27.0 acres, as measured by State criteria, or 23.2 acres, as measured by Federal criteria. These wetlands consist of vegetated and unvegetated wetlands (seasonally ponded water and alkaline flats), and tidal channel. Construction of the golf course will impact about 17.9 acres of wetlands, as defined by State wetland criteria.

To compensate for wetland impacts, Hellman Properties, LLC (applicant), proposes to construct 32.8 acres of wetland, comprised of a 26.0 acre salt marsh and a 6.8 acre freshwater marsh. In addition, the applicant proposes to reserve an additional 15.4 acres of uplands, currently in oil production, as a wetlands mitigation bank. With wetland restoration of this area, a total of 48.2 acres of wetlands could be restored in the future. Purchase and restoration of the area within the proposed mitigation bank would be the responsibility of other parties, and presumably used as compensatory mitigation for other wetland impacts. Restoration plans also consist of maintenance and monitoring requirements, proposed remedial actions, and performance criteria.

This Service is concerned that there is no analysis of feasible less environmentally damaging project alternatives and appears inconsistent with §30233 of the California Coastal Act of 1976. Consistent with the guidance under the California Environmental Quality Act adopted by the Commission in the document *Procedural Guidance for Evaluating Wetland Mitigation Projects in California's Coastal Zone*, dated September 1995, avoidance mitigation should be further explored. Our recommendation to further analyze avoidance as the primary form of mitigation is also consistent with Federal wetland regulatory policy. (A Clean Water Act section 404 permit, as well as compliance with the Environmental Protection Agency 404(b)(1) Guidelines are necessary, but we are not aware of any application pending.)

5-97-367 Exhibit D

D2

The Service is also concerned that "edge effects" will degrade the environmental resource value of the mitigation area with a golf course adjacent and interdigitated among the proposed restoration areas. These effects include human disturbance and noise. Although some habituation can occur for shorebirds and waterfowl, they are sensitive to disturbance. Individual birds engaged in transcontinental migrations where foraging and roosting are crucial to their survival can be adversely affected. Buffer areas between the golf course and the restoration areas appear to be proposed as less than 100 feet. According to the golf course plans, balls will be hit over restoration areas, which likely will trigger a periodic ball recovery program in the wetlands.

Little analysis is provided to justify the proposed "out of kind" wetland mitigation. The site now supports limited freshwater wetlands, yet 6.8 acre of freshwater restoration is proposed. The unmitigated loss of 7.0 acres of alkali flat wetlands, documented to be used by the snowy plover (*Charadrius alexandrinus nivosus*), a Federal threatened species, is not addressed. The Service acknowledges that the re-created wetlands may have some increased ecological value, as purported by the applicant in the above referenced technical reports. However, considering the State wetland criterion, and making an acreage comparison, the proposed saltwater marsh restoration ratio would be less than 1:1.

The Service recommends plan revisions that would result in an increase in the salt marsh ecosystem acreage that improves the quality of the existing wetlands areas.. The Service is also supportive of a concept to reserve areas for future wetland restoration and would like further details. However, the interlacing of human activities around and between these "habitat" areas also should be strongly discouraged. Future restoration would be to offset permissible wetland losses elsewhere; therefore, the "reserved lands area" portion of the mitigation proposed would be viewed independently and not actually offsetting wetland losses proposed with this project.

Also not addressed by the applicant is the loss of open space grasslands (about 137 acres, and one of the last open spaces in Seal Beach) associated with the proposed development. The California Department of Fish and Game noted that "a significant impact to raptor species listed as California Species of Special Concern" would take place The Service concurs that a significant amount of raptor foraging and wintering habitat will be lost.

In conclusion, the Service recommends that the Commission not approve a Coastal Development Permit for the project as proposed. Opportunities to avoid wetland impacts from urbanizing developments, reduce "edge effects", address impacts to raptors, and maximize coastal wetland restoration should be further explored. Further, the Service observes that coastal wetland restoration does not require the approval of "non-water dependent" or Coastal Act "incompatible" uses in wetlands (i.e., housing and golf course) to be considered feasible.

5-97-367 Exhibit D

We would appreciate a copy of the staff report prior to the scheduled Commission hearing. Please contact Robert James, Fish and Wildlife Biologist, at the letterhead address or at (760) 431-9440 if you have any questions or wish to further discuss this matter.

Sincerely,

Jim A. Bartel
Assistant Field Supervisor

1-6-98-TA-83
HELLMAN.WPD

cc: USACOE, Regulatory Branch, Los Angeles, CA (Attn: Eric Stein)
EPA, San Francisco, CA (Attn: Becky Tuden)
California Department of Fish and Game, Long Beach, CA (Attn: Scott Harris)
Regional Water Quality Control Board, Riverside, CA (Attn: Linda Garcia)

5-97-367 Exhibit D

Hellman Properties LLC
Post Office Box 2398
711 Seal Beach Boulevard
Seal Beach, California 90740
(562) 431-6022 Fax: (562) 493-3130

RECEIVED
MAR 17 1998
CALIFORNIA
COASTAL COMMISSION

March 17, 1998

Mr. Jim A. Bartel, Assistant Field Supervisor
FISH & WILDLIFE SERVICE
2730 Loker Avenue West
Carlsbad, CA 92008

RE: LETTER (NO DATE) TO JOHN T. AUYONG, CALIFORNIA COASTAL COMMISSION REGARDING HELLMAN RANCH RESERVE PROJECT COASTAL DEVELOPMENT PERMIT NO. 5-97-367

Dear Mr. James:

This letter is in response to your letter to the California Coastal Commission regarding the Hellman Ranch Reserve project. We share the same goal of resource protection and enhancement, and have planned this project to accomplish that goal and be consistent with all applicable provisions of Coastal Act policy.

We have included a preliminary response to your stated issues below and on the following pages. Your comments have been numbered and summarized for ease of review, with our responses noted below your comments. We would reserve the right to comment further on your letter if need be.

There is a considerable amount of information that has been developed with respect to this property and implementation measures and programs that will be a part of this project that we believe address many of your concerns.

1. Comment from letter: *"No analysis of feasible less environmentally damaging alternatives."*

The Coastal Act defines feasible as:

> "Capable of being accomplished in a successful manner within a reasonable period of time, taking into account environmental, social and technical factors."

5-97-367 ~~Addendum 4/98~~ Exhibit D

DS
pg 3

On the contrary, there has been significant alternatives analysis as part of the EIR and previous studies that demonstrates that this project is the most feasible and the least environmentally damaging alternative, while providing sufficient return to restore and protect in perpetuity, the habitat areas proposed on-site, all within the framework of land uses consistent with Coastal Act policies and the City of Seal Beach General Plan.

Factors which support the conclusion that the proposed project is less environmentally damaging include: (1) a golf course provides greater opportunities to integrate wetland habitats and buffers with open space/recreational use and has been successful in many projects; (2) a golf course is a visitor-serving, commercial recreational public use that promotes greater access to, and enjoyment of, the restored wetlands than other uses which may be more restrictive; (3) the golf course will be actively managed to protect the viability of the created and restored habitats; and (4) the proposed course and wetlands restoration project requires far less grading than either a boating facility or the previous Coastal Commission-approved residential development (1.6 million cubic yards of cut and fill for the RESERVE project versus 2.7 million cubic yards of grading for the previous proposal).

Additionally, the California Department of Fish and Game, California Coastal Conservancy and the California Coastal Commission have made findings regarding the Hellman wetlands that you should be aware of. These include:

> "Restoration of the wetlands natural values, including biological productivity and wildlife features, may be feasibly achieved by combining restoration activities with the development of adjacent property." *–California Department of Fish & Game, Determination of the Status of the Hellman Wetlands.*
>
> "The Department of Fish & Game determined that the wetlands on the site are severely degraded and in need of major restoration. This Fish & Game determination permits the Commission flexibility in consolidating and restoring wetlands in order to increase the productivity and viability of the wetlands." *–California Coastal Conservancy findings, Hellman Wetlands and Conservancy project #1-82.*
>
> "The Commission therefore concludes that in this particular wetland, maintaining the status quo is an undesirable planning option. Under 30233, the status quo is not the least environmentally damaging alternative."*–California Coastal Commission Findings, Coastal Conservancy Project #1-82, Hellman Wetlands.*

D-6

5-97-367 ~~Addendum 4/98~~ Exhibit D

p. 4

Additionally, the Fish & Wildlife Service supported a previously-approved Coastal Development Permit for this site that included 329 housing units. This project included houses planned in existing wetland areas and adjacent to a proposed restoration area, along with a 200-room hotel site directly adjacent to the proposed restoration area. This project did not meet the original Fish and Game goal of wetland consolidation (the restoration area was divided by an arterial highway) and left open the possibility of future residential or commercial development on oil production property, adjacent to the highway and the proposed restoration area.

Unlike the previous proposal, the RESERVE restoration project:

- Provides for a consolidated coastal salt marsh ecosystem
- Eliminates the hotel adjacent to the restored wetlands
- Eliminates the arterial highway through the site
- Reduces residential density from 329 housing units to 70
- Removes housing out of lowland areas
- Plans appropriately for future uses of oil production property (wetlands mitigation bank).

2. Comment from letter: *"Avoidance mitigation should be further explored."*

The avoidance issues has been thoroughly addressed in the Coastal Development Permit, Environmental Impact Report and the Wetland Restoration Plan for the RESERVE project. As background, most of the existing Hellman Ranch and surrounding area were all part of the Los Cerritos wetlands complex and San Gabriel River estuary. In the 1930's when the Corps of Engineers channelized the San Gabriel River, dredge fill material was placed on the Ranch. The Corps also created a ditch on the site so the land could continue to drain towards the river. When the Los Angeles Department of Water and Power condemned land for the Haynes Cooling Channel, dredge fill material was also placed on the Ranch. When the County of Orange created the Los Alamitos Retarding basin, fill material was placed on the Ranch. The point is, the current design and configuration of the existing wetlands are not the result of Mother Nature. Rather, they are the result of major urban infrastructure projects undertaken by federal and local governments. Biologists familiar with the site agree, and the Department of Fish & Game has made the determination, that the wetlands on the site are fragmented, severely degraded and degraded. Avoidance mitigation leaves a wetland that has no substantial values, a wetland that will continue to degrade and a wetland that is not consolidated. This is exactly the reason why the Coastal Commission and Coastal Conservancy have both previously made the finding that "under Section 30233 of the Coastal Act, the status quo is not the least environmentally damaging alternative."

5-97-367 ~~Addendum 4/98~~ Exhibit D

D-7

PC-5

Additionally, a wetland mitigation bank for approximately 90 acres of the Hellman Ranch site was considered as part of the EIR for the project. This proposal included reducing the number units approved for the site from the Commission approved 329 to 250. The environmental effects associated the housing development were of major concern to the City of Seal Beach, including traffic, air quality, water quality and public services, as well as the feasibility of a wetlands project of this magnitude, including grading requirements, limited tidal connection, timing, etc. Also taken into consideration is that directly adjacent to this site, within the City of Seal Beach, is the 1,000 acre National Wildlife Refuge and Anaheim Bay wetlands, administered by the Fish and Wildlife Service.

3. Comment from letter: *"Edge effects will degrade the environmental resource value, specifically the golf course."*

The edge condition as it relates to the golf course has been fully-documented in the EIR, the Wetlands Restoration Plan, the Coastal Development Permit and the report prepared by Audubon International for the RESERVE, entitled "An Environmental Approach to Golf Course Development and Management." The RESERVE golf course and this project has been a member of the Audubon Cooperative Sanctuary Program for over two years with plans to implement the Audubon principles into the final design and operations of the course. The buffers incorporated into the RESERVE project include edge conditions relating to existing and planned land uses. For the surrounding uses, the RESERVE has planned for appropriate edge conditions and buffers, especially considering the urban constraints and the context of the surrounding environment that this wetland restoration project is within. The golf course is proposed to be a links style course, designed to strict environmental standards in cooperation with the Audubon Cooperative Sanctuary Signature Program criteria for environmentally sensitive golf courses.

The golf course is designed in all instances to keep humans out of the wetland areas. The course will be graded so that all drainage is collected on the course and filtered through Best Management Practices, a substantial improvement over existing conditions and over typical golf course design. Strict materials applications, and other course management standards will be imposed to protect the wetlands. Roughs and fairways, managed correctly, provide excellent vegetated buffers in and of themselves.

There is both sufficient scientific understanding of how to sensitively design such a course, and sufficient precedent, to comfortably conclude that a properly designed and maintained course will be compatible with wetlands restoration, while providing controlled opportunities for viewing, recreation, and related public access activities. The activity of golfers on the golf course will be separated from nesting and foraging areas so as not to disturb habitat or wildlife. These

activities will be not dissimilar to bird watching trails and other controlled access opportunities for humans in habitat areas. The Audubon criteria, the design of the wetlands and golf course themselves, and the provisions for ongoing monitoring and maintenance will ensure that the project meets its objectives over the long-term. A bonus of the RESERVE project will be a wetlands interpretive facility, public access, dedication of a park site, and opportunities for research, school visits, bird watching, and related activities that will be open to the public, golfer and non-golfer alike.

Additionally, the residential project has been planned to be setback over 2,500 feet from the proposed restoration area, a substantial improvement over the previously approved plan that the Service supported.

4. Comment from letter: *"Unmitigated loss of 7 acres of alkali flat, documented to be used by the snowy plover."*

The western snowy plover is a resident shorebird of beaches and playas. This species been recorded at the 1,000 acre National Wildlife Refuge at Anaheim Bay, adjacent to the RESERVE project area. More than five biological surveys of the property within the last year, as part of the Environmental Impact Report, have not recorded the snowy plover on this site. According to wildlife biologists, the alkali flat on the property is severely degraded, not tidally influenced and is not suitable breeding habitat for the snowy plover. Additionally, the RESERVE restoration (mitigation) project proposes tidally influenced mud flats that will have much greater values than existing conditions. Furthermore, the Department of Fish & Game, in their degraded wetland analysis states that:

> "To the southeast of the channel is an 8.1 wetland area, consisting of 7 acres of salt flat. Assuming intense adjacent development, it seems unlikely that this 8.1 acre wetland would function viably. Human intrusion and the effect of adjacent disturbance would likely prevent this wetland from providing high value to wildlife."

The Fish & Game determination goes on to state that filling this wetland combined with creating wetlands in non-wetland areas such that a consolidated environment would be created, would be the most feasible means of enhancing wetland values.

5. Comment from letter: *"Less than 1:1 saltwater marsh restoration ratio."*

The RESERVE golf course will impact 17.9 acres of existing, severely degraded and degraded, fragmented wetlands and proposes a 28.1 acre consolidated restoration project, representing a 1.6:1 mitigation ratio. This represents an 18% increase in wetland acreage, according to federal criteria. This project also

represents a 3.6:1 mitigation ratio in terms of increase in functions and values, according to an hydrogeomorphic analysis created by the Army Corps of Engineers and completed by wildlife biologists. Additionally, there is freshwater wetland habitat associated with the RESERVE golf course that is not included in the quantitative or qualitative mitigation ratio. Further, the Coastal Commission has not undertaken any comprehensive scientific study to determine any fixed rule for mitigation ratios in all cases. The Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone states that "[wetland] replacement ratios vary depending on the acreage, functions, and values lost to development and the type of mitigation proposed."

6. Comment from letter: *"Service recommends revisions that would result in an increase in the salt marsh ecosystem acreage that improves the quality of the existing wetland areas."*

According to the Department of Fish & Game and RESERVE biologists, major restoration of the wetlands is required in order to increase the biological productivity of the site. To establish a fully-functioning ecosystem, improving the quality of the existing severely degraded and degraded wetlands is not an option that would substantially increase wetland values and has been determined to be infeasible.

7. Comment from letter: *"The "reserved lands area" portion of the mitigation proposed would be viewed independently and not actually off-setting wetland loss proposed with this project."*

We certainly agree with the above statement. At the request of the California Coastal Commission staff, we have proposed to reserve additional lands currently in oil production for a wetlands mitigation bank. The reservation of these lands is above and beyond the RESERVE'S wetland restoration project. However, planning appropriately for these lands will ensure that residential and commercial development will not occur adjacent to the proposed restoration area (which was not the case with the previously approved Commission project which the Service supported).

8. Comment from letter: *"Loss of open space grassland (about 137 acres, and one of the last open spaces in Seal Beach)*

The loss of open space grassland was evaluated as part of the current EIR, biological technical reports and several biologists working for the City of Seal Beach and the applicant. The loss of non-native vegetation that supports no federal or state listed endangered species was considered to be a less than significant impact and no mitigation measures were required as part of the EIR.

As far as the losing one of the last open spaces in Seal Beach, this is simply not a true statement. First of all, adjacent to the site, in the City of Seal Beach, is the 1,000 acre National Wildlife Refuge as part of the 5,000 acre Naval Weapons Station, which is predominantly open space. Secondly, the RESERVE project is nearly 80% open space, that will be available for public use in conjunction with this project. Public access to the site is increasing from 6% (today) to nearly 80% with implementation of the RESERVE project.

9. Comment from letter: *"Department of Fish & Game noted that "a significant impact to raptor species listed as California species of special concern" would take place. The service concurs that that a significant amount of raptor foraging habitat will be lost."*

Project biologists have determined that areas within the RESERVE project site will continue to provide some foraging value for raptors. Many of these species are expected to be winter visitors to the site, although some are potential breeders. Additionally, project biologists have determined, based on field surveys, that raptors, including "species of special concern," also forage in open space areas surrounding the Hellman property, such as the open fields to the north and northeast (approximately 30-40 acres) as well as the extensive areas of suitable habitat on the 5,000 acre Seal Beach Naval Weapons Station, directly east of Hellman site. The certified EIR for the RESERVE project states that, "due to the fact that fairly extensive raptor foraging habitat exists on the nearby Seal Beach Weapons Station, and the primarily temporary loss of foraging habitat on the project site, these impacts are not expected to be significant under CEQA." Additionally, the RESERVE project involves the dedication of Gum Grove Nature Park, an historic eucalyptus grove, which has documented nesting sites for raptors.

10. Comment from letter: *"Coastal wetland restoration does not require approval of "non water-dependent" or Coastal Act incompatible uses in wetlands (i.e., housing and golf course) to be considered feasible."*

Restoration is a permitted use under Section 30233 of the Coastal Act, as is a boating facility in a degraded wetland, pursuant to Section 30411 of the Coastal Act. A boating facility has been determined by Fish & Game not to be feasible. 30411 allows approval of uses other than boating facilities to promote major restoration of wetlands. Section 30411 be states:

> "Whether restoration of the wetland's natural values, including its biological productivity and wildlife habitat features, can most feasibly be achieved and maintained in conjunction with a boating facility or whether there are other feasible ways to achieve such values."

5-97-367 ~~Addendum 4/98~~ Exhibit D

D-11
~~p 2-9~~

The Statewide Interpretive Guidelines provide the Commission guidance regarding projects permitted under 30411 other than boating facilities. These projects should "result in no net loss of wetland habitat on the site as a minimum, [and] projects which result in a net increase in wetland habitat areas are greatly preferred", both under the Coastal Act and under Senate Concurrent Resolution 29.

Further guidance is provided to the Commission in that the Interpretive Guidelines also state that "other preferred options include restoration in conjunction with visitor-serving commercial recreational opportunities designed to increase public opportunities for coastal recreation."

It is our opinion, and we believe the opinion of Coastal Commission staff, the RESERVE project is in compliance with all applicable provisions of Coastal Act policy.

We hope this letter clarifies the issues of concern. We would be please to meet with you as soon as possible to answer any remaining questions you may have.

Sincerely,

Dave Bartlett
Project Manager

Copies: Charles Damm, California Coastal Commission
John T. Auyong, California Coastal Commission
Eric Stein, USACOE, Regulatory Branch, Los Angeles
Becky Tuden, EPA, San Francisco
Scott Harris, California Department of Fish & Game, Long Beach
Patty Wolf, California Department of Fish & Game, Long Beach
Craig Denisoff, Wetlands Coordinator, The Resources Agency
Linda Harris, RWQCB, Riverside
Dan Gorfain, State Lands Commission
Gwen Forsythe, Seal Beach City Council
Marilyn Hastings, Mayor, City of Seal Beach
Keith Till, City Manager, City of Seal Beach
Glen Shute, Shute, Mihaly & Weinberger
Susan Hori, Paone, Callahan, McHolm & Winton
Tony Bomkamp, Glenn Lukos Associates
Jerry Tone, Hellman Properties LLC

5-97-367 ~~Attachment 4/99~~ Exhibit D

D-12
~~p. 10~~

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

RECEIVED MAR 26 1998
MAR 30 1998
CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

Mr. Dave Bartlett, Project Manager
Hellman Properties LLC
P.O. Box 2398
711 Seal Beach Blvd
Seal Beach, California 90740

Re: Hellman Ranch Development, City of Seal Beach, California (Coastal Development Permit Application 5-97-367)

Dear Mr. Bartlett:

This responds to your letter of March 17, 1998, in which you objected to concerns raised in our letter of March 13, 1998, regarding the Hellman Ranch Development in the City of Seal Beach. This letter follows meetings with you and Jerry Tone (Hellman Properties LLC), Keith Till and Gwen Forsythe (City of Seal Beach), Tony Bomcamp (Glen Lukos and Associates), Charles Damm (California Coastal Commission), and Bob James and me of the U.S. Fish and Wildlife Service (Service) on March 23, 1998.

The Service acknowledges the significant planning efforts to date that have substantially modified earlier versions of the project through public and local jurisdictional participation in the California Environmental Quality Act and California Coastal Act process. Considerable environmental information has been generated about the proposed project site involving, at least, four project designs over a period of several years. In this regard, though the Service previously recommended the adoption of an earlier application for a coastal development permit in a letter dated November 13, 1989, this earlier project proposal ultimately was not adopted and is not at issue here. Moreover, the Service notes that this defunct proposal actually proposed greater wetland restoration in comparison to the current proposal.

During our meetings on March 23, 1998, we discussed your response to our comment letter of March 13, 1998. Though we appreciate the effort you and others made to explain why the proposed project should be adopted, the Service remains concerned about several aspects of this project. Integral to any alternative analysis and mitigation with respect to a proposed project, is an understanding of the baseline condition. We believe that it would be inappropriate to compare the present proposal to earlier, unapproved proposals to maintain that the present proposal reduces environmental impacts. The actual baseline should instead be the current, "no project" condition. Alternatives and mitigation proposals could then be compared to this condition.

Regarding restoration and open space issues, the proposed project currently would offset 27 acres of impact with the restoration of 26 acres, which is less than a 1:1 mitigation ratio. Though you

5-97-367 Exhibit D

noted on page 7 of your letter that the proposed project is "nearly 80% open space," the limited wildlife use of golf course areas cannot be viewed "biological open space."

With regard to the biological information, we discussed the shortcomings of the hydrogeomorphic (HGM) analysis. Although the Service recognizes the utility of professional opinion in biological efforts, we agreed that the HGM analysis was not derived from field data and that a lack of incorporation of other relevant variables (e.g., edge effects) exists that could influence the results and conclusions.

The Service also further detailed our concern regarding adverse, project-related edge effects, especially to migratory birds. We understand that no consistent design criterion exists for the proposed buffers between human and wildlife use areas. In addition to previously referenced effects, we discussed the potential for adverse modification of time-activity budgets, and increases in heart rates and other disturbance-related effects documented to occur in birds. We believe that the proposed freshwater restoration area would have limited wildlife value.

The Service remains concerned about wetland impacts, "edge" effects, impacts to raptors, and loss of grassland habitat of the proposed project. We remain supportive of plan revisions that would result in an increase in the saltmarsh ecosystem acreage, with increased buffers between wildlife and human activity. The Service further notes the potential availability of outside funding sources, like the Port Districts, to conduct wetland restoration activities.

We are available to continue to discuss project planning issues, which can include a further site visit. If we can be of any further aid or you have any questions, please contact Robert James, Fish and Wildlife Biologist, or me at the letterhead address or at (760) 431-9440.

Sincerely,

Jim A. Bartel
Assistant Field Supervisor

1-6-98-TA-86
HELLMA2.WPD

cc: California Coastal Commission, San Diego, CA (Attn: Charles Damm)
California Coastal Commission, Long Beach, CA (Attn: John Auyong)
USACOE, Regulatory Branch, Los Angeles, CA (Attn: Eric Stein)
EPA, San Francisco, CA (Attn: Becky Tuden)
California Department of Fish and Game, Long Beach, CA (Attn: Scott Harris)
Regional Water Quality Control Board, Riverside, CA (Attn: Linda Garcia)

5-97-367 Exhibit D

D-14

MEMORANDUM
via United States Mail

DATE: MAY 8, 1998

TO: CALIFORNIA COASTAL COMMISSION
ATT: JOHN AUYONG

RECEIVED
MAY 11 1998
CALIFORNIA
COASTAL COMMISSION

FROM: DAVE BARTLETT

COPIES TO: CLEM SHUTE
DWIGHT WORDEN
SUSAN HORI
JERRY TONE

RE: HELLMAN RANCH PROJECT AND USFWS INPUT INTO THE PLANNING PROCESS

For the record, we would like to include this memorandum of the USFWS involvement in the planning process for this project.

USFWS REVIEW TIME LINE

June 1995. The USFWS was part of a pre-planning meeting that included representatives from several resource agencies, including Fish & Game, ACOE, California Coastal Commission, National Marine Fisheries, Regional Quality Control Board, City of Seal Beach, Audubon International Two representatives from the USFWS attended the meeting.

August 1995. At that meeting, the USFWS asked that Hellman Properties to prepare a Pacific Pocket Mouse report, which we completed before the end of 1995. The Pacific Pocket mouse was determined not to be on the site.

November 26, 1996. The City of Seal Beach sent a Notice of Preparation (NOP) to the USFWS. **USFWS comment letter dated December 30, received by the City of Seal Beach.**

April 8, 1997. The City of Seal Beach sent (via certified mail) the Draft EIR and Technical Appendices to USFWS and requested comments. Comment period for Draft EIR ended on May 27. **No comments from the USFWS were received on the Draft EIR or technical appendices.**

June 5, 1997. The City of Seal Beach sent (via certified mail) the Revised Draft EIR (sections on biology and hydrology were revised). Comment period for Revised Draft EIR ended on July 23. **No comments from the USFWS were received on the Revised Draft EIR. The USFWS had over 90 days to respond to the project but did not.**

5-97-367 Exhibit D

Throughout 1996, 1997, 1998. Hellman Properties sent numerous reports to the USFWS to keep them informed regarding the project. These reports included the Wetlands Restoration Plan and other technical reports. **There was never any response to the technical reports that were sent to the USFWS for review.**

October 20, 1997. The City of Seal Beach certifies the Environmental Impact Report for the project.

November 1997. Hellman Properties submits for a Coastal Development Permit from the California Coastal Commission. The Commission schedules the project for February but it is postponed until April.

February 24, 1998. Coastal Commission staff asked the USFWS to comment on the project.

March 16, 1998. The Coastal Commission staff received a letter from the USFWS, indicating that the Service was not in support of the project. The letter was full of factual errors and made conclusions that were not based on adequate analysis. Additionally, no new information was contained in this letter.

March 17, 1998. Hellman Properties responded to the USFWS letter (see letter dated March 17).

March 23, 1998. At 11:00 a.m., representatives from Hellman Properties and the City of Seal Beach met with Bob James, the primary author of the USFWS letter to the Coastal Commission. Bob James indicated, 1) that he personally had not been to the site, but has driven by it; 2) that he had only skimmed the EIR; 3) that he wasn't aware the USFWS had previously supported another project on this site which was much more dense; 4) that he was not aware of the Audubon Program for the golf course; 5) that he would be unable to visit the site that afternoon; and 6) that he would not modify his assessment of the project in time for the Coastal Commission hearing in April.

March 23, 1998. On March 23, 1998 at 3:30 p.m., Hellman Properties and the City of Seal Beach met with Jim Bartel, Field Supervisor for the USFWS. We explained to Mr. Bartel that all of the USFWS concerns have been addressed in the EIR and summarized in our response letter and that based on this information, the USFWS should reconsider their position relative to this project. Jim agreed that the following day (March 24) that he would write a letter in response to the Hellman Properties letter to the USFWS letter dated March 17.

5-97-367 Exhibit D

STATE OF CALIFORNIA - THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
Region 5
330 Golden Shore, Suite 50
Long Beach, California 90802
(562) 590-5113

CITY OF SEAL BEACH
JUN - 2 1997
DEPARTMENT OF DEVELOPMENT SERVICES

May 21, 1997

S6

Mr. Lee Whittenberg
City of Seal Beach
211 Eighth Street
Seal Beach, CA 90740

Dear Mr. Whittenberg:

Draft Environmental Impact Report, Hellman Ranch Specific Plan
SCH# 96121009, Orange County

The Department of Fish and Game (Department) has reviewed the above-referenced Draft Environmental Impact Report (DEIR) as it affects biological resource values. The proposed Hellman Ranch Specific Plan is designed as a 231.3-acre master-planned community integrating 23.1 acres of saltwater wetlands, 9.7 acres of freshwater wetlands, dedication of Gum Grove Nature Park (10.2 acres), 107.5 acres of golf facilities, 34.7 acres for the Los Alamitos Retarding Basin, 1.8 acres of visitor recreational/commercial uses, 14.7 acres of single-family residential, 28.2 acres of mineral production, and 1.4 acres of public land use.

The Department has the following comments in regards to specific mitigation proposals for sensitive species with respects to impacts to specific habitat types:

Open Space Ruderal Grasslands

The DEIR indicates that the majority of the 137 acres of open space ruderal grasslands will be converted to other land uses and/or vegetative communities. The Department believes that the permanent loss of these open areas will have a significant impact to raptor species listed as California Species of Special Concern (CSC) such as the **White-tailed kite, (*Elanus leucurus*)** a potential breeding bird on site which has been declining regionally due to loss of post nesting foraging habitat, roost sites and nesting habitat and the **Western Burrowing Owl (*Speotyto cunicularia hypugea*)** which is especially dependant on open areas of low growing vegetation for foraging. Page 5-47, Volume I, of the DEIR points out that Burrowing Owls " have been largely extirpated from most of Orange County due to loss of suitable habitat(relatively extensive open areas with fairly level terrain)" so the presence of this species on the project site is significant.. S6-1

The DEIR further indicates that a single Burrowing Owl was observed in December of 1996 and January of 1997 and that a current spring survey for the presence and breeding status of any burrowing owls will be conducted on site. Because Burrowing owls exhibit high site fidelity, the Department considers a site to be S6-2

E-1 5-97-367 Exhibit E

S6 Responses to Comments from the California Department of Fish and Game, Dated May 21, 1997

S6-1 Although the majority of the 137 acres of ruderal grasslands will be converted to other land uses and/or vegetative communities, at least some of these areas will continue to provide potential foraging habitat for raptors, including the western burrowing owl. Some raptor species, such as the white-tailed kite, are presumed by project biologists to forage in open space areas surrounding the Hellman property, such as open fields to the north and northeast, as well as the extensive areas of suitable habitat on the Seal Beach Naval Weapons Station to the east. For burrowing owls, which may require foraging areas in proximity to nest sites, it is expected by project biologists that at least parts of the 28.2 acres of mineral production (Planning Area 9) and the 34.7-acre Los Alamitos Retarding Basin (Planning Area 5) will provide potential foraging habitat.

S6-2 As stated in the revised Hellman Ranch Specific Plan Draft EIR on page 5-53, a single burrowing owl was observed in the winter of 1997 by P&D, and later reobserved by MBA. MBA did perform a focused spring survey in 1997 with no owls observed during these surveys. In accordance with the California Department of Fish and Game's comment, it is understood that a site is considered occupied when at least one owl has been observed using a burrow within the last three years. High site fidelity of resident, breeding pairs of owls is well documented by burrowing owl biologists throughout California. It is suspected, however, that individuals at a wintering location may have less affinity to a particular site than a breeding pair. Based on the results of the most recent burrowing owl survey (spring 1997), no nesting burrowing owls were found on the Hellman Ranch property and no owls were observed using a burrow. Regardless, the impact on burrowing owl habitat would be considered a significant impact because an owl was observed using a burrow in the winter of 1996-1997. Consequently, a mitigation measure has been included in the EIR to provide suitable habitat should breeding burrowing owls move back onto the project site. It has been recommended by the California Coastal Commission that at least eight acres of habitat be maintained on the project site for burrowing owls. This will be accommodated in the approximate 28 acres of oil production area which has been identified as suitable owl habitat by project biologists. Because of the large buffer area around the oil production sites, these areas could serve both biologic and oil extraction uses.

S6-3 As stated in the Response to Comment S6-1 above, at least some portions of the golf course and wetland restoration areas are expected by project biologists to continue providing potential foraging habitat for the western burrowing owl, as well as other raptors. In addition, the mineral production areas and parts of the Los Alamitos Retarding Basin are expected to also provide potential foraging resources and breeding sites.

S6-4 Refer to responses to comments S6-1 to S6-3. The artificial burrows proposed as burrowing owl mitigation will be constructed in the mineral production areas. These areas are expected by project biologists to provide considerable foraging opportunities and a more adequate buffer around any burrows that may potentially become occupied.

assumed occupied if at least one burrowing owl has been observed occupying a burrow on the site within the last three years. S6-2

Based on the fact that Burrowing owls require habitat which consists of open areas with short growing vegetation, it is doubtful that the DEIR mitigation proposal to recreate roosting and breeding areas alone will be adequate to offset the loss of what will be the majority of foraging habitat for Burrowing Owls at the proposed project site. The vegetative communities that will exist following wetland restoration and gulf coarse construction activities will not encourage Burrowing owls to remain in the area for wintering or breeding purposes. S6-3

The Department recommends that the EIR propose appropriate mitigation measures such as avoidance and/or enhancement of open areas that will offset impacts to raptor foraging. In particular the Department recommends adhering to the enclosed mitigation measures prepared by the California Burrowing Owl Consortium which specifies minimum foraging and buffer areas from disturbance around active burrows. S6-4

Wetland Resources

Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) - Page 5-46, Volume I, of the DEIR indicates that the breeding status of the Belding's savannah sparrow "could not be determined" at the time that surveys were performed in 1996. Page 4, Volume 2,indicates that an additional survey during the breeding season would be conducted in 1997. Project construction taking place during the spring will have an impact on nesting Belding's savannah sparrows. It is imperative that the presence of breeding pairs be confirmed between March 1 and June 30 during the year immediately prior to any proposed springtime grading or other disturbances that are scheduled to take place in or adjacent to any remaining Belding's savannah sparrow breeding habitat. The final EIR shall include a discussion of performing a focused survey for breeding Belding's savannah sparrows and measures to be taken in order to plan project construction accordingly to avoid take of this species. S6-5

Southern Tarplant (*Hemizonia parryi spp. australis*) - The Department recommends avoidance of rare, threatened or sensitive plant species and generally does not support the use of relocation, salvage, and/or transplantation as mitigation for project impacts. Department studies have shown that these efforts are experimental in nature and largely unsuccessful. If the mitigation measures are implemented as stated in the DEIR, there should be a discussion as to what further action will be taken to assure for survival of the Southern tarplant and other if relocation efforts are not considered successful after the proposed five year monitoring period. S6-6

Coulter's goldfields (*Lasthenia glabrata spp. coulteri*), Parish's brittlescale (*Atriplex parishii*), Gambel's water cress (*Rorippa gambellii*) - The DEIR indicates that spring 1997 surveys will be performed for Coulter's goldfields, Parish's brittlescale, and Coulter's water cress. S6-7

Updated focused surveys for burrowing owls will be conducted in the spring prior to the initiation of project construction.

S6-5 A spring survey for Belding's savannah sparrow was conducted by Michael Brandman Associates in April 1997. No breeding pairs of sparrows were found during this survey. Therefore, the EIR concludes that the proposed project will not impact Belding's savannah sparrows. Also refer to response to comment S6-6, above. The spring survey for sparrows and the California burrowing owl is included as Appendix A to the Revised Draft EIR for the Hellman Ranch Specific Plan.

S6-6 Based on review of the proposed mitigation measures for the southern tarplant (*Hemizonia parryi* ssp. *australis*) by the Project biologist in coordination with the botanist from P&D Consultants, the following changes were incorporated in the project mitigation program to provide for a higher probability of success:

B3.6 The southern tarplant topsoil ~~shall~~ will be respread in the selected location as approved by the project biologist. ~~There will be 60~~ Sixty percent of the southern tarplant seeds ~~shall be~~ will spread in the fall following soil preparation. Forty percent of the seed ~~shall~~ will be kept in storage for subsequent seeding, if necessary.

B3.10 If the germination goal of 60 percent is not achieved following the first season, remediation measures ~~shall~~ will be implemented prior to seeding with the remaining 40 percent of seed. Remedial measures ~~shall~~ will include at a minimum: soils testing, control of invasive species, soil amendments and physical disturbance (to provide scarification of the seed) of the planted areas by raking or similar actions. Additional mitigation measures may be suggested as determined ~~necessary appropriate~~ by the project biologist.

B3.11 Potential seed sources from additional donor sites ~~shall~~ will also ~~be~~ identified in case it becomes necessary to collect additional seed for use on the site following performance of remedial measures.

S6-7 Survey results and mitigation measures for Coulter's goldfields are provided in the Hellman Ranch Specific Plan Revised Draft Environmental Impact Report. Based on review of the mitigation measures for the Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) by the project biologist in coordination with the botanist from P&D Consultants, the following changes will be incorporated into the mitigation program to provide for a higher probability of success:

B4.3 The Coulter's goldfields topsoil ~~shall~~ will be respread in the selected location as approved by the project biologist. ~~There will be 60~~ Sixty percent of the Coulter's goldfields seeds ~~shall be~~ will spread in the fall following soil preparation. Forty percent of the seed ~~shall~~ will be kept in storage for subsequent seeding, if necessary.

E2 5-97-367 Exhibit E

Mr. Lee Whittenberg
May 21, 1997
Page Three

The final EIR should include a discussion of the results of these surveys and measures to be taken to assure impacts to these species, and any other rare, threatened or sensitive plant species found as a result of these current surveys , will be reduced beyond a significant level. S6-7

The Department has direct authority under Fish and Game Code §1600 et seq. in regard to any proposed activity which would divert, obstruct, or affect the natural flow or change the bed, channel, or bank of any river, stream, or lake. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. Please contact the Department's Environmental Services Division at (562) 590-5137 to schedule a pre-project planning meeting. S6-8

Saltwater Wetland Restoration (Planning Area 1)

Page 3-5, Volume 1, of the DEIR indicates that the saltwater wetland restoration area is to " be dedicated to an appropriate public or nonprofit resources agency or organization for monitoring, maintenance and management."

The operation and maintenance of saltwater wetland resources can be resource intensive. The assurance that the proposed restored saltwater wetland will function well into the future may be in question if operation and maintenance funding sources are not assured during the planning stage of the restoration. It is therefore recommend that an endowment be established in order to assure that the wetland will perform successfully in the long term as the proposed design has intended. S6-9

Thank you for this opportunity to comment. Questions regarding this letter and further coordination on these issues should be directed to Mr. Scott Harris, Wildlife Biologist at (562) 590-5100.

Sincerely,

Patricia Wolf
Acting Regional Manager

copy: See Attached List

5-97-367 Exhibit E

E3

B4.6 If the germination goal of 60 percent is not achieved following the first season, remediation measures will be implemented prior to seeding with the remaining 40 percent of seed. Remedial measures shall will include at a minimum: soils testing, control of invasive species, application of soil amendments, and physical disturbance (to provide scarification of the seed) of the planted areas by raking or similar actions. Additional mitigation measures may be suggested as determined appropriate by the project biologist.

B4.8 Potential seed sources from additional donor sites shall will also be identified in case it becomes necessary to collect additional seed, for use on the site following performance of remedial measures.

S6-8 The project developer will consult with the Department of Fish and Game before any construction takes place on the project site. Appropriate permits will also be obtained before project construction takes place.

S6-9 The City is aware of the continuing expense of maintaining the restored wetlands. Decision-makers will consider the commentor's suggestion of an endowment during negotiation of a development agreement with the project applicant. It is assumed that the grantee of any conservation easement or other conveyance in this instance would require some on-going funding as a condition of acceptance.

copy: Mr. Jim Dice
Department of Fish and Game
Borrego Springs, California

Mr. Dan Gorfain
State Lands Commission
Sacramento, California

U.S. Fish and Wildlife Service
Carlsbad, California

U.S. Army Corps of Engineers
Los Angeles, California

State Clearinghouse
Sacramento, California

BURROWING OWL SURVEY PROTOCOL AND MITIGATION GUIDELINES

Prepared by:

The California Burrowing Owl Consortium

April 1993

5-97-367 Exhibit E

Eh

INTRODUCTION

The California Burrowing Owl Consortium developed the following Survey Protocol and Mitigation Guidelines to meet the need for uniform standards when surveying burrowing owl (*Speoryto cunicularia*) populations and evaluating impacts from development projects. The California Burrowing Owl Consortium is a group of biologists in the San Francisco Bay area who are interested in burrowing owl conservation. The following survey protocol and mitigation guidelines were prepared by the Consortium's Mitigation Committee. These procedures offer a decision-making process aimed at preserving burrowing owls in place with adequate habitat.

California's burrowing owl population is clearly in peril and if declines continue unchecked the species may qualify for listing. Because of the intense pressure for development of open, flat grasslands in California, resource managers frequently face conflicts between owls and development projects. Owls can be affected by disturbance and habitat loss, even though there may be no direct impacts to the birds themselves or their burrows. There is often inadequate information about the presence of owls on a project site until ground disturbance is imminent. When this occurs there is usually insufficient time to evaluate impacts to owls and their habitat. The absence of standardized field survey methods impairs adequate and consistent impact assessment during regulatory review processes, which in turn reduces the possibility of effective mitigation.

These guidelines are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or the resources that support them. The process begins with a four-step survey protocol to document the presence of burrowing owl habitat, and evaluate burrowing owl use of the project site and a surrounding buffer zone. When surveys confirm occupied habitat, the mitigation measures are followed to minimize impacts to burrowing owls, their burrows and foraging habitat on the site. These guidelines emphasize maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement of owls to an alternate site.

Each project and situation is different and these procedures may not be applicable in some circumstances. Finally, these are not strict rules or requirements that must be applied in all situations. They are guidelines to consider when evaluating burrowing owls and their habitat, and they suggest options for burrowing owl conservation when land use decisions are made.

Section 1 describes the four phase Burrowing Owl Survey Protocol. Section 2 contains the Mitigation Guidelines. Section 3 contains a discussion of various laws and regulations that protect burrowing owls and a list of references cited in the text.

We have submitted these documents to the California Department of Fish and Game (CDFG) for review and comment. These are untested procedures and we ask for your comments on improving their usefulness.

5-97-367 Exhibit E

SECTION 1 BURROWING OWL SURVEY PROTOCOL

PHASE I: HABITAT ASSESSMENT

The first step in the survey process is to assess the presence of burrowing owl habitat on the project site including a 150-meter (approx. 500 ft.) buffer zone around the project boundary (Thomsen 1971, Martin 1973).

Burrowing Owl Habitat Description
Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (Zarn 1974). Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of burrowing owl habitat: both natural and artificial burrows provide protection, shelter, and nests for burrowing owls (Henny and Blus 1981). Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement.

Occupied Burrowing Owl Habitat
Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance. Burrowing owls exhibit high site fidelity, reusing burrows year after year (Rich 1984, Feeney 1992). A site should be assumed occupied if at least one burrowing owl has been observed occupying a burrow there within the last three years (Rich 1984).

The Phase II burrow survey is required if burrowing owl habitat occurs on the site. If burrowing owl habitat is not present on the project site and buffer zone, the Phase II burrow survey is not necessary. A written report of the habitat assessment should be prepared (Phase IV), stating the reason(s) why the area is not burrowing owl habitat.

PHASE II: BURROW SURVEY

1. A survey for burrows and owls should be conducted by walking through suitable habitat over the entire project site and in areas within 150 meters (approx 500 ft.) of the project impact zone. This 150-meter buffer zone is included to account for adjacent burrows and foraging habitat outside the project area and impacts from factors such as noise and vibration due to heavy equipment which could impact resources outside the project area.

2. Pedestrian survey transects should be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines should be no more than 30 meters (approx. 100 ft.), and should be reduced to account for differences in terrain, vegetation density, and ground surface visibility. To efficiently survey projects larger than 100 acres, it is recommended that two or more surveyors conduct concurrent surveys. Surveyors should maintain a minimum distance of 50 meters (approx. 160 ft.) from any owls or occupied burrows. It is important to minimize disturbance near occupied burrows during all seasons.

3. If burrows or burrowing owls are recorded on the site, a map should be prepared of the burrow concentration areas. A breeding season survey and census (Phase III) of burrowing owls is the next step required.

4. Prepare a report (Phase IV) of the burrow survey stating whether or not burrows are present.

5. A preconstruction survey may be required by project-specific mitigations no more than 30 days prior to ground disturbing activity.

PHASE III: BURROWING OWL SURVEYS, CENSUS AND MAPPING

If the project site contains burrows that could be used by burrowing owls, then survey efforts should be directed towards determining owl presence on the site. Surveys in the breeding season are required to describe if, when, and how the site is used by burrowing owls. If no owls are observed using the site during the breeding season, a winter survey is required.

Survey Methodology
A complete burrowing owl survey consists of four site visits. During the initial site visit examine burrows for owl sign and map the locations of occupied burrows. Subsequent observations should be conducted from as many fixed points as necessary to provide visual coverage of the site using spotting scopes or binoculars. It is important to minimize disturbance near occupied burrows during all seasons. Site visits must be repeated on four separate days. Conduct these visits from two hours before sunset to one hour after or from one hour before to two hours after sunrise. Surveys should be conducted during weather that is conducive to observing owls outside their burrows. Avoid surveys during heavy rain, high winds (> 20 mph), or dense fog.

Nesting Season Survey. The burrowing owl nesting season begins as early as February 1 and continues through August 31 (Thomsen 1971, Zarn 1974). The timing of nesting activities may vary with latitude and climatic conditions. If possible, the nesting season survey should be conducted during the peak of the breeding season, between April 15 and July 15. Count and map all burrowing owl sightings, occupied burrows, and burrows with owl sign. Record numbers of pairs and juveniles, and behavior such as courtship and copulation. Map the approximate territory boundaries and foraging areas if known.

Survey for Winter Residents (non-breeding owls). Winter surveys should be conducted between December 1 and January 31, during the period when wintering owls are most likely to be present. Count and map all owl sightings, occupied burrows, and burrows with owl sign.

Surveys Outside the Winter and Nesting Seasons. Positive results (i.e., owl sightings) outside of the above survey periods would be adequate to determine presence of owls on site. However, results of these surveys may be inadequate for mitigation planning because the numbers of owls and their pattern of distribution may change during winter and nesting seasons. Negative results during surveys outside the above periods are not conclusive proof that owls do not use the site.

Preconstruction Survey. A preconstruction survey may be required by project-specific mitigations and should be conducted no more than 30 days prior to ground disturbing activity.

PHASE IV: RESOURCE SUMMARY, WRITTEN REPORT

A report should be prepared for CDFG that gives the results of each Phase of the survey protocol, as outlined below.

Phase I: Habitat Assessment

1. Date and time of visit(s) including weather and visibility conditions; methods of survey.

2. Site description including the following information: location, size, topography, vegetation communities, and animals observed during visit(s).

3. An assessment of habitat suitability for burrowing owls and explanation.

4. A map of the site.

Phase II: Burrow Survey

1. Date and time of visits including weather and visibility conditions; survey methods including transect spacing.

2. A more detailed site description should be made during this phase of the survey protocol including a partial plant list of primary vegetation, location of nearest freshwater (on or within one mile of site), animals observed during transects.

3. Results of survey transects including a map showing the location of concentrations of burrow(s) (natural or artificial) and owl(s), if present.

5-97-367 Exhibit E

C6

Phase III: Burrowing Owl Surveys, Census and Mapping

1. Date and time of visits including weather and visibility conditions; survey methods including transect spacing.

2. Report and map the location of all burrowing owls and owl sign. Burrows occupied by owl(s) should be mapped indicating the number of owls at each burrow. Tracks, feathers, pellets, or other items (prey remains, animal scat) at burrows should also be reported.

3. Behavior of owls during the surveys should be carefully recorded (from a distance) and reported. Describe and map areas used by owls during the surveys. Although not required, all behavior is valuable to document including feeding, resting, courtship, alarm, territorial, parental, or juvenile behavior.

4. Both winter and nesting season surveys should be summarized. If possible include information regarding productivity of pairs, seasonal pattern of use, and include a map of the colony showing territorial boundaries and home ranges.

5. The historical presence of burrowing owls on site should be documented, as well as the source of such information (local bird club, Audubon society, other biologists, etc.).

E7

5-97-367 Exhibit E

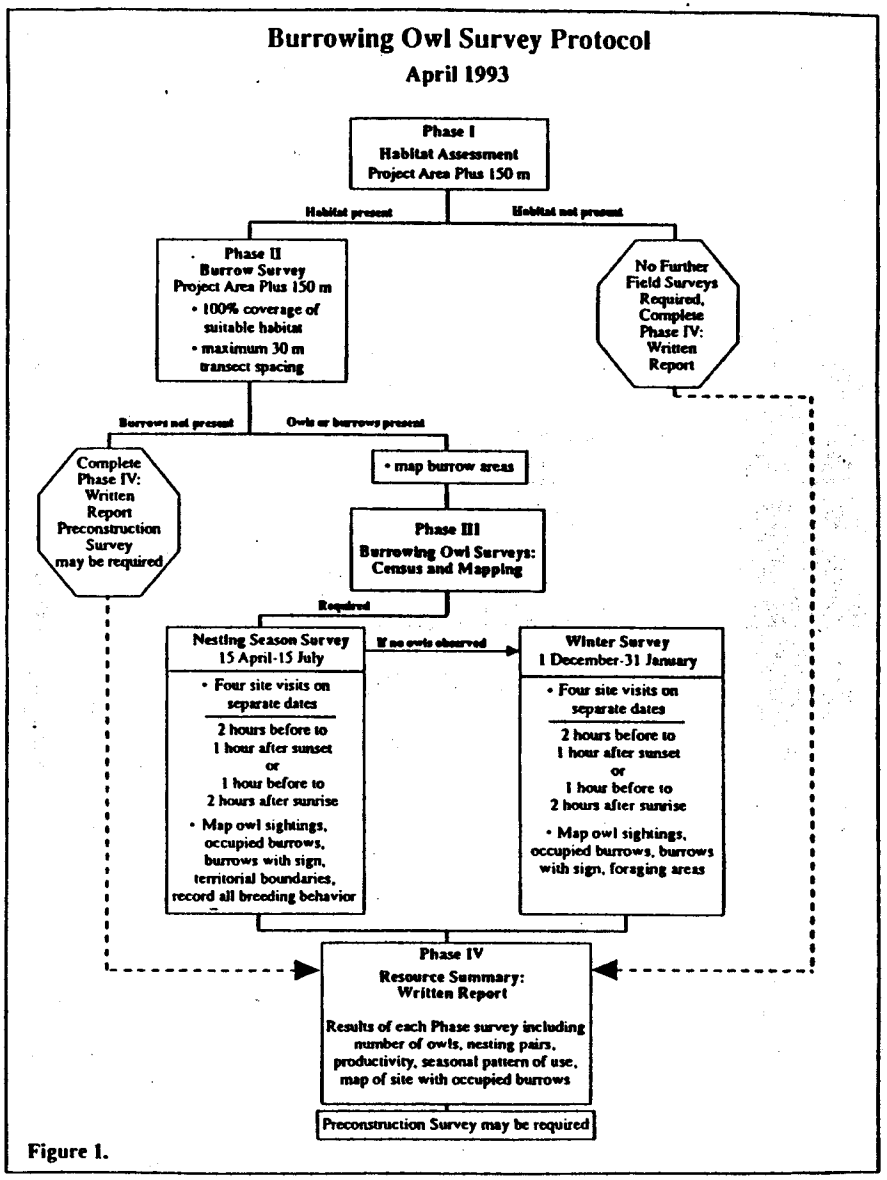


Figure 1.

SECTION 2 BURROWING OWL MITIGATION GUIDELINES

The objective of these mitigation guidelines is to minimize impacts to burrowing owls and the resources that support viable owl populations. These guidelines are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or their resources. The process begins with a four-step survey protocol (see *Burrowing Owl Survey Protocol*) to document the presence of burrowing owl habitat, and evaluate burrowing owl use of the project site and a surrounding buffer zone. When surveys confirm occupied habitat, the mitigation measures described below are followed to minimize impacts to burrowing owls, their burrows and foraging habitat on the site. These guidelines emphasize maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement of owls to an alternate site.

Mitigation actions should be carried out prior to the burrowing owl breeding season, generally from February 1 through August 31 (Thomsen 1971, Zarn 1974). The timing of nesting activity may vary with latitude and climatic conditions. Project sites and buffer zones with suitable habitat should be resurveyed to ensure no burrowing owls have occupied them in the interim period between the initial surveys and ground disturbing activity. Repeat surveys should be conducted not more than 30 days prior to initial ground disturbing activity.

DEFINITION OF IMPACTS

1. Disturbance or harassment within 50 meters (approx. 160 ft.) of occupied burrows.

2. Destruction of burrows and burrow entrances. Burrows include structures such as culverts, concrete slabs and debris piles that provide shelter to burrowing owls.

3. Degradation of foraging habitat adjacent to occupied burrows.

GENERAL CONSIDERATIONS

1. Occupied burrows should not be disturbed during the nesting season, from February 1 through August 31, unless the Department of Fish and Game verifies that the birds have not begun egg-laying and incubation or that the juveniles from those burrows are foraging independently and capable of independent survival at an earlier date.

2. A minimum of 6.5 acres of foraging habitat, calculated on a 100-m (approx. 300 ft.) foraging radius around the natal burrow, should be maintained per pair (or unpaired resident single bird) contiguous with burrows occupied within the last three years (Rich 1984, Feeney 1992). Ideally, foraging habitat should be retained in a long-term conservation easement.

3. When destruction of occupied burrows is unavoidable, burrows should be enhanced (enlarged or cleared of debris) or created (by installing artificial burrows) in a ratio of 1:1 in adjacent suitable habitat that is contiguous with the foraging habitat of the affected owls.

4. If owls must be moved away from the disturbance area, passive relocation (see below) is preferable to trapping. A time period of at least one week is recommended to allow the owls to move and acclimate to alternate burrows.

5. The mitigation committee recommends monitoring the success of mitigation programs as required in Assembly Bill 3180. A monitoring plan should include mitigation success criteria and an annual report should be submitted to the California Department of Fish and Game.

AVOIDANCE

Avoid Occupied Burrows

No disturbance should occur within 50 m (approx. 160 ft.) of occupied burrows during the non-breeding season of September 1 through January 31 or within 75 m (approx. 250 ft.) during the breeding season of February 1 through August 31. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or single unpaired resident bird (Figure 2).

MITIGATION FOR UNAVOIDABLE IMPACTS

On-site Mitigation

On-site passive relocation should be implemented if the above avoidance requirements cannot be met. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 50 m from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls (Figure 3). Relocation of owls should only be implemented during the non-breeding season. On-site habitat should be preserved in a conservation easement and managed to promote burrowing owl use of the site.

Owls should be excluded from burrows in the immediate impact zone and within a 50 m (approx. 160 ft.) buffer zone by installing one-way doors in burrow entrances. One-way doors should be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow should be provided for each burrow that will be excavated in the project impact zone. The project area should be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags should be inserted into the tunnels

5-97-367 Exhibit E

E8

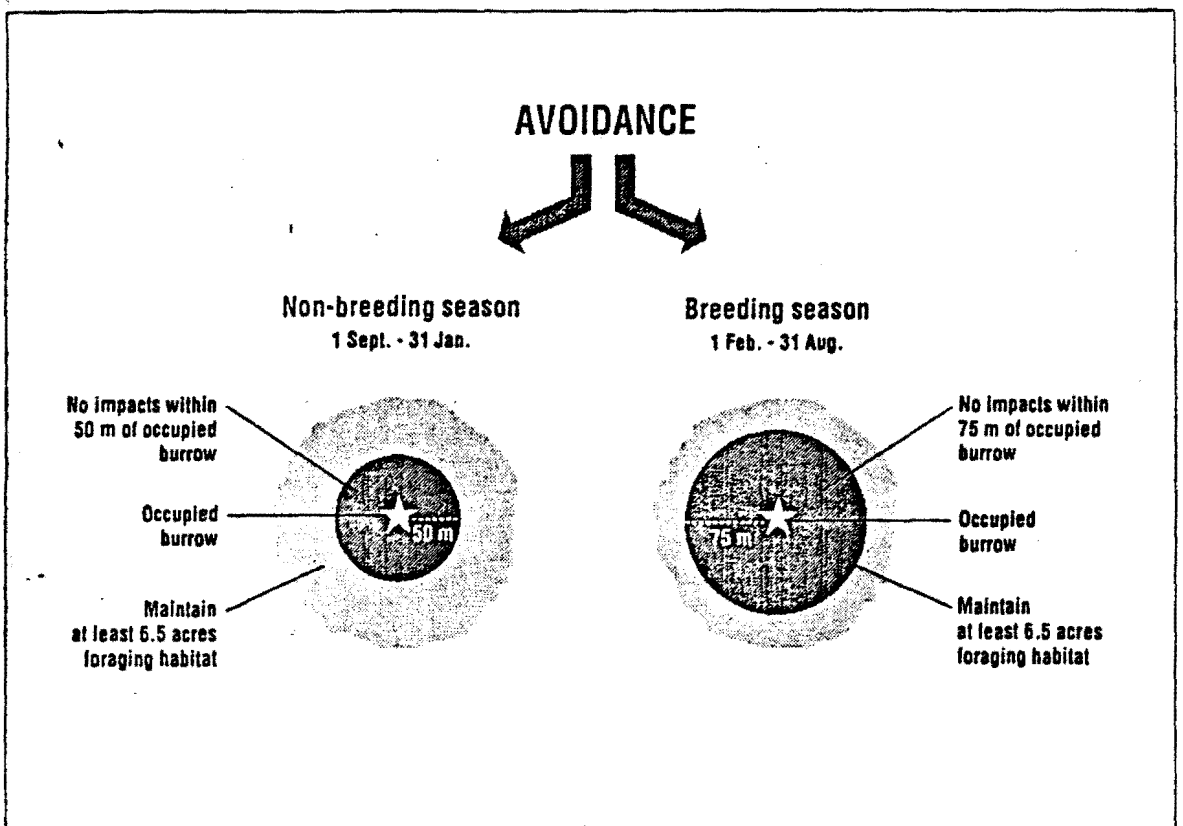


Figure 2. Burrowing owl mitigation guidelines.

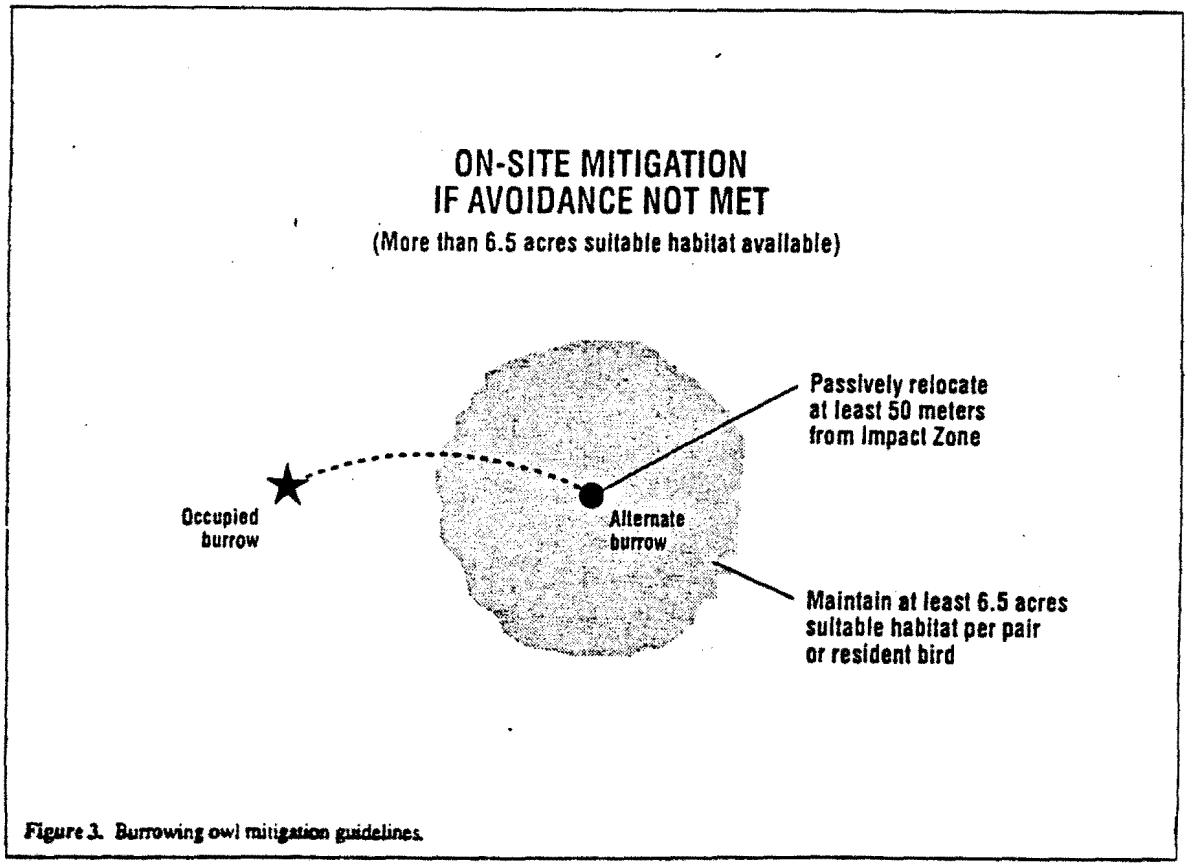


Figure 3. Burrowing owl mitigation guidelines.

5-97-367
Exhibit E

E9

during excavation to maintain an escape route for any animals inside the burrow.

Off-site Mitigation
If the project will reduce suitable habitat on-site below the threshold level of 6.5 acres per relocated pair or single bird, the habitat should be replaced off-site. Off-site habitat must be suitable burrowing owl habitat, as defined in the *Burrowing Owl Survey Protocol*, and the site approved by CDFG. Land should be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. Off-site mitigation should use one of the following ratios:

1. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair or single bird.

2. Replacement of occupied habitat with habitat contiguous to currently occupied habitat: 2 times 6.5 (13.0) acres per pair or single bird.

3. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair or single bird.

5-97-367 Exhibit E

E10

SECTION 3 LEGAL STATUS

The burrowing owl is a migratory bird species protected by international treaty under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3503, 3503.5, and 3800 of the California Department of Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs. Implementation of the take provisions requires that project-related disturbance at active nesting territories be reduced or eliminated during critical phases of the nesting cycle (March 1 - August 15, annually). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or the loss of habitat upon which the birds depend is considered "taking" and is potentially punishable by fines and/or imprisonment. Such taking would also violate federal law protecting migratory birds (e.g., MBTA).

The burrowing owl is a Species of Special Concern to California because of declines of suitable habitat and both localized and statewide population declines. Guidelines for the Implementation of the California Environmental Quality Act (CEQA) provide that a species be considered as endangered or "rare" regardless of appearance on a formal list for the purposes of the CEQA (Guidelines, Section 15380, subsections b and d). The CEQA requires a mandatory findings of significance if impacts to threatened or endangered species are likely to occur (Sections 21001{c}, 21083. Guidelines 15380, 15064, 15065). Avoidance or mitigation must be presented to reduce impacts to less than significant levels.

CEQA AND SUBDIVISION MAP ACT

CEQA Guidelines Section 15065 directs that a mandatory finding of significance is required for projects that have the potential to substantially degrade or reduce the habitat of, or restrict the range of a threatened or endangered species. CEQA requires agencies to implement feasible mitigation measures or feasible alternatives identified in EIR's for projects which will otherwise cause significant adverse impacts (Sections 21002, 21081, 21083; Guidelines, sections 15002, subd. (a)(3), 15021, subd. (a)(2), 15091, subd. (a).).

To be legally adequate, mitigation measures must be capable of "avoiding the impact altogether by not taking a certain action or parts of an action"; "minimizing impacts by limiting the degree or magnitude of the action and its implementation"; "rectifying the impact by repairing, rehabilitating or restoring the impacted environment"; "or reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action." (Guidelines, Section 15370).

Section 66474 (e) of the Subdivision Map Act states "a legislative body of a city or county shall deny approval of a tentative map or parcel map for which a tentative map was not required, if

it makes any of the following findings:...(e) that the design of the subdivision or the proposed improvements are likely to cause substantial environmental damage or substantially and avoidably injure fish and wildlife or their habitat". In recent court cases, the court upheld that Section 66474(e) provides for environmental impact review separate from and independent of the requirements of CEQA (Topanga Assn. for a Scenic Community v. County of Los Angeles, 263 Cal. Rptr. 214 (1989).). The finding in Section 66474 is in addition to the requirements for the preparation of an EIR or Negative Declaration.

5-97-367
Exhibit E

E11

LITERATURE CITED

Feeney, L. 1992. Site fidelity in burrowing owls. Unpublished paper presented to Raptor Research Annual Meeting, November 1992. Seattle, Washington.

Haug, E. A. and L. W. Oliphant. 1990. Movements, activity patterns, and habitat use of burrowing owls in Saskatchewan. J. Wildlife Management 54:27-35.

Henny, C. J. and L. J. Blus. 1981. Artificial burrows provide new insight into burrowing owl nesting biology. Raptor Research 15:82-85.

Martin, D. J. 1973. Selected aspects of burrowing owl ecology and behavior. Condor 75:446-456.

Rich, T. 1984. Monitoring burrowing owl populations: Implications of burrow re-use. Wildlife Society Bulletin 12:178-180.

Thomsen, L. 1971. Behavior and ecology of burrowing owls on the Oakland Municipal Airport. Condor 73:177-192.

Zarn, M. 1974. Burrowing owl. U. S. Department of Interior, Bureau of Land Management. Technical Note T-N 250. Denver, Colorado. 25pp.

State of California

Memorandum

To : Mr. John T. Auyong, Staff Analyst
California Coastal Commission
200, Oceangate, 10 Floor
Long Beach, California 90802

Date : March 16, 1998

RECEIVED
MAR 27 1998
CALIFORNIA
COASTAL COMMISSION

From : Department of Fish and Game - South Coast Region

Subject : **Request for Comments for the Hellman Ranch Development under Coastal Development Application # 5-636-97, Orange County**

The Department of Fish and Game (Department) has reviewed your letter dated February 21, 1998 regarding the proposed Hellman Ranch Development project located in the City of Seal Beach. Specifically your letter included several inquires as to the Department's position regarding wetland impacts and mitigation efforts in regards to this proposed project. Each of your inquiries is listed below, followed by the Department's responses:

1) Would a Streambed Alteration Agreement (SAA) under Section 1601 of the Title 14 California Code of Regulations be required for the project ?

The Department has not received enough information regarding the extent of freshwater influence on the wetland portion of the property, namely, the seasonal ponds, alkaline flats and tidal channel. We are in the process of clarifying this information and will be making a determination regarding Department jurisdiction. The Coastal Commission shall receive a copy of the Streambed Alteration Agreement should one be issued for this project.

2) Has the Department made any other wetlands determination for the Hellman Ranch site since its January 13, 1982 determination?

The Department has not made any subsequent wetlands determinations for this location.

3) Would the Department support the Coastal Commission's recommendations for further salt marsh mitigation by the applicant and setting aside existing oil-production facilities for future restoration by the applicant or other parties?

The Department supports the Coastal Commission's recommendation for additional saltmarsh restoration and/or creation efforts on the site as a result of the proposed project. Please note that the Department has received correspondence from D. Bartlett and Associates indicating a commitment, following the Coastal

5-97-367
Exhibit E

E-12

Commission's request, for additional salt marsh mitigation as well as a wetlands mitigation banking proposal for the oil-producing portion of the site. The Department recommends that the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers be brought into this discussion, if this has not already been done. This will facilitate a consensus as to the potential value of this area as a wetland mitigation bank and how best to accomplish this under the regulatory requirements of these resource agencies and the Department.

The Department appreciates this opportunity to further comment on the proposed Hellman Ranch development project. If you have any question regarding this issue, please contact Mr. Scott Harris, Wildlife Biologist, at (562) 590-5100.

Sincerely,

Ronald D. Rempel

Ronald D. Rempel
Regional Manager

cc: Mr. Scott Harris
Department of Fish and Game
Long Beach, California

Ms. Terri Dickerson
Department of Fish and Game
Laguna Niguel, California

Ms. Maryln Fluhearty
Department of Fish and Game
San Diego, California

Mr. Robert Tasto
Department of Fish and Game
Menlo Park, California

U.S. Fish and Wildlife Service
Carlsbad, California

U.S. Army Corps of Engineers
Los Angeles, California

5-97-367
Exhibit E

E13

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

REPLY TO
ATTENTION OF:

March 23, 1998

RECEIVED
MAR 30 1998
CALIFORNIA
COASTAL COMMISSION

Office of the Chief
Regulatory Branch

Hellman Properties LLC
Attn: Dave Bartlett
P.O. Box 2398
Seal Beach, California 90740

Dear Mr. Bartlett

We have received copies of correspondence from yourself and the U.S. Fish and Wildlife Service (Service) discussing issues related to projected wetland impacts associated with the proposed Hellman Ranch Development (DA File No. 98-00219-ES) in Seal Beach, California. The purpose of this letter is to clarify the Corps of Engineers current status of review on the proposed project.

At this time, we have not received a complete application for a Department of the Army permit or a draft Section 404(b)(1) alternatives analysis; however, based on information discussed at a December 15, 1997 site visit and a March 18, 1998 phone call between yourself and Eric Stein of my staff, there are substantive unresolved issues regarding the project. The proposed project site was historically part of the Alamitos Bay wetlands complex. The lowland portion of the site was partially filled with dredge spoils during construction of the San Gabriel River channel and contains a tidal channel running through the site. Because the lowlands were historically subject to the ebb and flow of the tide and may, in part, be reasonably returned to tidal influence, we believe that a portion of the lowlands is still subject to Corps jurisdiction under Section 10 of the Rivers and Harbors Act of 1899. The extent of Corps jurisdiction must be resolved prior to our analysis of alternatives and impacts.

The Clean Water Act Section 404(b)(1) guidelines stipulate that all practicable efforts must be made to avoid and minimize impacts to aquatic resources and that the Corps can only authorize the least environmentally damaging practicable project alternative. Furthermore, for non-water dependent projects, such as residential and recreational development, the guidelines establish a rebuttable presumption that a less damaging alternative exists that would not affect special aquatic sites (*e.g.* wetlands). In this case, the burden of proof is on the applicant to demonstrate that less damaging alternatives are not practicable. At this time, we do not have sufficient information to determine whether the proposed project would constitute the least environmentally damaging practicable alternative. The objectives of our analysis will be to ensure that impacts to all Corps jurisdictional area (under both Section 404 and Section 10) are avoided and minimized to the maximum extent practical and that all opportunities to restore wetlands on the project site are maximized.

5-97-367 ~~[illegible] 4/98~~ Exhibit E ~~[illegible]~~

E-14

Please be aware, that the Corps' alternatives analysis process may require you to substantially modify your proposed project in order to satisfy the requirements of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act.

Several comments in your and the Service's letters reference mitigation for the proposed project. The Section 404(b)(1) guidelines require that compensatory mitigation be used only to offset impacts that cannot be avoided or minimized. Therefore, until we have completed our alternatives analysis and know what the project impacts will be, it is difficult to comment on mitigation. However, given the extent of historic loss of coastal wetlands in Southern California, mitigation requirements for impacts to coastal wetlands typically involve creation or restoration of similar wetlands at a 4:1 or 5:1 ratio. Your letter states that "according to a hydrogeomorphic analysis, the project would result in a 3.6:1 mitigation ratio in terms of functions and values". The Corps is actively engaged in the development of a regional guidebook to assess hydrogeomorphic function (not values) of riverine wetlands in Southern California. Currently, no regional hydrogeomorphic model exists to assess functions of estuarine fringe or depressional wetlands, such as those found on the proposed project site. Therefore, any analysis of functional loss or gain associated with the project would be subject to review by the Corps, U.S. Fish and Wildlife Service, and U.S. Environmental Protection Agency. When you submit your application for a Corps permit, please include a detailed description of your "functional analysis" for our review.

We understand that there may be pending litigation regarding archeological resources on the proposed project site. We also understand that you have conducted archeological investigations of the site through the CEQA process. Please include copies of your archeological reports with your Corps permit application so that we can determine if the proposed project would result in adverse effects to sites either listed or eligible for listing on the National Register of Historic Places. If such sites exist within the Area of Potential Effect of our permit action, we will be required to coordinate with the State Historic Preservation Officer in order to ensure compliance with Section 106 of the National Historic Preservation Act. This determination will partially depend on the resolution of the extent of Corps jurisdiction.

As part of the Corps of Engineers permit process, we will distribute a public notice to facilitate our required public interest review and our analysis under Section 404(b)(1) and the National Environmental Policy Act. This process may result in public or agency comments that can only be addressed through project modification and could result in the requirement of an Environmental Impact Statement (EIS).

In summary, we do not currently have sufficient information to make conclusions on the merits of the proposed project or its compliance with the requirements of the Corps' permit program under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Unresolved substantive issues include the extent of Corps jurisdiction, analysis of project alternatives, mitigation requirements, impacts to archeological resources, and the potential need for an EIS. Please be aware that resolution of these issues may require you to substantially modify your proposed project. When you submit your application for a Corps

5-97-367 [redacted] 5-97-367

[redacted]
EIS

permit, please include information relevant to these issues (as described above) to assist in our review. If you have questions or wish to schedule a meeting to discuss these issues in more detail, please contact Eric Stein of my staff at (213) 452-3415.

Sincerely,

Mark Durham

Mark Durham
Chief, South Coast Section
Regulatory Branch

cc: USFWS; Attn: Robert James
USEPA; Attn: Rebecca Tuden
CCC-Long Beach; Attn: John Auyong
CDFG; Attn: Scott Harris
RWQCB-Santa Ana; Attn: Linda Garcia

5-97-367 [redacted] Exhibit E

P.C. 75
E-16

MEMORANDUM

DATE:	***APRIL 7, 1998***
TO:	***HELLMAN PROPERTIES LLC***
ATTENTION:	***DAVE BARTLETT***
FROM:	***G. VICTOR LEIPZIG, Ph.D.***
RE:	***REVIEW OF HELLMAN WETLANDS PLAN AND COASTAL COMMISSION STAFF REPORT***

Thank you for the opportunity to comment on your plan for the restoration of salt marsh at Hellman Ranch. I have reviewed both the Restoration Plan (and its Addendum) and the Coastal Commission staff comments and recommended modifications.

My overall impression is that the restoration plan seems quite well crafted, giving it good prospects to achieve a successful, functioning saltmarsh ecosystem.

Of the modifications suggested by Commission staff, there are two on which I would like to comment.

1. Suggested Expansion of the Phase I Restoration Area.

As proposed by the applicant, the Phase I restoration would create a muted tidal system with expected tidal range of approximately 1.5 feet (from +0.6 to +2.1 feet MSL). After addition of Phase 2, this range will drop to 1.2 feet (from +0.7 to +1.9 feet MSL). With Phase 3, this range drops further to about 1.0 foot.

Any further expansion of the acreage of the project will have the effect of reducing this muted range even further and should be avoided.

A muted tidal system is generally not as desirable as one with a full tidal range. It is the intertidal zone which is the most valuable component of a saltmarsh, and this zone is maximized when the tidal range is maximized, as in natural bays and estuaries which communicate freely with the ocean.

Unfortunately, a muted tidal range is inevitable at this site because the culvert to the San Gabriel River restricts the supply of water. The diameter of the culvert limits the total amount of water that can flow in or out on a given tide cycle. If the restoration area were larger, the same amount of water would still be exchanged, but, spread over a larger area, the tidal range would be even narrower. As a result, the intertidal zone would be even smaller, and the value of the restored habitat would be reduced rather than enhanced.

Other marshes provide valuable comparisons. Two of the more successful projects in recent years are Talbert Marsh in Huntington Beach and Batiquitos Lagoon in Carlsbad. Both rely on a fully open surface connection directly to the ocean and both have relatively high tidal ranges.

The 1978 restoration that created Inner Bolsa Bay is moderately successful. Its tidal range is only about 1.5 feet, but the value of the site was enhanced by creation of two

5-97-367 ~~2nd Addendum (4/98)~~
Exhibit E

E-17

artificial tern nesting islands which have been wildly successful. Inner Bolsa Bay also benefits from its proximity to Outer Bolsa Bay (fully tidal). However, Inner Bolsa Bay has not seen significant establishment of either cordgrass or mudflat habitats. Inner Bay has such a minimal intertidal zone that avifauna which feed in the intertidal zone, such as the majority of shorebird species, do not forage in Inner Bay, but rather move to Outer Bay for feeding.

Furthermore, an expansion of Inner Bolsa Bay was attempted in the late 1980's. That project has been considered a dismal failure by Fish and Game because of poor hydrology. Flushing is inadequate and residence time is excessively high. The culverts leading into Inner Bay have limited flow capacity (like the situation at Hellman Ranch) and expanding the areal extent of Inner Bay was an unsuccessful attempt to stretch that finite capacity.

The Hellman restoration plan already envisions a tidal range the same as, or potentially narrower than, that at Inner Bolsa Bay. I would definitely not advise reducing it further.

Insufficient tidal flushing is one of the prime reasons for the lack of success of some saltmarsh restorations. Given the limited water supply for this project, expanding the tidal area would put the success of the project at serious jeopardy. I would prefer to see a successful 28 acre project than a failed 36 acre project.

Besides the technical inadvisability of expanding the restoration area, there would appear to be a real question as to the merit of staff's argument that such expansion is required. There is no passage in the Coastal Act that mandates a specific acreage. The 2-to-1 ratio mentioned by staff may, however, be a long standing Commission policy. If so, then this would be an appropriate time to deviate from that policy in the interest of achieving the best possible restoration.

2. Suggested Drainage of Storm Runoff to the Sewer System.

As a former member of the Board of Directors of the County Sanitation Districts of Orange County, I can assure you that such a connection would be totally unacceptable. Sewer treatment facilities in Orange County (or anywhere else for that matter) are not sized to accommodate storm flows in addition to sewage flow. I know of no urban area in this county where storm runoff is directed to the sewers.

I believe the two modifications discussed above to be poorly thought through by staff. On these points, I encourage you to hold out for Commission approval of your application as submitted.

Sincerely,

G. Victor Leipzig, Ph.D.

5-97-367 ~~[illegible]~~
Exhibit E

E-18

HELLMAN PROPERTIES REQUESTED CHANGES TO CDP APPLICATION NO. 5-97-367 SPECIAL CONDITIONS

CONDITION NO.	SUBJECT	REQUESTED MODIFICATION
1.A.	Wetlands Restoration Area	• Replace description of wetlands restoration area with *"a minimum 28 acres salt marsh wetlands that includes appropriate transitional habitat zones as described in the Wetlands Restoration Plan."*
1.B.	Cessation of Mineral Production Activities	The mineral production activities should not be limited to 20 years. • Delete the April 15, 2018 termination date for mineral production activities. • Add that the deed restriction is subject to a 5 year sunset clause commencing upon termination of the mineral production activities. • Replace area covered by deed restriction with *"Lots 6 and 7 of Vesting Tentative Tract Map."*
1.C.	Freshwater Wetlands Deed Restriction	• Delete oil production facilities from the deed restricted area.
2.A.(1) and 2.C.(3) & (4)	Wetlands Restoration Area	• Replace description of wetlands restoration area with *"a minimum 28 acres salt marsh wetlands that includes appropriate transitional habitat zones as described in the Wetlands Restoration Plan."*
2.D.(2)	Timing of Wetlands Restoration Activities	• Delete requirement that freshwater and Phase 1 wetlands habitat be completed within 18 months of CDP approval date. • Replace with requirement that freshwater and Phase 1 wetlands habitat be constructed concurrent with golf course development.
2.D.(6)	Performance Standards	Performance standards should be limited to the standards and criteria set forth in the Concept Plan. • Delete subsection (2) which allows use of "any other information available" to determine if performance standards are being met.

5-97-367

Exhibit F

F-1

2.H.	Wetlands Financing and Long Term Maintenance	The responsibility for the long-term maintenance of the salt marsh wetland should be borne by the applicant, Hellman Properties, or the agency that accepts dedication of the wetlands. Long-term maintenance of the salt marsh should not be tied to the golf course. • Replace description of wetlands restoration area with *"a minimum 28 acres salt marsh wetlands that includes appropriate transitional habitat zones as described in the Wetlands Restoration Plan."* • Add that sources of funding can include devices such as letters of credit. • Delete requirement that wetlands maintenance costs be paid out of golf course revenues before any other costs.
2.L.	Timing of Construction Activities	Currently, there is no information to indicate that sensitive species nest within the golf course/wetlands area. Therefore, banning all construction activities during nesting season is overly broad. • Replace condition with requirement that site be surveyed to determine the presence of nesting species, and that if nesting species are identified consultation with the Department of Fish and Game will be required to determine if construction will result in harm to the nesting species, and the extent of any buffer required to prevent disruption of essential breeding activities.
3.	Vesting Tentative Tract Lot Mergers	• Delete requirement that the golf course and mineral production facilities be merged into a single lot.
4.A.	Timing of Golf Course Construction and Archaeological Test Program	• Clarify that archaeological test program must be completed only for sites impacted by golf course development (ORA-261, -262, -850, and -851).
4.E.(3)	Deed Restriction on Golf Course Plants	Native vegetation will be used to the greatest extent possible, but golf course landscaping will require the use of some non-native plants. • Delete total prohibition on use of non-native plants in the golf course. • Replace with *"Native plant species shall be used to the maximum extent possible throughout the golf course. No invasive exotic species listed by the California Exotic Pest Plant Council as unwanted species will be used in the golf course. In addition, the final golf course plant palette will be subject to review and approval by the Executive Director."*

5-97-367 Exhibit F Applicant's Revisions

F-2

4.E.(7)	Golf Course/Wetlands Interface	• Delete designation of lateral hazards and penalty shot language. • Replace with: *"Both saltwater and freshwater marsh wetland areas shall be designated as lateral hazard areas which golfers shall not enter."*
5.A.(3)	Width of Public Trail	• Replace required trail width with 20 feet.
5.B.	Trail from State Lands Parcel to Seal Beach Boulevard	• Delete requirement for a trail connecting State Lands Parcel with Seal Beach Boulevard.
7.A.	Gum Grove Park Dedication	• Delete metes and bounds description of dedicated area. Gum Grove Park will be a separate parcel.
7.A.(3)	Trail from State Lands Parcel to Seal Beach Boulevard	• Delete requirement for a trail connecting State Lands Parcel with Seal Beach Boulevard.
9.F.	Archaeological Conditions	• Add provision that if the archaeologist determines that cultural resources are not important as defined by CEQA, the site preparation, grading and construction activities may be resumed.
10.A.	Residential Community Streets	• Delete requirement for a deed restriction that would require Streets A, B and C within the residential development to be public and provide on-street parking.
10.C.	Timing of Residential Development	The residential development will not impact any wetlands; therefore, there is no nexus to require that wetlands restoration be commenced before residential development. • Delete prohibition on commencing residential development before commencement of wetlands construction and restoration.

5-97-367
Exhibit F Applicant's Revisions
F-3

Applicant's

Revisions to Special Conditions
Hellman Ranch Reserve
CDP No. 5-97-367

RECEIVED
MAR 30 1998
CALIFORNIA
COASTAL COMMISSION

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 the 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.

5-97-367 Exhibit F
p. F-4

1. WETLANDS RESTORATION AREA/CONSERVATION.

The wetlands restoration area shall consist of a minimum ~~59~~ 51 acres of wetlands (including appropriate transitional habitat zones to the extent that they will support wetland vegetation or wetland characteristics ~~excluding buffers~~) comprised of: 1) a minimum ~~thirty-six (36)~~ twenty-eight (28) acre salt marsh wetland (Phase 1 of the overall salt marsh wetland creation) to be created initially, located adjacent to the Haynes Cooling Channel and connected to the San Gabriel River by a culvert (as generally depicted on Page 1 of Exhibit B), and surrounded by a ~~buffer~~ transitional habitat area ~~consistent with the transition zone/densely vegetated berms (minimum five feet high above the adjacent golf course grade)/upland areas~~ described in the conceptual wetlands restoration plan ~~(the 36 acre figure shall only include shallow subtidal, occasionally exposed subtidal, lower intertidal, upper intertidal, and super tidal habitats and shall not include transition areas),~~ 2) a minimum 6.8 acres of freshwater marsh wetlands consisting of five (5) interconnected ponds integrated within the golf course, and 3) reservation of a minimum 16.2 acres of ~~all~~ mineral production area for future Phase 2 and Phase 3 creation of salt marsh wetlands. The wetlands shall be created, preserved, and maintained as described in the following conditions:

A. "Phase 1" Initial Proposed Salt Marsh Wetland Restoration Area PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall execute and record a document in a form and content acceptable to the Executive Director, irrevocably offering to dedicate

to a public agency, private association, or non-profit association approved by the Executive Director an open space and conservation easement, as proposed by the applicant and required by Parks, Recreation and Open Space Mitigation Measure R-3 as approved by City of Seal Beach City Council Resolution No. 4562, for the purpose of creating and maintaining a minimum ~~thirty-six (36)~~ twenty-eight (28) acre salt marsh wetland, including appropriate transitional habitat zones as described in the Wetlands Restoration Plan (Phase 1 of the overall salt marsh wetland creation). ~~surrounded by a buffer area consistent with the transition zone densely vegetated berms (minimum five feet high above the adjacent golf course grade)/upland areas described in the conceptual wetlands restoration plan (the 36 acre figure shall only include shallow subtidal, occasionally exposed subtidal, lower intertidal, upper intertidal, and super tidal habitats and shall not include transition/buffer/upland areas described in the conceptual wetlands restoration plan).~~ Such easement shall be over the area of the site located adjacent to the Haynes Cooling Channel and connected to the San Gabriel River by a culvert. ~~including areas in the general vicinity of the green for the 12th hole and the tee for the 13th hole and in the general vicinity of the green for 5th hole and the tee for the 6th hole, as generally depicted on Page 1 of Exhibit B of the staff report for this permit.~~ Alternatively, if the applicant provides assurance of its ability to maintain the salt marsh wetland, then, subject to the approval of the Executive Director, the applicant shall record a deed restriction containing the same provisions as set forth above. The easement shall:

(1) Permit the applicant, its agents, and/or the accepting agency or non-profit organization to enter the property, create and maintain habitat, revegetate portions of the area, and fence the newly created/revegetated area in order to protect such habitats.

(2) Restrict all development, vegetation clearance, fuel modification and grading within the easement except that necessary to establish/maintain the habitat.

(3) Permit staff of the Coastal Commission and other resources agencies (e.g., California Department of Fish and Game, U.S. Fish and Wildlife Service, etc.) to enter and inspect for purposes of determining compliance with coastal development permit 5-97-367 and other agency approvals.

(4) No development, as defined in Section 30106 of the Coastal Act shall occur in wetland creation areas ~~and wetland buffer areas~~ except for the creation and maintenance of habitat and fencing of the created habitat in order to protect such habitats.

The easement area shall be described in metes and bounds. The recorded document shall include legal descriptions of both the applicant's entire parcel and the easement area. The recorded document shall also reflect that development in the easement area is restricted as set forth in this permit condition. The offer shall be recorded free of prior liens which the Executive Director determines may affect the interest being conveyed. The offer shall run with the land in favor of the People of the State of California, binding all successors and assigns. and shall be irrevocable for a period of 21 years, such period running from the date of recording.

B. Reservation of ~~Oil~~ **Mineral** Production Area for Phase 2 and Phase 3 Wetland Creation. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive

5-97-367 p.F-5

Applicants

Director, which shall provide that the allowable uses and allowable development on both the entire 7.5 acre area of ~~oil~~ mineral-production facilities immediately to the southeast of the Haynes Cooling Channel (Lot 7 of Vesting Tentative Tract Map 15381) and the 8.7 westernmost acres of ~~oil~~ mineral-production facilities immediately to the southeast of the Haynes Cooling Channel (Lot 6 of Vesting Tentative Tract Map 15381) shall, ~~either~~ at the time the on-site ~~oil~~ mineral production ceases ~~or on April 15, 2018, whichever occurs earlier),~~ be restricted to: 1) the removal of the existing ~~oil~~ mineral-production facilities, 2) removal of contaminants and remediation of the site, and 3) wetland habitat creation/restoration and conservation/open space. These reservations will be subject to a five-year "sunset clause" which would begin upon termination of the mineral extraction activities. The deed restriction shall be recorded over ~~the revised~~ lots 6 & 7 of Vesting Tentative Tract Map 15381 which contains ~~the wetlands, golf course, and~~ ~~oil~~ mineral production facilities, and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

C. Freshwater Marsh Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that: No development, as defined in Section 30106 of the Coastal Act, shall occur in the freshwater marsh wetlands consisting of five interconnecting ponds within the golf course as shown on Exhibit C, except development necessary for purposes of enhancement and restoration of the wetlands. The deed restriction shall be recorded over ~~the revised~~ lot 4 ~~which contains the wetlands, golf course, and oil production facilities,~~ of Vesting Tentative Tract Map 15381 and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

2. FINAL WETLAND RESTORATION PROGRAM.

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a final wetland restoration program for the proposed project. The program shall be developed in consultation with the Commission, California Department of Fish and Game, and U.S. Fish and Wildlife Service and at a minimum shall include:

A. A detailed final site plan of the existing degraded and severely degraded wetlands and a detailed final site plan of the wetland creation restored sites that substantially conform with the plans contained in the Addendum to Concept Wetlands Restoration Plan for the Hellman Ranch ("Addendum") dated February 1998 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management (M&N File: 3693) and the Concept Wetlands Restoration Plan for the Hellman Ranch ("Concept Plan") revised November 1997 prepared by Moffatt & Nichol Engineers in association with Coastal Resources management, as revised as follows:

(1) The proposed initial "Phase 1" Salt Marsh Wetland shall be a minimum ~~thirty-six (36)~~ twenty-eight (28) acre salt marsh wetland (Phase 1 of the overall salt marsh wetland creation)

Applicant's

which includes an appropriate transitional habitat zone as described in the Wetlands Restoration Plan. ~~surrounded by a buffer area consistent with the transition zone/densely vegetated berms (minimum five feet high above the adjacent golf course grade)/upland areas described in the conceptual wetlands restoration plan. (the 36 acre figure shall only include shallow subtidal, occasionally exposed subtidal, lower intertidal, upper intertidal, and super tidal habitats and shall not include transition/buffer/upland areas described in the conceptual wetlands restoration plan).~~

~~(2) Revise Figures A1, A4 and A7 of the Addendum to reflect that the Phase 1 Salt Marsh Wetland has been expanded, to a minimum 36 acres, in the general vicinity of the green for the 12th hole and the tee for the 13th hole and in the general vicinity of the green for 5th hole and the tee for the 6th hole, as generally depicted on Page 1 of Exhibit B to the staff report for coastal development permit application 5-97-367.~~

(3) Describe the final acreage (minimum 6.8 acres) and locations of the freshwater marsh wetland areas.

(4) The final acreage of the freshwater marshes and all phases of the salt marsh. ~~shall not include the acreage of Transition/Buffer areas (i.e., the saltwater marsh areas which are never subject to the influence of tides, and the freshwater marsh areas not covered by water).~~

B. The baseline ecological assessment of the existing degraded and severely degraded wetland area submitted with the coastal development permit application.

C. A final overlay map (if a large scale map is produced, a reduced 8 1/2" x 11" or 11" x 17" copy shall be included in the program) which superimposes the following:

(1) The twenty-five (25) acres of degraded wetland as mapped by the California Department of Fish and Game in its January 13, 1982 Determination of the Status of Wetlands Within the City of Seal Beach, Immediately South and East of the San Gabriel River Channel (Ponderosa Seal Beach Wetlands);

(2) The current 1996 wetlands delineation (27 acres) of the project site prepared by Coastal Resources Management & Chambers Group as shown on Figure 4-7, Page No. 4-13 of the application for coastal development permit 5-97-367;

(3) The proposed areas of wetland fill resulting from the golf course and resulting from creation of new wetlands; and

(4) The proposed freshwater marsh and Phase 1 (initial creation) salt marsh areas.

D. Monitoring and Remediation

(1) An independent biologist to monitor the establishment and success of the salt marsh shall be selected by the applicant and approved by the Executive Director, and funding for the monitor biologist shall be provided by the applicant for a period of ten (10) years.

(2) Reference sites must be accessible to the independent monitor and shall

contain habitat of interest and shall be characterized by a muted tidal regime similar to the proposed salt marsh. Habitat areas within the referenced sites to be used as standards against which the restoration areas will be compared, will be selected using random sampling techniques in order to most accurately characterize the target wetland habitat.

(3) Success Criteria

The monitoring of the salt marsh shall be in compliance with the standards and criteria contained in the Concept Plan, except that:: 1) exotic, invasive and non-native species shall be excluded from any assessment of performance standards, and (2) the proposed performance standards shall be modified as follows for the various proposed habitat zones (the performance standards and success criteria shall be met within the first five years after completion of construction of the Phase 1 salt marsh):

a. Transition Zones

The management plan for the proposed berm ringing the salt marsh which serves as transition/buffer area shall be applied to all native species, not just sensitive species.

b. High Salt Marsh

Vegetation in the High Salt Marsh shall contain at least as many of the same native species (both in quantity and type) as the least specious reference site. The average total (all species combined) percent cover shall be at least eighty percent (80%) of the referenced wetland High Salt Marsh area. The average plant height for each species shall be at least seventy-five percent (75%) of that of the same species at the reference site, except that pickleweed shall be no less than twenty centimeters (20 cm) in average height.

c. Low Salt Marsh

The average percent cover of pickleweed shall be at least eighty percent (80%) of the referenced wetland Low Salt Marsh area., and the average height should be either seventy-five percent (75%) of pickleweed height at reference sites or twenty centimeters (20 cm), whichever is greater.

d. Mud Flat

Infauna shall be monitored and documented at both the project and reference sites. Avifauna at the proposed salt marsh shall be similar in type and number to the species and foraging use of the habitat at reference sites. The field methods for monitoring and flat shall be approved by the Executive Director.

e. Subtidal basin and channels

There shall be a similar number and type of species and individuals as at the reference sites. Demersal fish and water column fish shall be evaluated separately. Adult and juvenile fish shall be counted separately and performance standards applied to adults.

E. The final design and construction methods that will be used to ensure the mitigation

site achieves the defined goals, objectives and performance standards, and final construction plans.

F. Preliminary remedial measures and provisions which require the final remedial measures to be determined in consultation with the Coastal Commission ("CCC"), California Department of Fish and Game ("CDFG") and the U.S. Fish and Wildlife Service ("USFWS"). The determination that the wetlands have established and are functioning at a level where they no longer require remediation shall be made by the CCC, CDFG and USFWS.

G. Provisions for submittal, within thirty (30) days of completion of initial restoration work, of "as built" plans demonstrating that the freshwater and Phase 1 saltwater marsh wetlands have been constructed in accordance with the approved design and construction methods.

H. A written final detailed plan for financing the actual cost of constructing, establishing and maintaining in perpetuity all approved wetlands. The plan shall provide that the applicant ~~landowner, property manager and golf course owner/operator are ultimately~~ is responsible in perpetuity for wetland maintenance, as proposed in Sections 5.5.1 and 6.5.1 of the "Concept Wetlands Restoration Plan for the Hellman Ranch" revised November 1997 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management. ~~This includes re-establishing the wetlands if they are lost or impacted due to natural disasters.~~ The plan shall indicate, at a minimum: 1) the sources of funding, which may include devices such as letters of credit, 2) projected costs of constructing, establishing and maintaining in perpetuity all approved wetlands, as proposed in Sections 5.5.1 and 6.5.1 of the "Concept Wetlands Restoration Plan for the Hellman Ranch" revised November 1997 prepared by Moffatt & Nichol Engineers in association with Coastal Resources Management. ~~and 3) require that costs of ongoing maintenance of the wetlands, including monitoring by the independent biologist, shall be paid out of the golf course revenues before any other costs incurred by the golf course, landowner and its owner/operator.~~

I. Periodic cleaning and maintenance of the culvert connecting the salt marsh to the San Gabriel River.

J. Periodic removal of invasive, non-native plants shall be removed periodically from both the saltwater and freshwater marsh wetland areas in perpetuity to ensure maintenance of wetland habitat values.

K. ~~Invasive, exotic, non native plants shall not be used anywhere in the golf course, with the exception of grass for fairway, green and tee turf.~~ Native plant species shall be used to the maximum extent possible throughout the golf course. No invasive exotic species listed by the California Exotic Pest Plant Council as unwanted species will be used in the golf course. In addition, the final golf course plant palette will be subject to review and approval by the Executive Director.

L. ~~Construction activities for all development, including the wetlands, shall not occur during the nesting seasons of sensitive species.~~ Construction activities will be implemented so as to not disturb breeding behavior or activities of sensitive avian activities. Since it is not know whether sensitive species would be nesting on or near the site (I.e. Gum Grove Park), the site (including Gum Grove Park) will be surveyed to determine the presence of nesting sensitive species. If no nesting sensitive species are identified on the site, there would be no restrictions placed on construction. If nesting sensitive species are identified, a 200-foot buffer will be demarcated around the nesting area

and no work will be permitted in the 200-foot zone. Weekly monitoring visits will be conducted by a qualified ornithologist to determine whether the 200-foot buffer is adequate to prevent disruption of essential breeding activities. Determination that construction activities is causing disruptions in essential breeding behavior or activities will result in adjustment of the 200-foot buffer.

M. Prior to commencement of construction of the golf course, the proposed wetland areas (salt marsh, buffers and freshwater marsh), shall be staked and signed in a manner which clearly demonstrates to construction crews that the wetland areas are not to be entered for any reason.

The permittee shall undertake development in accordance with the final wetland mitigation program approved by the Executive Director. Any proposed changes to the approved final program shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

3. REVISED VESTING TENTATIVE TRACT MAP NO. 15381.

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, two copies of a final ~~revised~~ vesting tentative map for Tract No. 15381. ~~The final revised map shall merge proposed Lots 4, 6 and 7 (i.e., the proposed lots for the golf course and two oil production areas) into a single legal lot.~~ The applicant shall record the revised map approved by the Executive Director.

4. GOLF COURSE OPERATIONS AND GOLFER WETLAND EDUCATION PROGRAM

~~A. Timing of Golf Course Construction. Prior to commencement of construction of the golf course, the proposed archaeological test program (including all required excavation and development of reasonable mitigation measures) shall have been completed.~~

B. Timing of Golf Course Opening. The golf course shall not be opened for use until both the freshwater and Phase 1 saltwater marsh wetlands have been constructed in accordance with the Wetlands Restoration Plan approved by the Executive Director ~~their entirety~~.

C. Golf ball retrieval. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit, for the review and approval of the Executive Director, a written plan which describes in detail the proposed method for retrieving golf balls from wetland ~~the freshwater marshes and freshwater marsh buffer~~ areas. The plan shall include the following ~~prohibitions on golf ball retrieval~~: 1) a controlled program for golf ball retrieval, in conjunction with on-going maintenance and monitoring of wetland areas, ~~golf balls shall not be retrieved from any saltwater marsh wetland areas,~~ and 2) golf balls shall not be retrieved by golfers themselves under any circumstances. The golf course operator shall comply with the plan approved by the Executive Director.

D. Golfer education on wetlands. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit, for the review and approval of the Executive Director, a detailed written plan which describes the methods by which users of the golf course will be informed of the wetland areas (e.g., signage, brochures, instructions printed on score cards, etc.,

F-10

Applicants

which instruct golfers not to enter wetland or wetland buffer areas).

E. Golf Course Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(1) The applicant, ~~and~~ golf course owner/operator and/or wetlands manager/owner, shall implement and comply with the final wetland mitigation program approved by the Executive Director.

(2) Development and management of the golf course shall be in compliance with the document An Environmental Approach to Golf Course Development & Management prepared for Hellman Properties LLC by Siena College-Audubon International Institute dated December 1996 as proposed by the applicant.

(3 ~~Invasive, exotic, non native plants shall not be used anywhere in the golf course, with the exception of grass for fairway, green and tee turf.~~ Construction activities will be implemented so as to not disturb breeding behavior or activities of sensitive avian activities. Since it is not know whether sensitive species would be nesting on or near the site (I.e. Gum Grove Park), the site (including Gum Grove Park) will be surveyed to determine the presence of nesting sensitive species. If no nesting sensitive species are identified on the site, there would be no restrictions placed on construction. If nesting sensitive species are identified, a 200-foot buffer will be demarcated around the nesting area, and no work will be permitted in the 200-foot zone. Weekly monitoring visits will be conducted by a qualified ornithologist to determine whether the 200-foot buffer is adequate to prevent disruption of essential breeding activities. Determination that construction activities is causing disruptions in essential breeding behavior or activities will result in adjustment of the 200-foot buffer.

(4) The applicant and golf course owner/operator shall implement and comply with the final golf ball retrieval plan approved by the Executive Director.

(5) The golf course shall not be lighted nor shall it be open for night play.

(6) The golfer education program approved by the Executive Director shall be complied with and implemented.

(7) Both saltwater and freshwater marsh wetland areas shall be designated as lateral hazard ~~out-of-bounds~~ areas which golfers shall not enter.

(8) The golf course shall be open to the general public ~~(not just residents of the City of Seal Beach)~~ during all hours of operation, except during ~~official~~ club tournaments, tournaments for charity and other tournaments ~~of the Professional Golf Association or Ladies Professional Golf Association~~ held at the golf course.

(9) The golf course shall not be converted to a private membership course.

(10) Signs shall be installed which are clearly visible to the general public which inform the general public that the golf course is open for play to the public.

(11) Public parking for the golf course shall be in accordance with City of Seal Beach parking standards. ~~provided at all times based on eight spaces for each hole, plus one space for each employee.~~

The deed restriction shall be recorded over ~~the revised~~ lot 4 ~~containing the golf course, wetlands and oil production facilities~~ of Vesting Tentative Tract Map 15381 and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

F. Final Golf Course Plan Designs. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, final design and construction plans for the proposed golf course. The final plans shall be in substantial compliance with the final wetland restoration plan approved by the Executive Director and the "An Environmental Approach to Golf Course Development & Management" prepared for Hellman Properties LLC by Siena College-Audubon International Institute dated December 1996.

G. Final Plans for the Golf Clubhouse. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, final plans for the golf clubhouse. Public access shall be maintained to all common areas of the public golf clubhouse.

5. PUBLIC ACCESS PROGRAM

A. Dedication of Public Trails. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, an irrevocable offer-to-dedicate ~~twenty-five (25)~~ twenty (20) foot wide public access easements as: 1) proposed by the applicant, 2) required by Parks, Recreation and Open Space Mitigation Measure R-3 as approved by City of Seal Beach City Council Resolution No. 4562, ~~and 3) generally depicted on Exhibit L of the staff report for this permit~~, to a public agency or non-profit association acceptable to the Executive Director has been executed. The easement area shall be described in metes and bounds and shall restrict development within the easement area to public utilities, oil and gas pipelines, emergency access and construction and maintenance of the trails. The offer shall be recorded free of prior liens which the Executive Director determines may affect the interest being conveyed, and shall provide the public the right to use the dedicated route for public trail purposes and viewing of the proposed salt marsh wetland. The document shall provide that the offer of dedication shall not be used or construed to allow anyone, prior to acceptance of the offer, to interfere with any rights of public access acquired through use which may exist on the property. The offer shall run with the land in favor of the People of the State of California, binding all successors and assigns, and shall be irrevocable for a period of 21 years, such period running from the date of recording.

F-12

B. Public Trails Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(1) The proposed trails shall be improved and open to the public and maintained by the golf course operator prior to the acceptance of the easements.

(2) The design of any new ~~the~~ trails and access to the new trails shall meet the requirements of the Americans with Disabilities Act.

(3) The trails shall be a minimum of ten (10) feet wide.

(4) The trails shall not be lighted in order to minimize impact to the wetlands.

(5) The trails shall be open to the public from dawn to dusk. Any changes to the hours of operation of the trails shall require an amendment to this permit unless the Executive Director determines that no amendment is required.

(6) The proposed view overlooks at the ends of the trails shall contain handicap accessible seating.

(7) The trails shall be, as necessary, partially or fully enclosed with see-through structures, such as cages or arched fences, which protect trail users from errant golf balls.

The deed restriction shall be recorded over the public access trail easements and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

~~C. Trail Linking Gum Grove Park with the State Lands Parcel and Seal Beach Boulevard. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:~~

~~(1) A twenty-five (25) foot wide strip of land, at the base of the bluff below Surf Place and Catalina Avenue, which connects the proposed public trail emanating from the State Lands parcel and runs part of the way along the southerly edge of the proposed salt marsh restoration area shall be exclusively reserved for a public trail connecting Gum Grove Park with the State Lands parcel, as generally depicted on Exhibit L of the staff report for this permit.~~

~~(2) Structures such as partial arched fence enclosures or retaining walls necessary to protect trail users from errant golf balls and potential bluff failure shall be allowed in this area.~~

Applicant's

~~(3) A trail accessible to the general public shall be built between Gum Grove Park and Seal Beach Boulevard, as generally depicted on Exhibit L of the staff report for this permit. Said trail shall be accessible from the proposed residential development as well as from Seal Beach Boulevard.~~

~~The deed restriction shall be recorded over the trail as generally depicted on Exhibit L of the staff report for this permit and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.~~

6. STATE LANDS PARCEL.

A. Deed and Lease Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the owner of property commonly known as the California State Lands Commission parcel, situated northeasterly of Pacific Coast Highway at its intersection with First Street in the City of Seal Beach, which provides that:

(1) This coastal development permit approves only the construction of: a) an interpretive center consisting of a raised, handicap-accessible platform with information panels containing photographs, maps, exhibits, etc., overlooking the proposed salt marsh, b) the placement only of the Krenwinkle House on the site (no uses are established), c) the construction of parking spaces, and d) construction of a structure or structures containing a maximum of 10,000 square feet of visitor-serving uses on the State Lands parcel, provided that adequate parking is supplied.

(2) Any modifications to the development described in this condition shall require an amendment to the permit from the Coastal Commission.

(3) An approved coastal development permit from the Coastal Commission shall be obtained prior to the establishment of uses to be contained in the Krenwinkle House after it is located on the State Lands parcel.

(4) Only public access, public recreation, public education and visitor-serving commercial facilities, which are consistent with the requirements of the Coastal Act and with the requirements established by the California State Lands Commission for use of public lands, shall be permitted on the State Lands parcel.

(5) All office uses are prohibited on the State Lands parcel (excepting offices which are necessary for the administration of, and are adjunct to, the public access and visitor-service uses allowed).

(6) Parking for the visitor-serving uses on the State Lands parcel shall be in accordance with City of Seal Beach parking standards. ~~provided based on the following standards: 1) restaurant uses - one parking space for every fifty (50) square feet of public service area (area where~~

applicant's

~~the public can dine or wait to dine), 2) retail uses - one parking space for every 225 square feet of gross floor area, and 3) a minimum of ten (10) parking spaces shall be reserved for the exclusive use of trail users. A minimum of sixty-two (62) parking spaces, as depicted on Figure 5-4, Page 5-21 of the coastal development permit application, shall be provided and maintained on-site.~~

(7) As required by Mitigation Measure ~~R-6~~ R-5 of Seal Beach City Council Resolution No. 4562, the permittee or lessee shall install a bicycle rack near the entrance to the proposed pedestrian trail for the saltwater wetland. The bicycle rack shall: 1) be public, 2) be maintained by the permittee, and 3) accommodate a minimum of twenty (20) bicycles.

The document shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed and lease restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

B. Final Plans. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, plans for the proposed interpretive center and visitor-serving commercial building which are consistent with the requirements of this permit. The applicant shall comply with the plans approved by the Executive Director.

7. GUM GROVE PARK.

A. Dedication of Gum Grove Park. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, written evidence that an irrevocable offer to dedicate Gum Grove Nature Park to the City of Seal Beach, as proposed by the applicant and required by Parks, Recreation and Open Space Mitigation Measure R-1 as approved by City of Seal Beach City Council Resolution No. 4562, has been executed over the lot containing Gum Grove Park (Lot 3 of Vesting Tentative Tract Map No. 15381 as proposed). ~~The dedicated area shall be described in metes and bounds. The offer shall be recorded free of prior liens which the Executive Director determines may affect the interest being conveyed.~~ The offer shall run with the land in favor of the People of the State of California, binding all successors and assigns, and shall be irrevocable for a period of 21 years, such period running from the date of recording.

B. Gum Grove Park Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that:

(i) The park shall be preserved in perpetuity as a nature park open to the public in which active recreational activities or commercial facilities are prohibited.

(ii) Necessary parking facilities which are the minimum necessary to serve the park and which meets Americans with Disabilities Act requirements shall be provided.

(iii) New trails within the dedicated park area (i.e., Lot 3 of Vesting Tentative Tract

Applicants

Map No. 15381 as proposed), ~~including a trail which connects Seal Beach Boulevard with trails that connect to the State Land Parcel, which~~ shall meet Americans with Disabilities Act requirements ~~shall be provided~~.

(iv) Small scale interpretive signage which describes the Monarch Butterfly may be permitted if approved by an amendment to this permit.

~~(v) Changes in hours of operation of Gum Grove Park or the installation of gates to prohibit automobile access to the park shall only be allowed for documented, bonafide public safety reasons and shall require an amendment to this permit unless the Executive Director determines that an amendment is not required. Gates which prohibit or obstruct pedestrian access to the park shall not be installed.~~

(vi) Signage shall be conspicuously posted which indicates that the park is open to the general public.

~~(vii) In order to allow for public access to the trail connecting Gum Grove Park with Seal Beach Boulevard, as described in Special Condition No. 4 above, the Seal Beach Boulevard boundary of the lot for Gum Grove Park shall not be obstructed by fences or walls.~~

The deed restriction shall be recorded over the lot containing Gum Grove Park (Lot 3 of Vesting Tentative Tract Map No. 15381 as proposed) and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

8. PUBLIC ACCESS SIGNAGE.

A. Signage Plans. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit, for the review and approval of the Executive Director, a detailed signage plan which provides for the installation of signs clearly visible from Pacific Coast Highway and Seal Beach Boulevard and at key locations within the development which invite and encourage the public to use the public access and recreation opportunities proposed at the golf course and golf clubhouse, Gum Grove Park, and the State Lands parcel including the proposed public access trails around the salt marsh. Key locations include but are not limited to; 1) the entrance to the State Lands parcel (intersection of First Street and Pacific Coast Highway, 2) the proposed interpretive center, 3) the main entrance to the golf course, 4) the Adolfo Lopez Drive entrance to the proposed golf course, 5) the lobby of the golf clubhouse, and 6) Gum Grove Park. The plans shall also provide for signage which designates ten (10) of the parking spaces at the State Lands parcel for the exclusive use of trail users and which clearly indicates that the bike racks on the State Lands parcel are for the general public. The plans shall indicate the location, materials, dimensions, colors, and text of the signs. The permittee shall install the signs in accordance with the signage plans approved by the Executive Director.

B. Sign Maintenance. PRIOR TO THE ISSUANCE OF THE COASTAL

Applicants

DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that the golf course owner/operator shall; 1) implement and comply with the signage plans approved by the Executive Director, and 2) maintain the signs installed consistent with the signage plans approved by the Executive Director. The deed restriction shall be ~~recorded over the revised lot containing the golf course, wetlands, and oil production facilities and shall run with the land, binding all successors and assigns, and shall be recorded~~ free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

9. ARCHAEOLOGY

A. ~~Final Archaeological Research Design / Peer Review. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of~~ Prior to the commencement of site preparation, grading and construction activities for the residential development by this permit, all of the following measures shall be implemented. A synopsis report summarizing all work performed in compliance with subsections B. and C. hall be submitted to the Executive Director, ~~1) a final written archaeological research design which shall be in substantial conformance with the proposed~~ the State Office of Historic Preservation and the Native American Commission within six weeks of the conclusion of field work.

B. Archaeological Investigations. The permitee shall undertake the proposed archaeological investigation described in the archaeological research design entitled A Research Design for the Evaluation of Archaeological Sites within the Hellman Ranch Specific Plan Area dated November 1997 prepared by KEA Environmental, Inc. for the City of Seal Beach. ~~and 2) a minimum of three written peer reviews of the proposed research design, the recommendations of which shall have been incorporated into the final research design submitted to the Executive Director. The peer reviewers shall be selected by the City of Seal Beach and approved by both~~ Prior to undertaking the archaeological investigations, a copy of the archaeological research design shall be provided to the State Office of Historic Preservation and Native American Heritage Commission for their review and comment. ~~The permittee shall undertake the proposed archaeological investigation in compliance with the final archaeological research design approved by the Executive Director. An amendment to this permit shall be required for any changes to the research design required by the recommendations of the peer reviews which the Executive Director determines are not de minimis in nature and scope.~~

~~B.~~ C. Post-Investigation Mitigation Measures. Upon completion of the archaeological investigation, and PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF THE ~~GOLF COURSE AND WETLANDS~~ RESIDENTIAL DEVELOPMENT the applicant shall submit, for the review and approval of the Executive Director, a written report regarding the following: 1) a summary of the findings of the archaeological investigation, and 2) a final written mitigation plan which shall, ~~at a minimum; a) provide for the~~ identify recommended mitigation measures, including: capping of archaeological sites, ~~b) provide for the~~ data recovery and curation of ~~significant~~ important archaeological ~~materials, c) detail~~ resources as defined by CEQA, and detailed additional mitigation measures which need to be implemented. ~~and d) include a signed contract for~~ The applicant shall submit for review and approval of the Executive Director, a signed contract with a City-selected archaeological consultant that provides for the archaeological salvage that follows current accepted professional practice, ~~The written report and plan shall comply with archaeological impact~~

F-17

Applicant's

~~standards established by~~ if additional archaeological data recovery measures are determined appropriate. The report and additional mitigation measures shall be submitted to the State Office of Historic Preservation, ~~and the report and additional mitigation measures shall be reviewed and approved by the State Office of Historic Preservation~~ and the appropriate Native American person/group designated or deemed acceptable by the Native American Heritage Commission for review and comment. If the Executive Director determines that the report recommends changes to other mitigation measures or changes to the development approved by this permit that are not de minimis in nature and scope, then the applicant shall submit an application seeking to amend the permit to incorporate the recommended changes.

~~C.~~D. Monitoring of Construction Activities. All site preparation, grading and construction activities for the proposed residential development shall be monitored on-site by a ~~qualified~~ City-selected archaeologist and Native American monitor. The archaeologist and Native American monitor shall have the express authority to temporarily halt or re-direct all work should significant cultural resources be discovered. The Native American monitor ~~and archaeologist~~ shall be selected in compliance with the ~~requirements of the State Office of Historic Preservation ("OHP") and the California~~ Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites issued by the Native American Heritage Commission ("NAHC"). ~~The Native American and archaeologist may be the same person provided s/he meets the requirements of OHP and NAHC.~~ This requirement shall be incorporated into the construction documents which will be used by construction workers during the course of their work.

~~D.~~E. Discovery of Cultural Resources / Human Remains During Post-Archaeological Testing Construction Activities.

(1) If ~~an area of buried cultural deposits is~~ additional or unexpected archaeological features are discovered during site preparation, grading, and construction activities for approved development other than the archaeological investigation, all work shall be halted or re-directed while the permittee complies with the following:

~~A supplementary archaeology report shall be prepared that addresses the newly discovered deposits. The supplementary report shall be submitted~~ The archaeologist shall sample, identify and evaluate the artifacts as appropriate and shall report such findings to the applicant, the City and the Coastal Commission. If the archaeological resources are found to be significant, the archaeologist shall determine appropriate actions, and shall submit those recommendations in writing to the applicant and City. The archaeologist shall submit the recommendations for the review and approval of the Executive Director and shall be prepared in accordance with the provisions outlined in Special Condition 9.B above. If the Executive Director determines that the report recommends changes to the proposed development or changes to the mitigation measures that are de minimis in nature and scope, then construction can be recommenced and the permittee shall comply with all recommendations and mitigation measures contained in the supplementary recommendations and mitigation measures contained in the supplementary report. If the Executive Director determines that the changes are not de minimis, then the applicant shall submit an application

F-18

seeking to amend the permit if s/he wishes to continue construction and no further construction shall be allowed until the Commission has acted on the amendment application.

(2) Should human remains be discovered on-site during the course of site preparation, grading, and construction activities, the permittee shall ~~notify~~ comply with the requirements of Section 5097.98 of the Public Resources Code. If not already on site, the City-selected archaeologist and the Native American ~~Heritage Commission of such discovery within 24 hours of such discovery.~~ monitor will immediately be contacted and they will then immediately notify the City of Seal Beach, Director of Development Services who will implement the measures set forth in Section 5097.98 of the Public Resources Code.

~~E. Archaeology Deed Restriction. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a deed restriction which provides that:~~

~~(1) The permittee shall comply with all requirements of Special Condition No. 9 of this permit.~~

~~(2)~~ F. The permittee shall comply with Mitigation Measures CR-1 through CR-12 as approved by City of Seal Beach City Council Resolution 4562, which are incorporated by reference as conditions of approval of this coastal development permit.

~~(3)~~ G. Special Condition No. 9 of coastal development permit 5-97-367 shall be incorporated in its entirety into the construction documents which will be used by construction workers during the course of their work.
~~(4) Prior to the commencement of site preparation, grading, and construction activities for the golf course, golf clubhouse, homes, and wetlands approved by this permit, the following shall have been implemented and completed: 1) the approved archaeological investigation, and 2) all measures necessary to mitigate impacts to cultural resources discovered during the archaeological investigation.~~

~~This deed restriction shall be recorded over the entire site and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.~~

10. RESIDENTIAL DEVELOPMENT

~~A. Residential Community Streets. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide that; 1) the streets shown Vesting Tentative Tract Map No. 15402 shall be public and provide public on-street parking, 2) preferential parking shall not be established in the subdivision, 3) public parking shall not be prohibited via "red curbing" or other means, and 4) the width and numbers of curb cuts shall be~~

F-19

Applicants

~~minimized. The deed restriction shall be recorded over Street A, Street B, and Street C of Vesting Tentative Tract Map No. 15402 and shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.~~

B. Future Coastal Development Permit for Development of the Residential Community. This coastal development permit does not approve development on the lots created by Vesting Tentative Tract Map No. 15402. A future coastal development permit(s) is required for development, such as site preparation, construction of streets, common walls and landscaping, and construction of the actual homes, etc. on the site.

~~C. Timing of Construction. Residential development, including subdivision improvements and home construction, shall not commence until all the following occur: 1) the Phase 1 salt marsh wetlands and the freshwater marsh wetlands are constructed, 2) the trails have been opened to the public, and 3) Gum Grove Park has been dedicated to the City of Seal Beach.~~

D. Drainage. All runoff generated by the proposed residential community shall comply with the provisions of City of Seal Beach mitigation measures WQ-1 through WQ-10. ~~be directed away from the lowlands and ultimately into approved sewage treatment facilities rather than into storm drains which lead to the ocean or San Gabriel River.~~

11. WATER QUALITY

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a National Pollutant Discharge Elimination System permit ("NPDES"), Storm Water Pollution Prevention Plan, and Structural and Non-structural Best Management Practices for the proposed project, in compliance with the standards and requirements of the California Regional Water Quality Control Board. The applicant shall implement and comply with the water quality measures approved by the Executive Director.

12. HAZARDS

Mitigation Measures WQ-1, WQ-2, WQ-3, WQ-4, GEO-1, GEO-2, GEO-3, GEO-4, GEO-5, GEO-6, GEO-7, and GEO-8 as shown on Exhibit B of the City of Seal Beach City Council Resolution 4562 certifying the Hellman Ranch Specific Plan Environmental Impact Report on September 22, 1997 are hereby incorporated by reference as special conditions of this coastal development permit.

13. LEGAL INTEREST

PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, written documentation demonstrating that it has the legal ability to carry out all conditions of approval of this permit.

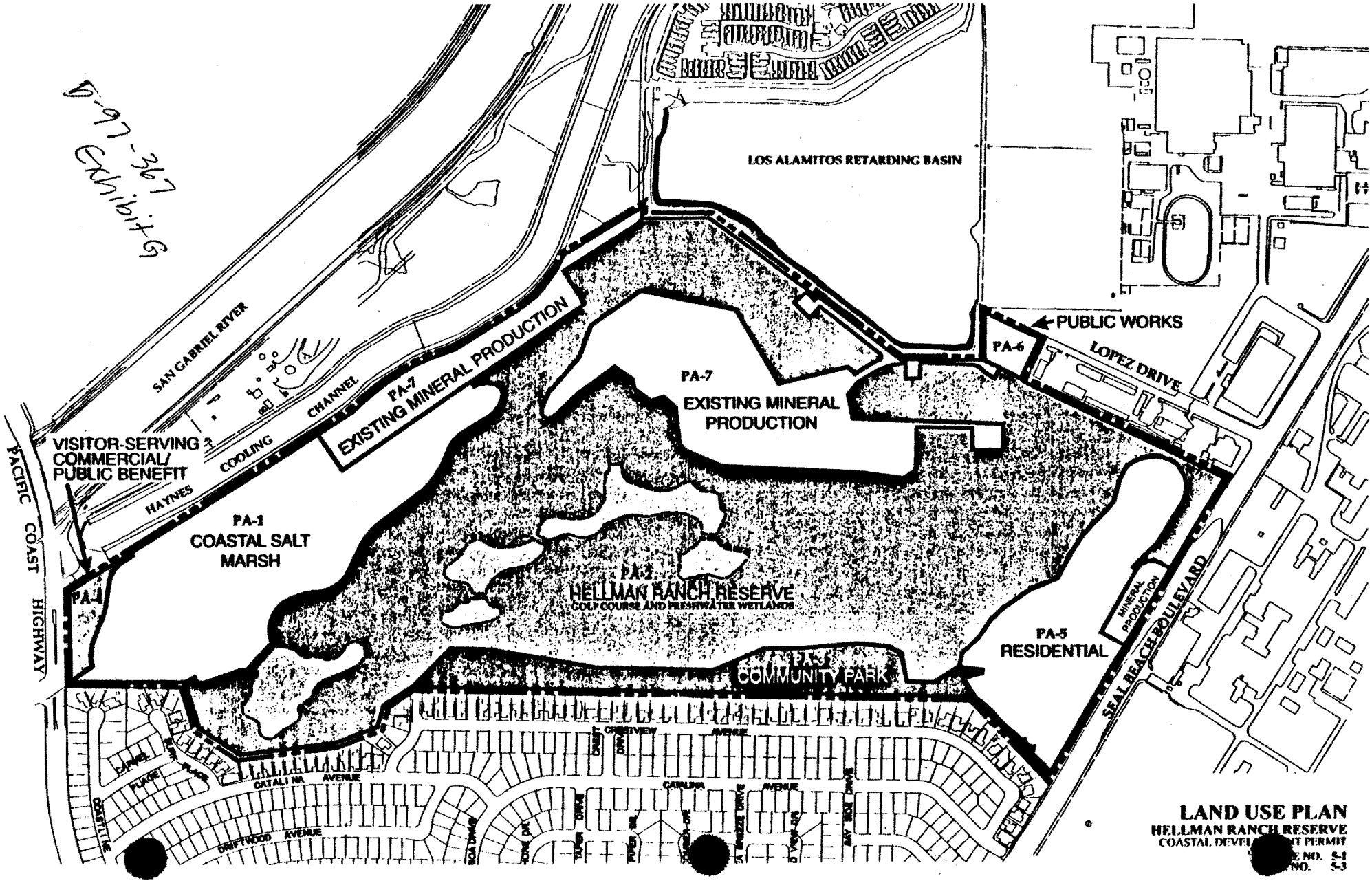
F-20

TABLE 5-1
HELLMAN RANCH RESERVE
COASTAL DEVELOPMENT PERMIT LAND USE PLAN

CDP PA	LAND USE	ACRES	DESCRIPTION	CONSERVATION EASEMENT
1	**COASTAL SALT MARSH**			Conservation easement for salt marsh wetland purposes.
	Coastal Salt Marsh	23.1	Restored, consolidated wetlands ecosystem with tidal connection to Pacific Ocean; several tidal zones for biodiversity.	
2	**HELLMAN RANCH RESERVE**			Conservation easement requiring a minimum of ~~9.7~~ 6.8 acres of freshwater marsh to be created and maintained as part of the golf course, pursuant to the RESERVE Wetlands Restoration Plan.
	18-Hole Public Golf Course and Clubhouse	107.5	Environmentally sensitive golf course, recreation and preservation of open space; out-of-play areas to function as habitat zones.	
	Freshwater Wetlands	~~9.7~~ 6.8	Freshwater marshes created in conjunction with golf course	
3	**COMMUNITY PARK**			Conservation easement for preservation of park for passive uses and an urban forest. Dedication of land to City of Seal Beach.
	Gum Grove Nature Park	11.07	Wilderness park and urban forest/ eucalyptus grove with nature trails.	
4	**VISITOR-SERVING COMMERCIAL/ PUBLIC BENEFIT**			Conservation easement within the development area establishing an open space/conservation area within 50-feet of the coastal salt marsh.
	Commercial	1.8 (includes the entire parcel)	10,000 square feet of visitor-serving commercial uses.	
	Interpretive Facility		Raised platform and display boards regarding wildlife and the wetlands ecosystem	
	Krenwinkle House		Area reserved for the relocation of the Krenwinkle House, which could become a City museum or a more formal interpretive center.	
5	**RESIDENTIAL**			None
	Single Family Residential	14.94	70 Single family homes accessed by Seal Beach Boulevard. Average lot size of 6,100 square feet.	
6	**PUBLIC WORKS**			None
	City Property	1.41	Extension of Lopez Drive to the Hellman Ranch property for access.	
7	**EXISTING MINERAL PRODUCTION**			None
	Gas and Petroleum Extraction	28.2	Existing pumping units, tank farm, pipelines and associated facilities.	
TOTAL		**196.49**		

5-97-367 Exhibit 6

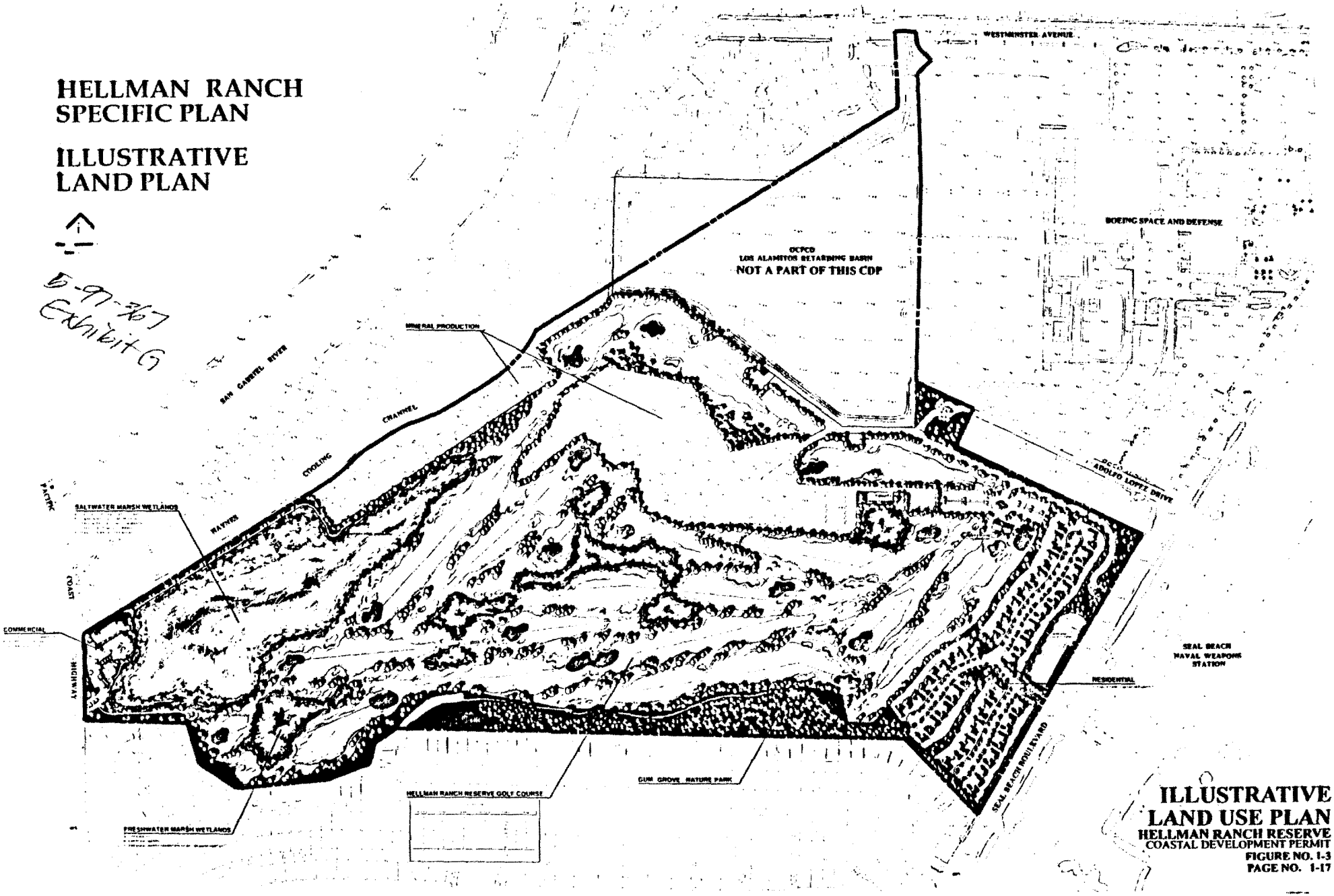
5-97-367
Exhibit G


LOS ALAMITOS RETARDING BASIN
PUBLIC WORKS
PA-6
LOPEZ DRIVE
PA-7
EXISTING MINERAL PRODUCTION
PA-7
EXISTING MINERAL PRODUCTION
SAN GABRIEL RIVER
COOLING CHANNEL
HAYNES
VISITOR-SERVING COMMERCIAL/ PUBLIC BENEFIT
PACIFIC COAST HIGHWAY
PA-1
PA-1
COASTAL SALT MARSH
PA-2
HELLMAN RANCH RESERVE
GOLF COURSE AND FRESHWATER WETLANDS
PA-3
COMMUNITY PARK
PA-5
RESIDENTIAL
MINERAL PRODUCTION
SEAL BEACH BOULEVARD
CATALINA AVENUE
DRIFTWOOD AVENUE
CREST VIEW AVENUE
CATALINA AVENUE
DOLFUTTE
PLACE
PLACE
DRIVE
DRIVE
DRIV

HELLMAN RANCH SPECIFIC PLAN

ILLUSTRATIVE LAND PLAN

5-97-367
Exhibit G



ILLUSTRATIVE LAND USE PLAN
HELLMAN RANCH RESERVE
COASTAL DEVELOPMENT PERMIT
FIGURE NO. 1-3
PAGE NO. 1-17

TABLE 1-2
PUBLIC ACCESS
EXISTING CONDITIONS

Land Ownership	Public Access	Description	Acres	% of Property
Hellman Properties LLC Hellman Ranch	Not Allowed	Mineral production areas and former working ranch. Existing degraded and severely degraded (technical) wetlands.	173.7	88%
Gum Grove Nature Park	Allowed	Nature park and urban forest leased to the City. Lease can be canceled by Hellman Properties with 30 days notice.	10.2	5%
State Lands Commission Property at PCH and First Street	Not Allowed	Property vacant and fenced.	3.4	2%
City of Seal Beach End of Lopez Drive	Allowed	Vacant; used as an informal dump site and trash transfer station.	1.4	1%
Southern California Edison 100-foot wide strip from PCH to northern property line	Not Allowed	Fee-title right-of-way for Edison facilities.	7.9	4%
		TOTALS	196.6	100%

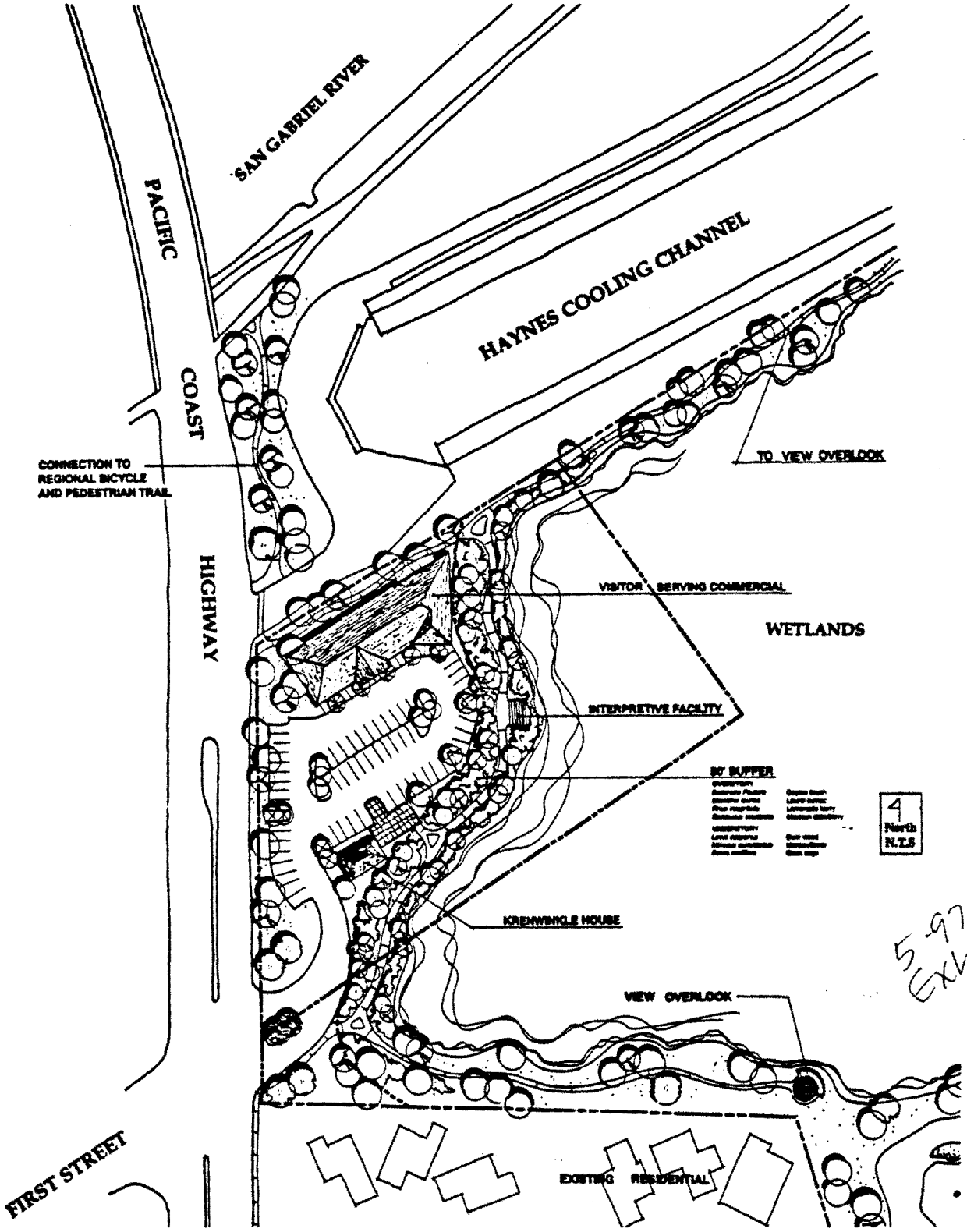
6% of the existing project area is designated for public use.

TABLE 1-3
PROPOSED PUBLIC ACCESS CONDITIONS

Land Use	Public Access	Description	Acres	% of Project
Coastal Salt Marsh Wetlands Restoration	Allowed	Public access around the perimeter of the marsh; pedestrian trails and public observations areas.	23.1	12%
Freshwater Marsh Wetlands	Allowed	Freshwater marsh creation as part of the golf course.	9.7	5%
Hellman Ranch Reserve	Allowed	Golf course open to the public.	100.8	51%
Golf Course Clubhouse	Allowed	Clubhouse open to the public.	6.7	3%
Gum Grove Nature Park	Allowed	Park dedicated to the City of Seal Beach; urban forest in perpetuity.	10.2	5%
CommercialPublic Benefit	Allowed	Visitor-serving commercial uses; interpretive facility and City-owned historic home. Pedestrian trails and public observation areas around perimeter of coastal salt marsh.	1.8	1%
City Property	Allowed	Primarily used for access to the project site.	1.4	1%
Single Family Residential	Not Allowed	70 homes located on the mesa near Seal Beach Boulevard	14.7	7%
Mineral Production	Not Allowed	Areas reserved for continued mineral production	28.2	14%
		TOTALS	196.6	100%

79% of the RESERVE project area will consist of open space, natural resource areas and land uses that will allow public access.

5-97-367 Exhibit 5



5-97-367 Exhibits

STATE LANDS COMMISSION CONCEPTUAL SITE PLAN
HELLMAN RANCH RESERVE
COASTAL DEVELOPMENT PERMIT
FIGURE 5-4

RESTORATION PLAN

STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, *Governor*

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
200 Oceangate, Suite 1000
Long Beach, CA 90802-4302
(562) 590-5071

May 21, 1998

We.9.b

Wednesday, June 10, 1998
Coastal Commission hearing

5-97-367 (Hellman Ranch)

Appendix E

Wetland Documents

Page E-1 Coastal Salt Marsh Wetland Functional Assessment.

Page E-21 February 1998 addendum to the concept wetlands plan

Page E-45 November 1997 concept wetlands plan

HELLMAN WETLANDS/SEAL BEACH

COASTAL SALT MARSH WETLAND FUNCTIONAL ASSESSMENT

Comparing Existing Conditions with Conditions after Implementation of the Hellman Ranch Reserve Wetland Restoration Project

RECEIVED
FEB 23 1998
CALIFORNIA
COASTAL COMMISSION

Prepared for:

Hellman Properties LLC
711 Seal Beach Boulevard
Seal Beach, CA 90740

Coastal Development Permit No. 5-97-367

Prepared by:

Glenn Lukos Associates
23441 South Point Drive • Suite 150
Laguna Hills, CA 92653
Contact: Tony Bomkamp
(714) 837-0404

and

Coastal Resources Management
2855 E. Coast Highway • Suite 225
Corona Del Mar, CA 92625
Contact: Rick Ware
(714) 636-3076

February 1998

5-97-367 ~~Addendum p. D-1~~ (6/98) 61

Executive Summary

The Hellman Ranch Reserve Project (RESERVE) is a proposed 27 acre salt marsh wetlands restoration program in connection with 7 acres of freshwater marsh habitat associated with the adjacent RESERVE golf course.[1]

A functional assessment of the existing 27 acres of severely degraded and degraded wetland habitat[2], on the RESERVE was conducted in order to compare the functions performed by the existing wetlands with the functions that would be expected with the 27 acres of restored coastal salt marsh wetlands.

Based on criteria developed by the U.S. Army Corps of Engineers, a Hydrogeomorphic (HGM) approach was utilized which considers physical, chemical, and biological characteristics of various wetland subclasses within a region. The details and precise methodology are described in the body of this report.

Based on the HGM approach, it has been determined that restored functions compared to existing functions at the RESERVE would increase by a ratio of 3.6:1. On a qualitative basis, the Reserve restoration project represents a 3.6:1 mitigation ratio. The table below summarizes the analysis.

Summary of Wetland Functional Capacity

Function	Existing Functional Capacity	Restored Functional Capacity	Ratio of Existing FC to Restored FC
Tidal Surge Attenuation	Not Applicable	Not Applicable	--
Sediment Deposition	1.14	5.7	5.0:1
Tidal Nutrient Removal	1.0	3.4	3.4:1
Particulate Organic Carbon Export	2.7	6.6	2.4:1
Maintain Characteristic Plant Structure and Composition	3.6	10.0	2.8:1
Resident Nekton Utilization Potential	0.62	8.7	14:1
Non-Resident Nekton Utilization Potential	0.62	8.7	14:1
Nekton Prey Pool Potential	0.71	8.2	11.5:1
Wildlife Habitat Utilization Potential	8.9	17.9	2:1
Total	19.3	69.2	3.6:1

[1] The 7 acre freshwater marsh habitat associated with proposed golf course and the 15.4 acres of oil production land reserved for a wetland mitigation bank, are not being considered. Only the salt marsh restoration component associated with the project which is currently before the California Coastal Commission under CDP 5-97-367 is being analyzed.

[2] California Department of Fish and Game Degraded Wetland Determination.

FUNCTIONAL ASSESSMENT

A functional assessment of the existing approximately 27 acres of degraded and severely degraded wetland habitat, on the Hellman Ranch Reserve, (Reserve) was conducted in order to compare the functions performed by the existing wetlands with the functions that would be expected within 26 acres of restored coastal salt marsh wetlands. For purposes of this analysis, he freshwater marsh associated with the Reserve Golf Course was not included. The functional assessment was performed using the Hydrogeomorphic (HGM) approach developed by the U.S. Army Corps of Engineers (Corps).[1]

Introduction

In order to assess functions provided by wetlands, the U.S. Army Corps of Engineers (Corps) has developed the Hydrogeomorphic (HGM) approach which considers the physical, chemical, and biological characteristics of various wetland subclasses within a region. The HGM approach provides a methodology, whereby changes in functional capacity of wetlands, due to project-related impacts can be quantified. This is accomplished by assigning values (functional indices) to each of the functions performed by the wetland being assessed which can then be compared with known indices from reference wetlands in the same regional subclass.

The same type of assessment can also be used to compare wetland functions performed by a given wetland with the functions performed by the same wetland following restoration or enhancement efforts. This functional assessment was prepared by Tony Bomkamp of Glenn Lukos Associates and Rick Ware of Coastal Resources Management. Mr. Bomkamp is a wetlands ecologist and botanist with over 20 year experience in California botany and ecology and has focused on wetland ecology over the last eight years. Mr. Bomkamp has extensive experience in wetland delineation, wetland functional assessment, and wetland restoration. In addition to his work as a consultant Mr. Bomkamp is a part-time instructor at Cal-State Fullerton where he teaches course on "endangered habitats" as well as a course on "wetlands". Mr. Ware is a marine biologist with over 20 years of experience in coastal habitats including coastal salt marsh. Mr. Ware has particular expertise in fisheries biology and ecology as well as in wetland restoration.

Methodology

Reference wetlands for the coastal salt marsh subclass have not been designated for the Southern California region by the Corps. In order to conduct the analysis provided below, reference wetlands were selected to provide a means for comparing the existing functions and the restored

---

[1] Brinson, M.M. 1993. "A hydrogeomorphic classification for wetlands" Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksberg, MS.
Smith, R.D., D. A. Ammann, C. Bartoldus, and M.M. Brinson. 1995. "An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices," Technical Report WRP-DE-9, U.S. Army Engineer Waterways Experiment Station, Vicksberg, MS.

5-97-367 ~~Addendum p. D-3~~ (8/98) ApE3

functions at the Reserve with target wetlands in the region. Target wetlands included Bolsa Chica, Upper Newport Bay, and Los Cerritos. Functions performed by coastal salt marsh habitats have been provisionally determined by the Los Angeles District of the Corps. The functions include:

- **Tidal Surge Attenuation**
- **Sediment Deposition**
- **Tidal Nutrient Removal**
- **Particulate Organic Carbon Export**
- **Maintain Characteristic Plant Structure and Composition**
- **Resident Nekton Utilization Potential**
- **Nekton Prey Pool Potential**
- **Wildlife Habitat Utilization Potential**

In conducting the HGM assessment it was necessary to perform the following operations: 1) determine the functional capacity index for the wetland (or portion of the wetland) and 2) calculate the functional capacity for the wetland.

<u>Determination of Functional Capacity Index</u>

The functional capacity index (FCI) is a measure of the ability of a wetland (or portion of a wetland) to perform a certain function. The HGM approach assigns a value of 1.0 for the highest level of function and a value of 0 when the function is not present. Since, as mentioned above, reference wetlands have not be designated for Southern California coastal salt marsh habitats, this study uses the above-mentioned wetlands as templates in assigning functional indices to the existing wetland functions at the Reserve as well as for the proposed restoration wetlands. It is important to note that the HGM approach recognizes that in many cases, the assessment of wetland functions under predicted future conditions is done in the same manner as an assessment of existing conditions with the exception that the assessment of future conditions must be made based upon expected conditions.

Much of the information upon which this assessment was based comes from direst observation of site conditions by Mr. Bomkamp and Mr. Ware. Mr. Bomkamp has performed wetland delineation, vegetation mapping, focused botanical surveys, and general botanical surveys on the site. Mr. Ware was responsible for conducting the most recent wetland delineation and assisted in the preparation of the coastal salt marsh restoration plan.

5-97-367 Addendum p. D-4 (4/98)

Calculation of Functional Capacity

In order to calculate functional capacity (FC), it is necessary to consider the size of the wetland (or portion of the wetland) in conjunction with the FCI. This is important, because consideration of FCI alone could lead to erroneous conclusions. A 10 acre coastal salt marsh with a FCI of 0.8 would be more valuable than a 2 acre coastal salt marsh with an FCI of 0.8. In order to calculate Functional Capacity it is therefore necessary to multiply the FCI by the size of the target wetland.

ANALYSIS OF FUNCTIONS

Tidal Surge Attenuation

Because tidal exchange on the site is muted by a culvert which connects the site to the San Gabriel River, this function is not provided by the wetlands on the site. Because tidal exchange would still pass through the existing culvert, there would be no change associated with this function from pre-project conditions to post-project conditions (Table 1 provides a summary for of the Functional Capacity values determined for each wetland function including existing conditions and restored conditions).

Sediment Deposition

Existing Conditions - Determination of Functional Capacity

The only area of wetlands on the site which receives tidal flow is the 3.1-acre tidal channel which varies in width from a few feet to 15 feet in some areas and extends for approximately 3,000 feet. The ability of the channel to remove sediments from inflowing tides or runoff from the site, discharging through the channel to the San Gabriel River is based upon three variables (V):

V(fd) = Flooding Duration

V(d) = Distance

V(r) = Roughness

The FCI is determined according to the following equation:

$$[V(fd) + V(d) + V(r)] / 3 = FCI$$

Under existing conditions the residence time of the 3.1-acre channel (Flooding Duration) is four days, meaning that a complete exchange of tidal waters occurs every four days at the extreme end of the tidal channel. It is expected that the difference in the V(fd) for existing conditions and restored conditions would be proportional, based upon the residence time of each, with the existing V(fd) value of 0.4, corresponding to a residence time of 4 days (a residence time of 8 days would result in proportional amount of sediment settling out of the water column and based upon proportionality would have a V(fd) value of 0.8).

5-97-367 ~~Addendum 4/98~~ 6/98 Ap E5 ~~p D-5~~

Under the existing conditions, the distance traveled by the flows within the 3.1-acre tidal channel is approximately 3,000 feet to the most distant segment of the tidal channel. As above, the relationship between the existing conditions when compared with the conditions after mitigation are expected to be proportional to the distance traveled. Therefore the existing V(d) value is 0.3 corresponding to 3,000 feet (a distance of 4,000 feet would allow for more sediments to drop out of the water column resulting in a V(d) value of 0.4).

Table 1
Summary of Wetland Functional Capacity

Function	Existing Functional Capacity	Restored Functional Capacity	Ratio of Existing FC to Restored FC
Tidal Surge Attenuation	Not Applicable	Not Applicable	--
Sediment Deposition	1.14	5.7	5.0:1
Tidal Nutrient Removal	1.0	3.4	3.4:1
Particulate Organic Carbon Export	2.7	6.6	2.4:1
Maintain Characteristic Plant Structure and Composition	3.6	10.0	2.8:1
Resident Nekton Utilization Potential	0.62	8.7	14:1
Non-Resident Nekton Utilization Potential	0.62	8.7	14:1
Nekton Prey Pool Potential	0.71	8.2	11.5:1
Wildlife Habitat Utilization Potential	8.9	17.9	2:1
Total	19.3	69.2	3.6:1

5-97-367 Addendum p. D-6

(4/98)

For coastal salt marsh habitats, roughness is generally a measure of the cover or density of the vegetation within the wetland which would serve to "filter" the water as it moves through the wetland. The channel exhibits approximately 40-percent vegetative cover with a corresponding V(r) value of 0.4 (100-percent cover would result in a V(r) value of 1.0).

The FCI for sediment deposit under existing conditions is: 0.4 + 0.3 + 0.4 / 3 = 0.367

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for sediment deposit is determined to be .367 multiplied by 3.1 (acres) which equals 1.14

Restored Conditions - Determination of Functional Capacity

Under restored conditions, the residence time of the wetland (Flooding Duration) would be approximately two days, meaning the a complete exchange of tidal waters would occur every two days within the created wetland. It is expected that the difference in the V(fd) values for existing conditions and restored conditions would be proportional, based upon the residence time of each with the restored V(fd) value of 0.2, corresponding to a residence time of 2 days (a residence time of 8 days would result in proportional amount of sediment settling out of the water column and based upon proportionality would have a V(fd) value of 0.8).

Distance traveled by the flows would be approximately 2,300 feet to the most distant segment of the restored wetland. As above, the relationship between the existing conditions when compared with the conditions after mitigation are expected to be proportional to the distance traveled. Therefore, under the restored conditions the V(d) value is 0.23 corresponding to 2,300 feet.

Roughness is generally a measure of the cover of the vegetation within the wetland which will serve to "filter" the water as it moves through the wetland. The target cover for the restored wetland is 75-percent which is reflected in a V(r) value of 0.75.

Therefore the FCI for sediment deposit under restored conditions is expected to be: 0.2 + 0.23 + 0.75 / 3 = 0.393

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under restored conditions, the FC for sediment deposit is determined to be .393 multiplied by 14.5 acres(of subtidal, mudflat, and low marsh) which equals 5.7.

Thus, upon implementation of the project the Functional Capacity for Sediment Deposition would increase from 1.14 to 5.7 or an increase of 5:1.

5-97-367 ~~Addendum~~ 6/98

Ap E7
p. ~~B-7~~

Tidal Nutrient Removal

Existing Conditions - Determination of Functional Capacity

The only area of wetlands on the site capable of tidal nutrient removal is the tidal channel. The ability of the channel to remove nutrients from inflowing tides through the San Gabriel River is based upon three variables (V):

V(fd) = Flooding Duration

V(cc) = Emergent Macrophyte Community Composition

V(s) = Macrophtye Structure

The FCI is determined according to the following equation:

[V(fd) + V(cc) + V(s)] / 3 = FCI

Under exisiting conditions the residence time of the 3.1-acre channel (Flooding Duration) is four days , meaning that a complete exchange of tidal waters occurs every four days at the extreme end of the tidal channel. It is expected that the difference in the V(fd) for existing conditions and restored conditions would be proportional, based upon the residence time of each with the existing V(fd) of 0.4, corresponding to a residence time of 4 days (a residence time of 8 days would result in proportional amount of sediment settling out of the water column and based upon proportionality would have a V(fd) value of 0.8).

The Emergent Macrophyte Community Composition generally consists of species which are inundated for significant periods of time with cordgrass (*Spartina foliosa*) as the dominant emergent. In some cases, pickleweed (*Salicornia virginica*) will occupy the low marsh areas and perform the function of an emergent macrophyte. The existing tidal channel supports no cordgrass and only limited pickleweed in the lower portions of the channel. The banks of the tidal channel support samphire (*Salicornia subteminalis*), a species most commonly found in upper marsh areas which experience only limited periods of inundation. For the 2.0-acre tidal channel, the V(cc) value is 0.1 based upon the nearly complete absence of emergent wetland vegetation.

The macrophyte structure on the banks of the channel, as described above consists primarily of samphire. Areas adjacent to the channel which are subject to very limited tidal influence support a moderate diversity and cover of species including alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and fleshy jaumea (*Jaumea carnosa*). Based upon the moderate diversity and cover, the V(s) value is 0.5.

Therefore the FCI for tidal nutrient removal under existing conditions is: 0.4 + 0.1 + 0.5 / 3 = 0.333

5-97-367 Addendum p. D-8 (4/98)

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for sediment deposit is determined to be .333 multiplied by 3.1 (acres) which equals 1.0

Restored Conditions - Determination of Functional Capacity

Under restored conditions the residence time of the wetland (Flooding Duration) would be approximately two days, meaning the a complete exchange of tidal waters would occur every two days within the created wetland. It is expected that the difference in the V(fd) values for existing conditions and restored conditions would be proportional, based upon the residence time of each with the restored V(fd) value of 0.2, corresponding to a residence time of 2 days (a residence time of 8 days would result in proportional amount of sediment settling out of the water column and based upon proportionality would have a V(fd) value of 0.8).

The restored salt marsh would include 2.4 acres of cordgrass habitat as well 3.6 acres of tidal pickleweed habitat. Based upon the success criteria provided in the mitigation plan the restored area is expected to achieve a minimum of 75-percent cover for a V(cc) value of 0.75. In addition to the emergent cordgrass and pickleweed marsh areas, the lower portions of the restored saltmarsh would include alkali heath, saltgrass, California sea lavender (*Limonium californicum*), and fleshy jaumea. The moderate diversity of species coupled with the minimum of 75-percent cover results in an FCI of 0.75.

The FCI for Tidal Nutrient Removal, under restored conditions, is expected to be: 0.2 + 0.75 + 0.75 / 3 = 0.57

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for Tidal Nutrient Removal is determined to be 0.57, multiplied by 6 (acres) which equals 3.4.

Thus, upon implementation of the project the Functional Capacity for Sediment Deposition would increase from 1.0 to 3.4 or an increase of 3.4:1.

<u>Particulate Organic Carbon Export</u>

Existing Conditions - Determination of Functional Capacity

Much of the wetland habitat on the site is in isolated depressions or in areas separated from tidal influence by berms, roads or fill and are therefore not connected to the 3.1-acre tidal channel. However, there are approximately 7.0 acres of wetlands that during times of flooding exhibit sufficient connection to the channel that they contribute through surface flow to the tidal channel thereby contributing to Particulate Organic Carbon Export. The ability of the wetlands to contribute to organic carbon export is based upon three variables (V):

5-97-367 Addendum 6/98

Ap E 9

V(fd) = Flooding Duration

V(cc) = Emergent Macrophyte Community Composition

V(s) = Macrophtye Structure

The FCI is determined according to the following equation:

[V(fd) + V(cc) + V(s)] / 3 = FCI

Under existing conditions the residence time of the channel (Flooding Duration) is four days, meaning that a complete exchange of tidal waters occurs every four days at the extreme end of the tidal channel. The 7.0 acres of wetlands beyond the tidal channel that are expected to contribute to organic carbon would experience only brief duration of flooding, being limited to heavy rainfall events. The V(fd) for the tidal channel has been established at 0.4; however including the 7.0 acres of adjacent wetlands that would contribute some organics during heavy rainfall would significantly reduce the average flooding duration. Although the flooding duration during rainfall events has not been calculated it is not unreasonable to expect a significant reduction in flooding duration when the 7.0-acre area is averaged with the tidal channel. Thus a V(fd) value of 0.2, which includes the residence time for the tidal channel and an undetermined (but very brief) duration for non-tidal channel areas would appear to be a conservative estimate.

Emergent Macrophyte Community Composition generally consists of species which are inundated for significant periods of time with cordgrass (*Spartina foliosa*) as the dominant emergent. In some cases, pickleweed (*Salicornia virginica*) will occupy the low marsh areas and serve the function of an emergent macrophyte. The existing tidal channel supports no cordgrass and only limited pickleweed in the lower portions of the channel. The banks of the tidal channel support samphire (*Salicornia subteminalis*), a species most commonly found in upper marsh areas which experience only limited periods of inundation. For the 3.1-acre tidal channel, the V(cc) value is 0.1 based upon the nearly complete absence of emergent wetland vegetation. The macrophyte structure on the banks of the channel, as described above consists primarily of samphire. Areas adjacent to the channel which are subject to very limited tidal influence support a moderate diversity and cover of species including alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and fleshy jaumea (*Jaumea carnosa*). Based upon the moderate diversity and cover, the V(s) value is 0.5.

Therefore the FCI for Tidal Nutrient Removal under existing conditions is: 0.2 + 0.1 + 0.5 / 3 = 0.27

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for Tidal Nutrient Removal is determined to be 0.27 multiplied by 10.1 (acres) which equals 2.7.

5-97-367 Addendum p. D-10 (4/98)

Restored Conditions - Determination of Functional Capacity

Under restored conditions the residence time of the wetland (Flooding Duration) would be approximately two days, meaning the a complete exchange of tidal waters would occur every two days within the created wetland. It is expected that the difference in the V(fd) values for existing conditions and restored conditions would be proportional, based upon the residence time of each with the restored V(fd) value of 0.2, corresponding to a residence time of 2 days (a residence time of 8 days would result in proportional amount of sediment settling out of the water column and based upon proportionality would have a V(fd) value of 0.8).

The restored salt marsh would include 2.4 acres of cordgrass habitat, 3.6 acres of tidal pickleweed habitat, and 5.7 acres of upper marsh pickleweed habitat. Based upon the success criteria provided in the mitigation plan, the restored areas would achieve a minimum of 75-percent cover for a V(cc) value of 0.75.

In addition to the emergent cordgrass and pickleweed marsh areas, the lower portions of the restored saltmarsh would include alkali heath, saltgrass, California sea lavender (*Limonium californicum*), and fleshy jaumea. The moderate diversity of species coupled with the minimum of 75-percent cover results in a V(s) value of 0.75.

Therefore the FCI for Particulate Organic Carbon Transport under restored conditions is expected to be: 0.2 + 0.75 + 0.75 / 3 = 0.566

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for Particulate Organic Carbon Export is determined to be 0.566, multiplied by 11.7 (acres) which equals 6.62.

Thus, upon implementation of the project the Functional Capacity for Particulate Organic Carbon Transport would increase from 0.2.72 to 6.62 or an increase of 2.4:1.

<u>Maintain Characteristic Plant Structure and Composition</u>

Existing Conditions - Determination of Functional Capacity

The wetlands on the site have been determined to be degraded to severely degraded due to a lack of tidal influence for all areas outside of the tidal channel. As such many of the wetland areas support non-native species such as five-hook bassia (*Bassia hyssopifolia*) and otherwise exhibit significant disturbance.

V(cc) = Emergent Macrophyte Community Composition

V(s) = Macrophtye Structure

The FCI is determined according to the following equation:

5-97-367 ~~Addendum~~ 6/98

AP E II
~~P D~~ H

[V(cc) + V(s)] / 2 = FCI

Emergent Macrophyte Community Composition generally consists of species which are inundated for significant periods of time with cordgrass (*Spartina foliosa*) as the dominant emergent. In some cases, pickleweed (*Salicornia virginica*) will occupy the low marsh areas and serve the function of an emergent macrophyte. The existing tidal channel supports no cordgrass and only limited pickleweed in the lower portions of the channel. The banks of the tidal channel support samphire (*Salicornia subteminalis*), a species most commonly found in upper marsh areas which experience only limited periods of inundation. For the 3.1-acre tidal channel, the V(cc) is 0.1 based upon the nearly complete absence of emergent wetland vegetation.

The macrophyte structure on the banks of the channel, as described above consists primarily of samphire. Areas adjacent to the channel which are subject to very limited tidal influence support a moderate diversity and cover of species including alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and fleshy jaumea (*Jaumea carnosa*). Other areas of wetland consist of degraded salt marsh and meadow habitats which have been established on areas of fill. Recent surveys, conducted for Belding's savannah sparrow, identified only about 2.3 acres of pickleweed habitat suitable for foraging for this state-listed species (the pickleweed is not suitable for nesting as evidenced by the fact that the species has never been recorded as nesting on the site). The remaining areas were determined to be degraded such that they would not provide even foraging habitat for the sparrow. Based upon the degraded conditions of the wetland vegetation on the site the V(s) value is 0.3.

Therefore the FCI for maintenance of the characteristic plant structure and composition under existing conditions is: 0.1 + 0.3 / 2 = 0.2

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for plant structure and composition is 0.2 multiplied by 18.0 (acres of vegetated wetlands) which equals 3.6.

Restored Conditions - Determination of Functional Capacity

Restoration would include approximately 2.4 acres of emergent cordgrass habitat and an additional 3.6 acres of emergent or low marsh pickleweed habitat. Based upon the success criteria provided in the mitigation plan, after restoration the site would achieve a minimum of 75-percent vegetative cover for a V(cc) value of 0.75.

The restored salt marsh would include 18.7 acres of wetland area including, cordgrass habitat, low marsh pickleweed habitat, and high marsh habitats. Based upon the success criteria provided in the mitigation plan, after restoration the site would achieve a minimum of 75-percent vegetative cover for an V(s) value of 0.75.

Therefore the FCI for plant structure and composition under restored conditions is expected to be: 0.75 + 0.75 / = 0.75

5-97-367 Addendum p. D-12 (4/98)

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for plant structure and composition is determined to be 0.75, multiplied by 13.4 (acres) which equals 10.0

Thus, upon implementation of the project the Functional Capacity for Plant Structure and Composition would increase from 3.6 to 10.0 or an increase of 2.8:1.

<u>Non-Resident Nekton Potential</u>

Existing Conditions - Determination of Functional Capacity

Non-resident, transient nekton are defined as those species of fish and macrocrustacea which are not dependent upon the on-site tidal habitat on a year-round basis for foraging, breeding, and/or nursery habitat. These species may transit in and out of the wetland channels during the course of tidal exchange through an existing tidal gate and a 48 inch diameter, 510 foot-long culvert leading from the San Gabriel River. This culvert supplies brackish-to-marine influenced tidal waters and flows from the San Gabriel River to 3.1-acre tidal channel on the property. For the subject site, three variables were identified which are important in determining the Non-resident Nekton Potential:

V(ae) = Aquatic Edge

V(fd) = Flooding Duration

V(hc) = Habitat Complexity

Aquatic edge considers the relationship between tidal channels and other deepwater areas with wetland areas. Because of the narrowness of the channel, its proximity to severely degraded wetland and upland areas, and the lower density of vegetation within the lower (relative to elevation) parts of the channel, the V(ae) value is 0.3.

Flooding Duration, as it relates to nekton, must consider the following. Although the bottom of the narrow channel is at approximately -1.0MSL and therefore always has a reservoir of standing water the conditions in the channel exhibit very poor quality for nekton. The existing non-resident nektonic potential is low due to the extremely reduced, muted tidal regime, the poorly maintained culvert and resulting limited tidal circulation, and limited area in the tidal channel. In addition, direct observations indicate that only part of the channel appear to be deep enough to support water column nekton (i.e., topsmelt) near the culvert at the southwest section of the property. Species which may occasionally occur include juvenile topsmelt (*Atherinops affinis*) and deepbody anchovy *(Anchoa compressa)*. Macrocrustaceans (i.e., shrimp) are not expected in this habitat. Based on the above, the value for V(fd) is 0.1.

For Non-Resident Nekton, habitat complexity relates to the 3.1-acre tidal channel only. The tidal channel consists of a narrow linear man-made ditch which is generally unvegetated except on the banks. Habitat complexity is very low with a V(hc) value of 0.2.

5-97-367 Addendum 8/98 p. D-13 Ap E13

The FCI for Non-Resident Nekton Potential, under existing conditions, is 0.3 + 0.1 + 0.2 / 3 = 0.2

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for Non-Resident Necton Potential is determined to be 0.2, multiplied by 3.1 (acres) which equals 0.62

Restored Conditions - Determination of Functional Capacity

The restored wetland will be created with a number of finger channels (suggested by both the Corps regulatory staff and the Coastal Commission biologists) to increase the ratio of deepwater aquatic habitat to wetland habitat and will cover approximately 11.7 acres. In addition, approximately 2.7 acres of low marsh habitat would be adjacent to the deepwater and mudflat areas, with an additional 8.6 acres of adjacent upper marsh. The presence of significant areas of native wetland habitat adjacent to the deepwater areas including numerous finger channels will result in a V(ae) value of 0.75.

The restored wetland will have have deepwater areas to -4.0MSL meaning that there will significant water in the wetland at all times (at least 4.1 acres under water at all times). Residence times will be approximately 2 days enhancing water quality. Improved muted flushing and lower residence times will increase water quality in the system. An improvement of the system's water quality, an increase in acreage, and creation of deeper, permanent channels will increase the functional value of the estuarine/tidal habitat for non-resident nekton including topsmelt, deepbody anchovy, shiner perch (*Cymatogaster aggregata)* California halibut (*Paralichthys californicus*), and diamond turbot (*Hypsopetta guttulata)*. Few, if any non-resident macrocrustacea will be present. The non-resident nekton potential under future conditions will also be a function of the quality of the San Gabriel River inflow, which periodically can be low in dissolved oxygen, salinity, and exhibit high water temperatures. Based on all of these future conditions, the values for V(fd) and V(hc) are 0.75.

The FCI for Non-Resident Nekton Potential under existing conditions is 0.75 + 0.75 + 0.75 / 3 = 0.75

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for Non-Resident Nekton Potential is expected to be 0.75 multiplied by 11.7 (acres) which equals 8.7

Thus, upon implementation of the project the Functional Capacity Wildlife Habitat Utilization Potential would increase from 0.62 to 8.7 or an increase of 14:1.

5-97-367 Addendum p. D-14 (4/98)

Resident Nekton Potential

Existing Conditions - Determination of Functional Capacity

Resident "nekton" as defined here includes species of fish and macrocrustacea which are either water column or benthic occurring and whose populations will occur year around within the system. They will reproduce, forage, and feed in the wetland channels. Planktonic larvae and eggs of future adult resident nekton enter the wetland channels through tidal flows of the San Gabriel River through the nearly-closed tidal gate. Eggs and larvae of residents are also transferred out through the system through the muted-tidal outflows. It is not currently known if any resident fishes occur in the 3.1-acre tidal channel. For the subject site, three variables were identified which are important in determining the Resident Nekton Potential:

V(ae) = Aquatic Edge

V(fd) = Flooding Duration

V(hc) = Habitat Complexity

Aquatic edge considers the relationship between tidal channels and other deepwater areas with wetland areas. Because of the narrowness of the channel, its proximity to severely degraded wetland and upland areas, as well as based upon direct observations the V(ae) value is 0.3.

Flooding Duration, as it relates to nekton, must consider the following. Although the bottom of the narrow channel is at approximately -1.0MSL and therefore always has a reservoir of standing water, the conditions in the channel exhibit very poor quality for nekton. The resident nektonic potential under existing conditions is extremely low as a result of the extremely reduced, muted tidal regime, and limited circulation in the tidal channel. Only a few, very tolerant benthic fishes are believed to be present because of the extremely limited circulation and flushing conditions. Species which may be found in very low numbers include brackish-tolerant species of gobiid fishes (i.e, cheekspot-goby *Illypnus gilberti*, longjaw mudsucker *Gillichthys mirabilis*, and the highly opportunistic yellowfin goby *Acanthogobius flavimanus*); killifish *(Fundulus parvipinnus)*; and mosquitofish (*Gambusia affinis*).

During prolonged freshwater flows, crayfish (*Procambaris clarkii*) may occur in the upstream regions of the drainage channel. Based on the above, the value for V(fd) is 0.1.

For Resident Nekton, habitat complexity relates to the 3.1-acre tidal channel only. The tidal channel consists of a narrow linear man-made ditch which is generally unvegetated except on the banks. Habitat complexity is very low with a V(hc) value of 0.2.

The FCI for Resident Nekton Potential under existing conditions is: 0.3 + 0.1 + 0.2 / 3 = 0.2

5-97-367 ~~Addendum 4/98~~ 6/98

Ap E15
~~D15~~

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for Non-Resident Necton Potential is determined to be 0.2, multiplied by 3.1 (acres) which equals 0.62

Restored Conditions - Determination of Functional Capacity

The restored wetland will be created with a number of finger channels (suggested by both the Corps regulatory staff and the Coastal Commission biologists) to increase the ratio of deepwater aquatic habitat to wetland habitat and will cover approximately 11.7 acres. In addition, approximately 2.7 acres of low marsh habitat would be adjacent to the deepwater and mudflat areas, with an additional 8.6 acres of adjacent upper marsh habitat. The presence of significant areas of native wetland habitat adjacent to the deepwater areas including numerous finger channels will result in a V(ae) value of 0.75.

The restored wetland will have have deepwater areas to -4.0MSL meaning that there will significant water in the wetland at all times (at least 4.1 acres under water at all times). Residence times will be approximately 2 days enhancing water quality. Improved muted flushing and lower residence times will increase water quality in the system. Improved tidal ranges and lower residence times will improve the water quality in the system, thus increasing the overall habitat quality and the functionality of the system. Species richness and abundances will increase, although it will not attain the diversity or the nekton potential which would be expected for full tidal regimes, or muted-tidal habitats that have a direct connection to more saline, marine waters. Based on other muted-tidal regime wetlands, about 13 species of fish could colonize the Hellman wetland channels, of which several are know to be residents in southern California muted tidal habitats. These forms could include topsmelt, arrow goby (*Clevelandia ios*), cheekspot-goby (*Illypnus gilberti*), shadow goby *Quietula-y-cauda*), longjaw mudsucker (*Gillichthys mirabilis*), yellowfin goby (*Acanthogobius flavimanus*), mosquitofish (*Gambusia affinis*), killifish (*Fundulus parvipinnus*), shiner surfperch *Cymatogaster aggregata*), bay pipefish (*Sygnathus leptorhynchus*), tilapia (*Tilapia mozambique)* and staghorn sculpin (*Leptocottus armatus*). Based on all of these future conditions, the values for V(fd) and V(hc) are 0.75.

The FCI for Resident Nekton Potential under existing conditions is 0.75 + 0.75 + 0.75 / 3 = 0.75

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for Resident Nekton Potential is expected to be 0.75 multiplied by 11.7 (acres) which equals 8.7

Thus, upon implementation of the project the Functional Capacity Wildlife Habitat Utilization Potential would increase from 0.62 to 8.7 or an increase of 14:1.

5-97-367 Addendum p. D-16 (4/98)

Nekton Prey Pool Potential

Existing Conditions - Determination of Functional Capacity

In order to support both resident and non-resident nekton there must be fodd sources available. The Nekton Prey Pool Potential is determined by the following variables:

V(fd) = Flooding Duration

V(ae) = Aquatic Edge

V(pvc) = Percent Vegetative Cover

Flooding Duration as it relates to nekton prey pool potential must consider factors similar to resident and non-resident nekton since they generally inhabitat the same areas. Although the bottom of the narrow channel is at approximately -1.0MSL and therefore always has a reservoir of standing water, the conditions in the channel exhibit very poor quality for nekton prey. The resident nektonic prey pool potential under existing conditions is low for the same reasons that potential for resident and non-resident is low, i.e., the reduced muted tidal regime, and limited circulation in the tidal channel. The V(fd) value for nekton prey is 0.2.

Aquatic edge considers the relationship between tidal channels and other deepwater areas with wetland areas. Because of the narrowness of the channel, its proximity to severely degraded wetland and upland areas, as well as based upon direct observations the V(ae) value is 0.3.

The bottom one foot of the tidal channel, which is the area which is iunundated is generally unvegetated. At high tides, the water levels will reach some of the vegetated areas for short duration. Because of the lack of vegetation in the portion of the channel which is always inundated the V(pvc) value is 0.2.

Therefore the FCI for Nekton Prey Pool Potential under existing conditions is: 0.2 + 0.3 + 0.2 / 3 = 0.23

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for Non-Resident Necton Potential is determined to be 0.23, multiplied by 3.1 (acres) which equals 0.71

Restored Conditions - Determination of Functional Capacity

The restored wetland will have have deepwater areas to -4.0MSL meaning that there will significant water in the wetland at all times (at least 4.1 acres under water at all times). Residence times will be approximately 2 days enhancing water quality. Improved muted flushing and lower residence times will increase water quality in the system. Improved tidal ranges and lower residence times will improve the water quality in the system, thus increasing the overall

5-97-367 ~~Addendum~~ 6/98

p D-17 Ap E 17

habitat quality and the functionality of the system. As such the biomass of prey which water column and benthic fish utilize (i.e., plankton polychaetes, amphipods, insect larvae, snails, and clams) are expected to increase to levels which will support a great population of resident organisms and the V(fd) value is 0.6.

The restored wetland will be created with a number of finger channels (suggested by both the Corps regulatory staff and the Coastal Commission biologists) to increase the deepwater aquatic habitat to wetland habitat edge and will cover approximately 11.7 acres. Immediately adjacent to the deepwater and mudflat areas will be cordgrass marsh and low marsh pickleweed habitat areas, connected to the deepwater areas which would be inundated for significant periods of time. Based upon the success criteria detailed in the mitigation plan these areas would exhibit at least 75-percent vegetative cover. Therefore the value for V(ae) and V(pvc) is 0.75.

The FCI for Nekton Prey Pool Potential under restored conditions is 0.6 + 0.75 + 0.75 / 3 = 0.7.

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for Nekton Prey Pool Potential is expected to be 0.7 multiplied by 11.7 (acres) which equals 8.2.

Thus, upon implementation of the project the Functional Capacity Wildlife Habitat Utilization Potential would increase from 0.71 to 8.2 or an increase of 11.5:1.

<u>Wildlife Habitat Utilization Potential</u>

Existing Conditions - Determination of Functional Capacity

The wetlands on the site receive limited use by wildlife with the 3.1-acre tidal channel used most frequently by herons and egrets. As noted above, the Belding's savannah sparrow was observed foraging in a limited area of pickleweed in the fall of 1996; however they did not remain on the site for purposes of nesting. Wildlife Habitat Uilization Potential is based upon three variables (although it should be noted that numerous biological investigations have been conducted on the site and information regarding usage, often limited useage, by wildlife is well documented):

V(ae) = Aquatic Edge

V(ue) = Upland Edge

V(hc) = Habitat Complexity

Aquatic edge considers the relationship between tidal channels and other deepwater areas with wetland areas. Because of the narrowness of the channel, its proximity to severely degraded wetland and upland areas, as well as based upon direct observations the V(ae) value is 0.3.

Ecotonal areas (areas where two different habitats come together) often exhibit high species diversity; however, because all of the upland area on the site consists of non-native grassland,

ruderal habitats, and developed areas (roads, drilling pads, etc.,) which have low habitat value. Due to the degraded condition of the upland habitat the V(ue) value is 0.3.

For Wildlife Habitat Utilization Potential it is important to consider habitat complexity of all the wetlands on the site. Direct observations of the wetlands indicated that complexity of the vegetation on the site is low with many of the wetland areas exhibiting very sparse vegetation or monocultural stands of saltgrass or alkali weed (*Cressa truxillensis*). Approximately 2.3 acres of pickleweed habitat exhibit moderate diversity and habitat complexity. Overall the habitat complexity is low to moderate with the V(hc) value of 0.4.

The FCI for Wildlife Habitat Utilization Potential under existing conditions is 0.3 + 0.3 + 0.4 / 3 = 0.33

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the existing conditions, the FC for Wildlife Habitat Utilization Potential is determined to be 0.33, multiplied by 27 (acres) which equals 8.9

Restored Conditions - Determination of Functional Capacity

The restored wetland will be created with a number of finger channels (suggested by both the Corps and the Coastal Commission biologists) to increase the deepwater aquatic habitat to wetland habitat edge. In addition, approximately 18.7 acres of wetlands would be adjacent to the deepwater and mudflat habitats. The presence of significant areas of native wetland habitat adjacent to the deepwater areas including numerous finger channels will result in a V(ae) value of 0.75.

The restored wetland will have a transition zone which will be planted with native species typically found in trasitional areas between salt marsh and upland habitats. Addittionally the Golf Course Reserve has been designed as a "links" style course that will incorporate areas of native vegetation along the fairways. The incorporation of extensive areas of native habitat adjacent to the coastal salt marsh would result in a V(ue) value of 0.5.

The 27-acre restored wetland will incorporate deepwater habitats, mudflats, low marsh areas with cordgrass and pickleweed, high marsh areas with pickleweed, samphire, alkali heath, and fleshy jaumea, and transition zones with transitional species resulting in a V(hc) value of 0.75.

The FCI for Wildlife Habitat Utilization Potential under existing conditions is 0.75 + 0.5 + 0.75 / 3 = 0.67

Functional Capacity (FC), as discussed above is determined by multiplying the FCI by the size of the wetland area. Therefore, under the restored conditions, the FC for Wildlife Habitat Utilization Potential is expected to be 0.67, multiplied by 27 (acres) which equals 17.9

Thus, upon implementation of the project the Functional Capacity Wildlife Habitat Utilization Potential would increase from 8.9 to 17.9 or an increase of 2:1.

5-97-367 Addendum 6/98 p-D-19 AE 19

RECEIVED
FEB 17 1998
CALIFORNIA
COASTAL COMMISSION

ADDENDUM TO

CONCEPT WETLANDS RESTORATION PLAN

FOR THE HELLMAN RANCH

Prepared for:
HELLMAN PROPERTIES, LLC
711 Seal Beach Blvd.
Seal Beach, CA 90740

Prepared by:
MOFFATT & NICHOL ENGINEERS
250 West Wardlow Road
Long Beach, CA 90807

In Association with

COASTAL RESOURCES MANAGEMENT
2855 E. Coast Highway, #225
Corona Del Mar, CA 92625

February, 1998

M&N File: 3693

5-97-367 Addendum p. D-20 (4/98)

CONTENTS

INTRODUCTION 1
GRADING PLANS 2
PHASE 1 2
PHASE 2 2
PHASE 3 2
HYDRAULIC MODELING 3
PHASE 1 TIDAL HYDRAULICS AND RESIDENCE TIMES 3
PHASE 2 TIDAL HYDRAULICS AND RESIDENCE TIMES 4
PHASE 3 TIDAL HYDRAULICS AND RESIDENCE TIMES 5
SALT MARSH PLANTING AND HABITAT AREAS 6
CONCLUSIONS AND RECOMMENDATIONS 7

5-97-367 Addendum 6/98

Ap. E21
~~p D21~~

INTRODUCTION

This report is an addendum to the Conceptual Wetlands Restoration Plan (Restoration Plan) for the Hellman Ranch. The Restoration Plan was initially prepared in October of 1996 in association with entitlements issued by the City of Seal Beach, and revised in November of 1997 in conjunction with the application package submitted to the California Coastal Commission (CCC) by Hellman Properties, LLC. The Restoration Plan initially proposed 23.1 acres of salt marsh and 9.7 acres of freshwater marsh.

The Restoration Plan now proposes 32.8 acres of wetland, comprised of a 26.0-acre salt marsh and a 6.8-acre freshwater marsh. The 26.0-acre salt marsh is envisioned to be in the same location on the site as initially proposed in the Restoration Plan, with the addition of an adjacent 2.9-acre pool which was initially proposed as freshwater marsh.

CCC staff has requested that Hellman Properties, LLC reserve land currently in oil production for future additional wetland restoration as a wetland mitigation bank. The mitigation bank would be phased into the project as Phases 2 and 3, assuming that the area initially restored is Phase 1. A 6.7-acre area along the Haynes Cooling Channel would be Phase 2, and 8.7 acres of the central oil production area would either be Phase 3 of the salt marsh or would be phased into the freshwater marsh. A total of 15.4 acres of wetland are included in the mitigation bank. Approximately 48.2 acres of wetland may ultimately be created, consisting of 41.4 acres of salt marsh and 6.8 acres of freshwater marsh.

This report discusses the feasibility of implementing the proposed phased salt marsh and includes preliminary grading concepts, hydraulic analyses, and created wetland habitat areas for each phase.

5-97-367 Addendum p. D-22 (4/98)

GRADING PLANS

Phase 1

Grading for Phase 1 is conceived to provide an initial area of wetland restoration, with a tidal channel, intertidal area and buffer area which can be connected to Phase 2 in the future. Phase 1 was modified from the initial Restoration Plan to provide a channel extending further northeast towards the Phase 2 area, and an interim dike separating the Phase 1 and 2 areas. The dike will reach an elevation of +10 feet relative to mean sea level (MSL) and extend along the Phase boundary. Also, inclusion of a 2.9-acre area, which was initially proposed as freshwater marsh in the initial Restoration Plan, is now being included in the salt marsh. It is connected to the main body of the marsh by an open channel. Figure A1 shows the grading plan for Phase 1. The total area in Phase 1 would be 26.0 acres.

Phase 2

The grading plan for Phase 2 is a physical extension of the plan for Phase 1. The subtidal channel (denoted by the -2 feet MSL contour) in the center of the Phase 1 marsh and the higher contours along the northern edge of the marsh extend into the Phase 2 area. The surface for the Phase 2 area could be graded in its dry condition prior to being opened to saltwater flows. The temporary dike would be removed as one of the last construction stages and the grading could then be completed. Figure A2 shows the grading plan for Phase 2. The additional area in Phase 2 is 6.7 acres for a total salt marsh area of 32.7 acres.

Phase 3

Phase 3 consists of 8.7 acres of land currently in oil production. The Phase 3 area may be connected to the Phase 2 area with a narrow open channel. The total salt marsh area after implementation of Phase 3 would be 41.4 acres. The Phase 3 wetland would reach to –1 foot MSL and would be sloped to provide sufficient areas of habitat around the perimeter of the intertidal area. Figure A3 shows the proposed salt marsh grading plan for Phase 3.

5-97-367 ~~Addendum~~ 8/98

Ap E23
~~p D23~~

HYDRAULIC MODELING

Hydraulic modeling was performed on the Phase 1, 2 and 3 wetlands to identify tidal elevations and ranges, and residence times of tidal flows. The modeling method used for this effort was the same as that used for the Restoration Plan. A numerical hydrodynamic circulation model (HCM) was applied to simulate tidal flow conditions in the entire marsh in each phase. As specified on page 40 of the Restoration Plan, the model solves physics equations for a hydraulic system represented by a series of basin (nodes) interconnected by channels (links).

A driving tide is specified at the San Gabriel River. The driving tide is a statistically-derived artificial tide representing long-term conditions of the nearest tidal gage (Los Angeles Harbor). The maximum tidal range is approximately 8.3 feet, occurring between +4.0 feet MSL at spring high tide and –4.3 feet MSL at spring low tide. The tide includes semi-diurnal and mixed components. Tidal flows will pass through the existing 48-inch culvert. Tidal hydraulics and residence time analyses for each phase are described below.

Phase 1 Tidal Hydraulics and Residence Times

The link-node system used for modeling the Phase 1 area is shown in Figure A4 and simulated tidal elevations for the area are shown in Figure A5. Figure A5 is a plot of the full tidal amplitude of the driving tide in the San Gabriel River (the River), overlain by a plot of the resulting muted tide in the Phase 1 marsh. The tidal amplitude computed for the Phase 1 marsh is muted from that in the River due to the effects of flow through the culvert. The maximum tidal range is approximately 1.5 feet, with a spring low tide at +0.6 feet MSL and a spring high tide at +2.1 feet MSL. This compares with a tide range of 2.0 feet in the salt marsh of the initial Restoration Plan.

Only one daily low and high tide occur in the marsh between the time period of approximately 100 to 225 hours of the simulation. This period corresponds to when the River experiences very small tide ranges between the most extreme tide ranges of the simulation. Two daily low and

high tides occur in the marsh when the tide ranges in the River are most even, during the period between 0 and 100 hours, and between 225 and 325 hours.

The lowest low tide in the marsh reaches +0.5 feet MSL, and occurs after the lowest high tide in the River (at approximately hour 170). During this condition, low high tide conditions in the River create relatively low water levels in the marsh for a prolonged period of time, allowing the marsh to drain to its lowest elevation.

A phase lag of several hours occurs between high and low tides in the River and high and low tides in the marsh. The lag is a function of the constriction imposed by the culvert.

The storage curve of the Phase 1 marsh is shown in Figure A6. The figure shows the areas calculated at 1-foot elevation increments for the proposed wetland. The storage curve is used to perform the numerical modeling, and is the basis for creation of the planting plan once tidal elevations are determined.

Residence times in the salt marsh during Phase 1 are shown in Figure A7. Residence time represents the relative frequency of tidal flushing of the marsh and is an indirect indicator of water quality. The maximum residence time in Phase 1 will be approximately 1.3 days.

Phase 2 Tidal Hydraulics and Residence Times

The link-node system used for modeling the Phase 2 area is shown in Figure A8. Simulated tidal elevations for the entire salt marsh in Phase 2 are shown in Figure A9. The tidal amplitude computed for Phase 2 is further muted from that in the River as compared to Phase 1. The tidal range is approximately 1.2 feet, with a spring low tide at +0.7 feet MSL and a spring high tide at +1.9 feet MSL. One daily low and high tide occur in the Phase 2 marsh, similar to that of the Phase 1 marsh. Mixed tides in the marsh occur opposite in time from those in the River, as in Phase 1. The lowest low tide in the marsh reaches +0.5 feet MSL and occurs after the lowest high tide in the River. A phase lag of several hours occurs between high and low tides in the

5-97-367 Addendum 4/98

App E 25
~~p D 25~~

River and high and low tides in the marsh. The lag is approximately equal to that of Phase 1 tidal hydraulics.

The storage curve of the Phase 2 marsh is shown in Figure A10. The figure shows that expansion of the marsh has resulted mainly in additional area above the mean water surface, approximately +1.0 MSL. Areas above this elevation provide pickleweed habitat for the Belding's Savannah Sparrow. An increase in subtidal habitat has also occurred to provide for fish habitat. The planting plan is addressed in a subsequent section of this Addendum.

Residence times in the salt marsh during Phase 2 are shown in Figure A11. The maximum residence time will be approximately 1.6 days. Tidal flushing has improved in the central portion of the marsh over Phase 1 conditions, and in the southern leg.

Phase 3 Tidal Hydraulics and Residence Times

The link-node system used for modeling the Phase 3 area is shown in Figure A12. Simulated tidal elevations for the entire marsh during Phase 3 are shown in Figure A13. The tidal amplitude computed for the Phase 3 marsh is further muted from that in the River compared to Phases 1 and 2. The tidal range is approximately 1.0 feet, with a spring low tide at +0.8 feet MSL and a spring high tide at +1.8 feet MSL. One daily low and high tide occur in the Phase 3 marsh, similar to that of Phases 1 and 2. The lowest low tide in the marsh reaches approximately +0.5 feet MSL and also occurs after the lowest high tide in the River. A phase lag of several hours occurs between high and low tides in the River and those in the marsh. The lag is similar to that of previous phases.

The storage curve of the Phase 3 marsh is shown in Figure A14. The figure shows that expansion of the marsh has resulted in additional area above the mean water surface (approximately +1.0 MSL) for pickleweed habitat. A relatively small increase has also occurred in subtidal habitat.

Residence times in the salt marsh during Phase 3 are shown in Figure A15. The maximum residence time will be approximately 2.8 days in the most distant pool. Implementation of Phase 3 will cause residence times to increase throughout the system.

SALT MARSH PLANTING AND HABITAT AREAS

The plan for planting of the salt marsh is similar to that presented in the initial Restoration Plan. Salt marsh habitats will colonize at specific elevations relative to the tides. Areas of each habitat type are provided below for each phase.

A breakdown of the areas for each habitat within the Phase 1 area is shown in Table A1.

TABLE A1

PHASE 1 HABITAT AREAS

Habitat Type	Area (acres)
Subtidal Basin and Channels	9.5
Unvegetated Mudflat	2.6
Pickleweed – Low Marsh	2.9
Pickleweed – High Marsh	8.8
Transition Zone/Buffers	2.2
TOTAL	26.0

A breakdown of the areas for each habitat within the Phase 1 and 2 areas is shown in Table A2.

TABLE A2

PHASE 2 HABITAT AREAS

Habitat Type	Area (acres)
Subtidal Basin and Channels	12.0
Unvegetated Mudflat	3.0
Pickleweed – Low Marsh	3.1
Pickleweed – High Marsh	11.8
Transition Zone/Buffers	2.8
TOTAL	32.7

5-97-367 Addendum 6/98

A1 E27
~~p. D-27~~

A breakdown of the areas for each habitat within the Phase 1, 2 and 3 areas is shown in Table A3.

TABLE A3

PHASE 3 HABITAT AREAS

Habitat Type	Area (acres)
Subtidal Basin and Channels	14.9
Unvegetated Mudflat	3.2
Pickleweed – Low Marsh	3.7
Pickleweed – High Marsh	15.6
Transition Zone/Buffers	4.0
TOTAL	41.4

CONCLUSIONS AND RECOMMENDATIONS

Implementing Phases 1, 2 and 3 of the proposed salt marsh as part of the Hellman Ranch Specific Plan are technically feasible based on tidal hydraulics and residence times. Tidal residence times are an indirect indication of water quality. Implementation of Phases 1 and 2 will result in acceptable hydraulic and water quality conditions in the salt marsh. Implementation of Phase 3 will cause a reduction in the wetland tidal range and an increase in tidal residence times which may be undesirable.

Tidal hydraulics of the marsh in Phase 1are more efficient than those in Phases 2 and 3. The tidal range is greater in Phase 1 than in subsequent phases. A phase lag exists between high and low tides in the marsh and those of the River. The phase lag is approximately the same for each phase. Residence times vary between the phases, with relatively shorter times during Phase 2 than in other phases, although the most distant reach of the marsh has a slightly longer residence time in Phase 2 than in Phase 1. Residence times are highest at Phase 3. All residence times are within standards recommended for successful marsh restoration (7 days according to the County of Orange in DEIR 551, 1996).

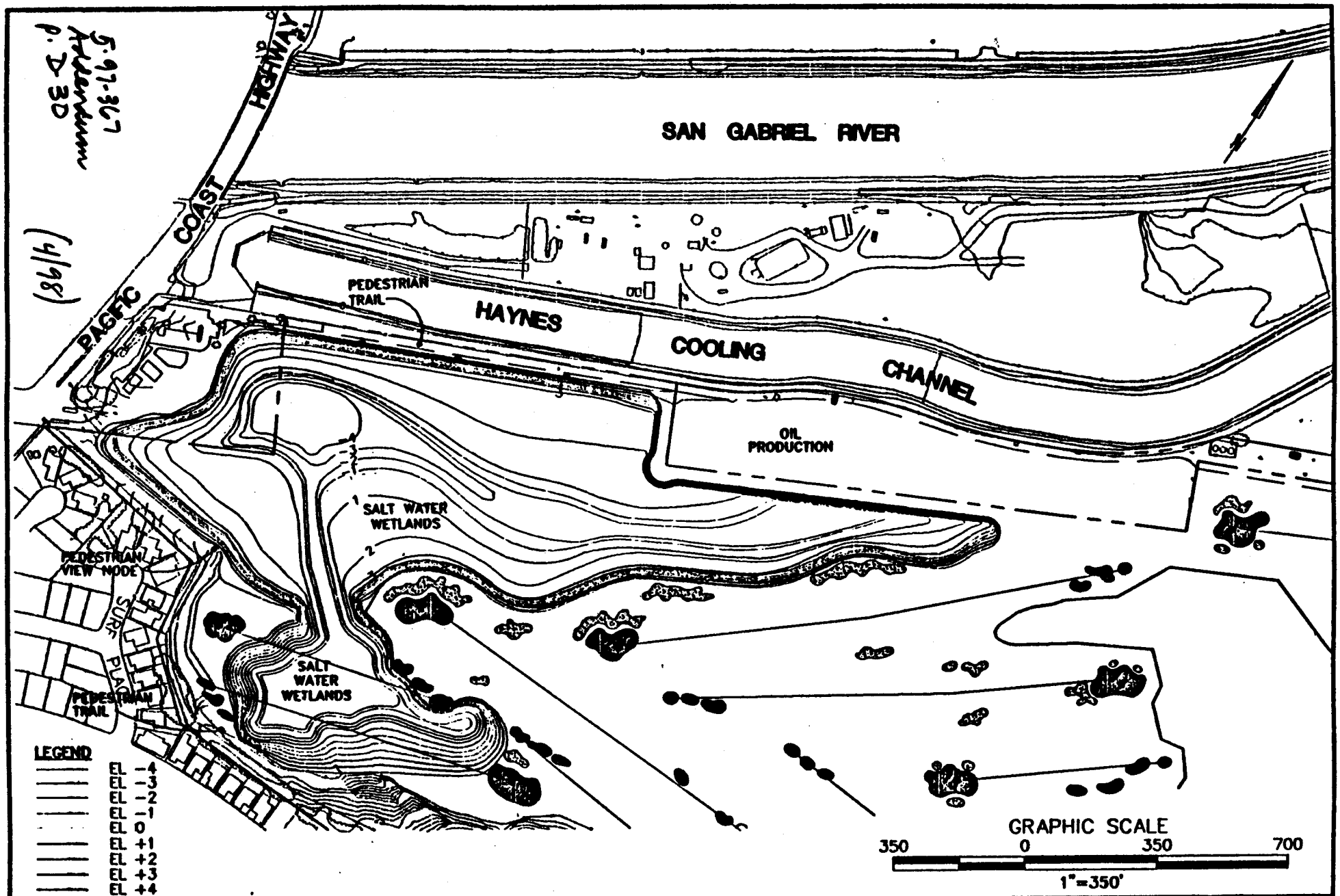
Implementing Phases 2 and 3 will decrease the tidal range of the marsh established in Phase 1. This may adversely affect wetland habitat, which will have colonized in response to the Phase 1

tidal elevations. The habitat will have to naturally adjust to the modified tidal range at each Phase. The effect generated from Phase 1 to Phase 2 may not be significant, but the effect from Phase 1 to Phase 3 is more pronounced. To address this issue, the following options could be considered: 1) provide multiple connections to the San Gabriel River at Phase 3 to maintain the initial tidal range of Phases 1 and 2, or 2) do not include Phase 3 in the salt marsh.

5-97-367 Addendum 9/98

Ap E 29
~~p. D-29~~

5-97-367
Addendum
p. D 30
(4/98)

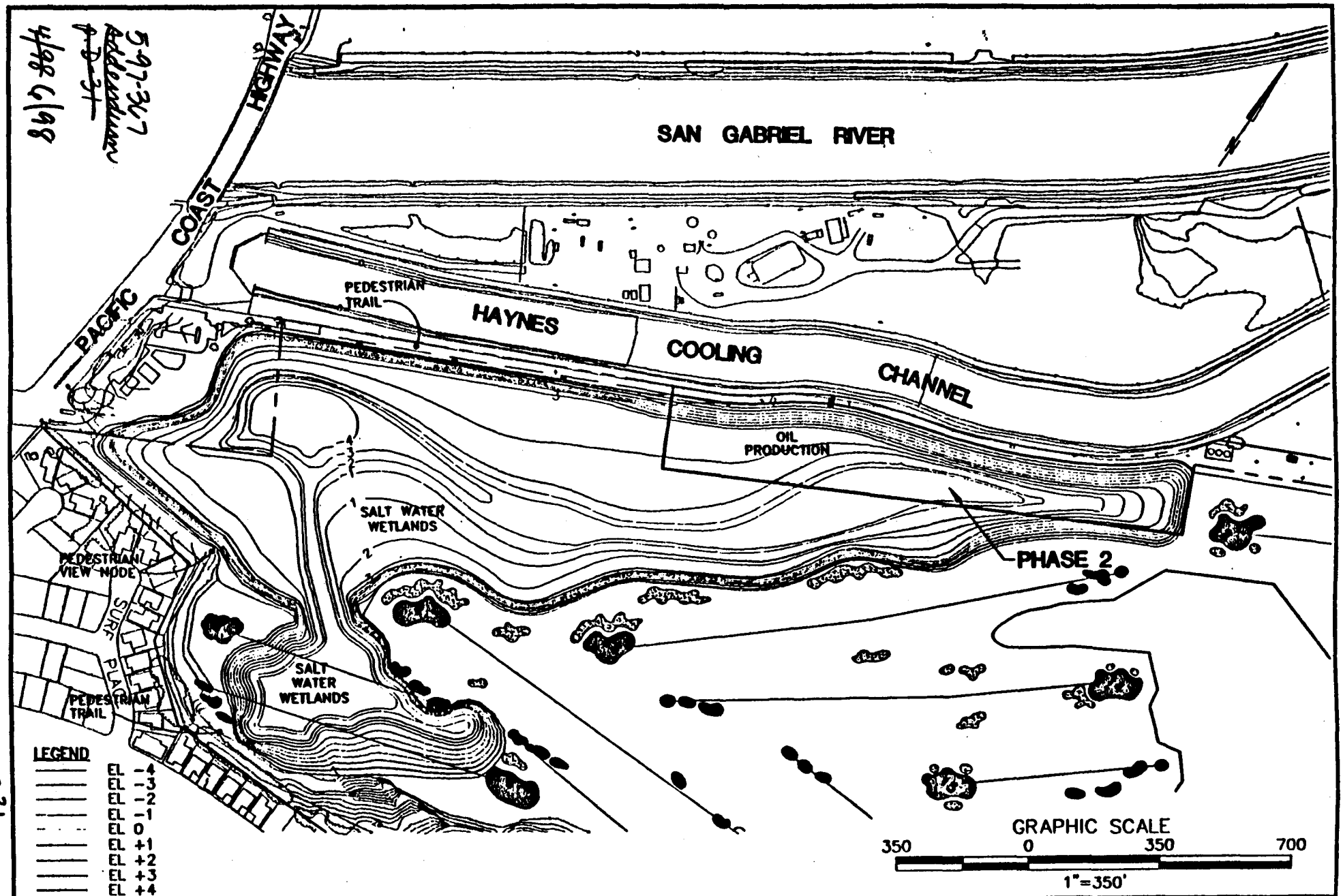


MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 1
GRADING PLAN

DATE 2-16-98
FIG. A1

5-97-347 Addendum
4/98 6/98



MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

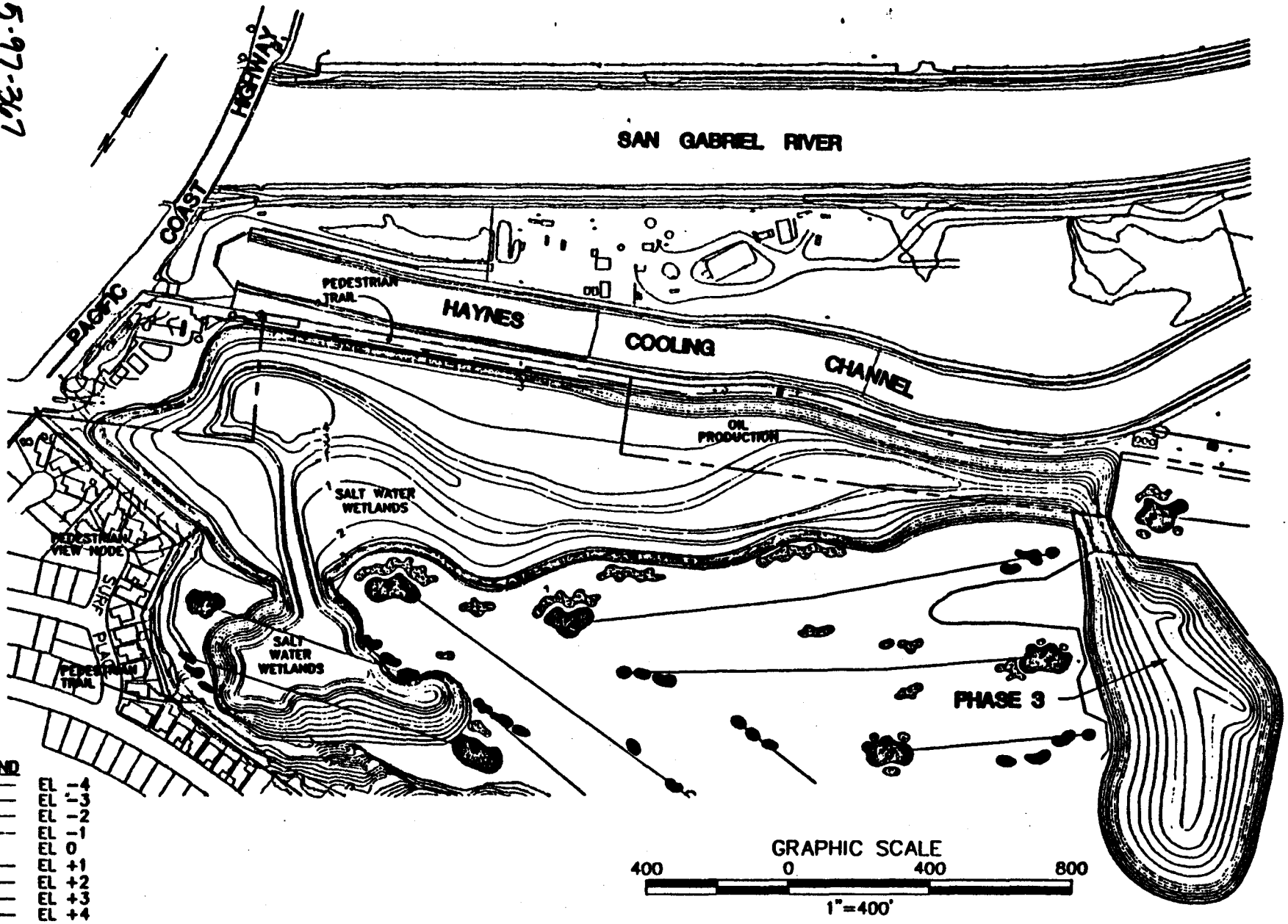
HELLMAN RANCH WETLAND PLAN
PHASE 2
GRADING PLAN

DATE 2-16-98
FIG. A2

Hp E 31

L:\3885\DG-CP-DG\3885\1.DWG

5-97-367
Addendum
p. D-32



LEGEND

	EL -4
	EL -3
	EL -2
	EL -1
	EL 0
	EL +1
	EL +2
	EL +3
	EL +4
	EL +5
	EL +6
	EL +7
	EL +8
	EL +9
	EL +10

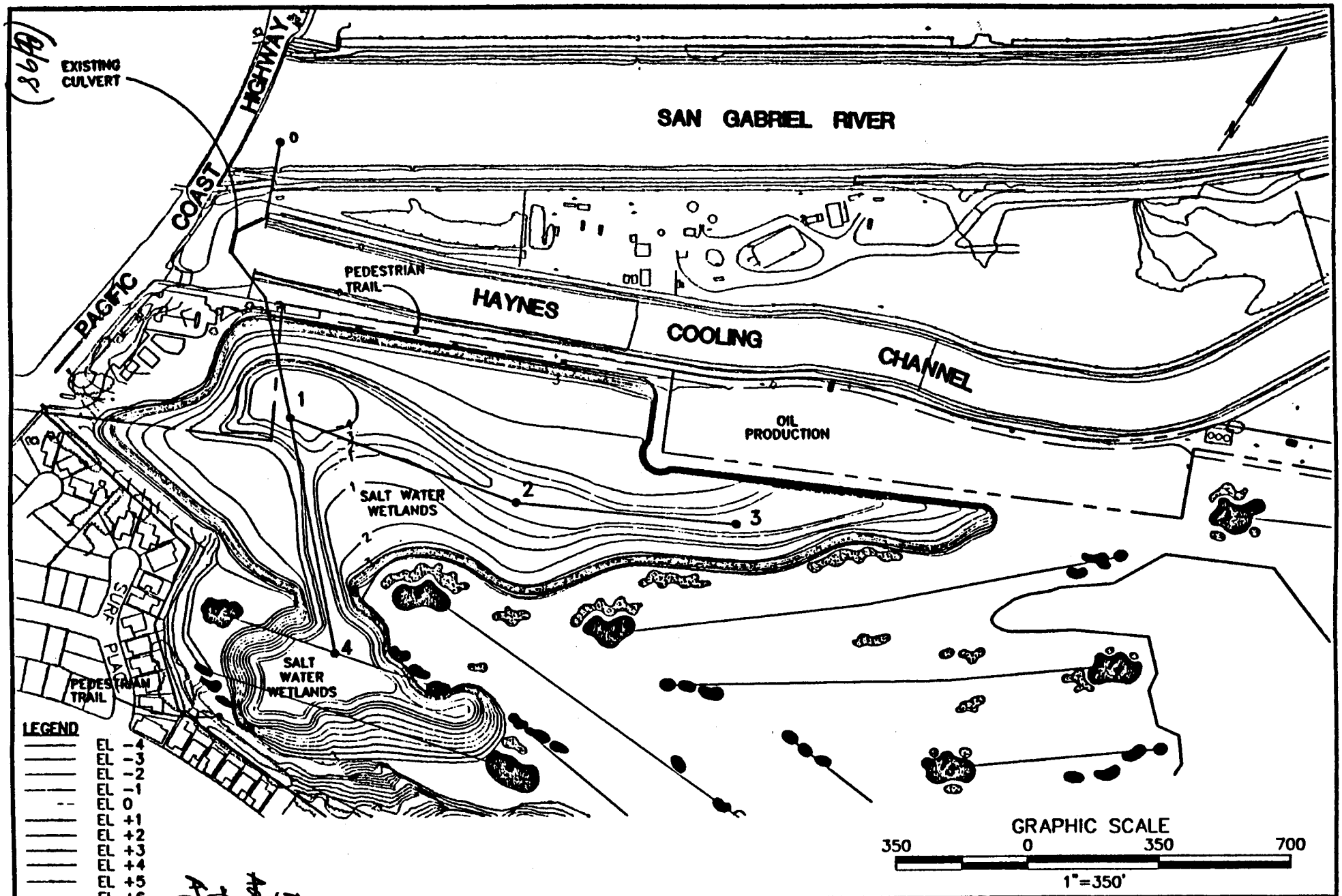
(4/98)

MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 3
GRADING PLAN

DATE 2-16-98
FIG. A3

L:\3864\DWG\3864FIG3.DWG



5-97-367
Addendum
App 33
App E 33

MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 1
LINK – NODE DIAGRAM

DATE 2-16-98

FIG. A4

L:\3985\SD_GP7.DWG

Addendum
J.E. 34
(4/98)
G97-37

TIDAL FLUCTUATION SIMULATION, PHASE 1
HELLMAN RANCH WETLAND

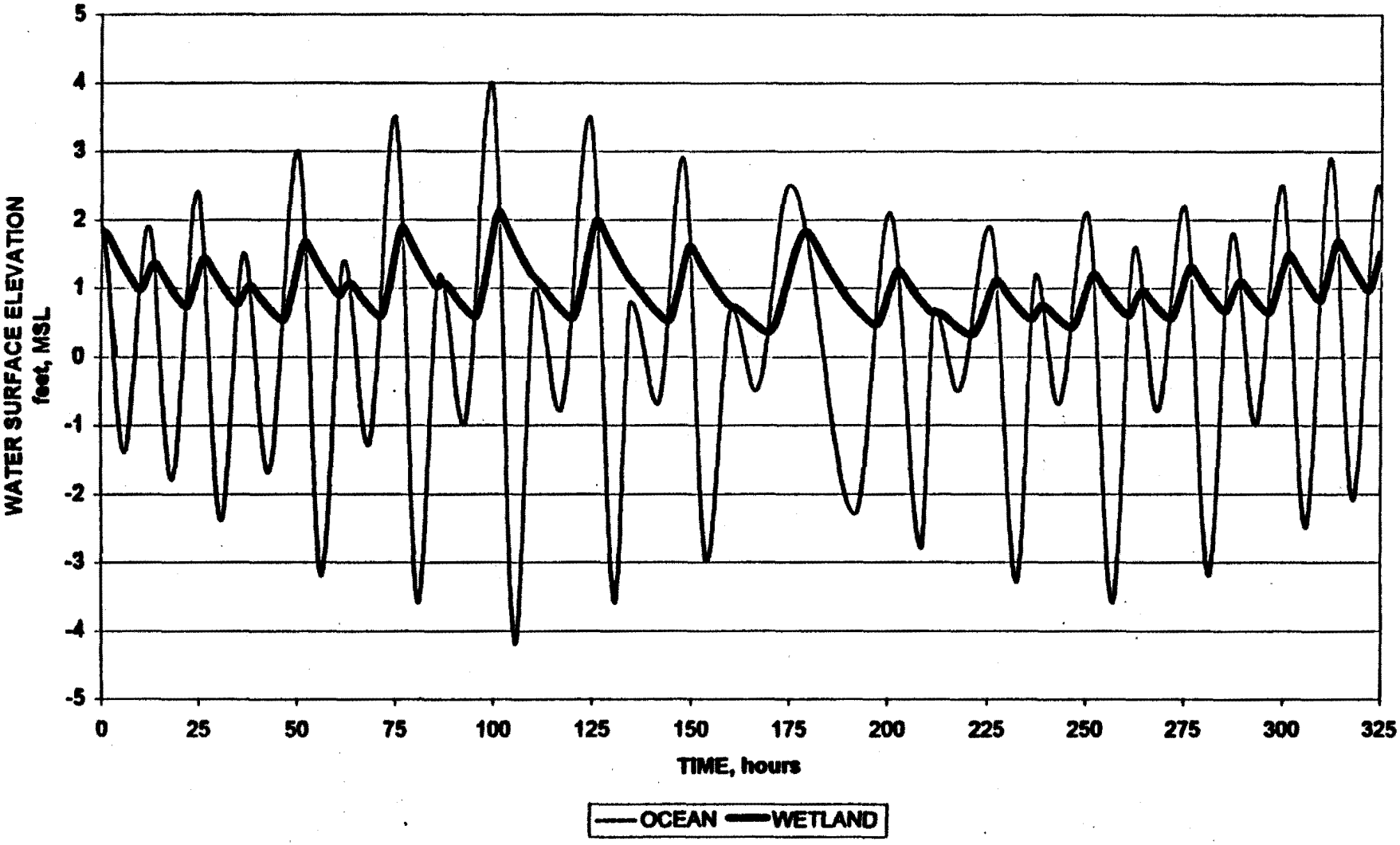


FIGURE A5

SALT MARSH STORAGE CURVE, PHASE 1

HELLMAN RANCH WETLAND

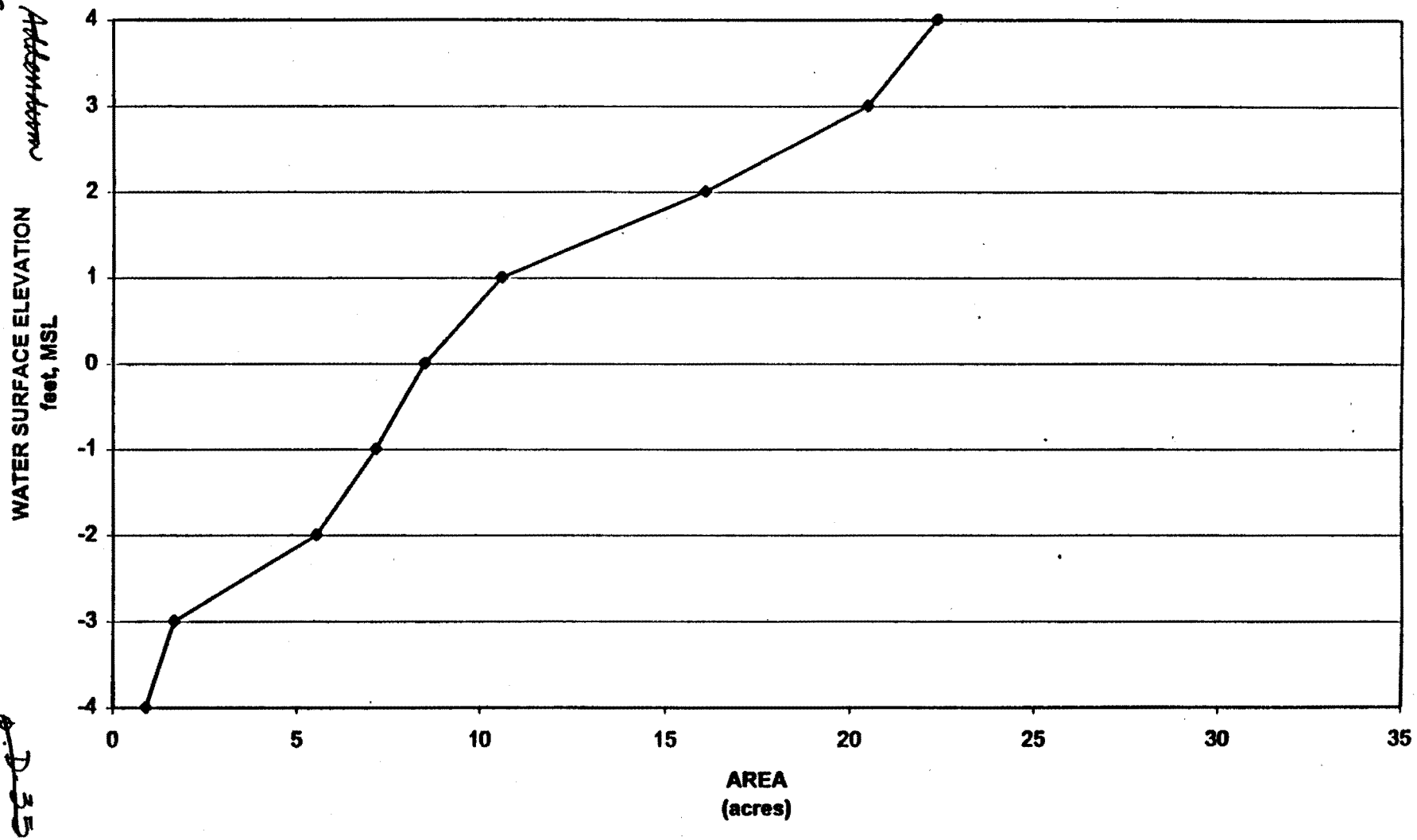
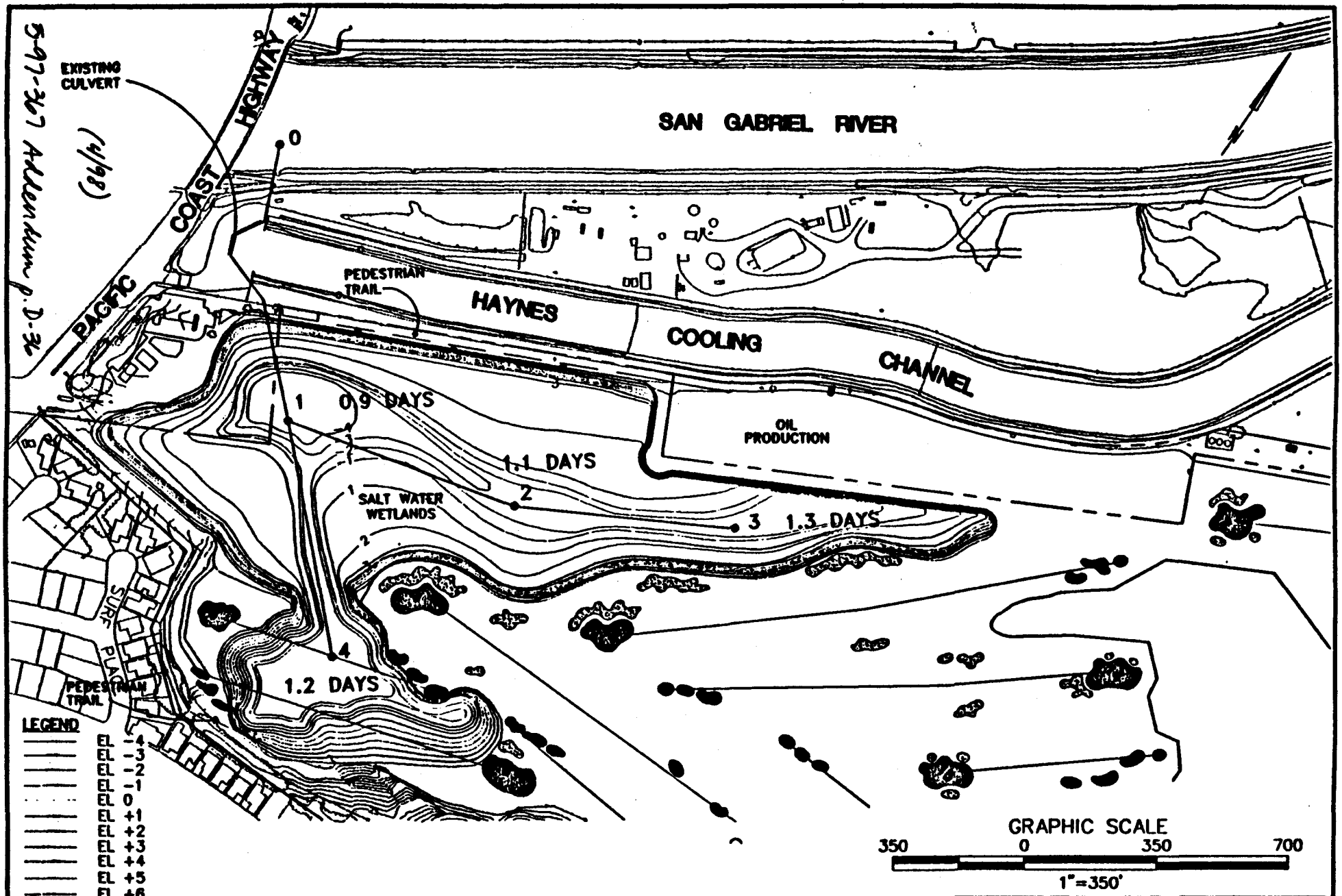


FIGURE A6

G-97-367 Attachment 6/98

Page 35 of 35

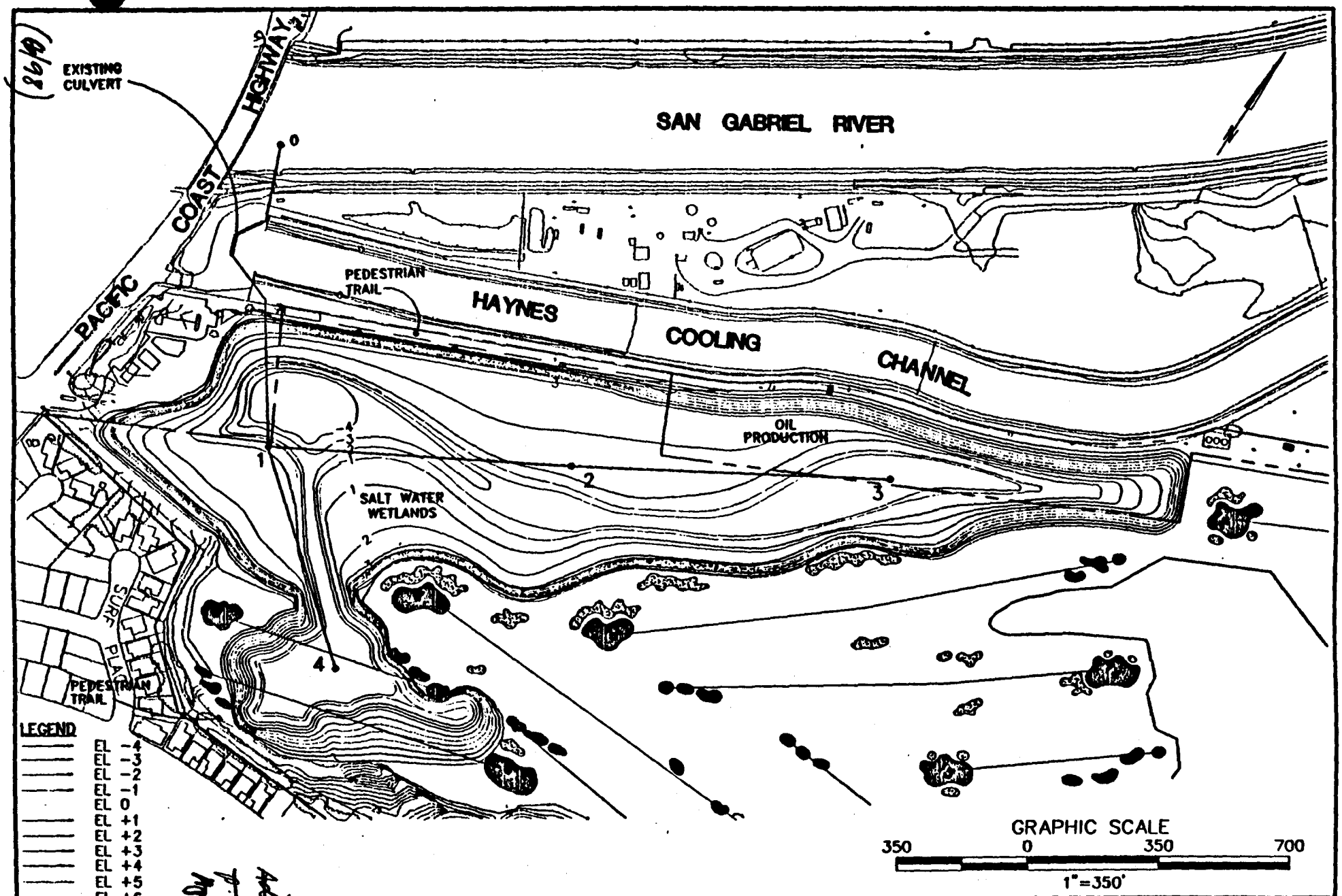
5-97-367 Allenbaum p. D-36 (1/98)



MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 1
SALT MARSH RESIDENCE TIMES

DATE 2-16-98
FIG. A7



MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 2
LINK - NODE DIAGRAM

DATE 2-16-98

FIG. A8

5-97-367
Addendum
Exh 37
pg E37

L:\3693\SD_DP2.DWG

S-97-307 Addendum p. D-38

(4/98)

TIDAL FLUCTUATION SIMULATION, PHASE 2

HELLMAN RANCH WETLAND

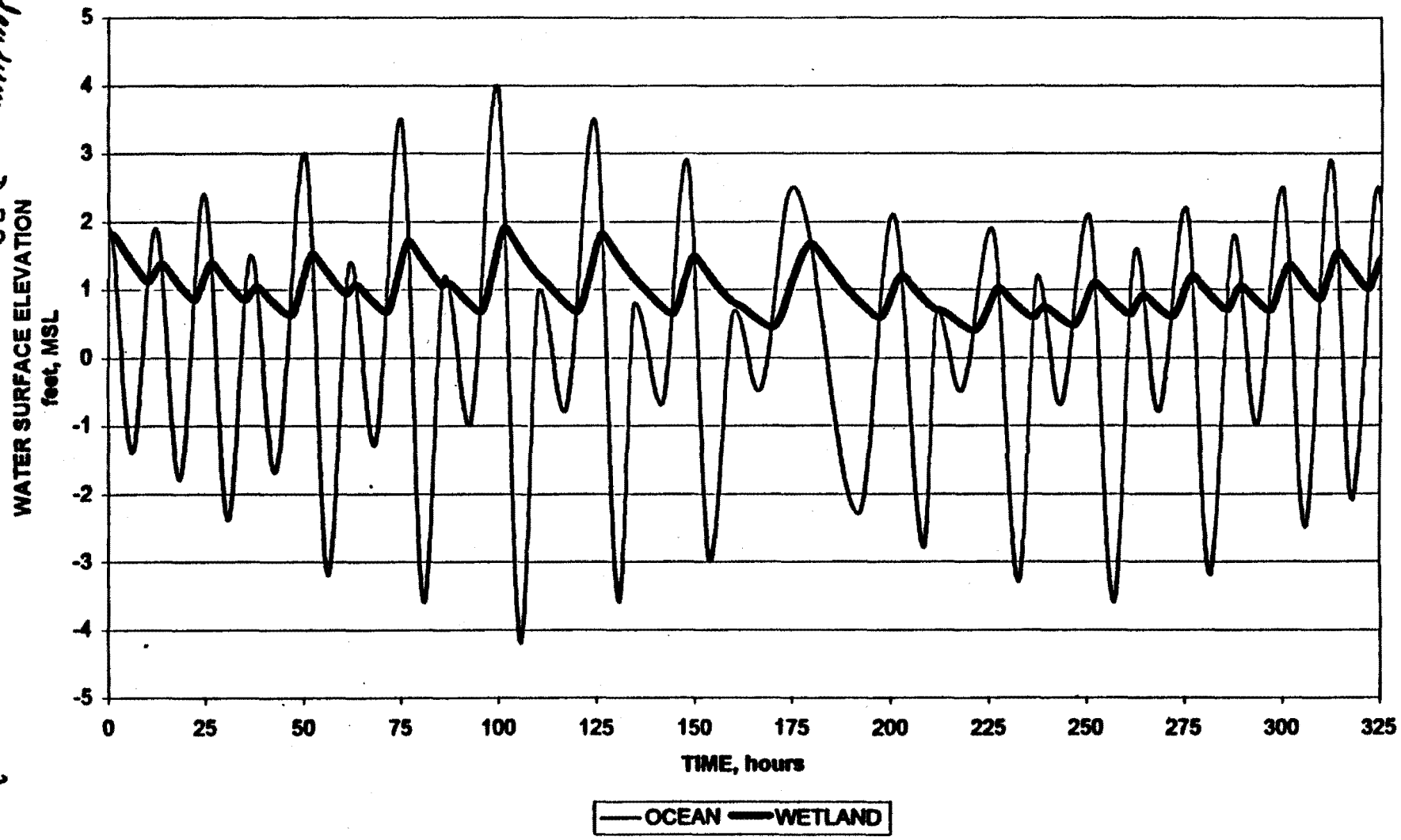
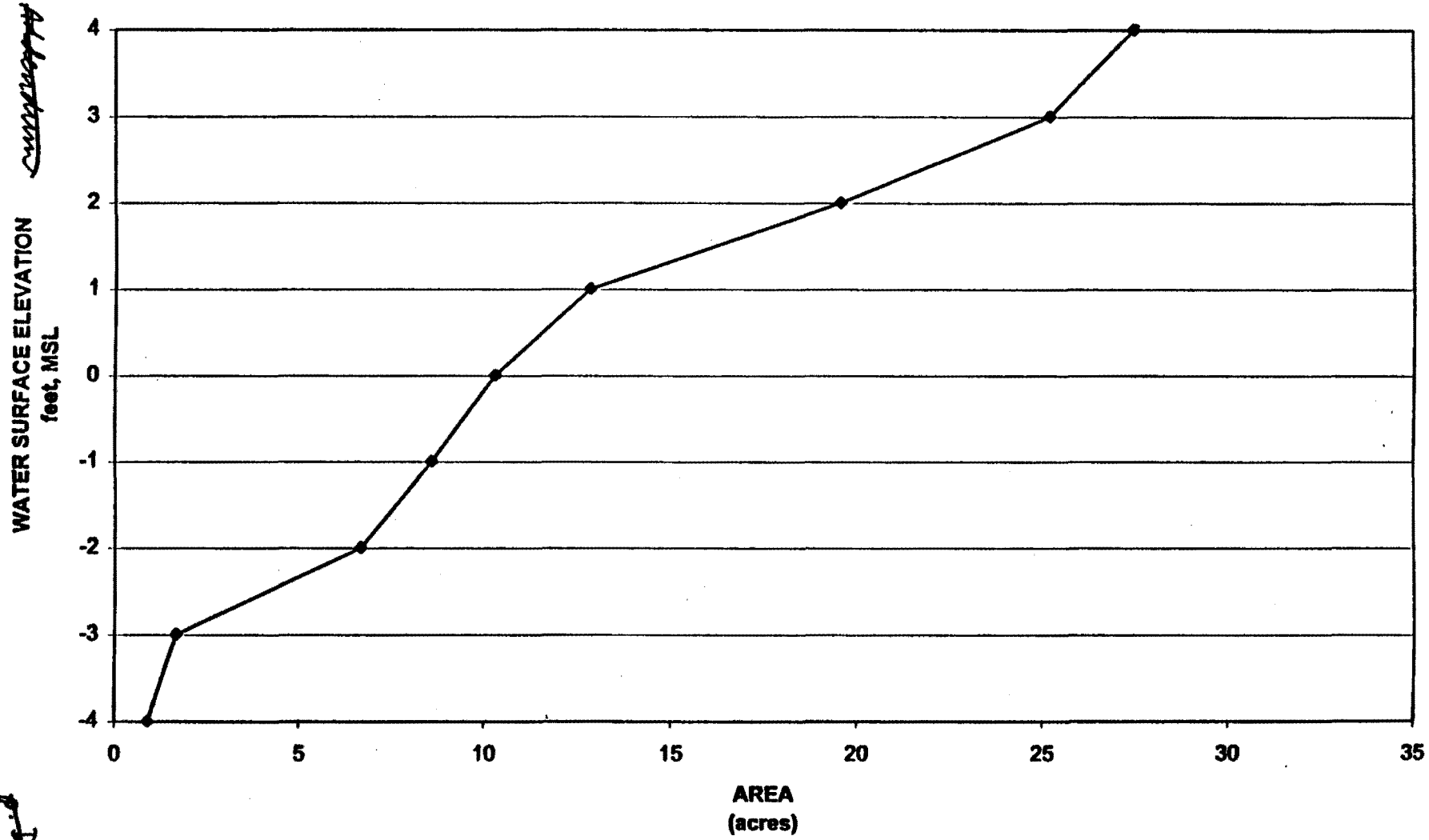


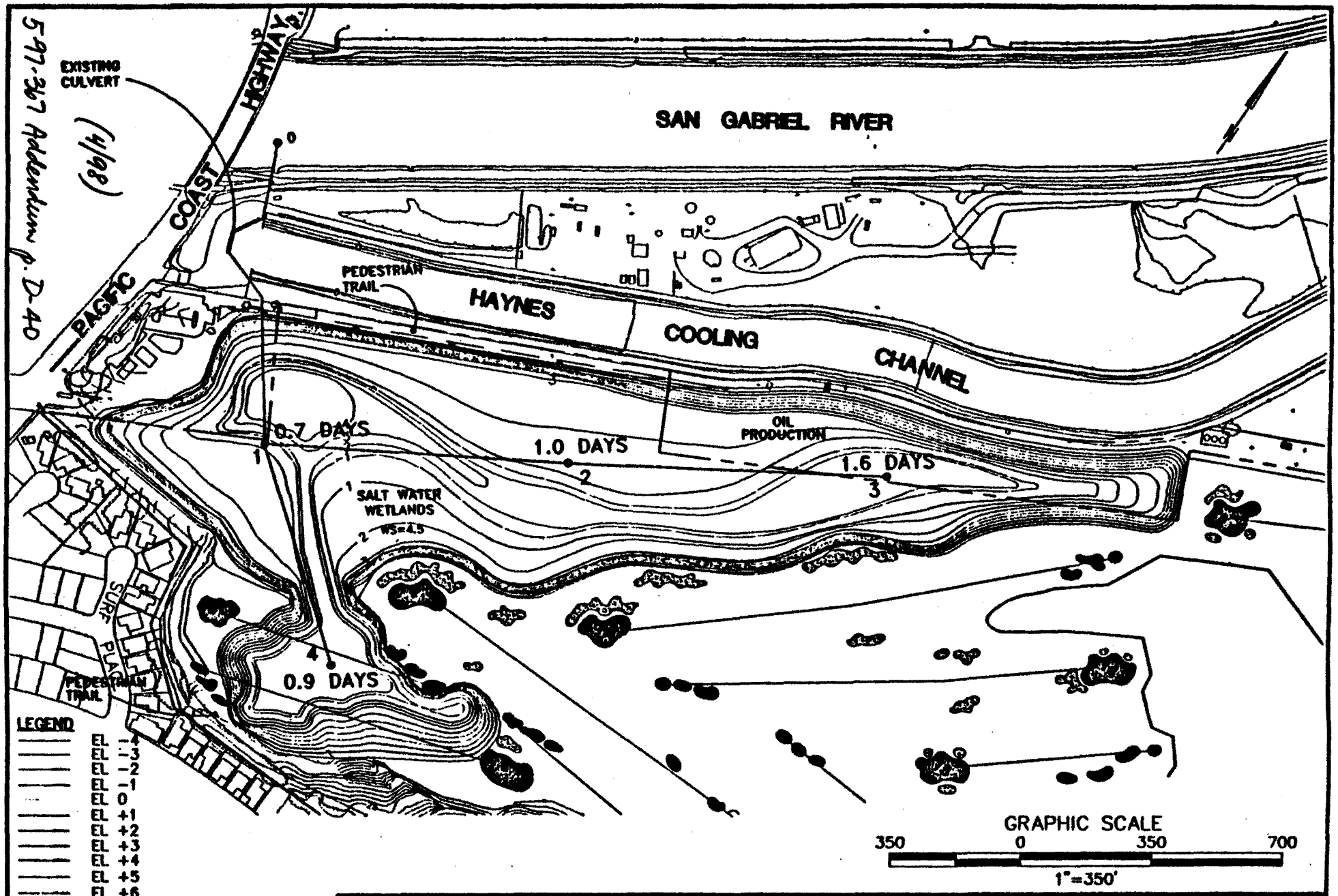
FIGURE A9

SALT MARSH STORAGE CURVE, PHASE 2
HELLMAN RANCH WETLAND



5.97.367 Attachment 6/98

Page 4 of 39



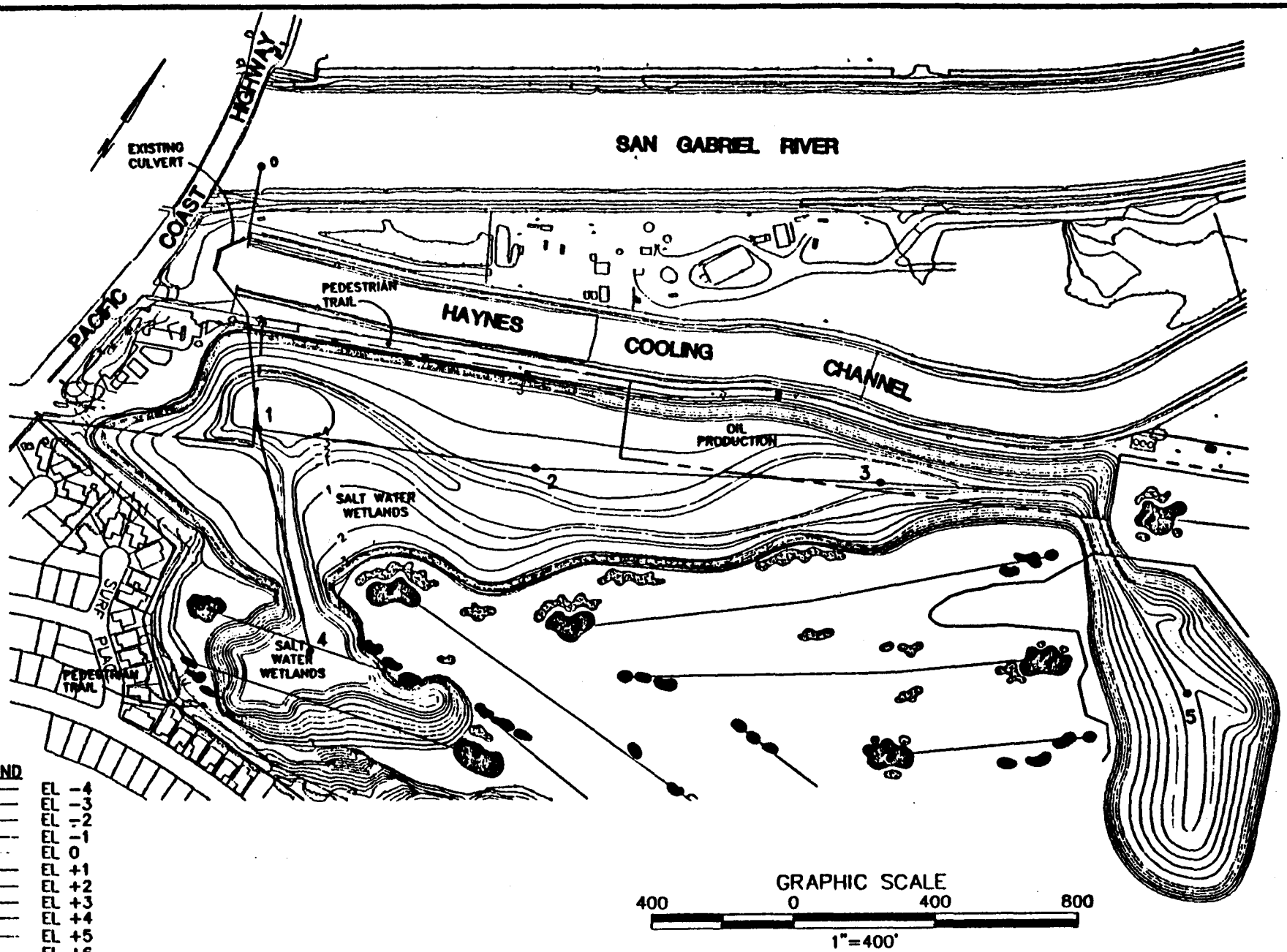
597-367 Addendum p. D-40 (4/98)

MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 2
SALT MARSH RESIDENCE TIMES

DATE 2-16-98

FIG. 1



LEGEND

- EL −4
- EL −3
- EL −2
- EL −1
- EL 0
- EL +1
- EL +2
- EL +3
- EL +4
- EL +5
- EL +6
- EL +7
- EL +8
- EL +9
- EL +10
- LINKS
- NODES

5-97-367 Addendum 9/98

P-D-44
Ap E 41

MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 3
LINK – NODE DIAGRAM

DATE 2-16-98
FIG. A12

L:\3983\SD_GRADING

5-97-847 Attachment p. D-42

(4/4)

TIDAL FLUCTUATION SIMULATION, PHASE 3
HELLMAN RANCH WETLAND

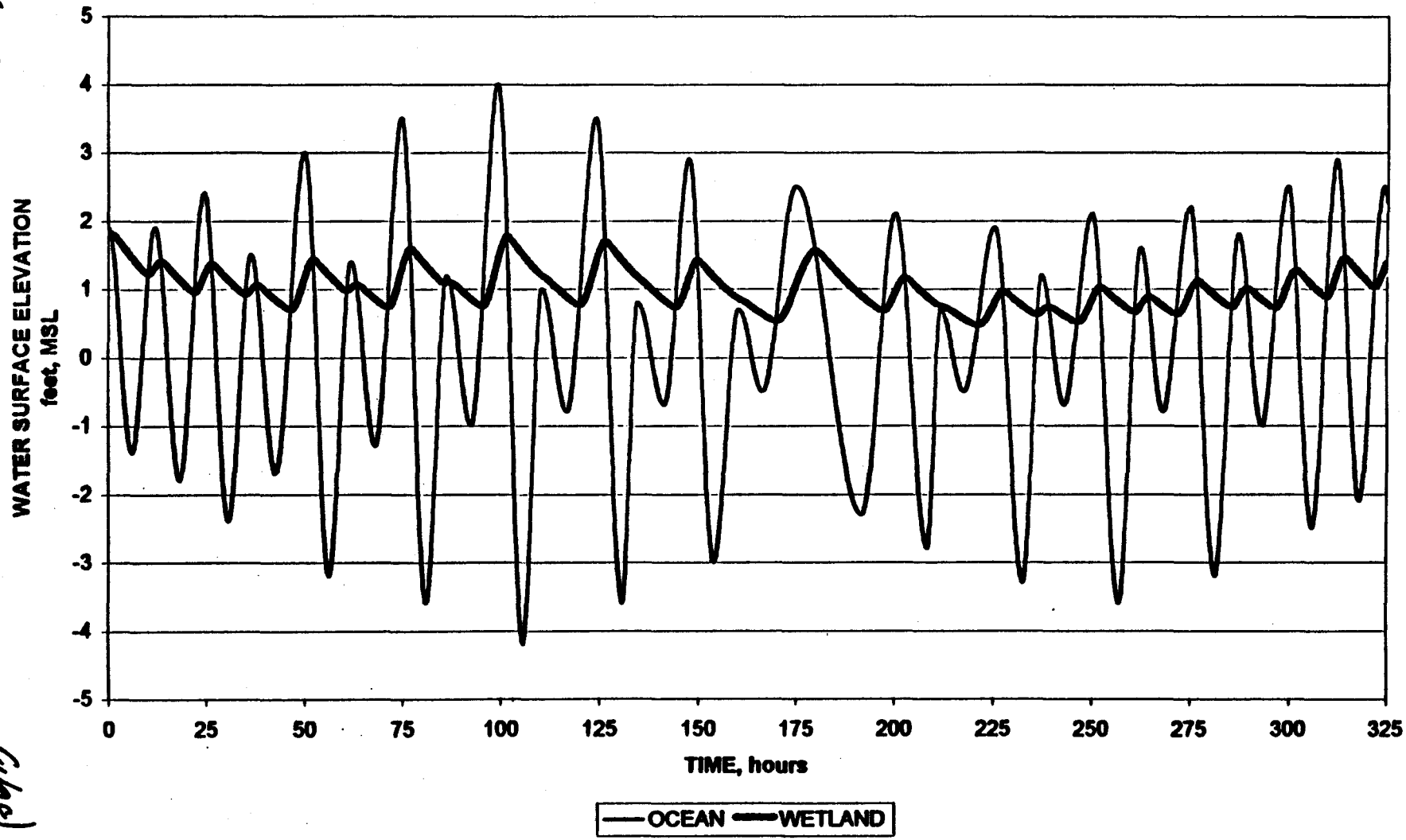


FIGURE A13

SALT MARSH STORAGE CURVE, PHASE 3

HELLMAN RANCH WETLAND

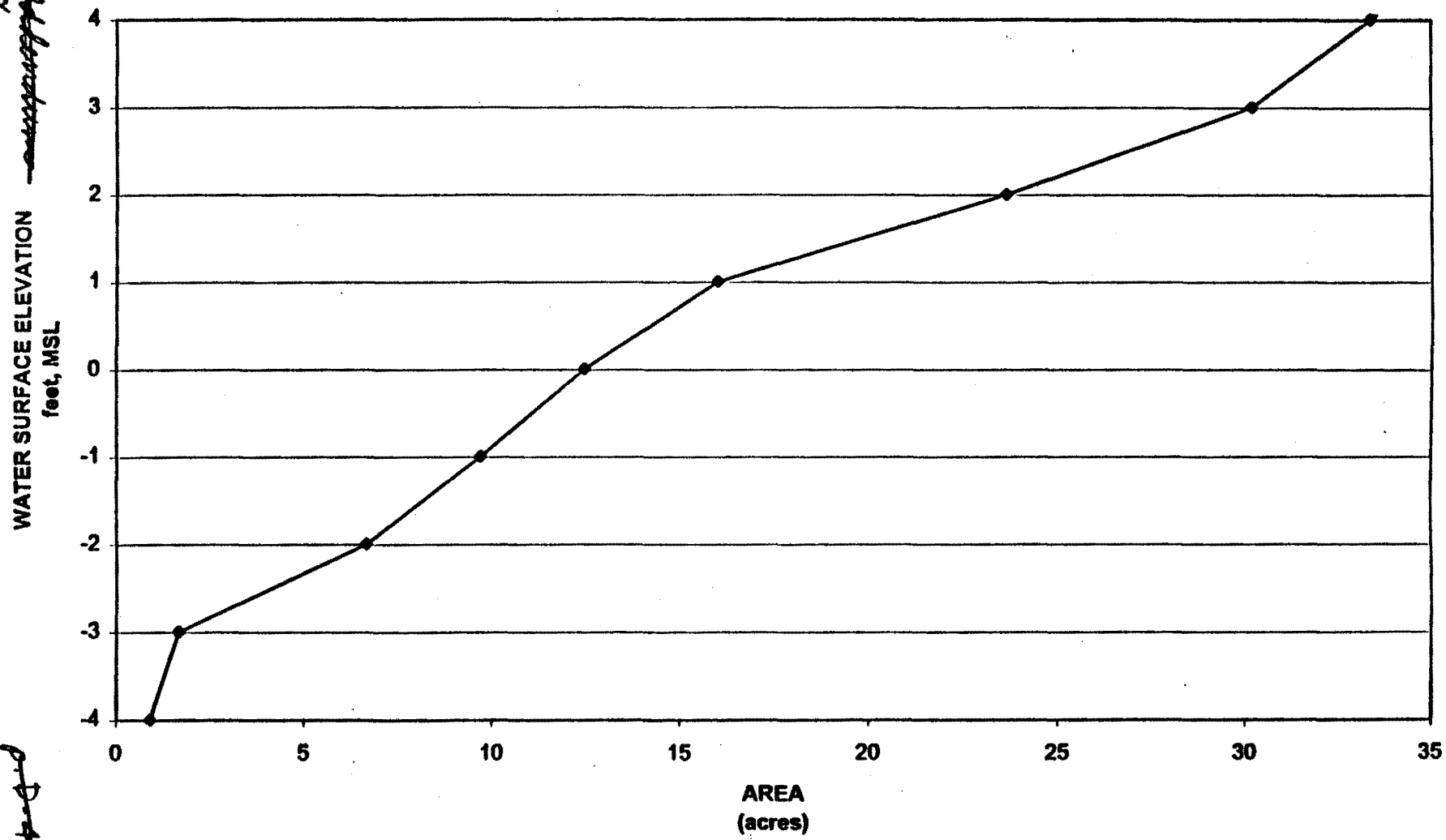
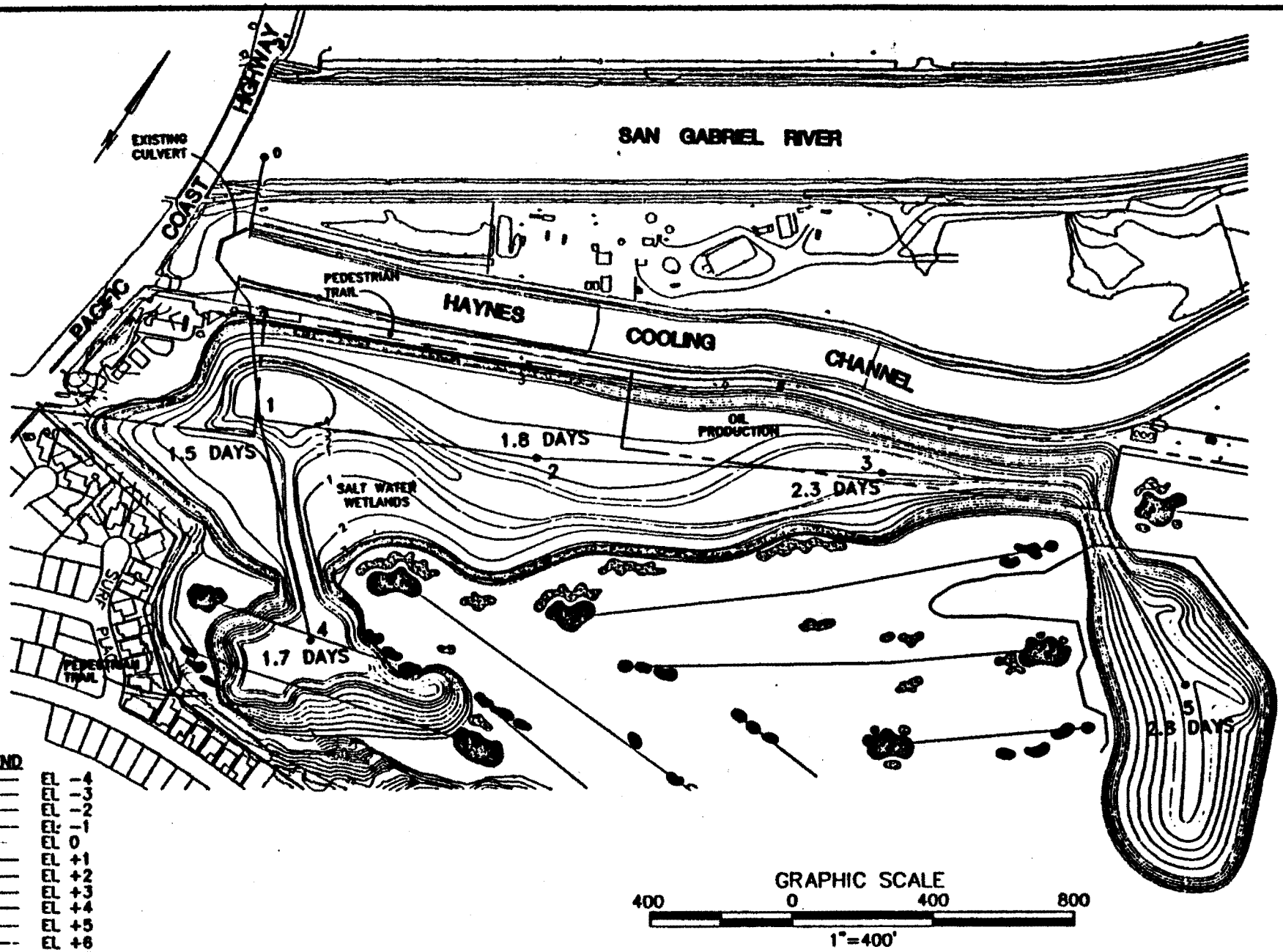


FIGURE A14

5-97-367 Addendum p. D-44

(4/98)



LEGEND

- EL −4
- EL −3
- EL −2
- EL −1
- EL 0
- EL +1
- EL +2
- EL +3
- EL +4
- EL +5
- EL +6
- EL +7
- EL +8
- EL +9
- EL +10
- LINKS
- NODES

MOFFATT & NICHOL ENGINEERS
LONG BEACH, CALIFORNIA

HELLMAN RANCH WETLAND PLAN
PHASE 3
SALT MARSH RESIDENCE TIMES

DATE 2-16-98

FIG. A15

L:\3883\SD_CP\LONG

CONCEPTUAL WETLANDS

RESTORATION PLAN

FOR THE HELLMAN RANCH

see Feb. 1998 addendum

Prepared for:

HELLMAN PROPERTIES, LLC
711 Seal Beach Blvd.
Seal Beach, CA 90740

Prepared by:

MOFFATT & NICHOL ENGINEERS
250 West Wardlow Road
Long Beach, CA 90807

in Association with

COASTAL RESOURCES MANAGEMENT
2855 E. Coast Highway #225
Corona del Mar, CA 92625

and

MICHAEL BRANDMAN ASSOCIATES
17310 Red Hill, Suite 250
Irvine, CA 92714

Revised November, 1997

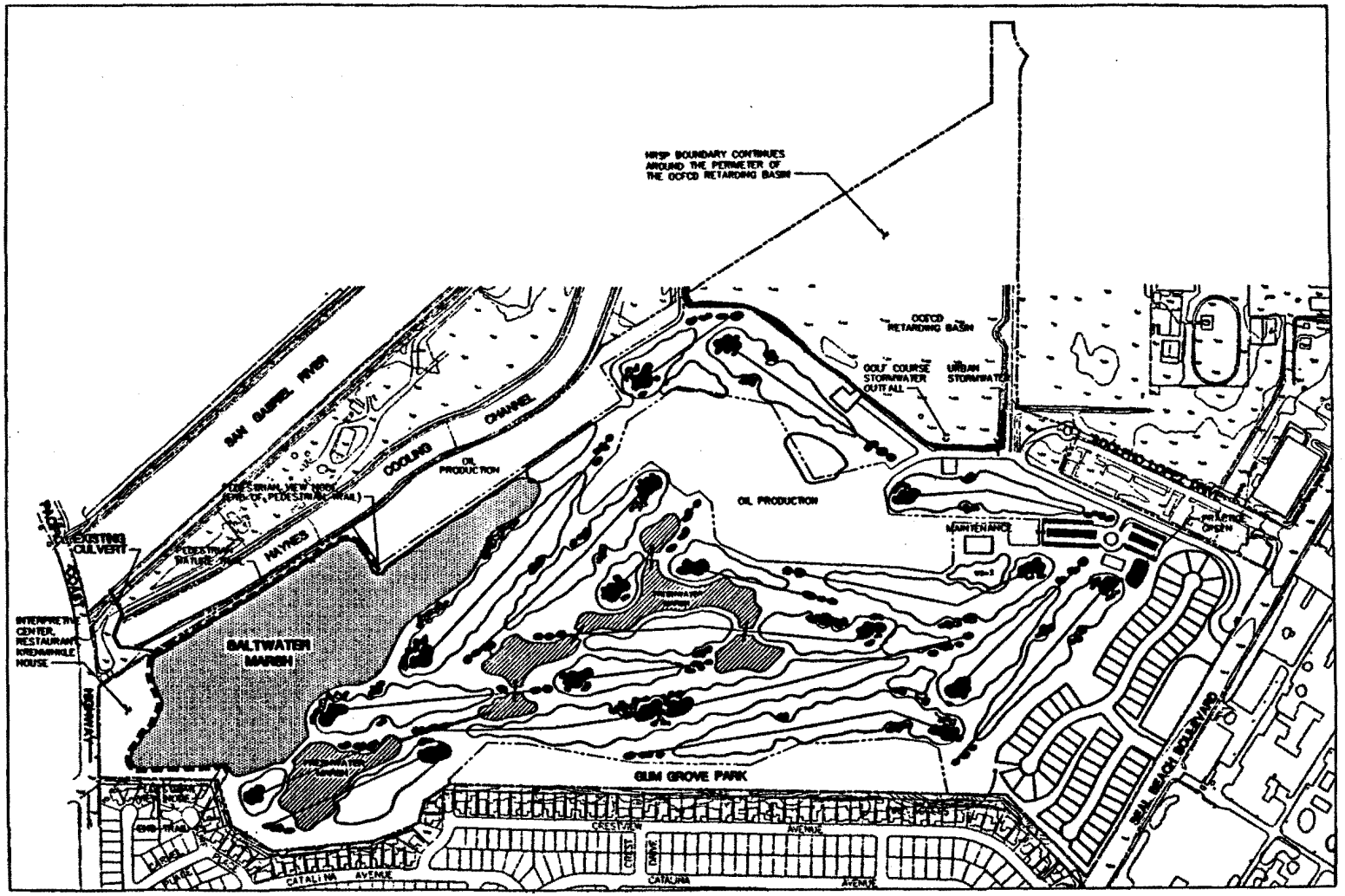
Ap E45

EXECUTIVE SUMMARY

The Hellman Ranch Specific Plan (HRSP) proposes development on land which is mostly vacant, but has limited oil field uses and 23.2 to 27.0 acres of degraded wetlands depending on whether State or Federal criteria are considered. Proposed development includes Conservation Planning Areas and Development Planning Areas which are described in the HRSP. The Planning Areas call for creation, restoration and/or preservation of environmentally sensitive habitats and development of low-intensity urban land uses including:

- Restoration of a severely degraded saltwater marsh and creation of new saltwater marsh with a substantially improved tidal connection;
- Creation of new freshwater wetlands;
- Preservation of Gum Grove Nature Park;
- Provision of an interpretive and historical center;
- Development of an environmentally sensitive golf course; and
- Development of low-intensity residential and commercial land uses.

Construction of the golf course will impact 17.9 acres of the existing wetland, and creation of new wetlands will affect 9.1 acres of existing wetlands, for a total of 27.0 acres of wetland affected according to State Department of Fish and Game (CDFG) criteria. A total of 32.8 acres of wetland habitat is proposed to be either restored or created. Approximately 17.7 acres will consist of coastal salt marsh with a 5.4 acre buffer, and 9.7 acres will consist of freshwater marsh. The golf course is to be a "modified links" style course with native habitat incorporated into its design. The course with extensive use of native vegetation will serve to buffer the wetlands from residential land uses and increase site biodiversity, while still providing recreation and public access, preserving open space, and realizing economic benefits for the project. The proposed project is shown in Figure E-1.



LEGEND

- SALTWATER MARSH
- FRESHWATER MARSH

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

PROPOSED HELLMAN RANCH SPECIFIC PLAN

DATE 10-11-96

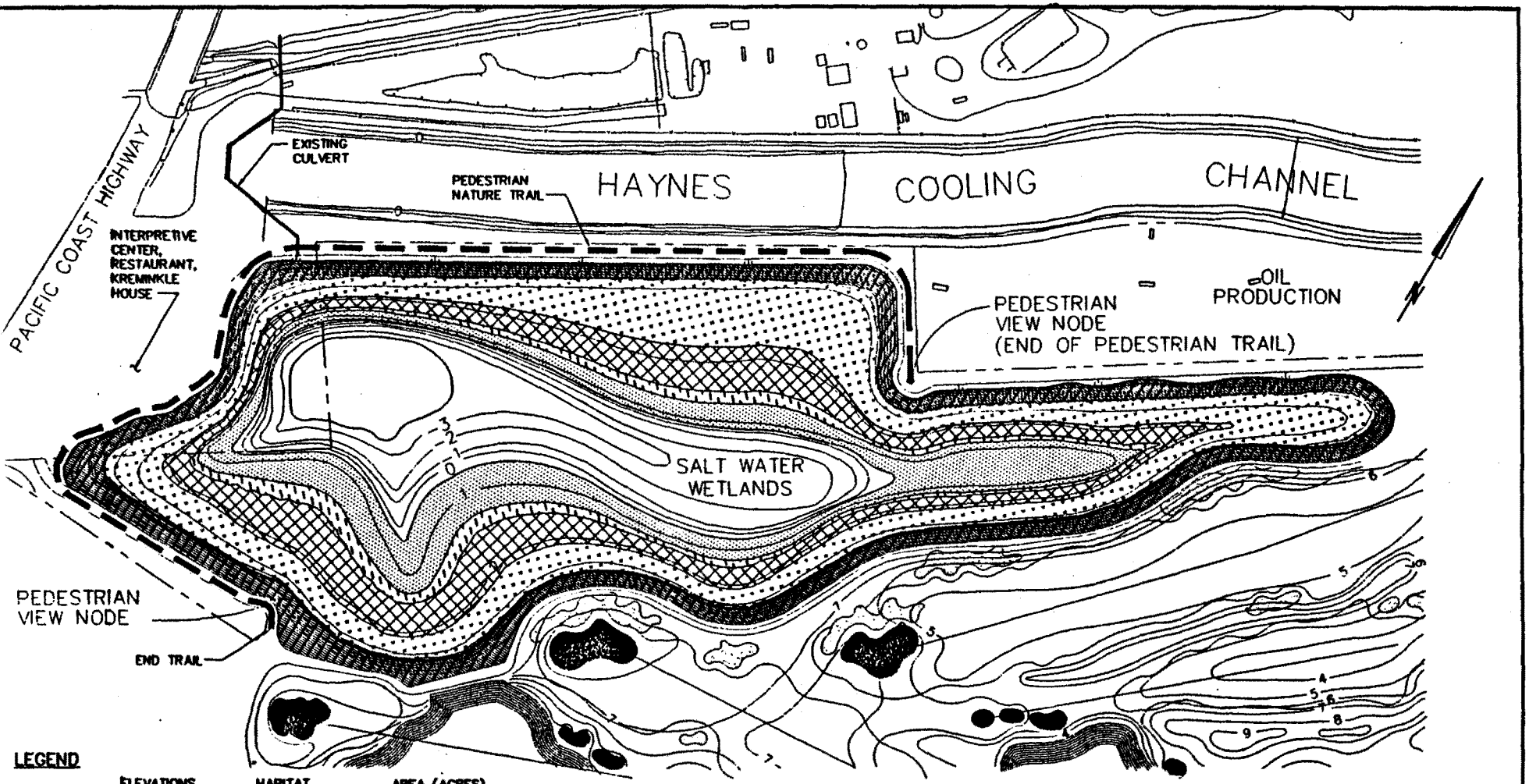
FIG. E-1

A647

The existing wetlands have been described as degraded to severely degraded by previous researchers. Wetland delineations and resource surveys have been done by Radovich (1980), LSA (1989), Levine (1995), Coastal Resources Management (CRM, 1996) and Michael Brandman Associates (MBA, 1996). Each researcher has confirmed that wetlands on the property are termed degraded to severely degraded. Table E-1 shows areas of existing wetland defined according to State and Federal delineation criteria. The site once possessed historic wetlands, but was isolated from tidal influence by the channelization of the San Gabriel River in 1961-62 and substantially disturbed by disposal of dredged materials and other human activities. Limited utilization of the site by one endangered bird, the Belding's savannah sparrow, has been recently documented. The alkaline meadows on the site also support one sensitive plant species, the Southern tar plant.

A qualitative analysis of wetland functions and values for existing and proposed wetlands is presented. The analysis shows that the proposed marsh will provide improvements to wetland functions and values on the site. A presentation of potential biological constraints is also presented. The constraints imposed by relatively poor water quality in the San Gabriel River are discussed relative to the potential impact on the proposed marsh. The marsh will likely adapt to River conditions and will be a dynamic system responding to flow conditions. Certain species like pickleweed will be more tolerant of conditions in the marsh than other species such as cordgrass.

As shown in Figure E-2, the proposed salt marsh consists of a central tidal basin separated from the golf course by a buffer area and drainage divide. A conceptual grading plan has been developed to provide appropriate elevations and areas for salt marsh habitat indigenous to the area. The wetland is to receive muted tidal flow from the San Gabriel River through the existing 48-inch culvert.



LEGEND

ELEVATIONS	HABITAT	AREA (ACRES)
-4.0 — +0.3	BASIN - CHANNEL	4.1
+0.3 — +1.3	UNVEGETATED MUDFLAT	3.2
+1.3 — +1.5	CORDGRASS MARSH	1.1
+1.5 — +2.2	PICKLEWEED - TIDAL	3.6
+2.2 — +4.5	PICKLEWEED - HIGH MARSH	5.7
+4.5 — +10.0	BUFFER AREA	5.4
	TOTAL	23.1

0 1 2 3
SCALE: 1"=170'

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN
SALT MARSH PLANTING PLAN

DATE 11-01-96
FIG. E-2

E-49

TABLE E-1

AREAS OF EXISTING WETLANDS ON HELLMAN PROPERTY

Habitat Type	Area According to State Criteria[1] (Acres)	Area According to Federal Criteria[2] (Acres)
Vegetated Wetlands	14.9	15.3
Unvegetated Wetlands (includes seasonally ponded water and alkaline flat)	9.0	5.9
Tidal Channel	3.1	2.0
TOTAL	**27.0**	**23.2**

Notes:

1) State criteria requires a site to contain one of the following characteristics to be classified as wetland: a) permanent or periodic dominance by wetland plant species, b) substrate dominated by undrained hydric soil, and c) non-soil substrate saturated or inundated during the growing season of each year.

2) Federal criteria requires a site to contain all of the following characteristics to be classified as wetland: a) dominance of wetland plants, b) hydric soils, and c) wetland hydrology.

The existing hydraulic system is characterized by a single long and narrow tidal channel. The channel is connected to the River with a culvert and has several constrictions along its length. Measured tides show substantial muting of tides (3 feet) in the channel, and phase lags at high and low tides.

Hydraulic modeling indicates that the proposed tide will also be muted, and that the tidal range will reach 1.9 feet between mean lower low water (MLLW) and mean higher high water (MHHW). The model also shows the residence times of tidal waters within the salt marsh to be approximately 1.3 to 1.7 days, depending on location within the salt marsh. Residence time of tidal waters is an indicator of the frequency of tidal flushing and water quality. Existing residence times are approximately 4 days.

A planting plan is proposed which will encompass the ranges of habitat required by sensitive and endangered species in the area. The plan emphasizes habitat for the Belding's savannah sparrow. Habitat for this sensitive species has been planned for the portion of the salt marsh farthest from

the golf course to minimize golf-related disturbances. The salt marsh will be directly buffered by a 35 to 50 foot-wide strip around the perimeter of the marsh, separating the marsh from the golf course. Table E-2 shows acreages of proposed salt marsh habitats.

TABLE E-2

PROPOSED SALT MARSH

HABITAT AREAS

Habitat Type	Area (acres)
Subtidal basins and channels	4.2
Unvegetated Mudflat	3.1
Cordgrass Marsh	2.4
Pickleweed-Tidal	3.6
Pickleweed-High Marsh	5.7
Transition Zone/Buffers	5.4
TOTAL	**23.1**

A thorough operation and maintenance program has been developed for the salt marsh. This program includes debris removal, weeding, irrigation, replanting, culvert cleaning, sediment removal, predator control and signage as determined necessary by the biological monitor and engineer. Monitoring of the marsh includes pre- and post-construction surveys of salt marsh plant life; site use by fish, invertebrates, and birds; and tides, sedimentation, and water quality.

The proposed freshwater marsh consists of 7 interconnected basins within the interior of the golf course. The conceptual grading plan provides for a shallow area (1-2 feet deep) along the perimeter of each wetland basin for establishment of native wetland plant species, with a deeper open water area in the center of each wetland basin. Water is to be provided to the wetland primarily from groundwater wells and limited stormwater runoff. Wetlands will be connected by subsurface drainage lines. Periodic flushing of the ponds will occur. The bottom of the freshwater ponds will be lined with impermeable material to prevent subsurface drainage from the salt marsh and golf course from entering the freshwater marsh. The planting plan for the

Ap E5'

freshwater marsh includes a variety of native hydrophytic species. Table E-3 shows the acreages of the proposed freshwater marsh habitats, and Figures E-3A and B show the freshwater marsh plan.

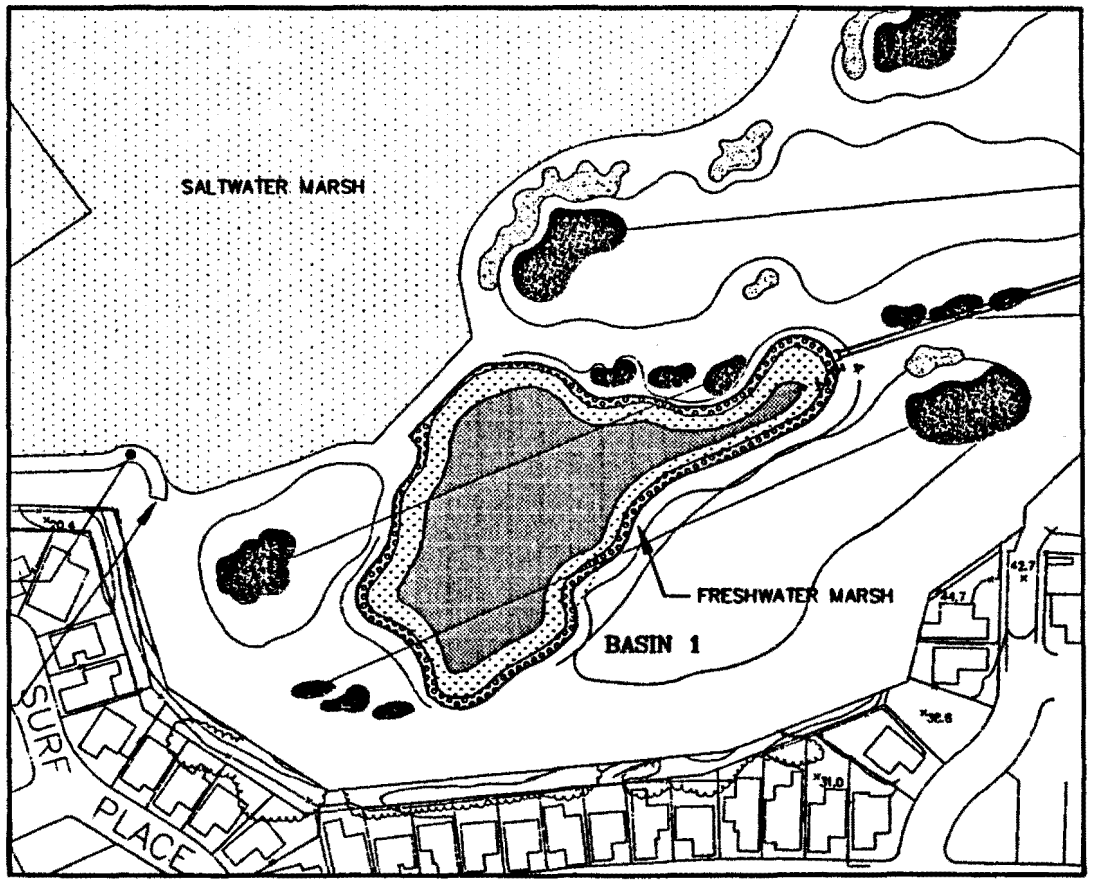
TABLE E-3

PROPOSED FRESHWATER MARSH

HABITAT AREAS

Habitat Type	Area (acres)
Open water	4.2
Emergent Marsh (Bulrushes & Cattails)	3.1
Emergent Marsh (transition to wet meadow habitat)	2.4
TOTAL	9.7

Maintenance and monitoring of the freshwater marsh is also proposed with weeding and replanting as determined necessary by the biological monitor. Monitoring of the marsh includes post-construction surveys of freshwater marsh plant life and site use by birds.



N

GRAPHIC SCALE IN FEET

0 75 150 300

LEGEND

	ACRES
OPEN WATER	1.6
EMERGENT MARSH WITH BULRUSHES & CATTAILS, 1'-2' DEEP	0.8
EMERGENT MARSH TRANSITION TO WET MEADOW HABITAT, RUSHES, SPIKERUSHES & SEDGES, 0-1' DEEP	0.5
PIPE CONNECTION	
TOTAL	2.9

MOFFATT & NICHOL ENGINEERS

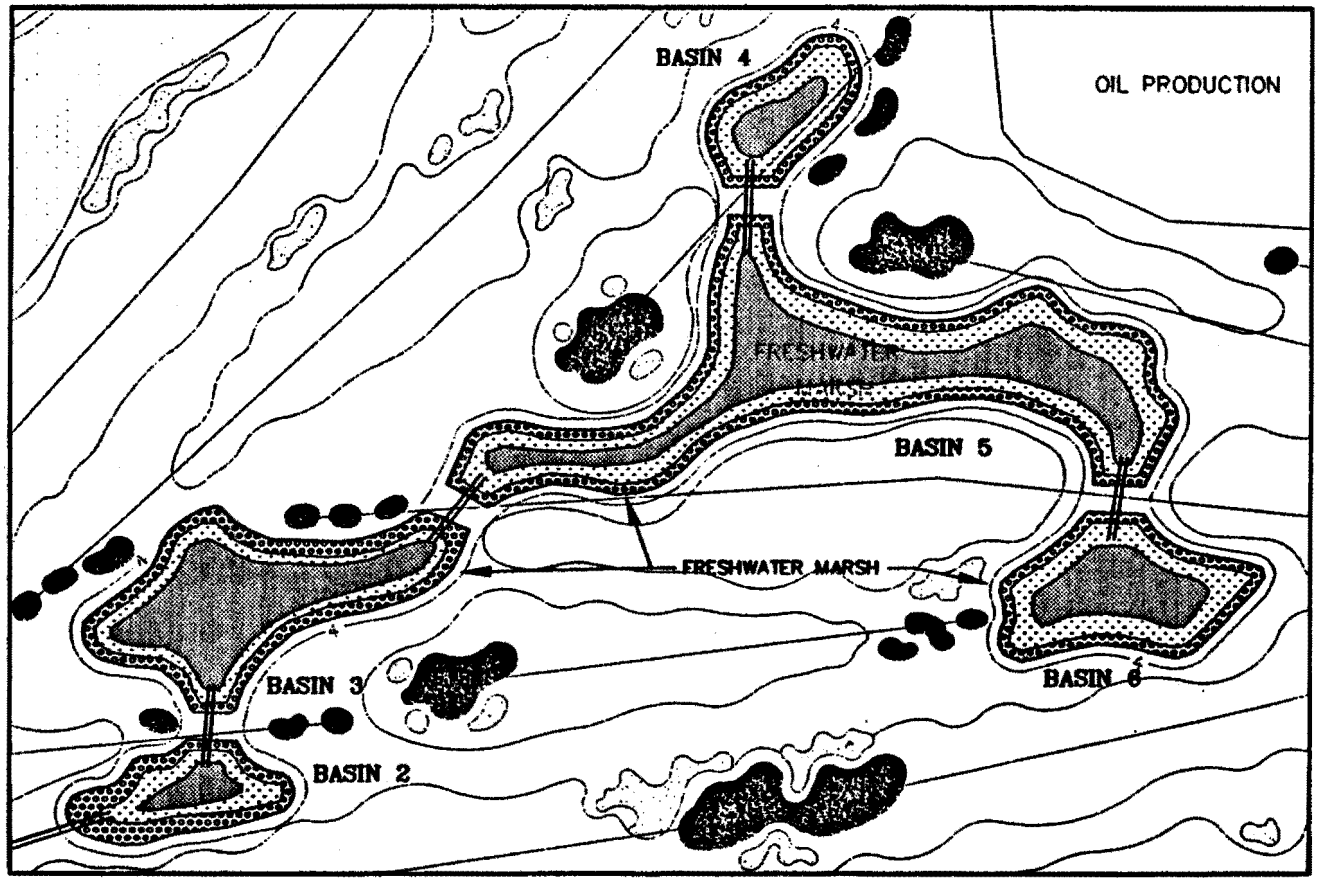
HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH PLANTING PLAN-BASIN 1

DATE 10-18-96

FIG. E-3A

mp E3



LEGEND

	ACRES
OPEN WATER	2.6
EMERGENT MARSH WITH BULRUSHES & CATTAILS, 1'-2' DEEP	2.3
EMERGENT MARSH TRANSITION TO WET MEADOW HABITAT, RUSHES, SPIKERUSHES & SEDGES, 0-1' DEEP	1.9
TOTAL	6.8

PIPE CONNECTIONS

GRAPHIC SCALE IN FEET

0 75 150 300

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH PLANTING PLAN-BASINS 2-6

10-16-89

FIG. E-3B

CONTENTS

EXECUTIVE SUMMARY i
1.0 INTRODUCTION 1
1.1 Purpose 1
1.2 Scope of Work 1
1.3 Background 3

2.0 PROJECT OBJECTIVES 4

3.0 SUMMARY OF EXISTING WETLAND CONDITIONS 6
3.1 Habitat 6
3.1.1 Tidal Channel 7
3.1.2 Salt Marsh 7
3.1.3 Seasonal Pnds 9
3.1.4 Alkaline Flats 10
3.2 Wildlife 10
3.2.1 California Least Tern 10
3.2.2 Belding's Savannah Sparrow 11

4.0 RESTORATION GOALS 13
4.1 Wetland Functions and Values 14
4.2 Biological Constraints 19

5.0 SALTWATER MARSH RESTORATION PLAN 24
5.1 Habitat Goals 24
5.2 Grading 26
5.2.1 Subtidal Areas 30
5.2.2 Tidal Channels 30
5.2.3 Mudflats 30
5.2.4 Low Marsh 30
5.2.5 High Marsh 30
5.2.6 Transitional and Buffer Areas 32
5.3 Hydraulics 32
5.3.1 Existing Conditions 32
5.3.2 Proposed Hydraulic Connection 38
5.3.3 Hydraulic Modeling 40
5.4 Planting 47
5.4.1 Donor Plant Material Sources 50
5.4.2 Planting Palette 50
5.4.3 Salt Marsh Buffers 50
5.4.4 Target Species 56
5.4.5 Collection and Revegetation Permits 56
5.4.6 Salt Marsh Habitat Site Preparation 56
5.4.7 Construction Sequence of the Salt Marsh 59
5.4.8 Salvage and Relocation of Southern Tarplant 60

Ap E55

5.5 Maintenance and Monitoring 60
5.5.1 Maintenance 61
5.5.2 Monitoring 62
5.5.3 Salt Marsh Performance Criteria 65

6.0 FRESHWATER MARSH RESTORATION PLAN 68
6.1 Habitat Goals 68
6.2 Grading 68
6.3 Hydrology 72
6.4 Planting 72
6.4.1 Donors 72
6.4.2 Plant Palette 73
6.4.3 Freshwater Marsh Buffers 77
6.4.4 Target Species 77
6.4.5 Freshwater Marsh Habitat Site Preparation 79
6.4.6 Construction Sequence of the Freshwater 79
6.5 Maintenance and Monitoring 81
6.5.1 Maintenance 81
6.5.2 Monitoring 82
6.5.3 Freshwater Marsh Performance Criteria 85
7.0 AGENCY COORDINATION 88

8.0 RESPONSIBLE PARTIES 89

9.0 REFERENCES 90

TABLES

TABLE E-1 AREAS OF EXISTING WETLANDS ON HELLMAN PROPERTY
TABLE E-2 PROPOSED SALT MARSH AREAS
TABLE E-3 PROPOSED FRESHWATER MARSH AREAS
TABLE 1 WETLAND IMPACTS
TABLE 2 SALT MARSH TIDAL ZONES
TABLE 3 RECORDED WATER LEVELS AT LOS ANGELES OUTER HARBOR
TABLE 4 OPTIONAL HYDRAULIC CHARACTERISTICS
TABLE 5 SALT MARSH PLANTS AND ELEVATIONS
TABLE 6 SALT MARSH PLANT PALETTE
TABLE 7 PROPOSED SALT MARSH HABITAT AREAS
TABLE 8 TARGET BIRD SPECIES FOR THE SALT MARSH
TABLE 9 SIZE OF FRESHWATER MARSH BASINS
TABLE 10 FRESHWATER MARSH PLANT PALETTE
TABLE 11 TARGET BIRD SPECIES OPEN/WATER FRESHWATER MARSH
TABLE 12 REMEDIAL PROCEDURES

Ap E57

FIGURES

FIGURE E-1	PROPOSED HELLMAN RANCH SPECIFIC PLAN
FIGURE E-2	SALT MARSH PLANTING PLAN
FIGURE E-3 (A AND B)	FRESHWATER MARSH PLANTING PLAN
FIGURE 1	PROJECT VICINITY MAP
FIGURE 2	EXISTING WETLANDS
FIGURE 3	CONCEPTUAL SALT MARSH CROSS-SECTION
FIGURE 4	SALT MARSH GRADING PLAN
FIGURE 5	SALT MARSH GRADING CROSS-SECTIONS
FIGURE 6	PHOTOGRAPHS OF LOWER TIDAL CHANNEL
FIGURE 7	PHOTOGRAPHS OF UPPER TIDAL CHANNEL
FIGURE 8	LOCATIONS OF TIDE GAGES
FIGURE 9	EXISTING HELLMAN WETLAND WATER ELEVATIONS
FIGURE 10	SALT MARSH HYDRAULIC CONNECTION
FIGURE 11	EXISTING CULVERT PLAN
FIGURE 12	EXISTING CULVERT PROFILE
FIGURE 13	LINK-NODE DIAGRAM
FIGURE 14	DRIVING AND PREDICTED TIDAL ELEVATIONS
FIGURE 15	SALT MARSH STORAGE CURVES
FIGURE 16	PARAMETRIC MEAN PERIODIC TIDE
FIGURE 17	SALT MARSH RESIDENCE TIMES
FIGURE 18	SALT MARSH PLANTING PLAN
FIGURE 19	SALT MARSH BUFFER CROSS-SECTIONS
FIGURE 20 (A AND B)	FRESHWATER MARSH GRADING PLAN
FIGURE 21	FRESHWATER MARSH CROSS-SECTION
FIGURE 22 (A AND B)	FRESHWATER MARSH PLANTING PLAN

1.0 INTRODUCTION

1.1 Purpose

This document presents a wetland restoration plan which is to be implemented as part of the Hellman Ranch Specific Plan (HRSP). Implementation of the HRSP will impact existing degraded wetlands on-site. Wetland restoration is proposed as mitigation for project impacts. The project vicinity is within northern Orange County, in the City of Seal Beach and adjacent to the southeast bank of the San Gabriel River. Figure 1 shows the location of the HRSP area in relation to wetlands in the region.

This plan provides technical recommendations for a concept-level restoration plan to serve as the basis for subsequent, more detailed design. Design and construction components of wetland restoration are presented herein. The plan concludes with a description of the provisions for monitoring and maintenance to promote successful plan implementation.

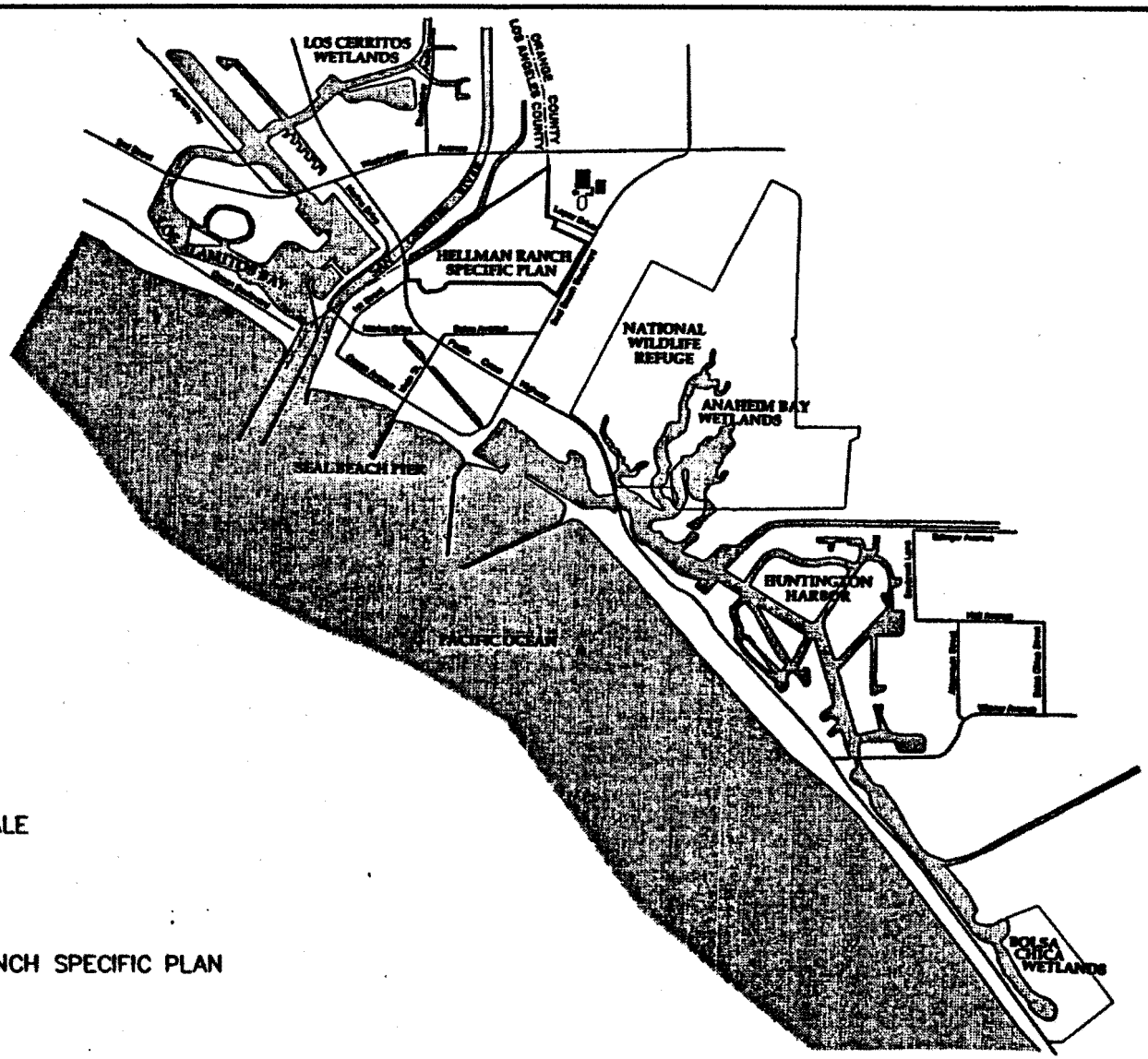
1.2 Scope of Work

The scope of work for this project calls for development of a preliminary wetland restoration plan to include:

1. Grading;
2. Hydraulics;
3. Saltwater and freshwater marsh planting; and
4. Maintenance and monitoring recommendations.

This report presents these items for consideration as part of the Hellman Ranch Specific Plan.

Ap E59



NO SCALE

SOURCE: HELLMAN RANCH SPECIFIC PLAN

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

PROJECT VICINITY MAP

DATE 10-31-95

FIG. 1

1.3 Background

The Hellman project site is located within a regional wetland complex which is a significant component of the Pacific Flyway. The regional system includes: Newport Bay, Talbert Marsh, Bolsa Chica, Anaheim Bay, the Santa Ana Rivermouth, and Rancho Los Cerritos. Due to its proximity to these regionally important coastal wetlands, the Hellman site offers a significant contribution to the flyway.

The wetlands were recognized as degraded at the time of past delineations and resource surveys (CDFG, 1980 and LSA, 1989). Existing conditions reflect continuing degradation of the wetlands indicating a gradual decline in habitat quality (CRM, 1996). Human intervention and wetland restoration is therefore warranted at the Hellman Site.

A previous wetland restoration plan for the site was prepared by LSA Associates in conjunction with the initial HRSP, and approved by the California Coastal Commission in 1990. This current plan proposes wetlands of higher quality and greater diversity than the LSA Plan. The current plan proposes isolating wetland areas from storm drainage originating in the surrounding development and buffering the salt marsh from development using Hellman Ranch Reserve Golf Course. A topographic divide up to an elevation of +10 feet above mean sea level (MSL) will be created around the salt marsh to physically separate it from drainage coming off of adjacent land. Design and management of the golf course utilizes state-of-the-art environmental management principals, allowing the golf course and wetlands complex to co-exist while minimizing adverse affects to the marsh and providing additional transitional habitat for wetland species. This plan also proposes creating freshwater marsh areas on-site to enhance biodiversity and increase wetland habitat areas.

Mp E61

2.0 PROJECT OBJECTIVES

As stated in the HRSP, "The purpose of the Hellman Ranch Specific Plan (HRSP) project is based on the following underlying principle:

> *To create a state of the art project that will balance the land use, environmental benefits and ownership economics of the property, while meeting or exceeding all applicable federal, state and local plans and regulations."*

The overall objective of the project is to develop the Hellman Ranch property in accordance with the HRSP, which proposes to construct a golf course, housing and small commercial center. The overall project is envisioned to meet the local need for a golf course, which will help to make the project economically viable while minimizing impacts to the existing degraded wetlands. The golf course will also serve as the "economic engine" to fund restoration of wetlands at the site.

Since project inception, the Hellman ranch developers determined that a key objective of the development project was to have the principles of conservation, biology, habitat improvements, and sustainable resource management requirements drive the design process. In order to implement this key objective, a team of environmental professionals was assembled to gather information concerning the biological resources associated with the site. A development plan was conceptually designed to be compatible with the biological resources on site. A comprehensive review of the requirements and design parameters at the federal, state and local level was completed to develop a state of the art restoration plan that incorporates the habitat zones necessary to achieve maximum biodiversity while attracting target sensitive species.

The wetland project will meet Federal and State mitigation requirements, and be implemented under the auspices of the U.S. Army Corps of Engineers and the California Coastal Commission. Wetland areas will be restored and created within the HRSP area, such that the 27.0 acres of wetland (defined by State criteria) impacted during construction will be compensated for by the creation of 23.1 acres of tidal saltwater marsh and 9.7 acres of freshwater marsh, for 32.8 total acres of new wetlands. Specific objectives of the restoration program include:

- Restore a permanent tidal connection;
- Maximize the functioning and efficiency of the existing hydraulic connection;

- Consolidate the saltwater marsh ecosystem;
- Replace and significantly improve the existing habitat values on the site;
- Maximize nesting habitat for the Belding's savannah sparrow;
- Provide meaningful foraging value for the California least tern;
- Provide important habitat for shorebirds, including herons, egrets and ducks;
- Provide habitat for invertebrates and fish;
- Create functioning and self-sustaining freshwater wetlands;
- Improve water quality;
- Add to regional biological significance; and
- Provide sufficient transitional and buffer areas.

Conceptual project design was developed to meet these objectives.

Ap E6 3

3.0 SUMMARY OF EXISTING WETLAND CONDITIONS

Wetland delineations on the project site indicate that approximately 27.0 acres of wetland exist on the site according to State of California criteria, while 23.2 acres exist according to Federal government (U.S. Army Corps of Engineers) criteria. Two recent delineations were done to calculate these areas. LSA did a delineation according to State criteria and CRM delineated wetlands according to Federal criteria. (LSA, 1989 and CRM, 1996). The condition of the existing wetlands is "degraded" and "severely degraded" as described in the delineation performed by LSA in 1989 for the previous Supplemental Environmental Impact Report (SEIR) for the Hellman Ranch Specific Plan (Michael Brandman Associates, MBA, 1989). CRM confirmed the degraded condition of the wetland in 1996 (CRM, 1996).

3.1 Habitat

A detailed survey was performed by Mr. Robert Radovich of the California Department of Fish and Game (CDFG) in 1980 which is referred to extensively throughout this section. This section summarizes pertinent information from the restoration plan prepared by LSA (1990). Information is also included from CRM (1996) and MBA (1996).

The Hellman property is located within the historic footprint of salt marsh and tidal channels comprising the Alamitos Bay wetland, which is part of the larger regional system. The wetland, like others in Southern California, have been reduced in area and fragmented by development (Zedler, 1984A). The Hellman property has also been significantly altered from its original condition by oil drilling starting in the 1930's and flood control in the early 1960's. The most important of these alterations was the channelization of the San Gabriel River by the U.S. Army Corps of Engineers in 1961-1962 (L. Flannery, Personal Communication, 1996), and the resultant removal of tidal influence over much of the lower-lying portions of the site. When the river was channelized, a culvert and flap gate were installed to maintain drainage from a swale on the Hellman property. The flap gate became propped partially open, allowing limited tidal flow to be reintroduced to the site and for re-establishment of wetlands to occur. Another major alteration of the site occurred with the addition of large quantities of fill and dredge spoils to portions of the site during excavation of the Haynes Cooling Channel in 1962. Additional

disturbance has resulted from many years of historical off-road vehicle use, soil discing, addition of small quantities of fill, and other types of human intrusion.

The result of these various practices has been the transformation of the Hellman site into an area containing isolated and severely degraded wetlands. A recent study performed by Coastal Resources Management (CRM, 1996) verified previous studies which concluded that the site is not extensively utilized by birds or fish and it is in substantial need of restoration.

The existing wetlands are presented in terms of four habitat types described below. Figure 2 shows existing wetlands on the site. Acreages referred to below have been defined by wetland delineation according to State guidelines, which are generally more expansive than area delineations performed according to Federal guideline (State guidelines require the presence of only a single wetland parameter [vegetation, soils and hydrology] whereas, federal guidelines, pursuant to Section 404 of the Cleanwater Act, require the presence of all three parameters).

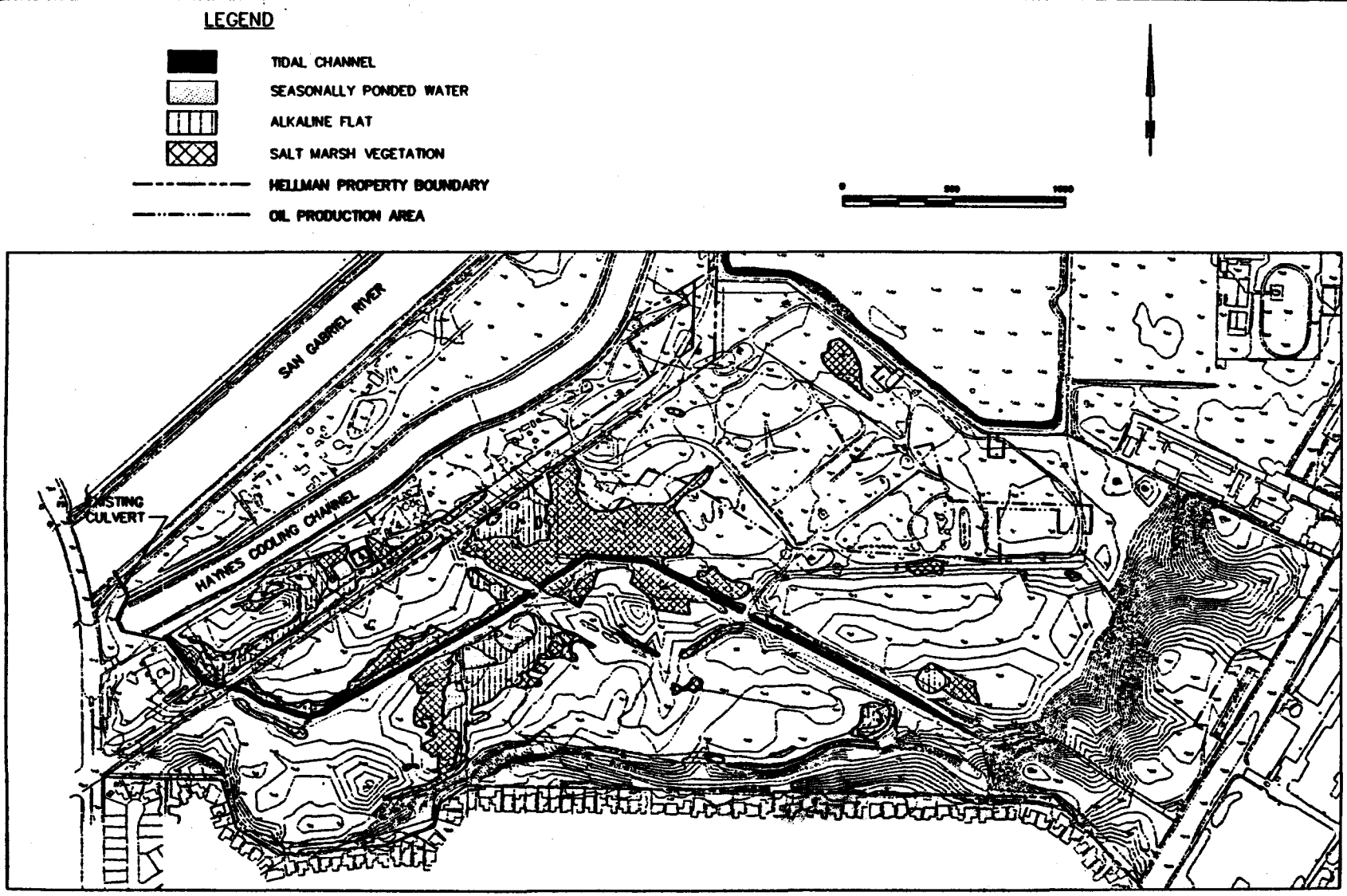
3.1.1 Tidal Channel

Approximately 3.2 acres of tidal channels exist on the site according to DFG criteria. The narrow man-made drainage channel that runs through the site contains brackish water due to its connection to the San Gabriel River. The bottom and lower banks of the channel are unvegetated mud, while the upper banks are vegetated primarily with common pickleweed *(Salcornia virginica)*. A large quantity of algae, primarily *Enteromorpha* sp., grows in the water of the channel, with a small amount of sea lettuce (*Ulva* sp.) occurring near the channel mouth. This habitat was described as a "degraded wetland" by Radovich of the CDFG in the 1980 report, and confirmed by LSA (1989) and Levine (1995). As of 1996, the degraded wetland condition at the Hellman site has remained unchanged (CRM, 1996).

3.1.2 Salt Marsh

Approximately 14.9 acres of salt marsh habitat exist on-site. The 1996 verification of the previous delineation to State criteria, and the delineation done in 1996 according to Federal criteria classified salt marsh areas on the site (CRM, 1996). The classification of salt marsh is broadly interpreted for purposes of this project. The vegetation in the salt marsh at the Hellman site is very mildly influenced by tidal water. The term salt marsh is therefore used here to

Ap E65



MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

EXISTING WETLANDS ACCORDING TO STATE CRITERIA

DATE 10-11-95

FIG. 2

describe the vegetation rather than the physical characteristics of this habitat type. It encompasses some of the smaller vegetated areas which were classified as alkaline flats by Radovich (1980), LSA (1989) and CRM (1996).

Due to degraded conditions, the vegetation on-site does not include many of the species which are often associated with a fully functional tidal salt marsh such as cordgrass *(Spartina foliosa)*, and saltwort *(Batis maritima)*. However, the existing vegetation can be roughly compared to the vegetation types associated with normal tidal zones as described by Zedler (1982). In wetter areas of the salt marsh, vegetation is similar to that associated with the mid-littoral zone (i.e., the zone around mean higher high water). These areas are dominated by pickleweed and samphire *(Salicornia subterminalis)* which form nearly pure stands in some locations. Other vegetation in these wetter areas includes such plants as fleshy jaumea *(Jaumea carnosa)*, and alkali heath *(Frankenia grandiflora)*. The drier portions of the vegetated wetlands are more characteristic of the upper littoral zone or the lower maritime zone. Pickleweed is still found, but these areas are dominated by facultative plants, i.e. plants which can grow in either wet or dry conditions. Dominant vegetation includes weedy, halophytic (salt tolerant) species such as saltgrass *(Distichlis spicata)*, alkali weed *(Cressa truxillensis)* and fivehook bassia *(Bassia hyssopifolia)*. In addition to these species, the drier wetland areas support a significant component of upland weeds such as annual grasses *(Bromus* spp., *Avena barbata)*, Russian thistle *(Salsola tragus)* and cheeseweed *(Malva parviflora)*. These vegetated wetlands which lie outside the tidal channel were originally described as "severely degraded" by Radovich (1980) and confirmed by LSA (1989) and CRM (1996).

3.1.3 Seasonal Ponds

Approximately 2.0 acres of seasonal ponds exist on the site. The seasonal pond classification includes some of the area that was included by Radovich (1980) under the broader term of the open water. MBA (1996) identified 1.6 acres of seasonal ponds. A separate category for seasonal ponds is established and applied in this case because the ponds have somewhat more wetland value than alkaline flats, and field studies have shown that ponding for a significant length of time is limited to only certain portions of the alkaline flats.

Much of the site has relatively impermeable soils, and where depressions occur these impermeable soils pond shallow water from seasonal rains and runoff. In some areas ponded

App E67

water stands for months during a normal rainy season, while in other areas the ponds may last for several weeks after significant rains. Most of these seasonal pond areas are completely lacking vegetation, whereas others support small patches of pickleweed and other species. These areas were also originally described as "severely degraded" by Radovich (1980) and confirmed by LSA (1989) and CRM (1996).

3.1.4 Alkaline Flats

Approximately 7.0 acres of alkaline flats exist on the Hellman site. The classification of alkaline flats is applied in this summary to describe barren areas, i.e. less than 30% vegetative cover, which exhibit some hydrological indicators of wetlands. Small patches of pickleweed and facultative halophytes occur in some areas of these alkaline flats. Excluding the seasonal ponds, this is essentially the same classification originally used by Radovich (1980) and LSA (1989).

3.2 Wildlife

In general, the wildlife use of the site is quite low when compared with other, more fully functional salt marshes in the region (MBA 1996 and Levine, 1995). This is partly due a lack of adequate tidal flushing which in turn has resulted in low habitat diversity (LSA, 1990). Additionally, the historical disturbance of the site has contributed to this lack of diversity, through both the destruction of vegetation and by contributing to poor soil conditions (Ibid). Finally, site use by off-road vehicles, hikers, off-road bicyclists and domestic animals has severely limited wildlife use of the site (Ibid). The property was fenced in approximately 1990, eliminating illegal use of the site for these activities. In his study for the CDFG, Radovich (1980) observed that "the wildlife values of the subject wetland areas are poor." This observation was confirmed by CRM and MBA in 1996.

The two sensitive animal species that were identified as potentially occurring on the wetland portions of the site include the: 1) California least tern; and 2) Belding's savannah sparrow (Levine, 1995).

3.2.1 California Least Tern

The California least tern *(Sterna antillarum browni)* is listed as an endangered species by both the CDFG and U.S. Fish and Wildlife Service (USFWS). This small tern forages primarily in

near-shore ocean waters and river mouths. The tern also travels up rivers for short distances and will occasionally forage in adjacent or nearby waters such as cooling channels, tidal channels and significant ponds which contain fish. The CDFG has reported that the California least tern has been observed foraging in the tidal channel on the Hellman property (Radovich, 1980). More recently MBA and LSA biologists did not observe the California least tern on-site, but MBA biologists observed this species in the San Gabriel River Channel in the vicinity of the site (MBA, 1989 and LSA, 1989). Therefore, it is likely that the California least tern occasionally forages in the tidal channel on-site, but the tidal channel would not be a primary foraging area. Since this species typically breeds on open, sandy beaches, there is no potential breeding habitat on-site. A survey of the site in 1995 did not document use by least terns (Levine, 1995). Least terns in nearby Anaheim Bay (MEC, 1995) have been observed foraging.

3.2.2 Belding's Savannah Sparrow

As summarized in the LSA report of 1989, the Belding's savannah sparrow *(Passerculus sandwichensis beldingi)* is listed as an endangered subspecies by the CDFG. This subspecies is a resident in coastal salt marshes in Santa Barbara, Ventura, Los Angeles, Orange and San Diego counties. The nearest documented breeding habitat for this bird is Anaheim Bay. It nests in stands of pickleweed, above the high tide line, and frequently forages in the intertidal areas. The CDFG has reported the presence of the subspecies on the site (Comment on Draft EIR, 1987, and Radovich, 1980). However, breeding by the listed subspecies is not cited in these references. Furthermore, it is difficult to distinguish between the Belding's savannah sparrow and the non-endangered subspecies *(P.s. nevadensis)* during the winter when *P.s. nevadensis* is present. Surveys by MBA biologists during the 1987 breeding season indicate that the Belding's savannah sparrow did not breed on the site at that time. During field studies by LSA biologists during the winter of 1988-1989, the presence of *P.s. nevadensis* was noted (LSA, 1989). MBA and LSA biologists have independently determined that significant breeding habitat for the listed subspecies does not occur on-site. Massey, et al. (1977) and Levine (1995) do not list the site as occupied by this species. Given the available information, significant breeding by the Belding's savannah sparrow is not likely to occur on the site, but occasional breeding by very low numbers of these birds is conceivable as confirmed by MBA during the most recent surveys in 1996 (MBA 1996). During these most recent surveys three Belding's savannah sparrows were identified onsite; however, because of the seasonality of the survey it is not known if the birds

Ap E6.9

identified are breeding onsite. It is more likely that the site is being used as a stopover point between breeding populations at Anaheim Bay and Los Cerritos wetland (Wimer, 1996).

4.0 RESTORATION GOALS

The existing 27.0 acres of degraded wetland on the Hellman property (according to State criteria) will be impacted by construction of the golf course and wetland project. As shown in Table 1, the golf course will affect 17.9 acres of existing wetland and construction-of the saltwater and freshwater marshes will affect 6.8 and 2.3 acres of existing wetland, respectively. Replacement of wetlands impacted by construction of the golf course and new wetlands is proposed.

The wetland restoration goal is to replace wetlands impacted by the project at a minimum ratio of 1:1, requiring 27.0 acres of new wetland to be created to mitigate for 27.0 acres of wetland which is impacted. Approximately 23.1 acres of saltwater marsh and 9.7 acres of freshwater marsh are proposed for a total of 32.8 acres of wetland.

Restoration will occur by converting 23.7 acres of existing upland areas into wetlands, and improving existing wetland conditions on 9.1 acres. The proposed salt marsh will be one large tidal basin which will be a consolidated ecosystem adjacent to a tidal connection, rather than the fragmented system isolated from a tidal connection which exists today. Creation of freshwater marsh habitat will increase biodiversity and is expected to provide additional foraging areas for many species expected to use the salt marsh, in addition to providing habitat to freshwater marsh bird species.

Planning in coordination with the resource and regulatory agencies (U.S. Army Corps of Engineers and California Coastal Commission) has occurred, and will likely continue, in order to maximize compliance with State and Federal mitigation requirements, and to solicit agency input concerning the restoration plan.

ApE71

TABLE 1

WETLAND IMPACTS

OVERALL PROJECT IMPACTS TO WETLANDS (IN ACRES)					
HABITAT TYPE	**SALT MARSH**	**FRESHWATER MARSH WEST**	**FRESHWATER MARSH EAST**	**GOLF COURSE**	**TOTAL ACRES**
Tidal Channel	0.39	0.00	0.26	2.50	3.15
Seasonally Ponded Water	0.79	0.00	0.00	1.24	2.03
Alkaline Flat	2.72	0.00	0.62	3.67	7.01
Salt Marsh	2.87	0.00	1.43	10.51	14.81
TOTAL	**6.77**	**0.00**	**2.31**	**17.92**	**27.00**

Note: Acreages are relative to wetland criteria of the CDFG.

4.1 Wetland Functions and Values

This section provides quantification of how the proposed wetlands will change habitat values over existing wetlands.

According to the hydrogeomorphic classification, (Brinson, 1993) the wetland in question is tidal salt marsh. The guidebook for assessing wetland functions (Smith, et.al., 1995) lists a number of hydrogeomorphic functions for wetlands (including tidal fringe wetlands), and specific quantitative variables and combination models for each. These functions are grouped in four categories: Hydrologic, Biogeochemical, Plant Habitat, and Animal Habitat. A full HGM assessment requires that a group of Reference Wetlands be measured so that Site Potential may be measured against Reference Standards. Reference wetlands have not yet been identified for coastal saltmarshes within this region, and the scope of this project does not warrant the creation a reference wetland domain to facilitate this process. However, for the purposes of this analysis, the wetland on the Hellman Ranch can be qualitatively evaluated for each HGM function comparing the existing conditions to the expected conditions upon completion of the proposed restoration project (expected conditions would be similar with other regional habitats of similar hydrogeomorphic positions such as Bolsa Chica, Anaheim Bay, Upper Newpor Bay, etc.). Definitions for each

function were taken from *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices*, and the independent function variables were considered in assigning qualitative assessment ranks of high, medium, or low.

Hydrologic

Dynamic Surface Water Storage-Existing Conditions **Low**

The wetlands at the site provide only minimal temporary storage of nuisance flows and storm runoff within areas identified as seasonal ponds. Significant runoff from the site is detained in the adjacent Los Alamitos Retarding Basin which is included in the specific plan.

Dynamic Surface Water Storage-With Project **Low**

The restored wetlands at the site would also provide only minimal temporary storage of nuisance flows and storm runoff. Significant runoff from the golf course would be directed via drains, for detention, to the adjacent Los Alamitos Retarding Basin.

Long-Term Surface Water Storage-Existing Conditions **N/A**

No water is stored onsite for long periods of time; however, this is consistent with similar coastal wetlands.

Long-Term Surface Water Storage-With Project **N/A**

No water would be stored onsite for long periods of time; however, this is consistent with similar coastal wetlands.

ApE73

Energy Dissipation-Existing Conditions **N/A**

Currently the site receives only muted tidal flows and has no input from an associated riverine system; therefore, the site does not provide important energy dissipation functions.

Energy Dissipation-With Project **N/A**

Upon implementation of the project, the site would still receive muted tidal flows and will receive relatively low inflow from an associated riverine system; therefore, the site would not provide important energy dissipation functions.

Biogeochemical

Nutrient Cycling-Existing Conditions **Low**

The potential for natural cycling of carbon and nitrogen at the site is low. The lack of significant tidal influence prevents exchange of nutrients between the wetland habitats and the aquatic ecosystem. In addition, few animals are supported by the wetlands at the site and few are dependent upon these wetlands as either a breeding site or year-round site of residence.

Nutrient Cycling-Restored Saltmarsh **High**

Natural cycling of carbon and nitrogen would be greatly enhanced through restored tidal flushing which would provide a mechanism for nutrient-rich ocean waters to be carried to the site as well as for organics, which accumulate in the marsh to be carried out of the marsh into the aquatic environment. In addition, the enhanced habitat would provide for much higher usage by wildlife species which would, in turn, also increase nutrient cycling.

Removal of Elements and Compounds-Existing Conditions **Low**

Wetland vegetation often acts as a filter, removing nutrients, contaminants, and other compounds from the aquatic system which are subsequently buried, chemically altered, or incorporated into biomass and therefore rendered harmless. This function depends upon significant flooding by either freshwater or saltwater within the marsh. The muted tidal flows on the site restrict this function to the narrow tidal channel on the site with essentially none of the remaining wetland areas providing this function.

Removal of Elements and Compounds-Restored Saltmarsh **Medium**

Restoration of the saltmarsh including tidal flushing, with low residence times (approximately 1.7 days) will allow the vegetation to perform this natural wetland function in a manner comparable to coastal salt marshes in the region.

Retention of Particulates-Existing Conditions **Low**

Wetland vegetation often acts as a filter, removing particulates and sediments from the aquatic system which are subsequently incorporated into the marsh substrate, therefore improving water quality. This function depends upon significant flooding by either freshwater or saltwater within the marsh. The muted tidal flows on the site restrict this function to the narrow tidal channel on the site with essentially none of the remaining wetland areas providing this function.

Retention of Particulates-Restored Saltmarsh **Medium-High**

Restoration of the saltmarsh including tidal flushing with low residence times (approximately 1.7 days), will allow the vegetation to perform this natural wetland function in a manner comparable to coastal salt marshes in the region.

MpE75

Organic Carbon Export-Existing Conditions **Low**

Saltmarshes are a net exporter of carbon. Areas dominated by succulents produce approximately 40 grams of Carbon per square meter per year (g $C/m^2/yr$) and areas of mixed cordgrass and succulents export approximately 110 g $C/m^2/yr$. Deeper areas, within the marsh, which support epibenthic algae export between 185 and 340 g $C/m^2/yr$. Essentially all of the export of carbon is dependant upon transport by water which transports both dissolved and particulate carbon. The lack of tidal influence on the site largely prevents the export of carbon from the site. Additionally, areas such as the alkali flats and alkali meadow, even if subject to tidal flushing would produce less carbon for export due to the lower productivity. A quantitative analysis of carbon export by the 27 acres of wetlands at the Hellman Ranch has not been conducted; however; only the tidal channel (approximately 2.0 to 3.0 acres) receives regular tidal flushing with another approximately 2.0 acres receiving some tidal influence. The remaining 22.0 to 23.0 acres are not expected to provide any appreciable amount of carbon for export.

Organic Carbon Export-Restored Saltmarsh **High**

The restored saltmarsh will have deepwater areas which support epibenthic algae, areas of cordgrass, and a predominance of succulent vegetation (pickleweed) in conjunction with regular tidal flushing and would be expected to export carbon at the rate typical of healthy salt marsh habitats characteristic of the region.

Plant Habitat

Maintain Characteristic Plant Communities-Existing Conditions **Low**

The wetlands on the site have been characterized as degraded to severely degraded. The lack of tidal influence for the majority of the wetlands has resulted in a conversion from pickleweed marsh to areas of saltgrass (*Distichlis spicata*), alkali weed (*Cressa truxillensis*), five-hooked bassia (*Bassia hyssopifolia*), and other non-native upland grasses.

Maintain Characteristic Plant Communities-Restored Saltmarsh **High**

The restored wetlands, with restored tidal flushing will incorporate all of the vegetation zones typically associated with southern California salt marshes including areas of cordgrass, pickleweed, as well as upper marsh vegetation.

Maintain Characteristic Detrital Biomass-Existing Conditions **Medium**

The detrital biomass maintained by the existing wetlands is consistent with alkali flats and meadows in the area; however, wetlands of this type do not maintain as high a detrital biomass as areas with lower salt marsh marsh vegetation. Also, because of the lack of tidal flushing over most of the alkali meadow and alkali flats, the accumulated biomass is not available for export to the aquatic system.

Maintain Characteristic Detrital Biomass-Restored Saltmarsh **High**

The detrital biomass maintained by the restored wetlands is expected to be consistent with other tidally-influenced coastal wetlands.

4.2 Biological Constraints

Potential constraints to restoration are posed by water quality in the San Gabriel River. This section discusses those constraints.

Biological Conditions in the San Gabriel River

A productive brackish water marsh community exists along the reach of the San Gabriel River upstream of the Hellman Ranch property, near the I-405 bridge. The brackish water marsh consists primarily of cattails and rush. Blue herons, black-crowned night herons, snowy egrets, great egrets, various dabbling ducks, pelicans, and terns have been observed along the marsh banks, in the marsh or foraging in the river (R. Ware, pers. observ.). Water quality conditions in the San Gabriel River are apparently adequate to support these marsh habitats and higher-trophic level predators, which suggest that invertebrate and fish prey are also abundant enough to provide a food base for these birds.

AP E77

Water Quality

Water temperature is typically elevated year around in the river as a result of thermal discharges from the Haynes Alamitos and Scattergood Generating Stations. Seasonal fluctuations in water temperatures, dissolved oxygen, and pH occur along the reaches of the San Gabriel River (MBC, 1995) and also vary with depth. The fluctuations in water quality are influenced by the volume of thermal discharge into the River, tidal influence from San Pedro Bay, low-flow conditions in the River, and periodic high-flow runoff in the River which drains the Los Angeles County watershed.

Generally, water temperatures are lower in the nearshore waters and increase to maximum temperatures in the vicinity of the Generating Stations. Conversely, dissolved oxygen levels are above 6 milligrams per liter (mg/l) at offshore stations during most of the year, but frequently fall under lower than 5 mg/l, which are below the threshold levels needed to sustain aquatic life. Regional Board data for the River sampling station at the Pacific Coast Highway (PCH) sampling station between September 1965 and May 1979 indicated the mean temperature was 75.9 degrees F, and ranged between 48.8 to 88.8 degrees Fahrenheit (F). Seasonal fluctuations occur, but water temperatures above the mean temperature of 75.9 degrees F occur frequently, irrespective of season. Thermal maxima, dissolved oxygen minima, (<5 mg/l), and lower pH (<7.5) occur most frequently between June and September.

The impacts on aquatic and marine life during these periods will include increased physiological stresses that could reduce species diversity and abundances of both water column (i.e, fish and plankton) and benthic species (animals that live on or in the channel bottoms). These conditions however, are not unlike natural conditions which occur in higher reaches of southern California bays and estuaries, such as Upper Newport Bay, Inner Bolsa Bay, and the Tijuana Estuary. During these periods, flora and fauna which are better adapted to these conditions will capitalize on the inability of others to tolerate the poorer environmental conditions, and will temporarily become the dominant forms until seasonal extremes in water quality conditions pass. The only difference is that because the temperatures in the San Gabriel River are elevated for a longer period during the year, the biological communities of water column and benthic species may be suppressed to a greater degree than areas which are not subjected to constant thermal stress.

The Hellman Ranch lies within the Lower Reaches of the San Gabriel River within the tidal prism (Hydro Unit 405.15, State Water Resources Control Board, 1990). In 1990, this section of the River was listed by the State Water Resources Control Board as having "Impaired" water quality due to elevated levels of contaminants in fish tissues.

Non-tidal portions of the Lower San Gabriel River (Hydro Unit 405.15) and Upper San Gabriel River (Hydro Unit 405.4) were listed as "Intermediate Quality" bodies of water that generally support beneficial uses with an occasional degradation of water quality. Potential threats include elevated contaminants in fish tissues and drinking water impairment. resulting from both point source and non-point sources.

To put these terms, "impaired and intermediate" water quality in perspective, other "impaired" estuarine and coastal water quality bodies in the vicinity include the Ballona Wetlands, Colorado Lagoon (Alamitos Bay), Upper Newport Bay and Mugu Lagoon (two of the most productive marshes in California), Long Beach Inner Harbor, Los Angeles Harbor, Marina del Rey, San Monica Bay, San Pedro Bay (to which the San Gabriel River flows), Aliso Creek, San Juan Creek, Tijuana River, Tijuana Estuary, Agua Hedionda Lagoon, Batiguitos Lagoon, Famosa Slough, San Elijo Lagoon, Mission Bay, San Diego Bay, and the coastline of San Diego County (State Regional Water Quality Control Board, 1990).

Potential Impacts of San Gabriel River Water Quality on the Proposed Hellman Wetlands

Invertebrates, Fish, and Shorebirds. Water quality conditions will likely mirror seasonal changes that occur in the San Gabriel River and because tidal flow is present, there will be a constant inflow of waters to the wetland, typical of the range of tides to muted tidal systems such as Inner Bolsa Bay. Water quality in the Hellman wetlands is expected to remain favorable to the growth and establishment of wetland plants, various invertebrates, fish, and birds throughout the year. However, periodic degradation in water quality, particularly elevated temperatures and low dissolved oxygen levels may occur when these conditions persist in the San Gabriel River. The estimated residence time of the system will be less than 7 days which is considered adequate to flush and maintain the system and to maintain a balanced ecosystem. It should be noted however, than chronic, long-term degradation of water quality would result in less biological value of the wetland in both a local and a regional perspective.

ApE79

A year-around thermally stressed system would result in a lower diversity of invertebrates and fish. The communities would consist of fewer species but perhaps large numbers of opportunistic species. Worms (polychaetes and oligochaetes), clams, and insect larvae would be present year around and would provide a food base for resident fishes, (i.e, gobies), transient fishes (i.e, topsmelt and halibut), overwintering and resident species of shorebirds, waterfowl, and marsh birds.

Wetland plants-*Algae.* Prolonged high temperatures would result in a greater abundance of opportunistic plants, such as the benthic algaes *Enteromorpha* and *Ulva* which commonly occur on mudflats of bays, coastal lagoons, and estuaries of southern California. While these algaes commonly occur year around in southern California, high temperatures, plus the addition of nutrients and limited water circulation will stimulate algal growth and could result in a eutrophic (overproductive) shallow water body. The worse-case, short-term event would be a die off of benthic organsims and fishes in the wetland channels when stagnation occurs, due to high temperatures and low concentrations of dissolved oxygen. This would trigger further decay and stagnation if the waters could not be circulated out of the system.

Vascular marsh flora. A number of parameters affect the makeup of coastal salt marsh plant community and productivity. Tidal inundation, elevation, soil salinity, soil types, nutrients, and toxic compounds are all key factors. Water temperature and dissolved oxygen are not limiting factors, as these vascular plants are not submergent vegetation and they obtain their oxygen through their leaves and shoots, and transport it into their root system.

The Hellman marsh community will undergo a long-term and dynamic evolution in terms of the types of plants which will be present, relative coverage, and distribution based upon their adaptation to the factors listed above. Plant distributions may vary over time, because some species (such as pickleweed) are more tolerant of drought conditions and higher soil salinities than others (such as cordgrass). Periodic floods will stimulate salt marshes through increased seed production of pickleweed and cordgrass. However, longer periods of inundation and retention of fresh water will promote the establishment of brackish marsh species such as Typha and cattails which decreases the habitat value and the function of the coastal wetland.

Nutrients (i.e, nitrogen and phosphate) will should not be limiting. Overstimulation of the wetlands through poor golf course management would however ovestimulation the system and

could result in eutrophic conditions. Based upon the proposed golf course fertilization and management plans, this potential problem should not occur.

Ap E 81

5.0 SALTWATER MARSH RESTORATION PLAN

The restoration plan for the saltwater marsh consists of site grading, hydraulics, and planting. Each component of the plan is presented in this section. Specific habitat goals for saltwater marsh restoration are discussed below.

5.1 Habitat Goals

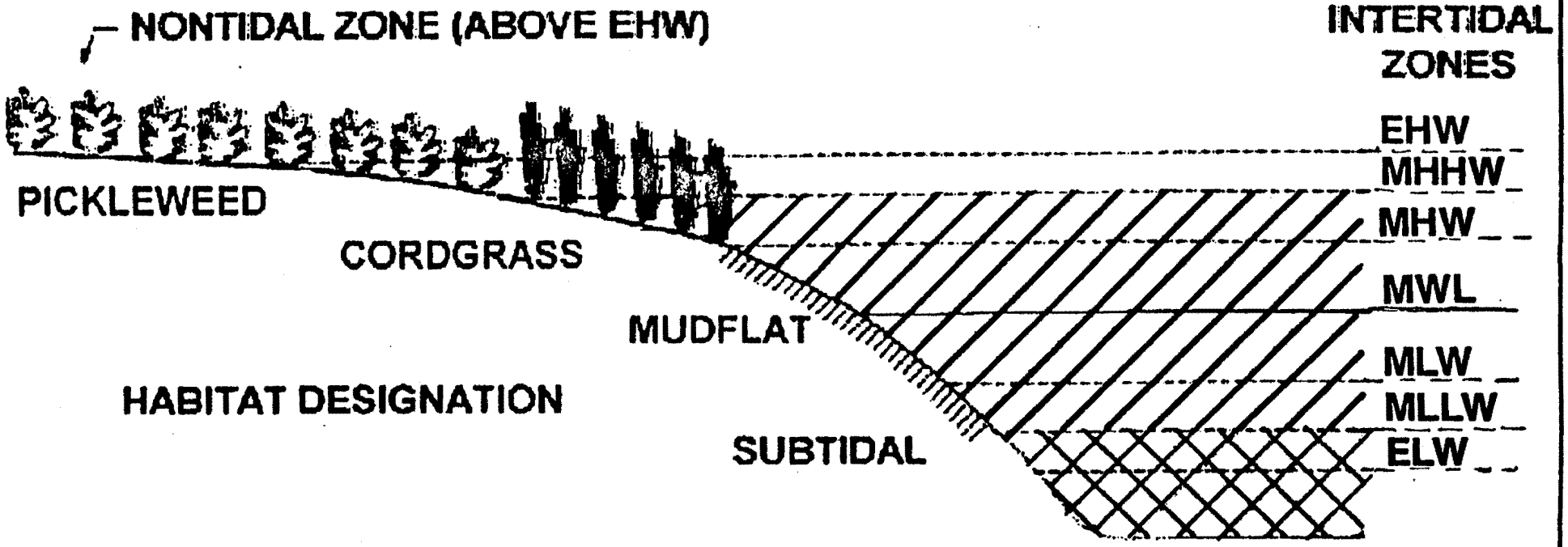
The goal of the saltwater marsh restoration plan is to create 17.7 acres of self-sustaining habitat to mitigate for project impacts and improve overall wetland quality. Review of wetland restoration/creation implemented at other sites (Anaheim Bay Mitigation site, Bolsa Chica and Batiquitos Lagoon) and studies conducted by other researchers indicates that a series of salt marsh habitat bands are appropriate for the Hellman Site (MacDonald, 1977 and Zedler, 1984B).

The vegetation zones of the saltwater marsh are described relative to tidal zones. These tidal zones are associated with the mixed tides of Southern California as presented in Table 2. The specific acreage of each vegetation type and the appropriate elevation ranges are provided in the Table.

Figure 3 shows a cross-section of habitats in a conceptual salt marsh.

Other goals to be met in restoration of the saltwater marsh include those listed below:

- Create shallow open water fishery habitat and seabird foraging habitat;
- Restore shorebird foraging habitat on the mudflats;
- Restore salt marsh vegetation that will serve as foraging and nesting habitat for the endangered Belding's savannah sparrow and light-footed clapper rail;
- Restore functioning habitat that will support plant and animal species found in these natural communities, as defined by plant diversity, composition, productivity, structure, and wildlife use;



NO SCALE

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

CONCEPTUAL SALT MARSH CROSS - SECTION

DATE 10-11-96

FIG. 3

App E83

- Establish species of salt marsh plants with low maintenance requirements;
- Beach area wetlands;
- Establish vegetation that will be self-sustaining over the long-term, and
- Implement a monitoring and maintenance program.

On a day to day basis, the existing salt marsh experiences very little use by birds and fish. It is assumed that this is due to a lack of resources attributable to the severely degraded condition of the marsh caused by a lack of tidal flushing

In contrast, the proposed project will restore regular tidal flushing to the marsh, resulting in tidal conditions associated with habitat exhibiting increased functions and values. Tidal flushing will improve water quality to the level required for fish and will result in improved sediment conditions to better support invertebrates, a major component of the food web. This increase in resources, that is, an expansion of the food web, will most likely result in an increase of migrant use of the site. It is also anticipated that the number of resident birds breeding and/or foraging at the site will also increase.

5.2 Grading

The proposed saltwater marsh will be located within the northwestern portion of the Hellman property, adjacent to the 200-foot-wide open channel that supplies cooling water to the Haynes Generating Station. The project site slopes generally from northeast to southwest and is relatively flat and low lying with elevations ranging from +11.5 feet MSL on the fill areas to +1.0 foot MSL in the tidal channel.

Proposed grading has been designed to provide elevations that correspond to the required "bands" of salt marsh habitat. Habitat will be established at the specific elevation ranges that correspond to the tidal regime controlled by the renovated culvert. The wetland will be located along the edge of the property. The golf course will be situated between the wetland and the residential area to isolate the wetland from most human activity, including the intrusion of pets, noise, light, urban runoff and other development-related potential impacts.

TABLE 2

PROPOSED SALT MARSH TIDAL ZONES

Utilization and Proposed Area Total Acreage: 23.1	
Type: Fish and seabirds Acres: 4.1	1. Shallow Subtidal Zone (Basins and Channels) The lowest zone is the shallow subtidal zone, defined as the area below extreme low water (ELW), as determined by the lowest spring tide. This corresponds to between -4.0' and to +0.1' relative to mean sea level (MSL) in this marsh. This area is never exposed to the air, and is technically considered a deepwater habitat by CDFG and USFWS.
Type: Fish and invertebrates Acres: Area included within subtidal zone above	2. Occasionally Exposed-Subtidal Zone The zone is occasionally exposed subtidal zone, defined as the area between ELW and mean lower low water (MLLW). This area remains inundated at low tides, all of it is entirely exposed during extreme low tides. This area lies between +0.1' and +0.3' MSL in this marsh.
Type: Birds and invertebrates Acres: 3.2	3. Lower Intertidal Zone (Mudflat) The next zone is the lower intertidal zone, ranging from MLLW to mean high water (MHW) which corresponds to +0.3' and +1.3' MSL in this marsh. This area is regularly exposed to the air, from one to two times a day. The plant growth conditions imposed by regular, alternate inundation and drying preclude the growth of most vascular plants, resulting in a mudflat, or mud bank in the case of the steeper grades.
Type: Shorebirds Acres: 4.7	4. Upper Intertidal Zone (Low Marsh) The next highest zone is the upper intertidal (low marsh), ranging from MHW (+1.3' MSL) to mean higher high water (MHHW) which is +1.9' MSL in this marsh. This zone is inundated once per day on average, and supports only those vascular plants (cordgrass and pickleweed) which are adapted to this frequent saturation with saline water. This zone is very important to this marsh as it provides habitat for the Belding's savannah sparrow.
Type: Birds and Rodents Acres: 5.7	5. Super Tidal Zone (High Marsh) The uppermost marsh zone is the super tidal (high marsh) defined as the zone above MHHW (+1.9' to +4.5' MSL) in this marsh. This zone is inundated only by the higher tides, occurring less often than once per day, and is characterized by the plants which are adapted to the saline conditions resulting from the subsurface saline water table and occasional inundation of surface soils, followed by long periods of dryness. The deep rooted plants utilize the moisture in the deeper soils, while the shallow rooted plants retain moisture within the plant tissues. This zone is very important to this marsh as it also provides habitat for the Belding's savannah sparrow.

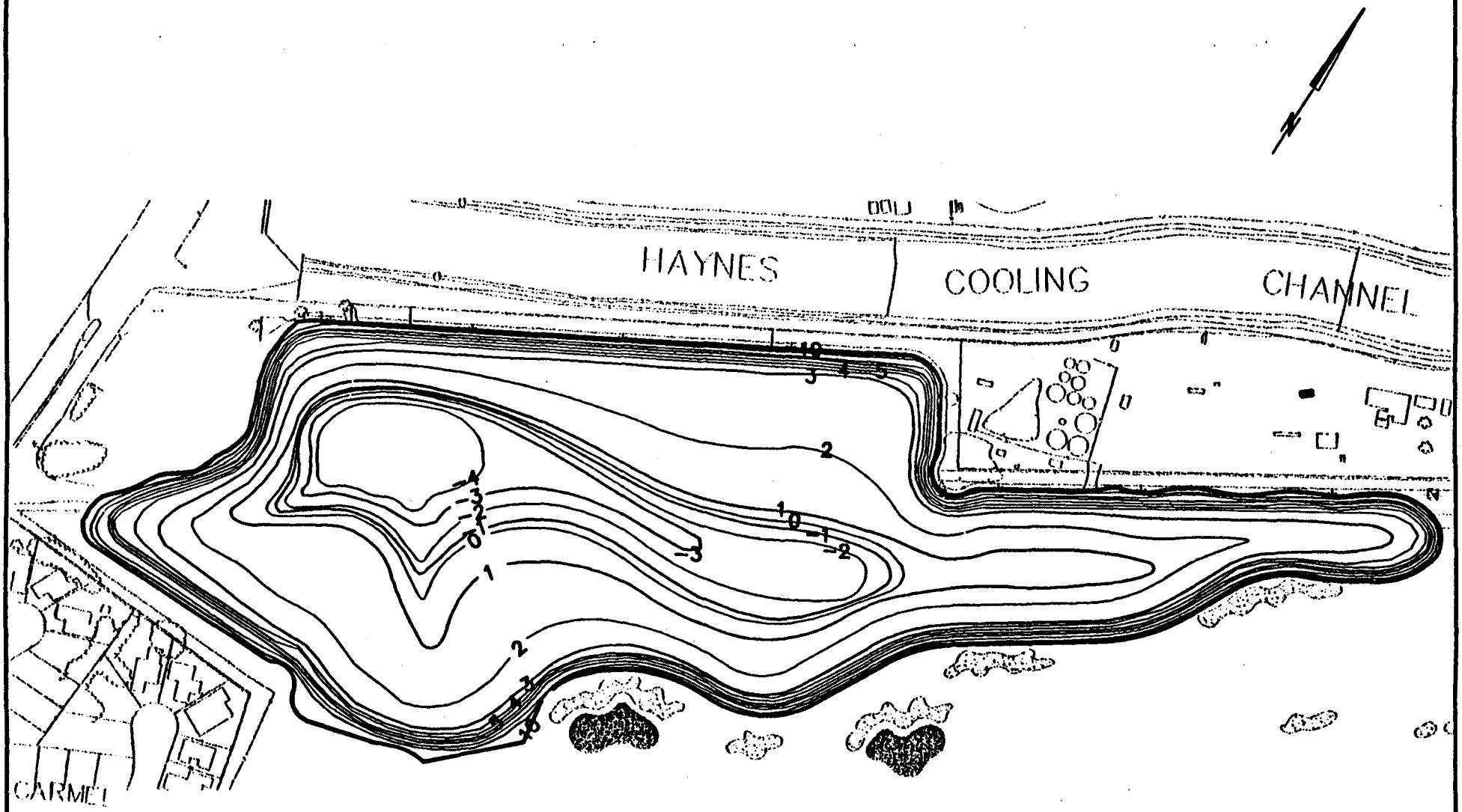
Np E85

TABLE 2
(Continued)

Type: Birds and Rodents Acres: 5.4	6. Transition Areas Transition and buffer areas lie above the influence of tides (+4.5' MSL) and provide a zone of foraging for birds and rodents. This zone is very significant in that it provides a band of separation between sensitive salt marsh species and human activities. This zone shields the marsh from disturbance while providing valuable habitat for marsh birds.

The planform of the salt marsh was configured with a minimum of restrictions to facilitate the most efficient tidal exchange. Basin geometry and slopes were designed to provide the appropriate area of each habitat type resulting in a balanced ecosystem. Slopes within the basin were designed to maximize soil stability. Excavated material, which is largely accumulated silt and artificial fill, will be reused on other portions of the Specific Plan Area. No soil export is expected to occur.

All elevations discussed below are referenced to MSL. The proposed grading plan is shown in Figure 4. The saltwater marsh will consist of a single tidal basin. The basin has an elongated plan form of irregular outline based on the property lines and golf course development. Elevations within the basin range from -4.0 to +10.0 feet MSL. A deep channel area is proposed nearest the golf course to provide fish habitat and minimize golf course impacts to wetland birds, which rest and forage in the shallower intertidal areas. The area most suitable for birds is proposed for the shore of the wetland opposite from the golf course, where pickleweed habitat for the Belding's savannah sparrow will be established. A shallow mudflat and low marsh area is also proposed on the west side of the marsh. Not shown on the plan is the shallow channel connecting the culvert mouth to the –4 foot contour in the marsh. The channel cut is simply to provide hydraulic conveyance between the proposed –1 foot and –4 foot contours. The preliminary design plan will show the channel. Representative cross-sections of the wetland are shown in Figure 5. The proposed series of habitat bands within the saltwater marsh are discussed below.



NOTE: ELEVATIONS RELATIVE TO MEAN SEA LEVEL

GRAPHIC SCALE

250 0 250 500

1"=250'

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH GRADING PLAN

DATE 9-06-96

FIG. 4

L:\3693\QLRANCH1.DWG

5.2.1 Subtidal Areas

Subtidal areas are proposed within the central portion of the marsh. Elevations range between 0.0 and -4.0 feet MSL. The lowest elevations exist near the mouth of the existing culvert. This area will provide subtidal habitat for fish.

5.2.2 Tidal Channels

The shape of the basin bottom is contoured to provide several sinuous tidal channels reaching into all portions of the wetland. Tidal channels exist between the elevations of +0.3 to -4.0 feet MSL. Channels are relatively steep-sided with a bank slope of approximately 1 vertical to 5 horizontal (1:5). Tidal channels also provide habitat for fish.

5.2.3 Mudflats

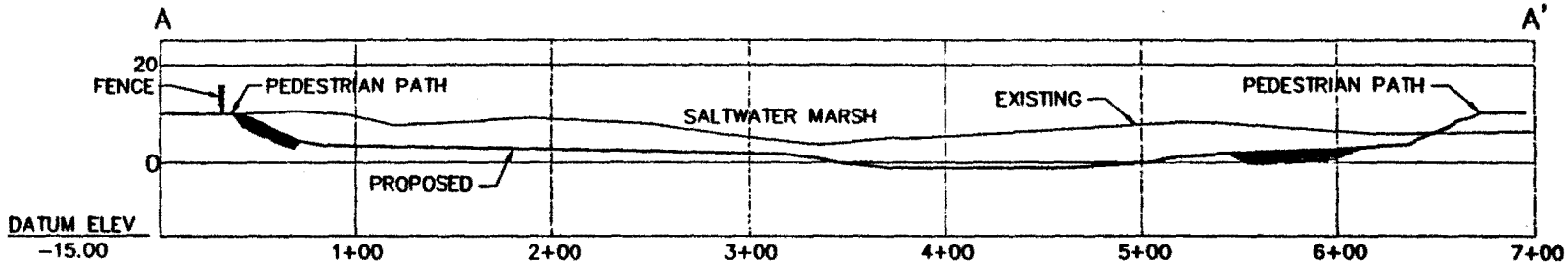
Mudflat areas will exist above the tidal channels between elevation ranges of +0.3 to +1.3 feet MSL. Mudflats are flatter in slope than channels. They are usually exposed at low tide and inundated at high tide. The mudflat slopes are approximately 1:7. They provide habitat for invertebrates and feeding shorebirds.

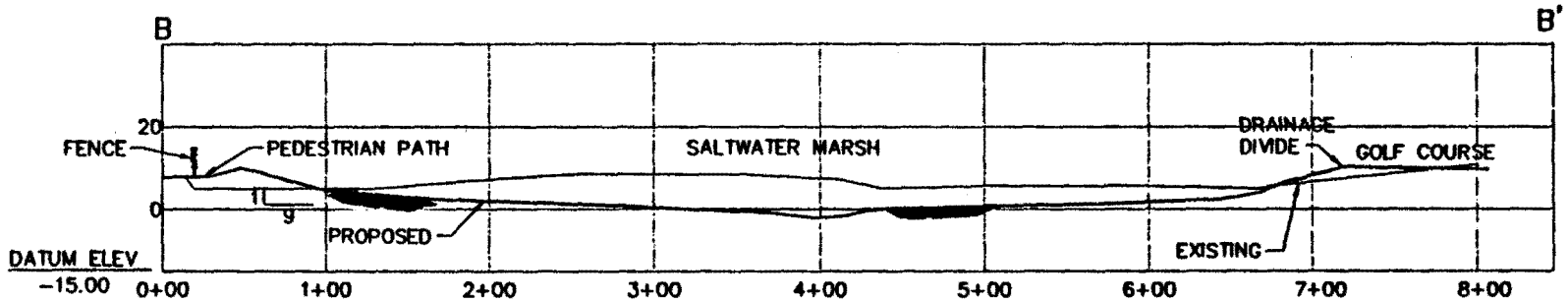
5.2.4 Low Marsh

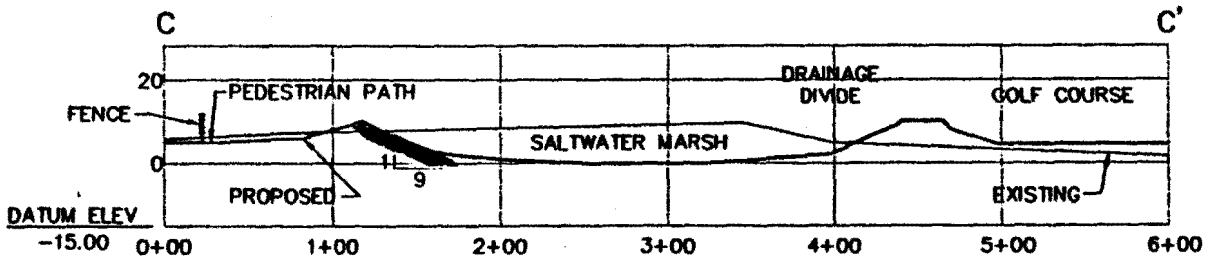
Low marsh lies above the mudflat, between +1.3 and +1.9 feet MSL and is utilized for establishment of pickleweed which is the habitat for the Belding's savannah sparrow. The grading plan maximizes this area within the wetland. Slopes of low marsh areas are relatively flat, at approximately 1:50.

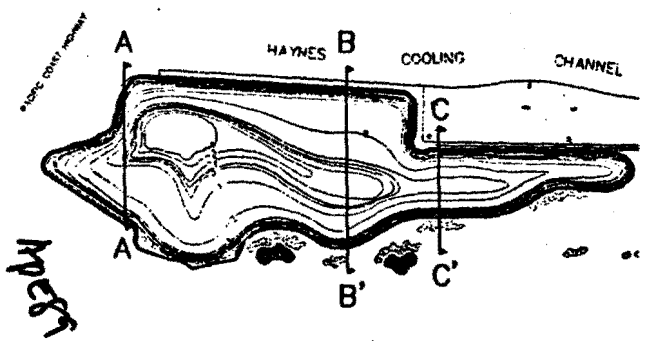
5.2.5 High Marsh

High marsh areas lie along the highest margins of the wetland. Their elevations range from +1.9 to +4.5 feet MSL. The slope of the high marsh is approximately 1:15. This area is infrequently inundated by the tide, yet receives tidal influence in the soil. High marsh provides transitional and buffer habitat for sensitive salt marsh bird species.









HORIZONTAL SCALE 1"=75'

VERTICAL SCALE 1"=30'

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH GRADING CROSS-SECTIONS

DATE 11-01-96

FIG. 5

5.2.6 Transitional and Buffer Areas

All areas between +4.5 and +10.0 feet MSL are buffer areas and do not receive direct tidal influence. The buffer provides transition between the wetland and upland areas and serves as a protective band surrounding the more sensitive wetland habitat areas. The total width of the buffer ranges from between 35 and 50 feet. The lower-lying portion of the buffer (between +4.5 and +9.0 feet MSL) serves to discourage access by predators and humans, while the top one foot of the buffer (from +9.0 to +10.0 feet MSL) provides drainage buffering from the golf course rough. The lower buffer is 20 to 35 feet wide and the drainage buffer is 15 feet wide. A berm lies at +10.0 feet MSL around the wetland to separate the golf course drainage from the wetland. Slopes within the transitional/buffer areas are approximately 1:18. Buffering is discussed in more detail in Section 5.4.

5.3 Hydraulics

Tidal hydraulic studies were performed to design appropriate tidal elevations and regular flushing to maintain quality habitat. Numerical modeling of hydraulics was performed to determine the concept design for connecting the proposed wetland to a tidal source.

Under present conditions most of the surface runoff across the site is concentrated in a rough earthen ditch which passes through a culvert under a western private access road to the westerly property corner. At this point a second culvert, 48 inches in diameter by 510 feet long, leads around the south end of the Haynes Cooling Channel and into the adjacent San Gabriel River channel. Tidal flows pass through the culvert and through the ditch to the site, providing existing habitat with severely muted tidal conditions. Existing tidal flows are greatly restricted by the partial opening provided by the nearly closed tide gate at the San Gabriel River.

5.3.1 Existing Conditions

Existing tidal flows enter the site through the 4-foot diameter culvert at the San Gabriel River. The culvert is nearly half-filled with sediment causing it to be substantially constricted. The culvert connects to a narrow tidal channel extending across the site. The channel is 10 to 15 feet wide. The bed elevation averages 0.5 feet above MSL, and the top is at 5 feet above MSL.

Figure 2 shows a plan view of the existing channel, while Figures 6 and 7 show photographs of the existing condition and channel dimensions.

Three road crossings existing along the channel. From downstream to upstream, the first is the main access road from First Street in Seal Beach. A culvert conveys flows under the crossing. A second crossing exists farther upstream on the channel near the existing oil facility trailer. A small bridge crosses the channel at this point. The third crossing is the main access road from Seal Beach Boulevard. The culvert under the crossing is blocked and no tidal flows enter this portion of the channel.

Tidal Elevations

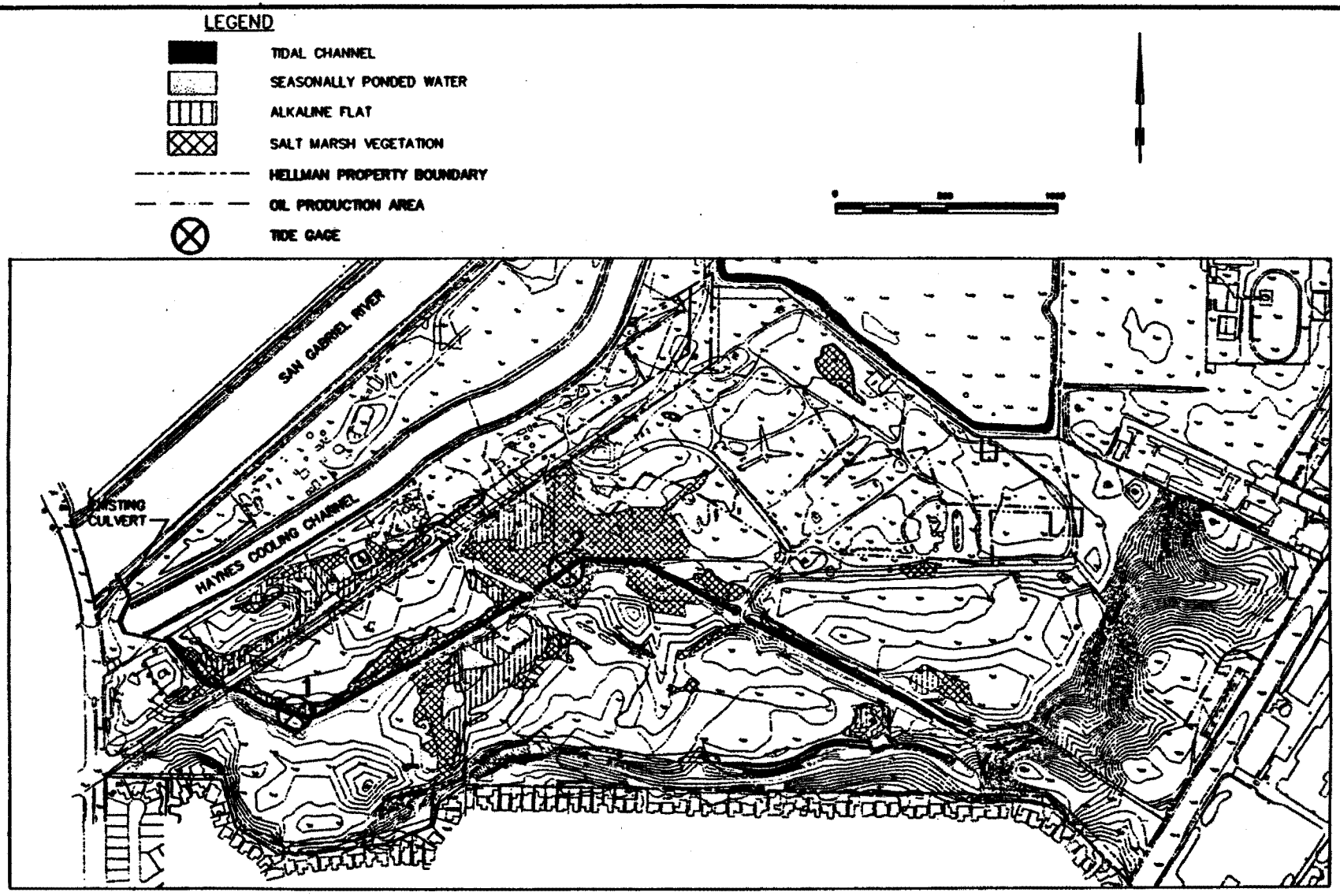
Tides were measured using automatic tide gages from November 3rd to 10th, 1997. Manual tide measurements were also made on November 4th to verify the gage readings. The locations of the gages is shown in Figure 8. Results of the tidal readings are shown in Figure 9, which shows the tide in the ocean, and at both gage locations in the tidal channel. The tides in the existing tidal channel are severely muted from that of the ocean. The high tides are muted by about 0.5 feet from that of the ocean, and the low tides in the marsh were muted to be about 1.5 to 1.0 feet above MSL.

High tides are muted by the culvert conveyance capacity. Tidal muting of the low tide is caused by the relatively high elevations of existing culvert inverts and the channel bed. The culvert at the San Gabriel River extends down to –1 foot MSL, while the bed elevation in the marsh is at +0.5 MSL. The channel is able to fill with seawater, but is unable to completely drain.

Phase Lags

Phase lags, or time delays between high and low tide in the San Gabriel River and the existing marsh occur. Figure 9 shows the tides in the marsh relative to those in the River. The high tide phase lag is approximately 1 hour, while the low tide phase lag is approximately 4 to 5 hours. Phase lags are caused by culvert and channel constrictions.

pp E91



MOFFATT & NICHOL ENGINEERS

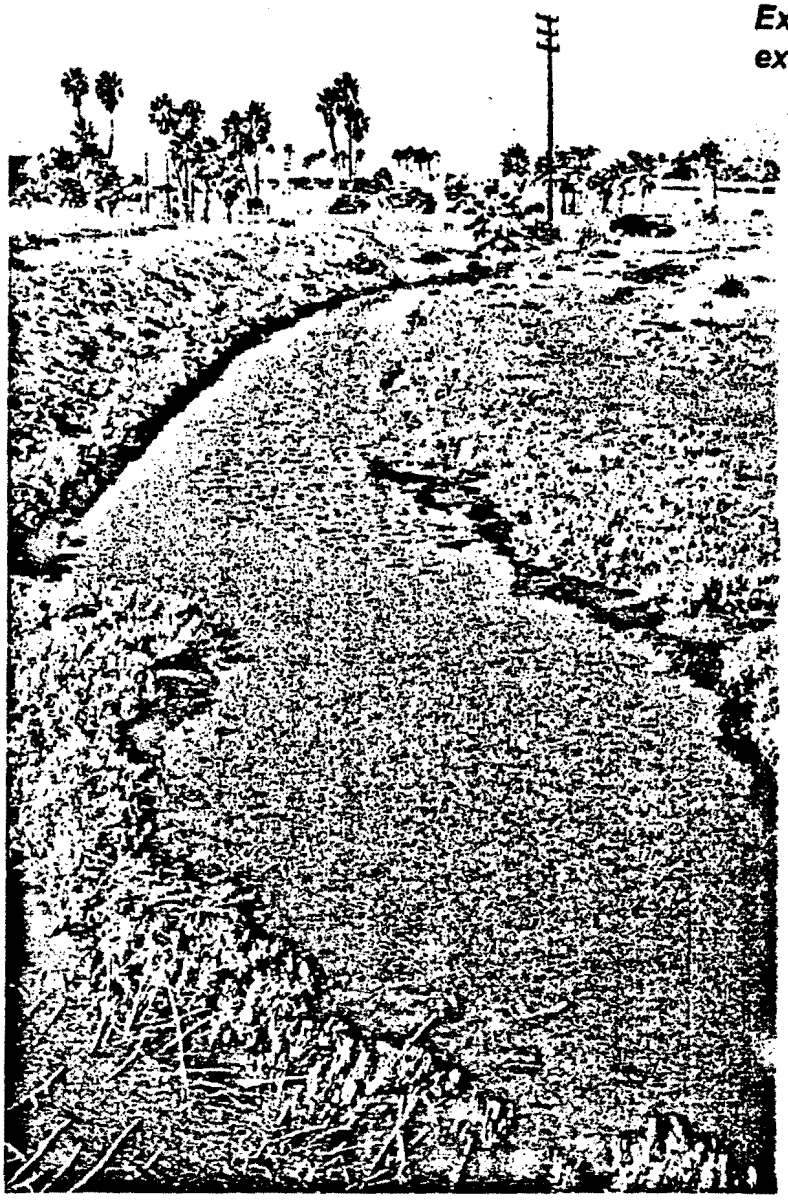
HELLMAN RANCH WETLAND PLAN

LOCATIONS OF TIDE GAGES

DATE 11-11-97

FIG. 8

Existing tidal channel extending from culvert



Existing channel upstream from crossing under main access road from First Street

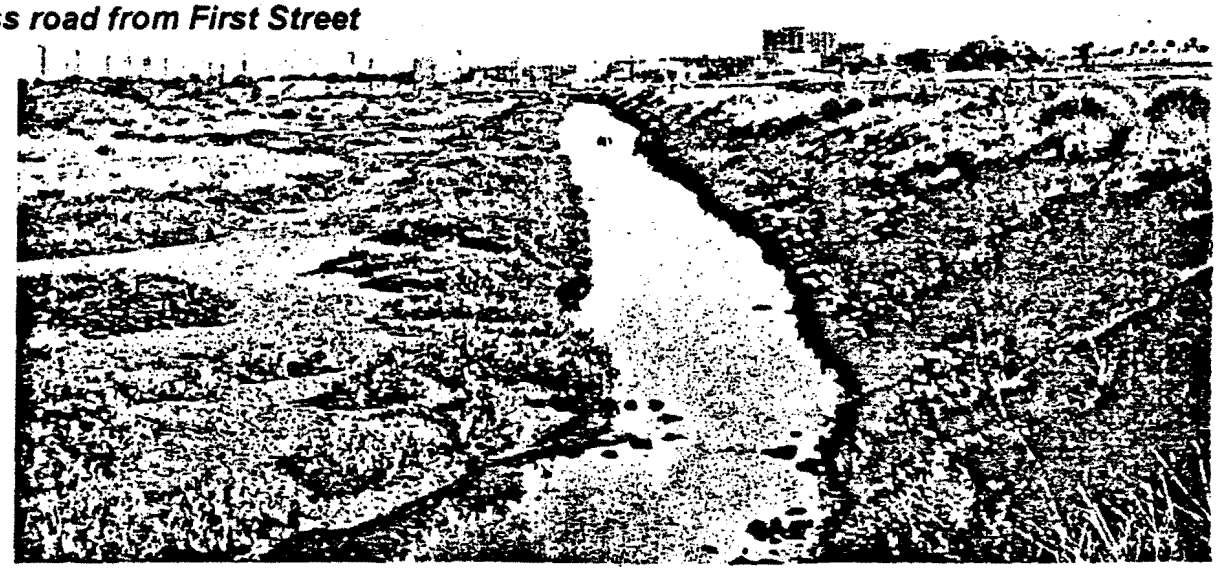
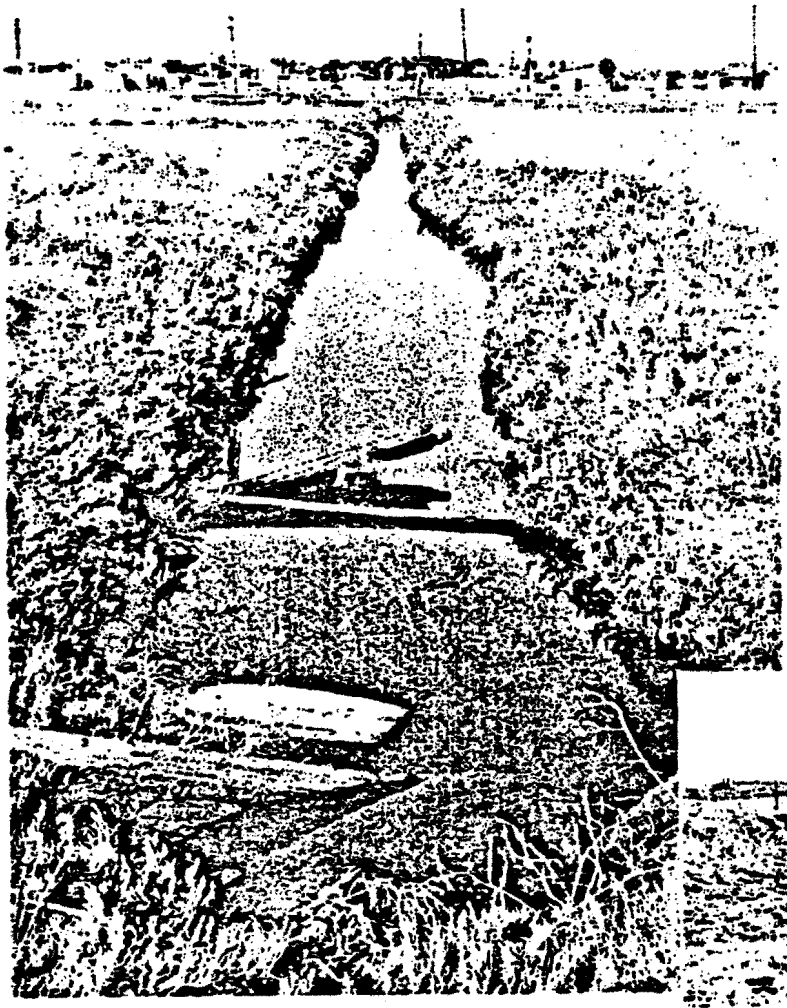


Figure 6 - Photographs of Lower Tidal Channel

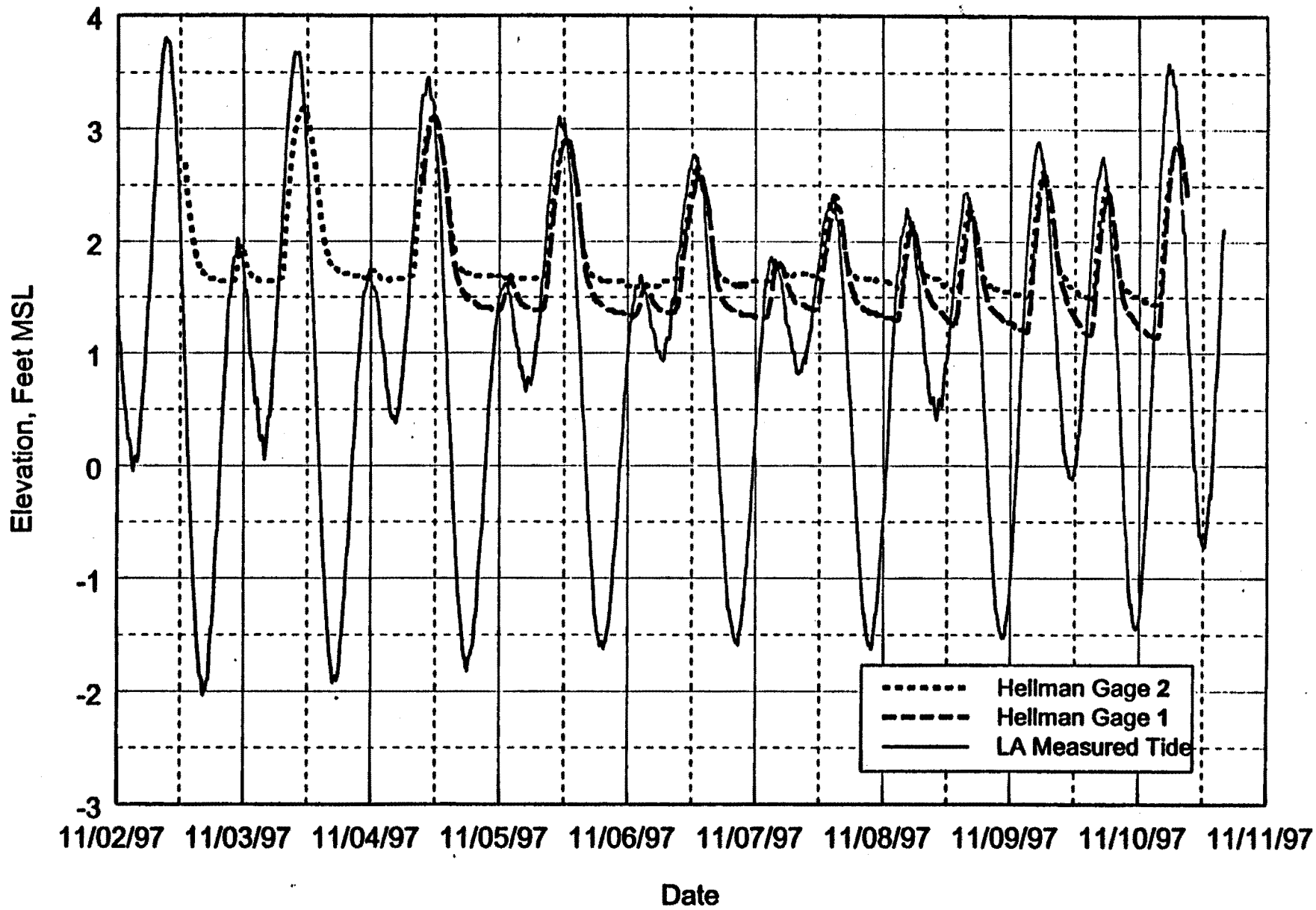
Ap E93

Existing tidal channel upstream from second road crossing near trailer



Existing tidal channel upstream of road crossing farthest from culvert. Culvert is blocked

Figure 7
Photographs of Upper Tidal Channel



MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

EXISTING HELLMAN WETLAND WATER ELEVATION

DATE 11-11-97

FIG. 9

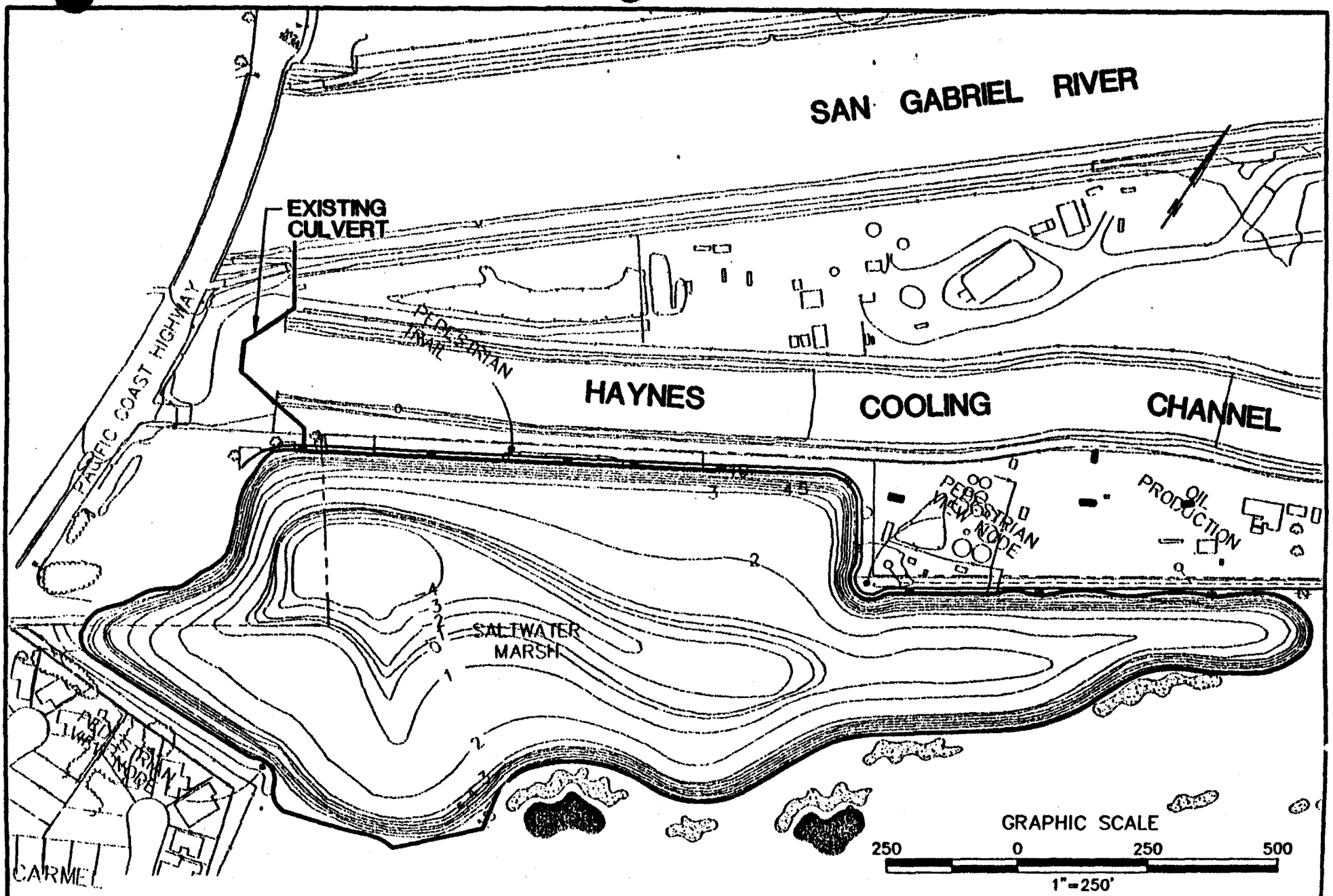
L:\3983Y2.DWG

Residence Times

Residence times of tides are defined as the time taken for a water molecule to move from the most distant reach of the wetland back to the seawater source, in this case the San Gabriel River. Residence times are an indication of tidal flushing frequency. Tidal flushing frequency is an indirect measure of water quality. Shorter residence times can suggest relatively better water quality while longer residence times suggest relatively poorer water quality. Residence times within seven days are considered excellent. The residence time of the existing marsh between the culvert at the San Gabriel River and the second upstream road crossing is 4 days. Residence times upstream of the second road crossing cannot be calculated due to the poor conveyance by the blocked culvert.

5.3.2 Proposed Hydraulic Connection

The current proposal is to supply tidal water to the new wetland through the existing culvert. Figure 10 shows the proposed wetland hydraulic connection. The culvert's seaward end is a concrete outlet structure built into the sloping side wall of the San Gabriel River channel. The existing flapgate at the seaward end of the culvert would be removed. The culvert is about one mile upstream from the ocean. The river receives discharges of heated cooling water from the two power plants upstream, and on outgoing tides the river water is appreciably warmer (+4 degrees Fahrenheit) than the ambient ocean (MBC, 1995). At certain tidal states the water flowing from the river into the wetland may also be warm, but this should not adversely affect the ecosystem if temperature ranges remain within approximately 5 degrees Fahrenheit on average over the year (WRA, Personal Communication, 1996). Temperatures in the river will be highest in summer and coolest in winter, which is normal to natural salt marsh habitat. Temperature readings are presently being taken near the mouth of the culvert twice a week. The readings are being taken to verify previous data and to characterize temporal changes in temperature in more detail. Temperature readings show the San Gabriel River water to be warmer than the open ocean by 5.8 degrees Fahrenheit on average in the summer. Temperatures in the River are 1.7 degrees over those in Inner Bolsa Bay on average in the summer.



MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH HYDRAULIC CONNECTION

DATE 10-16-96

FIG. 10

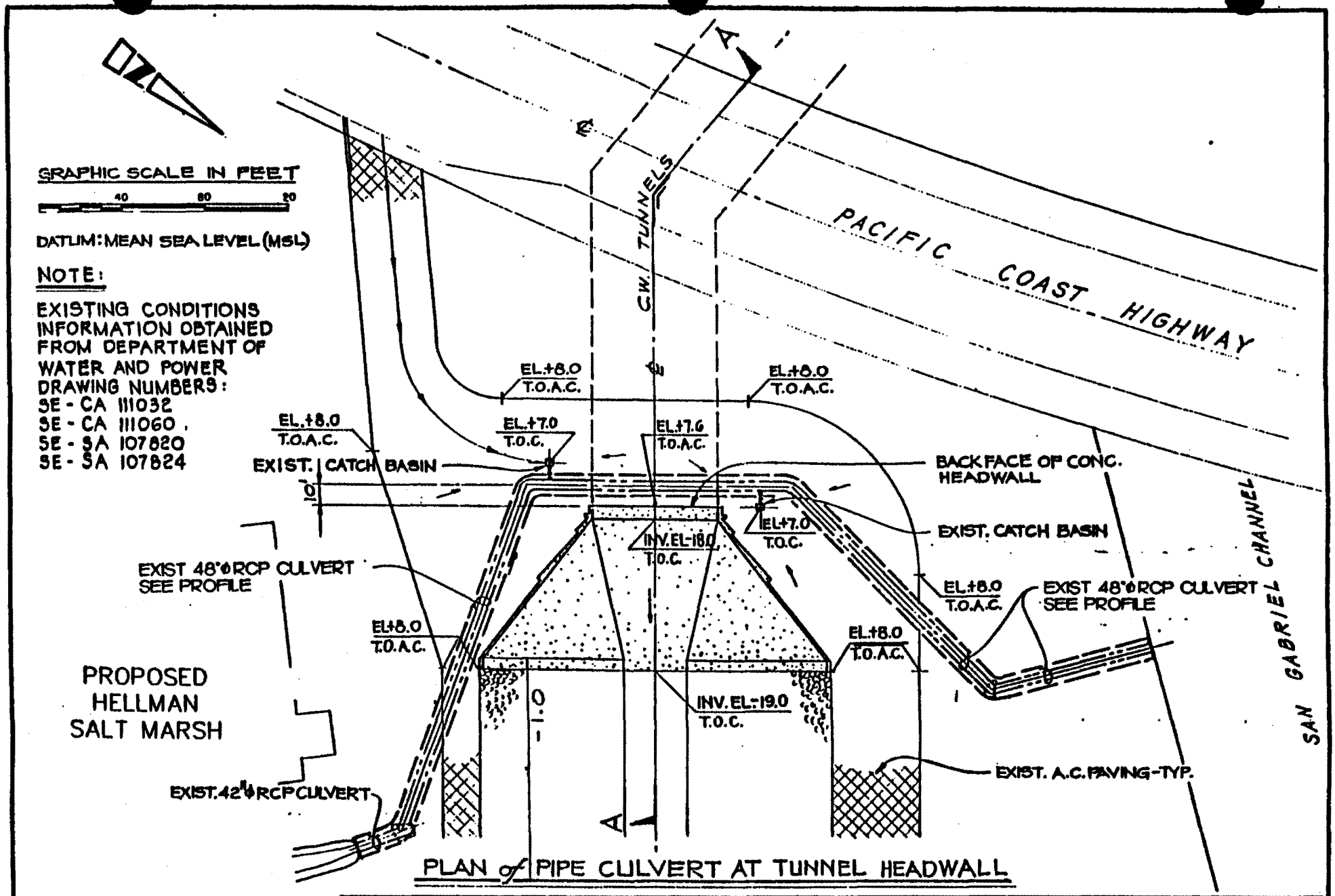
L:\3653\GLFIG8.DWG

The culvert is 510 feet long and has three short-radius bends along its route around the Haynes Cooling Channel. Its flow capacity will limit the tide range within the wetland, keeping it considerably smaller than that of the ocean. Tidal ranges, however, will be adequate to provide for valuable functioning muted tidal habitat as exists at the Anaheim Bay Wetlands and at Inner Bolsa Bay in Bolsa Chica. The culvert has a level profile with its invert elevation at -1.0 feet MSL. This restricts the lower limit on the water surface elevation range within the wetland. Figures 11 and 12 show the culvert plan and profile, respectively. The culvert would be cleaned and cleared prior to operation. The actual water levels in the wetland will depend on the maintenance of the culvert, as discussed later in this plan. Culver inlet design will require an energy dissipator in the marsh to minimize formation of eddies and bank erosion.

5.3.3 Hydraulic Modeling

Tidal fluctuations within the wetland were computed using a previously developed numerical hydrodynamic circulation model (HCM). It is of the lumped-parameter (link-node) type in which the waterway system is represented as a series of basins (nodes) interconnected by channels (links). Equations of motion and continuity are solved at successive time steps to give the water elevations at the nodes and the velocities in the links. The system is driven by a sequence of tide elevations applied at the downstream interface, which in this case is the San Gabriel River mouth. The model is capable of modeling the performance of culverts and other special structures, as well as natural channels of approximately trapezoidal cross-section. A diagram of the model system representing the proposed wetland is shown in Figure 13. It consists of three nodes and three links.

Under dry-weather conditions the tides in the river are closely approximated by the ocean tides measured at the Los Angeles gage, shown in Table 3. In order to compute typical wetland tidal behavior, use was made of an artificial two-week tidal sequence having the same statistical mix of tide heights as the Los Angeles station. This driving tide and the corresponding computed wetlands tide are shown in Figure 14. The figure shows that the wetland tides are muted by the restricted capacity of the existing culvert.



PLAN of PIPE CULVERT AT TUNNEL HEADWALL

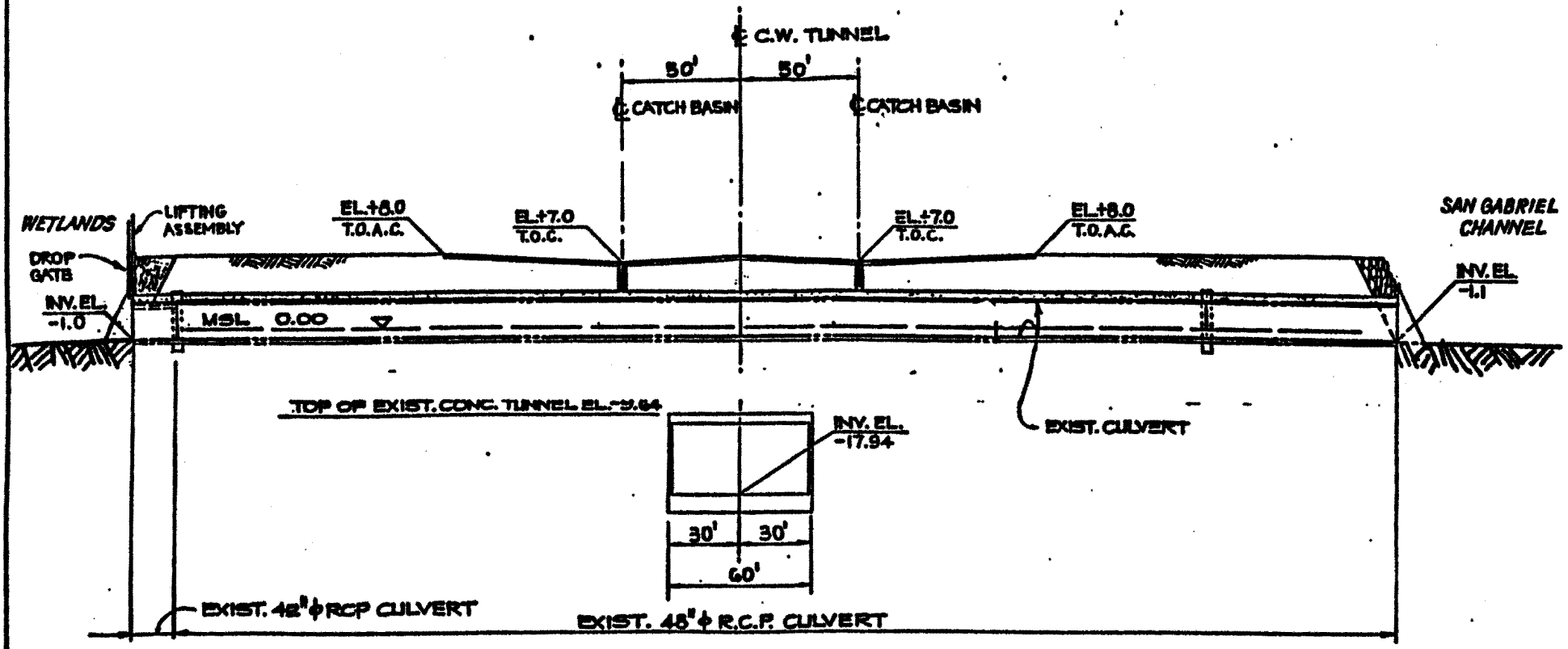
MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

EXISTING CULVERT PLAN

DATE 9-06-96

FIG. 11



PIPE PROFILE

GRAPHIC SCALES IN FEET

0 5 10 20 30
VERTICAL

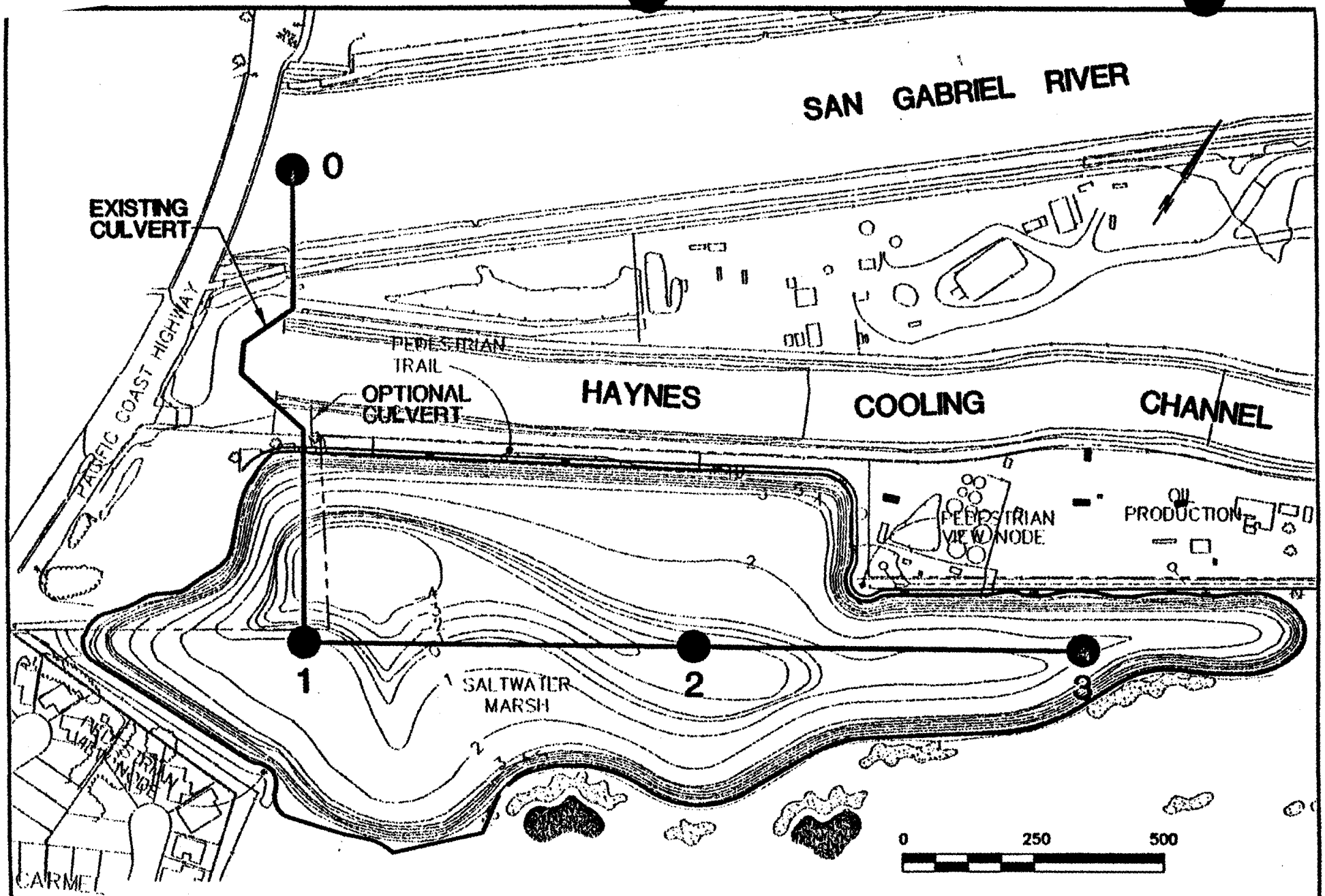
0 20 40 80 120
HORIZONTAL

DATUM: MEAN SEA LEVEL (MSL)

NOTE:

EXISTING CONDITIONS INFORMATION OBTAINED FROM DEPATMENT OF WATER AND POWER. DRAWING NUMBERS:
SE-CA 111032
SE-CA 111060
SE-SA 107820
SE-SA 107824

MOFFATT & NICHOL ENGINEERS	HELLMAN RANCH WETLAND PLAN EXISTING CULVERT PROFILE	DATE 9-06-96 FIG. 12



LEGEND

- LINKS
- NODES

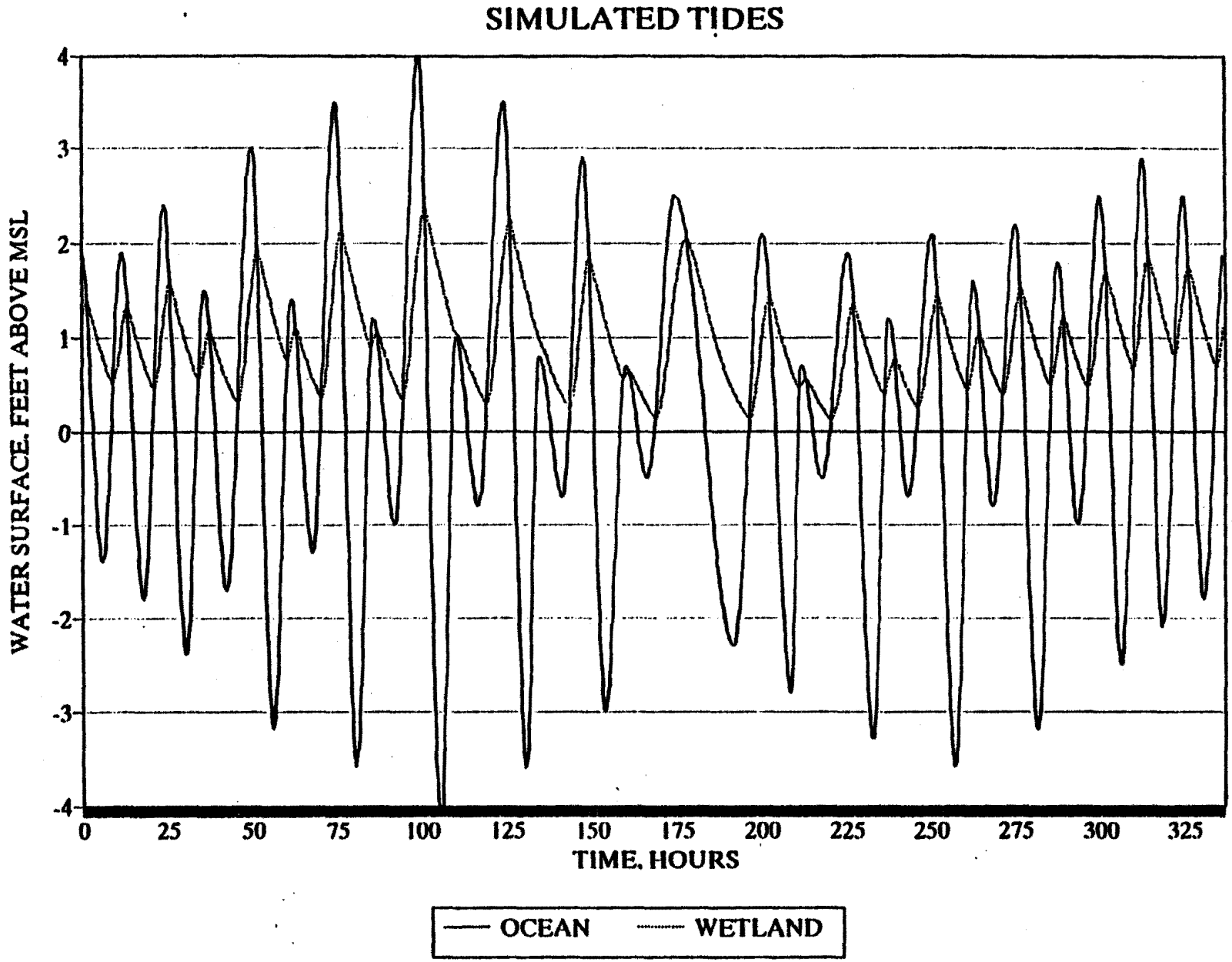
MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

LINK–NODE DIAGRAM

DATE 10-11-96

FIG. 13



MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

DRIVING AND PREDICTED TIDAL ELEVATIONS

DATE 10-11-96

FIG. 14

TABLE 3

RECORDED WATER LEVELS AT LOS ANGELES OUTER HARBOR

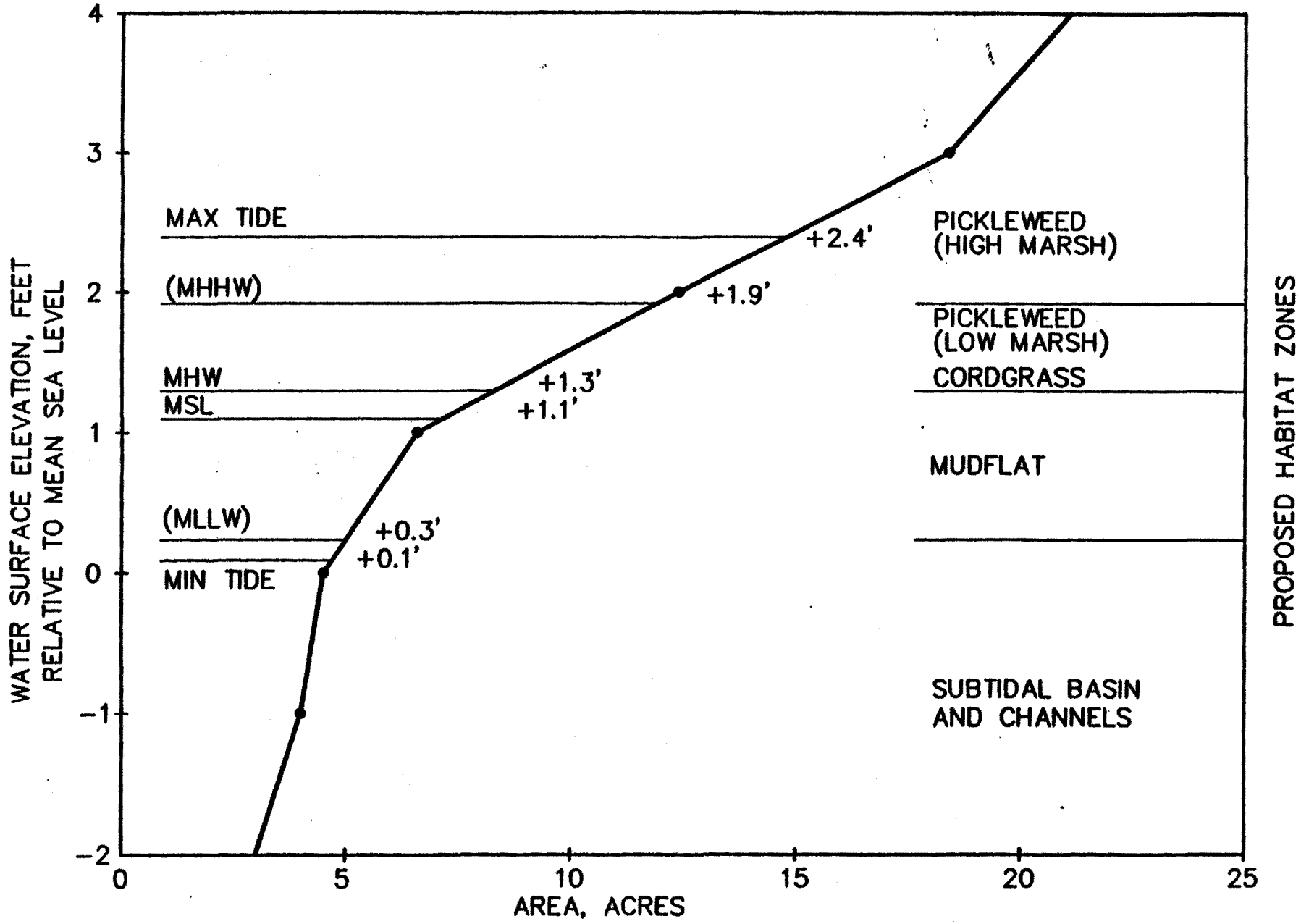
	Datum (ft, MLLW)	Datum (ft, MSL)
Extreme High Water (1/27/83)	7.96	5.16
Mean Higher High Water (MHHW)	5.52	2.72
Mean High Water (MHW)	4.77	1.97
Mean Sea Level (MSL)	2.80	0.00
Mean Low Water (MLW)	0.95	-1.85
Mean Lower Low Water (MLLW)	0.00	-2.80
Extreme Low Water (12/17/33)	-2.59	-5.39

Tidal Elevations

Figure 15 shows the reservoir storage curve of the wetland as defined by the proposed grading plan. The total area of wetland below elevation +4.5 feet MSL is 17.7 acres, and approximately 4.1 acres (23%) will be permanently inundated. The maximum water elevation will be +2.4 feet MSL, and the corresponding surface area is about 12.0 acres. Thus the intertidal zone will occupy about 5.7 acres.

The elevations of mean lower low water and mean higher high water in the ocean are -2.8 feet and +2.7 feet MSL, respectively, for a tide range of 5.5 feet. As shown in Figure 14, on the previous page, tides range in the marsh from +0.1 to +2.4 feet MSL, for a tide range of 2.3 feet. This lower tide range from ocean conditions is described as muted tides. The invert elevation of the culvert is -1.0 foot MSL and tides cannot drop below this level in the marsh. The length of the culvert and its diameter further restrict tidal flow, so that the physical minimum tidal elevation is never reached before a flooding tide occurs again, so that tidal elevations in the marsh will never actually fall below -0.1 feet MSL.

Ap E 103



MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH STORAGE CURVE

DATE 10-16-96

FIG. 15

L:\3983\FIG11.DWG

Residence Times

Residence time calculations were made to determine the rate of tidal flushing within the proposed wetland. An extension of the hydrodynamic model permits simulation of the transport of contaminants within a waterway system by advection and mixing. To compute residence times, the contaminant is "aged"; a periodic (repetitive) tide is applied, all the water within the system is given an increment of age at each time step, and the model is run for several tide periods until the age in each node reaches an approximately steady state. The final node ages, averaged over a tidal cycle, are then the mean residence times.

For this purpose the typical daily tide in the San Gabriel River as shown in Figure 16 was used. It ranges from -2.8 feet to +2.7 feet, and has minor extremes of -0.9 ft and +1.2 feet MSL. Mixing computations were then carried out as a second step. Under these conditions the wetland tide ranges between +0.1 feet to +1.6 feet MSL, and the mean residence time for water in the most inland node of the wetland is 1.7 days. This represents fairly rapid water turnover, and the water quality should support fish habitat. Residence times of 7 days or less are optimal for restoration purposes (County of Orange, 1996). Drainage into the wetlands from the land side will be excluded by the graded berm surrounding the site thereby keeping runoff from the golf course and urban areas from entering the salt marsh. Figure 17 shows residence times throughout the salt marsh. For comparison, existing residence times at Bolsa Chica range from 20 to 28 days, depending on location (Moffatt & Nichol Engineers, 1994).

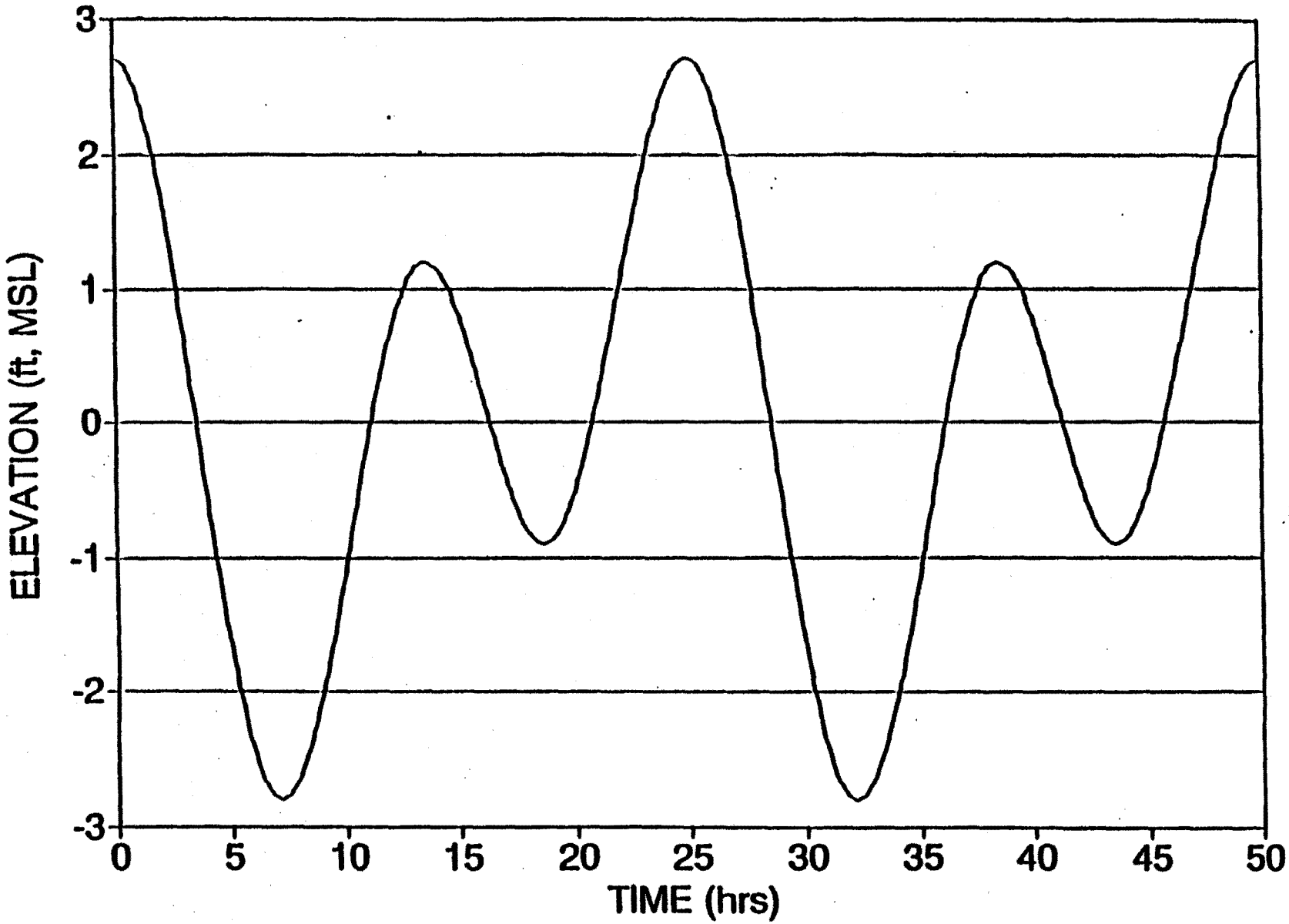
Flooding

Final design will have to consider flood impacts on water levels of the marsh. A flow control device such as a gate on the culvert may be necessary to control water levels in the marsh during floods on the San Gabriel River. Numerical modeling of the flood and marsh water surface elevations may be an appropriate analysis tool for completing final design of the control device.

5.4 Planting

The species of plants to be incorporated into the saltwater marsh project occur in local wetlands as well as throughout the Southern California coastal salt marsh system. These plants, when re-introduced and allowed to propagate with the assistance of both tidal waters and irrigation systems, will restore important wildlife habitat values to the Hellman Property.

Ap E 105

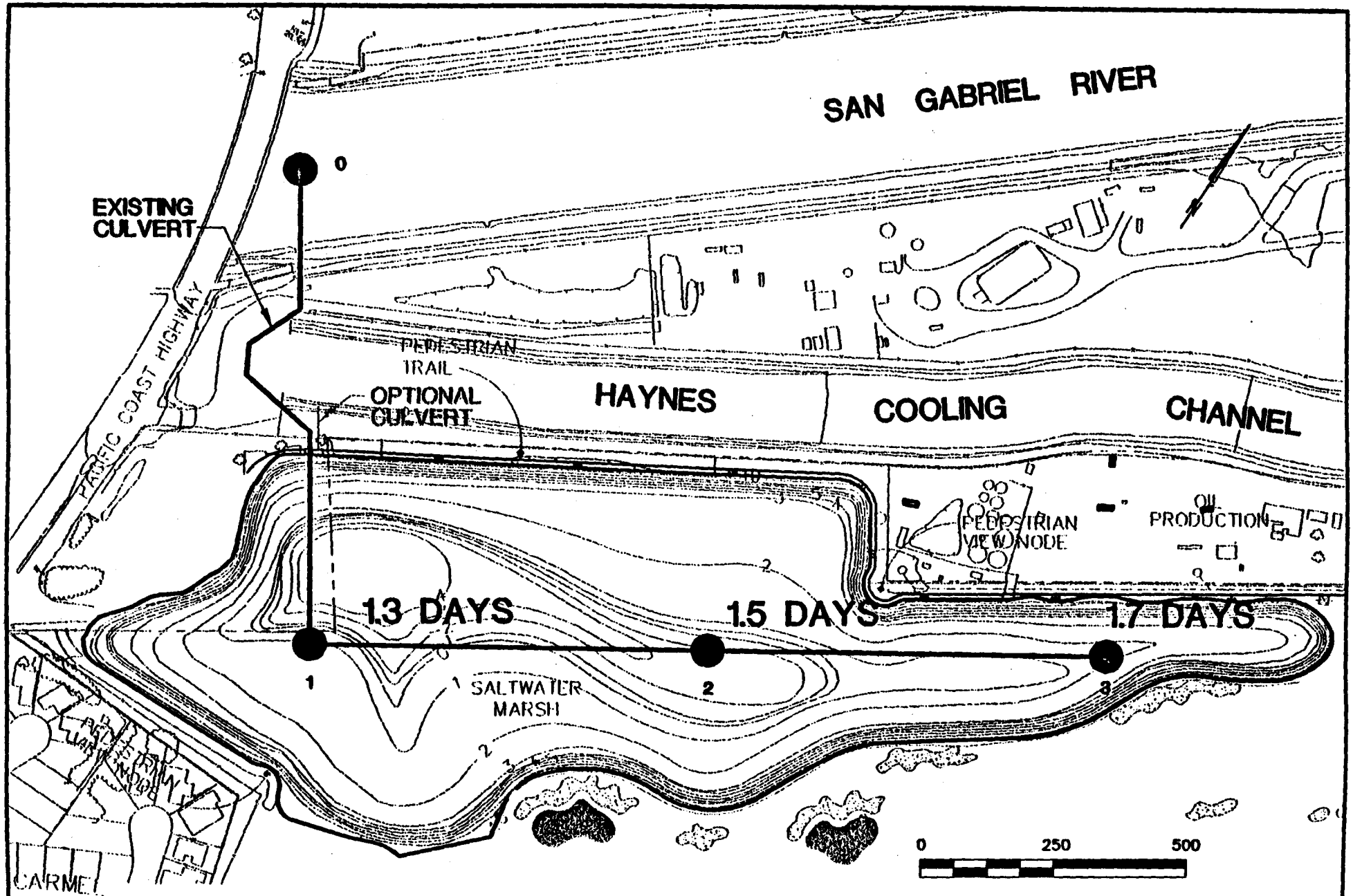


MOFFATT & NICHOLS ENGINEERS

HELLMAN RANCH WETLAND PLAN

PARAMETRIC MEAN PERIODIC TIDE

DATE 10-11-96



LEGEND

- LINKS
- NODES

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH RESIDENCE TIMES

DATE 10-11-96

FIG. 17

5.4.1 Donor Plant Material Sources

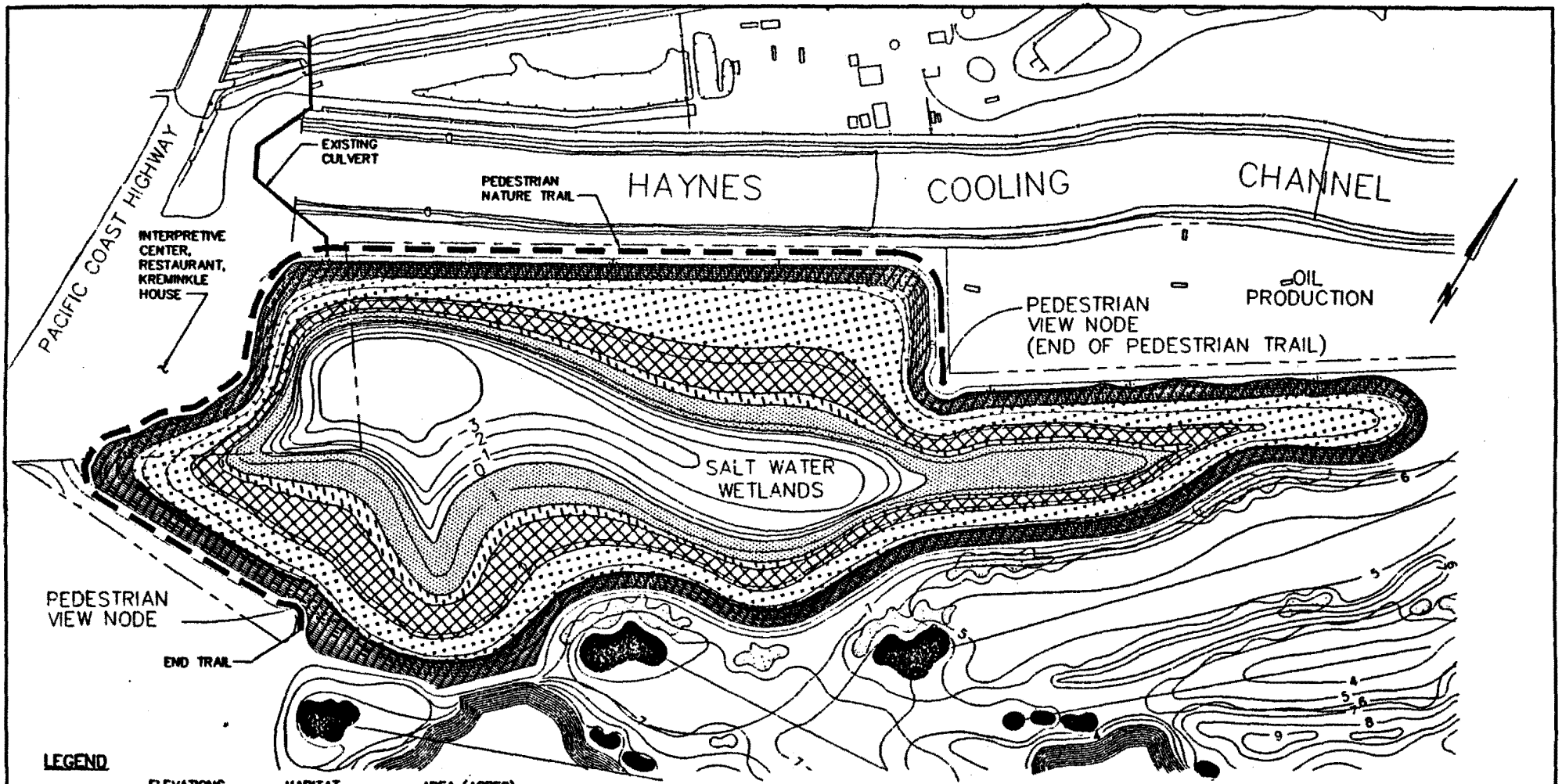
Plant material for the revegetation program will be obtained from two sources: (1) salvage of on-site vegetation that will be removed during the project grading process, and (2) commercially-grown plants. The primary source for pickleweed will be on-site, salvaged vegetation with necessary augments provided by commercial sources. Because the amount of other types of high quality vegetation is minimal on-site, other species will be obtained primarily from a commercial nursery, and secondarily collected/salvaged on-site. The on-site material may also be used as stock material from which the commercial nursery can grow and supply donor material. Collection of material from on-site for nursery growth should occur one year before construction. Material salvaged during the grading process will be maintained on-site in an irrigated and managed nursery area.

5.4.2 Planting Palette

The planting palette for the project site was developed based on successful plantings at other mitigation sites in the region, and on information provided by previous investigators. (MacDonald, 1977 and Zedler, 1984B). The revegetation program emphasizes pickleweed habitat which is used by Belding's savannah sparrows for nesting and foraging. The plant palette including ecological requirements is provided in Table 5 and planting specifications are provided in Table 6. Figure 18 illustrates the planting plan relative to the golf course and buffer habitats. Each plant species will be grown or maintained in one-gallon containers for a period of time sufficient to develop root growth strength sufficient to retain the soil ball. The various species will be distributed uniformly throughout their planting range. Environmental conditions (i.e., tidal inundation, soil salinity, micronutrients) existing along the gradient from the low-to-transitional habitats will govern the final distribution. Table 7 shows the areas of each proposed wetland habitat type.

5.4.3 Salt Marsh Buffers

Salt marsh buffers are provided to minimize impacts to sensitive habitat and species from undesirable animal activity (including humans) and development. The buffer system developed for the Hellman project is designed to provide a comprehensive series of barriers between the salt marsh and human/animal activities. Buffering is achieved using distance, elevation changes and



LEGEND

	ELEVATIONS	HABITAT	AREA (ACRES)
	-4.0 — +0.3	BASIN - CHANNEL	4.1
	+0.3 — +1.3	UNVEGETATED MUDFLAT	3.2
	+1.3 — +1.5	CORDGRASS MARSH	1.1
	+1.5 — +2.2	PICKLEWEED - TIDAL	3.6
	+2.2 — +4.5	PICKLEWEED - HIGH MARSH	5.7
	+4.5 — +10.0	BUFFER AREA	5.4
		TOTAL	23.1

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH PLANTING PLAN

DATE 11-01-96

FIG. 18

vegetation. A tiered system of buffers is proposed consisting of transitional habitat surrounding the marsh, the golf course, the residential setback from the golf course and a drainage separation around the wetland. The buffers will shelter the sensitive salt marsh habitat and wildlife from disturbance by humans, vehicles, domestic and wild animals, light, noise, runoff and other phenomena. This system of buffers will work together to maximize protection of the most sensitive salt marsh resources. The most intense land uses are sited at the greatest distance from the marsh.

The tier 1 buffer is the transitional habitat surrounding and integrating with the wetland. The tier 1 buffer is a zone of no direct or indirect intrusion, and is to exist where the most sensitive uses (i.e. nesting) will occur. This buffer will minimize intrusion by humans and predators, and screen the wetland from effects of development.

TABLE 5

SALT MARSH PLANTS AND ELEVATIONS

Plant Species	Typical Habitat	Revegetation Planting Range (Feet, MSL)
Cordgrass (*Spartina foliosa*)	Low Marsh	+1.3 to 1.9
Perennial Pickleweed (*Salicornia virginica*)	Low Marsh to High Marsh	+1.9 to +2.4 +2.4 to +4.5
Samphire (*Salicornia subterminalis*)	High Marsh	+2.4 to +4.5
Fleshy jaumea* (*Jaumea carnosa*)	High Marsh	+2.4 to +4.5
Frankenia* (*Frankenia grandiflora*)	High Marsh	+2.4 to +4.5
California sea lavender* (*Limonium californicum*)	High Marsh and Transitional	+2.4 to +4.5
Saltgrass* (*Distichlis spicata*)	High Marsh and Transitional	+2.4 to +4.5
Emory's baccharis* (*Baccharis emoryi*)	High marsh and transitional scrub	+2.4 to +10.0
Southwestern spiny hush (*Juncus acutus ssp leopoldii*)	High marsh and low buffer	+2.4 to +4.5
Coastal Scrub species	Transition and Buffer	+4.5 to +10.0
Southern tarplant *Hemizonia parry issp;. Australis*	High marsh, transition and buffer	+3.5 to 10.0

* Species will be partially planted at elevations above the managed-tidal influence but will be maintained through soil chemistry manipulation (i.e, addition of salts and irrigation).

TABLE 6

SALT MARSH

PLANT PALETTE

Plant Species	Spacing on Center (feet)	Container Type/Size	No. Units Per Acre*	Source
Cordgrass (*Spartina foliosa*)	3	1 gallon cont. stock	10,890 (lm)	commercial
Perennial Pickleweed (*Salicornia virginica*)	2	1 gallon cont. stock	10,890 (lm) 5,445 (hm)	on-site, commercial
Samphire (*Salicornia subterminalis*)	2	1 gallon cont. stock	1,089 (hm)	on-site, commercial
Fleshy jaumea (*Jaumea carnosa*)	2	flats (6"x6" outplants)	1,089 (hm)	commercial, on-site
Frankenia (*Frankenia grandiflora*)	2	1 gallon cont. stock	1,089 (hm)	commercial, on-site
California sea lavender (*Limonium californicum*)	2.	1 gallon	1,089 (hm)	commercial, on-site
Saltgrass (*Distichlis spicata*)	2	flats (6"x6" outplants)	1,089 (hm)	commercial,
Emory's baccharis (*Baccharis emoryi*)	4	1 gallon cont. stock	2,722 (hm)	commercial
Southwestern spiny rush *Juncus acutus ssp leopoldii*	scattered	1 gallon	100 (hm, lb)	commercial

lm = low marsh; hm = high marsh; lb = low buffer

TABLE 7

PROPOSED SALT MARSH

HABITAT AREAS

Habitat Type	Area (acres)
Subtidal basins and channels	4.1
Unvegetated Mudflat	3.2
Cordgrass Marsh	1.1
Pickleweed-Tidal	3.6
Pickleweed-High Marsh	5.7
Transition Zone/Buffers	5.4
TOTAL	**23.1**

Ap E111

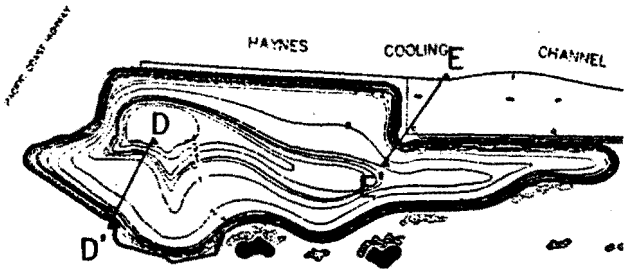
The wetland buffer area is a continuous band of transitional habitat occupying the area immediately outside of the high marsh. Elevations of the buffer range from +4.5 feet MSL to +10.0 feet MSL. The width of buffer areas is a minimum of 35 feet, with some bands reaching up to 60 feet in width. The overall area of buffer is 5.4 acres. Vegetation occupying the buffer is proposed to include Emory's Baccharis which reaches heights of 12 feet and is relatively dense to discourage access and to provide visual screening. Portions of the buffer zone integrating into the high marsh areas will be planted with Southwestern spiny rush and will also provide habitat for Southern tarplant, a sensitive plant species, identified on site, which occurs along the margins of salt marshes in coastal Southern California. Relocation procedures for this species is discussed below. Figure 19 shows conceptual buffer cross-sections for tiers 1 and 2.

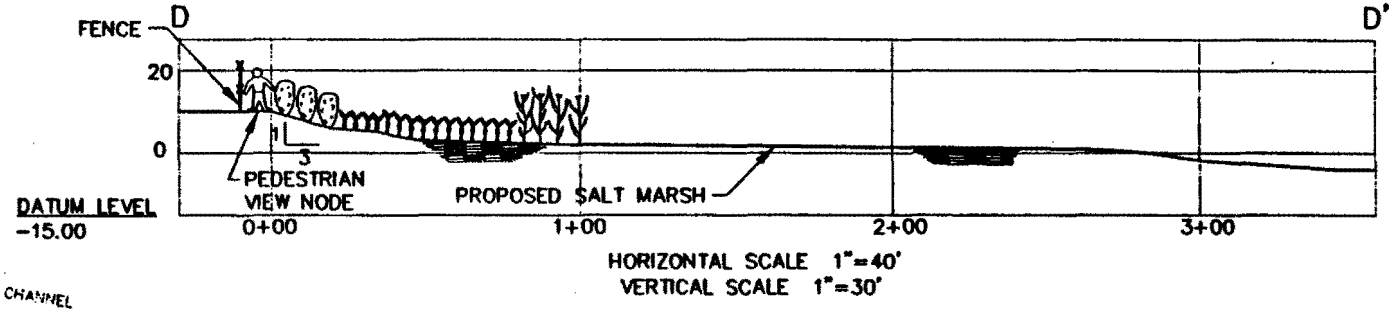
Subtidal habitat is proposed to lie adjacent to the golf course to result in minimal disturbance to birds from golf. Pedestrian nodes located at the northeast and south ends of the marsh are buffered by the slope, distance and vegetation provided in the transitional habitat zone.

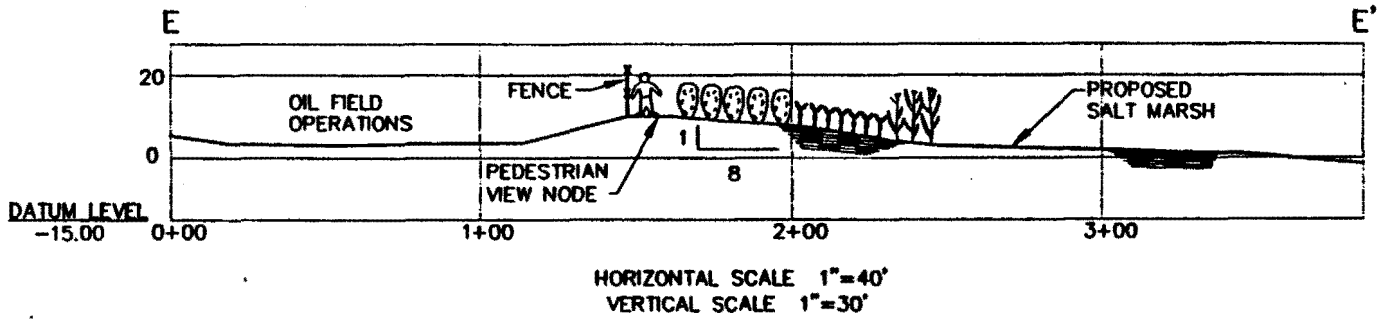
The tier 2 buffer is the drainage separation between the salt marsh and the golf course. The geometry of the proposed salt marsh is a simple basin with a "rim" or drainage divide surrounding the marsh at an elevation of +10.0 feet MSL. Land immediately adjacent to the salt marsh will lie at elevations lower than +10.0 feet MSL. The drainage divide prevents the salt marsh from receiving runoff from the golf course and surrounding land uses.

The tier 3 buffer is the "modified links" golf course, which buffers the wetland from residential development. The golf course use is designed to not interfere with sensitive uses in the salt marsh. The golf course also provides native habitat and freshwater marsh wetland to increase habitat areas on-site for use by wetland wildlife. The area occupied by the golf course physically separates the residential land use area from the salt marsh.

The tier 4 buffer is the setback between the residential land uses and the golf course. The setback provides physical separation between the course and the homes, and further adds to the separation between the homes and the salt marsh.







MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

SALT MARSH BUFFER CROSS-SECTIONS

DATE 11-01-96

FIG. 19

h6113

5.4.4 Target Species

The saltwater marsh has been designed to attract a variety of resident and overwintering birds many of which may utilize the onsite freshwater marsh habitat as well. A total of 24 species have been targeted as species for which to provide breeding and/or foraging habitat as well as cover and a reliable saltwater source. Table 8 lists the target species, their sensitivity status, and abundance and seasonality.

5.4.5 Collection and Revegetation Permits

A State of California Department of Fish and Game Scientific Collecting Permit is required of each person who will be collecting wetland plants. Secondly, written permission to collect donor site vegetation will be required from State of California Fish and Game Commission and from the California Department of Fish and Game Region 5 Manager because these resources are sensitive biological resources. Permission will be requested when the project schedule and mitigation plan are approved by the agencies.

5.4.6 Salt Marsh Habitat Site Preparation

Several tasks are required to prepare the site for salt marsh planting. The tasks are summarized below. A biological monitor will be on-site as needed to facilitate appropriate soil treatment, weeding and irrigation of the salt marsh area during its creation.

Grading - Site recontouring will be conducted in accordance with the grading plan, as illustrated in Figure 4 of Section 3.

Soils Treatment - Soils will be tilled and prepared to enhance the aeration of compacted soils. At elevations above the extreme high tide line (2.4 feet MSL) the soils shall be tested for soil salinity. To maximize the probability of success of the planned habitat, soils shall be maintained within a range of 10 to 45 parts per thousand through artificial means (i.e., the addition of salt pellets combined with freshwater irrigation, or direct seawater irrigation) as necessary. At lower elevations between +0.1 feet and +2.4 feet MSL, the tidal flow will naturally maintain soil salinities within the tolerance range of coastal salt marsh species.

TABLE 8

TARGET BIRD SPECIES FOR THE SALT MARSH

Bird Species	Status		Abundance and Seasonality			
	USFWS	CDFG	AB[a]	BC[b]	LC[c]	NB[d]
Gavia immer common loon	–	SSC	o/WM	u/V		s/W
Pelecanus erythrorhynchus American white pelican	–	SSC	o/W	c/W		s/W
Pelecanus occidentalis californicus California brown pelican	FE	SE	u/SW	c/S		u/W
Phalacrocorax auritus double-crested cormorant	–	SSC	u/R	c/W		–
Plegadis chihi white-faced ibis	–	SSC	s/W	o/W		s
Pandion haliaetus osprey	–	SSC	o/WS	u/V		s/W
Elanus leucurus white-tailed kite	–	FP	u/R	c/R		o/R
Circus cyaneus northern harrier	–	SSC	o/R	u/W		u/R
Falco peregrinus anatum American peregrine falcon	FE	SE	u/W	u/W		s/W
Rallus longirostris levipes light-footed clapper rail	FE	SE	u/R	o/V		u/R
Charadris alexandrinus nivosus western snowy plover	FT	SSC	o/R	f/W		s/R
Numerius americanus long-billed curlew	–	SSC	f/R	f/W		f/R
Larus californicus California gull	–	SSC	f/R	c/W		c/R
Sterna elegans elegant tern	–	SSC	u/S	c/S		f/S
Sterna antillarum browni California least tern	FE	SE	f/S	c/S		f/S
Rhynchops niger black skimmer	–	SSC	o/R	c/R		f/S

Ap E115

TABLE 8 (CON'T.)

Bird Species	Status		Abundance and Seasonality			
	USFWS	CDFG	AB[a]	BC[b]	LC[c]	NB[d]
Speotyto cunicularis hypugea western burrowing owl	–	SSC	o/R	s/R		s/R
Asio flammeus short-eared owl	–	SSC	o/W	u/W		s/W
Lanius ludoviclanus loggerhead shrike	–	SSC	u/R	c/W		u/R
Dendroica petechia brewsteri yellow warbler	–	SSC	s/M	s/V		o/M
Geothlypis trichas sinuosa saltmarsh common yellowthroat		SSC	u/R	s/W		f/R
Passerculus sandwichensis beldingi Belding's savannah sparrow	–	SE	f/R	c/R		f/R
Passerculus sandwichensis rostratus large-billed savannah sparrow		SSC	s/W	s/W		f/W?
Agelaius tricolor tricolored blackbird	–	SSC	s/V	u/W		s/W

LEGEND

STATUS FT - federally threatened; FE - federally endangered; ST - California state threatened; SE - California State endangered; FP California fully protected; SE - California State endangered

LOCATIONS AB - Anaheim Bay National Wildlife Refuge; BC - Bolsa Chica Ecological Reserve; LC - Los Cerritos Wetlands Information is forthcoming; NB - Upper Newport Bay Ecological Reserve

ABUNDANCE
- c - common—observed or expected throughout the site in relatively high numbers
- f - fairly common—observed or expected in moderate numbers over most of the site
- u - uncommon—observed or expected in low numbers over a portion or all of the site
- o - occasional—observed or expected only sporadically on the site
- s - scarce—observed or expected rarely on the site

SEASONALITY R - resident or found in vicinity year round; W - present in winter only; M - migrant; S - present in summer only; V - visitor from nearby areas

[a] from Kelsey, R., pers. comm. 1996
[b] from Orange County Environmental Management Agency 1994
[c]
[d] from Hays et al.1990.

SOURCE: MBA, 1996

Weed Removal - Weed species that establish within the salt marsh area prior to and during planting will be removed manually or by use of the product Rodeo, an herbicide.

Irrigation - Irrigation is recommended at higher portions of the salt marsh to augment tidal flows. Buffer areas will require freshwater irrigation for plant establishment.

5.4.7 Construction Sequence of the Salt Marsh

Construction of the salt marsh requires completion of a series of tasks. The following sequence is proposed for the planting tasks:

- Initiate commercial nursery operations (one year-program) and pre-construction monitoring;
- Collect donor material from on-site areas and store material in the on-site nursery;
- Grade habitat to final restoration contours and initiate construction monitoring;
- Initiate irrigation activity (seawater or brackish water) to acclimate soils to the site; monitor soil salinities; acclimate commercially grown stock to field salinities (three month testing period);
- Plant and maintain salt marsh vegetation with an irrigation system; all planting shall be conducted between September and March;
- Introduce tidal action;
- Initiate post-construction monitoring and maintenance programs, and
- Evaluate and report project findings.

A biological monitor shall be on-site during all salvage, grading, and replanting operations to oversee the process and interact with the contractors. The biological monitor shall be approved by the project sponsor or its designee and the resource agencies, and shall have experience in monitoring and implementing wetland restoration projects. Construction may occur during the nesting season or from September to March since the present nesting potential on the site is low.

Ap E117

Pre-construction nesting surveys will be conducted to verify the nesting status prior to construction. Construction will be prohibited if nesting is documented.

5.4.8 Salvage and Relocation of Southern Tarplant

Southern tarplant, a California Native Plant society List 1B (endangered in California) species, was identified on the site during surveys conducted in 1996 (MBA, 1996). This species inhabits saline or alkaline meadows and the margins of coastal salt marshes in southern California. In order to maintain a viable population of this species onsite, a relocation program is to be implemented, coinciding with construction of the salt marsh. This species will be incorporated into the upper marsh and buffer zone areas which will provide suitable habitat in perpetuity for this declining species.

The limits of each population will be carefully delineated during the peak of the flowering season (August to September) with the limits of each population clearly marked with lathe and flagging. Populations will be monitored every two weeks until it is determined that the plants have gone to seed. Once the plants have gone to seed, the plants and top two to three inches of topsoil ill be salvaged and store in cardboard boxes (salvage of the southern tarplant is expected to occur in late October or early November). The plants and topsoils will be stored in a cool dry environment until the topsoil and plant material (inoculum) is to be distributed in the upper marsh and lower buffer zone areas. Distribution of the inoculum should occur between December 1 and March 1. Salvage and redistribution of the inoculum will be directed by a botanist or horticulturist experienced in salvage of native species.

5.5 Maintenance and Monitoring

Long-term success of this restoration project requires adequate design, quality construction and post-construction monitoring and maintenance. Post-construction monitoring and maintenance activities involve biological and engineering measurements. Concept-level monitoring requirements are presented here as a basis for formulation of a more refined monitoring plan to be prepared during subsequent project review. The program should be implemented for a period of 5 years after completion of construction, with the exception of culvert maintenance which will occur into perpetuity. The specific monitoring and maintenance program is discussed below.

5.5.1 Maintenance

Regular intervals of maintenance are recommended; these should be more frequent during the first two years of the five year monitoring program. Tasks should include clearing debris, weeding, maintenance of the culvert, removal of sediment and predator control. Maintenance personnel should avoid, as much as possible, damage to the wetland plants and communities, and should avoid areas where nesting birds are present. Costs for maintenance could be covered by a maintenance account to be established prior to construction. The responsibility for maintenance will rest with the landowner and property manager.

1. **Debris Clearing** - As needed, debris which may become deposited within the salt marsh will be cleared and removed from the project site. A debris boom shall be installed at the lagoon end of the culvert to catch flotsam and jetsam if observations indicate a need for the protection.

2. **Weed Control** - Weeds which may become established in the salt marsh area will be removed by hand on an as-needed basis.

3. **Replanting** - Replanting of material which does not survive will be performed as necessary. Monitoring will provide information on the need for replanting.

4. **Culvert Maintenance** - The culvert will be visually inspected if the tidal elevations in the marsh drop substantially (greater than 0.5 feet) from the target elevations. Regular inspection shall also occur quarterly for the first year, and semiannually into perpetuity to identify obstructions and the rate of marine growth. If obstructions or excessive growth occurs limiting tidal flow, they are to be removed immediately.

5. **Sedimentation** - Sedimentation may occur from storm flows which enter the marsh through the culvert, and by marsh sediment mobilized as an equilibrium geometry develops following construction or bank erosion. Sediment will accumulate in the deepest portion of the tidal basin, located within the -4.0 foot MSL contour near the culvert entrance. Depth readings shall be obtained quarterly during the first year of operation, and semiannually thereafter. If the depth of the tidal basin becomes shallower

AP E119

than -2.0 feet MSL, the basin shall be dredged to restore the sediment retention capabilities of the basin.

6. **Predator Control** - Control of feral cats, dogs, coyotes, foxes and other predators to the salt marsh will occur through a program of proactive trapping of animals and education of pet owners. Traps will be set up throughout the marsh buffer area to attract and catch predators, which will be removed from the site. An education program of noticing to nearby landowners and businesses will occur to recommend pet control for marsh protection.

7. **Signage** – Signs specifying the sensitivity of the marsh area and the restricted access status will be posted as necessary.

5.5.2 Monitoring

Recommended monitoring activities are described below. The program will specify measures required to mitigate for significant, adverse environmental impacts caused by the project. Certain measures may apply to the salt marsh which will be considered in preparation of a final monitoring and maintenance program. In addition, the Coastal Commission will stipulate monitoring requirements which will be incorporated into the monitoring program.

The primary purpose of the monitoring is to verify that the restored wetlands actually develop biological and environmental characteristics that are actually superior to those of the site in its present condition. If results are unsatisfactory, subsequent remedial action will be based on the monitoring program findings. Monitoring will be the responsibility of the landowner.

Biology

Monitoring surveys for plant growth, benthic invertebrate use, shorebird use, and endangered species shall be conducted by qualified specialists who have previous experience conducting these types of wetland restoration monitoring programs. Monitoring surveys should be conducted at the following intervals:

- Pre-plant salvage, during plant salvage, during the grading process, and post-grading.

- Post-planting surveys weekly for the first month, monthly for one year, at three month intervals for two years, and six-month intervals for years three through five. Routine replanting can also be conducted on this schedule to replace dead material. Biologists will monitor the presence or absence of planting units until vegetative growth appears. Once vegetative spreading has begun, total aerial cover and plant height will be used as a measure of transplant success. Other important features that will be monitored include soil salinity, soil chemistry, the presence and types of other plants, invertebrates, and birds using the revegetated areas.

- Monitoring the benthic invertebrate communities will occur at intervals of 6 months, one year, three years, and five years following the transplant. Organisms will be collected in three replicated samples at each of two sites within the Hellman mudflat habitat with a 0.01 m coring device, screened through a 0.5 mm mesh screen. Samples will be returned to the laboratory where the organisms will be sorted and identified to the lowest possible taxonomic category. The abundance, richness, and diversity of the community will be determined and reported.

- Shorebird activity will be monitored by a qualified shorebird specialist. Two 2-hour surveys will be conducted during low tides on two successive days at the project site and at either the Cerritos Wetland or Bolsa Chica. Data collection and analysis will include identifying all shorebird species and counting the number of birds using the project area. Based on the time of observation, the number of sightings per hour will be calculated. Behavioral data that will be collected will focus on foraging behavior, but also include resting, breeding, and flying behaviors. The monitoring surveys will assist in determining the rate at which mudflat community function (i.e, providing a shorebird foraging habitat) is developing and the degree to which the sediments are being colonized by benthic invertebrates. Shorebird use of the mudflats will be quarterly for the first year following creation of the mudflats, and annually for the remaining four years (ten surveys).

KP E/21

- Annual surveys will be conducted between late-March to late-September of each of the five-year programs, to document the presence of Belding's savannah sparrows and California least terns by a qualified endangered species biologist.

Hydraulics

Tidal elevations will be recorded to identify whether appropriate tidal regimes are being provided to the salt marsh habitat. Monitoring of tides can be done automatically with gages. An automatic gage should be installed and maintained for the first six months of operation. Alternatively, longer-term measurement by manual observations of a staff gage should be made during several periods of neap and spring tides.

Sedimentation

Substantial sediment accretion or movement within the salt marsh is not expected, since upstream drainage from the Specific Plan Area is being diverted to the retarding basin and the sea water source is relatively free of suspended solids. Any sedimentation will be detected by recording bathymetry in the deep areas of the wetland near the culvert mouth at yearly intervals.

If sedimentation is determined to be attributable to flooding from stormflow, the culvert shall be fitted with a "stop-log" gate at the culvert entrance to the San Gabriel River. The gate can be manually inserted prior to storms which may contribute sediment to the marsh. Use of the stop-log is also recommended during the first flush storm of each wet season to prevent inflow of undesirable materials into the marsh.

Water Quality

Water temperature and levels of dissolved oxygen are to be recorded in the marsh, at the San Gabriel River and at a control site such as Inner Bolsa Bay at Bolsa Chica. The monitoring objective is to identify whether these water quality parameters remain within ranges acceptable to wetlands. If ranges extend beyond the appropriate limits for the wetland and the habitat monitoring identifies potential adverse reactions to these conditions, the site will be retrofitted with measures to improve water quality conditions.

Such measures may include:

- Utilize aeration systems within the culvert and in areas of the wetlands to increase the level of dissolved oxygen when levels fall below 5 mg/l.
- Control the inflow of water from the San Gabriel River during episodes of flooding, oil spills, or other periods of water quality degradation through the manual or automatic opening of the tidal gate.
- Install a trash and debris screen on the culvert to reduce the inflow of trash and riverborne debris from entering the wetlands
- Install a secondary culvert and pipe in the San Gabriel River to collect deeper and cooler river waters during incoming (flood) tides that would be oxygen-richer than ebbing river waters.
- Collect cooler waters from the Haynes Alamitos Cooling Channel rather than the thermally-elevated waters of the San Gabriel River, or use this second connection as back up source during periods of degraded water quality.
- Monitor water quality conditions on a bi-weekly basis in the San Gabriel River and the Hellman Wetland Channels to plan for potential times when water quality may become adverse to the wetlands.

5.5.3 Salt Marsh Performance Criteria

Short-term and long-term success criteria are needed because of the relatively slow rate of development of salt marsh communities compared to other habitat types. Criteria and goals for each phase, or year will be re-evaluated regularly by the resource agencies and the project team when monitoring reports are submitted.

Preliminary criteria that will be evaluated for vegetation and wildlife habitat use include:

- Maintenance of soil salinities between 10 and 45 parts per thousand by using soil additives for five years of monitoring;
- 90 percent survival of replanted material at the end of the third month of monitoring;

App E123

- 80 percent survival of replanted vegetation at the end of the first year and 25 percent cover of the revegetation area;

- 75 percent cover of the replanted vegetation at the end of the fifth year of monitoring and plant height of each species that is no less than 75 percent that of each species in Bolsa Chica or the Cerritos Wetlands;

- A mudflat benthic invertebrate community that has 50 percent the diversity and abundance of a control area in Bolsa Chica or Cerritos Wetlands, as selected by the project biologist, after the first year, and 85 percent the diversity and abundance at the end of the fifth year;

- Evaluation of the shorebird richness compared to the richness of a control site located at Bolsa Chica or the Cerritos Wetland as an indicator of habitat success. Lack of shorebirds will trigger evaluation of the salt marsh for inadequacy of ecosystem functioning, and

- Evaluation of the utilization of the recreated wetlands as a foraging or nesting habitat by the Belding's savannah sparrow and the California least tern at the completion of the five-year monitoring program. This information will also indicate the status of the ecosystem, and may require further study to identify shortcomings of the salt marsh.

Reporting

Pre-and post-construction field survey results will be submitted to the Corps of Engineers and the resource agencies in the form of a written status report within 60 days of each survey. The report will present field methods, results, and discussion of the results rating the level of mitigation success relative to specified criteria and propose recommendations and alternatives if the restoration project is not meeting mitigation success requirements. Annual reports will also be prepared to identify trends in salt marsh evolution. A final project report at the end of the five-year period will be prepared, analyzing the long term success of the project and making a final determination of restoration success.

Remedial Work

Remedial work will be performed as necessary to meet the performance standards within reason. Such work may include, but not be limited to regrading, replanting, modifying irrigation systems, adjusting the tidal regimes, modifying the culvert system (additional culverts), and weed eradication.

Contingency Plan

If at the 3-year milestone within the 5-year monitoring period the site is not functioning as anticipated, remedial measures will be taken to bring the site into compliance with performance criteria. Specific remedial measures will be determined at that time in coordination with regulatory/resource agencies.

MP E125

6.0 FRESHWATER MARSH RESTORATION PLAN

In order to provide high quality wetland habitat, consistent with the Specific Plan and the Resources Management Plan for the Hellman Ranch, a wetland complex consisting of approximately 8.5 acres of open water and freshwater marsh will be incorporated into the golf course and designated as Conservation Area 2. The open water/freshwater marsh complex has been designed to provide habitat for water fowl, herons and egrets, as well as passerines such as red-winged blackbirds and tricolored blackbirds. Addition of the 9.7-acres of open water and freshwater marsh will add to the value of the 17.7 acres of created/restored coastal salt marsh by providing additional areas for foraging as well as cover for resting and nesting.

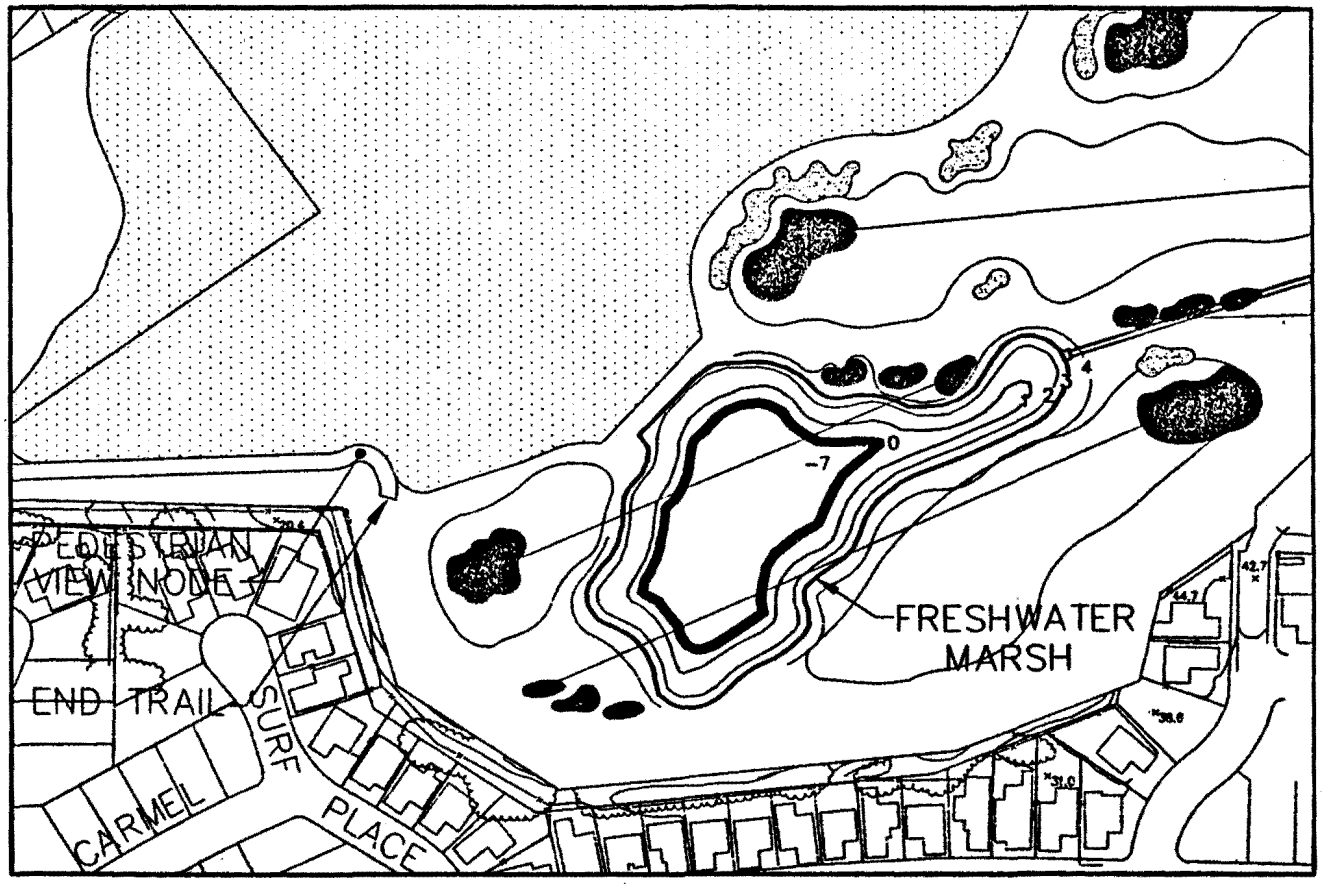
6.1 Habitat Goals

The goal of the freshwater marsh creation program is twofold: 1) establishment of approximately 8.5 acres of high quality open water/freshwater marsh habitat which is structurally and floristically diverse, thereby providing maximum value for wildlife, and 2) aesthetically and functionally consistent with the golf course design.

6.2 Grading

The open water/freshwater marsh complex will be created by forming a series of seven interconnected basins which extend from the coastal salt marsh near the southwest corner of the site to the east end of the site adjacent to the maintenance area. Figure 20A and B depicts the grading of the basins. Combined, the basins will cover a total of approximately 9.7 acres including approximately 3.6 acres of open water and approximately 4.9 acres of freshwater marsh as specified in Table 9.

The basins will be excavated to a depth of approximately 10.0 feet in the center with shallow shelves between 0.5- and 1.5-feet-deep around the perimeter of each basin. Figure 21 depicts the cross section of basins. Each basin will have a manufactured bentonite hardpan to prevent percolation as well as prevent saltwater intrusion into the basins near the salt marsh due to a fluctuating water table. A soil layer of approximately 12 to 18 inches will be placed over the bentonite hardpan for establishment of the wetland vegetation. The rapid change in depth from the shallow shelves, along the perimeter of the basins, to the middle of each basin will discourage



LEGEND:

PIPE CONNECTIONS

GRAPHIC SCALE IN FEET

0 75 150 300

NOTE: ELEVATIONS IN FEET RELATIVE TO MEAN SEA LEVEL

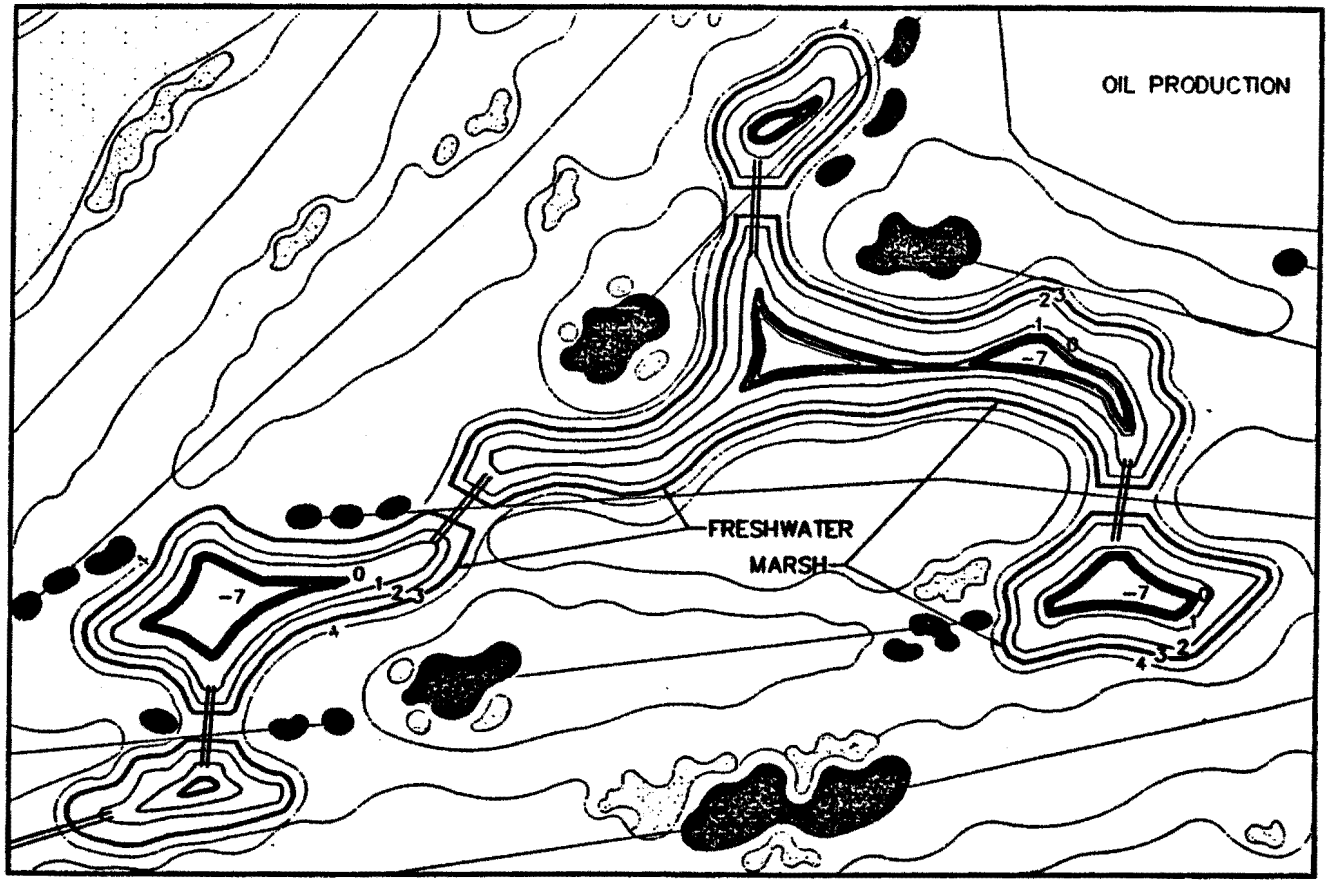
MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH GRADING PLAN

DATE 11-01-98

FIG. 20A



LEGEND:

PIPE CONNECTIONS

GRAPHIC SCALE IN FEET

0 75 150 300

NOTE: ELEVATIONS IN FEET RELATIVE TO MEAN SEA LEVEL

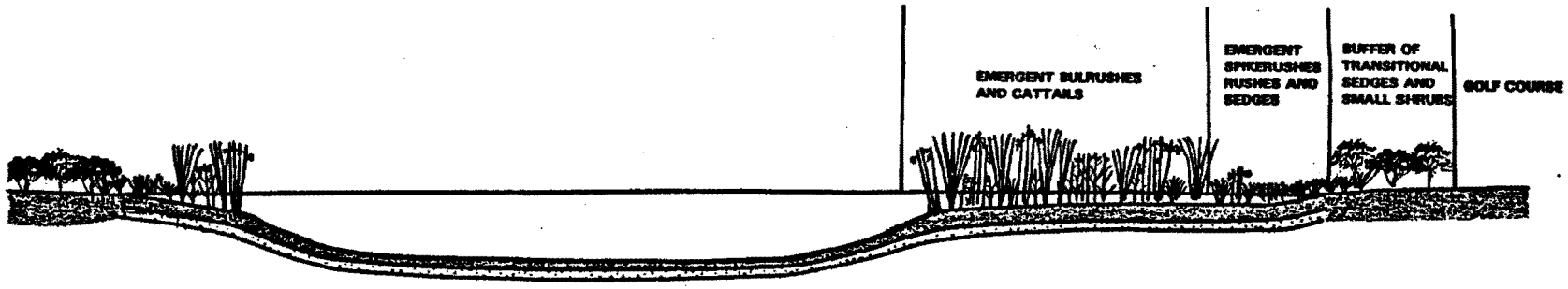
MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH GRADING PLAN

10-16-95

FIG. 20B



VERTICAL SCALE: 1" = 10'

OPEN WATER

EMERGENT MARSH WITH BULRUSHES & CATTAILS 1' - 2' DEEP

EMERGENT MARSH TRANSITION TO WET MEADOW HABITAT RUSHES, SPIKERUSHES, & SEDGES 0 - 1' DEEP

SOIL

BENTONITE

SOURCE: MICHAEL BRANDMAN ASSOCIATES

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH CROSS-SECTION

DATE 10-10-96

FIG. 21

RE E129

establishment of emergent vegetation (in the deep water areas) thereby retaining open water in the center of each basin.

TABLE 9

SIZE OF FRESHWATER MARSH BASINS

Basin	Open Water Component	Freshwater Marsh Component	Combined Open Water and Freshwater Marsh
1	1.6 acres	1.3 acres	2.9 acres
2	0.3 acre	0.5 acre	0.8 acre
3	0.7 acre	0.8 acre	1.5 acres
4	0.2 acre	0.5 acre	0.7 acres
5	1.0 acre	1.7 acre	2.7 acres
6	0.4 acre	0.7 acre	1.1 acre
TOTAL	4.2 acres	5.5 acres	9.7 acres

6.3 Hydrology

Water for the basin complex will be provided by an onsite groundwater well which will also be used to provide water for irrigating the golf course. Water will also be provided to the basin complex through direct precipitation and runoff during storm events.[1] All of the basins will be hydrologically connected by an underground pipe system and the water level will be maintained at approximately +3.0 feet MSL. The underground drainage system consists of 8-inch PVC pipe. Seasonal flushing of the ponds is expected to occur during the late Winter or early Spring storms.

6.4 Planting

All plant species selected for the created habitat are native to coastal Orange County freshwater (or brackish water) marshes.

6.4.1 Donors

Where feasible, cuttings or seeds will be collected on, or in the vicinity of the Hellman Ranch. Commercial nurseries will also be used as suppliers of freshwater marsh plants.

[1]Irrigation runoff from the golf course will be minimized in order to maintain high water quality within the basins.

6.4.2 Planting Palette

Vegetation will consist of emergent hydrophytes which will be established on the shelves in water between 0.5 and 1.5 feet deep. Moving close to the shore, where the water becomes less than 0.5 feet in depth, there will be a variety of rushes, sedges and other hydrophytes.

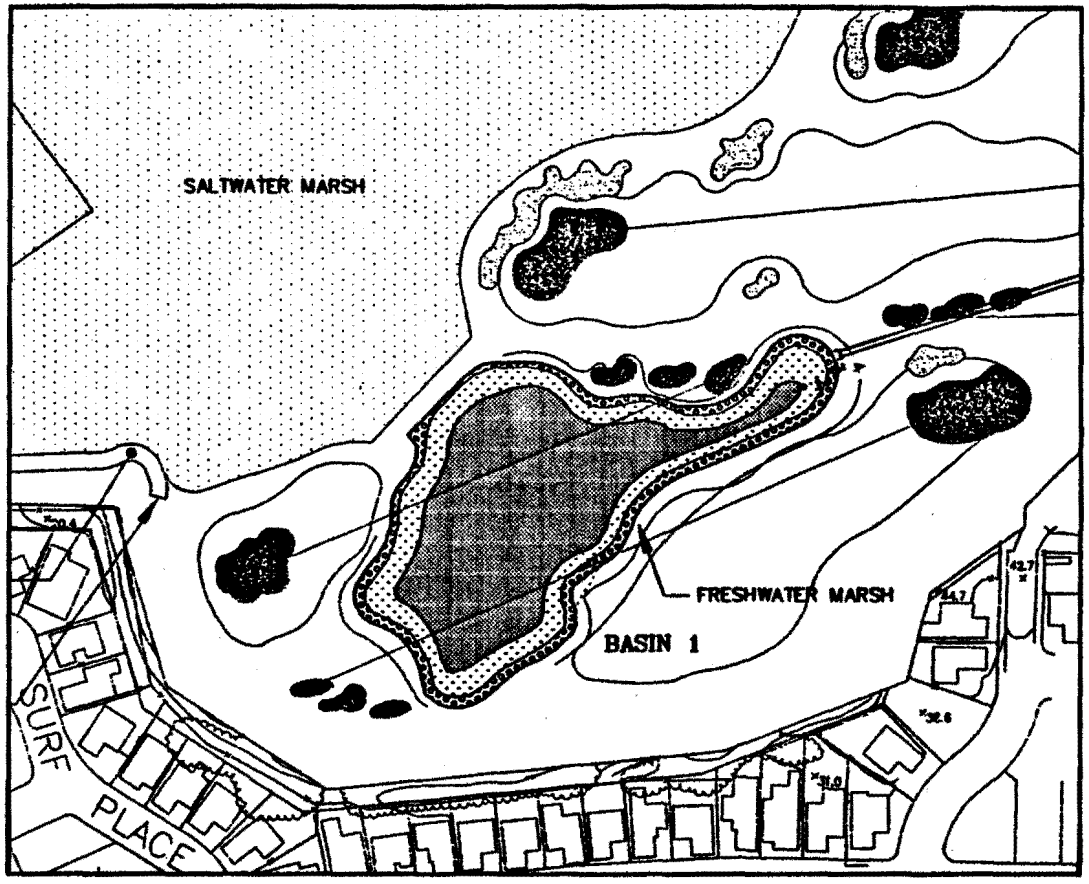
Dominant species within the created freshwater marsh community will consist of perennial emergents including Olney's bulrush (*Scirpus americanus*) and narrow-leaved cattail (*Typha angustifolia*) with sub dominants including coastal bulrush (*Scirpus robustus*)[2], small-fruited bulrush (*Scirpus microcarpus*), and California bulrush (*Scirpus californicus*). Near the shore of the ponds where the water is only inches deep, smaller stature species will be utilized including creeping spikerush (*Eleocharis macrostachya*), needle-stemmed spikerush (*Eleocharis acicularis*), rugulose rush (*Juncus rugulosus*) and iris-leaved rush (*Juncus xiphioides*).

Olney's bulrush, narrow-leaved cattail, small-fruited bulrush, and coastal bulrush have been selected as dominants (or sub-dominants), because these species are lower in stature (typically reaching heights of less than five feet) than other species of bulrush or cattail (often reaching ten to 15 feet). This will allow for better lines-of-sight over the pond/marsh areas for the golfers while still providing dense cover and large seeds for wildlife. Areas away from tees and greens will receive scattered plantings of the taller California bulrush, adding greater structural diversity to the marsh.

The freshwater hydrophytes listed in Table 10 below constitutes the plant palette for the freshwater marsh. Figures 22A and B show the freshwater marsh planting plan.

[2]Maritime bulrush (*Scirpus maritimus*) is closely related to the coastal bulrush and may be substituted if necessary due to availability.

MP EB1



N

GRAPHIC SCALE IN FEET

0 75 150 300

LEGEND	ACRES
OPEN WATER	1.6
EMERGENT MARSH WITH BULRUSHES & CATTAILS, 1'-2' DEEP	0.8
EMERGENT MARSH TRANSITION TO WET MEADOW HABITAT, RUSHES, SPIKERUSHES & SEDGES, 0-1' DEEP	0.5
PIPE CONNECTION	
TOTAL	2.9

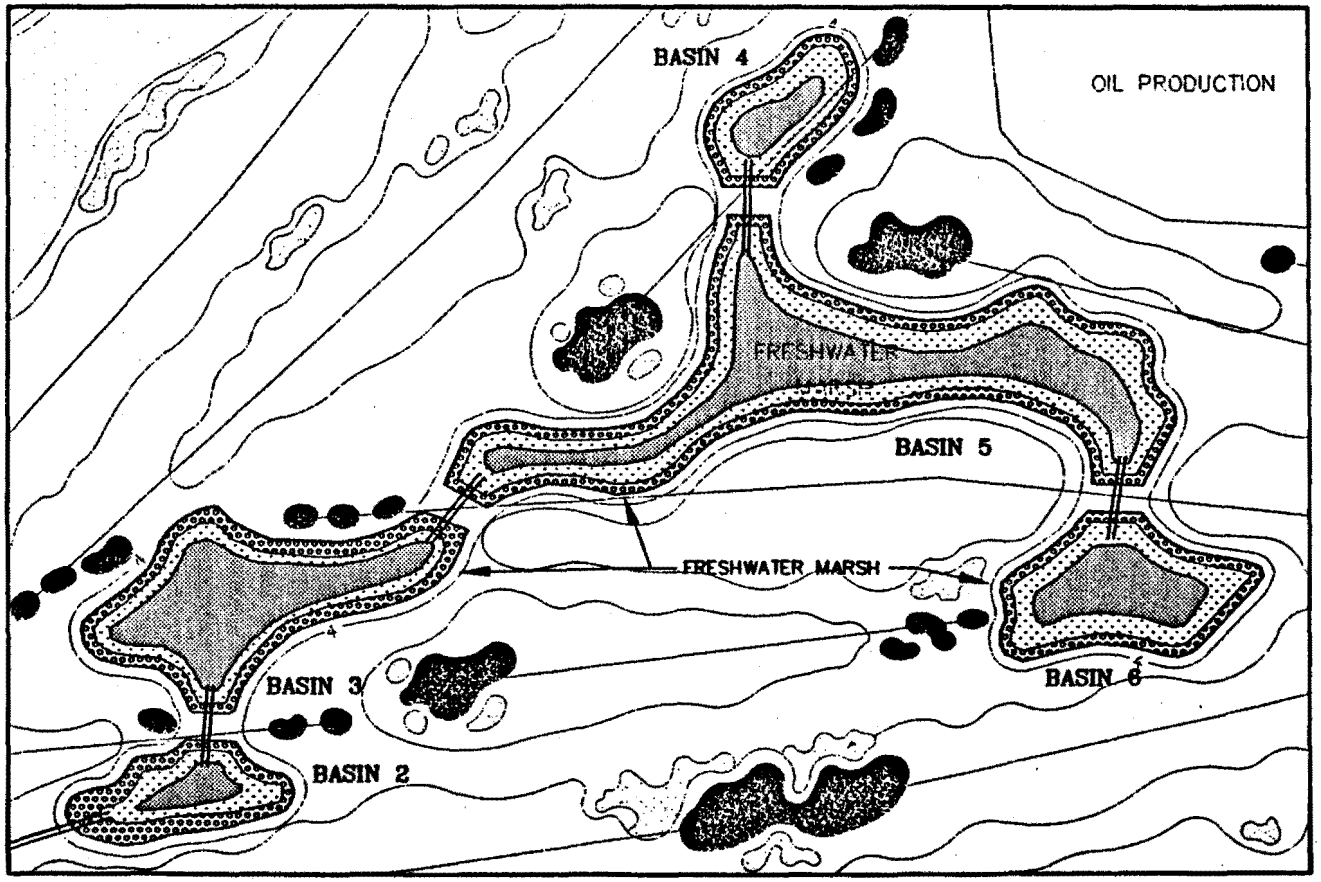
MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH PLANTING PLAN-BASIN 1

10-18-95

FIG. 22A



LEGEND

	ACRES
OPEN WATER	2.6
EMERGENT MARSH WITH BULRUSHES & CATTAILS, 1'-2' DEEP	2.3
EMERGENT MARSH TRANSITION TO WET MEADOW HABITAT, RUSHES, SPIKERUSHES & SEDGES, 0-1' DEEP	1.9
PIPE CONNECTIONS	
TOTAL	6.8

GRAPHIC SCALE IN FEET

0 75 150 300

MOFFATT & NICHOL ENGINEERS

HELLMAN RANCH WETLAND PLAN

FRESHWATER MARSH
PLANTING PLAN-BASINS 2-6

DATE 10-16-96

FIG. 22B

MAE133

TABLE 10

FRESHWATER MARSH PLANT PALETTE[3]

Species	No. of Units per Acre	Size	Density
Narrow-leaved cattail (*Typha angustifolia*)	2,722/acre	liners	4 ft.
Olney's bulrush (*Scirpus americanus*)	2,722/acre	liners	4 ft.
California bulrush (*Scirpus californicus*)	500/acre	liners	scattered
Small-fruited bulrush (*Scirpus microcarpus*)	500/acre	liners	scattered
Coastal bulrush (*Scirpus robustus*)	500/acre	liners	scattered
Creeping spikerush (*Eleocharis macrostachya*)	1,000/acre	liners	scattered
Needle-stemmed spikerush (*Eleocharis acicularis*)	1,000/acre	liners	
Rugulose rush (*Juncus rugulosus*)	500/acre	liners	scattered
Iris-leaved rush (*Juncus xiphiodes*)	500/acre	liners	scattered
Mexican rush (*Juncus mexicanus*)	500/acre	liners	edge of ponds
Common monkey flower (*Mimulus guttatus*)	4 lbs/acre	seed	scattered
Scarlet monkey flower (*Mimulus cardinalis*)	2 lbs/acre	seed	scattered
Clustered field sedge (*Carex praegracilis*)	500/acre	liners	edge of pond
San Diego sedge (*Carex spissa*)	1 lb/acre	seed	scattered
Hooker's evening primrose (*Oenothera elata hookeri*)	1 lb/acre	seed	scattered

[3]This is a proposed plant palette; however, in the event that one or more of the proposed species are not available at the time of planting, similar native hydrophytes will be substituted as determined appropriate by the Project Restoration Specialist/Ecologist.

6.4.3 Freshwater Marsh Buffers

As a buffer, extending for approximately 5 to 10 feet from the edge of the ponds, wet meadow species will be planted, including clustered field sedge (*Carex praegracilis*) and Mexican rush (*Juncus mexicanus*). The buffer will provide a transition area from the freshwater marsh to the turfgrass of the golf course.[4]

6.4.4 Target Species

The open water/freshwater marsh complex has been designed to attract a large variety of native resident and overwintering birds may of which are also expected to utilize the onsite saltwater marsh habitat as well. A total of 20 species have been targeted as species for which to provide breeding and/or foraging habitat as well as cover and a reliable freshwater source. Table 11 lists the target species, their residential status and types of habitat (freshwater versus saltwater) most commonly utilized.

TABLE 11

TARGET BIRD SPECIES
OPEN WATER/FRESHWATER CREATION AREAS

Target Species	Resident Period	Freshwater (F) or Saltwater (S)	Comments
Podilymbus podiceps pied-billed grebe	Winter	F & S	High Potential
Ardea herodias great blue heron	Resident	F & S	High Potential
Ardea albus great egret	Resident	F & S	High Potential
Egretta thula snowy egret	Resident	F & S	High Potential
Butorides striatus green heron	Resident	F & S	High Potential
Nycticorax nycticorax black-crowned night-heron	Resident	F & S	High Potential
Anas platyrhynchos mallard	Resident	F & S - Open Water	High Potential

[4]The wet meadow species are typically low growing and will not require mowing or spraying with herbicides.

TABLE 11 (Continued)

TARGET BIRD SPECIES
OPEN WATER/FRESHWATER CREATION AREAS

Target Species	Resident Period	Freshwater (F) or Saltwater (S)	Comments
Anas acuta northern pintail	Winter	F & S - Open Water	High Potential
Anas cyanoptera cinnamon teal	Winter	F & S - Open Water	High Potential
Anas clypeata northern shoveler	Winter	F & S - Open Water	High Potential
Anas americana American wigeon	Winter	F & S - Open Water	High Potential
Aythya affinis lesser scaup	Winter	F & S - Open Water	High Potential
Oxyura jamaicensis ruddy duck	Winter	F - Open Water	High Potential
Rallus limicola Virginia rail	Winter	F	Rare - Possible in Winter
Porzana carolina sora	Winter	F	Rare - Possible in Winter
Gallinula chloropus common moorhen	Winter	F	High Potential
Ceryle alcyon belted kingfisher	Resident	F & S	High Potential
Geothlypis trichas common yellowthroat	Resident	F	High Potential
Passerculus sandwichensis beldingi Belding's savannah sparrow	Resident	S	High Potential
Agelaius phoeniceus red-winged blackbird	Resident	F	High Potential
Agelaius tricolor tricolored blackbird	Resident	F	High Potential

6.4.5 Freshwater Marsh Habitat Site Preparation

A biological monitor will be on-site on an as-needed basis to facilitate appropriate soil treatments, weed removal activities, etc.

Site Grading - Surface grading will be accomplished during the construction of the golf course including excavation and grading of the 7 basins.

Soils Treatment - Soil tests will be performed prior to the development of construction-level documents to determine the necessity of any soils amendments. Soil will be tested for salinity levels and petroleum content (from heavy machinery). It is anticipated that little or no amendment will be necessary in portions of the revegetation sites covered with salvaged vegetation and topsoil materials. The sites will not be fertilized to discourage the establishment of weed species.

Weed Removal - Any weed species that become established at the revegetation sites, prior to the initiation of revegetation implementation, will be removed by hand or with minimal amounts of the herbicide Rodeo. Weed species expected to occur at the sites include mustard (*Brassica* spp.), pigweed (*Amaranthus* spp.), tumbleweed (*Salsola kali*), mustard (*Brassica* spp.), and non-native grasses.

Irrigation - Because the basins will be fully filled (to +3.0 feet MSL) upon completion of the installation of the plants, it will not be necessary to provide additional sources of irrigation.

6.4.6 Construction Sequence of the Freshwater Marsh

Construction of the freshwater marsh requires completion of a series of tasks. Construction may occur during the nesting season between September and March because the existing nesting potential on the site is low. Pre-construction nesting surveys will be conducted to verify the nesting status, and construction will be prohibited during any documented nesting.

Creation of the freshwater marsh will include grading and construction of the basins, purchase and installation of the vegetation, maintenance and five years of biological monitoring.

hp E137

- Grade habitat to final restoration contours and initiate construction monitoring;
- Initiate irrigation activity to acclimate soils to the site;
- Plant and maintain freshwater marsh vegetation with an irrigation system; all planting will be conducted between September and March;
- Initiate post-construction monitoring and maintenance programs, and
- Evaluate and report project findings.

The follow further clarifies details of the construction process. The seven basins will be planted with approximately 6.1 acres of emergent wetland species, as container stock or hand broadcast as seed. Final plant quantities, plant locations and spacing, and plant sizes will be determined during the development of detailed construction level documents.

A biological monitor will be onsite during planting implementation on an as-needed basis to facilitate compliance with specified plant locations and planting methodologies, and to ensure that delivered plant materials are healthy and vigorous.

Plant species will be obtained from native species nursery suppliers such as:

- Tree of Life Nursery, (714) 728-0685
- Mockingbird Nursery, (909) 780-3571
- Native Sons Wholesale Nursery, (805) 481-5996
- Consentinos Nursery, (310) 456-6026
- S & S Seeds, (805) 684-0436
- Coastal Zone Nursery, (310) 457-3343

Seeds, cuttings, etc. will be collected from as many local or site-specific sources as possible.

Container species will be stored onsite in a secure area and will not be allowed to dry out, become sun-burned, or suffer any type of mechanical damage. Plant rootballs will not be exposed to drying or heating conditions.

6.5 Maintenance and Monitoring

6.5.1 Maintenance

A landscape maintenance Contractor experienced in maintaining revegetation/mitigation projects will be retained. The maintenance Contractor will be responsible for performing weed control, replacing failed plant species, providing general site maintenance, and performing any other maintenance tasks necessary to facilitate the successful establishment of the revegetation species as determined by the Project Restoration Specialist.[5] The maintenance Contractor will also be responsible for coordinating with the Project Restoration Specialist regarding site maintenance activities and any necessary remedial measures. At the end of each month, the maintenance Contractor will provide the Project Restoration Specialist with a report that summarizes all maintenance activities. The responsibility for maintenance will ultimately rest with the landowner and property manager.

Debris Clearing - As needed, debris which may become deposited within the freshwater marsh habitat will be cleared and removed from the project site.

Weed Control - In any newly established area, weedy species will easily become established. Some of these will be naturally suppressed by inundation. Others, however, if allowed to become established, can suppress the desired native species. Of particular concern in the freshwater marsh areas are, giant horseweed (*Conyza canadensis*), cocklebur (*Xanthium strumarium*), saltcedar (*Tamarisk ramosissima*), curly dock (*Rumex crispus*), and possibly giant reed (*Arundo donax*). The freshwater marsh will be closely monitored for the presence of these species. As they appear, the maintenance Contractor will remove them by hand (herbicides will not be used). Weed control activities will be performed on an as-needed basis. It is anticipated that weed control will occur most frequently during spring and summer months.

[5]Where appropriate, the golf course groundskeeper may perform routine maintenance such as weed control and replanting at the direction of the Restoration Specialist.

Ap E139

Replanting - Replanting and reseeding will be performed by the maintenance Contractor to replace any failed plants or to compensate for lack of seed mix germination at the direction of the Project Restoration Specialist. The Project Restoration Specialist will determine the quantity and size of replacement plants necessary to facilitate compliance with specified performance standards (see Monitoring section below).

6.5.2 Monitoring

The applicant will be responsible for retaining a Restoration Specialist to perform vegetation monitoring during the 5-year maintenance and monitoring period. The Project Restoration Specialist will be responsible for monitoring revegetation species' health and growth performance, facilitating compliance with specified performance standards through the provision of appropriate remedial action recommendations, and coordinating with the maintenance Contractor. The Project Restoration Specialist will have experience in native wetland creation, ecology, and monitoring.

Monitoring Surveys

Upon completion of planting, accurate records will be made of the germination success, species planted, species quantities, planting locations, and types of planting (container size, cutting, etc.). Any significant problems encountered, such as site conditions unsuitable for planting and pest infestation, will be recorded. Permanent photo documentation stations will be established at appropriate locations within the freshwater marsh creation areas to photographically record the progress of habitat establishment over the 5-year monitoring period. Permanent vegetative sampling stations will be established within the freshwater marsh. Transect lines and quadrants, encompassing at least 10 percent of the total freshwater marsh creation area, will be used to determine success (one quantitative survey per year).

After the initial planting effort has been completed, the freshwater marsh creation area will be monitored on a monthly basis for the first year and quarterly for the following 4 years. If during the last 2 years the planted species meet or exceed specified performance standards and guidelines, monitoring frequency will be decreased to three times a year, based on resource agency approvals. Quantitative data will be collected once a year using the vegetative sampling methodology outlined below to determine revegetation success. Qualitative surveys consisting

of a general site walkover and characterization of the revegetation sites will be completed during each monitoring visit. General observations, such as fitness and health of the vegetation and weed problems will be noted in each site walkover.

Information gathered during quantitative surveys will include species' densities, and species' coverage for all target plant species within the habitat creation areas. An average percent coverage and species' density will be calculated for all appropriate species in the habitat creation test areas and will be used to evaluate the overall growth performance of the entire site. In the event that any or all of the habitat creation should fail to meet the specified requirements, compliance will be ensured by performing appropriate remedial procedures listed in Table 12.

Monitoring procedures will be as follows:

- During the first year, monitoring will occur every month. One quantitative survey will be performed to determine planted species' growth performance and compare the revegetation site to existing similar habitats (control sites).

- During the second year, third, fourth, and fifth years, monitoring will occur on a quarterly basis. One quantitative survey will be performed to determine planted species' growth performance.

Replanting will be performed as necessary with the appropriate-sized stock to ensure that these performance standards are met. If substantial non-compliance with the performance standards listed above occurs, the permittee will consult the resource agencies to determine whether corrective measures and an extension of the 5-year monitoring period will be necessary. A report summarizing site performance will be submitted to the resource agencies at the end of each of the 5 years.

A1 E141

TABLE 12

REMEDIAL PROCEDURES

Performance Standard	Non-Compliance	Remedial Measure
80-percent survival of planted species (first year); 100-percent survival the remaining 4 years	<80-percent survival of trees; :10-percent deviation in understory species' survival rates	Replanting to ensure 80-percent survival of target species and <10-percent deviation in understory species" survival rates throughout the 5-year monitoring period. Provide supplemental monitoring for 5 years following planting (depending on resource agency input). Supplemental weed removal will be performed as necessary.
35-, 55-, 75-, 85-, and 90-percent coverage at years 1, 2, 3, 4, and 5	:5-percent deviation from specified coverage	Replanting using appropriate sizes and quantities to provide <5-percent deviation from specified percent coverages. Supplemental weed removal will be performed as necessary.
Replanting with appropriate species and species quantities to obtain <20-percent deviation from target species' densities. Supplemental weed removal will be performed as necessary. Planting with appropriate-sized stock to maintain <10 percent deviation from specified coverages	Tree heights listed in Table 9 (to be used as guidelines)	<10-percent deviation from specified coverages

At the end of the fifth year, the coverage guidelines will be used to evaluate the success of the habitat creation. The Project Restoration Specialist will determine the appropriateness of any variance in tree height (<10 deviation allowed).

6.5.3 Freshwater Marsh Performance Criteria

The performance goals for the wetland creation site include success standards and species composition guidelines determined during surveys of freshwater marsh habitats in coastal southern California. The performance standards and guidelines to be used include 80-percent survival of all planted species the first year and 100-percent survival for the remaining 4 years and/or 75-percent coverage of planted species at 3 years following planting and 90-percent coverage at 5 years following planting. The performance standards and guidelines listed below will be used as guidelines for providing functional habitat for wildlife species and for determining revegetation success.

- 35-percent coverage of target wetland species (<5-percent deviation allowed) at the end of first year of monitoring.
- 80-percent survival of all planted wetland species (<10-percent deviation allowed for understory species) at the end of first year monitoring.
- 55-percent coverage of target wetland species (<5-percent deviation allowed) at the end of the second year.
- 75-percent coverage of target wetland species (<5-percent deviation allowed) at the end of the third year.
- 85-percent coverage of target wetland species (<5-percent deviation allowed) at the end of the fourth year.
- 90-percent coverage of target wetland species (<5-percent deviation allowed) at end of fifth year.
- 100-percent survival of all planted wetland species (<10-percent deviation allowed for understory species) at the end of second, third, fourth, and fifth years.

The use of the site by wildlife species for foraging, nesting, and sheltering purposes will be considered as well as plant-growth rates and coverage, when evaluating success of the created habitat. The freshwater marsh creation will be considered successful if specified survival rates, species' composition/densities, and coverages are achieved and the site provides adequate habitat

M E/43

for wildlife species. The Project Restoration Specialist will use both qualitative (site walk-throughs, photo documentation, etc.) and quantitative (transects, quadrants, etc.) methods to evaluate compliance and non-compliance with specified performance standards, as well as the use of the planting area by wildlife species in the overall determination of success for the created habitat. The Project Restoration Specialist will recommend remedial actions as necessary to facilitate compliance with performance standards and successful establishment of freshwater marsh species.

Reporting

At the end of the first, second, third, fourth, and fifth years, an annual report that discusses the results of the monitoring efforts for each year and determines whether all the requirements specified in the habitat creation program have been achieved, will be submitted to the resource agencies. Surviving species' numbers, overall composition/densities, heights, and coverage, pest problems, additional maintenance procedures, and general health of the plantings will be summarized in these reports. Photographs from each photo documentation station will be included in the reports to provide visual documentation of the mitigation progress. Should it be determined at the end of any year that part of the planting has substantially failed to meet the requirements (percent coverage, percent survival rates, species' composition/densities, etc.) specified by the creation plan, and this report, recommendations for corrective measures will be listed in these reports so that the habitat establishment effort may be brought back into compliance as quickly as possible. If at the end of the 5-year monitoring period there is substantial non-compliance with specified performance standards, the permittee will consult the resource agencies. This consultation will be to determine whether the habitat creation effort is acceptable and represents the broad range of normality for each of the freshwater marsh habitats created. If such a determination cannot be made, additional maintenance by the permittee or corrective measures shall be prescribed.

Remedial Work

Remedial actions shall be based on detailed investigations (such as soil tests, and excavation of failed plantings to examine root development) to determine causes of failure and appropriate remedial actions. A brief report summarizing habitat creation site conditions including plant growth performance, plant health, the plant mortality, the presence of pests, the presence of weed

species, and any necessary remedial measures will be forwarded to the maintenance Contractor and the applicant by the Project Restoration Specialist following each monitoring site visit.

Contingency Plan

It at the 3-year milestone within the 5-year monitoring period the site is not functioning as anticipated, remedial measures will be taken to bring the site into compliance with performance criteria. Specific remedial measures will be determined at that time in coordination with regulatory/resource agencies.

Ap E145

7.0 AGENCY COORDINATION

Coordination will occur with resource agencies (CDF&G, USFWS, and the NMFS), regulatory agencies (U.S. Army Corps of Engineers and the California Coastal Commission), the County of Orange (Department of Harbors, Beaches, and Parks), and the City of Seal Beach. Coordination will help to refine mitigation goals and objectives, and evaluate the results of the mitigation program at key project milestones. Coordination meetings will also address issues of compliance with state and federal mitigation and regulatory permitting requirements.

8.0 RESPONSIBLE PARTIES

The applicant has prepared a preliminary proposed Restoration Plan and Specific Plan. These project plans have undergone environmental review under requirements of the California Environmental Quality Act to evaluate potential environmental impacts, project alternatives, and the need for mitigation measures. Ultimately, the Coastal Commission and the U.S. Army Corps of Engineers will make key permitting decisions with the input of the U.S. Fish and Wildlife Service, California Department of Fish and Game, National Marine Fisheries Service, Regional Water Quality Control Board and others including the City of Seal Beach. As described in the draft HRSP, the applicant is consulting closely with these agencies to identify their requirements. The proposed project is designed to meet and exceed all agency requirements.

MPE147

9.0 REFERENCES

Brinson, M.M. (1993). "A hydrogeomorphic classification for wetlands," Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

California Department of Fish and Game, Comment of Draft EIR for Hellman Ranch Specific Plan, 1987.

California Department of Fish and Game, Internal Memorandum from Robert Radovich, September 3, 1983.

Coastal Resources Management, "Wetlands Survey on the Hellman Ranch Property," August, 1996.

County of Orange, "Final EIR for the Bolsa Chica Local Coastal Program," 1996.

Cowardin, L.M. et al., "Classification of Wetlands and Deep Water Habitats of the United States," U.S. Department of the Interior, Fish and Wildlife Service. Washington D.C., 1979.

Levine, D.A., 1995 Results of Focused Biological Surveys to Determine the Status of the California Least Tern (*Sterna antillarum brownii*), the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*), the Coastal California Gnatcatcher (*Polioptila californica californica*), and Other Sensitive Species on the Hellman Ranch, City of Seal Beach, Orange County, California.

LSA Associates, "Analysis of Biological Resources for Hellman Ranch Supplemental EIR," 1989.

LSA Associates, "Hellman Property Wetland Restoration Plan," revised in January, 1990.

MacDonald, Keith B., "Plant and Animal Communities of Pacific North American Salt Marshes," in Wet Coastal Ecosystems, V. Chapman, ed., pp. 167-191. New York: Elsevier Scientific Publishing Co., 1977.

Massey, B.W. 1977, "A Census of the Breeding Population of the Belding's Savannah Sparrow in California," California Department of Fish and Game, Sacramento, California.

MBC Applied Environmental Sciences, "National Pollutant Discharge Elimination System, 1995 Receiving Water Monitoring Report, Los Angeles Region," 1995.

Michael Brandman Associates, Inc. 1987, "Final Subsequent Environmental Impact Report for the Hellman Ranch Specific Plan, "Prepared for the City of Seal Beach, Seal Beach, California.

Michael Brandman Associates, Inc., 1996, "Draft Biological Technical Report Hellman Ranch Specific Plan," "Prepared for Hellman Properties, LLC, Seal Beach, California.

MEC Analytical Systems, Inc., "Anaheim Bay Biological Monitoring Project, Final Report, Volume 1," Prepared for the Port of Long Beach, Long Beach, California, December 1995

Moffatt & Nichol Engineers, "Tidal Hydraulics Flood Flow Hydraulics, and Water Quality Assessment for the Proposed Plan at Bolsa Chica," September 1993.

Moffatt & Nichol Engineers. 1997. Final Hellman Ranch Wetland Restoration Plan. Prepared in Association with Coastal Resources Management and Michael Brandman Associates.

Radovich, Robert. 1980, "Determination of Wetlands within the City of Seal Beach, Immediately South and East of the San Gabriel River Channel (Ponderosa Seal Beach Wetlands)," California Department of Fish and Game.

Smith, R. Daniel, A. Ammann, C. Bartoldus, and M. Brinson. (1995). *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices.* Technical Report WRP-DE-9, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

State Water Resources Control Board. 1990. 1990 Water Quality Assessment. Division of Water Quality,. 226. pp.

U.S. Army Corps of Engineers, Lowell Flannery, personal Communication, October, 1996.

Ware, Rick, Personal Observation, 1997.

Wetland Research Associates, personal communication with Lorraine Parsons; "October 1996.

Wimer, M., "Habitat Assessment for Belding's Savannah Sparrow on Hellman Ranch based on the Visit of October 5, 1996."

Zedler, J.B., "The Ecology of Southern California Salt Marshes, A Community Profile," U.S. Fish & Wildlife Service, Biological Services Program, Washington, D.C., 1984A.

Zedler, J.B., "Salt Marsh Restoration, A Guidebook for Southern California," California Sea Grant Program, Report No. T-CSGCP-009, 1984B.

AP E 145

STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, *Governor*

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
200 Oceangate, Suite 1000
ong Beach, CA 90802-4302
(562) 590-5071

May 21, 1998

We.9.b

Wednesday, June 10, 1998
Coastal Commission hearing

5-97-367 (Hellman Ranch)

Appendix F

Pesticide Information

Page F-1 Applicant's May 11, 1998 letter to Coastal Commission staff

Page F-3 May 11, 1998 memo from Audubon International to the applicant, with the UC-IPM Pest Management Guidelines attached

Page F-81 "An Environmental Approach to Golf Course Development and Management", December 1996

HELLMAN PROPERTIES LLC
POST OFFICE BOX 2398
711 SEAL BEACH BOULEVARD
SEAL BEACH, CALIFORNIA 90740
(562) 431-6022 FAX: (562) 493-3130

RECEIVED
MAY 14 1998
CALIFORNIA
COASTAL COMMISSION

May 11, 1998

Mr. John T. Auyong
Staff Analyst
CALIFORNIA COASTAL COMMISSION
200 Oceangate • 10th Floor
Long Beach, CA 90802-4302

Re: CDP 5-97-367 • Request for Additional Information

Dear John:

This letter will address your comments in your April 30 and May 4 letter regarding the above referenced project.

A. April 30th Letter

1. Hellman Land Ownership

- There is no existing subdivision on the Hellman Ranch property.
- Attached is ownership documentation we provided to the City of Seal Beach for the proposed Tract Map.
- Shell Oil (now Signal Hill Petroleum) has a 50% producing interest in APN 980-36-605. Signal Hill Petroleum has no land rights.
- Hellman Properties LLC owns the entire operating interest for the mineral rights.
- APN 043-160-31 is owned by Southern California Edison.
- APN 043-160-54 is owned by Southern California Edison.
- APN 095-010-25 is owned by Southern California Edison.
- The grant deed, presumably, is on file at the Orange or Los Angeles County Recorder's office.

2. Pesticides

- The information regarding pesticides is attached. Of the 110 acres planned for the golf course, less than 10% of the property will use pesticides. As part of the environmental golf course management plan, pesticides will be selected using a risk-based assessment protocol, that will ensure materials to be used will act quickly, degrade quickly, are non-toxic and non-mobile. A monitoring program will also be established.

F1

commercial building and the Krenwinkle House. Another 40-feet of buffer/transition zone is also provided per the restoration plan.

5. Use of Mineral Production Areas for Future Wetland Expansion

- We have agreed to reserve land for future wetland expansion, in which the restoration would be completed by a third party. The extent of corrective action and/or remediation of all or a portion of this site has not been determined. However, it may be similar to the corrective action plan for this project that we are currently processing through the County of Orange and Regional Water Quality Control Board.

6. Pesticide Use on the Golf Course

- Please see A-2, above. A chemical free golf course is not possible in the southern California climate. Limiting their use and application is proposed by the applicant.

Please contact me if you have any questions.

Sincerely,

Dave Bartlett

Attachments:
1. Ownership documentation
2. Pesticide information
3. Addendum to Concept Wetlands Restoration Plan for the Hellman Ranch, 3/25/98
4. Matrix regarding changes to staff conditions
5. State Lands Commission Conceptual Site Plan
6. Hard copy of April 7, 1998 on-screen presentation (computer disks to come under separate cover)

Copies: Jerry Tone, Hellman Properties, w/o attachments

Audubon International

Center for Sustainable Resource Management
PO Box 1226 • Cary, NC 27512 • (919) 380-9640 • fax (919) 380-7415

MEMORANDUM

TO: Mr. Dave Bartlett

FROM: Miles M. (Bud) Smart, Ph.D.
Director, Department of Environmental Planning
Siena College-Audubon International Institute

DATE: May 11, 1998

REFERENCE: Hellman Ranch

Dear Dave,

I have attached a copy of the UC-IPM Pest Management Guidelines for turfgrass for 1997 (the most recent publication). This is the document produced by IPM Education and Publications, UC Statewide IPM Project, University of California-Davis that details recommended pest control for turfgrass in California. We will use this document as a starting point, and from this list carefully select pesticides for use on the golf course based on site specific conditions. This selection process will include, among others, the type of turfgrass, soils, pesticide properties, management practices (for example, the turf next to surface water features will be no spray zones), and an ecological risk assessment (following the procedures of the EPA) to select the most appropriate pesticides for this site.

Please give me a call if I may be of assistance in this matter.

Regards, Bud

Printed on Recycled Paper

P3

UC IPM Pest Management Guidelines: Turfgrass

December 1997

Authors

Insects and Mites: R. Cowles, K. Kido, H. Kaya, H. Costa

Diseases: M. E. Grebus, J. Hartin, A. H. McCain, H. D. Ohr

Nematodes: B. B. Westerdahl, E. Caswell-Chen

Weeds: C. L. Elmore, D. W. Cudney, V. Gibeault, C. Wilen

(For author affiliations, see F.1)

About this publication

These guidelines are available from:

- UC Cooperative Extension County Offices
- World Wide Web (http://www.ipm.ucdavis.edu)
- by subscription (as Publication 3365-T) from:
  Communication Services/
  DANR Publications
  6701 San Pablo Avenue
  Oakland, CA 94608-1239
  510-642-2431; 800-994-8849

Produced and edited by:
IPM Education and Publications
UC Statewide IPM Project
University of California, Davis
Guidelines Coordinator: B. Ohlendorf
Technical Editor: M. L. Flint
Production: M. Brush

Note to readers: These guidelines represent the best information currently available to the authors and are intended to help you in making the best choices for an IPM program. Not all registered materials are mentioned. Always check the label and with local authorities for the most up-to-date information regarding registration and restrictions on pesticide use. Check with your agricultural commissioner for latest re-entry intervals.

University of California
Division of Agriculture and
Natural Resources

UC IPM

Table of Contents

		page	updated
A.	Turfgrass Species (section reviewed 7/96)	A.1-3	12/97
B.	Insects and Mites (section reviewed 8/97)		
	General Information	B.1-2	8/97
	Australian Sod Fly	B.3	8/97
	Bermudagrass Mite	B.4	8/97
	Bermudagrass Scale	B.5	8/97
	Billbugs	B.6-7	12/97
	Black Turfgrass Ataenius	B.8-9	12/97
	Cutworms and Armyworms	B.10-11	12/97
	Dichondra Flea Beetle	B.12	8/97
	Fiery Skipper	B.13-14	12/97
	Leafhoppers	B.15	8/97
	Sod Webworms	B.16-17	12/97
	Plant Bugs	B.18	8/97
	Southern Chinch Bug	B.19-20	8/97
	Masked Chafers	B.21-22	12/97
C.	Diseases (section reviewed 7/96)		
	Use of Fungicides	C.1	7/96
	Anthracnose	C.1	7/96
	Curvularia Blight	C.2	12/97
	Fairy Ring	C.3	7/96
	Fusarium Blight	C.4	12/97
	Summer Patch	C.5	7/96
	Pythium Blight	C.6	8/97
	Rhizoctonia Blight	C.7-8	12/97
	Sclerotium Blight	C.9	8/97
	Loose Smut	C.10	7/96
	Dollar Spot	C.11	12/97
	Necrotic Ring Spot	C.12	12/97
	Leaf Spot	C.13	12/97
	Leaf Blotch	C.14	12/97
	Powdery Mildew	C.15	7/96
	Rust	C.16	7/96
	Stripe Smut	C.17	7/96
	Fusarium Patch	C.18	12/97
	Melting Out	C.19	12/97
	Red Thread	C.20	7/96
	Spring Dead Spot	C.21	7/96
	Take-All Patch	C.22	7/96
	Seed Rot and Damping Off	C.23	7/96
	Pythium Root Rot	C.24	7/96
D.	Nematodes (section reviewed 8/97)	D.1-2	8/97
E.	Weeds (section reviewed 7/96)		
	Integrated Weed Management	E.1-8	7/96
	Special Weed Problems	E.9-10	8/97
	Common and Scientific Names of Weeds	E.11	12/97
	Sensitivity of Turf Species to Herbicides	E.12	8/97
	Susceptibility of Weeds to Herbicide Control	E.13-14	12/97
	Herbicide Treatment Table	E.15-20	8/97
F.	Precautions and Notes	F.1	12/97

F5

Turfgrass Species

(Updated 12/97)

Proper selection of a turf species is an important component of an integrated pest management program. When turf species are planted in areas where they are not well adapted, they require greater care to grow and maintain and are more susceptible to invasion by pests. The major species used for turfgrass in California are outlined below. Cultivars are continually being developed or improved. For the latest information, consult your farm advisor or local nursery. Information on establishing and maintaining a healthy stand of turfgrass is outlined in the Weed section.

BENTGRASS (*Agrostis* spp.). Two species of bentgrass commonly used for turf are colonial and creeping bentgrasses. Colonial bentgrass is best adapted to the coastal region in central and northern California where it is used for general lawn areas. It is a fine-textured grass with upright leaves and dense growth. Colonial bentgrass grows best in cool, humid weather, and can tolerate some shade; it has low tolerance to heat, salinity, water stress, and traffic. Colonial bentgrass requires frequent irrigation because it has a shallow root system. It tends to be susceptible to a wide range of diseases.

Creeping bentgrass is a specialty grass used for golf course putting greens, lawn bowling greens, and lawn tennis facilities. It is capable of withstanding very low cutting heights. Creeping bentgrass is a very fine-textured grass with flat, narrow leaves, a bright green color, and a shallow root system. It requires a high level of nitrogen fertilization and needs to be irrigated fairly frequently because of its shallow roots.

KENTUCKY BLUEGRASS (*Poa pratensis*). Kentucky bluegrass produces a dense turf with dark green, medium-textured leaves; it spreads by rhizomes. Kentucky bluegrass grows best in fall, winter, and spring when temperatures are cool; during summer its growth slows. Kentucky bluegrass requires frequent irrigation during the summer months because of its shallow root system.

RYEGRASS (*Lolium* spp.). The species of ryegrass used for turfgrass are annual and perennial ryegrass. Annual ryegrass is used principally for overseeding bermudagrass in winter: it is well adapted to sunny conditions and survives well during the cooler months. Annual ryegrass has low heat tolerance, is coarse textured, and shiny dark green. It dies in late spring to early summer.

Perennial ryegrass is well adapted to sunny or partially shady conditions. It grows best during periods of cool temperatures and is very competitive, rapidly establishing a uniform green cover. Fall seeding is preferred. Perennial ryegrass has a bunchgrass-type growth habit, thus open areas should be reseeded. It is extremely vigorous in its growth, particularly in the seedling stage, thus minimizing weed invasion. Selection of new, improved perennial ryegrass cultivars will decrease invasion of weeds compared to the older pasture-type cultivars such as Linn perennial ryegrass.

KENTUCKY BLUEGRASS AND PERENNIAL RYEGRASS MIX. For general lawns, mixing Kentucky bluegrass and perennial ryegrass is preferred over planting either species singly. The mixture results in a more disease-resistant turfgrass stand offering good color and year round growth. By weight, at least 15 percent perennial ryegrass seed is recommended in the mixture.

TALL FESCUE (*Festuca arundinacea*). Tall fescue is well adapted to sunny or partially shady conditions. It is coarse-textured, although newer cultivars are finer textured, but not as fine as perennial ryegrass. Tall fescue has good disease resistance and excellent tolerance to heat stress. Unlike bermudagrass or Kentucky bluegrass, tall fescue is a bunch-type grass, thus open areas need to be reseeded. The extremely vigorous growth of tall fescue is a deterrent to weed invasion. Selection of new, improved turf-type tall fescue cultivars can improve the

F7

competitiveness of the turf over the older pasture-type tall fescue cultivars such as Kentucky 31 or Fawn.

FINE FESCUE (*Festuca rubra commutata*). Fine fescue is a fine-textured, cool season turfgrass that can have either a clumped or creeping type of growth. Fine fescue makes a dense, wear resistant turf when well established. It is usually mixed with other turf species because it tolerates shade well, thus it will fill in shady areas. It is often mowed at 1 to 1.5 inches to tolerate heat in California. Fine fescues do not like excessive nitrogen.

COMMON BERMUDAGRASS (*Cynodon dactylon*). Common bermudagrass is drought tolerant and well adapted to sunny conditions. It is a medium, coarse-textured grass with a gray green color, but it becomes dormant and loses its color in cold weather. Common bermudagrass establishes a deep root system and produces long rhizomes and stolons. Plant common bermudagrass in spring or summer at a rate of 1 lb seed/1000 sq. ft. Common bermudagrass requires frequent mowing to maintain an attractive quality. It has good wear quality when it is growing, but produces heavy thatch and can produce thatch in light traffic areas. There are new seeded cultivars of common bermudagrass that have improved turfgrass quality characteristics.

HYBRID BERMUDAGRASS. Cultivars of hybrid bermudagrass include Tifgreen, Tifway II, and Santa Ana. All hybrid bermudagrass cultivars form thatch that must be removed periodically by verticutting. Hybrid bermudagrasses are drought tolerant, but good irrigation practices will enhance their competitiveness.

Tifgreen is well adapted to sunny conditions. It becomes dormant and loses color during periods of cold temperatures, but less than common bermudagrass. This cultivar is fine textured with dense, prostrate growth. It produces few seed heads and has a deep blue green color.

Tifway II is also well adapted to sunny conditions. It retains its color in winter better than any of the other bermudagrasses. This cultivar has a medium fine texture, a dark green color, and dense growth; it can withstand traffic better than Tifgreen.

Santa Ana has excellent wear characteristics and a dark color. Its requirements are similar to those of the other hybrids, but Santa Ana is more tolerant of smoggy conditions.

KIKUYUGRASS (*Pennisetum clandestinum*). Kikuyugrass is well adapted to coastal regions within fifty miles of the ocean in southern California and central California. It is spreading to some of the inland valleys as well. Kikuyugrass is a coarse-textured, hairy, light green, perennial, warm season grass that spreads aggressively by very thick rhizomes and stolons; its leaves are coarse textured and hairy. Kikuyugrass has good drought, heat, and wear tolerance, but it is difficult to mow and is prone to thatch heavily. It was first considered a weed, but is now also used as a turf.

ST. AUGUSTINEGRASS (*Stenotaphrum secundatum*). St. Augustinegrass is well adapted to areas with full sun or moderate shade; it is the most shade tolerant warm season grass. It is a coarse-textured, creeping grass of medium green color. St. Augustinegrass is propagated by stolons and forms a dense, prostrate turf that is virtually weed free, but thatch is a severe problem. St. Augustinegrass frequently needs iron as a fertilizer supplement. It is relatively drought tolerant.

ZOYSIAGRASS (*Zoysia japonica*). Zoysiagrass grows well in full sun, although it is tolerant of moderate shade. Zoysiagrass is medium textured, dark green in color, and is slow to establish from stolons or rhizomes. It turns brown when it is dormant in winter. Zoysiagrass is an attractive, uniform, dense, low-growing, good quality grass that requires less fertilization than bermudagrass. Zoysiagrass is moderately deep rooted and thus requires infrequent irrigation. Vertical mowing is needed periodically to reduce excessive thatch and scalping.

DICHONDRA (*Dichondra micrantha*). Dichondra will grow in partial shade, but it does best in full sun under cool coastal conditions. It is not a turfgrass but a low-growing perennial, broadleaf ground cover. Mowing dichondra is a matter of personal preference, it may either remain unmowed or be mowed. Dichondra has a deep root system when properly irrigated. Frequent irrigation to maintain dichondra increases weed invasion.

F9

Insects and Mites

GENERAL INFORMATION

(Updated 8/97)

MONITORING

It is important to accurately identify insects found in lawns as many of them are not pests. In addition, the most effective treatment for one pest may not work on another.

To detect cutworms, sod webworms, southern chinch bugs, fiery skipper larvae, and billbug adults, use the pyrethrum test. This test involves mixing 1 tablespoon of a commercial garden insecticide containing 1 to 2% pyrethrins in 1 gallon of water. If the insecticide has only 0.5% pyrethrins, use 2 tablespoons. One to two fluid ounces of a dishwashing liquid can be substituted for pyrethrins; while this test is easier to do than the pyrethrum one, it is not quite as sensitive. Apply the solution to 1 square yard of turf as evenly as possible using a sprinkling can. This will irritate the insects so that they move to the surface within 10 minutes. Use the descriptions in this guideline to accurately identify the insects. White grubs and billbug larvae will not respond to the pyrethrum test. Specific monitoring guidelines for these pests are given under their respective descriptions.

In large lawn areas such as parks, golf courses, and cemeteries, monitor several locations to determine the extent of an infestation. Certain pests, such as white grubs, often repeatedly infest limited areas where adults prefer to lay their eggs. If problems are localized, spot treatments may be suitable.

TREATMENTS

Before applying a treatment for foliar or thatch-dwelling pests, irrigate the turf well and then treat as soon as the plants dry. Apply the required amount of insecticide in enough water to thoroughly wet the grass down to the ground; for foliage feeders such as the fiery skipper, sod webworm, armyworms, and cutworms 2 to 5 gallons of water per 1,000 square feet of turf works well. The Bermudagrass mite as well as the root-feeding pests (billbugs, black turfgrass ataenius) require a greater volume of water (25 gallons per 1,000 square feet) to move the pesticide into the area where the pest is feeding. Insects that feed in the thatch layer (southern chinch bug) should have treatments applied in 10 to 25 gallons of water per 1,000 square feet of turf. Do not irrigate following a chemical application until necessary to prevent wilting; this will allow the insecticide to remain on the plants for the longest possible period. Do not apply insecticides when temperatures exceed 90°F or to water-stressed dichondra.

When applying parasitic nematodes, irrigate before and after the application. In addition, soil temperatures must also be above 60°F when applying nematodes. During hot weather, apply nematodes in the morning or late evening and irrigate every few days for 2 weeks after the application to keep the soil moist, but not soggy. When treating for pests that feed below ground on grass roots, irrigate following application.

In general, sprays work best when treating foliar turfgrass pests, but granular formulations are acceptable for controlling white grubs, bill bugs, chinch bugs, cutworms, skipper larvae, and sod webworms. Granules are advantageous when attempting to control pests residing in or below the thatch layer because they move past leaf blades and partially penetrate the thatch layer. However, granular insecticides are often a second choice relative to wettable powders or emulsifiable concentrate formulations because they do not work as fast and because of accidental ingestion by birds.

Predators and parasites of turfgrass pests are disrupted by broad-spectrum insecticides such as pyrethroids (e.g., fluvalinate and cyfluthrin), carbamates (carbaryl), and to a lesser extent, organophosphates (e.g., chlorpyrifos and acephate). Alternatives such as insect pathogenic nematodes and *Bacillus thuringiensis* (Bt) control a narrower range of organisms,

F11

thus preserving naturally occurring beneficial insects. Some applications, for example the pathogenic nematode, *Steinernema carpocapsae*, against cutworms and black turfgrass ataenius, have been shown to be equally effective as conventional insecticides. Bt products are typically inexpensive, but timing is very critical for effecting control; therefore, use of this material requires additional scouting. The additional material expense of nematodes or effort involved in scouting when using Bt has the ultimate payoff in allowing natural enemies, such as tiphiids (white grub parasites) and big-eyed bugs (Geocoris), to remain part of the turf system. (For sources of commercially available nematodes, check the pamphlet *Suppliers of Beneficial Organisms in North America*, available for free from California Department of Pesticide Regulation, P.O. Box 942871, Sacramento, CA 94271-0001, 916-654-1144.)

AUSTRALIAN SOD FLY

Scientific Name: *Inopus rubriceps*
(Updated 8/97)

DESCRIPTION OF THE PEST

In California, the Australian sod fly is currently found only in the San Francisco Bay Area. Adult male flies are 0.25 inch (6 mm) long, black, with yellowish legs. Females are 0.4 inch (9.5 mm) long, black, with reddish legs and a red head. Adults may be active in May, but their major period of activity is from September through November. Eggs are laid in the soil. After hatching, larvae may take 2 years to complete development. Fully grown larvae are 0.5 inch (1.3 cm) long maggots with flattened, distinctly segmented bodies that are light tan with a coarsely granular surface. There are six long, stiff bristles per segment, no legs, and a distinct, conical black head capsule. The flattened and distinctly segmented body of the sod fly larvae easily distinguishes this species from other maggots, such as the march fly, that occur in turf but mostly feed on decaying organic matter.

DAMAGE

Australian sod fly can affect all turf species. Larvae feed on sap from the roots of grasses. As a result of their feeding, grass declines and is replaced over time with broadleaf weeds.

TREATMENT

There are no known biological or cultural controls and no registered chemical controls.

F13

BERMUDAGRASS MITE

Scientific Name: *Eriophes cynodoniensis*
(Updated 8/97)

DESCRIPTION OF THE PEST

The bermudagrass mite is a typical eriophyid mite that is so small it can barely be seen even with a 10X hand lens. It has a wormlike shape with all four legs and mouthparts at the anterior end. Eggs are spherical, transparent, and about one-third the length of the adult mite. They are laid under leaf sheaths. One generation, from egg through two nymphal stages and reaching the egg-laying adult stage again, takes 7 to 10 days in summer when temperatures are in the 80° to 110°F range.

DAMAGE

Adult and immature mites suck juices and inject toxic saliva that shortens internodes and swells leaf sheaths, forming a witches'-broom growth pattern. Damage first appears in spring and is followed by dieback and browning in summer.

CULTURAL CONTROL

This pest only feeds on bermudagrasses. Hybrid bermudagrasses, *Cynodon transvaalensis*, show resistance to bermudagrass mite and are better to grow than common bermudagrass, especially in high temperature inland areas. Tifdwarf is a highly resistant cultivar. Reduced nitrogen fertilization and close mowing or scalping with removal of clippings can slow down reproduction of, or physically remove, bermudagrass mites.

WHEN TO TREAT

Examine leaf sheaths of stunted plants with a 10X or 30X hand lens for mites and their eggs. Damage thresholds have not been established for this pest, but if a treatment seems necessary, mow the turf closely and remove clippings first. This will not only physically remove most of the population (see cultural control), but may also displace remaining mites so that they are more readily contacted by the miticide. After mowing, irrigate the turf and spray while the grass is still wet. To increase the chance of getting the pesticide under the leaf sheath, add adequate spreader-sticker to the spray mixture. Do not water or cut the grass within 24 hours of chemical treatment. A second application 10 days after the first may be necessary to obtain satisfactory control.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. DIAZINON*	
(Diazinon) 4EC	2–3 fl oz
COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses. Highly toxic to birds.	
...*or*...	
(Diazinon) 50WP	1.25 oz
COMMENTS: Not for use on sod farms or golf courses. Highly toxic to birds.	
B. FLUVALINATE	
(Mavrik Aquaflow)	0.11–0.23 fl oz
COMMENTS: May cause coughing reaction in susceptible individuals.	
C. DICOFOL	
(Kelthane) 35WP	0.4–0.5 oz

** Apply sprays in 25 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

BERMUDAGRASS SCALE

Scientific Name: *Odonaspis ruthae*
(Updated 8/97)

DESCRIPTION OF THE PEST

Bermudagrass scales are 0.06 inch (1.6 mm) long, clam-shaped, white armored scales, found on the crown, stolons, and under leaf sheaths of bermudagrass. High populations of bermudagrass scales can give the grass stems and crowns a whitish, moldy appearance. Close examination of the grass with a hand lens will help to distinguish the clam-shaped shields of the scales.

The adult female produces eggs under her body covering. These hatch into crawlers that move to a new location, settle down, start to suck juices from the grass, and molt into the familiar sessile form. Two or three generations complete development each year.

DAMAGE

Bermudagrass scale infests both common and hybrid bermudagrasses in southern California. It occurs most frequently in shaded lawn areas and is favored by development of a heavy thatch. Feeding by the bermudagrass scale stunts the plants and causes them to appear dry. This scale is especially damaging to bermudagrass suffering from other stresses, such as shade or drought, and can kill large areas of turf under these conditions.

CULTURAL CONTROL

Bermudagrass scale is dependent on shade. To reduce the amount of shade in the turf, remove excessive thatch, thus opening up the turf to light as well as removing some of the bermudagrass scale population with the thatch. Do not plant bermudagrass in heavily-shaded areas.

TREATMENT

There are no registered chemical control options.

FIE

BILLBUGS

Scientific Names: Phoenix billbug: *Sphenophorus phoeniciensis*
Hunting billbug: *Sphenophorus venatus vestitus*

(Updated 12/97)

DESCRIPTION OF THE PESTS

The Phoenix and hunting billbugs are dark brown and light brown, respectively, 0.33 inch (8.38 mm) long weevils (snout beetles) with a long, downward-pointing proboscis (snout), and elbowed, clubbed antennae. The hunting billbug is less common in California and has a Y-shaped marking on the thorax with separate, inward-facing marks that resemble parentheses on either side of the Y. These two marks in the Phoenix billbug combine to form an M. Adults are often seen walking on paved areas, but are difficult to find in turf unless a pyrethrum or detergent test is used. Eggs are inserted into grass stems. They hatch about 6 to 8 weeks after adults first appear. Larvae are creamy white, legless, and somewhat hunch-backed, C-shaped grubs with a brown head. The lack of legs distinguish these grubs from white grubs.

DAMAGE

Billbug larvae first feed on the inside of the grass stem and crown, then move into the soil where they feed on roots. Fine, whitish, sawdustlike larval excrement (frass) may be observed on the soil surface. Because billbugs feed higher up on the plant than white grubs, billbug-damaged turf is easier to pull from the soil because it breaks at the crown. Root feeding to a depth of 3 inches does occur; however, damaged turf cannot be rolled back like a carpet and the soil does not feel spongy underfoot. All species of turf can be affected; however, zoysiagrass is preferred by hunting billbug while Phoenix billbug prefers bermudagrass. Turf planted on fumigated soil is especially susceptible to damage because of the loss of natural enemies. Drought-stressed turf is also more severely impacted than well-maintained turf.

BIOLOGICAL CONTROL

Commercially available nematodes, *Steinernema carpocapsae* or *Heterorhabditis bacteriophora* are well suited for controlling billbug larvae, especially in sod farms or other locations where the soil has been fumigated before sod establishment.

WHEN TO TREAT

If you suspect a billbug infestation, look for piles of fine frass at the base of turf plants. In areas where frass or damage is evident, dig up the turf to look for grubs. Treat when one or more grubs are found per square foot of turf. Apply nematodes to moist turf and irrigate following application of either nematodes or chemical insecticides to move the material into the zone of larval feeding activity.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. IMIDACLOPRID	
(Merit) 75 WP	3–4 teaspoons (0.15–0.19 oz)
(Merit) 75 WSP	0.15–0.19 oz (1 packet/8,250–11,000 sq ft)

COMMENTS: Maximum of 1 application/year. Applications cannot exceed 8.6 oz/acre/year (0.19 oz/1000 sq ft). Optimum control will be achieved when applications are made before egg hatch of the target pests followed by sufficient irrigation or rainfall. Applications should not be made when turfgrass areas are waterlogged or soil is saturated with water. Not for use on commercial sod farms.

...or...

(Marathon) 60 WP	10.7oz/acre
(Marathon) 60 WSP	1 packet/3000 sq ft

COMMENTS: For use on sod farms only. Apply May through July. For optimum control, treatment should be followed by rainfall or irrigation. Do not use less than 2 gal spray volume/1000 sq ft.

Pesticide (commercial name)	Amount/1000 sq ft**
B. DIAZINON*	
(Diazinon) 4EC	2–3 fl oz
COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses. Do not use where waterfowl may graze.	
...*or*...	
(Diazinon) 50WP	3 oz
COMMENTS: Not for use on sod farms or golf courses. Do not use where waterfowl may graze.	
C. STEINERNEMA CARPOCAPSAE	
(Scanmask)	25 million
...*or*...	
HETERORHABDITIS BACTERIOPHORA	
(Cruiser)	25 million
COMMENTS: Most effective larval treatment and the preferred choice on soil that has been fumigated to reintroduce these parasites into the soil. Store nematodes properly before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during the coolest time of day in hot areas.	
D. CHLORPYRIFOS	
(Dursban) 50W	0.75–1.5 oz
(Dursban Pro) 2E	1.5–3.0 oz

** Apply sprays in 25 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

F1-

BLACK TURFGRASS ATAENIUS

Scientific Name: *Ataenius spretulus*
(Updated 12/97)

DESCRIPTION OF THE PEST

The adult black turfgrass ataenius beetle is 0.2 inch (5 mm) long, shining jet black, and has parallel grooves on the wing covers (elytra). Adults can be seen any time of day, especially on green or tee areas on golf courses. Adult black turfgrass ataenius can easily be mistaken for another beetle, *Aphodius lividus* (not known to damage turf), which is slightly smaller, chocolate brown with straw-colored stripes near the center of the back and along the margin of the elytra. Female ataenius adults burrow into the thatch and upper soil where they lay clutches of 11 or 12 eggs. Eggs hatch into typical scarab grubs, which can be distinguished from other white grubs by their small size, the scattered pattern of bristles on the last abdominal segment and a pair of pads at the tip of the abdomen. At least two or three generations develop in California each year. Adults are continuously active during warm months in inland areas. They probably overwinter in a reproductive dormancy.

DAMAGE

Although black turfgrass ataenius is common in many turfgrass areas, it is predominantly a pest of golf courses, especially during summer on highly stressed, cool season grasses. It is also commonly found damaging bentgrass/rye mixed turf and in annual bluegrass. The larval stage damages turf by feeding on roots, resulting in irregular dead patches. The damaged area appears to be drought stressed, even where there is sufficient irrigation. Symptoms may resemble those of turf root diseases such as summer patch, take-all patch, and Pythium root rot. Extensive root feeding sometimes allows the turf to be rolled back like a carpet. Digging by vertebrate predators, such as crows, raccoons, and skunks, is a common indication of high grub populations.

BIOLOGICAL CONTROL

Milky spore (*Bacillus* spp.) organisms have recently been detected infecting black turfgrass ataenius in California. Milky spore pathogens affecting ataenius do not include the one that controls Japanese beetles and are not commercially available. When black turfgrass ataenius is infected with milky spore diseases in other geographical areas, it undergoes a 3- or 4-year boom-and-bust cycle at a site, then the site becomes protected from further damaging populations due to milky spore presence in the soil. It is not known at present if this will also occur in California. For short-term control, the parasitic nematodes *Steinernema carpocapsae* and *Heterorhabditis bacteriophora* appear to be quite effective.

CULTURAL CONTROL

Improve root development as much as possible to allow turf to withstand grub feeding by increasing the mowing height and by using small-tine or water injection aeration to promote deep rooting.

WHEN TO TREAT

Sample for black turfgrass ataenius grubs when the symptoms described above are observed and/or about 2 weeks after the adults are seen. Using a cup cutter (a tool commonly used on golf courses), sample for grubs underneath areas of turf damage, or in areas where grubs have been active in the past (collars, wet spots, and areas where black layer occur are preferred by grubs). Grubs will be present at the thatch/soil interface. If there are more than four grubs per cup cutter sample (or 40 grubs per square foot), treatment is probably necessary. Threshold levels are much lower for bentgrass grown in the desert region than the rest of the state because of the heat and high humidity. Apply liquid sprays or nematode applications to moist turf and granules to dry turf. In both cases irrigate following application to move the material into the zone of larval feeding activity.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. IMIDACLOPRID	
(Merit) 75WP	0.05 oz
(Merit) 0.5G	1.4 lb
(Merit) 75WSP	0.15 oz (1 packet/8250 sq ft)

COMMENTS: Use in areas that have had severe infestations of black turfgrass ataenius in the past. Maximum of 1 application/year. applications cannot exceed 8.6 oz/acre/year (0.18 oz/1000 sq ft). Optimum control will be achieved when applications are made before egg hatch of the target pests followed by sufficient irrigation or rainfall. Applications should not be made when turfgrass areas are waterlogged or soil is saturated with water. Not for use on commercial sod farms.

...or...

(Marathon) 60 WP	10.7oz/acre
(Marathon) 60 WSP	1 packet/3000 sq ft

COMMENTS: For use on sod farms only. Apply May through July. For optimum control, treatment should be followed by rainfall or irrigation. Do not use less than 2 gal spray volume/1000 sq ft.

B. CARBARYL*	
(Chipco Sevin)	6 fl oz
C. CHLORPYRIFOS	
(Dursban) 50W	1 oz
(Dursban Pro) 2E	3 oz
D. DIAZINON*	
(Diazinon) 4EC	3 fl oz

COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses.

E. TRICHLORFON	
(Dylox) 80	3.75 oz
F. STEINERNEMA CARPOCAPSAE	
(Scanmask)	25 million

COMMENTS: Store nematodes properly before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during the coolest time of day in hot areas.

G. HETERORHABDITIS BACTERIOPHORA	
(Cruiser)	25-35 million

COMMENTS: Store nematodes properly before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during the coolest time of day in hot areas.

** Apply sprays in 25 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

F19

CUTWORMS and ARMYWORMS

Scientific Names: Black cutworm: *Agrotis ipsilon*
Variegated cutworm: *Peridroma saucia*
Granulate cutworm: *Feltia subterranea*
Armyworm: *Pseudaletia unipuncta*

(Updated 12/97)

DESCRIPTION OF THE PESTS

Cutworms and armyworms are larvae of heavy-bodied, night-flying moths in the Family Noctuidae. The white or greenish eggs of these noctuids are laid in masses, darkening as they approach hatching. Larvae can grow up to 2 inches (5 cm) long and typically curl up and lie still when disturbed.

Although damage is similar, armyworms are distinct from cutworms in their behavior. While cutworms are usually solitary feeders, armyworm eggs are laid in masses and larvae will feed as a group. If there is a high population and food is scarce, armyworms will move as a group, feeding indiscriminately on plants in their path. Variegated cutworms are also known to march like armyworms when populations are high.

DAMAGE

Any turf species can be affected by any of these noctuid larvae; armyworms prefer damp areas. Cutworms and armyworms are active from mid-March to October. Cutworms and armyworms feed on leaves and crowns and may cut off plants near the soil surface. The larvae feed at night and hide in the thatch layer or in a burrow in the soil during the day. Look for close clipping of grass around aeration holes, which are commonly occupied by larvae. Damage appears as circular spots of dead grass or depressed spots.

BIOLOGICAL CONTROL

Larvae are parasitized by braconid wasps (*Apanteles* spp.) and by tachinid flies. Birds also commonly feed on armyworms and cutworms. The extensive contact noctuid larvae have with soil or thatch makes *Steinernema carpocapsae* nematodes a valuable control measure. *Bacillus thuringiensis* subsp. *kurstaki* (Bt is not as effective against cutworms and armyworms as for sod webworms; consider using Bt only when armyworms and cutworms are in the first and second instars.

CULTURAL CONTROL

Remove thatch to eliminate much of the daytime resting habitat for noctuid larvae. Armyworms tend to lay eggs in damp areas with rank growth, so eliminate such areas, if possible.

WHEN TO TREAT

Conduct a pyrethrum or detergent test (see GENERAL INFORMATION) to determine the infestation level. Consider treatment when there are more than five larvae per square yard. Mow the lawn and irrigate before treating. After treatment, do not mow or irrigate for at least 24 hours (in the case of Bt, delay watering a couple days) unless nematodes were applied, in which case apply a post-treatment irrigation.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. ACEPHATE (Orthene Turf, Tree, and Ornamental Spray)	1.2–2.4 oz (cutworms) 0.5–1.2 oz (armyworms)
COMMENTS: Odorous. Up to 2.4 oz material/1000 sq.ft. can be used for black cutworm.	
B. CARBARYL* (Chipco Sevin)	3 fl oz

Pesticide (commercial name)	Amount/1000 sq ft**
C. CHLORPYRIFOS	
(Dursban) 50W	0.75 oz
(Dursban Pro) 2E	1.5 fl oz
COMMENTS: Odorous.	
D. CYFLUTHRIN	
(Tempo) 20WP	0.175 oz (5 grams)
E. DIAZINON*	
(Diazinon) 4EC	2–3 fl oz
COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses.	
...or...	
(Diazinon) 50WP	3 oz
COMMENTS: Not for use on sod farms or golf courses.	
F. FLUVALINATE	
(Mavrik Aquaflow)	0.23 fl oz
G. TRICHLORFON	
(Dylox) 80S	2.5–3.75 oz
H. STEINERNEMA CARPOCAPSAE	
(Scanmask)	25 million
COMMENTS: Store nematodes properly before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during the coolest time of day in hot areas.	
I. BACILLUS THURINGIENSIS	Label rates
(various products)	
COMMENTS: Only effective on early instar larvae. Repeat application may be necessary. Breaks down rapidly in sunlight and washes readily off leaves.	

** Apply spray in 2–5 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

F21

DICHONDRA FLEA BEETLE

Scientific Name: *Chaetocnema repens*
(Updated 8/97)

DESCRIPTION OF THE PEST

Eggs are laid near the soil surface and require 3 days to hatch. The soil-dwelling larvae are white, with fine bristles and a light brown head capsule. Last (fourth) instar larvae are about 0.17 to 0.25 inch long. The white pupae are 0.05 inch long and are found in the same depths (up to 4 inches) in the soil as the larvae. Larvae require 22 to 25 days to complete development; pupation takes about 5 days. Adults are ovoid, about 0.06 inch long, and have greatly thickened hind femora for jumping. Newly emerged adults are white for one day, then turn a characteristic black color with a metallic reddish bronze tinge. The antennae, front, and middle legs are reddish yellow. Adults can be observed by passing a hand over affected dichondra. The disturbed adults will jump, some of them onto your hand or arm. Dichondra flea beetle overwinters as an adult.

DAMAGE

Dichondra flea beetles do not feed on grasses but seriously damage dichondra, causing many dichondra lawns to be replaced with grass turf. Larvae feed between May and October on small roots and the outsides of larger roots. This injury causes dichondra to wilt and die; often large patches are affected. Adults feed on dichondra leaves, producing distinctive crescent marks on the upper surface. Severely skeletonized plants may wither; however, this is most likely caused by larval root feeding. Larval populations can be assessed by placing turf soil cores in a Berlese funnel and extracting the larvae.

WHEN TO TREAT

Treat if populations are high enough that damage may occur.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. FLUVALINATE (Mavrik Aquaflow)	0.11–0.23 fl oz
B. ACEPHATE (Orthene Turf, Tree, and Ornamental Spray)	1–1.9 oz

COMMENTS: Odorous. Up to 2.4 oz material/1000 sq.ft. can be used for black cutworm.

** Apply in 25 gal water/1000 sq ft

FIERY SKIPPER

Scientific Name: *Hylephila phyleus*
(Updated 12/97)

DESCRIPTION OF THE PEST

Adult fiery skippers are orange or orange brown butterflies commonly seen feeding on lantana blossoms. Skippers are distinguished from other butterflies by having a hooked knob at the end of their antennae. Adult females glue hemispherical eggs singly to the underside of grass leaves. When larvae hatch, they first notch leaves. As they grow, they consume entire leaves. Larvae have distinctive reddish markings on the front of what appears to be an oversized black head, a narrowed neck followed by a dark thoracic shield, and a greenish pink body color with a granulated texture. Larvae spin silk shelters in the thatch from the third instar on, and are not readily seen unless flushed out with a pyrethrin or detergent test.

DAMAGE

Skipper larvae feed from May through September and damage appears as a 1- or 2-inch diameter round spot from which all the grass has been eaten by a single larva. If there is a large population, then these spots will coalesce into dead patches. Usually damage appears on turf planted near flower beds, where adult skippers feed. Bermudagrass is preferred by fiery skippers, though they also feed on St. Augustinegrass, bentgrass, crabgrass, and to a lesser extent, other grasses.

BIOLOGICAL CONTROL

Larvae are attacked by parasitic braconid and ichneumonid wasps. The extensive soil or thatch contact of fiery skipper larvae may make *Steinernema carpocapsae* nematodes a valuable control measure, although this has not been tested. *Bacillus thuringiensis* subsp. *kurstaki* (Bt) is a microbial insecticide that should be effective against fiery skipper, but this also has not been tested.

CULTURAL CONTROL

Remove thatch to eliminate larval habitat.

WHEN TO TREAT

Use the pyrethrum or detergent test to monitor this pest (see the section on MONITORING under GENERAL INFORMATION). Five larvae per square yard on bentgrass greens and fifteen per square yard in bermudagrass are reasonable estimates for treatment thresholds.

Mow the lawn and irrigate before treating. After treatment, do not mow or irrigate for at least 24 hours, unless nematodes were applied; they do best with a post-treatment irrigation. When using Bt products, delay normal watering a couple days.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. CARBARYL* (Chipco Sevin) 80WSP	1.5–3 fl oz
B. CHLORPYRIFOS (Dursban) 50W	0.75 oz
(Dursban Pro) 2E	1.5 fl oz
C. STEINERNEMA CARPOCAPSAE (Scanmask)	25 million

COMMENTS: Store nematodes properly before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during the coolest time of day in hot areas.

F23

Pesticide (commercial name)	Amount/1000 sq ft**
D. BACILLUS THURINGIENSIS (various products)	Label rates

COMMENTS: Breaks down rapidly in sunlight and washes readily off leaves.

** Apply in 2-5 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

LEAFHOPPERS

Scientific Names: *Draeculacephala minerva, Deltacephalus sonorus,* and others
(Updated 8/97)

DESCRIPTION OF THE PESTS

Adults are 0.125 to 0.25 inch long, wedge-shaped, active insects that jump and fly short distances when disturbed. Their colors vary by species; whitish green, yellow, and brownish gray are common colors, often the colors are speckled or mottled. Adults lay eggs into host leaves. Nymphs lack wings; their color varies with species. Disturbed nymphs have a characteristic habit of moving sideways or backwards. Generation time varies from 12 to 30 days, depending on species and temperature.

DAMAGE

All grasses can be affected by leafhopper feeding. Though these species are common, observations of injury are unusual. Both nymphs and adults suck sap from the leaves, resulting in yellowing or bleaching. Turf can lose vigor and die as a result of extended presence of high populations of leafhoppers.

WHEN TO TREAT

Treat if populations are high enough that damage may occur.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. CHLORPYRIFOS	
(Dursban) 50W	0.75 oz
(Dursban Pro) 2E	1.5 fl oz
COMMENT: Odorous.	
B. FLUVALINATE	
(Mavrik Aquaflow)	0.11–0.23 fl oz
C. ACEPHATE	
(Orthene Turf, Tree, and Ornamental Spray)	1 oz
COMMENTS: Odorous.	
D. CARBARYL*	
(Chipco Sevin) 80WSP	1.5–3 fl oz

** Apply in 2–5 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

SOD WEBWORMS

Scientific Names: Lucerne moth: *Nomophila noctuella*
Western lawn moth: *Tehama bonifatella*
Sperry's lawn moth: *Crambus sperryellus*

(Updated 12/97)

DESCRIPTION OF THE PESTS

Adult sod webworms, called lawn moths, are typical snout moths: they have labial palps (sensory appendages) that extend in front of the head. The moth holds its wings close to and over its body at rest, giving it a slender appearance. When disturbed, the moth makes a short flight close to the grass. At night, these moths drop their eggs indiscriminately into turf. The creamy larvae have a distinctive double row of brown or black spots down their backs, located at the base of long bristles. The Lucerne moth larva is somewhat larger than the other sod webworm larvae. During the day larvae reside in silk-lined burrows, writhing when disturbed. At night they emerge to feed.

DAMAGE

First instar sod webworm larvae are leaf skeletonizers. Later instars notch or cut off leaf blades that are drawn back into the burrow. Heavily-infested turf (more than 100 per square yard) quickly appears moth eaten, with irregular patches of brown grass or bare areas.

All turf species can be affected, however perennial ryegrasses and turftype tall fescues, which are infected with endophytes (symbiotic fungi), are resistant to sod webworms. Warm season grasses appear relatively tolerant of webworm feeding. The greatest damage can occur on drought-affected bluegrass and on bentgrass green and tee areas.

Lucerne moths are primarily a problem where clover and dichondra are mixed with turf. Control of these dicots helps minimize the damage caused by this pest.

BIOLOGICAL CONTROL

Natural enemies in California include a parasitic tachinid fly and two parasitic braconid wasps, along with earwig, rove beetle, robber fly, paper wasp, ant, and vertebrate predators. The extensive soil or thatch contact of sod webworms makes *Steinernema carpocapsae* nematodes a valuable control measure. *Bacillus thuringiensis* subsp. *kurstaki* (Bt), a microbial insecticide, can be used but it breaks down rapidly in sunlight, washes readily off leaves, and is ineffective against late instar larvae.

CULTURAL CONTROL

Thatch removal can assist in removing sod webworm habitat, however these larvae do not require a thatch layer to be present in very high numbers.

WHEN TO TREAT

Monitor for these pests from June to early October. Consider treating only when a pyrethrum or detergent test (see section on MONITORING under GENERAL INFORMATION) indicates there are more than 15 larvae per square yard. If Bt is used, apply it when there are predominantly early instar larvae. Other materials should be effective on both small and large larvae.

Mow the lawn and irrigate before treating. Nematode applications also require post-application irrigation. Delay normal watering a couple days when Bt products are applied and 24 hours with the other products.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. ACEPHATE (Orthene Turf, Tree, and Ornamental Spray) COMMENTS: Odorous.	0.5–1 oz
B. CARBARYL* 80WSP (Chipco Sevin)	Label rates
C. CHLORPYRIFOS	
(Dursban) 50W	0.75 oz
(Dursban Pro) 2E	1.5 fl oz
COMMENT: Odorous.	
D. CYFLUTHRIN (Tempo) 20WP	0.176 oz (5 grams)
E. DIAZINON*	
(Diazinon) 4EC	2–3 fl oz
COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses. Do not apply where waterfowl may graze.	
...or...	
(Diazinon) 50WP	3 oz
COMMENTS: Not for use on sod farms or golf courses. Do not apply where waterfowl may graze.	
F. FLUVALINATE (Mavrik Aquaflow)	0.15 fl oz (1 teaspoon)
G. TRICHLORFON (Dylox) 80	2.5–3.75 oz
H. STEINERNEMA CARPOCAPSAE (Scanmask)	25 million
COMMENTS: Store nematodes properly before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during the coolest time of day in hot areas.	
I. BACILLUS THURINGIENSIS (various products)	Label rates
COMMENTS: Slow acting stomach poison; only effective on early instar larvae. Breaks down rapidly in sunlight and washes readily off leaves.	

** Apply in 2–5 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

F27

PLANT BUGS

Scientific Names: False chinch bug: *Nysius californicus*
Weed bug: *Arrhyssus crassus*
White-marked fleahopper: *Spanogonicus albofasciatus*

(Updated 8/97)

DESCRIPTION OF THE PESTS

Plant bugs are sucking insects. The anterior portion of their forewings is leathery and the posterior portion is membranous. The false chinch bug and weed bug are occasional nuisance pests. Both species are a pale gray color and feed on weedy hosts; the false chinch bug is just under 0.25 inch, while the weed bug is just over 0.25 inch. When winter rains permit heavy growth of vegetation, these bug populations build up to large numbers. Later, as the vegetation dries down, the bugs migrate from the wild hosts and invade residential areas, including lawns and houses. The white-marked fleahopper adults are about 0.125 inch long, are blackish or grayish, and have white markings on the wings, which are folded over the back. Their long antennae, white markings, larger size, and sucking mouthparts distinguish them from flea beetles.

DAMAGE

Little is known about direct feeding of these species on grasses or dichondra. All species feed via sucking mouthparts, so damaging populations would be expected to cause yellowing and stunting of the turf. Turf is sometimes treated to prevent false chinch bugs and weed bugs from migrating into dwellings. Fleahoppers can be observed by running your hand over the turf or dichondra lawn. If they are present, they will hop about; some will land on the hand or sidewalks where they can be observed more readily.

WHEN TO TREAT

Treat if populations are high enough that damage may occur.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. DIAZINON*	
(Diazinon) 4EC	2–3 fl oz
COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses. Highly toxic to birds.	
...or...	
(Diazinon) 50W	2–3 oz
COMMENTS: Not for use on sod farms or golf courses. Do not apply where waterfowl may graze.	
B. CHLORPYRIFOS	
(Dursban) 50W	0.75 oz
(Dursban Pro) 2E	1.5 oz
C. FLUVALINATE	
(Mavrik Aquaflow)	0.11–0.23 fl oz
COMMENTS: May cause coughing reaction in susceptible individuals.	
D. ACEPHATE	
(Orthene Turf, Tree, and Ornamental Spray)	1.2–2.4 oz
COMMENTS: Odorous.	
E. CARBARYL*	
(Chipco Sevin) 80WSP	4.4–6 fl oz
F. CYFLUTHRIN	
(Tempo) 20WP	0.25 oz (7 grams)

** Apply in 2–5 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

SOUTHERN CHINCH BUG

Scientific Name: *Blissus insularis*
(Updated 8/97)

DESCRIPTION OF THE PEST

Southern chinch bug adults are 0.125 inch (0.3 cm) long true bugs, black with nearly all white wings folded flat over the body. Both long- and short-winged adult forms may be present. Early instar nymphs are bright red but darken to black by the last instar. There are several generations a year, with all life stages present during summer; populations tend to be highest when temperatures are above 90°F. All life stages usually reside in the lower parts of the turf and the thatch, but can also be observed at the border between damaged and healthy grass.

Big-eyed bugs, which are beneficial predators, are similar in appearance to chinch bugs but their eyes, which are the widest part of their body, distinguish them from chinch bugs.

DAMAGE

Although bermudagrass, buffalograss, and zoysiagrass are fed upon, only St. Augustinegrass is seriously damaged in California. Active from April through October, chinch bug nymphs and adults suck sap from nodes and crown of the grass. Yellowish to brownish patches appear, especially in sunny areas where these bugs are most active.

BIOLOGICAL CONTROL

Big-eyed bugs, ants, and the fungal insect pathogen *Beauveria bassiana* are the most important natural enemies of chinch bugs. Maintaining moist conditions favors development of *Beauveria*.

CULTURAL CONTROL

Thatch removal is important for eliminating conditions favorable for chinch bug survival. Low nitrogen fertilization slows chinch bug reproduction. Maintaining adequate moisture will increase the tolerance of turf to feeding damage and will promote beneficial fungi that attack chinch bugs. If St. Augustinegrass is desirable, then plant resistant varieties like Floralawn, Floratam, or FX-10.

WHEN TO TREAT

Use the flotation method or pyrethrum test to determine chinch bug presence and population level. For the flotation method, take a 6-inch diameter coffee can, remove top and bottom, and pound into the turf to a depth of 2 to 3 inches. Fill with water and wait for 5 to 10 minutes for bugs to float to the surface. The pyrethrum test is described in the section on MONITORING under GENERAL INFORMATION. Treat when combined nymph and adult counts average at least three per coffee can sample, or 135 per square yard. Mow the lawn and irrigate before treating. After treatment, do not mow or irrigate for at least 24 hours.

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. ACEPHATE (Orthene Turf, Tree, and Ornamental Spray) COMMENTS: Odorous.	1.2–2.4 oz
B. CARBARYL* (Chipco Sevin) 80WSP	4.4–6 fl oz
C. CYFLUTHRIN (Tempo) 20WP	0.25 oz (7 grams)

F29

Pesticide (commercial name)	Amount/1000 sq ft**
D. CHLORPYRIFOS	
(Dursban) 50W	0.75 oz
(Dursban Pro) 2E	1.5 fl oz
E. DIAZINON*	
(Diazinon) 4EC	2–3 fl oz
COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses. Highly toxic to birds.	
...or...	
(Diazinon) 50W	2–3 oz
COMMENTS: Not for use on sod farms or golf courses. Do not apply where waterfowl may graze.	
F. FLUVALINATE	
(Mavrik Aquaflow)	0.11–0.23 fl oz
COMMENTS: May cause coughing reaction in susceptible individuals.	

** Apply in 10–25 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

MASKED CHAFERS

Scientific Names: *Cyclocephala hirta, C. pasadenae*
(Updated 12/97)

DESCRIPTION OF THE PEST

Masked chafers are C-shaped beetle larvae that are white, up to 1 inch (2.5 cm) in length, with a dark translucent dorsal stripe, brown head capsule and legs, and a characteristic pattern of bristles on the underside of the posterior end of the abdomen (the raster). Masked chafers have a scattering of bristles, while less commonly encountered May or June beetles have two parallel rows of bristles. They also have a slight constriction at the forward portion of the abdomen, distinguishing them, along with their greater size, from black turfgrass ataenius grubs. Adult beetles are golden brown, hairy on the underside of the thorax, and have a darker brown head. *Cyclocephala hirta* is common throughout California, *C. pasadenae* is found in southern California. These species complete one generation per year; adult males are attracted to lights at night, mostly from mid-June through July.

DAMAGE

All turf species are affected by masked chafer larvae, which damage turf by feeding on the roots, resulting in irregular dead patches. Symptoms resemble drought stress and exist even where there is sufficient irrigation. Grub activity can cause the ground to feel spongy; extensive root feeding sometimes allows the turf to be rolled back like a carpet. The most damage usually takes place in late summer or early fall. Digging by vertebrate predators, such as crows, raccoons, skunks, and coyotes, is a common indication of high grub populations.

BIOLOGICAL CONTROL

Tiphiid wasps are common parasites of masked chafers, but may not consistently be effective in reducing grub populations below damage thresholds. *Heterorhabditis bacteriophora* are commercially available parasitic nematodes that can effectively control masked chafers, which are not effectively controlled by *Steinernema carpocapsae*.

CULTURAL CONTROL

Feeding by masked chafers tends to be most serious on rye/bluegrass turf, whereas fescues are somewhat less affected. Warm season grasses tend to be the most tolerant of grub feeding. Establishing warm season grasses may therefore prevent white grub damage. Thorough spike-aeration of turf also kills significant portions of white grub populations when they are feeding close to the soil surface. This can be achieved by wearing spiked shoes when mowing lawn or walking on turf.

WHEN TO TREAT

Carefully dig around roots of grass to detect white grubs. If the infestation is heavy, the turf may be loose and easy to roll back like a carpet. Consider treatment only if there is an average of more than six grubs per square foot in most turf; one grub per square foot on golf greens. However, sufficient watering and turfgrass health greatly affects these thresholds.

Current chemical control options are most effective against early instar larvae (less than 0.5 inch long). Grubs may take up to 10 days to die following contact with an insecticide, so wait at least this long to evaluate insecticide efficacy. Adult activity generally occurs during the period from mid-June to July. Optimum timing for treatment is 3 to 4 weeks following peak adult activity. Since most of applied insecticides bind to the leaf blades and thatch, remove thatch before and irrigate immediately following application to obtain good results.

F31

TREATMENT

Pesticide (commercial name)	Amount/1000 sq ft**
A. IMIDACLOPRID	
(Merit) 75 WP	3 teaspoons (0.15 oz)
(Merit) 75 WSP	0.15 oz (1 packet/11,000 sq ft)

COMMENTS: Maximum of 1 application/year. Applications cannot exceed 8.6 oz/acre/year (0.19 oz/1000 sq ft). Optimum control will be achieved when applications are made before egg hatch of target pests followed by sufficient irrigation or rainfall. Applications should not be made when turfgrass areas are waterlogged or soil is saturated with water. Not for use on commercial sod farms.

...or...

(Marathon) 60 WP	10.7oz/acre
(Marathon) 60 WSP	1 packet/3000 sq ft

COMMENTS: For use on sod farms only. Apply May through July. For optimum control, treatment should be followed by rainfall or irrigation. Do not use less than 2 gal spray volume/1000 sq ft.

B. CARBARYL*	
(Chipco Sevin) 80WSP	6 fl oz
C. CHLORPYRIFOS	
(Dursban) 50W	1.5–3 oz
(Dursban Pro) 2E	3–6 fl oz
C. DIAZINON*	
(Diazinon) 4EC	3 fl oz

COMMENTS: Must be applied by a commercial applicator; not for use on sod farms or golf courses.

D. TRICHLORFON	
(Dylox) 80	3.75 oz
E. HETERORHABDITIS BACTERIOPHORA	25 million

COMMENTS: Apply during late spring/early summer before adults emerge, or early fall when most chafers are in the susceptible stages. Irrigate before and after applying nematodes. Store nematodes before use as directed. Apply to warm, moist, but not soggy soil. Several irrigations may be needed during 2 weeks after application to keep soil moist. Apply during cool time of day in hot areas.

** Apply in 25 gal water/1000 sq ft
* Permit required from county agricultural commissioner for purchase or use.

Diseases

USE OF FUNGICIDES
(Updated 7/96)

The fungicides products mentioned in this section are registered for use on turfgrass in California, but many have not been evaluated by the University of California for their effectiveness in controlling turfgrass diseases. For convenience, a few commercial names are listed for each fungicide; the listings are not complete and other products may be registered for use in California. In general, use fungicides only on golf and bowling greens and, in rare exceptions, on other turfgrass areas. Read and follow label recommendations carefully for rate recommendations, which usually vary based on the severity of the disease and whether the treatment is preventative or curative.

ANTHRACNOSE
Pathogen: *Colletotrichum graminicola*
(Updated 7/96)

SYMPTOMS
Anthracnose appears as irregular patches of diseased turf that can be up to 12 inches in diameter but usually is much smaller, about the size of a dime. Leaf blotches are brown, fading to light tan. The fungus forms minute, black fruiting structures (acervuli) on dead grass blades.

COMMENTS ON THE DISEASE
All grasses, especially annual bluegrass, are susceptible to anthracnose. The disease is most severe under high temperatures (80° to 90°F), when foliage remains wet, and soil fertility is low.

CULTURAL CONTROL
Apply adequate balanced nutrients, especially potassium and phosphorus. Do not fertilize during periods of high temperatures. Do not irrigate any more than necessary to maintain vigorous growth of turf and do not water in late afternoon or evening. Alleviate compaction and avoid low mowing and high traffic.

WHEN TO TREAT
Fungicides are not recommended for use on grass other than golf greens, where they may be helpful when the disease is severe. At the onset of damage symptoms, use one of the following fungicides.

TREATMENT

Pesticide	Commercial Names
A. CHLOROTHALONIL	Daconil 2787
B. FENARIMOL	Rubigan
C. MANCOZEB	Fore
D. PROPICONAZOLE	Banner GL
E. TRIADIMEFON	Bayleton
F. THIOPHANATE-METHYL	Fungo Flo Scotts Systemic Fungicide Clearys 3336

CURVULARIA BLIGHT

Pathogen: *Curvularia* spp.
(Updated 12/97)

SYMPTOMS

Curvularia blight causes thinning out and decline of the grass; irregular patches and streaks may also occur. Leaves yellow and then become brown from the leaf tip down. The pathogen invades the grasses through cut tips of dying leaves.

COMMENTS ON THE DISEASE

Bentgrasses, annual bluegrass, and fescues are susceptible to Curvularia blight. The disease is favored by high temperatures and adverse growing conditions.

CULTURAL CONTROL

Improve growing conditions by avoiding overwatering or drought stress and by applying adequate fertilizer to promote moderate growth. Also, increase mowing height, reduce thatch (do not allow it to exceed 0.5 inch), and avoid dense shading by pruning.

WHEN TO TREAT

Fungicides may be warranted on golf greens if hot weather is expected to continue.

TREATMENT

Pesticide	Commercial Names
A. CAPTAN	various
B. CHLOROTHALONIL	Daconil 2787
C. IPRODIONE	Chipco 26019 Scotts Fungicide X
D. MANEB	various
E. MANCOZEB	Fore
F. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III

FAIRY RING

Pathogens: *Marasmius oreades, Lepiota* spp.
(Updated 7/96)

SYMPTOMS

Fairy ring appears as a dark green band of turf that develops in a circle (from 10 to 20 cm up to 10 m) or semicircle in moist turf; mushrooms may or may not be present. Frequently, just behind the dark green band is an area of sparse, brown, dying grass caused by lack of water penetration. A second ring of thin dying grass may appear inside the circle. Weeds commonly invade infested areas.

COMMENTS ON THE DISEASE

All grasses are susceptible to fairy ring, which is caused by several species of mushroom-forming fungi. In northern and central California, the predominant fungus is *Marasmius oreades*. *Lepiota* spp. are predominant in southern California.

Fairy ring develops most frequently in soils high in undecomposed organic matter containing lignin. Thus, adding woody plant materials, such as sawdust, wood chips, bark, and other uncomposted material, favors fairy ring development.

CULTURAL CONTROL

Apply adequate nitrogen. Aerate soil for better water penetration and water heavily in holes for several days; soil wetting agents may improve water penetration. Dethatch the turf because fairy ring often develops in soils with high levels of thatch. In some situations, replace infested soil. If fairy ring symptoms consist only of mushrooms and there is no zone of dark green grass, the mushrooms can be raked off and disposed of. While this will not weaken or control the fungus, it will improve the turf's appearance.

WHEN TO TREAT

Fairy ring can be eliminated by removing the turf and root zone containing the white, cottony mass, and by fumigating the soil. However fumigation is a dangerous and expensive process that should be done only by a licensed specialist.

TREATMENT

Pesticide	Commercial Name
A. METHYL BROMIDE*	Brom-O-Gas

COMMENTS: Complete soil sterilization. Use 400 lb/acre, 1 lb/100 sq ft, or 10 lb/1000 sq ft.

* Permit required from county agricultural commissioner for purchase or use.

FUSARIUM BLIGHT

Pathogens: *Fusarium culmorum, F. tricinctum*
(Updated 12/97)

SYMPTOMS

Fusarium blight first appears as small, circular, grayish green areas, ranging from a few inches up to a foot in diameter. Some plants in the center of the circles may survive, giving them a frog eye or donut appearance. The crown or basal area of the dead stems is affected with a reddish rot and is hard and tough. The dead foliage appears bleached.

COMMENTS ON THE DISEASE

The disease principally attacks bluegrass, the most susceptible cultivars are Park, Campus, Fylking, and Nugget. A-34, Baron, Merion, Victa, Windsor, and the new cultivars, such as Adelphi, Bonnieblue, Geronimo, Majestic, Parade, and Rugby, are much less susceptible.

Fungi survive in soil and turf as resting structures. The disease is favored by daytime temperatures of 85° to 95°F and night temperatures of 70°F or above. Fusarium blight occurs most commonly in areas that have been stressed for moisture and in areas in full sun. The disease is also favored by excessive nitrogen fertilization.

CULTURAL CONTROL

Provide the appropriate amount of irrigation to avoid moisture stress in the plants. Keep the thatch moist, but not overly wet. Avoid heavy nitrogen applications. Use 20% perennial ryegrass when seeding bluegrass, and choose resistant varieties. Do not mow lower than 2 inches. Remove thatch mechanically if more than 0.5 inch accumulates.

WHEN TO TREAT

Complete control with fungicides has not been attained in California. When fungicides are necessary, make an application in spring before initial symptoms appear, or at the earliest appearance of the disease.

TREATMENT

Pesticide	Commercial Names
A. TRIADIMEFON	Bayleton
COMMENTS: Provides the most effective control.	
B. FENARIMOL	Rubigan
C. IPRODIONE	Chipco 26019 Scotts Fungicide X
D. MANCOZEB	Fore
E. THIOPHANATE-METHYL	Fungo Flo Scotts Systemic Fungicide Clearys 3336

SUMMER PATCH

Pathogen: *Magnaporthe poae*
(Updated 7/96)

SYMPTOMS

Summer patch appears as circular yellow or tan areas up to one foot in diameter, consisting of dead and dying plants. Roots, crowns, and stolons are affected by a dark, brown rot. The youngest roots may appear healthy, but dark brown hyphae may be present on these tissues. Vascular discoloration and cortical rot occur in later stages of the disease. On occasion, patches may retain centers of green, apparently unaffected grass.

COMMENTS ON THE DISEASE

Most bluegrasses and fine fescues are susceptible to summer patch; resistant Kentucky bluegrass cultivars include Adelphi, Enmundi, Sydsport, and Touchdown. Infections generally first appear in late spring. The disease is favored by high temperatures (83° to 95°F) and is most severe when turf is mowed too low or when soil moisture levels are too high.

CULTURAL CONTROL

Promote root growth by soil aeration and slow release nitrogen. Improve drainage, reduce compaction, and avoid drought stress. Do not mow too low or water too frequently. Maintain thatch at about 0.5 inch in thickness and lower the soil pH by adding an acidifying nitrogen fertilizer.

WHEN TO TREAT

Fungicides may be required for control if summer patch has been a problem in previous years. Apply treatment 3 to 4 weeks before symptoms are likely to occur in late spring when temperatures are in the 65° to 68°F range. Irrigate after application.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL COMMENTS: Use with caution on bluegrass species.	Rubigan
B. THIOPHANATE-METHYL	Fungo Flo Scotts Systemic Fungicide Clearys 3336
C. TRIADIMEFON	Bayleton
D. MYCLOBUTANIL	Eagle WSP

PYTHIUM BLIGHT

Pathogen: *Pythium* spp.
(Updated 8/97)

SYMPTOMS

Pythium blight, also known as grease spot, kills turf in small, roughly circular spots (2 to 6 inches) that tend to run together. Blackened leaf blades rapidly wither and turn reddish brown. Leaf blades tend to lie flat, stick together, and appear greasy. Roots may be brown.

COMMENTS ON THE DISEASE

All grasses are susceptible to Pythium blight. This disease is also known as grease spot. The fungus forms thick-walled sexual spores, which enable it to survive in the soil for long periods. Pythium blight usually appears in low spots that remain wet; the disease depends on excessive moisture and may be very destructive at high temperatures (80° to 95°F). Under humid conditions, masses of fungal mycelium may appear.

CULTURAL CONTROL

Reduce shading and improve soil aeration and water drainage. Avoid overwatering; irrigate only when needed to a depth of 4 to 6 inches. Avoid mowing wet grass. Keep nitrogen levels low during hot, humid weather.

WHEN TO TREAT

In California's semiarid climate this disease is usually kept under control with proper water management. Fungicides may be required, however, on some golf greens. Treat when symptoms first appear.

TREATMENT

Pesticide	Commercial Names
A. METALAXYL	Subdue
COMMENTS: Very effective against Pythium blight. The combination of metalaxyl and mancozeb is synergistic.	
B. FOSETYL-AL	Chipco Aliette
COMMENTS: Very effective against Pythium blight.	
C. MANCOZEB	Fore

RHIZOCTONIA BLIGHT

Pathogen: *Rhizoctonia solani*
(Updated 12/97)

SYMPTOMS

Rhizoctonia blight first appears as small, irregular brown patches or rings that may enlarge to many feet in diameter. The centers of the areas may recover, resulting in rings of diseased grass. Leaves and leaf sheaths become water-soaked, wilt, turn light brown, and die. Stems, crowns, and roots may also be infected. In light infestations, roots are usually not involved and plants recover.

COMMENTS ON THE DISEASE

This disease was formerly called brown patch. Bentgrasses, bermudagrasses, bluegrasses, fescues, ryegrasses, zoysia, and annual bluegrass are susceptible to Rhizoctonia blight.

Rhizoctonia is a soil-inhabiting fungus that is active as fine fungal threads in the soil or in and on the turf. Hard masses of these fungal threads (sclerotia) develop that are very resistant to fungicides.

Excess thatch and mat along with high temperatures (75° to 95°F), high humidity, and soft, lush growth due to excess nitrogen favor the development of Rhizoctonia blight. This disease is more common in warm, inland areas.

CULTURAL CONTROL

Reduce shading and improve soil aeration and water drainage. Irrigate only when needed to a depth of 4 to 6 inches, if possible. Avoid nitrogen fertilization that results in a soft foliage growth. Maintain thatch at less than 0.5 inch.

WHEN TO TREAT

Fungicides may be useful in treating Rhizoctonia blight on golf greens when there has been a history of infestations. They may also be necessary on young turf when seedling are being infected. Other infestations may be managed best by improving water and fertility management.

TREATMENT

Pesticide	Commercial Names
A. CAPTAN	various
B. CHLOROTHALONIL	Daconil 2787
C. FENARIMOL COMMENTS: Use with caution on bluegrass species.	Rubigan
D. IPRODIONE	Chipco 26019 Scotts Fungicide X
E. MANCOZEB	Fore
F. MYCLOBUTANIL COMMENTS: Do not apply more than 7.2 oz/1000 sq. ft/year.	Eagle WSP
G. PCNB	Terraclor Turfcide

F39

Pesticide	Commercial Names
H. THIOPHANATE-METHYL	Fungo Flo Scotts Systemic Fungicide Clearys 3336
I. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III
J. TRIADIMEFON	Bayleton

SCLEROTIUM BLIGHT

Pathogen: *Sclerotium rolfsii*
(Updated 8/97)

SYMPTOMS

Sclerotium blight affects circular areas of turf, enlarging up to 9 feet in diameter; some plants may remain alive in the centers of these areas. The grass turns reddish brown as it dies. As the fungus advances, abundant white mycelium grows on the turf. Look for light to dark brown sclerotia, which are tiny, hard, resting bodies that resemble mustard seeds, at the base of the stems to help identify this disease.

COMMENTS ON THE DISEASE

Sclerotium blight is also known as southern blight. Bentgrasses, bluegrass, fescues, ryegrasses, dichondra, and many kinds of plants are susceptible to this damage. The fungus survives in thatch as sclerotia. It is spread by sclerotia and infected plant parts. The disease is favored by warm or hot weather, high moisture, and heavy thatch.

CULTURAL CONTROL

Reduce the amount of thatch. Aerating and verticutting can spread the fungus sclerotia. Fertilize regularly.

WHEN TO TREAT

Apply a treatment at first signs of the disease.

TREATMENT

Pesticide	Commercial Names
A. PCNB	Terraclor Turfcide
COMMENTS: Very effective against Sclerotium blight. Irrigate after application.	
B. TRIADIMEFON	Bayleton

F41

LOOSE SMUT

Pathogen: *Ustilago cynodontis*
(Updated 7/96)

SYMPTOMS

Loose smut causes the flower heads of bermudagrass to be replaced with masses of dark spores.

COMMENTS ON THE DISEASE

Loose smut is primarily a disease of bermudagrass. The fungus survives in the grass plant and produces spores in place of the flowers. The spores, which are airborne, infect germinating seeds and young stolons. The disease is favored by warm weather and conditions that promote flowering.

CULTURAL CONTROL

Keep grass growing vigorously. Mow before the grass flowers to prevent the production of spores.

WHEN TO TREAT

Before planting bermudagrasses, be sure that seeds have been treated.

TREATMENT

Pesticide	Commercial Names
A. CAPTAN	various
COMMENTS: Seed treatment.	
B. THIRAM	Spotrete F Thiram 75 W Proturf Fluid Fungicide III
COMMENTS: Seed treatment.	
C. MYCLOBUTANIL	Eagle WSP

DOLLAR SPOT

Pathogens: *Sclerotinia homeocarpa, Lanzia* sp. and *Moellerodiscus* sp.
(Updated 12/97)

SYMPTOMS

Dollar spot affects small, circular areas of turf, about 1 to 5 inches in diameter. The spots may merge to form large, irregular areas. Leaves appear water-soaked at first, then later turn brown; they often have a reddish band extending across the leaf. Fine, white, cobwebby hyphae (fungal threads) may be seen in early morning.

COMMENTS ON THE DISEASE

Bentgrasses, bermudagrasses, bluegrasses, fescues, ryegrasses, and annual bluegrasses are susceptible to dollar spot. The fungus survives in soil as sclerotia, which are tiny, hard, often dark, resting bodies. The disease is common near the coast, especially on creeping bentgrass and annual bluegrass. Moderate temperatures (60° to 80°F), excess moisture or water stress, fog, and excess mat and thatch favor dollar spot. Turf deficient in nitrogen tends to develop more dollar spot than turf adequately fertilized.

CULTURAL CONTROL

Keep thatch to a minimum. Irrigate only when needed to a depth of 4 to 6 inches, but do not stress the plants between irrigations. Apply adequate nitrogen. Maintain good air circulation by keeping the turf mowed and pruning barrier trees and shrubs. Composted top dressings may suppress dollar spot.

WHEN TO TREAT

Fungicides are usually needed to control this disease, especially on closely clipped grass such as golf greens. If the disease has been present in previous years, apply fungicide in early spring or fall before disease develops.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL	Rubigan
COMMENTS: Use with caution on bluegrass species.	
B. TRIADIMEFON	Bayleton
C. THIOPHANATE-METHYL	Fungo Flo Scotts Systemic Fungicide Clearys 3336
D. VINCLOZOLIN	Curalan
E. IPRODIONE	Chipco 26019 Scotts Fungicide X
F. CHLOROTHALONIL	Daconil 2787
G. MANCOZEB	Fore
H. THIRAM	Spotrete F Thiram 75 W Proturf Fluid Fungicide III
I. MYCLOBUTANIL	Eagle WSP
J. PCNB	Turfcide 10G

 F43

NECROTIC RING SPOT

Pathogen: *Leptosphaeria korrae*
(Updated 12/97)

SYMPTOMS

Necrotic ring spot appears as large, ring-shaped patches that often cause depressions in the turf. The roots, rhizomes, and crown of affected plants are brown or black.

COMMENTS ON THE DISEASE

Bluegrasses and fine fescues are susceptible to necrotic ring spot. Necrotic ring spot is favored by cool conditions in spring and early fall, as well as drought stress and compacted soils. Another disease, spring dead spot, is caused by the same pathogen but primarily infects bermudagrass.

CULTURAL CONTROL

Maintain a mowing height of 2 inches or higher. Avoid drought stress and apply adequate amounts of a balanced fertilizer. Overseed with perennial ryegrass or tall fescue.

WHEN TO TREAT

Systemic fungicides have proven effective when applied on a preventative basis.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL	Rubigan
COMMENTS: Use with caution on bluegrass species.	
B. IPRODIONE	Chipco 26019 Scotts Fungicide X

LEAF SPOT

Pathogen: *Bipolaris sorokiniana*
(Updated 12/97)

SYMPTOMS

Leaf spot occurs on leaf blades, sheaths, and stems as circular to elongated purplish or brown spots with brown colored centers and purplish to dark brown borders. Leaf spots occur on leaves throughout the turf, indicating spread by windborne spores. Crown and roots are frequently affected with a dark brown rot. Plants with crown infections are weakened and may die in hot, windy weather, resulting in a thinning out of the turf in scattered areas.

COMMENTS ON THE DISEASE

Bentgrasses, bluegrasses, fescues, and ryegrasses are susceptible to leaf spot. The fungus survives in infected grass plants or grass debris and may be seedborne. The spores are airborne.

The disease is favored by warm temperatures (70° to 90°F) and high humidity. It is most damaging on closely clipped turf. Leaf spot is more severe under high nitrogen fertilization.

CULTURAL CONTROL

Reduce shade and improve soil aeration and water drainage. Avoid dry spots, overfertilizing with nitrogen, and clipping the grass too short.

WHEN TO TREAT

Leaf spot usually is not serious enough in California to warrant the use of fungicides.

TREATMENT

Pesticide	Commercial Names
A. CAPTAN	various
B. CHLOROTHALONIL	Daconil 2787
C. IPRODIONE	Chipco 26019 Scotts Fungicide X
D. MANEB	various
E. MANCOZEB	Fore
F. MYCLOBUTANIL	Eagle WSP
G. PCNB	Turfcide 10G
H. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III

F45

LEAF BLOTCH

Pathogen: *Bipolaris cynodontis*
(Updated 12/97)

SYMPTOMS

Leaf blotch appears as tiny purplish to reddish spots that occur on leaf blades and leaf sheaths. Seedlings are very susceptible, but older plants rapidly become resistant. Affected seedlings wither, die, and turn brown. The roots and crowns of infected plants may develop small lesions and rot. The disease occurs in irregular patches that range in size from 2 inches to 3 feet across.

COMMENTS ON THE DISEASE

Leaf blotch is a disease of bermudagrasses only. The pathogen survives in infected bermudagrass plants and debris and may be seedborne. The fungal spores are airborne.

Leaf blotch damages young seedlings or adult plants that are weakened by factors such as excess thatch, nitrogen deficiency, and other unfavorable growing conditions.

CULTURAL CONTROL

Remove thatch at regular intervals and apply adequate nitrogen.

WHEN TO TREAT

Fungicides are usually not necessary. Healthy older plants will not be damaged.

TREATMENT

Pesticide	Commercial Names
A. CAPTAN	various
B. CHLOROTHALONIL	Daconil 2787
C. IPRODIONE	Chipco 26019 Scotts Fungicide X
D. MANEB	various
E. MANCOZEB	Fore
F. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III

POWDERY MILDEW

Pathogen: *Erysiphe graminis*
(Updated 7/96)

SYMPTOMS

Powdery mildew causes grayish white, cobwebby growth to develop on the upper leaf surface, at first in isolated patches, then spreading to give a grayish white appearance to the leaves. In advanced stages of the disease, the leaf blades may turn pale yellow.

COMMENTS ON THE DISEASE

All grasses are susceptible to powdery mildew, but it is most severe on Kentucky bluegrass and fescues. Powdery mildew is most injurious in shady areas with high humidity and poor air circulation with temperatures at about 65°F.

CULTURAL CONTROL

Improve air circulation and reduce shading. Plant less susceptible species in powdery mildew prone areas. Supply adequate moisture and fertility, and raise the mowing height.

WHEN TO TREAT

Fungicides are generally not necessary except in severe cases.

TREATMENT

Pesticide	Commercial Names
A. TRIADIMEFON	Bayleton
B. FENARIMOL	Rubigan
C. MYCLOBUTANIL	Eagle WSP

F47

RUST

Pathogens: *Puccinia striiformis, P. graminis, P. coronata,* and *Uromyces* spp.
(Updated 7/96)

SYMPTOMS

Rust begins as small yellow spots on leaves and stems. These spots develop into elongated, reddish brown pustules. The pustules contain reddish spores that adhere to your fingers when the pustules are rubbed. Rust kills leaves and debilitates plants when it is severe. The turf quality is affected because of the yellowish color and reduced plant vigor.

COMMENTS ON THE DISEASE

Bluegrasses, ryegrasses, zoysiagrass, and tall fescue are susceptible to rust. The disease overwinters in infected grasses. Moderately warm, moist weather favors rust development. Moisture in the form of dew for 10 to 12 hours is sufficient for the spores to infect plants.

CULTURAL CONTROL

Keep plants growing rapidly with adequate but not excessive nitrogen fertilization and irrigation. Provide good air movement on surface of grass. Mow the grass at weekly intervals and remove the clippings to lower the number of spores. Avoid irrigating late in the day. Turfgrass comprised of different grass species fares better against rust than turfgrass composed of a single species.

CHEMICAL CONTROL

A fungicide may be effective at times of the year when the grass is growing slowly. At other times, manage this disease with proper mowing, fertilizing, and irrigation.

TREATMENT

Pesticide	Commercial Names
A. TRIADIMEFON	Bayleton
COMMENTS: Very effective against rust.	
B. CHLOROTHALONIL	Daconil 2787
C. MANEB	various
D. MANCOZEB	Fore
E. MYCLOBUTANIL	Eagle WSP

STRIPE SMUT

Pathogen: *Ustilago striiformis*
(Updated 7/96)

SYMPTOMS

Plants infected with stripe smut are often pale green and stunted with long, black stripes of spore pustules. Infected leaves curl, then die and become shredded.

COMMENTS ON THE DISEASE

Bentgrasses, perennial ryegrass, fescues, and bluegrasses are susceptible to stripe smut. Bluegrass cultivars Adelphi, Baron, Bonnieblue, Glade, Newport, Park, Sydsport, and Touchdown are resistant.

Fungal spores formed in the leaves can contaminate seed and infect seedlings and young tillers. The fungus survives in the grass plant. Stripe smut is favored by moderate temperatures and is prevalent in spring and fall. Infected plants may die in hot, dry weather.

CULTURAL CONTROL

Plant resistant cultivars or species. Avoid drought stress, but too much water in summer can encourage spread of the disease. Keep nitrogen levels to a minimum during summer months. Use disease-free seed.

WHEN TO TREAT

If you use susceptible cultivars, treat seed with captan or thiram.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL	Rubigan
B. MYCLOBUTANIL	Eagle WSP
C. THIOPHANATE-METHYL	Fungo Flo Clearys 3336
D. TRIADIMEFON	Bayleton
E. CAPTAN	various
COMMENTS: Seed treatment for susceptible cultivars.	
F. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III
COMMENTS: Seed treatment for susceptible cultivars.	

FUSARIUM PATCH

Pathogen: *Microdochium nivale*
(Updated 12/97)

SYMPTOMS

Fusarium patch causes roughly circular patches of 1 to 2 inches to develop that may enlarge to 12 inches. The leaves first appear water-soaked, then turn reddish brown. Finally, the leaves appear bleached. Minute white or pinkish, gelatinous spore masses are occasionally seen on the dead leaves. Fungal threads, which are also white or pinkish, may be seen in the early morning.

COMMENTS ON THE DISEASE

Bluegrasses, fescues, ryegrasses, and zoysiagrass are susceptible to Fusarium patch. It is common on annual bluegrass and creeping bentgrass.

Fusarium patch is also known as pink snow mold. It is commonly observed only in central and northern California and is rarely found in southern California.

Cool (40° to 60°F), moist conditions, such as prolonged rainy periods in winter, favor Fusarium patch. High nitrogen applied in fall also favors the disease. Fusarium patch is more severe when the soil pH is neutral or alkaline. The pathogen survives in grass residues.

CULTURAL CONTROLS

Reduce shade and improve soil aeration and water drainage. Avoid excess nitrogen fertilization, especially in fall. Adjust soil pH to 6.5 to 6.7. High levels of potassium tend to suppress the disease. Reduce mowing height to reduce pockets of high humidity.

WHEN TO TREAT

If Fusarium patch has been a problem in previous years, apply a fungicide in fall before symptoms develop.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL	Rubigan
B. IPRODIONE	Chipco 26019 Scotts Fungicide X
C. MANCOZEB	Fore
D. THIOPHANATE-METHYL	Fungo Flo Scotts Systemic Fungicide Clearys 3336
E. TRIADIMEFON	Bayleton
F. VINCLOZOLIN	Curalan

MELTING OUT

Pathogen: *Drechslera poae*
(Updated 12/97)

SYMPTOMS

Melting out causes circular to elongated purplish or brown spots with straw-colored centers to occur on leaf blades, leaf sheaths, and stems. The leaf spots may be widespread throughout the lawn, indicating spread by windborne spores. Crowns and roots are frequently affected with a dark brown rot. The crown-infected plants are weakened and may die in hot, windy weather, resulting in a thinning out of the turf in scattered areas.

COMMENTS ON THE DISEASE

Kentucky bluegrass is the primary turfgrass species susceptible to melting out. Many improved bluegrass selections are resistant, including: Adelphi, Bristol, Destiny, Eclipse, Enmundi, Glade, Ikone, Liberty, Majestic, Mona, P-104, Rugby, and Somerset.

The fungus survives on infected bluegrass plants or grass debris and may be seedborne. The spores are airborne.

Cool (50° to 75°F), moist conditions favor melting out. It first appears on shaded plants. Melting out is most severe on closely clipped turf and on turf that has high levels of nitrogen.

CULTURAL CONTROLS

Reduce shade and improve soil aeration and water drainage. Avoid dry spots and do not mow the grass lower than 1.75 inches. Maintain thatch below 0.5 inch. Fertilize at moderate rates.

WHEN TO TREAT

With the use of resistant cultivars and proper cultural practices, fungicides should not be necessary in most situations. For susceptible cultivars, apply a treatment at the onset of symptoms.

TREATMENT

Pesticide	Commercial Names
A. IPRODIONE	Chipco 26019 Scotts Fungicide X
B. PNCB	Terraclor Turfcide
C. VINCLOZOLIN	Curalan
D. CLOROTHALONIL	Daconil 2787
E. MANCOZEB	Fore
F. MYCLOBUTANIL	Eagle WSP
G. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III
H. CAPTAN	various
I. MANEB	various

F 51

RED THREAD

Pathogen: *Laetisaria fuciformis*
(Updated 7/96)

SYMPTOMS

Red thread may kill turf in patches that are 2 to 8 inches in diameter, or the disease may occur over large areas without killing the plants. A pink web of fungal threads binds the leaves together. Look for pink, gelatinous fungal crusts projecting from the leaves to help identify this disease.

COMMENTS ON THE DISEASE

Bentgrasses, bluegrasses, fescues, ryegrasses, and bermudagrasses are susceptible to red thread. The disease survives as pinkish or red gelatinous crusts of fungal threads. It commonly occurs along the coast of northern and central California and is rare in southern California. Red thread usually appears on plants deficient in nitrogen and during periods of prolonged cool, wet weather.

CULTURAL CONTROLS

Avoid nitrogen deficiencies; apply adequate balanced fertilizers. Prevent drought stress, provide adequate air circulation and reduce shading.

WHEN TO TREAT

Fungicides are rarely warranted. Prevent this disease with proper fertilization.

SPRING DEAD SPOT

Pathogen: *Leptosphaeria korrae*
(Updated 7/96)

SYMPTOMS

Spring dead spot appears as circular areas of dead grass, 6 to 12 inches in diameter, that occur as the turf resumes growth in spring. The spots may coalesce to form large areas. Spring dead spot typically affects turf that is several years old.

COMMENTS ON THE DISEASE

Bermudagrass is the only turf species susceptible to spring dead spot. The pathogen survives in debris as fungal threads and sclerotia, which are tiny, hard, often dark, resting bodies. The fungus is spread by sclerotia and infected plant parts. Spring dead spot affects dormant plants and is most severe when temperatures are in the mid to low 50s°F.

CULTURAL CONTROL

Remove dead grass. Fertilize in the summer to maintain vigor, but do not overfertilize in late summer. Overseeding with ryegrass may be beneficial.

WHEN TO TREAT

Systemic fungicides applied in fall are usually necessary when the disease has been severe and not managed by cultural practices.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL	Rubigan
COMMENTS: A systemic fungicide that is very effective against spring dead spot. Apply in September.	
B. MYCLOBUTANIL	Eagle WSP

F53

TAKE-ALL PATCH

Pathogen: *Gaeumannomyces graminis* var. *avenae*
(Updated 7/96)

SYMPTOMS

Take-all patch appears as circular or ring-shaped dead areas which range from a few inches up to 3 feet or more in diameter. Dying bentgrass at the advancing margins of these areas has a purplish tinge. The roots of the diseased plants are rotted and have dark strands of mycelium visible on the surface of the roots. Large black perithecia, which are globular or flask-shaped fungal fruiting bodies, may be visible with the use of a hand lens.

COMMENTS ON THE DISEASE

Bentgrasses are the most susceptible, but fescues and ryegrasses are also susceptible to take-all patch. This disease was formerly called Ophiobolus patch.

The pathogen survives in grass debris and living grass plants. In California, take-all patch principally occurs in late fall and winter. Soil conditions that favor the disease include light texture, low organic matter, low or unbalanced fertility, high pH, and high moisture conditions.

CULTURAL CONTROL

Improve growing conditions, such as soil drainage and fertility. Lower soil pH using elemental sulfur (ammonium sulfate) if it is above 7. Replant with less susceptible grasses, and fertilize in fall with ammonium chloride.

WHEN TO TREAT

Fungicides may be necessary on golf greens that have experienced the disease in the past. Apply a fungicide on a preventative basis in fall.

TREATMENT

Pesticide	Commercial Names
A. FENARIMOL	Rubigan
B. TRIADIMEFON	Bayleton

SEED ROT and DAMPING OFF

Pathogens: *Pythium* spp., *Rhizoctonia solani, Fusarium roseum, Helminthosporium* spp.
(Updated 7/96)

SYMPTOMS

Seeds affected by seed rot are rather dry and do not germinate. Damping off may affect seedlings at either the pre- or postemergence stage. The hypocotyl area of seedlings is particularly susceptible. Seedlings appear water soaked, then blacken, shrivel, and turn brown. In general, affected seedlings are not killed, but are yellow and stunted, with markedly reduced root systems.

COMMENTS ON THE DISEASE

All grasses are susceptible to these diseases. Seed rot and damping off are favored by excessive moisture and by sowing seeds of low viability above the recommended rates, especially during periods unfavorable for seed germination and growth. Do not plant seeds of cool season grasses during hot weather.

CULTURAL CONTROL

Improve soil aeration and water drainage. Sow only fresh, healthy seed at recommended rates and seasons and do not overwater. Mechanically remove thatch if it exceeds 0.5 inch in depth.

WHEN TO TREAT

Treat seed with thiram or captan. Spray seedlings at first evidence of damping off with mancozeb.

TREATMENT

Pesticide	Commercial Names
A. THIRAM	Spotrete F Thiram 75W Proturf Fluid Fungicide III
COMMENTS: Use for seed treatment.	
B. MANCOZEB	Fore
COMMENTS: Use for seedling spray.	

F 55

PYTHIUM ROOT ROT

Pathogen: *Pythium* spp.
(Updated 7/96)

SYMPTOMS

Pythium root rot causes poor growth as a result of rotten roots. Small, bleached patches develop in the turf that may progress to large dead areas.

COMMENTS ON THE DISEASE

All grasses are susceptible to Pythium root rot. The disease is favored by hot weather, poor drainage, and excessive soil moisture.

CULTURAL CONTROL

Improve drainage and do not overwater. Increase mowing height to reduce plant stress.

WHEN TO TREAT

Fungicides may be considered for use on turf when cultural control has not resulted in satisfactory control.

TREATMENT

Pesticide	Commercial Names
A. METALAXYL	Subdue
B. FOSETYL-AL	Aliette

Nematodes

Scientific Names: Root knot nematodea: *Meloidogyne naasi, Meloidogyne* sp.
Lesion nematode: *Pratylenchus* sp.
Stubby root nematode: *Paratrichodorus* sp.
Seed and leaf gall nematode: *Anguina pacificae*
Sting nematode: *Belonolaimus longicaudatus*

(Updated 8/97)

DESCRIPTION OF THE PESTS

Plant parasitic nematodes are microscopic roundworms that feed principally on plant roots. They survive in soil and plant tissues, and several different species may occur in a lawn. They have a wide host range, and vary in their environmental requirements and in the symptoms they cause. While the other species occur throughout the state, sting nematode only occurs in certain areas in southern California.

DAMAGE

Several genera of nematodes may be associated with turfgrasses in California, but only root knot nematode has been shown to be damaging. Of the root knot species, *Meloidogyne naasi* prefers grasses over other hosts and infestations of this nematode can reduce the growth and vigor of turfgrasses. Recently, sting nematode, a major pest of turf and other commercial crops in the southeastern United States, has been collected from several turf sites in the Coachella Valley. Sting nematode feeds on the tips and along the sides of the roots. Activity of this pest is highest in light, sandy, moist soils when air temperature is in the 68° to 100°F (20° to 40°C) range.

Although not proven to be damaging, lesion nematodes are commonly found associated with turfgrasses, stubby root nematode may be found feeding on growing root tips, and seed and leaf gall nematode have been found in galls on Kentucky bluegrass along the central California coast. Additional nematodes associated with turfgrasses in California are ring nematode, *Criconemoides* sp.; dagger nematode, *Xiphinema* sp.; and pin nematode, *Paratylenchus* sp.

SYMPTOMS

The symptoms described below are indicative of a nematode problem, but are not diagnostic because they could result from other causes as well. Infestations may occur without causing any aboveground symptoms.

Aboveground symptoms of a severe root knot nematode infestation include patches of yellow plants, stunting, and poor growth. Feeding by root knot nematodes results in swellings, called galls, on roots. Severely galled roots may appear malformed and the root system shortened and thickened. Turf affected by sting nematode exhibits drought and malnutritional symptoms and does not respond to watering or feeding. Badly affected plants collapse and die in patches that can measure up to several feet in diameter. Roots of grasses infested with lesion nematodes may exhibit brown-black lesions of various sizes and shapes. Feeding by stubby root nematode causes swollen and/or discolored root tips and restricts root growth. Kentucky bluegrass infested with seed and leaf gall nematode will have green galls at the bases of stems. Galls contain nematodes of different stages; mature galls are generally filled with bacteria that resembles white cream.

FIELD EVALUATION

To make management decisions, it is important to know the nematode species present. If nematode species have not previously been identified, take soil samples and send them to a diagnostic laboratory for identification.

Randomly take several soil cores (1 to 2 inches in diameter) to a depth of 6 to 8 inches, from each area of suspected nematode infestation, mix them thoroughly, and make a composite

F57

sample of about 1 quart (1 liter) for each area. To allow comparison take similar samples from adjacent areas with apparently healthy plants. Place the samples in separate plastic bags, seal them, and place a label on the outside with your name, address, location, the previous crop, and the grass you intend to grow. Keep samples cool (do not freeze), and transport as soon as possible to a diagnostic laboratory. Contact your farm advisor to help you find a laboratory for extracting and identifying nematodes, and for help in interpreting sample results.

MANAGEMENT

Sanitation. Clean soil from equipment with water before moving from infested to noninfested areas. Avoid introducing nematode-infested soil or rootings into areas free of nematodes.

When to Treat. Apply a preplant or postplant treatment if sampling indicates that either the root knot nematode or sting nematode is present. When treating established turf, leave a few of the affected areas untreated for comparison if possible.

TREATMENT

Pesticide (commercial name)	Amount/Acre
PREPLANT	
A. METHYL BROMIDE*	400–500 lb
COMMENTS: Inject under polyethylene tarps, from compressed gas cannisters.	
B. CHLOROPICRIN* (Clor-O-Pic)	150–500 lb
COMMENTS: Inject, preferably cover with tarps.	
C. METAM SODIUM* (Vapam, Soil Prep, Sectagon II)	50–100 gal
COMMENTS: Contact your farm advisor for advice on the most effective application method for a particular situation.	
POSTPLANT	
A. FENAMIPHOS* (Nemacur) 10G	100 lb
COMMENTS: For use on established golf courses. Apply a minimum of 0.5 inch water immediately after application.	

* Permit required from county agricultural commissioner for purchase or use.

Weeds

INTEGRATED WEED MANAGEMENT
(Updated 7/96)

A dense, vigorously growing, competitive stand of turfgrass will resist invasion by weeds. Integrated weed management focuses on establishing and maintaining a competitive stand of turf. While it is difficult to eliminate all weeds from turf, in highly maintained turf it is possible to prevent large irregular patches of weeds, which make turf unattractive and reduce its utility.

The objective of an integrated weed management program is to keep weed populations below levels that are incompatible with the purpose of the turf. The first step is preparing the site properly and choosing an appropriate turfgrass species for the location, followed by cultural practices that contribute to turf vigor, such as proper irrigation, mowing, fertilization, thatch removal, and aeration. The increased vigor allows turf to better withstand insect, disease, and nematode damage and to recover more quickly. Healthy turf can also out-compete weeds and reduce the chances of their becoming established. Herbicides are used as tools in turf management where high quality turf is required; however, their use should be integrated with a good cultural program.

TURF ESTABLISHMENT (Before planting turf or renovating weedy turf)
Before planting, annual weeds can be controlled by irrigating to allow germination, followed by cultivation or application of a contact herbicide. Repeat this process two or three times to improve the chances of establishing a turfgrass with a minimum of weeds. Using turfgrass sod in well prepared soil that has been cultivated and amended to improve water-holding capacity in sandy soil or to improve drainage in clay soils will decrease annual weeds. Soil that is wet for long periods of time, often as a result of poor drainage, favors some weeds such as red sorrel, curly dock, nutsedge, and annual bluegrass.

Populations of some perennial weeds such as dallisgrass, bermudagrass, and purple nutsedge can be reduced before planting turf by cultivating in summer and keeping the soil completely dry to dehydrate the propagules (stems, rhizomes, tubers). Rework the soil to bring up new propagules, but be sure to keep the soil dry; three to four cultivations may be needed for best results.

SELECTING A TURFGRASS
Turf species and cultivars vary in their adaptability to different areas of California. Choosing a well-adapted cultivar to plant will be one of your most important weed management decisions (see section on Turfgrass Species at the beginning of this guideline). Cool season species (bentgrass, bluegrass, perennial ryegrass, and tall fescue) are most competitive in the coastal and northern regions of California; some of the newer cultivars of perennial ryegrass, Kentucky bluegrass and tall fescue, however, are more competitive and grow better than the old cultivars. Warm season species (bermudagrass, St. Augustinegrass, zoysiagrass, and dichondra) are most competitive with weeds in the interior valleys and desert regions; kikuyugrass is more competitive in coastal regions. When turf species are planted in areas where they are not well adapted, they require greater care (e.g. management skills and resources) to grow and maintain and are more susceptible to invasion by weeds. For new, improved cultivars, consult turfgrass literature or your farm advisor. Irrigation, mowing, and fertilization requirements vary for each turf species and must be carefully followed to maintain their competitive edge against weed invasions.

MANAGING ESTABLISHED TURF
Turfgrass can be established and maintained to discourage weeds in the turf or to decrease chances for weed invasion. Any condition that exposes the soil surface to additional light allows weeds to invade. Weed problems are often the result of overwatering or

F59

underwatering, mowing too low or too high, low fertility, excessive wear, disease or insect damage, soil compaction, and excessive shading.

Irrigation Management. California has a Mediterranean climate that is characterized by rainfall in winter and spring and very little rainfall in summer and fall. Irrigation is needed, therefore, for both cool and warm season turfgrasses. It is very important to follow good irrigation practices, regardless of turfgrass species used, so that optimum growth and development of turfgrass is obtained. A rapidly growing, competitive turfgrass sward resists weed invasion.

Most turf sites in California are irrigated with a sprinkler irrigation system. A uniform application of water is extremely important for maximum efficiency because it is important to avoid wet and dry spots within the sward. Turf is weakened in wet spots because of poor soil aeration and root disease that can result in the invasion of shallow-rooted weeds such as crabgrass, annual bluegrass, and oxalis. Also, runoff from overirrigated areas is wasteful and results in accumulation of water in low parts of the sward. In contrast, dry sites will be characterized by turf of poor color, density, and uniformity that allows the invasion of deep-rooted weeds such as bermudagrass, dandelions, plantains, clover, knotweed, and yarrow.

Proper timing and an adequate amount of irrigation are necessary for optimum growth, maximum quality, and best appearance of the respective turf species. Warm season turf species require less irrigation than cool season turf species. Frequently used warm season turf species in California include: common and hybrid bermudagrass, St. Augustinegrass, kikuyugrass, and zoysiagrass. The most commonly used cool season turfgrasses for California are tall fescue, Kentucky bluegrass, and perennial ryegrass, which are the higher water-use-rate-grasses. Water use rates vary based on location (low desert valleys can approach 0.37 inches per day in July, while during the same period turf in northern coastal regions may require only 0.12 inches per day). The table below shows the relative water use rates of turfgrass types for three different locations in California. See local newspapers or contact local Cooperative Extension offices for the water required in specific areas.

TABLE 1. Evapotranspiration of turfgrass types at three different locations (acre inches per month per acre).

MONTH	IRVINE cool season grass	IRVINE warm season grass	DAVIS cool season grass	UKIAH cool season grass
January	1.2	1.2	0.8	0.8
February	1.6	1.4	1.5	1.1
March	2.8	2.8	2.6	2.0
April	4.5	3.1	4.0	2.6
May	4.6	4.0	5.1	4.1
June	4.8	3.6	6.0	4.6
July	5.9	4.3	6.5	5.4
August	5.0	4.0	5.7	4.7
September	3.6	3.1	4.3	3.6
October	2.8	1.9	3.2	2.2
November	1.8	1.5	1.4	1.0
December	1.2	0.9	0.8	0.6

ET cool season turfgrass = ET_o X 0.8

ET warm season turfgrass = ET_o X 0.6

Key points for maximum irrigation efficiency:

- Irrigate deeply, but infrequently.
- Irrigate late at night or early in the morning. At these times water loss from evaporation is minimal and distribution is usually good because of good water pressure and limited wind.
- Avoid runoff by matching water application rates to soil infiltration rates (the rate water enters the soil).
- Use less water in shaded areas than in open sun.
- Remove thatch in spring if it is more than 0.5 inch thick.
- Do not overfertilize; fertilize moderately according to the individual species and location.

Fertilization. Proper fertilization of turfgrass is an important component in producing vigorous, dense growth. Low fertility, especially low nitrogen, is one of the factors that allows weeds to invade turf. Apply nitrogen monthly during the year when the turf is actively growing (see Table 2) using the following guidelines:

Turf Species	Nitrogen (lb/1000 sq ft/month)
bentgrass, colonial	0.75–1
bentgrass, creeping	1
bermudagrass, common	1 (spring–summer)
bermudagrass, hybrid	
Tifgreen	1
Tifway ii	1
Santa Ana	1
dichondra	1
fine fescue	0.75
Kentucky bluegrass	0.75–1 (Sept–May)
kikuyugrass	infrequent
ryegrass, annual (for overseeding)	1
ryegrass, perennial	1
st. augustinegrass	0.75
tall fescue	0.75
zoysiagrass	0.5–0.75

TABLE 2. Periods of active growth of cool and warm season turf species.

Turfgrass Species	Period of Active Growth
Cool season turf	
bentgrass	Mar–Jun and Sep–Nov
fine fescue	Mar–Jun and Oct–Dec
Kentucky bluegrass	end of Feb–end of May and Oct–Dec
ryegrass, annual (for overseeding)	Oct–May
ryegrass, perennial	Feb–Jun and Oct–Dec
tall fescue	Mar–Jun and Oct–Dec
Warm season turf	
bermudagrass	Apr–end of Sep
dichondra	Apr–Oct
kikuyugrass	Feb–Nov
St. Augustinegrass	Mar–Oct
zoysiagrass	Apr–Oct

F 61

Mowing. Correct mowing height and frequency of mowing is critical for preventing weed invasion. Different turf species have different mowing height requirements. Mowing Kentucky bluegrass too short (shorter than 1.5 inches) weakens the turf and encourages weed growth. Conversely, mowing bermudagrass too long (longer than 1 to 2 inches) results in a buildup of thatch, which reduces the competitive ability of the grass. The table below outlines the correct mowing height for the different turfgrass species.

Turf Species	Mowing height (inches)
bentgrass, colonial	0.5–1
bentgrass, creeping	0.25 or less
bermudagrass, common	0.75–1.5
bermudagrass, hybrid	
Tifgreen	0.25–0.5
Tifway ii	0.5–0.75
Santa ana	0.5–0.75
dichondra	0.5–0.75
fine fescue	1.5–2.5
Kentucky bluegrass	1.5–2.5
kikuyugrass	0.5–1
ryegrass, annual	1.5–2
ryegrass, perennial	1.5–2
St. Augustinegrass	0.75–1.5
tall fescue	1.5–2.5
zoysiagrass	0.5–1

Mow turf so that no more than one-third of the leaf blade is taken off at each cutting. In the summer months, cool season turfgrasses (Kentucky bluegrass, perennial ryegrass, fine fescue, tall fescue and colonial bentgrass) may be mowed at the higher height.

Unless mowed frequently, weedy turf areas will develop a patchy appearance in just a few days because of uneven growth. Common weeds that require frequent mowing to prevent patchiness are annual bluegrass and annual ryegrass in winter and crabgrass, dallisgrass, and buckhorn plantain in summer.

Thatch Removal and Aeration. Thatch develops in turf when surface organic matter is developed faster than organic matter is decomposed. Creeping species such as bentgrass, bermudagrass, zoysiagrass, St. Augustinegrass, and kikuyugrass can produce a thick thatch. Removing thatch increases the turf vigor; it also reduces scalping by the mower and gives a more uniform appearance to the turf. Thatch can reduce the effectiveness of preemergence herbicides by either (1) binding with the herbicides, making them ineffective or (2) increasing degradation of the herbicides due to the increased activity of microorganisms.

Thatch removal (by verticutting) should be done before preemergence herbicides are applied; otherwise the herbicide will be removed or its activity will be decreased. The same principle applies to aeration. Apply herbicides after aeration to get maximum control of the weeds.

MONITORING

Regular weed surveys (winter, spring, and summer) will help determine what species are present, their approximate population levels, and what types of management practices may be necessary. Use *Turfgrass Pests*, UC/DANR Publication 4053; *Grower's Weed Identification Handbook*, UC/DANR Publication 4030; *Weeds of the West*, UC/DANR Publication 3350; or contact your local county office of the University of California Cooperative Extension to help identify weed species.

Use a form such as the following one to keep written records of monitoring results. A written weed history will aid in making future weed management decisions.

WEED SURVEY FORM		
ANNUAL SPECIES		
( ) annual bluegrass	( ) large crabgrass	( ) smooth crabgrass
( ) goosegrass	( ) common chickweed	( ) prostrate spurge
( ) knotweed	( ) malva	( ) wild barley
( ) burclover	( ) black medic	( ) spurweed
( )_____	( )_____	( )_____
PERENNIAL SPECIES		
( ) dandelion	( ) broadleaf plantain	( ) bermudagrass
( ) oxalis	( ) dallisgrass	( ) white clover
( ) English daisy	( ) kikuyugrass	( ) yellow nutsedge
( )_____	( )_____	( )_____
( )_____	( )_____	( )_____
( ) Check for frequency of occurrence; L = low, M = medium, H = high frequency.		

HERBICIDES

Herbicides are an effective tool where high quality turf is desired. However, they must be applied with care and accuracy and in the context of a good overall turf management program. Before using any herbicide, carefully review the label for conditions of use including rates, methods of application, and precautions. Never use an herbicide in any manner contrary to its label.

When using any herbicide for the first time, apply it at the recommended rate on a limited area to make sure it is successful under local conditions. Excessive rates, improper timing, or application errors of selective herbicides can injure or kill desirable turf. Insufficient application, on the other hand, usually results in failure or incomplete weed control.

Adjuvants are compounds that modify a spray solution. These include wetting agents, surfactants, spreaders, emulsifiers, and solvents. Adjuvants can enhance herbicide activity and/or reduce herbicide selectivity. Some adjuvants alone can cause injury to turf. Adjuvants should only be used when called for by the product label. Be aware of formulation changes for the herbicide; new formulations may result in turf injury even though no injury was noted in previous formulations.

Both broadcast and spot treatment of herbicides can be made. The extent of the weed infestation will determine which application method will be used. Broadcast applications can be made either by spraying herbicides mixed in water or by applying herbicides fixed to granules. Small scattered infestations can be controlled with spot applications. Larger more uniform infestations should be controlled with broadcast applications. To increase the uniformity of granular applications apply one-half of the required herbicide over the entire area to be treated in one direction (north-to-south) and the other half over the entire area in the perpendicular direction (east-to-west). Before making broadcast spray applications, carefully calibrate the sprayer to insure accuracy. See *The Safe and Effective Use of Pesticides*, UC/DANR Publication 3324 for additional information.

Spot treatment with selective herbicides such as 2,4-D is useful in small areas. Be sure to apply the recommended rate and concentration. Be careful not to prolong application over individual spots as over application can occur and result in turf injury to the surrounding area. Spot treatments are also useful with nonselective herbicides such as glyphosate, used to control individual clumps of weeds such as tall fescue, dallisgrass, or nutsedge. When applying the herbicide, apply just enough spray to wet the leaves of the weed. Do not allow the application equipment to drip or leak between spot applications; also, do not walk through the treated area onto untreated turf. Both activities can cause severe turf injury. If the weed is taller than the turf, the herbicide can be applied with a wiper, giving a selective application to the weed.

F63

SITE PREPARATION. Four herbicides recommended for preplant use on areas to be planted with turfgrass are glyphosate (Roundup or Rodeo plus surfactant), dazomet (Basamid), metham (Vapam) and methyl bromide. Glyphosate is a translocated herbicide used primarily for control of perennial weeds. Methyl bromide is a nonselective soil fumigant that requires special application techniques using a vaporproof covering like polyethylene. A polyethylene covering will also increase the control of dazomet and metham. Preplant fumigation of a site can kill bermudagrass, nutsedge, and other perennials, as well as all existing annual weeds and many germinating seeds.

Newly Established Turf. Bromoxynil (Buctril) can be applied to newly emerged turf when it is about one month old to control seedling broadleaf weeds. DCPA can be used "at greening" when a solid stand of turf is apparent. Postemergent herbicides such as 2,4-D or dicamba can be used once the turf has produced several tillers and has been mowed two or three times.

Established Turf. Herbicides may be applied before (preemergent) or after (postemergent) weeds emerge. **Preemergent herbicides** used to control weeds in turf are applied to the soil before the weed seeds germinate and are incorporated into the top 1 to 3 inches of soil by rain or irrigation where they will be taken up by the roots and shoots of the emerging weeds. Preemergent herbicides include atrazine (Drexel Atrazine), benefin (Balan), bensulide (Presan), DCPA, dithiopyr (Dimension), isoxaben (Gallery), napropamide (Devrinol), oxadiazon (Ronstar), pronamide (Kerb), pendimethalin (Pre-M), and the combination materials benefin plus trifluralin (Team), and benefin plus oryzalin (XL).

Atrazine, which is labeled for sod production only, is used exclusively in St. Augustinegrass or zoysiagrass for control of annual broadleaf weeds and some annual grasses.

Benefin is used primarily for annual grass control, but it will control some annual broadleaf species. Apply it 2 to 3 weeks before initial weed germination and use sprinkler irrigation to wash it off the turf leaves.

Bensulide is also used primarily for control of annual grasses. Apply it before initial weed seed germination; the timing of the application depends on location in the state and the weed species targeted. Bensulide gives 4 to 6 months control of annual grasses and will inhibit germination of overseeded grass.

DCPA is one of the safest herbicides for most turf species. It is used principally for crabgrass control, but will also give short term control of prostrate spurge.

Dithiopyr is used on established turf for control of annual grass and some seedling broadleaf weeds Some bentgrass cultivars and fine leaf fescue are sensitive to this material if treated during periods of severe stress. Used primarily as a preemergent herbicide to control germinating crabgrass, annual bluegrass, spurge, and oxalis, it will also control crabgrass seedlings up to the 3-tiller stage.

Isoxaben is used on established turf for the control of many broadleaf weeds. Apply it in late summer to early fall for winter annuals or in early spring for summer annuals or perennial weed seedlings. For best results, follow with a sprinkler irrigation of at least 0.5 inch of water.

Napropamide effectively controls crabgrass and many other annual weeds before emergence. It is currently registered on dichondra, warm season turf and tall fescue.

Oryzalin controls annual grasses in warm season turf. It has long residual activity; a summer application may prohibit germination of a fall overseeding of winter annual grass.

Oxadiazon is used in established turf principally for crabgrass control, although annual bluegrass and many annual broadleaf weeds can also be controlled. It should not be used on turfgrass greens or tees, nor is it registered for use on home lawns.

Pendimethalin is used on established turf to control many weeds including crabgrass, foxtail, oxalis, and spurge. Due to its long residual period, the turf should not be overseeded with grasses for 8 to 12 weeks after application.

Pronamide is used for preemergence or early postemergent control of annual bluegrass in bermudagrass turf. It is most effective in late fall at, or just before emergence. For postemergent control it takes 14 to 21 days before results are evident. Do not overseed with annual ryegrass within 90 days of treating with pronamide.

Postemergent herbicides used in turfgrass weed control either translocate systemically or act as contact herbicides. Herbicides that translocate penetrate the leaves and stems, move in the vascular system, and eventually reach a site of action where they interfere with plant processes, ultimately killing the weeds. Herbicides that translocate include 2,4-D, fluazifop (Fusilade), DSMA, glyphosate (Roundup), mecoprop (MCPP), and MSMA. Some translocated herbicides such as dicamba (Banvel) and triclopyr (Turflon) also have some soil activity and can be taken up by roots. Contact herbicides like bromoxynil (Buctril) and bentazon (Basagran) kill only the plant tissues touched by the spray, although bentazon does have some soil activity. Movement within the plant beyond the point of contact is limited. Both types of postemergent herbicides must pass through the leaves or shoots of the plant and must not be washed from the leaves with water from rainfall or irrigation for at least 48 hours after application. A surfactant (adjuvant) is often added to foliar sprays to help penetrate leaves.

Bentazon helps to control yellow nutsedge and selected broadleaved weeds in turf. Repeated applications are necessary for best results.

Bromoxynil is a contact material used for the control of many young broadleaf weeds. It is the least phytotoxic of the postemergent materials to newly-seeded grass turf, yet controls broadleaf weeds when they are small seedlings.

Dicamba is a foliar-applied, translocated material that also has soil activity. Spray dicamba on calm days to avoid drift onto susceptible plants.

Dithiopyr may be used for the control of young tillered crabgrass (large or smooth) up to the 3-tiller stage. May be combined with MSMA.

DSMA is a translocated material used primarily for crabgrasses, dallisgrass, and nutsedge control. Temperature, soil moisture, and the type of turf determine the degree of turf selectivity. Do not use DSMA on St. Augustinegrass turf as injury will result.

Fluazifop is a translocated, selective herbicide that controls most annual and perennial grasses. Its effectiveness is reduced when grasses are under moisture stress. Annual grasses are easiest to control when young. Higher rates of application and repeat treatments are necessary for control of perennial grasses.

Glyphosate is a translocated material used for control of a broad spectrum of weeds. Apply it to rapidly growing young annual weeds or perennial weeds at the flowering stage. In a mowed turf area, omit at least one mowing before application.

Mecoprop is a translocated, broadleaf herbicide. Because of its selectivity, it is generally safer to use on turfgrass than 2,4-D or triclopyr. Mecoprop is the safest postemergent herbicide to use on bentgrass. Mecoprop is frequently formulated into broadleaf mixes. Like 2,4-D, mecoprop has little soil activity.

F65

MSMA is a selective, translocated herbicide. It is used principally for crabgrass, dallisgrass, and nutsedge. The degree of selectivity on turf of MSMA is determined by temperature and rate, Do not use MSMA on St. Augustinegrass, bentgrasses, or kikuyugrass.

Pronamide is a selective herbicide that is used to control annual bluegrass in bermudagrass turf. It controls annual bluegrass slowly by inhibiting root development and thus reducing the weed vigor. Best control is accomplished when the annual bluegrass is young and before seed head stage. Do not treat where the material can move into sensitive cool season grass species and do not overseed with cool season species for 90 days following treatment.

The herbicide **2,4-D** is a selective material used for broadleaf weed control. It is applied in spring when weeds are rapidly growing. Repeat treatments may be required for late emerging weeds or on perennials. This herbicide is available as an amine or ester formulation. The 2,4-D ester form is used for hard-to-kill perennial broadleaf weeds. Do not use it on newly-seeded turf, St. Augustinegrass, bentgrasses or dichondra. The amine form is generally more selective on turfgrass and is less subject to drift problems to nontarget species.

Triclopyr is a translocated herbicide used for some broadleaf weeds; it is especially effective on oxalis. Do not use triclopyr on bentgrass or warm season turf species such as common and hybrid bermudagrasses and kikuyugrass. It has some soil activity, so do not apply high rates or make repeated applications over the root zones of susceptible shrubs and trees.

SPECIAL WEED PROBLEMS
(Updated 8/97)

CALIFORNIA BURCLOVER AND BLACK MEDIC. California burclover and black medic are annual or short-lived perennial weeds that infest turf. Invasion by these two species is encouraged by low nitrogen fertility. Herbicides that control these annual species include mecoprop, dicamba, or triclopyr.

CRABGRASS. Two species of crabgrass that commonly infest turf in California are smooth crabgrass and large crabgrass. Both species are annuals that spread primarily by seed, and to a lesser extent, by rooting at swollen nodes of stems. Crabgrass is frequently a problem in overirrigated turf. Frequent, shallow irrigation encourages the establishment of crabgrass. Preemergent applications of products containing benefin, bensulide, DCPA, dithiopyr, oryzalin, oxadiazon, pendimethalin, and trifluralin control crabgrass. Postemergent applications of products containing MSMA will aid in the control of crabgrass.

Crabgrass may germinate in warmer parts of the state throughout the year. In southern California, the major germination period is from late January to early March, depending on the weather, and seeds continue to germinate throughout the spring and summer. While germination is early in warm winter areas, growth is slow during spring months until mid-May. In June and July the plants produce tillers, shoots, and flowers in late July and August. Crabgrass may overwinter in warm areas and produce new growth and a second crop of seed in spring or early summer. For best control, apply preemergence herbicides before the end of January in warm winter areas. The optimum application period for postemergence herbicides in these areas in late May.

GOOSEGRASS (SILVER CRABGRASS, WIREGRASS). Goosegrass seedlings are often confused with crabgrass, but goosegrass germinates later in spring, is darker green, grows in tufts, and has a white or silvery color near the flattened stem bases. This annual weed is normally found on compacted soils or areas of heavy wear. Preemergence applications of oxadiazon have been helpful in the control of goosegrass.

SPOTTED SPURGE AND PROSTRATE SPURGE. Spurge is an annual weed that germinates in open spaces from March through October. It can be a problem in closely mowed turf that has open areas. Preemergence applications of products containing DCPA, isoxaben, pendimethalin, oryzalin, and trifluralin plus benefin, and oryzalin plus benefin have been helpful in the control of spurge. Postemergent applications of products containing bromoxynil or triclopyr have been helpful in limiting the establishment of spurge. In addition, raising the mowing height and increasing fertility may make the turf more competitive against this species.

BERMUDAGRASS. Bermudagrass is a perennial weed that is commonly found throughout California. It spreads by seed and by stem sections (rhizomes and stolons). The rhizomes and stolons are many jointed and root at the nodes. Bermudagrass does not grow well in the shade. Fall and winter fertilization and high mowing heights (greater than 1.5 inches) will reduce bermudagrass invasion into cool season turf. Avoid spreading stem sections of bermudagrass to uninfested areas with mowers and other turf maintenance equipment. Preemergent herbicides (pendimethalin, or benefin plus trifluralin) will aid in the control of germinating bermudagrass seedlings.

WHITE CLOVER. White clover is a low-growing perennial that roots at its nodes. It produces flowers that attract bees to turf areas. It develops readily in turf that is low in nitrogen; add nitrogen in spring and fall. Postemergent application of dicamba, mecoprop, or triclopyr will control white clover.

DALLISGRASS. Dallisgrass seedlings germinate in spring and summer and it becomes a perennial with the formation of short rhizomes. It has a clumpy growth habit that gives turf an irregular surface unsuitable for most sports activities. Repeated postemergent

 F67

treatment with MSMA or nonselective spot treatment with glyphosate can reduce dallisgrass infestations.

DANDELION. Dandelion is a perennial with a heavy taproot. Removal of the leaves and 1 to 2 inches of taproot will not control it because it will regenerate from the remaining portion of the taproot. Poorly maintained open turf areas allow the establishment of dandelion. Frequent mowing to remove the flowers will reduce the spread of viable seeds. Postemergent treatment of 2,4-D will control dandelion; products containing MCPA and MCPP are less effective than 2,4-D, and dicamba is ineffective.

ENGLISH DAISY. English daisy is a perennial weed that is most common in cool coastal climates. It is difficult to control, but products containing dicamba will reduce infestations. Repeat treatments are required since regrowth can occur and seedlings are common.

KIKUYUGRASS. Kikuyugrass is a perennial weed that is found in south and central coastal counties and is localized in the Sacramento and San Joaquin valleys. Frequently, kikuyugrass is mistaken for St. Augustinegrass. A quick way to tell them apart is to examine their leaves: kikuyugrass has pointed leaves with hairy stems, St. Augustinegrass has short, blunt leaves with no hairs. Most cultural practices have not reduced kikuyugrass invasion. Repeated postemergent applications of MSMA will reduce kikuyugrass in warm season turf. Repeated triclopyr or triclopyr plus MSMA applications have controlled kikuyugrass invasions into cool season turf.

CREEPING WOODSORREL (*Oxalis* spp.). Creeping woodsorrel is a perennial that is often found in well maintained turf areas. Creeping woodsorrel grows year round in California and produces running rootstocks and has leaves similar to those of clover. There are no cultural controls available for this weed. Herbicides that control *Oxalis stricta* (an annual found in many southern states) do not control *Oxalis corniculata* (creeping woodsorrel). Preemergent treatment with herbicides containing pendimethalin or dithiopyr will limit emergence. In cool season turf, postemergent treatment with triclopyr controls creeping woodsorrel. 2,4-D does not control this weed.

PLANTAIN. Both broadleaf and narrowleaf (buckhorn) plantain are found as weeds in turf. Poorly maintained open turf areas encourage the establishment of plantain. Postemergent treatment with products containing 2,4-D will control this perennial.

NUTSEDGE. Yellow and purple nutsedge, sometimes called nutgrass, are serious perennial weeds in turf. Both produce an extensive system of underground tubers from which they can regenerate. Nutsedge is very difficult to control once it is established in turf. When establishing turf, try to plant in seedbeds that are free of nutsedge. Control small localized infestations of nutsedge with metham or repeated applications of glyphosate. Yellow nutsedge may be reduced in turf by multiple postemergent applications of products containing MSMA or bentazon. Purple nutsedge is more difficult to reduce. Maintain a closed, competitive turf and avoid overly wet soil.

COMMON AND SCIENTIFIC NAMES OF WEEDS
(Updated 12/97)

Common Name	Scientific Name
barnyardgrass	*Echinochloa crus-galli*
bermudagrass	*Cynodon dactylon*
bindweed, field	*Convolvulus arvensis*
bluegrass, annual	*Poa annua*
burclover, California	*Medicago polymorpha*
catsear, common	*Hypochaeris radicata*
chickweed, common	*Stellaria media*
chickweed, mouseear	*Cerastium fontanum* subsp. *vulgare*
clover, white	*Trifolium repens*
crabgrass, large	*Digitaria sanguinalis*
crabgrass, smooth	*Digitaria ischaemum*
cudweed	*Gnaphalium stramineum*
daisy, English	*Bellis perennis*
dallisgrass	*Paspalum dilatatum*dandelion
dandelion	*Taraxacum officinale*
dock, curly	*Rumex crispus*
foxtail, yellow	*Setaria pumila*
geranium, cutleaf	*Geranium dissectum*
goosegrass	*Eleusine indica*
healall (selfheal)	*Prunella vulgaris*
henbit	*Lamium amplexicaule*
kikuyugrass	*Pennisetum clandestinum*
knotgrass	*Paspalum distichum*
knotweed, prostrate	*Polygonum aviculare*
lettuce, prickly	*Lactuca serriola*
mallow, little (cheeseweed)	*Malva parviflora*
medic, black	*Medicago lupulina*
nutsedge, purple	*Cyperus rotundus*
nutsedge, yellow	*Cyperus esculentus*
oxtongue, bristly	*Picris echioides*
pearlwort, birdseye	*Sagina procumbens*
pigweed, redroot	*Amaranthus retroflexus*
pimpernel, scarlet	*Anagallis arvensis*
plantain, broadleaf	*Plantago major*
plantain, buckhorn	*Plantago lanceolata*
purslane, common	*Portulaca oleracea*
ryegrass, Italian	*Lolium multiflorum*
soliva (spurweed)	*Soliva sessilis*
sorrel, red	*Rumex acetosella*
speedwell, Persian	*Veronica persica*
spurge, spotted	*Chamaesyce maculata*
velvetgrass, German	*Holcus mollis*
woodsorrel, creeping	*Oxalis corniculata*
yarrow, common	*Achillea millefolium*

F69

SENSITIVITY OF TURF SPECIES TO HERBICIDES
(Updated 8/97)

	PREEMERGENCE												
	ATR	BEN	BES	DCP	DIT	ISO	NAP	ORY	OXA	PEN	PRO*	BEN ORY	BEN TRI
TURF SPECIES													
bentgrasses	s	s	T	r	r	—	s	s	s	s	s	s	r
bermudagrass, common	r	T	T	T	T	T	T	R	T	T	T	t	T
bermudagrass, hybrid	r	T	T	T	T	T	t	r	T	T	T	T	T
bluegrass, Kentucky	s	T	T	T	T	T	r	s	T	R	s	s	T
dichondra	s	s	T	s	—	—	T	t	s	t	r	t	t
fescue, tall	s	T	T	T	T	T	t	s	T	T	s	s	T
fescue, fine	s	T	T	T	R	—	T	s	T	T	s	s	T
kikuyugrass	—	t	t	t	—	—	r	—	r	r	—	—	—
ryegrasses	s	T	T	T	—	T	r	s	R	r	s	s	T
St. Augustinegrass	t	T	T	T	—	T	s	T	R	—	s	T	T
zoysiagrass	T	T	T	T	—	T	r	s	R	R	s	T	T

	POSTEMERGENCE														
	BTZ	BRO	DIC*	DSM	GLY	MEC	MSM	PRO*	24A*	24E*	TRY	FLU	24D* MEC	24D* MEC DIC*	24D* TRY
TURF SPECIES															
bentgrasses	r	r	R	r	s	T	s	s	r	s	s	s	s	R	s
bermudagrass, common	T	T	T	T	s	T	T	T	T	T	r	s	T	T	r
bermudagrass, hybrid	T	T	T	T	s	T	T	T	T	T	s	r	T	T	r
bluegrass, Kentucky	T	T	T	T	s	T	R	s	T	T	T	s	T	T	T
dichondra	s	s	s	r	s	s	s	r	s	s	s	T	s	s	[illegible]
fescue, fine	T	T	T	T	s	T	T	s	T	T	T	T	T	T	[illegible]
fescue, tall	T	T	T	T	s	T	t	s	T	T	T	s	T	T	T
kikuyugrass	—	t	r	r	s	r	s	—	t	r	s	s	t	t	s
ryegrasses	T	T	T	T	s	t	T	s	T	T	T	s	T	T	T
St. Augustinegrass	T	R	s	s	s	t	s	s	s	s	s	—	r	s	s
zoysiagrass	T	t	R	R	s	r	T	s	r	s	s	s	r	r	s

ATR = atrazine (Drexel Atrazine)
BEN = benefin (Balan)
BES = bensulide (Presan)
DCP = DCPA (Dacthal W-75 for Turf)
DIT = dithiopyr (Dimension)
ISO = isoxaben (Gallery)
NAP = napropamide (Devrinol)
ORY = oryzalin (Surflan)

BTZ = bentazon (Basagran)
BRO = bromoxynil (Buctril)
DIC = dicamba* (Banvel 4-S)
DSM = DSMA (Methar)
OXA = oxadiazon (Ronstar)
PEN = pendimethalin (Pre-M, Pendulum)
PRO = pronamide* (Kerb)
TRI = trifluralin

GLY = glyphosate (Roundup)
MEC = mecoprop (MCPP)
MSM = MSMA
24A = 2,4-D amine*
24E = 2,4-D ester*
24D = 2,4-D*
TRY = triclopyr (Turflon)
FLU = fluazifop (Fusilade 2000)

Upper case = Registered for this turf species in California
S = sensitive
R = relatively tolerant
T = tolerant
— = no information

* Permit required from county agricultural commissioner for purchase or use

SUSCEPTIBILITY OF WEEDS TO HERBICIDE CONTROL

(Updated 12/97)

	PREEMERGENCE												
	ATR	BEN	BES	DCP	DIT	NAP	ISO	ORY	OXA	PEN	PRO*	BEN ORY	BEN TRI
ANNUAL WEEDS													
barnyardgrass	C	C	C	C	C	C	N	C	P	C	C	C	C
bluegrass, annual	C	C	C	C	C	C	N	C	C	C	C	C	C
burclover, California	C	N	N	N	—	C	C	P	C	P	N	P	P
chickweed, common	C	P	N	P	C	C	C	C	N	C	C	C	C
crabgrass, large	P	C	C	C	C	C	N	C	C	C	C	C	C
crabgrass, smooth	P	C	C	C	C	C	N	C	C	C	C	C	C
cudweed	C	N	N	N	—	N	C	N	N	N	N	N	N
foxtail, yellow	P	C	C	C	C	C	N	C	C	C	C	C	C
geranium, cutleaf	—	—	N	N	P	—	C	C	—	C	—	C	C
goosegrass	P	P	C	P	P	P	N	C	P	C	P	C	C
henbit	C	N	N	N	P	N	C	P	C	P	—	C	C
knotweed, prostrate	C	C	N	P	—	C	C	C	C	C	C	C	C
lettuce, prickly	C	N	N	N	—	P	C	P	C	P	N	P	P
mallow, little (cheeseweed)	C	N	N	N	—	P	—	P	C	P	P	P	P
medic, black	C	N	N	N	—	N	C	N	N	N	N	N	N
oxtongue, bristly	N	N	N	N	—	N	C	N	N	N	N	N	N
pearlwort, birdseye	—	P	N	—	—	—	C	C	N	C	—	C	C
pigweed, redroot	C	C	C	P	—	C	C	P	C	P	C	P	P
pimpernel, scarlet	C	C	N	C	—	C	C	C	C	C	—	C	C
purslane, common	C	C	N	C	C	C	C	C	C	C	C	C	C
ryegrass, Italian	P	C	C	P	C	P	N	C	N	C	C	C	C
soliva (spurweed)	C	N	N	N	—	C	—	P	C	P	N	P	P
speedwell, Persian	—	C	N	P	—	—	C	C	—	C	—	C	C
spurge, spotted	C	N	N	P	C	N	C	C	P	C	N	C	C
PERENNIAL WEEDS													
bermudagrass	N	N	N	N	N	N	N	N	N	N	N	N	N
bindweed, field	N	N	N	N	N	N	N	N	N	N	N	N	N
catsear, common	P	N	N	N	N	N	N	N	N	N	N	N	N
chickweed, mouseear	P	N	N	N	N	N	N	N	N	N	N	N	N
clover, white	P	N	N	N	N	N	C	N	N	N	N	N	N
daisy, English	N	N	N	N	N	N	N	N	N	N	N	N	N
dallisgrass	N	N	N	N	N	N	N	N	N	N	N	N	N
dandelion	N	N	N	N	N	N	N	N	N	N	N	N	N
dock, curly	N	N	N	N	N	N	N	N	N	N	N	N	N
healall (selfheal)	N	N	N	N	N	N	N	N	N	N	N	N	N
kikuyugrass	N	N	N	N	N	N	N	N	N	N	N	N	N
knotgrass	N	N	N	N	N	N	N	N	N	N	N	N	N
nutsedge, purple	N	N	N	N	N	N	N	N	N	N	N	N	N
nutsedge, yellow	N	N	N	N	N	N	N	N	N	N	N	N	N
plantain, broadleaf	N	N	N	N	N	N	N	N	N	N	N	N	N
plantain, buckhorn	N	N	N	N	N	N	N	N	N	N	N	N	N
sorrel, red	P	N	N	N	N	N	N	N	N	N	N	N	N
velvetgrass, German	N	N	N	N	N	N	N	N	N	N	N	N	N
woodsorrel, creeping	C	N	N	N	N	N	N	N	N	N	N	N	N
yarrow, common	N	N	N	N	N	N	N	N	N	N	N	N	N

ATR = atrazine (Drexel Atrazine)
BEN = benefin (Balan)
BES = bensulide (Presan)
DCP = DCPA (Dacthal W—75 for Turf)
DIT = dithiopyr (Dimension)
NAP = napropamide (Devrinol)
ISO = isoxaben (Gallery)
ORY = oryzalin (Surflan)
OXA = oxadiazon (Ronstar)
PEN = pendimethalin (Pre—M, Pendulum)
PRO = pronamide* (Kerb)
TRI = trifluralin (Team 2G)

C = control P = partial control N = no control — = no information

Permit required from county agricultural commissioner for purchase or use.

F71

Susceptibility of Weeds to Herbicide Control, continued

	POSTEMERGENCE														
	BTZ	BRO	DIC*	DIT	DSM	FLU	GLY	MEC	MSM	24A*	24E*	TRY	24D* MEC	24D* MEC DIC*	24D* TRY
ANNUAL WEEDS															
barnyardgrass	N	N	N	—	N	C	C	N	C	N	N	N	N	N	N
bluegrass, annual	N	N	N	P	N	N	C	N	N	N	N	N	N	N	N
burclover, California	—	N	C	—	N	N	C	C	N	P	P	P	C	C	C
chickweed	—	P	C	—	N	N	C	C	N	P	C	P	C	C	C
crabgrass, large	N	N	N	C	C	C	C	N	C	N	N	N	N	N	N
crabgrass, smooth	N	N	N	C	C	C	C	N	C	N	N	N	N	N	N
cudweed	N	N	C	—	N	N	C	C	N	N	P	—	P	P	P
foxtail, yellow	N	N	N	—	—	P	C	N	—	N	N	N	N	N	N
geranium, cutleaf	—	—	C	—	N	N	C	C	N	C	C	C	C	C	C
goosegrass	N	N	N	—	N	C	C	N	C	N	N	N	N	N	N
henbit	C	—	C	—	N	N	C	C	N	P	C	—	C	C	C
knotweed, prostrate	—	—	C	—	N	N	P	C	N	P	C	—	C	C	C
lettuce, prickly	—	C	C	—	N	N	C	C	N	C	C	—	C	C	C
mallow, little (cheeseweed)	—	C	C	—	N	N	P	C	N	C	C	—	C	C	C
medic, black	—	N	C	—	N	N	P	C	N	P	P	C	C	C	C
oxtongue, bristly	—	N	C	—	N	N	C	C	N	C	C	P	C	C	C
pearlwort, birdseye	—	—	C	—	N	N	C	C	N	—	—	—	—	C	—
pigweed, redroot	C	C	C	—	N	N	C	C	N	C	C	C	C	C	C
pimpernel, scarlet	—	—	C	—	N	N	C	C	N	C	C	C	C	C	C
purslane, common	C	C	C	—	N	N	C	C	N	C	C	C	C	C	C
ryegrass, Italian	N	N	N	—	N	C	P	N	N	N	N	N	N	N	N
soliva (spurweed)	—	C	P	—	N	N	C	C	N	C	C	—	C	C	C
speedwell, Persian	—	—	—	—	N	N	C	—	—	N	N	N	P	P	N
spurge, spotted	—	C	P	—	N	N	C	P	N	P	P	C	P	P	C
PERENNIAL WEEDS															
bermudagrass	N	N	N	N	N	C	C	N	N	N	N	N	N	N	N
bindweed, field	N	N	P	N	N	N	P	N	N	P	P	P	P	C	P
catsear, common	N	N	C	N	N	N	C	P	N	C	C	—	C	C	C
chickweed, mouseear	N	N	C	N	N	N	C	C	N	P	P	—	C	C	C
clover, white	N	N	C	N	N	N	P	C	N	P	P	C	C	C	C
daisy, English	N	N	P	N	N	N	C	N	N	N	N	N	N	P	P
dallisgrass	N	N	N	N	C	P	C	N	C	N	N	N	N	N	N
dandelion	N	N	P	N	N	N	C	P	N	C	C	P	C	C	C
dock, curly	N	N	C	N	N	N	C	N	N	P	P	C	P	P	C
healall (selfheal)	N	N	P	N	N	N	C	—	N	N	N	P	N	C	P
kikuyugrass	N	N	N	N	P	C	C	N	P	N	N	N	N	N	N
knotgrass	N	N	N	N	N	C	C	N	N	N	N	N	N	N	N
nutsedge, purple	N	N	N	N	N	N	P	N	P	N	N	N	N	N	N
nutsedge, yellow	P	N	N	N	P	N	P	N	P	N	P	N	N	N	N
plantain, broadleaf	N	N	P	N	N	N	C	P	N	C	C	P	C	C	P
plantain, buckhorn	N	N	P	N	N	N	C	P	N	C	C	P	C	C	P
red sorrel	N	N	C	N	N	N	C	N	N	N	N	—	P	C	P
velvetgrass, German	N	N	N	N	N	P	C	N	N	N	N	N	N	N	N
woodsorrel, creeping	N	N	N	N	N	N	C	P	N	N	N	C	N	P	C
yarrow, common	N	N	C	N	N	N	C	P	N	P	C	—	P	C	P

BTZ = bentazon (Basagran)
BRO = bromoxynil (Buctril)
DIC = dicamba* (Banvel 4-S)
DIT = dithiopyr (Dimension)
DSM = DSMA (Methar)
FLU = fluazifop (Fusilade 2000)
GLY = glyphosate (Roundup)
MEC = mecoprop (MCPP)
MSM = MSMA
24A = 2,4—D amine*
24E = 2,4—D ester*
TRY = triclopyr (Turflon)

C = control P = partial control N = no control — = no information

* Permit required from county agricultural commissioner for purchase or use.

HERBICIDE TREATMENT TABLE

(Updated 8/97)

Herbicide (commercial name)	Amount/Acre

PREPLANT

A. DAZOMET (Basamid) — 275 lb a.i./acre or 10 oz a.i./100 sq ft

COMMENTS: Soil-applied fumigant for control of annual weeds. Apply directly to the soil and mix 6 inches deep with a power tiller. Seed in 3 weeks if temperature is over 60°F and soil is moist but not wet.

B. METHAM* (Vapam) — 345–517 lb a.i. or 8–10 lb a.i./1000 sq ft

COMMENTS: Preirrigate soil to imbibe seeds and juvenate perennial propagules. Apply as soil begins to dry; soil temperature should be at least 50°F at 1 inch for best results. Apply in water on calm day; follow immediately with sprinkler irrigation to seal the soil surface or, preferably, cover with vaporproof covering. Seed in 2 weeks on light sandy soils, in 3-4 weeks on heavier clay or organic soils. Extend waiting period if temperature is below 60°F. Two applications usually required to eradicate bermudagrass, nutsedge, or kikuyugrass. Rototilling before treatment will enhance control.

C. METHYL BROMIDE* (Brom-O-Gas) — 430 lb a.i. or 10 lb a.i./1000 sq ft

COMMENTS: Methyl bromide is extremely dangerous and must be applied by a licensed applicator. Soil should be friable for gas to penetrate. Inject methyl bromide under a vaporproof cover, sealed at the edges; remove cover in 24-48 hrs. Vapor is toxic when sealed cover is removed; exclude people and pets from the area until the cover has been removed and the fumigant dissipated. Will kill roots of trees and shrubs present in the fumigated soil. Methyl bromide is effective on bermudagrass, field bindweed, kikuyugrass, and nutsedge. Control may be incomplete for hard-seeded species like mallow, clovers, medics, and pigweed.

D. GLYPHOSATE (Roundup, Rodeo plus surfactant, Roundup Pro) — 2–4 lb a.i.

COMMENTS: Glyphosate is a nonselective, foliar-applied postemergent herbicide that will eliminate nearly all established weeds and turf species from a site before seedbed preparation. It has no preemergence activity on emerging weeds or turf species. Use the lower rate for annual weeds and the higher rate for perennial weeds. Apply to actively growing weeds that are not stressed. A single application of glyphosate will not control nutsedge.

POSTPLANT

Preemergent to weed

A. ATRAZINE (Drexel Atrazine) — 1–2.2 lb a.i.

COMMENTS: Used for control of annual broadleaf weeds and some annual grasses in St. Augustinegrass or zoysiagrass turf. Do not use on other turf types or injury will result. May be applied up to 30 days before cutting or lifting sod. Do not apply in light textured (sandy) soils where tree or shrub roots may absorb the herbicide.

B. BENEFIN (Balan) — 3 lb a.i.

COMMENTS: For crabgrass control, apply 2-3 weeks before initial germination (January for Los Angeles Basin, early to mid-February for Central Valley and central coast, mid-February to March 1 for northern California and north coastal areas). Sprinkle-irrigate after application to wash herbicide off leaves and into the soil. For annual bluegrass control, apply 2-3 weeks before initial germination (August-September) and sprinkle-irrigate after application to wash herbicide off leaves and into the soil. For speedwell control, apply preemergence in January. Benefin is often combined with other preemergence herbicides, such as trifluralin or oryzalin, for longer residual. Do not apply to bentgrass greens.

Herbicide (commercial name)	Amount/Acre

C. BENEFIN
...AND...
ORYZALIN
(XL 2G) 2–3 lb a.i.
COMMENTS: For use on warm season grasses only. Apply on established turf before annual weeds germinate. Do not aerate or verticut after application. Do not use on bluegrass, bentgrass, ryegrass, or fescue turf.

D. BENEFIN 1.5–2 lb a.i. (cool season species)
...AND... 2–3 lb a.i. (warm season species)
TRIFLURALIN
(Team 2G)
COMMENTS: Apply on established turf in spring 1-2 weeks before expected germination of summer annuals (crabgrass, goosegrass, foxtail, or barnyardgrass). For annual bluegrass control, apply in late summer or early fall before germination. A second application can be applied 10-12 weeks after the first in the southern part of the state to control late-germinating weeds. Do not overseed grasses for 12-16 weeks after application.

E. BENSULIDE 7.5–10 lb a.i.
(Presan)
COMMENTS: Safest preemergence control material in bentgrass. For crabgrass control, apply 2-3 weeks before initial germination (January for Los Angeles Basin and south coast area, mid-February for Central Valley and central coast, mid-February to March 1 for northern California and north coastal areas). For annual bluegrass control, apply 7.5 lb a.i./acre in fall and 7.5 lb a.i./acre in midwinter (Jan-Feb). Crabgrass may germinate and become established in turf in late summer if lower rates are used. Good management will allow use of lower rates. For annual bluegrass control, apply in early fall before annual bluegrass germinates (mid-August to mid-September). Exclude children and pets during application and until treated area has been thoroughly sprinkler-irrigated.

F. DCPA 10 lb a.i.
(Dacthal)
COMMENTS: Apply 2-3 weeks before initial crabgrass germination (January for Los Angeles Basin and south coast area, early- to mid-February for Central Valley and central coast area, mid-February to March 1 for northern California and north coast area). Do not use on bentgrass and dichondra. Exclude children and pets during application and until treated area has been thoroughly sprinkler-irrigated. Will not control crabgrass after germination. For annual bluegrass control, apply at the end of August or beginning of September.

G. DITHIOPYR 0.25–0.5 lb a.i.
(Dimension)
COMMENTS: Apply to established turf before annual weeds germinate. Apply in spring for crabgrass, spurge, and oxalis, or in fall for annual bluegrass. May be applied as a single application in spring or fall, or as a split application with half being applied in spring and half in fall. Do not apply more than 1.5 lb a.i. per year. Do not apply within 3 months of seeding, overseeding, or sprigging. May injure fine fescue or bentgrass in golf course greens.

H. ISOXABEN 0.5–1 lb a.i.
(Gallery)
COMMENTS: Apply to established turf in late summer or early fall before winter annual weeds germinate. Provides 6-8 month control of many broadleaf weeds including: henbit, speedwells, oxalis, brass buttons and knotweed. A spring application helps control spurge and other summer broadleaf annuals. Follow application with at least 0.5 inch water. Will not control established weed plants. Not for use on putting greens or grass grown for seed.

Herbicide (commercial name)	Amount/Acre

I. NAPROPAMIDE — 2–3 lb a.i.
(Devrinol)
COMMENTS: Apply at seeding or on established dichondra; can also be used on bermudagrass, St. Ausustinegrass, and fescue. Principally for grass control, but will control some broadleaf weeds. A split application of 2 lb can be applied for crabgrass and 2 lb for goosegrass; apply 8-10 weeks apart. Follow treatment with a minimum of 1 inch of water to wash maerial from the leaves and into the soil. Do not reseed or overseed within six months after application.

J. ORYZALIN — 1.5–2 lb a.i.
(Surflan)
COMMENTS: For use on warm season grasses only. Apply on established turf before annual weeds germinate. Use low rate of application for annual bluegrass control in late summer or early fall. Use high rate in late winter or early spring before germination of summer annual weeds. Do not aerate or verticut after application. Do not use on bluegrass, ryegrass, or tall fescue turf. Long residual may prohibit overseeding of winter annual grass from a summer application.

K. OXADIAZON — 2–4 lb a.i.
(Ronstar)
COMMENTS: The granule formulation can be used safely on most grass species except bentgrass. Some foliar injury may be observed if the granules are applied to wet foliage or the herbicide is not washed from the leaves after application. Only use the wettable powder formulation on dormant established bermudagrass, St. Augustinegrass, or zoysiagrass turf. Apply the wettable powder formulation at least 2 weeks before turf greens in spring. Do not use on dichondra or on newly seeded turf. Has not been effective for control of prostrate spurge or creeping woodsorrel (Oxalis) in California.

L. PENDIMETHALIN — 1.5–3 lb a.i.
(Pre-M)
COMMENTS: Apply to established turf before annual weeds germinate. Useful in the control of many weeds including: crabgrass, foxtail, oxalis, and spurge. Use lower rate for control of annual bluegrass in fall or as a split application for control of crabgrass or spurge in late winter and early summer. Do not aerate or verticut after application. Do not overseed with grasses for 8-12 weeks after application. Do not apply on bentgrass.

M. PRONAMIDE* — 0.5–1 lb a.i.
(Kerb) 50WSP
COMMENTS: Used for control of annual bluegrass in bermudagrass turf; the higher rate gives longer residual control. Most effective in late fall at, or just before, emergence; 14-21 days are required before results are observed. Do not use on seedling, newly sprigged, or newly sodded turf.

Postemergent to weed

A. BENTAZON — 1–2 lb a.i.
(Basagran) 4EC
COMMENTS: Apply in 40 gal water/acre for yellow nutsedge in established turfgrass; thorough coverage is important. The nutsedge should be growing vigorously with good soil moisture. If control is not as desired, apply a second treatment after 10-14 days. Do not apply more than 3 lb a.i. per season. For optimum control, do not mow 3-5 days before or after application. Do not use on newly seeded or sprigged turf or golf course greens.

B. BENTAZON — 1 lb a.i.
(Basagran) 4EC
...PLUS...
2,4-D* — 1 lb a.i.
COMMENTS: For nutsedge and other broadleaf control. Do not use on newly seeded or sprigged turf.

F75

Herbicide (commercial name)	Amount/Acre

C. BROMOXYNIL (Buctril) — 0.25–0.5 lb a.i.

COMMENTS: Apply on young turfgrass after grass has emerged and when broadleaf weeds are in the 3- to 4-leaf stage or up to 6 inch weed height, or on rosette plants before they exceed 1.5 inches in diameter to control broadleaf weeds. On established turf, use lower rate on small weeds and higher rate on large weeds. During periods of high temperature, leaf tip burn may occur on turf. Do not use on bentgrass greens. Apply in at least 20 gal water/acre. May be tank-mixed with other broadleaf materials such as 2,4-D and 2,4-DP, MCPP, dicamba, MSMA, or DSMA, or combinations of these materials, depending upon the weed species present.

D. DICAMBA* (Banvel 4-S) — 0.25–0.5 lb a.i./100 gal water

COMMENTS: Apply in 40 gal water/acre for control of chickweeds, clovers, English daisy, prostrate knotweed, pearlwort, red sorrel, curly dock. Do not apply more than two times per year. The 4 lb acid equivalent/gal formulation can also be used for spot spraying; do not exceed 0.5 lb acid equivalent/acre/season. Active through the soil; do not use where roots of ornamental plants may extend into treated area or spray on tree basins. Spray on calm days to avoid spray drift onto susceptible crops or ornamentals. Do not use on dichondra or spray in tree basins.

E. DITHIOPYR (Dimension) — 0.25–0.5 lb a.i.

COMMENTS: Apply to crabgrass before tillering stage. May be used with MSMA to control existing crabgrass. Equally effective on smooth or large crabgrass.

F. DICAMBA* *...AND...* 2,4-D* (Trimec) — Label rates

COMMENTS: For English daisy or other difficult to control broadleaf weeds such as dandelion or plantain. Do not exceed 0.25 acid equivalent/acre of dicamba on bentgrass turf. Active through the soil; do not use where roots of ornamentals may extend into treated area. Spray on calm days to avoid spray drift onto susceptible crops or ornamentals. Do not use on dichondra.

G. DSMA (Methar) — 3–4 lb a.i.

COMMENTS: Apply in 175-200 gal water/acre. Effective for crabgrass, dallisgrass, and nutsedge control. Temperature, soil moisture, and turf type determine degree of turf selectivity. Avoid spraying under hot, droughty conditions. Bentgrasses, fine-leaved fescues, and dichondra are most sensitive; bermudagrass is most tolerant. Do not use on St. Augustinegrass turf. Use lower rate on bentgrasses and fine-leaved fescues and if daily temperatures exceed 80°F. Lower rate is sufficient to control young crabgrass; use higher rate for mature crabgrass; requires 2-3 resprays at 5-7 day intervals. Use repeated monthly sprays for established dallisgrass and nutsedge. Use higher rate on bermudagrass and, if temperatures are 80°F or lower, in Kentucky bluegrass as well; will yellow zoysiagrass turf.

H. FLUAZIFOP (Fusilade) — Label rates

COMMENTS: For selective grass control in dichondra only. Will not control annual bluegrass. Apply when the grass is young and vigorous and has good soil moisture. Retreatments may be required for hard-to-kill weeds such as bermudagrass, dallisgrass, and kikuyugrass. Will not control nutsedge.

Herbicide (commercial name)	Amount/Acre

I. GLYPHOSATE (Roundup) — 1–2 lb a.i./acre or 1.6 oz a.i./gal/1000 sq ft

COMMENTS: Apply to rapidly growing weeds in 20-40 gal water/acre or as a spot treatment. For control of annual weeds shorter than 6 inches, apply 1 lb a.i./acre; if 6 inches or taller, apply 1.5 lb a.i./acre. Allow minimum of 3 days between application and renovation or cultivation. For control of perennial weeds, apply 4-5 lb a.i./acre to vigorous but nearly mature weeds (bermudagrass in summer-fall; field bindweed, at full bloom). In mowed turfgrass areas, do not mow before application. Delay verticutting, removing sod, or tillage for at least 7 days after treatment. To maximize control, allow the soil surface and root area to dry after verticutting or sod removal before replanting. When turf or ornamentals are to be planted, a followup preemergence program is required to control the seeds of perennials.

J. MECOPROP (MCPP) — 1–1.5 lb acid equivalent

COMMENTS: For control of clover, prostrate knotweed, pearlwort. Spray on calm days to avoid spray drift onto susceptible crops or ornamentals. Safer to use on bentgrass than 2,4-D; do not use on dichondra. Use 1 qt surfactant/100 gal spray. For spot spraying use the same concentration/100 gal spray or 3-4 tsp mecoprop plus 2 tsp surfactant/gal water. (Rate for spot spraying applies only to formulations containing 2 or 2.5 lb acid equivalent/gal.)

K. MSMA — 2–4 lb a.i.

COMMENTS: Temperature and turf type determine degree of selectivity. Use lower rate for nutsedge control, on bentgrass, and on other turf types when daily temperature exceeds 85 F. For control of dallisgrass and nutsedge. Make no more than two applications/season at a 30-day interval. Apply uniformly over area regardless of distribution of the weed. Hesitating with sprayer over weedier spots may cause excessive rate and injure or kill the turf. Repeated applications of high rates reduces kikuyugrass. Turf may be temporarily discolored. Injurious to St. Augustinegrass, red fescue, dichondra, and zoysiagrass.

L. PRONAMIDE* (Kerb) 50WSP — 0.75–1.5 lb a.i.

COMMENTS: For control of annual bluegrass in bermudagrass turf only. Use 0.75-1 lb a.i. to control seedling to young tillering stages of annual bluegrass; a higher rate of 1-1.5 lb a.i. is needed for seed-forming stages. Do not apply where the herbicide can move into sensitive cool season grasses. Do not overseed cool season grasses within 90 days after treatment.

M. TRICLOPYR (Turflon) — 0.25–0.5 lb a.i.

COMMENTS: For use on cool season turf species only. Especially useful for creeping woodsorrel control. Apply in 50-100 gal water/acre to vigorously growing broadleaf weeds, preferably in spring or fall. May be retreated 4 weeks following the first application for hard-to-kill weeds. To broaden weed spectrum and control dandelion, use a tank mix of amine or low volatile ester of 2,4-D with triclopyr. Do not apply around trees or shrubs, since injury may result. Do not follow application with an irrigation within 4 hrs.

N. 2,4-D LOW-VOLATILE ESTERS* (Weedone LV4) — 0.48–0.95 lb a.i.

COMMENTS: Apply in 100 gal water/acre. Use to control common yarrow, speedwells, mallows, mature knotweed. For spot treatments, use 4 tsp formulation/1 gal water.

O. 2,4-D WATER-SOLUBLE AMINES* (Weedar 64) — 1–1.5 lb a.i.

COMMENTS: For control of dandelion, plantain, young pigweed use 1 lb acid equivalent plus 1 qt surfactant in 100 gal water/acre. For spot treatment use 2 tsp formulation plus 2 tsp surfactant to 1 gal water. For control of young knotweed (2- to 4-leaf stage), field bindweed, wild lettuce, and filaree use 2 lb acid equivalent plus 1 qt surfactant in 100 gal water/acre. For spot treatment, use 4 tsp formulation plus 2 tsp surfactant to 1 gal water. On bentgrasses use water-soluble amine only and do not exceed 0.75 lb acid equivalent/acre.

F77

Herbicide (commercial name)	Amount/Acre
P. 2,4-D*	0.5–1 lb a.i.
...PLUS...	
MCPP	1 lb a.i.

COMMENTS: A tank mix. Do not apply in windy conditions where drift can occur. Do not mow grass 2-3 days before or after treatment. Do not use on bentgrass greens, St. Augustinegrass, or centipede turf. Do not irrigate for 4 hrs after application.

Q. 2,4-D*	Label rates
...AND...	
MCPP	
...*AND*...	
DICAMBA* (Trimec, etc.)	

COMMENTS: For broad spectrum control of broadleaf weeds. Use lower rates for bentgrass, hybrid bermudagrass and other sensitive turfgrasses. Nonselective on dichondra. Avoid applying to drought- and heat-stressed turf. Do not irrigate within 24 hrs of application. Newly seeded turf should not be treated until after the second or third mowing. Bentgrass is the most sensitive of the turfgrasses. Read label for further application directions. Do not allow spray drift to contact broadleaf ornamentals or injury may occur.

R. 2,4-D*	Label rates
...*PLUS*...	
TRICLOPYR (Turflon)	Label rates

COMMENTS: A tank mix used for control of a broad spectrum of broadleaf weeds. Particularly effective for oxalis when other broadleaf weeds are present. Do not use on dichondra, bentgrass, or warm season turfgrasses. Avoid applying to drought or heat stressed turf. Do not irrigate within 24 hour of application. Do not allow drift to contact broadleaf ornamentals or injury may occur.

* Permit required from county agricultural commissioner for purchase or use.

AUTHORS AND AFFILIATIONS (12/97)

Insects and Mites: R. Cowles, Entomology, The Connecticut Agricultural Experiment Station; K. Kido, Entomology, UC Riverside; H. Kaya, Nematology, UC Davis; H. Costa, Entomology, UC Riverside

Diseases: M. E. Grebus, Plant Pathology, UC Riverside; J. Hartin, UCCE, San Bernardino Co.; A. H. McCain, Environmental Science, Policy and Management, UC Berkeley; H. D. Ohr, Plant Pathology, UC Riverside

Nematodes: B. B. Westerdahl, Nematology, UC Davis; E. Caswell-Chen, Nematology, UC Davis

Weeds: C. L. Elmore, Veg Crops/Weed Science, UC Davis; D. W. Cudney, Botany and Plant Sciences, UC Riverside; V. Gibeault, Botany and Plant Sciences, UC Riverside; C. Wilen, UC IPM Project, UCCE, San Diego Co.

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

PRECAUTIONS FOR USING PESTICIDES

Pesticides are poisonous and must be used with caution. READ THE LABEL BEFORE OPENING A PESTICIDE CONTAINER. Follow all label precautions and directions, including requirements for protective equipment. Apply pesticides only on the crops or in the situations listed on the label. Apply pesticides at the rates specified on the label or at lower rates if suggested in this publication. In California, all agricultural uses of pesticides must be reported. Contact your county agricultural commissioner for further details. Laws, regulations, and information concerning pesticides change frequently. This publication reflects legal restrictions current on the date next to each pest's name.

Legal Responsibility. The user is legally responsible for any damage due to misuse of pesticides. Responsibility extends to effects caused by drift, runoff, or residues.

Transportation. Do not ship or carry pesticides together with food or feed in a way that allows contamination of the edible items. Never transport pesticides in a closed passenger vehicle or in a closed cab.

Storage. Keep pesticides in original containers until used. Store them in a locked cabinet, building, or fenced area where they are not accessible to children, unauthorized persons, pets, or livestock. DO NOT store pesticides with foods, feed, fertilizers, or other materials that may become contaminated by the pesticides.

Container Disposal. Dispose of empty containers carefully. Never reuse them. Make sure empty containers are not accessible to children or animals. Never dispose of containers where they may contaminate water supplies or natural waterways. Consult your county agricultural commissioner for correct procedures for handling and disposal of large quantities of empty containers.

Protection of Nonpest Animals and Plants. Many pesticides are toxic to useful or desirable animals, including honey bees, natural enemies, fish, domestic animals, and birds. Crops and other plants may also be damaged by misapplied pesticides. Take precautions to protect nonpest species from direct exposure to pesticides and from contamination due to drift, runoff, or residues. Certain rodenticides may pose a special hazard to animals that eat poisoned rodents.

Posting Treated Fields. For some materials, *re-entry intervals* are established to protect field workers. Keep workers out of the field for the required time after application and, when required by regulations, post the treated areas with signs indicating the safe re-entry date. Check with your county agricultural commissioner for latest re-entry interval.

Preharvest Intervals. Some materials or rates cannot be used in certain crops within a specified time before harvest. Follow pesticide label instructions and allow the required time between application and harvest.

Permit Requirements. Many pesticides require a permit from the county agricultural commissioner before possession or use. When such materials are recommended, they are marked with an asterisk (*) in the treatment tables or chemical sections of this publication.

Processed Crops. Some processors will not accept a crop treated with certain chemicals. If your crop is going to a processor, be sure to check with the processor before applying a pesticide.

Crop Injury. Certain chemicals may cause injury to crops (phytotoxicity) under certain conditions. Always consult the label for limitations. Before applying any pesticide, take into account the stage of plant development, the soil type and condition, the temperature, moisture, and wind. Injury may also result from the use of incompatible materials.

Personal Safety. Follow label directions carefully. Avoid splashing, spilling, leaks, spray drift, and contamination of clothing. NEVER eat, smoke, drink, or chew while using pesticides. Provide for emergency medical care IN ADVANCE as required by regulation. (8/91)

The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, disability, age, medical condition (cancer-related), ancestry, marital status, citizenship, sexual orientation, or status as a Vietnam-era veteran or special disabled veteran. The University also prohibits sexual harassment. Inquiries regarding the University's nondiscrimination policies may be directed to the Affirmative Action Director, University of California, Agriculture and Natural Resources, 300 Lakeside Drive, 6th Floor, Oakland, CA 94612-3560; (510) 987-0096 (3/96)

F-79

An Environmental Approach to Golf Course Development & Management

Prepared for:

Hellman Properties LLC
711 Seal Beach Boulevard
Seal Beach, CA 90740

Prepared by:

Siena College-Audubon International Institute
Audubon International
P.O. Box 1226
Cary, NC 27512-1226

December 1996
©Audubon International

COASTAL COMMISSION
5-97-367
EXHIBIT # 6
PAGE 1 OF 26

F81

1.0 INTRODUCTION

This document outlines a program that will be implemented in order achieve environmental balance between the proposed Hellman Ranch Reserve Golf Course and the proposed restored and natural resource areas and their associated habitats. This approach to golf course development and management integrates environmental and agronomic practices and promotes the management of golf courses as ecosystems. By managing golf courses and associated developments as ecosystems, the golf course can take advantage of, or mimic, naturally functioning ecosystems.

On a practical level this program will integrate final golf course design, golf course cultural practices (maintaining the turf), special management zones, best management practices, integrated pest management, and environmental monitoring. The result will be a thoughtfully designed and carefully operated course in which there is effective integration of development, management and the environment.

It is intended that this program and the principals and practices herein be implemented in, a) the final design of the golf course (i.e., precise grading) and, b) management and operations of the golf course. The result will be detailed golf management program that will focus on sustainable resource management and the application of scientifically based decisions in the design, construction, and management of the golf course.

The focus of this approach will be on the following:

- ➡ Identifying Specific Management Zones on the golf course relative to their position in the watershed and proximity to ecologically sensitive areas. These areas would be cared for and managed more sensitively than other, less sensitive areas of the course.

- ➡ Incorporating Best Management Practices into the design of the golf course and maintenance facility, and the use of Integrated Pest Management to control pests;

- ➡ Controlling potential problems at their source through appropriate turfgrass cultural practices including the judicious use of fertilizers and pesticides, selection of pesticides based on an ecological risk assessment, an effective irrigation management program, and identification of management zones within the golf course area;

- ➡ Conducting an environmental monitoring program that evaluates the effectiveness of the management program.

This management program will be developed to detail how the golf course design, construction, and most importantly, maintenance will protect ecologically sensitive areas and wildlife habitats and meet the environmental objectives of both the land owner and regulatory agencies. By implementing the principles and practices contained in this plan, an environmentally sensitive approach to golf course development and management will be ensured.

2.0 ENVIRONMENTAL CONSIDERATIONS

Increasing attention has been focused recently on the interrelationships between golf courses and the environment, in particular on protecting habitat and water resources from contamination by nutrients and pesticides (Balogh and Anderson 1992; Walker and Branham 1992). By taking a proactive environmental approach to construction and management, the probabilities of negative occurrences can be significantly reduced (Peacock and Smart 1995; Peacock et al, 1996). Furthermore, recent scientific studies at several state universities indicate golf course management practices and environmental interactions can be favorable.

MANAGEMENT OF RESOURCES

1. **Identify drainage basins in the watershed in which the property is located.**
2. **Identify environmentally and ecologically sensitive areas of the site.**
3. **Identify management practices that will protect the property:**
   - --Specific Management Zones
   - --Best Management Practices (BMP's)
   - --Integrated Pest Management (IPM), including ecological risk assessment to select pesticides for use.
4. **Identify, conceptually, management practices for resource protection:**
   - --Creeks, wetlands, streams, lakes
   - --Associated habitats
   - --Surface water
   - --Subsurface water
   - --Groundwater

The first step in a proactive approach is to examine the golf course relative to its position in the watershed, and to identify the drainage basins and sub-drainage basins (the smallest units of land that drain to a common point). These analyses are generally completed in conjunction with the precise grading plan for a project, and are essential because the watershed and it's component drainage basins are the units of management at the ecosystem level. The second step is to identify environmentally and ecologically sensitive areas on or near a golf course. This includes, for example, creeks and wetlands and their associated habitats. The third step is to identify those management practices that would be appropriate to ensure protection of any sensitive areas or species. The management practices that will be addressed include the following:

- Specific Management Zones
- Best Management Practices
- Integrated Pest Management, including selection of pesticides and fertilizer and restrictions on the use of certain materials in sensitive areas.

The fourth step is to identify, at least conceptually, how the Specific Management Zones,

Best Management Practices and Integrated Pest Management practices would be employed for management of sensitive areas, protection of surface and ground water during construction, grow-in and operations, and subsurface drainage.

2.1 Watershed Drainage Basins

Drainage basins particular to the differing topographic divisions should be identified with topographic maps and aerial photography. Onsite and offsite areas should be identified and the areas of each sub-basin will then be determined. The sub-basin areas form the basis for the Specific Management Zones for a golf course watershed. This information is used to determine where specific Best Management Practices need to be employed.

2.2 Ecologically Sensitive Areas

One of the key objectives of this approach is to provide the necessary protection for ecologically sensitive areas and species by correct golf course design and management operations. Ecologically sensitive areas are those resources that are susceptible to change since change could alter ecosystem structure. These sensitive areas are identified in the sub-basin areas within the watershed. Design, construction and operations are to be managed to protect these resources.

2.3 Specific Management Zones

The process of managing the golf course in an environmentally sensitive and responsible manner involves establishing Specific Management Zones throughout a golf course. Specific management zones are defined as areas on a course that have distinct management practices that coincide with their position in the watershed, and are based on the sub-basin analyses conducted for the watershed. Management practices include many different aspects of turf management (e.g., the type and application rates of fertilizers or pesticides, or mowing heights). Thus, a golf course area next to a wetland or stream, or other environmentally sensitive area must be managed differently than an upland area. Landscapes lower in the watershed generally have more environmentally sensitive areas than landscapes higher up in the watershed. Specific management zones should be established for the property based on environmentally sensitive areas in the watershed. The management zones should be identified and specific management practices detailed for each zone.

2.4 Best Management Practices

Best Management Practices (BMP's) are accepted industry standards for the reduction of erosion and pollutant movement, particularly developed for use in agriculture and industry. These standards can also be applied for golf courses and other types of land uses. For golf courses, BMP's represent those engineering or cultural approaches to golf course management which act to prevent the movement of sediments, nutrients or pesticides into environmentally sensitive areas. They are tools used in management to

protect these areas and associated species. Through the use of Best Management Practices turfgrass management can coexist in harmony within a natural setting. The goals of BMPs are as follows:

1) to reduce the off-site transport of sediment, nutrients and pesticides;

2) to control the rate, method and type of chemicals being applied; and

3) to reduce the total chemical load.

The quantity and quality of water from a golf course watershed can be protected by appropriate watershed controls and management practices. Because water is the primary movement mechanism for contaminants, protection of water resources also provides protection for sensitive areas and species.

The following is a sample of BMPs that may be incorporated throughout the design and management of a golf course to prevent and minimize any adverse environmental impact. Many of the BMPs suggested by the US Department of Agriculture, Soil Conservation Service (Bottcher and Baldwin, 1986) can be adapted for use in turfgrass management situations:

Aquatic filter ponds - Utilization of ponds or detention basins in order to dilute, filter or assimilate nutrients from drainage water will function in pollution abatement.

Subsurface drainage - Collection of infiltrated surface water primarily from greens and tees and reducing runoff and leaching will allow channeling of potential pollutants for abatement. Collection, filtration and drainage into vegetative areas for additional filtration will control the potential release of nutrients and pesticides from a golf course.

Regulated runoff impoundment - Detention with associated filtration through plant material within basins prior to discharge is used to reduce runoff quantity and nutrient and pesticide discharge.

Land absorption area - Providing an adequate land absorption area for drainage or runoff filtration so that soil and plants absorb nutrients. Surface drainage on a golf course is filtered through turf areas. All drainage from impervious surfaces is directed into areas which have vegetative cover or which contain the runoff rather than allowing direct discharge.

Grassed waterways or buffers - Using a constructed waterway or outlet maintained with vegetative cover in order to prevent soil erosion and filter nutrients. Buffers, grassed swales and selected golf course roughs serve in this capacity. Vegetative areas act as natural biofilters to reduce stormwater flow and pollution. These practices use the natural

processes of infiltration, filtration and biological uptake to reduce flows and pollutant loadings. Filter strips, buffers and grassed swales are examples of vegetative practices. Sediment removal rates for individual BMP are generally greater than 70% and nutrient removal is typically greater than 50% (USEPA, 1993). The effectiveness of swales in reducing flows and pollutants is similar to filter strips. Edges of roughs and fairways should be contoured to provide a swale which will direct flow onto the fairway and rough areas and channel runoff away from ecologically sensitive areas and eventually into a stormwater system.

Wauchope (1978) noted that in cases where water quality has declined due to agricultural practices leading to loss of nutrients and erosion, grass buffer strips placed between treated fields and surface waters have significantly reduced the problem. This result is related to the architecture of the turf canopy and the fibrous nature of the turf root system. Turf density, leaf texture and canopy height are physical factors which restrain soil erosion and sediment loss by dissipating impact energy from rain and irrigation water droplets providing a resistance to surface movement of water over turf.

Critical area planting - the planting of vegetation to stabilize the soil and reduce erosion and runoff. Turfgrasses are the premium choice of plants for this purpose. In roughs and out-of-play areas, low maintenance hearty species/cultivars specifically adapted for this site will be selected for use.

Resistant crop varieties - the use of plant varieties that are resistant to insects, nematodes, diseases, etc., in order to reduce pesticide use. Care should be taken in the selection of the turfgrass species and cultivars best adapted for the edaphic, climatic and traffic intensity conditions of a proposed site.

Cultural control of pests - the use of cultural practices to partially substitute for pesticides. Details of the proper cultural practices including mowing, fertilization, irrigation, and supplementary cultural practices are included in this plan to take advantage of every aspect of cultural control of pest problems. One of the best deterrents to pests is a healthy turf which is the result of selecting the proper grasses and using the proper cultural programs.

Soil testing and plant analysis - testing to avoid over-fertilization and subsequent losses of nutrients should be extensively utilized. All initial fertilizer recommendations should be based on soil testing. All subsequent fertilization programs should be finalized based on a minimum sampling program consisting of annual soil and quarterly tissue analyses.

Timing and placement of fertilizers - timing and placement of fertilizers for maximum utilization by plants and minimum leaching or movement by surface runoff should be detailed. Every precaution in fertilization timing, including scheduling to avoid potential

rainfall which could produce runoff and/or leaching, verification of application rate through proper calibration of equipment, and choice of materials should be employed by the golf course superintendent.

Slow release fertilizer - applying slow release fertilizers to minimize nitrogen losses from soils prone to leaching. All fertilization programs should include the use of slow release nitrogen fertilizers.

Irrigation water management - determining and controlling the rate, amount, and timing of irrigation water application in order to minimize soil erosion, runoff, and fertilizer and pesticide movement. The irrigation system should be designed to have an average application rate below the infiltration capacity of the soil so that no surface ponding will occur and maximum efficiency of water percolation will occur. All irrigation should be based on a water balance method which takes into account plant water use as monitored by environmental conditions, soil drainage and natural rainfall.

Biological control of pests - use of natural enemies as part of an Integrated Pest Management (IPM) program which can reduce the use of pesticides. While biological controls which provide effective pest management for turfgrasses are limited, whenever practical these should be considered. For example, parasitic nematodes, and bacteria/toxins for insect control are available. The IPM program is further summarized in Section 2.5 of this document.

Pesticide selection - selecting pesticides should be based on an ecological risk assessment, and should include pesticides which are less toxic, persistent, soluble and volatile whenever feasible. All pesticides selected for use should be screened for their potential to be sources of pollution. Only materials which have a documented margin of safety should be included in the recommended list.

Pesticide rotation - rotating materials for use on specific pest problems to prevent natural resistance from developing. Screening of materials for use allows multiple selections for specific problems. Rotating choices of materials helps preclude resistance to a specific material or class of materials from occurring.

Correct application of pesticides - includes spraying when conditions for drift are minimal or avoiding application when rain is forecast and irrigating with appropriate volumes of water when specified. All of these conditions as well as proper calibration of equipment should be scrutinized at every pesticide application by the golf course superintendent.

Correct pesticide container disposal - following accepted methods for pesticide container disposal. This should be a routine practice under the supervision of the golf course superintendent.

6F87

The goal of Best Management Practices (BMPs) is to reduce or eliminate the movement of sediment, nutrients or pesticide into environmentally sensitive areas.

2.5 Integrated Pest Management

Integrated Pest Management (IPM) is the use of information about turfgrass pest problems, including environmental conditions which may precipitate these problems, and the integration of this information with turfgrass cultural practices and pest control measures to prevent or control unacceptable levels of pest damage (Ferrentino, 1990).

The goal of IPM is to reduce reliance on any one form of pest control, such as chemical pesticide application, in order that all forms of control are applied as appropriate to control damage. Strategies for IPM have been employed for over 30 years. IPM is a preventative approach incorporating a number of objectives including the following:

1) Development of a healthy turf that can withstand pest pressure;

2) Judicious and efficient use of chemicals;

3) Enhancement of populations of natural, beneficial organisms; and

4) Effective timing of handling pest problems at the most vulnerable stage, often resulting in reduced pesticide usage.

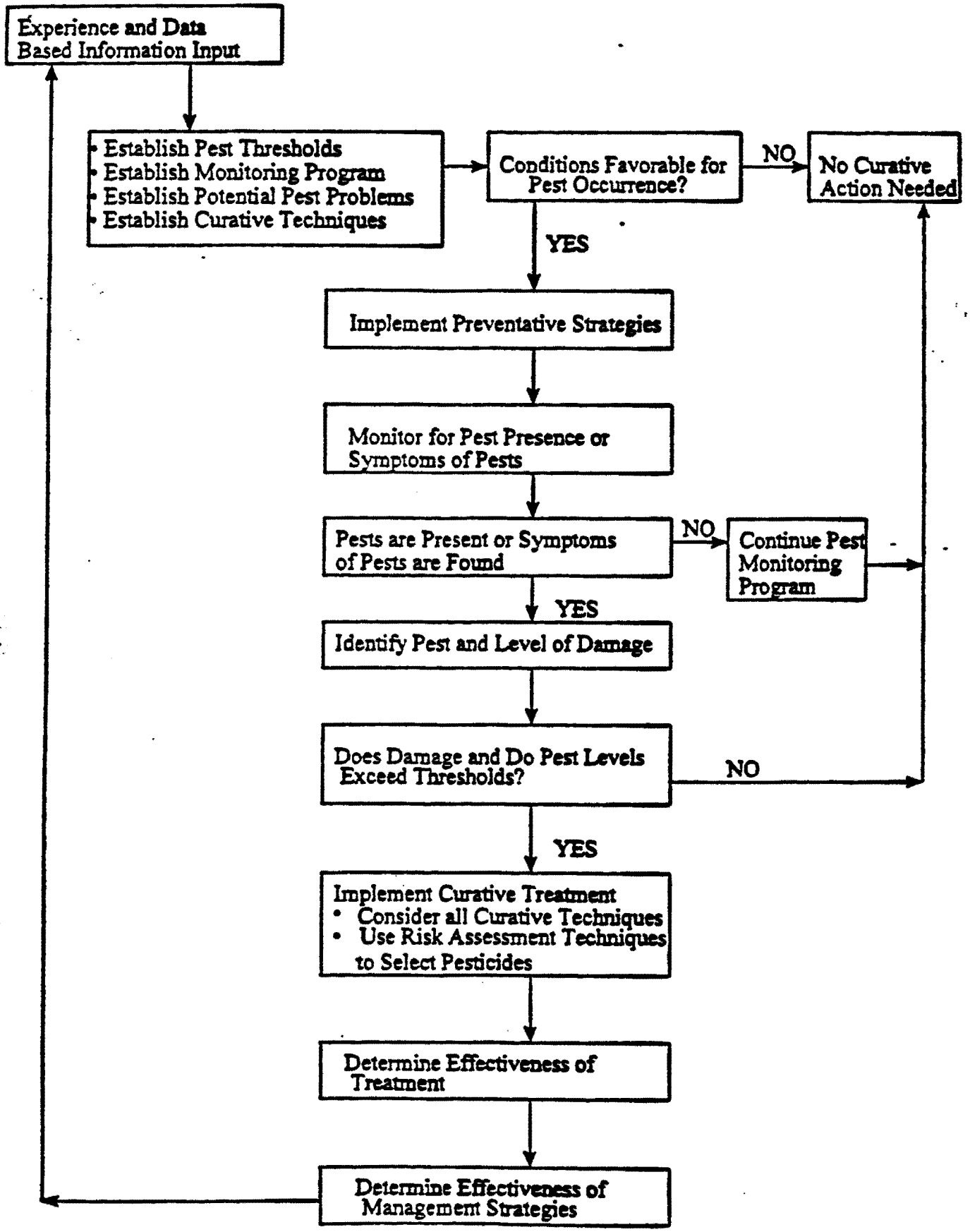
Experience and training are important requisites to an IPM approach which focuses on the following basic components:

- ⇒ monitoring of potential pest populations and their environment;
- ⇒ determining pest injury levels and establishing treatment thresholds;
- ⇒ decision making to develop and integrate all biological, cultural and chemical control strategies;
- ⇒ educating personnel on all biological and chemical control strategies;
- ⇒ timing and spot treatment utilizing either the chemical, biological or cultural methods;
- ⇒ evaluating the results of treatment.

Like BMPs, IPM strategies should be incorporated into every aspect of the Management Program and should take into consideration the entire scheme of golf course operations as they relate to environmental considerations. A flow chart showing the steps in IPM-related decision making is illustrated in Figure 2. Incorporated into this approach are the following:

1) Selection of the best regionally adapted turfgrass species and cultivars;

Figure 2
Integrated Pest Management Decision Flow Chart



Pesticides should be selected for use based on an ecological risk assessment approach that is protective to the environment. Pesticide use should be restricted in most cases to curative rather then preventive applications. Pesticide applications should not be made on a regularly scheduled basis, but rather on a need basis, thus reducing environmental exposure.

2) The use of proven cultural practices such as aerification, vertical mowing, topdressing, maintenance of proper soil nutrient levels, sound irrigation management and proper mowing techniques to produce a high quality playing surface;

3) A sound pesticide management program to control those pests that exceed a tolerance level for acceptable turf growth; and

4) Monitoring of the turf and environmental conditions which may precede pest problems and for population changes in pest and beneficial organism populations.

A comprehensive monitoring program is one of the most critical components to an effective IPM effort. A well-trained and experienced golf course superintendent employs scouting to detect symptoms of pest problems on a daily basis. This approach coupled with compiling a site specific history, and consulting with other superintendents in the area and with specialists in turfgrass management make it a viable program.

While economic advantages of IPM are marginal, the sociological and environmental consequences of judicious pesticide use is strong justification for implementation.

2.5.1 IPM Pesticide Selection - A Risk Assessment for Selection

Selection and use of pesticides are important considerations in the IPM program. Pesticides should be selected for use based on an ecological risk assessment approach that is protective of the environment. Pesticide use should be restricted in most cases to curative rather then preventive applications. Pesticide applications should not be made on a regularly scheduled basis, but rather on a need basis, thus reducing environmental exposure. The only exceptions may be preemergence herbicides used to control weeds. It is much more effective and less harmful to the environment to control weeds before they emerge rather than after.

Pesticide selection should be based on effectiveness, toxicity to non-target species, solubility and persistence. Additionally, materials should be applied strictly in accordance

2.5.2 Pesticide Selection Criteria
Steps in Determining Pesticide Selection

1. Step wise models. Step wise models should be used to evaluate pesticides based on their chemical characteristics and site conditions. Step wise models (as in the California Pesticide Contamination Prevention Act; GUS model, Gustafson 1989; SCS Ranking in Goss 1991; PLP model in Warren and Weber 1994) provide a series of 'if-then' situations to evaluate pesticides. These models are often used to identify potential exposure of the pesticides to the environment and non-target organisms in surface runoff and subsurface leaching.

2. Exposure. The levels of potential exposure of a pesticide through surface runoff and subsurface leaching will be determined from these step-wise models.

3. Toxicity. The level of risk associated with exposure is then evaluated with toxicity data to determine the potential hazard that exposure to a pesticide can cause. Aquatic toxicity is a primary environmental focus because aquatic organisms are unable to move from sources of contamination, and thus have a high degree of susceptibility. Pesticides will be eliminated or restricted based on this analysis, or further analyses will be conducted as in number 4, below.

4. Models. Pesticides that have the potential to move through the environment should be further evaluated with computer simulation models. Surface water and leaching movement will be modeled with the Simulator for Water Resources in Rural Basins -Water Quality (SWRRB-WQ). SWRRBWQ is a model that uses GLEAMS pesticide fate component, CREAMS daily rainfall hydrology model, and SCS technology for estimating peak runoff rates and newly developed sediment yield equations to simulate hydrologic and related processes in rural basins (Williams et al., 1985; Arnold and Williams, 1994). This model was developed for row crop agricultural and has recently been evaluated for turf (Warren-Hicks et al., 1996). The model over predicts actual field observations for movement of pesticides to surface waters by a factor of 2 to 3 times. Therefore any error would be conservative in comparison.

Scenarios for pesticide use for pesticides modeled with SWRRBWQ should be developed. These should represent worst case scenarios for pesticide use at a golf course; that is, the greatest amount of material was applied to the total acreage of a golf course, and all at the same time. Estimated concentrations of pesticides, in surface runoff and subsurface leaching, from the computer simulations should be evaluated with risk assessment procedures to determine relative risk to aquatic organisms.

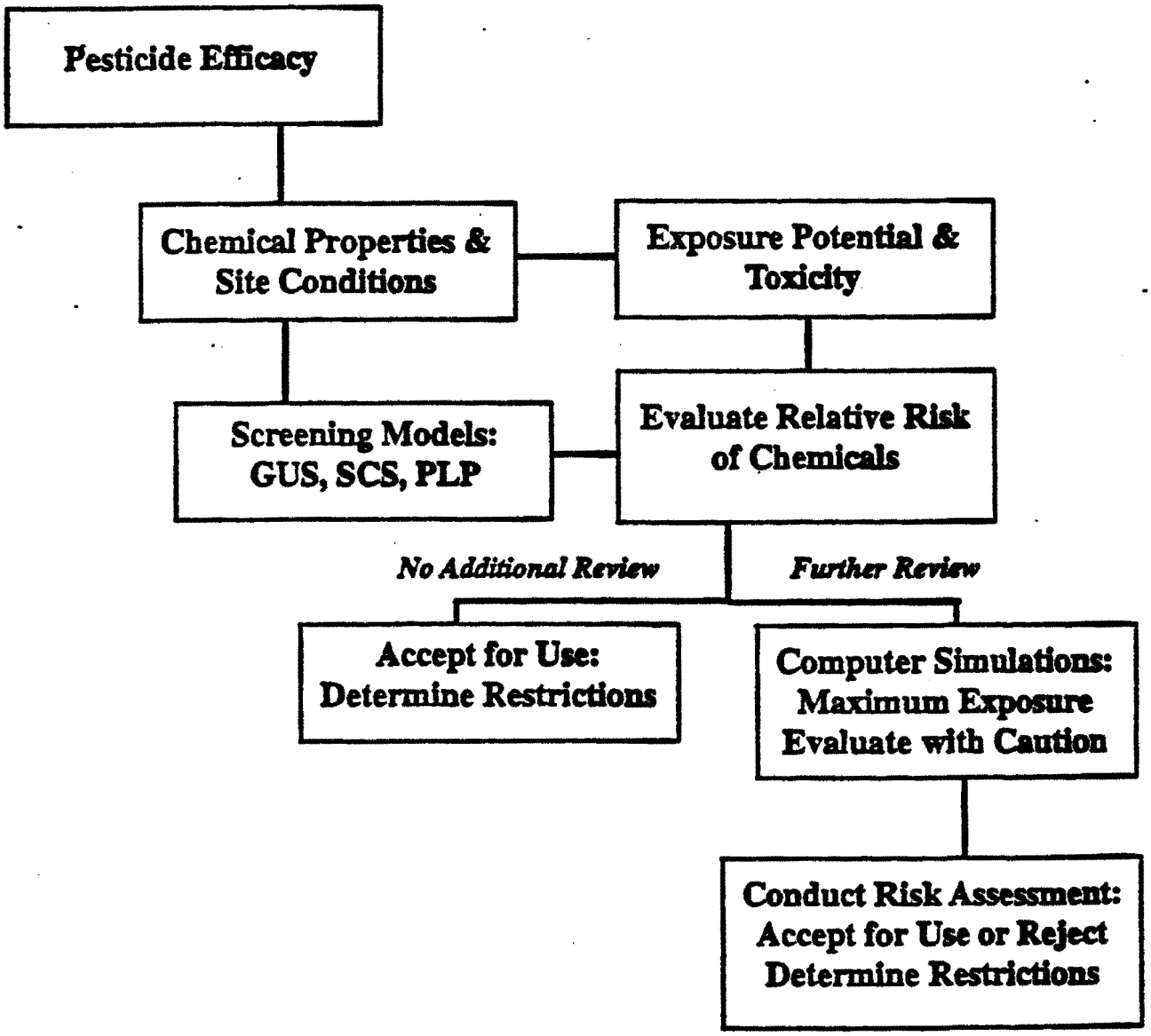
5. Risk Assessment. Ecological risk assessment protocols should be used to select pesticides. Aquatic ecological risk assessments should be conducted with methods that estimate the probability and magnitude of adverse effects to organisms from exposure to one or more pesticides or other toxic chemicals (Parkhurst et al., 1995). This approach differs from other ecological risk assessments because it is both quantitative and probabilistic. Most methods are deterministic and would describe risk as, for example, "an exceedance of the acute water quality standard for chemical X in a Creek will cause adverse effects to aquatic insects." With this approach, a risk could be characterized as "a 50% probability that 5% or more of the insect species in a Creek will be lost from acute chemical X toxicity." Ecological effects characterization identifies and quantifies responses of aquatic species to the chemical concentrations that can induce harmful effects. It is a compilation of ecological effects criteria, which are comparable to EPA's acute and chronic ambient water quality criteria.

Estimated community risk for single chemicals is a set of procedures that describe risk as the percentage of species or genera affected by acute or chronic toxicity. The procedures use models relating chemical concentration to the percent of species or genera affected and the probability distribution of expected environmental concentrations, with associated uncertainties. These two models are integrated to produce a joint probability function. For multiple chemicals, estimated community risk integrates the joint probability functions for each chemical, and the probability that more than any percentage of the genera will be affected by the chemical is identified.

6. Restrictions. Determinations of whether a pesticide can be used at the site should be based on the risk assessment results. For those that can be used, any restrictions for use will be clearly identified in tables. The restrictions will be based on amount applied, time of year applied, location applied in management zones (e.g., greens, tees or fairways), formulations, or the time between applications.

Figure 2
Pesticide Selection Process For IPM

Below is a pesticide selection flow diagram. From this evaluation, a recommended pesticide list would be developed for each pest category for use in an Integrated Pest Management program. All materials are registered by the U. S. Environmental Protection Agency and the State of California. Selection includes analysis of conditions of the site, properties of the soil, properties of the pesticide, and management practices.



with label instructions, at labeled rates, under appropriate environmental conditions (i.e. no spraying on windy days or when rain is forecast), and with a low-volume sprayer to reduce the possibility of drift. In sensitive management zones, where spraying is allowed, the use of a shrouded sprayer would be recommended. Materials should be rotated for use on a particular disease or pest. This will deter the development of resistant strains of pests which may require more frequent and/or higher rates of pesticide applications.

2.6 Management of Resources

2.6.1 Ecologically Sensitive Areas. An active ecological management program should be in place. This program is generally coordinated with the overall maintenance program for a golf course to ensure that course maintenance activities focus not only on maintaining golf turf quality and course playability, but also on maintaining the health and functional characteristics of ecologically sensitive areas. Critical elements include periodic inspections, maintenance of proposed vegetative conditions, restoration or repair of damaged areas, record keeping and golfer notification. Each of these is briefly discussed below:

Inspections. All ecologically sensitive areas on the site should be inspected at least twice annually: once in the spring and once in the autumn. Inspections should focus on examining the condition of vegetation, the color and clarity of surface waters, the integrity of banks and ground cover, and other physical indicators of habitat stability. In conjunction with the inspections, the condition of vegetated buffer strips should be inspected for the presence of debris, the integrity of vegetative cover, and the existence of channels or other indicators of concentrated storm water flow.

Maintenance of Vegetative Conditions. Vegetative conditions established during construction should be maintained in the future. Cut material should be hand removed from ecologically sensitive areas and no machinery should be used at any time within theses areas of the site. The herbaceous cover of the buffer filter strips should be maintained by mowing at a frequency of twice per year: a vegetation height of approximately six inches should be maintained in the buffer filter strips.

Restoration and Repair of Damaged Areas. Observed damage to resources should be remedied promptly. Accumulated silts should be removed, eroded channels should be filled, compacted areas should be raked and other damages should be repaired using hand tools only, unless a mechanical tool arm can reach into the area to perform a specific task. Damaged ground cover vegetation which may have led to these problems should then be restored by seeding or vegetative planting depending on the type of vegetation damaged. Channels which form within the buffer filter strips should be filled and immediately seeded. If additional grading is necessary to prevent the reformation of the channel, such grade adjustments should be implemented to restore sheet flows. Additional level

F93

spreaders should be installed as necessary. Trash and other debris should be removed from resource and buffers when observed.

Record Keeping. An annual record of all resource and buffer inspections and remedial actions should be maintained as part of the maintenance records for the golf course. These records will include the dates of inspection, inspection findings for each resource and filter strip location, a description of each remedial action taken, and the dates of such actions.

Notification. Education and notification of golfers of environmentally sensitive areas is an important part of the overall management strategy for resource areas. Appropriate signs should identify areas that are ecologically sensitive, or that golfers should not enter. The scorecard should also identify these areas, and the starter should notify golfers of the sensitive areas on the course. Information should also be posted in the clubhouse and locker rooms.

2.6.2 Surface Water

2.6.2.1 Surface Water and Golf Course Construction and Grow-In. Protection of surface waters from runoff is critical during construction and during the "grow-in" period when the bare soil and thin turf cover makes the site most vulnerable.

Construction. Golf course clearing should include installing erosion control barriers between the areas being cleared for buffers, roughs and fairways and ecologically sensitive areas. These should remain in place after turf is established until all cleared areas have adequate turf cover to prevent erosion. Turf buffer strips of at least 15 feet have been shown to improve water quality in polluted runoff (Doyle et al., 1977), and buffers should be fully established with a one-inch height of cut before removal of erosion barriers. As the turf matures, potential runoff problems will diminish. The effectiveness of turf as a buffer is related to the fibrous nature of the turf root system and the architecture of the turf canopy. Studies at the Pennsylvania State University and the University of Maryland have shown that grassed areas are extremely effective in reducing soil losses compared to other cropping systems with measured soil losses of only 0.03 tons/acre on grassed areas with a slope of 16% on a silt loam soil. Additionally, any runoff from turf areas should be directed into a buffer area, vegetated swale, or other BMP for filtration, therefore there should be no negative impact on water quality in ecologically sensitive areas.

Sodding is an effective mechanism to control runoff and erosion. On slopes greater than 5%, a 20-foot stabilization buffer should be established. The stabilization buffer should consist of a 4-foot wide strip of sod at the base, and then extending up-slope, a 6-foot sprigged bed, a second 4-foot sod strip, and a 6-foot sprigged bed. For sprigging of these sloped areas, rates should be increased by 50% to 750 bushels/acre to enhance establishment rate. Care will have to be taken during the grow-in phase with irrigation management to prevent runoff and sediment movement into resource areas and allow the

buffer areas to adequately filter any possible surface nutrient or sediment movement.

Grow-In. Controls put in place during golf course construction should remain in place after turf buffer strips are established and until all areas have adequate turf cover to prevent erosion. Care should be taken during the grow-in phase with irrigation management to prevent runoff and sediment movement into ecologically sensitive areas and allow the buffer areas to adequately filter any possible surface nutrient/sediment movement.

2.6.2.2 Surface Water After Construction. The main concerns with surface water and golf courses are that transport of sediments, nutrients and pesticides from more intensively maintained turf areas will impact surface water quality. A golf course designed properly makes it difficult for runoff contaminants to adversely affect surface water quality or associated wildlife because of the management practices that will be in place (i.e., Specific Management Zones, BMPs and IPM) and because design considerations that allow runoff from the golf course areas to be routed through many different BMPs (Smart & Peacock, 1996). After much research on runoff from golf courses, Watschke and Mumma (1989) concluded that nutrient and/or pesticide concentrations in storm water and the impact on surface water would be considerably less than other urban pollutants not associated with well managed turfgrass areas.

In addition, controlled and uncontrolled discharge from surface drainage into resource areas directly from a golf course, landscaped areas, parking lots and roads should be minimal. Post development drainage plans should include filtration and dilution for all runoff. All storm water runoff from development property, roadways and the golf course should be directed into filtration areas, such as golf course fairways, and grassed swales before discharge into a storm water system.

The primary control of the potential contamination of surface waters from runoff from nutrients and pesticides is by management practices and design as indicated above. However, information about the potential pollutants provides additional data that can be useful in preventing problems. A general overview of the characteristics of phosphorus, nitrates and pesticides is provided.

Phosphorus. Phosphorus is unlikely to create problems except under very specialized conditions in ponds and streams. Even though the granular phosphorus fertilizer carriers are greater than 88 percent water soluble and totally water soluble forms exist for liquid application, the phosphorus becomes rapidly fixed within the soil profile and vertical movement in most soils is only 0.3 to 1.2 inches/year (Young et al., 1985). Possible phosphate movement due to soil erosion could be a point source of pollution in turf systems (Walker, 1990). However, these instances would be very site specific and nonexistent where BMPs are employed and runoff is retained to be filtered within the golf course. Recent work at the Pennsylvania State University found that in runoff from creeping bentgrass and perennial ryegrass turf conditions phosphate loss was reduced F95

compared to the initial concentrations in the irrigation water by up to 94%. Similarly, phosphate concentration in leachate from the same turf areas found up to a 77% reduction (Linde et al., 1994). This indicates the turf is acting as a filter to remove nutrients from the water source prior to runoff or leaching occurring. The most vulnerable time for phosphate to be lost is immediately following fertilization when excess irrigation or heavy rainfall would cause movement. This occurrence can be completely avoided by 1) not fertilizing when rain is predicted; and 2) making certain that fertilizer is irrigated to remove the material from the leaves into the soil immediately following application.

Nitrate. Nitrate movement as surface runoff can also be minimized by management. Research has shown that the total nitrogen loss from a fertilizer application can be reduced from 9.5 percent of the total amount applied using urea as the nitrogen carrier to 0.26 percent by changing to a slowly available carrier such as sulfur coated urea (Dunigan et al., 1976). These slowly available nitrogen sources should be used. Additionally, the Best Management Practices provide added protection against problems associated with nutrient loss during runoff or leaching.

Pesticides. Movement of pesticides into surface water during runoff depends on the chemical nature of the material, length of time between application and rainfall, and the volume and intensity of rainfall following application (Thompson et al., 1984; Watschke and Mumma, 1989; Hurto, 1991; Smith, 1995). Selection of the correct material for the job, through the IPM selection process discussed earlier, and application on a curative basis (the IPM approach), reduce the likelihood of negative incidents. Also important are the management practices previously described (Specific Management Zones, BMPs, in addition to IPM) that control the movement of pesticides. Pesticides should be used that act quickly, degrade quickly, are non-toxic and non-mobile. An environmental monitoring program should be established to monitor pesticide and nutrient concentrations.

2.6.3 Subsurface Drainage. The factors that protect surface water also form the basis for protection of subsurface waters. Several design factors should ensure that there is adequate on-site retention. The first one-half inch of surface runoff should be treated through use of BMPs. The putting greens should drain through vegetated turf buffers after drainage over fairway or roughs. Subsurface drainage should be through grass-lined swales and/or overland flow over fairway and roughs. The routing should be designed to maximize the distance over these areas. Where subsurface drainage presents additional challenges, filtration traps constructed of a sand/charcoal filter should be installed adjacent to the putting green.

2.6.4 Groundwater. The factors that protect surface water also form the basis for protection of ground water. Careful management of nitrate, as described in the Agronomic Considerations of this document, should be required. Management along with effective implementation of Best Management Practices can effectively eliminate problems associated with nutrient loss during runoff or leaching.

3.0 AGRONOMIC CONSIDERATIONS AND REQUIREMENTS

Agronomic and cultural practices are important components in maintaining environmental integrity and enhancing current and proposed conditions. The land use design and extensive use of Specific Management Zones, Best Management Practices, and Integrated Pest Management, as previously discussed, coupled with state-of-the-art agronomic and cultural practices, ensure environmental sensitivity of a golf course as it interfaces with ecologically sensitive areas.

The following sections discuss agronomic and cultural practices that are critical to maintaining environmental sensitivity.

3.1 Soil Mixes and Modifications

Putting Greens. It is important that greens are constructed with surface and internal drainage that will maximize the playability even immediately after rainfall or irrigation. Construction techniques should ensure that surface runoff is directed to adjacent buffer filtration areas which provide good drainage and resist wear and compaction will be utilized for construction of the playing surface.

Tees. Tees are the most trafficked areas on the golf course considering number of players and size. The higher height of cut on the tee surface provides a much deeper root system in the soil profile and imparts considerably better wear tolerance. A modified soil mix for tees consistent with the greens should be used to ensure resistance to compaction. Typically tee areas are not as intensively managed as greens and the nutrient and pesticide requirements are lower. Surface runoff should be directed into adjacent fairways or buffers.

Fairways and Roughs. Since it is imperative that soil with desirable chemical characteristics be used for turfgrass growth, extensive fill may likely be used in many areas. Soils should be disturbed during the construction process to ensure no hardpans or compacted areas interfere with rooting during establishment. Soil samples should be analyzed from as many locations as necessary once final grading begins so that pre-planting fertilization recommendations can be made.

3.2 Turfgrass Selection

Over the years extensive turfgrass breeding programs and research have resulted in grass varieties that are exceptionally well-suited for golf course turf. Selection of turfgrass species and cultivars should consider the following:

1) Climatic conditions - local annual temperature and rainfall data;

2) Edaphic conditions - soil physical and chemical characteristics;

3) Golf course playability - it is anticipated traffic conditions will necessitate selection of species and cultivars which will absorb wear and yet remain in a high state of playability.

3.3 Construction and Grow-In

Soil erosion is most likely to occur during the construction and grow-in phases of golf course development. The major pathway for phosphorus loss is soil erosion, because sediment is the carrier. Therefore, any technique effective in reducing soil erosion will also reduce phosphorus losses. Buffer strips, grass waterways, berms, sodding steep slopes and silt fences are examples of structural techniques for erosion control during construction and grow-in. Sodding rough and turf buffer areas is an effective mechanism to control runoff and erosion.

3.4 Basic Growing-in Program

A well planned growing-in program is important to the environmental integrity of a golf course. The grow in period can result in soil erosion and nutrient movement unless proper procedures are followed. Those procedures that will minimize negative impacts are discussed below. Planted areas should be kept continuously moist until the root system becomes established and new growth is evident. This means frequent watering that soaks the soil to a depth which will ensure flushing of salts below the extent of the root system. Water should not be allowed to puddle or run off the surfaces. After vigorous growth is noted, watering frequency should be decreased with application volumes increased. This will ensure adequate soil moisture at depths to optimize root growth and continue the flushing action for salt removal.

All areas should be fertilized at three to four weeks after germination or sodding. Nitrogen sources should include at least 50% of the nitrogen from a slowly available form such as IBDU, SCU or a polymer coated urea. Additional fertilizations will be necessary every 4 to 8 weeks until the turf has reached full cover. Once the course has matured, the objective becomes slower growth with good color, density, and playability.

To help control weeds and promote lateral growth, mowing should begin when the grasses reach a threshold at 150% of their mowing height. This will encourage lateral spread, increase density, and maintain a fine texture. The mowing should be frequent enough so that no more than one-third of the top growth is removed at any one clipping.

Pest Control. The course should be inspected daily for pests. When control is necessary, materials approved in the plan will be used following restrictions as defined in the plan.

4.0 GOLF COURSE CULTURAL PRACTICES

The primary cultural practices that produce and sustain a healthy turf are mowing, irrigation and fertilization. These three operations, alone or in combination, often cause changes in the root and canopy micro-environment which can have either a positive or negative result. Thus, it is essential that these practices are executed in a proper and timely manner to ensure turfgrass quality and playability. The best deterrent to weed, insect and disease infestation is a healthy turf. Thus, maintaining hearty grasses will minimize the need to apply fertilizers and pesticides. All of these components are important IPM strategies

4.1 Mowing

Mowing is the most basic maintenance operation on a golf course. Without regular mowing at the appropriate heights of cut, the course would become unplayable. With good mowing practices, density, texture, color, root development, wear tolerance and other aspects of turf quality are enhanced. Proper mowing practices also can reduce the amount of irrigation needed. Taller grass can have a significantly higher evapotranspiration rate and thus a greater need for water. Mowing grass too short stresses the turf which not only produces a need for more water, but can cause the weakened turf to be more susceptible to weed, insect and disease infestation.

4.2 Fertilizing

The most important aspect of a sound fertilizer program is to ensure that the nutrients applied are used efficiently by the turfgrasses and do not end up in surface and/or ground water. Nitrogen and phosphorus are the elements most often associated with eutrophication of lakes and streams. Other nutrients do not seem to pose a problem to bodies of water. However, care must be taken so that nutrients do not enter resource areas or watercourses. Care must be taken around areas that drain to watercourses, especially around bunkers (Peacock et al. 1990).

Minimizing nitrate movement is directly related to Best Management Practices by efficiency in rate and timing of nitrogen inputs through choice of materials and efficiency in rate and timing of irrigation. Reports by Petrovic, 1990; Walker and Branham, 1992; and Linde et al., 1994 concluded that several management options are available to minimize or eliminate any threat to ground or surface water by 1) limiting irrigation to replacement of soil moisture; 2) using slow release nitrogen sources; 3) timing fertilizer applications in relation to active uptake; and 4) use of realistic nitrogen application rates. All of these factors should be part of the fertilization management program, and when implemented, should reduce or eliminate nonpoint source losses of nutrients from the golf course.

4.3 Irrigation System

Based on average local rainfall, supplemental irrigation will likely be needed to provide turf needs especially during the critical spring and summer months.

design and operational strategy must fulfill all environmental requirements for protecting ecologically sensitive areas, surface water and ground water. In addition, the irrigation system should be designed to meet the water requirements of the turf by supplementing natural rainfall. A state-of-the-art irrigation system where irrigation is managed with computer control should be used and irrigation should be based on measuring weather conditions.

4.4 Water Management

Because of the many variables to consider, i.e., slope, soil types, rooting depth, etc., even with the most sophisticated irrigation system available, experience has proven that fine-tuning of the irrigation program by the golf course superintendent and irrigation technician is essential.

Knowledge of the water reserve in the root zone is a key input required for determining irrigation needs. On greens, approximately seventy-five percent of the root system may occur in the top four inches of soil. On tees, fairways and roughs the depth of rooting can vary from six to twelve inches, depending on how these surfaces are managed. Therefore, with knowledge of soil water storage, actual daily rainfall and calculated daily evapotranspiration (ET) information it is possible to determine when the available soil moisture is depleted and irrigation required. A weather station should be installed at the maintenance facility to record rainfall, solar radiation, air temperature, soil temperature, and relative humidity. This information could then be tied to a computer with software to carefully determine evapotranspiration demands and irrigation requirements.

4.5 Supplementary Cultural Practices

To help develop and sustain quality turf, spiking, vertical mowing, aerifying, topdressing and rolling are used. These operations physically alter the plant's environment by removing and or relocating soil and organic materials or altering turf growth habit.

5.0 BASIC ANNUAL MAINTENANCE GUIDE

The following remarks supplement the Basic Annual Maintenance Guide on the following pages. It should be noted that this basic program will need to be adjusted and fine tuned by the superintendent based on specific situations.

1. **Soil Analysis**
   Sample representative greens, tees, fairways and roughs for analysis and recommendations. The primary purpose of soil testing is to insure a sound fertilizer program based on nutrient availability and balance for good growth of the grass. A healthy plant is less susceptible to disease and other pests.

2. **Plant Tissue Testing**
Sample representative greens, tees, fairways and roughs for leaf nutritional content to determine nutritional status of the turf. This in combination with soil testing will provide a basis for adjusting the fertilization program.

3. **Calibration of Equipment**
All spreaders and sprayers must be repaired, if needed, and calibrated for proper distribution of fertilizers and pesticides.

4. **Mowing**
With good mowing practices, density, texture, color, root development, wear tolerance and other aspects of turf quality are enhanced.

5. **Fertilizing**
The fertilizer program should be based on soil test results for pH, soil nitrogen reserves, calcium, magnesium, phosphorus and potassium. Nitrogen fertilization should be determined by color, density and the rate of growth (clipping yields) of the grass as well as soil nitrogen reserves (as determined from testing). Interpretation of soil nitrogen analyses to exact amounts which are available to the plant is difficult. For this reason, nitrogen rates may be adjusted, but not solely based on soil testing.

6. **Irrigation Program**
Each time water is applied, operate the system long enough to wet the soil to the depth of rooting. When greens are stressed, hand water or syringe during the heat of the day in addition to regular night irrigation.

7. **Spiking**
This procedure is needed to relieve surface compaction and ensure good gas exchange (oxygen and carbon dioxide).

8. **Vertical Mowing**
During the growing season, this operation is needed to reduce mower induced grain and thatch buildup, and to provide a smoother, faster putting surface on greens.

9. **Aerifying**
Aerifying surfaces relieves compaction, increases soil and surface air exchange and improves fertilizer and water movement into the soil.

10. **Topdressing**
In addition to following aerification, topdressing should be applied once or twice per month during the growing season at the rate of one-quarter cubic yard per 1000 square feet. This practice not only helps control thatch, but also helps provide a smooth, true surface for mowing and accurate ball roll. Adding compost into the topdressing helps boost biological activity and may help with disease control.

F101

BASIC ANNUAL MAINTENANCE GUIDE

OPERATION	J	F	M	A	M	J	J	A	S	O	N	D	REMARKS
GENERAL:													
Soil Analysis		X						X					1
Plant Tissue Analysis		X			X			X			X		2
Calibrate Equipment		X						X					3
GREENS:													
Mowing	X	X	X	X	X	X	X	X	X	X	X	X	4
Fertilizing			X	X	X	X		X	X	X	X		5
Irrigating	X	X	X	X	X	X	X	X	X	X	X	X	6
Spiking				X	X	X	X	X	X				7
Vertical Mowing			X		X				X		X		8
Aerifying			X		X				X	X			9
Topdressing			X	X		X			X	X		X	10
Disease Control			X	X	X	X	X	X	X	X			16
Weed Control				X	X	X	X	X	X				15
Insect Control						X	X	X	X				15, 11
Wetting Agents						X	X	X	X				12

118

BASIC ANNUAL MAINTENANCE GUIDE

OPERATION	J	F	M	A	M	J	J	A	S	O	N	D	REMARKS
TEES:													
Mowing	X	X	X	X	X	X	X	X	X	X	X	X	4
Fertilizing			X	X	X	X	X	X	X	X			5
Irrigating	X	X	X	X	X	X	X	X	X	X	X	X	6
Spiking				X		X		X					7
Vertical Mowing													8
Aerifying				X	X		X		X				9
Topdressing					X	X	X	X	X				10
Disease Control			X							X	X		16
Weed Control			X	X	X	X	X	X	X				14
Insect Control					X	X	X	X	X				15
FAIRWAYS:													
Mowing	X	X	X	X	X	X	X	X	X	X	X	X	4
Fertilizing			X	X	X	X	X	X	X	X			5
Irrigating	X	X	X	X	X	X	X	X	X	X	X	X	6
Aerifying				X		X		X					9
Disease Control				X					X	X			16
Weed Control			X	X	X	X	X	X	X				14
Insect Control					X	X	X	X	X				15

BASIC ANNUAL MAINTENANCE GUIDE

OPERATION	J	F	M	A	M	J	J	A	S	O	N	D	REMARKS
ROUGHS:													
Mowing			X	X	X	X	X	X	X	X	X		4
Fertilizing				X						X			5
Irrigating	X	X	X	X	X	X	X	X	X	X	X	X	6
BUNKERS:													
Raking			X	X	X	X	X	X	X	X	X		13
Edging	X	X	X	X	X	X	X	X	X	X	X	X	13

11. **Nematode Control**
May be needed infrequently. A soil nematode analysis will determine population levels and suggest treatment.

12. **Wetting Agent Applications**
If localized dry spots appear on the greens, apply a good quality wetting agent and water immediately to prevent yellowing of the grass. During this period, use a wetting agent when applying a liquid fertilizer or pesticide unless the label states otherwise.

13. **Raking and Edging Bunkers**
Bunkers need to be raked daily and edged as necessary, as often as once per month during the peak turf growing season.

14. **Weed Control**
Monitor for the presence of weeds. If the population becomes so large that it effects the playing surface, use the appropriate herbicide.

15. **Insect Control**
Monitor daily for beetles, grubs, caterpillars and other insect pests. However, do not treat unless the pest is found, identified and present in damaging numbers as determined by the threshold level.

16. **Disease Control**
During periods when disease or conditions favoring a disease outbreak are prevalent, inspect the surfaces daily and treat only as necessary.

6.0 ENVIRONMENTAL MONITORING

A monitoring program is a key component of the management program. Golf course operations can benefit from obtaining a wide variety of information on which to base cultural program decisions. Irrigation, fertilization and pesticide application decisions which interact with environmental quality should be based on responses noted from an on-going monitoring program.

The monitoring program should encompass sampling and analysis of soils, groundwater, surface water including irrigation water, sediment and aquatic organisms to determine if any detrimental effects on the environment are noted. The goals of a monitoring program are as follows: 1) to provide baseline data as to the site characteristics regarding environmental conditions; 2) to provide data that assesses environmental conditions, thus providing a basis for management decisions and for measuring compliance with environmental regulations; and 3) to ensure that Integrated Pest Management and the BMPs are functioning properly.

A properly implemented monitoring program will provide in-depth guidelines for the following areas: 1) Sample considerations (locations, sample frequency, sample field

methods, sample analyses both for field and laboratory use, and necessary laboratory QA/QC protocols); 2) Data Storage; 3) Data Analysis, 4) Criteria for Management Response; 5) Reports and Reporting formats; and 6) Quality assurance and quality control.

Results of an Environmental Monitoring Program provide feedback to the golf course superintendent, and thus provide a useful management tool. For example, the results of the program are used in determining the correct application rates and timing of pesticides and fertilizers, and the optimum operation of irrigation programs. Results of a monitoring program also trigger management responses should pesticides or fertilizers be found in the water or sediments at elevated concentrations or if biological communities have been negatively affected.

Record keeping is an important part of the process. On-going cultural and environmental programs should be monitored through the use of a record-keeping system. The information from the record keeping is used to evaluate and modify cultural processes on an on going basis; and determine compliance with environmental standards.

7.0 REFERENCES CITED

Arnold, J.G. and J.R. Williams. 1994. SWRRB-WQ - A watershed scale model for soil and water resources management. USDA, Agricultural Research Service.

Balogh, J.C. and J.L. Anderson. 1992. Environmental impacts of turfgrass pesticides. *In* Balogh and Walker (eds.) Golf Course Management and Construction: Environmental Issues. Lewis Publishers, Chelsea, MI. pp. 221-353.

Bottcher, A.B. and L.B. Baldwin. 1986. General guide for selecting agricultural water quality practices. Publication SP-15, IFAS, University of Florida, Gainesville, FL.

Doyle, R.C., G.C. Stanton and D.C. Wolf. 1977. Effectiveness of forest and grass buffer strips in improving the water quality of manure polluted runoff. Proceedings of the 1977 Winter Meeting of the American Society of Agricultural Engineers. Paper No. 77-2501.

Dunigan, E.P., R.A. Phelan and C.L. Mondart, Jr. 1976. Surface runoff losses of fertilizer elements. J. Environ. Qual. 5(3):339-342.

Ferrentino, G.W. 1990. Starting an Integrated Pest Management program. Cornell University Turfgrass Times. Vol. 1 (1):6-8.

Goss, D. 1991. Screening procedure for soils and pesticides relative to potential water quality impacts. *In* Using computer Simulation Models in Pesticide Registration Decision Making. A Symposium/Workshop, Weed Sci. Soc., Loiusville, KY.

STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, *Governor*

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
200 Oceangate, Suite 1000
Long Beach, CA 90802-4302
(562) 590-5071

May 21, 1998

We.9.b

Wednesday, June 10, 1998
Coastal Commission hearing

5-97-367 (Hellman Ranch)

Appendix G

Correspondence

Page G-1 Letters of Support received at and after the April 7, 1998 hearing on the project, as well as support from the City, County Supervisor, and State Senator.

Page G-25 Letters of Opposition received at and after the April 7, 1998 hearing on the project.

Page G-59 Letter from Gabrieleno/Tongva tribe with conditions as adopted by the City of Los Angeles for archaeological mitigation.

Page G-66 Letter from Gabrieleno/Tongva tribe commenting on archaeological conditions as described in the addendum to the March 19, 1998 staff report for the proposed project.

Page G-72 Public Resources Code Section 5097.98

Page G_74 Hard copy of applicant's visual presentation at the April 7, 1998 hearing.

SACRAMENTO OFFICE
STATE CAPITOL
SACRAMENTO, CA 95814
(916) 445-4961

DISTRICT OFFICE
18552 MAC ARTHUR BLVD.
SUITE 395
IRVINE, CA 92612
(714) 833-0180
(800) 221-2225

California State Senate

SENATOR
ROSS JOHNSON
CHAIRMAN, SENATE REPUBLICAN CAUCUS
THIRTY-FIFTH SENATORIAL DISTRICT

COMMITTEES
APPROPRIATIONS
FINANCE, INVESTMENT AN
INTERNATIONAL TRADE
INDUSTRIAL RELATIONS
INSURANCE
JOINT COMMITTEE ON RUL

RECEIVED
DEC 12 1997
CALIFORNIA
COASTAL COMMISSION

December 10, 1997

Mr. Rusty Areias
Chairman
California Coastal Commission
1400 N Street, Suite 9
Sacramento, California 95814

Dear Rusty:

I urge you to support the Hellman Ranch Reserve Project (Coastal Development Permit #5-97-367), located in the City of Seal Beach.

The foundation of this project is environmental protection and public access. A severely degraded wetlands will be restored, enhanced and protected. Public access to over 75% of the project will be provided by a community nature park, public golf course, open space and a viable wetlands ecosystem.

The restored saltwater marsh and freshwater wetlands provide badly needed foraging and nesting habitat for Belding's Savannah Sparrow and the California Least Tern.

Once again, I urge you to approve the Hellman Ranch Reserve Project when it comes before you.

Warm regards,

Ross

ROSS JOHNSON
Senator, 35th District

RJ:bjp

cc: Mr. Charles Damm

5-97-367
COASTAL COMMISSION
Support letters
EXHIBIT # H
PAGE 1 OF 3

61

RESOLUTION NUMBER 4592

A RESOLUTION OF THE CITY OF SEAL BEACH DECLARING SUPPORT OF THE HELLMAN RANCH DEVELOPMENT PLAN

WHEREAS, the City of Seal Beach has been a consistent advocate of sensible development, particularly of environmentally sensitive priorities, which serves the best interest of the public's health, safety and welfare; and

WHEREAS, the Hellman Ranch property, located in the heart of this City, has been the focal point of many controversies over the years, which included a development proposal for 1,000 homes, and a proposed plan for 329 homes which was eventually defeated by a vote of the people of Seal Beach through an initiative ballot; and

WHEREAS, after nearly a decade of intense planning, which included many different levels of community participation, the property owner of the Hellman Ranch has created a development proposal that meets the concerns and needs of this community by observing the property's unique physical constraints as well as restoration and enhancement of a severely degraded wetland area; and

WHEREAS, the proposal offered by the Hellman property owner has garnered significant community support through its sensitivity to the community's concerns, and has received unanimous approvals at all levels of local government, which included a 5-0 vote by the Planning Commission and 5-0 vote by the City Council.

NOW, THEREFORE, BE IT RESOLVED that the City of Seal Beach hereby urges the California Coastal Commission to lay this long-standing controversy to rest by approving the Hellman Ranch Reserve Project (Coastal Development Permit #5-97-367), allowing this community to continue to provide safe, environmentally sensitive development to our residents, while still providing public access in the coastal areas.

PASSED, APPROVED AND ADOPTED by the City Council of the City of Seal Beach at a meeting thereof held on the 8th day of December, 1997, by the following vote:

AYES: Councilmembers Brown, Campbell, Dorothy Fulton, Hastings

NOES: Councilmembers None

ABSENT: Councilmembers None

Mayor Marilyn Bruce Hastings

ATTEST:

Joanne M. Yeo, City Clerk

RECEIVED
DEC 16 1997
CALIFORNIA
COASTAL COMMISSION

COASTAL COMMISSION
5-97-367

EXHIBIT # H
PAGE 3 OF 3

G2

JAMES W. SILVA
CHAIRMAN OF THE BOARD OF SUPERVISORS
SUPERVISOR, SECOND DISTRICT

ORANGE COUNTY HALL OF ADMINISTRATION
10 CIVIC CENTER PLAZA, P.O. BOX 687, SANTA ANA, CALIFORNIA 92702-0687
PHONE (714) 834-3220 FAX (714) 834-6109

February 3, 1998

RECEIVED
FEB 6 1998
CALIFORNIA
COASTAL COMMISSION

The Honorable Rusty Areias
Chairman
California Coastal Commission
1400 "N" Street, Suite 9
Sacramento, CA 95814

Dear Chairman Areias:

I am writing to you in support of the Hellman Ranch Reserve Project in Seal Beach which is included in my Supervisorial District.

As you may know, the Hellman Ranch Property has been the center of controversy for many years in the city of Seal Beach. It has taken years of planning to develop a project that has finally won the broad-based support of the community. The proposal before you won that support because is balances sensible development with environmental sensitivity. The plan allocates nearly 80% of the property for conservation uses including restoration of the salt and freshwater wetlands, preservation of the wilderness park, and creation of an environmental interpretive facility. Only 15 acres of the land will be used for residential use. All of these elements integrated together will be enjoyed by both the Orange County community and the many tourists who will visit Orange County for years to come.

The Hellman Ranch property owner, after many years of controversy has created a proposal which I believe meets the needs and concerns of the Seal Beach residents. Therefore, I urge to you approve the Hellman Ranch Reserve Project.

Thank you in advance for your favorable consideration of this matter.

Sincerely,

Jim

James W. Silva, Chairman
Board of Supervisors

5-97-367
COASTAL COMMISSION
support letters
EXHIBIT # H
PAGE 2 OF 3

cc: Charles Damm, South Coast District Director, California Coastal Commission

G3

124

RECEIVED
MAY 11 1998
CALIFORNIA
COASTAL COMMISSION

May 6, 1998

Rusty Areias
California Coastal Commission
200 Ocean Gate
10th Floor
Long Beach, Ca. 90802-4416

Dear Sir:

We desperately need a public golf course in this northern end of Orange County. The closest to us are, Old Ranch Country Club, Los Alamitos Country Club and Sea Cliff Country Club. They were all public at one time, with the exception of Old Ranch, and went private. Long Beach has three courses near by but they give preferential starting times to residents of Long Beach and are almost impossible to play on week ends.

The golf team at Los Alamitos High School has the El Dorado golf course in Long Beach for practice rounds, but unless the boys and girls have transportation to and from the course it is very difficult for them to participate. The golf course on the Hellman property would be within walking distance for all the children in Seal Beach.

We have fought so long and worked so hard to keep massive housing developments from this land. We feel this is a perfect compromise: open space, wetlands, park and recreation area. We hope you will approve this project.

Sincerely yours,

Joan Stegman
118 13th St. #4
Seal Beach, Ca. 90740

May 1, 1998

RECEIVED
MAY 5 1998
CALIFORNIA
COASTAL COMMISSION

Robert Zmuda
1020 Catalina Ave.
Seal Bch., CA 90740
(310) 732-3631

Dear California Coastal Commission:

Subject: Hellman Ranch Development

I live in Seal Beach just a few hundred feet from the edge of the Hellman Ranch property. I am writing you to urge you to vote in favor of the Hellman Ranch development, including the golf course. I believe this proposal strikes an appropriate balance between the interests of the land owner, the local residents, and environmental concerns. I think this is the best development plan for this property that we can realistically hope for. Please vote "yes" on this project.

Sincerely,
Robert Zmuda

G5

02-24-1998

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

To: The Honorable Mr. John Anyong
California Coastal Commission
South Coast Area Office
200 Oceangate, Suite 1000
Long Beach, CA. 90802-4302

From: Mr. and Mrs. Thomas E. Dutton
105 Surf Place
Seal Beach, CA. 90740-5909

Sir,
This letter is being written to show my families support for the Hellman Ranch Reserve Project. As a long time homeowner in Seal Beach and one who's property backs up to the proposed wetlands, I feel that this project is a great improvement over the current condition of the property, and a quantum leap over the developments proposed in the past.

This project shows that with careful planning, the right inputs, and the need to preserve wetlands and open space for all to enjoy can be accomplished. We must allow property owners the right to develop their land with reasonable expectations of personal satisfaction. You, as the protectorate of the California Coast, must also allow for the preservation of species, open space, and habitat. This project is the best compromise for all involved.

The fact that the Hellman Family has no "mortgage" on this land, is the only way that this innovative plan of limited new housing, golf course as habitat, and restored wetlands can go forward. Having survived both the Ponderosa Plan and all four Mola Plans, any plan that puts wetlands before dense housing has my vote.

With this Commission's leadership, the Great State of California, The County of Orange, and most important for my family, The City of Seal Beach, can have an environmentally sensitive plan that is a compromise, yes, but one that all factions can live, thrive, and prosper with. This plan will be a model for future generations. It will also show that developers can work with the people and the environment to plan for a beneficial co-existence that works for all.

I would like my comments read into the record at the nest meeting.

Respectfully,

Thomas Dutton

Thomas Dutton

March 31, 1998

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

Mr. Rusty Aerias, Chairman
California Coastal Commission
1400 "N" Street, Suite 9
Sacramento, CA 95814

RE: Hellman Plan
Seal Beach, California

Dear Mr. Aerias,

My family and I have been residents of Seal Beach for the past 11 years. This letter is written to tell you of our FULL SUPPORT for the Hellman Ranch project that your staff is currently reviewing.

We remember similar proposals that were submitted, but this specific Hellman project is best for the residents, land holder and city. If this plan is not approved, I would envision the land will be sold to another developer who would construct many more homes than on this Hellman plan.

We are EXCITED about every aspect of the Hellman plan and strongly encourage you to to help us get it approved.

I would like my comments read into record at the next meeting. Thank you for your help!

Sincerely,

John

John Wing, Seal Beach Resident
(562) 596-7877

April 1, 1998

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

Mr. John Auyong
California Coastal Commission
South Coast Area Office
200 Oceangate, Suite 1000
Long Beach, CA 90802-4302

RE: Hellman Ranch Project
Seal Beach, California

Dear Mr. Auyong,

This letter is written to confirm my FULL SUPPORT for the Hellman Ranch Project currently under review by your office. I have been a longtime resident of Seal Beach and my family has been property owners in this town for decades. We all want to see the Hellman Ranch Project become a reality.

Several plans have been considered for this land but none have received the support from the residents that this plan does. Seal Beach is a family oriented community and the Hellman plan will succeed in continuing with this tradition.

We are EXCITED about every aspect of the Hellman Ranch Plan and look forward to enjoying many happy times when the project becomes a reality.

Please read my comments at the next meeting. Thank you for your anticipated supported for this wonderful plan.

Sandy Wing

Sandy Wing, Seal Beach Resident
(562) 596-7877

68

Hellman Tu 14h

JOSEPH H. DAVIS
811 AVALON DRIVE
SEAL BEACH, CALIFORNIA 90740

Received at Commission Meeting

APR - 7 1998

April 6th, 1998

Mr. Rusty Areias, Chairman
California Coastal Commission 5-97-367
1400 "N" Street, Suite 9
Sacramento, California, 95814

Re: Hellman Ranch Reserve
Project No: CDP 5-97-367
Project Location: Seal Beach

Dear Chairman Areias,

My home overlooks the site of the Hellman Ranch Reserve Project, and I view it every day of my life. I have been looking at it for 30 years. I have seen all of the plans, listened to all of the proposals, and heard all of the opinions and I feel that I am as qualified as anyone to evaluate this project.

I believe that the project, as proposed, is the best plan that could be envisioned for this site, and is only possible because of the magnanimous generosity of the landowner to dedicate 80 percent of the project to open space, public access, and environmental protection. Not only is the landowner providing the land, but he is also improving it with a maintained greenbelt, restoring and maintaining the wetlands and enlarging them by a hundred times.

I understand that your staff is suggesting a trail connecting the wetlands and Gum Grove Park. I urge you to reject this condition because it is simply a bad idea. Gum Grove Park is used be the neighborhood as a dog run where the dogs are released to run and relieve themselves. (Certainly not compatible with wildlife habitat). There would be no way to patrol this trail , and would leave all of the adjacent homeowners vulnerable .

Chairman Areias, please reject any additional changes to the proposed plan. The City of Seal Beach and the people of Seal Beach overwhelmingly support this plan as proposed. We do not want a thoroughfare between Gum Grove Park and Pacific Coast Highway behind our homes.

Very truly yours

Joseph H. Davis

Cc: Shirley Dettloff, Coastal Commissioner

G9

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

April 5, 1998

Shirley Dettloff
California Coastal Commissioner

Dear Ms. Dettloff,

By means of this letter I am expressing my deep concern for the consequences of the changes to the Hellman Ranch Specific Plan recommended by the California Coastal Commission.

It is my understanding that the recommended changes involve the following: 1. Additional wetland acreage beyond the 44 acres in the Hellman Specific Plan. 2. Additional acreage for a 25' wide pedestrian trail behind existing homes. 3. Public access to Gum Grove Park from both Seal Beach Boulevard and First Street. I also understand that the property owner has stated that these changes would make it impossible to build the planned regulation 18-hole golf course, which in turn would result in cancellation of the entire project.

As citizens of Seal Beach, we cannot afford to let this happen, for the following reasons:

1. You need to consider that the Hellman Ranch Specific Plan is an **80% open space development with only 70 homes**--a a rarity in an age when almost all residential developers focus on profit-enabling high-density projects, with their attendant degradation of the natural environment. If this development fails to materialize, it is extremely unlikely that its environmental advantages will ever be matched by future developments.

2. The tradeoff between restored and dedicated wetland and the acreage required for the golf course is a reasonable one. Keep in mind that the regulation 18-hole course, which is needed to make the entire project economically viable for the developer and our city, is at the same time much more environmentally benign than high-density housing. In fact, the wetlands acreage and the vegetation on the golf course will be synergistic in providing habitat for a wide variety of marine and land-based wildlife. We should be grateful that the Hellman developers are willing to provide 44 acres of restored and dedicated wetlands. Even an uninitiated observer can see that currently the Hellman property is essentially nonfunctional as a wetland area.

3. The Commission's recommendation for a 25' wide pedestrian trail behind existing homes is ill-advised. Twenty-five feet of width is more properly allocated to a road, not a trail, and is not wise use of precious acreage.

GLD

Furthermore, the combination of excessive trail width and two public access points to Gum Grove Park opens up potential problems, in the form of noise control and vandalism, for the numerous Seal Beach property owners whose property would back up to the pedestrian trail and the park. It makes more sense to provide a more secluded park with a single entry point and a narrow trail which blends into the environment, preserves acreage, and has less negative impact on concerned Seal Beach citizens.

4. As you undoubtedly know, within the past two decades our city has fortunately averted at least two controversial high density developments proposed for the Hellman property. In stark contrast to the city's opposing factions spawned by those proposals, the people of Seal Beach have spent countless hours of their personal time working cooperatively for over 5 years to make the Hellman Ranch Specific Plan a reality. It would be a shame to let the changes recommended by the Commission deny Seal Beach this rare opportunity to provide an 80% open land development with a synergistic combination of significant environmental improvement, public land use, and benefits to our city.

As a concerned citizen, I urge you and the Commission to recognize the logic of the above arguments. I speak not only for myself on this issue, but for the citizens of Seal Beach who are demanding that reason should prevail, and that the California Coastal Commission should approve the Hellman Ranch Specific Plan as proposed.

Sincerely,

Lawrence R. Weill

Dr. Lawrence R. Weill
100 Surf Place
Seal Beach, CA 90740

5-97-367
4/5/1998 letter to Shirley Dettloff

G11

Received at Commission
Meeting

APR - 7 1998

From: 5-97-367

Dear Coastal Commisioners,

We in Seal Beach are so excited about the Hellman Ranch project. I myself worked against the Mola design because there were too many houses and nothing was really guaranteed.

But this time the Hellman Ranch folks and particulary Dave Bartlett and Jerry Tone have respected the wishes and feelings of this town.

After all, everyone knows that this town is a slow growth town, and therefore we need a very quality project completed by quality developers.

I am hoping that you will pass this plan right now because I just don't think it could be any better for our town. Also, it would be wonderful to have it signed sealed and delivered as a credit to Gwen Forsythe who has worked 10 years to see this project come to completion.

I am very pleased about the restoration of the wetlands and also the inclusion of a compatably safe Golf Course I play golf in Kauai and am very familiar with the extra precautions that are necessary to keep a golf course environmentally safe. But I know that it can be done.

All of us respectfully hope that you will pass this plan and give us the Hellman Ranch project that we deserve

Thankyou,

Perry Watson
1635 Catalina
598-9294

912

Received at Commission Meeting

APR - 7 1998

From: 5-97-347

February 22, 1998

California Coastal Commission:

From: Paul Yost, Seal Beach Planning Commissioner District 3

I am writing in support of the Hellman project. As the planning commissioner whose district includes the Hellman property, I have followed this project with great interest. As a city council candidate, I have a good feel for the interests of the residents of Seal Beach district 3. I can comfortably say there is very little opposition and much public support for this project. During the planning commission public hearings on the EIR (on which I sat as a planning commissioner), very few people showed up in opposition and many residents of Seal Beach spoke in favor of the Hellman Project.

This proposal offers the community much that is positive. It preserves open spaces. It provides for the deeding of Gum Grove Park over to the city and its citizens. It proposes limited housing in an area that is geologically sound, and which minimally impacts the rest of the city in terms of traffic and congestion. And, it calls for the restoration of what is now severely degraded wetland.

Please join me and support the Hellman Project.

I would like my comments included in the packet for the other coastal commissioners.

Thank You,

Pal Yost

Paul Yost
Seal Beach Planning Commissioner District 3
485 Schooner, Seal Beach, CA 90740 (562) 493-1736

G13

Received at Commission
Meeting

APR - 7 1998

From: 5-97-367

To the California Coastal Commission:

We are so pleased with the Hellman Ranch plan that has come before the Coastal Commission. It has been a long time coming but I'm sure that all of the people of Seal Beach support this plan.

I was q supporter of the Coastal Commission from the very beginning and this is like a dream come true. We in Seal Beach are certainly looking forward to the restoration of the historical wetlands, the championship golf course and the fewer homes.

We young people of Seal Beach hope that the commisssion will support this plan for our city.

Ed Watson

Edward W. Watson
Seal Beach
598-9294

G14

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

To the Coastal Commissioners,

The majority of the citizens in Seal Beach back this Hellman Ranch plan. In fact,I'll bet you could hardly find anyone who does not support this terrific plan. We are particulary pleased how carefully the planners worked to save the blighted wetlands and provide us with a golf course too.

Please know that we also support the Coastal Commission and your hard work. We know that you will find merit in this plan and reward all the hard work by everyone involved, with a yes vote.

Sincerely,

Shelly Welsh

G15

Robert B. Thornburg

Received at Commission Meeting
APR - 7 1998
Item: 5-97-367

April 6, 1998

Shirley Dettloff
Commissioner
California Coastal Commission
The Great State of California

Dear Commissioner Dettloff,

I am a 10 year resident of Seal Beach, California and have followed the Hellman Ranch issue closely during that time. I feel that the current Hellman Ranch Specific Plan as approved by the City of Seal Beach, which is before you now, is clearly the best use of the property.

The Hellman family has made many, outstanding concessions in their current plan which makes the Plan a "win-win" for them, the city of Seal Beach and the surrounding area. It absolutely mirrors that of a citizens committee which I served on almost ten years ago which specified a small, high quality residential development, wetlands and a golf course. The proposed use of the property is fantastic and the current landowner is the best choice of developer.

Please vote your approval on the Hellman Specific Plan as approved by the City of Seal Beach.

Kindest regards,

Robert B. Thornburg

1665 Crestview Avenue, Seal Beach, California 90740 (562) 431-7508 (562) 431-7239 fax

Anne E. Thornburg

Received at Commission Meeting
APR - 7 1998
From: 597-367

April 6, 1998

Shirley Dettloff
Commissioner
California Coastal Commission
The Great State of California

Dear Commissioner Dettloff,

I am a 10 year resident of Seal Beach, California and have followed the Hellman Ranch issue closely during that time. I feel that the current Hellman Ranch Specific Plan as approved by the City of Seal Beach, which is before you now, is clearly the best use of the property.

The Hellman family has made many, outstanding concessions in their current plan which makes the Plan a "win-win" for them, the city of Seal Beach and the surrounding area. It absolutely mirrors that of a citizens committee developed almost 10 years ago, and which specified a small, high quality residential development, wetlands and a golf course. The proposed use of the property is fantastic and the current landowner is the best choice of developer.

Please vote your approval on the Hellman Specific Plan as approved by the City of Seal Beach.

Kindest regards,

Anne E. Thornburg

Anne E. Thornburg

1665 Crestview Avenue, Seal Beach, California 90740 (562) 431-7508 (562) 431-7239 fax

G17

4/6/98

To the attention of Shirley Dittloff:

We have lived in Seal Beach all our lives. (over 50 years) We would like to see the Hellman Ranch Specific Plan, which includes a 18-hole regulation length golf course, restored wetlands, 70 homes and dedicated Gum Grove Wilderness Park. Please don't change this plan. The people of Seal Beach have approved this plan. It's taken a lot of work to get this far. Don't make us start all over.

Received at Commission Meeting

APR - 7 1998

From: 597-367

Thank you,

Terry and Judy Bray
416 Jade Cove Way
Seal Beach 90740

G18

Received at Commission Meeting
APR - 7 1998
From: 5-97-367

January 28, 1998

Mr. Rusty Areias, Chairman
Caifornia Coastal Commission
1400 "N" Street, Suite 9
Sacramento, CA 95814

Dear Chairman Areias:

My husband and I have been residents of Seal Beach for over 26 years living next to Gum Grove Park and looking out over the Hellman Estate. During this time this property served only as a pitiful, dried up home for wild life, as well as unsightly oil producing property. Although it was open, it was always a fire hazard and an eyesore as we have waited through the years for it to be transformed into something productive and aesthetic for the people of Seal Beach.

Now we believe just the right plan to answer all requirements of cost efficiency together with ecological and practical community service has been presented. I am afraid that if this plan is not accepted we will never see the property improved and everyone will lose. A small, restored wetlands is certainly better than none at all. We believe most of our friends and neighbors in Seal Beach are counting on this wonderful development to happen. Please let it happen!

I would like my comments to be read into the record at the next meeting.

Sincerely,

Georgia Curlette
1015 Crestview Ave
Seal Beach, CA 90740

cc: Lee Whittenberg, Mayor Marilyn Hastings, Gwen Forsythe, Jerry Tone.

G19

Received at Commission Meeting
APR - 7 1998

Greg & Christine Johnstone
930 Driftwood Avenue
Seal Beach, CA 90740

5-97-367

April 4, 1998

Shirley Dettloff
California Coastal Commission

Dear Ms. Dettloff:

This letter is in regards to the hearing on Tuesday for the Hellman Wetlands Proposal. We are unable to attend the Public Hearing but wish to express our position on this issue as citizens of Seal Beach.

We urge you to consider the proposal as currently presented, and not modified to increase wetland acreage. In particular, we do not support any proposal which includes a golf course plan which is anything but an 18 hole regulation course (greater than 6,500 yards). The current demand for regulation golf courses is already overwhelming. This is especially true for Seal Beach residents who have no special privileges in regards to reservation times in Long Beach, which has some of the busiest golf courses in the country.

The residents of Seal Beach have endured this seemingly endless development process. Finally, there is a proposal which has the overwhelming support of the majority of Seal Beach residents. We strongly feel that the current proposal is favorable in that it: (1) includes a reduced development of homes over previous proposals; (2) restores wetlands which would otherwise be in poor condition; and (3) includes the most feasible proposal for a golf course.

We appreciate that you have a difficult decision and hope that you will consider the views of the majority of Seal Beach citizens in your final analysis.

Sincerely,

G Johnstone Christine Johnstone

Greg and Christine Johnstone

G20

GEORGE KALOIAN
1000 DRIFTWOOD AVE.
SEAL BEACH, CA. 90740-5825

Received at Commission Meeting
APR - 7 1998
From: 5-97-317

April 7, 1998

Att: Shirley Dettloff
California Coastal Commissioner
Re: The Hellman Ranch Specific Plan

To Whom It May Concern:

As a long time resident (25 years) of Seal Beach, I have raised my children here and have always tried to support the city in any way that would continue to keep Seal Beach as "a good place to live and play

Now we have a golden opportunity to make Seal Beach a "GREAT place to live and play by insuring the building of a true, full length, regulation golf course as set forth in the Hellman Ranch Specific Plan. Without its worth as a scenic green space thing of beauty, and its value as a money generating sports activity for local and outside residents, then the whole Hellman property becomes just another waste of the last good open space in the city of Seal Beach.

And that waste I will NOT support.

Yours truly,
George Kaloian

G21

Received at Commission Meeting

APR - 7 1998

From: 5-97-327

Mary Hughes
1724 Catalina Av.
Seal Beach, CA 90740
April 6, 1998

Shirley Dettloff
California Coastal Commissioner

Dear Ms. Dettloff,

I urge you to support the Hellman Ranch Specific Plan as it is currently written. As a resident of Seal Beach for over twelve years, and living just one block south of the Hellman property, I have followed and supported the development of this current plan and I continue to do so.

Our community, together with the City Council, has worked for over five years on the development of this plan which includes: a regulation golf course, restored wetlands, 70 homes and the preservation of Gun Grove Wilderness Park. It is a plan that meets the needs of both the community and the property owner. It is a plan that takes into consideration the effect on our environment, schools, traffic, and both the local and extended community.

Please, support and accept the Hellman Ranch Specific Plan with no changes.

Sincerely,

Mary C. Hughes

Mary Hughes

G22

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

Randy Hughes
1724 Catalina Av.
Seal Beach, CA 90740
April 6, 1998

Shirley Dettloff
California Coastal Commissioner

Dear Ms. Dettloff,

I urge you to support the Hellman Ranch Specific Plan as it is currently written. As a resident of Seal Beach for over twelve years, and living just one block south of the Hellman property, I have followed and supported the development of this current plan and I continue to do so.

Our community, together with the City Council, has worked for over five years on the development of this plan which includes: a regulation golf course, restored wetlands, 70 homes and the preservation of Gun Grove Wilderness Park. It is a plan that meets the needs of both the community and the property owner. It is a plan that takes into consideration the effect on our environment, schools, traffic, and both the local and extended community.

Please, support and accept the Hellman Ranch Specific Plan with no changes.

Sincerely,

Randy Hughes

G23

Received at Commission Meeting

APR - 7 1998

From: 5-97-367

Damon R. Swank
1685 Crestview Avenue
Seal Beach, California 90740
Telephone (562) 431-6291

Bigger type
Easier to Read!

Monday, April 06, 1998

TO THE CALIFORNIA COASTAL COMMISSION

Re: The Hellman Project, Seal Beach

This letter is for your consideration at the meeting scheduled for Tuesday, April 7, 1998 in Long Beach.

I am in favor of the project. I ask that you approve it as submitted, without any modifications.

I first lived in Seal Beach in 1966, and have owned a home here since 1978. Over the years, we have coped with a series of terrible proposals to develop this land. Fortunately, none of them came to fruition.

The present project, as submitted, is viable and desirable. I do not believe we will ever see a better one. The project needs the income from a full-sized golf course to pay for the improvements to the wetlands. Extracting more concessions will jeopardize the golf course. Further reducing the available acreage puts the project in jeopardy. Requiring public trails through a private project is not reasonable or desirable.

We want this project to go through. We have worked hard for many years to defeat the other projects. Please approve this one as submitted, without modifications.

Yours truly,

Damon R. Swank

Damon R. Swank

G24

April 28, 1998

CALIFORNIA EARTH CORPS
4927 Minturn Avenue
Lakewood, CA 90712
(562) 630-1491

RECEIVED
MAY 15 1998
CALIFORNIA
COASTAL COMMISSION

Rusty Areias, Chairman
California Coastal Commission
1400 N Street Suite 9
Sacramento, CA 95814

Re: Hellman Ranch Development 5-97-367

Dear Chairman Areias:

California Earth Corps does not believe this Project can be justified under the Coastal Act, as presented. But CEC OPPOSES this permit because of the unresolved issues raised, the conflicts with Federal regulations and the adverse precedents that would be set.

THIS IS NOT A RESTORATION PROJECT

Under Sec. 30233a of the Coastal Act, filling a wetland, even a severely degraded wetland, can only be permitted under eight very limited options. The only options even remotely applicable are 3) a boating facility and 7) a wetland restoration project. This is clearly a residential housing project, with a golf course and other palliatives added to gain public support and necessary Seal Beach City permits. A restoration project should seek to restore at least the area historically tidal, in this case, about 75 acres, starting with an adequate supply of tidal flushing. The application fails to meet the criteria of 30233a.7.

THIS IS NOT A BOAT DOCK

A possible justification for Permit under Sec. 30233a.3 as expanded under Sec 30411 when analyzed "as if a boating facility" also fails every test of common sense. A golf course is not a boating facility

THIS IS ANOTHER SHELL GAME FROM HELLMAN

In 1910, Isaias Hellman was threatened by a run on his Bank, now Wells Fargo. He hired Wyatt Earp, the best gun he could find, to rout an angry mob. Earp took a wagon to a nearby ironworks and "filled the sacks with iron washers the size of $20 gold pieces" and delivered them to Hellman's bank in full view of the angry crowd, announcing he had $1 million to deposit. It worked. Now nearly one hundred years later, Hellman has hired the best gun around to fill a sack with a housing project and tell the people it's a restoration project worth millions. Well, it won't work again. This Commission is too smart for that.

G25

THIS PROJECT FAILS THE CRITERIA FOR FEDERAL CONSISTENCY

Section 10 of the Rivers and Harbors Act covers all historically tidal and submerged lands. Until the late 1950's, approximately 75 acres of the Hellman Property, and all of the State Lands' Parcel, were tidal, as shown by the USGS aerial photographs. Sometime after 1958, the dredge spoils from the Haynes Forebay (LADWP) and the San Gabriel River channelization (USA COE) were laid down on Hellman tidelands, resulting in up to ten feet of overburden. CEC believes Section 10 preserves Public Trust and Sovereign Lands protections over these recently tidal areas and makes the case for "reasonable restoration" of these 75 acres.

Section 404 of the Clean Water Act requires a permit from the Army Corps of Engineers before any dirt is moved around on any current or former wetlands adjacent to tributaries of navigable waterways. The current flow through the present tidal channel itself meets the criterion for tributary status and must be protected and not filled unless part of a "reasonable restoration". This is not "reasonable restoration".

MITIGATION MUST PRECEDE DEVELOPMENT

Surely, if we learned anything at all at San Onofre, it is that mitigation must precede development, or else, if it happens at all, it will be substantially less than that envisioned as necessary to permit the project. The appropriateness of the mitigation credits allowed can only be determined by the successful achievement of the restoration criteria. The experience at San Diegito should provide much insight as to how to (and how not to) proceed. Particularly, any argument for a reduction below a 4:1 ratio based on the quality of the enhanced wetland to result from the project can only be assessed after these wildlife values have been achieved as measured against the permit criteria. Only then should development credits be awarded.

MITIGATION LESS THAN 4:1 WOULD SET A BAD PRECEDENT

It is unclear exactly what mitigation is currently being proposed. The ration varies from .85 to 2.1 depending on how tidal acreage is defined, when it is restored and who adds it up. The design and even the criteria for design of mitigation for the project are even more ambiguous. This is comparable to the Marina Pacifica Project on the opposite side of this former Los Cerritos Estuary, where the mitigation (Simm's Pond) is a sad reminder of what happens when the Coastal Commission acts before a mitigation is clearly thought out. What is clear is that substantially less than 4:1 would either set a precedent or result in litigation.

G26

BUFFERS OF LESS THAN 100 FEET WOULD SET A BAD PRECEDENT

Requiring only 5 foot buffers instead of the 100 feet usually required cannot be supported biologically, aesthetically or legally and would either set a bad precedent or result in litigation.

ARCHEOLOGY CONDITIONS ARE IMPROPER

Native American concerns have not been addressed or have been disregarded. Archeological conditions attached to the proposed permit seem to minimize opportunity for any discovery of artifacts. As one example, shovel test pits to a depth of 50 cm. where the recent terrain has been covered with dredge spoils of up to ten feet (318 cm) would seem to promise little information beyond what was in San Gabriel river sediments forty years ago.

AVAILABLE RESTORATION OPTIONS ARE UNADDRESSED

Because this is a development project, and not a restoration project, the best restoration options can not even be considered and will be forever precluded. Because the Coastal Act, State and Federal Policy all place the first priority on wetland restoration, this project is just not compatible with wetlands policy.

1) Petroleum production is not incompatible with a fully functional tidal marsh. Audubon (the environmental organization, not to be confused with Audubon International, the golf course development company) has successfully designed and operated wetland reserves on producing oilfields. The existing wellheads can be upgraded to be compatible with restored habitat and wildlife or can be relocated and centralized on the site adjacent to Seal Beach Boulevard.

2) The Flood Control Retention Basin would offer substantially more flood protection if restored to tidal wetlands with direct gravity flow to sea than the currant operation whereby impounded water must be pumped by notoriously unreliable pumps up and over the levy to the San Gabriel River. This potential restoration could add up to 120 acres of additional wetland, is already in public domain and would substantially improve protection of surrounding properties.

3) The State Lands Parcel can most appropriately be used to site an expanded inlet to provide full tidal reach to the uppermost part of the current retention basin. The four foot culvert is inadequate to supply even the proposed 23 acre tidal marsh contemplated in the proposed project, yet may be restructured to accommodate both full tidal flushing to a 200+ acre restored estuary and highly reliable storm water runoff protection at a comparable price to that being contemplated for an over-a-raised-levy project.

4) Putting together a financial package for a 200+ acre estuarine restoration project at this site is altogether possible, absent the proposed project. With the project, we get another Simm's Pond.

G27

THE COASTAL COMMISSION SHOULD DENY THIS PROJECT SO THAT A REAL RESTORATION PROJECT MAY BE CONSIDERED.

The San Gabriel River, its' watershed and estuary within recent history were at least ranked with the Ventura and Santa Marguarita as most vital to sustaining Southern California biota. The loss of this estuary and marine nursery substantially contributed to the collapse of the astonishingly productive fishery on this portion of the Southern California Bight that just a few decades ago sustained tens of thousands of jobs in a flourishing sport and commercial fishery, then the largest sector of the California economy. If we are ever to restore these marine waters to anything approaching their former productivity, we must start by restoring these tidal wetlands. That is why the resource agencies constituting the Southern California Wetlands Clearinghouse have made the Los Cerritos wetlands restoration a top priority. To foreclose this option to permit a dubiously justifiable housing project just doesn't make sense. We ask that you deny this project.

Thank you for considering our comments.

Don May, President
California Earth Corps

G28

G29

RECEIVED
APR 29 1998
CALIFORNIA
COASTAL COMMISSION

Chairman and Fellow Commissioners
CALIFORNIA COASTAL COMMISSION HEARING
Santa Barbara June 1998

HELLMAN RANCH DEVELOPMENT - **OPPOSITION**

From testimony given in the April hearings held in Long Beach, it appears the 196 acres under this application was, before Hellman ownership, pristine wetlands and wilderness. Unfortunately, it is not that today. The Coastal Commission, guided by staff, has the opportunity to restore part of that legacy. Staff is representing the "silent majority", the future visitors and residents to the site. The proponents are representing the few who would profit the most from the concept before you. There are forward thinking land planners and environmentalists who can create a concept that would not deny a profit to the owner. The City of Seal Beach has fought against such a plan, and won. Staff is up against the wall fighting the convincing presentation of the well funded Hellman proposal. Perhaps their recommendations are more reasonable than what has been portrayed. I, for one, do not believe there will be no development without a golf course. The Hellman's are not stupid.

The Hellman's have held the property since 1910. How they acquired it, and at what price is not an issue. What they have done since, is! The owners have profited from oil extraction, and have profited from letting others use it as a dumping ground. They have profited from annual lease revenue from what the City describes as a park, but is without public restrooms, telephone, trails, picnic tables, irrigation. They have profited by backfilling the natural connection of the San Garbiel River to the wetlands with a culvert drainage pipe, and then letting that deteriorate and plug up. And all this time the City stood by and did nothing to enforce any beautification or preservation of these wetlands now gone to ruin.

The Hellman Ranch and the City of Seal Beach can't contain their greed. After rendering this 196 acres uninhabitable even for the hardiest of wildlife, they want to profit by turning these devastated wetlands into an area closed not only to the general public, but all wildlife for good.

G30

The Hellman Ranch has spent a great deal of money hiring professionals to give a convincing presentation. The City of Seal Beach has spent countless hours of staff and public official time supporting this presentation justifying their actions by stating that all of the community is for this project. We know the people that support this project are those who will directly benefit by it. It is the responsibility of the Coastal Commission to represent those people who do not support this project, because they are those who do not live in Seal Beach surrounding the project; they are those who are not yet born who will never experience the wetland environment and wilderness that this site once had to offer; they are those who cannot talk to us, the animals and birds, that forever will be denied their home if this project should be allowed to proceed as proposed.

The presentation put on by the proponents has vivid and striking impact---just because the owners have devastated the 196 acres for their private gain. If the owners had screened their oil well sites, had not plugged the wetlands from filling from the San Gabriel River with salt water, had not dumped waste on the site, had opened the area to hikers, naturalists, historians, and yes, the original owners, the American Indians, birds and animals, would their presentation have the same impact? The City and supporters seem to believe that the owners are now "angels from heaven." This disgraceful site, surrounded by a chain link fence, will now be transformed into a beautiful 18 hole golf course and 70 beautiful homes in a private community. To a few of us, this "heaven" is really an extension of the "hell" that they created in the first place. People, wetlands, and wildlife are excluded.

The presentation gave an interesting fact. Only 7% of the population visit the site now, and over 77% is projected to visit it after the development of the community and golf course. If the population of Seal Beach is 29,000, that means that about an average of 6 people per day, 365 days a year visit the site. After development, an average of 61 people per day, 365 days a year are expected to visit or live on the site, which is 196 acres in size. Not bad, but what if the daily average number of out-of-town visitors to Seal Beach, without the golf course, to the average with the golf course, was used?

G31

My guess would be we would see a change upwards of less than 1%. Is it fair to give up these wetlands for so few people, when the Hellman's have deprived the general public of this wilderness for the last 80+ years? After all, there are three public golf courses within ten minutes of all Seal Beach residents, including those in Leisure World.

A golf course would further desecrate land that once was archeological significant, and was once a sanctuary for wildlife. A golf course is one of the most inefficient uses of pristine lane. This site calls for the development of affordable housing integrated into the wetlands, with full public access to people, animals and birds. The Coastal Act was passed to represent the people and protect the remaining natural assets from further depletion by those few in your presence, seeking personal gain at the expense of the those present and future citizens who support our government.

The Mola plan, that the City opposed, did more for the wetland restoration and affordable beachside community housing than the present proposal will ever do. And, it too, was driven by maximum profit for the owners and City.

The City of Seal Beach, has been a champion of protecting the interests of the wealthy, at the general public, including visitors to the coastline. They have refused to file a local coastal plan, which would have included the Hellman property, because of a few residents in Surfside that value their private community that denies public access to the surfline, and the few residents that deny defacto public use of the boardwalk area of Old Town Seal Beach.

It is time that the voice of conscience is heard over the voices of many that have orchestrated an approved of this project before you. Part of what has been taken from this land by the owners and for the last eighty years, needs to be given back. Staff's position is not unreasonable. Please vote your conscience. Thank you.

Walt Miller
Seal Beach resident and property owner last 23 years
231 Seal Beach Boulevard
Seal Beach
Tel. (562)598-8783
Fax (562)430-0912

G32

4-16-98

RECEIVED
APR 20 1998
CALIFORNIA
COASTAL COMMISSION

Dear Mr. Areias,

I would like to comment on the Hellman Ranch Reserve (CDP 5-97-367) in Seal Beach. I do NOT support the Hellman Plan for developing this property.

I believe the City of Seal Beach has not adequately addressed archeological preservation (the city fired the archeologist because his report indicated too many impediments to development) and wetland restoration (the proposed acres for restoration are far less that the historical number). In addition, I feel the City of Seal Beach limited legitimate discussions on these topics throughout the entire approval process.

I fear harassment from the city and certain residents for my position, so I will not sign this letter

Sincerely,
A Seal Beach Resident

cc Charles Damm

633

BETH MURRAY

4302 WEST ST., A, OAKLAND, CA 94608 (510) 547-7515

May 3, 1998

RECEIVED
MAY 12 1998
CALIFORNIA
COASTAL COMMISSION

RECEIVED
MAY 11 1998
CALIFORNIA
COASTAL COMMISSION

45 Fremont St.
San Francisco, CA 94105

Dear Coastal Commision,

I am writing to voice my opinion that you reject the filling of wetlands at Hellman Ranch. The "restoration" that developers there is proposing amounts to a giant loss of habitat for birds which depend upon wetlands. California has already lost the majority of it's wetlands: look at the quality of our water without wetlands to filter it; look at the incredible decrease in riparian wildlife. We don't need any more golf courses!

Thank you for your consideration.

Sincerely,

Beth Murray

G34

70 Santa Paula Avenue
San Francisco CA 94127-1542
6 May, 1998

RECEIVED
MAY 12 1998
CALIFORNIA
COASTAL COMMISSION

RECEIVED
MAY 11 1998
CALIFORNIA
COASTAL COMMISSION

California Coastal Commission
45 Fremont St.
San Francisco 94105

Dear Commissioners

I am appalled that you are set to allow the development of the wetlands at the Hellman Ranch on the San Gabriel river. With both the Army Corps of Engineers and the U.S. Fish and Wildlife Service recommending against the project it is puzzling to learn that your agency is even considering the filling in of the wetlands for a golf course and dozens of homes.

Have you considered the runoff of pesticides and fertilizer from the golf course? Have you considered the effect of those seventy homes on the water table, or the disposal of sewage from this project? The San Gabriel river needs your protection, and please remember that you hold the public trust in your hands.

Yours very sincerely,

Anne C. Britton

Anne C. Britton

G35

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
SOUTH COAST AREA
245 W. BROADWAY, STE. 380
P.O. BOX 1450
LONG BEACH, CA 90802-4416
(310) 590-5071

5/2/98

RE: HELLMAN RANCH / SAN GABRIEL RIVER

I urge the Coastal Commission to reject a golf course and houses development in this area. Golf courses can be built in many other areas without having a negative impact on wetlands areas. Human recreation shouldn't wipe out needed wetland habitats.

Thank you.

M. Cope
4023 East ave
Hayward 94542

G36

"I'll furnish my houses with style and with grace
Generate truckloads of solid waste."

James Taylor
"Sourgass"

When we step back away from the tiny microcosm of the Hellman Wetlands, it is much easier to see the forest without so many trees obstructing our view. The question then becomes more clear: "Are we talking about the benefits of overcrowding the birds & fauna of these lands versus the benefits of overcrowding humans here?" Any scientist of biology will be quick to explain how, in ten years, the effects of too many animals living on a limited biosphere is far more innocuous when contrasted with the effects too many people will have on an environment. I'd prefer to live next to the former. We must only look as far as South Central FL to see the effects and affects of the latter.

6 97-367

DAVID PARKE 1043 CRAGMONT AVE., BERKELEY, CA 94708

RECEIVED
MAY 15 1998
CALIFORNIA
COASTAL COMMISSION

RECEIVED
MAY 14 1998
CALIFORNIA
COASTAL COMMISSION

May 3, 1998

45 Fremont St.
San Francisco, CA 94105

Dear Coastal Commision,

I am writing to voice my opinion that you reject the filling of wetlands at Hellman Ranch. The "restoration" that developers there is proposing amounts to a giant loss of habitat for birds which depend upon wetlands. California has already lost the majority of it's wetlands: look at the quality of our water without wetlands to filter it; look at the incredible decrease in riparian wildlife. We don't need any more golf courses!

Thank you for your consideration.

Sincerely,

G38

RECEIVED
MAY 20 1998
CALIFORNIA
COASTAL COMMISSION

Tobias G. Wehrhan
4218 La Cresta Ave
Oakland, CA 94602

5/16/98

RECEIVED
MAY 19 1998
CALIFORNIA
COASTAL COMMISSION

Coastal Commission
45 Fremont St.
San Francisco, CA 94105

Dear Sirs/Madams:

I am writing to urge you to reject the filling-in or further degradation of wetlands at Hellman Ranch along the San Gabriel River.

Please note that both the U.S. Forest Service and the Army Corps of Engineers recommend denying the project. Your agency's plans to cite Section 30411 – ~~allowing~~ which allows filling of wet lands that are degraded for boating facilities – will set a dangerous precedent. The Hellman Ranch parcel under consideration is one mile from the coast and offers no boating recreation whatsoever. If the logic of using section 30411 prevails developers will be rewarded for degrading their own wetlands!

I insist that the Commission reject the Hellman Ranch filling or further degradation of wetlands at that site.

Please respond and assure me of your intentions to reject the Hellman Ranch filling.

Sincerely, Tobias G. Wehrhan

G39

10 Panoramic Way
Berkeley, CA 94704
May 16, 1998

RECEIVED
MAY 20 1998
CALIFORNIA
COASTAL COMMISSION

California Coastal Commission
45 Fremont Street
San Francisco, CA 94105

Dear Coastal Commission Members:

I am writing to ask you to reject the proposal by Hellman Ranch to fill historic wetlands along the San Gabriel River by filling them to build a golf course and 70 homes.

Both the Army Corps of Engineers and the U.S. Fish and Wildlife Service recommended denying the project. I urge you to do so.

We have lost all the wetland we can possibly afford to lose already in California.

Sincerely,

Constantina Economou

Constantina Economou

640

CALIFORNIA STATE UNIVERSITY, LONG BEACH

DEPARTMENT OF ANTHROPOLOGY

RECEIVED
APR 8 1998
CALIFORNIA
COASTAL COMMISSION

April 3, 1998

Mr. John Auyong
California Coastal Commission
200 Oceangate, Suite 1000
Long Beach, CA 90802

Dear Mr. Auyong:

I am writing concerning the proposed development at the Hellman Ranch in Seal Beach, which I understand is on the Coastal Commission agenda for next Tuesday, April 7.

Unfortunately, I will be unable to attend this meeting due to a prior commitment. I am, however, deeply concerned about the project and its impact on archaeological sites as well as ethnic communities of Native Americans.

These sites have never been adequately studied, but there are indications that they could be very significant. As you know, there is a lawsuit against the City of Seal Beach over the faulty EIR for this project. It is crucial that these sites be thoroughly investigated before the project is improved. Otherwise, Seal Beach could have a replay of what happened in Newport Beach, where development proceeded in spite of finding several hundred human remains in what has been described as the oldest and largest Native American cemetery in western North America.

I am enclosing a packet of news articles on the Newport Beach case. I hope the Commission will study these articles, as well as briefs in the court case, before making any decisions on this important case.

Thank you.

Sincerely,

Eugene E. Ruyle
Professor of Anthropology

1250 BELLFLOWER BLVD · LONG BEACH, CA 90840-1003 · 310/985-5171 · FAX 310/985-4379

641

ORANGE COUNTY

Los Angeles Times

SUNDAY, NOVEMBER 2, 1997
COPYRIGHT 1997/THE TIMES MIRROR COMPANY/CC1/696 PAGES

Facts of O.C. Prehistory May Be Buried Forever

■ **Archeology:** Ancient Newport burial site, one of richest of its kind, was excavated and built over with little notice.

By DEBORAH SCHOCH
TIMES STAFF WRITER

NEWPORT BEACH—Nothing prepared the diggers for the strange and beautiful artifacts—the beads, mysterious stone spheres and decorated clay cylinders—buried in the bluff top above Newport Bay.

Then they started unearthing bones. Hundreds of human bones. Arm bones. Leg bones. Teeth. Bone fragments. Parts of human skulls.

Still, the excavation crews pushed on, quietly dismantling—some say destroying—one of the oldest and most important archeological sites on the California coast. Week after week, during late 1995 and early 1996, archeological field workers for an Irvine Co. project dug up the bones, which were later reburied in trenches nearby, to make room for 149 luxury homes.

From accounts of the Irvine Co.'s archeologist and others who worked at the site just off Jamboree Road, the bluff top teemed with clues to life along the Pacific coast 4,000 to 9,500 years ago, at the close of the Ice Age.

"We kept walking around, saying, 'Where is the Smithsonian? Where is National Geographic?'" recalled one archeological worker who agreed to talk on condition that he not be named. "It was a fantastic, amazing story. Sad situation. Sad story. I guess money talks."

A pricey, gated community called Harbor Cove now sits atop the bluff that once cradled the remains of a village believed to be thousands of years older than the fabled Egyptian pyramids of Giza.

And virtually no one outside Irvine Co. officials and a small circle of archeologists, field workers and Native Americans knows what really emerged from this site, called ORA-64. Rumors spread among the local Native American community that hundreds of prehistoric human remains were unexpectedly unearthed. A forensic expert estimated that the site contained as many as 600 burials.

The age of the bones may never be known because they were reburied without radiocarbon dating at the request of two state-appointed Native Americans called "most likely descendants" overseeing the site, Irvine Co. officials say.

What is clear is this: An ancient site long considered by archeologists as highly significant was excavated, then developed with little public awareness, even after years of behind-the-scenes lobbying by some scientists to save it, according to an extensive Times review of dozens of state and local documents and more than 100 interviews.

The saga of ORA-64—so named because it was the 64th site in Orange County on a national list of archeological finds—offers a rare glimpse into a world where the interests of developers, archeologists and Native Americans clash over tangled questions of how to balance modern-day progress with cultural and scientific concerns. While the excavation of prehistoric sites is not unusual in Southern California, the ORA-64 story stands out because of the site's established scientific value and the debate that has ensued over how the burials were handled.

The Irvine Co. and the state Native American Heritage Commission, which oversees the handling of Indian remains, insist that ORA-64 was developed in strict accordance with state and local laws.

"This company has spent more than $2 million seeking to develop that site, but to do it in a way that is sensitive to whatever was there in terms of prehistory—in terms of removing it, cataloging it, analyzing it, sharing the results with the public," said Larry Thomas, the Irvine Co.'s senior vice president for communications. "That's hardly a destruction of a site."

Thomas added that the company tried to protect the site from "Indiana Jones" types hunting for buried treasure.

"You have an obligation not to identify specific places . . ." he said. "We have not sought to create any greater interest in this than already existed, but to try to explain what we were doing as we were going along."

Thousands of artifacts from the site remain in laboratories and in storage, and the Irvine Co. has promised a full public accounting of what was discovered. The report has been delayed for months because of the wealth of data.

Even so, some Native Americans and scientists argue that the site was so important that it should have been preserved. Some contend that state laws intended to protect sites from scavengers can instead unintentionally allow their destruction by development, by keeping locations secret. It was, according to one official attached to the state Office of Historic Preservation, "a failure of the system."

"They say that everything that was done was legal. Well, it may be legal, but it isn't right," said Lillian Robles, an elder with the Juaneno Band of Mission Indians and a critic of the digging at ORA-64. "If it's so

G42

BONES: Irvine Co. Defends Work on Burial

legal, why was everyone so hush-hush?"

Michael E. Macko, the consulting archeologist for the Irvine Co. who oversaw the excavation of ORA-64, based his estimate that the site was occupied roughly 4,000 to 9,500 years ago on radiocarbon dating of shells that appear to have been the kitchen waste of the inhabitants who sought food from the coastline.

Fewer than 10 archeological sites along the California coast date back more than 9,000 years, and ORA-64 was one of the largest, said Jon M. Erlandson, a leading expert in early coastal life who has reviewed data from the site.

"This is one of the most impressive and important sites from the Pacific coast of North America," said Erlandson, a University of Oregon associate professor of anthropology who is assisting on ORA-64 research.

The excavation could produce important new details about California's past, such as the impact of climate changes and types of vegetation, as well as trade and social patterns of the early inhabitants, say archeologists familiar with the site.

The prehistoric dwellers left behind a wealth of artifacts—thousands of them, Macko says, including many hundreds that he considers of museum quality.

There are the perfectly round stone balls, 50 to 60 in all, some the size of baseballs, two as big as bowling balls. Similar balls have been found elsewhere in California, in Oregon and eastward—but the sheer numbers at ORA-64 make the find important, Macko says. He hypothesizes that they were used for sports.

There are 30 thimble-sized, decorated clay cylinders seemingly fired at high temperatures. A 1971 discovery of similar objects during an earlier dig at ORA-64 led to published scientific reports that they were the oldest known decorated, fired-clay ceramics in the Western Hemisphere.

And there are the four stone bifaces—stone artifacts shaped like large arrowheads and flaked on either side—20 to 30 centimeters long. One is made of a natural volcanic glass called obsidian traced to an area on the eastern Oregon-California border, Macko says.

How the obsidian traveled across the mountains and valleys of what is now California to be buried above Newport Bay "is one of the most fascinating research questions that we have," Macko said.

Missing from this treasure trove are the artifacts found with the burials. Those were returned to the earth along with the bones during 11 reburials from August 1995 to January 1997. Native Americans associated with the project performed the ceremonies.

Without the bones, some scientists say, huge amounts of knowledge about the early people who made these artifacts is lost. But the appointed Native American overseers—Jim Velasques and David Belardes—opposed any chemical testing of bone, the Irvine Co. says. And they also asked for secrecy.

"I signed an agreement with them that said no information on human remains would be distributed without their approval. And I don't plan on violating that agreement," Macko said.

Belardes, a leader of the Juaneno Band of Mission Indians, said he opposed any bone examination that would be destructive, such as radiocarbon dating or DNA testing.

Velasques, tribal chair of the Coastal Gabrielino/Diegueno band of Mission Indians, confirmed that he had requested secrecy at the site, and said the Irvine Co. treated the remains with dignity.

"From what I saw, to me it was better that [the remains] be exhumed and buried in a better place than they be bulldozed over," he said.

Under state law, when human remains are found at a construction site, the county coroner must determine whether they are recent or ancient. At ORA-64, that job fell to coroner's consultant Judy Suchey, a nationally recognized forensic anthropologist who—when questioned by reporters last spring—said that approximately 600 or more remains had been uncovered.

Irvine Co. officials questioned how Suchey had reached that count. Thomas, the company spokesman, said at the time that only three full skeletons and hundreds of bone fragments had been discovered. Any count is difficult because most bone was found not as full skeletons, but fragmented, scattered and disturbed by rodents, Macko said. In later interviews, however, Thomas said that Suchey's estimate of 600 might be correct.

"It could be," he said. "It could be more. It could be less. But we don't know how she reached that conclusion."

Suchey, an anthropology professor at Cal State Fullerton, said she based her estimate on the bones she saw in the field and in a laboratory, where they were briefly held before reburial, as well as conversations she had with people at the site.

With the permission of the coroner's office, The Times reviewed nearly 200 of the 4,000 photographic slides Suchey says she collected of the burials. They show portions of tibias and femurs, plastic bags filled with bone fragments, even an upper jaw with 12 teeth. Slides dated Nov. 16, 1995, show what appear to be four partially excavated burials still in the ground.

However, a request by The Times to reproduce photographs of the bones was denied by the coroner's office at the request of the Native American Heritage Commission.

Macko says Suchey's estimate is probably on target. One worker, who requested anonymity, said he helped dig up at least a dozen skeletons that were 30% to 80% complete.

Some workers said many remains turned up after heavy equipment arrived at the site in 1995, systematically removing thin layers of soil to reveal bones and other objects underneath.

"Bones turned up everywhere," one worker recalled. "You could see a cranium that had just been sheared in half by the scraper—bones that were crushed by the scraper."

Macko, however, denies that extensive damage occurred. "Most things were recovered with absolutely no damage," he said.

First workers excavated the site, digging roughly 1,900 one-by-one-meter squares in the ground, Macko said. Paddle-wheel scrapers removed one to two inches of soil at a time to assure objects were unearthed before grading began, he said. When remains were found, scraping was halted and bones were removed by hand, he said.

The scraper's accuracy was "mind-boggling," Macko said.

According to Erlandson, the ORA-64 excavation was handled

643

properly. The standard routine, he said, would have been to dig a small percentage of a site and bulldoze the rest.

"This was much better than the average project," he said. Still, he added, he wishes the site could have been saved from development.

Some archeological workers questioned the wisdom of hiring a handful of state prison inmates from two halfway houses to work on the ORA-64 site. Macko said the inmates were doing manual labor such as washing material and repairing screens, not excavation.

"I saw no reason not to give these guys a chance at all," he said.

More study of the artifacts and other scientific review remain. But Macko is scheduled to speak about the site Thursday at the Pacific Coast Archeological Society, which already is stirring fresh curiosity among local archeologists.

□

Although ORA-64's final excavation attracted little public attention, a much smaller dig generated a flurry of coverage in January 1973, when scientists reported the unearthing of thimble-sized, decorated, fired-clay ceramics believed to be 6,000 to 7,150 years old.

Archeologist Christopher Drover—who discovered the ceramics—later applied to nominate ORA-64 to the National Register of Historic Places.

State records show that the state Historical Resources Commission approved Drover's request in July 1977, a step that some officials say can virtually assure a place on the National Register. But the final paperwork apparently was never signed in Sacramento or forwarded to the National Register in Washington. Consequently, the site was never listed. (While National Register status does not in itself block development of a historic site, it sometimes can prompt more thorough federal scrutiny of a private project and more public awareness of a site's importance.)

Other experts sought to save part or all the site. One consulting archeologist, Joan Brown, urged in a 1992 report for the city of Newport Beach that ORA-64 be preserved. "This is one of the most important prehistoric site[s] remaining in Orange County," Brown wrote. Her report, part of an environmental review process for the proposed Harbor Cove development, was deemed confidential under state law because it contained site locations.

The following year, conservationists in Newport Beach attempted to drum up support and money to buy the ORA-64 land and two other Irvine Co. properties above Newport Bay. The campaign focused on environmental concerns, not archeology, and voters turned down Measure A in November 1993 by a 2-to-1 ratio.

"If people thought it was so significant archeologically that it should have been untouched, there was an opportunity to purchase it from us, and we were a willing seller," Thomas of the Irvine Co., said.

The Irvine Co. then pressed ahead with the Harbor Cove project, receiving approval from the Newport Beach City Council and the California Coastal Commission, which reviewed the company's archeological plans. Excavation work at ORA-64 began Jan. 19, 1995, finishing a year behind schedule in May 1996.

In a last-ditch effort for preservation, Jonathon E. Ericson, a UC Irvine professor of environmental analysis, design and anthropology, wrote Irvine Co. President Donald L. Bren in May 1995, urging at least partial preservation of what he called "perhaps one of the most important sites of its type in North America and the world." Ericson said he never heard back from Bren.

Some archeologists still wonder whether government review should have assured ORA-64's preservation, much as it might protect a wetlands or a rare songbird.

The California Environmental Quality Act requires the study of whether a project might significantly damage an important archeological site. It strongly encourages site preservation, but if that proves impossible, the site is supposed to be excavated so that its information is recovered and saved—such as retrieving artifacts and studying them.

Some wonder if the ORA-64 excavation illustrates a flaw in the act.

"If they can't protect a site of that importance, then [CEQA is] not doing what it's supposed to do," said Patricia Martz, associate professor of anthropology and archeology at Cal State Los Angeles and former chairwoman of the state Historical Resources Commission.

"It was a failure of CEQA and local government to deal appropriately with a valuable environmental resource," said William Seidel, coordinator of the state's Historical Resources Information System, which keeps track of archeological sites and other historic places for the state Office of Historic Preservation. "I think it was a failure of the system."

Today, as they did thousands of years ago, people are settling in at the bluff top above Newport Bay.

Nearly all the houses at Harbor Cove are finished—large, big-windowed homes, some with Spanish-style red-tile roofs, some with New England-style gray stone details and coach lights. Mercedes Benzes, BMWs and Lexuses are parked in the driveways. Landscapers have planted flowers and trees.

Robles, the tribal elder of the Juaneno band of Mission Indians, wonders how much Harbor Cove residents know about the people who came before them.

"When it's winter, and the doors start slamming, and they hear footsteps," she said, "they will know the ancestors are around."

Deborah Schoch can be reached at (714) 966-5813 or by e-mail at deborah.schoch@latimes.com

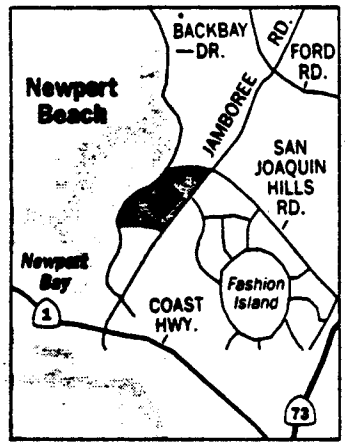
G44

LOS AN ORANG

BONES: Burial Site Built Over With Scant Public N

Ancient Find

The excavation of an Upper Newport Bay bluff top to build housing in 1995 and 1996 yielded artifacts that could date back 4,000 to 9,500 years. Found at the Harbor Cove site:

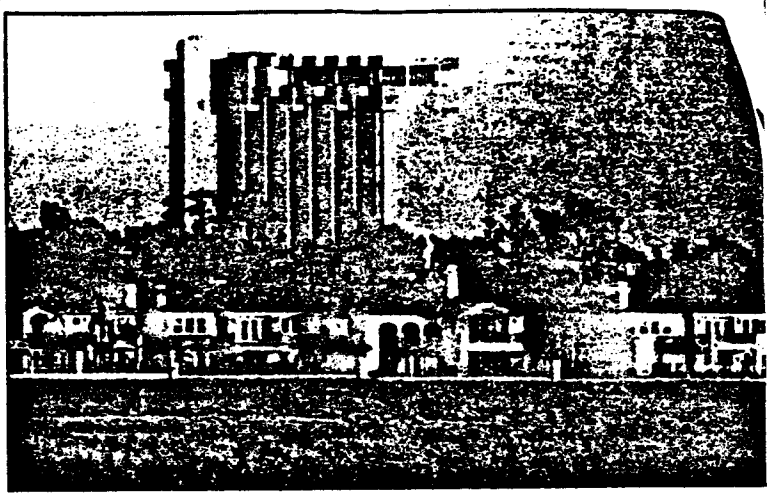


■ Area excavated
■ Bones, graves uncovered

- Graves: Possibly as many as 600 burials uncovered, with many found in a cemetery-like area.
- Ceramic cylinders: 30 small tapered objects, perhaps used in religious ceremony.
- Stone spheres: 50 to 60 perfectly shaped balls ranging from baseball-size to bowling ball-size.
- Bone beads: Hundreds of intricately designed beads carved from rabbit bone.
- Bifaces: Four dual-faced pieces, 20 to 30 centimeters long; possibly denoted status within the settlement. One biface is made of obsidian traced to a site on the eastern California-Oregon border.

Source: Macko Inc.; Researched by APRIL JACKSON/Los Angeles Times

Los Angeles Times



KEVIN P. CASEY / Los Angeles Tim

Harbor Cove project near Back Bay was built on site where bones up t 9,500 years old were found. Some remains were reburied in foregrounc

BONES: Houses Now Sit Atop Site

A 30-acre site is roped off for archeological excavation in 1995-96 that was directed by the Irvine Co. The ancient burial site, now a housing development, yielded thousands of artifacts as much as 9,500 years old and remains of an estimated 600 or more Native Americans, some of which were reburied nearby at the request of tribal overseers.

645

Sacred Issue

By DEBORAH SCHOCH
TIMES STAFF WRITER

Native Americans protest removal of prehistoric remains to make way for development.

NEWPORT BEACH—Burning sage and wearing black armbands, a group of Native Americans gathered outside a gated community on Sunday to honor ancient people who lived here as long as 9,500 years ago and whose bones were uncovered by development.

The All Souls' Day ceremony was part protest, part memorial service as about 70 Indians and supporters expressed outrage that 600 or more prehistoric burials were moved in 1995 and 1996 to make way for an Irvine Co. project to build 149 luxury homes on a Newport Bay bluff top.

"Hopefully, the message will get to the Irvine Co. that they'll never do anything like this again," said Lillian Robles, an elder with the Juaneño band of Mission Indians, as she and her colleagues prayed in a circle across the street from the gates of the new Harbor Cove community.

The Native Americans also traveled to three other archeological sites Sunday: the Bolsa Chica mesa near Huntington Beach, Hellman Ranch in Seal Beach and a site in Long Beach.

But it was the Irvine Co. project on Jamboree Road that drew the largest crowd and the most emotional outpouring from Native Americans, who say they learned only recently that hundreds of burials and thousands of artifacts were unearthed there and reburied during a major excavation to make way for homes selling for $600,000 and more.

The human remains and artifacts were unearthed quietly during the 16-month excavation

Please see PROTEST, B7

PROTEST

Continued from B1

at a cost of more than $2 million. The work proceeded even though some scientists had lobbied to save part or all of the site, considered one of the oldest and most important on the California coast.

Scientists believe the site, known as ORA-64, dates from 4,000 to 9,500 years ago, at the close of the Ice Age.

The location was so named because it was the 64th site in Orange County on a national list of archeological finds.

Officials of the Irvine Co. said that state-appointed Native Americans were involved in the ORA-64 project and that government approvals were sought and received in public forums.

"It's involved public entities all along the line," Larry Thomas, Irvine Co.'s senior vice president for communications, said Sunday.

Marchers carried picket signs reading, "Stop corporate grave robbing," "Where's your conscience?" and "800 graves plundered so you can live, work and play here."

Among them was Laurel Breece of Balboa Island, an archeologist who said she would have liked to see ORA-64 preserved as much as possible. "We all lost at '64.' All of us are responsible," she said. "Cultural resources belong to all of us."

'We all lost at [the site]. All of us are responsible. Cultural resources belong to all of us.'

LAUREL BREECE
Archeologist who was among protesters

While the Native Americans did not enter the gates of Harbor Cove, one resident came out to meet them. Frances Mead-Messinger said she did not know about the burials when she bought her home earlier this year. Her great-grandmother was a Choctaw from Oklahoma, she said.

She offered her yard to the Native Americans to hold a ceremony in coming months. "I think we need to work together to make the Indians feel as comfortable as possible," Mead-Messinger said.

Her invitation was praised by some Native Americans. "I think it took a lot of courage," said one marcher, Connie Lester of La Habra, who is part Cherokee. "She's got blood, and she understands how we feel."

Irvine Co.'s Thomas said Sunday evening that Standard Pacific, which built the homes, notified buyers about the archeological site. Moreover, the entire area where homes have been and will be built has been excavated, with no remains left on the developed portions, he said.

More details about ORA-64 are expected when Irvine Co. archeologist Michael Macko addresses the Pacific Coast Archeological Society Thursday. The public session will be at 7:30 p.m. at Western Digital Corp., 8105 Irvine Center Drive, Irvine.

G46

SECTION
B
MONDAY
NOVEMBER 3, 1997

AL SCHABEN / Los Angeles Times

With eagle staff in hand, Fred Short burns sage for purification and to show respect for elders.

B47

SECTION B

WEDNESDAY
NOVEMBER 5, 1997 cc++

Loss of Prehistoric Burial Site 'a Shame,' Experts Say

By DEBORAH SCHOCH
TIMES STAFF WRITER

NEWPORT BEACH—News that prehistoric bones of 600 or more burials were unearthed and then reburied during an Irvine Co. project near Newport Bay is provoking surprise and concern among anthropologists and other experts.

Some call the number of burials remarkable. And some say the fact that bones were reburied without radiocarbon dating or DNA testing constitutes a loss of scientific information that could have advanced knowledge about genetics and the relationships between California's earliest inhabitants.

"It must have been a significant site. It's a shame it's destroyed, and it's even more a shame that it was destroyed without the benefit of full analysis," Dennis Stanford, chairman of the Department of Anthropology at the Smithsonian Institution's National Museum of Natural History in Washington said Tuesday.

"We certainly would have put our word in on preserving the site," Stanford said.

An estimated 600 human burials and thousands of artifacts were unearthed on a 30-acre site in 1995 and 1996 during an Irvine Co. archeological excavation. The dig, which the company said cost more than $2 million, was done prior to the building of 149 luxury homes in the gated Harbor Cove community just off Jamboree Road.

Testing of shell showed that the site, known in archeological circles as ORA-64, was 4,000 to 9,500 years old, Irvine Co. archeologist Michael E. Macko said. Those dates rank the site as being among the oldest known areas of human habitation on the California coast, experts say.

"I don't think we have any sites that have been excavated in California where 600 or more burials have been found and are of such antiquity," said Lynn Gamble, president of the Society for California Archeology and an assistant professor of anthropology at San Diego State University. "The fact that they excavated so much yields this incredible information. But at the same time, we shouldn't be destroying these sites."

The state Native American Heritage Commission, which oversees the discovery of Indian remains, says that the Irvine Co. followed state law in excavating the site. Commission executive secretary Larry Myers said last week that in his experience, the Irvine Co. has involved the Native American community in such excavations, adding, "I think they're better than most."

But news that the dig uncovered as many as 600 burials of partial skeletons and bone fragments has created a stir among Native Americans and scientists alike. Some Native Americans say they only heard recently about the burials, while some scientists believe more testing should have been done.

The project was monitored by two Native Americans—Jim Velasques and David Belardes—who were appointed by the state commission as "most likely descendants." The two men requested that no destructive testing of the bones be done, which ruled out radiocarbon testing and DNA testing. The bones were reburied with Native Americans officiating, the Irvine Co. said.

"We chose to honor the wishes of the Native Americans," said Larry Thomas, Irvine Co. senior vice president for communications. Thomas added that the Harbor Cove project was reviewed by the city of Newport Beach and the state Coastal Commission, which required the Irvine Co. to conduct an excavation and issue public reports of the findings.

Sonia Johnston, a tribal leader of the Juaneno band of Mission Indians, who has spoken out against the excavation of ORA-64, said she too would not have allowed the destructive testing of bones: "These are our ancestors. These were human beings. It's not something that I'm in favor of."

Several experts expressed surprise at the number of burials found at ORA-64, the name bestowed on the site because it was the 64th in Orange County added to a national list of archeological sites.

"Six hundred burials from one site, if we're talking about one site, is indeed very unusual," said Michael A. Glassow, professor of anthropology at UC Santa Barbara and an expert in California archeology.

"I would think anywhere in North America where you had 600 burials in that time frame would be incredibly important," added Thomas R. Hester, professor of anthropology and director of the Texas Archeological Research Laboratory at the University of Texas at Austin. He called the lack of DNA testing or radiocarbon dating "a tremendous loss."

Native Americans often forbid such testing of bone, saying it is disrespectful of their ancestors. Some scientists are comparing the ORA-64 dilemma to the nationally publicized dispute over a 9,200-year-old skeleton named Kennewick Man found in 1996 along the Columbia River in Washington. Native Americans and the Army Corps of Engineers sought its reburial without extensive study, while a group of internationally known scientists—including the Smithsonian's Stanford—have sued, seeking the rights to study the remains.

Thousands of ORA-64 artifacts are still under study, and L. Mark Raab, a professor of anthropology at Cal State Northridge, said he is intrigued by reports of round stone balls and other artifacts that appear to have links to eastern Oregon and other parts of the Great Basin.

"You put this whole thing together, and it looks like an extraordinary package of scientific information," Raab said.

Raab said he was not aware of the extent of the ORA-64 discoveries. "I find it striking that a discovery of this magnitude could have been made, and it prompted so little awareness," he said.

However, Thomas said that a report on ORA-64 is now being compiled by Macko to be presented at archeological forums. Macko is scheduled to present some of his findings Thursday at 7:30 p.m. at the Pacific Coast Archeological Society meeting at Western Digital Corp. in Irvine.

"We too believe that this is a remarkable site," Thomas said. But before scientists begin judging the significance of the site based on newspaper stories, he said, scientific discipline would seem to require that they wait "for a thorough, formal report from one of their peers, that is in progress now."

G48

Irvine Co. Archeologist Speaks on Burial

■ **Excavation:** Lecture on ancient remains near Newport Bay grows tense when audience asks about handling of dig.

By DEBORAH SCHOCH
TIMES STAFF WRITER

IRVINE—A crowd of about 200 people crammed into a meeting room Thursday night for an archeologist's public unveiling of data from one of Orange County's most important prehistoric finds.

The crowd at the Western Digital Building gasped as Michael E. Macko held up a mahogany obsidian blade, uncovered along with more than 2,000 bone beads and dozens of round stone balls during a controversial excavation above Newport Bay.

The Times reported Sunday that the remains of an estimated 600 or more prehistoric people were unearthed, moved and reburied in 1995 and 1996 to make room for 149 luxury homes in a gated community called Harbor Cove despite lobbying by some scientists. Mack was the archeologist who oversaw the 16-month Irvine Co. excavation, which cost more than $2 million.

DON BARTLETTI / Los Angeles Times

Michael E. Macko, standing above, talks about finds at development.

The site, called ORA-64, was "clearly the most incredible site I've had a chance to work on," Macko said.

The atmosphere in the room became tense when Macko finished his presentation and archeologists and residents began asking questions.

A Newport Beach woman asked why the public wasn't told sooner about the site. "I live in the neighborhood," she said. "Why are we just finding out about this now?"

Macko responded that there were several newspaper stories.

Another woman asked Macko if he ever recommended against excavation to the Irvine Co.

Macko responded later, "I'm not going to touch on political decisions."

A man in the audience interjected, "It's not a political decision. It's an ethical decision."

Radiocarbon dating of shell shows the 30-acre site to be 4,000 to 9,500 years old, Macko said. That would date human habitation there to the close of the Ice Age, experts said.

The Irvine Co. and the state Native American Heritage Commission, which oversees the treatment of Indian remains, said state law was followed. The state appointed two Native Americans they call "most likely descendants," Jim Velasques and David Belardes, to assist at the site. The Irvine Co. said the two men forbade radiocarbon dating or DNA testing of the bones, which were reburied in trenches at an undisclosed location.

Thousands of artifacts from the site remain in storage and in laboratories under study.

Larry Thomas, Irvine Co. senior vice president, has repeatedly said that the site was not destroyed and that his company has continually sought to be sensitive to the site's scientific and cultural importance.

Although the full scope of the burials was not public until recently—Macko confirmed last week that 600 or more burials were found there—Thomas said his firm went through a public approval process in excavating and developing the site. A research design for the dig was reviewed by the state Coastal Commission. And Thomas said that the home builder at the site, Standard Pacific, notified buyers. The homes in the gated community sell for $600,000 or more.

A number of Native Americans and archeologists say they were not aware of the scope of the project. Some Native Americans, for instance, say they learned only this spring and summer that 600 burials were found there.

Some prominent archeologists have expressed dismay that DNA testing and radiocarbon testing was not done, saying that valuable scientific information has been lost.

Nick Spain, an archeologist who did exploratory work at the site in 1971 and 1972, asked Macko what percentage of the intact portion of the site was excavated using scrapers, or heavy equipment.

Macko responded that an estimated 85% to 90% of the area was examined with scrapers. Any damage was extremely minor, and the process was monitored. The burials were excavated by hand, he said.

SECTION B
FRIDAY
NOVEMBER 7, 1997

G49

ORANGE COUNTY PERSPECTIVE

Protecting Reminders of History

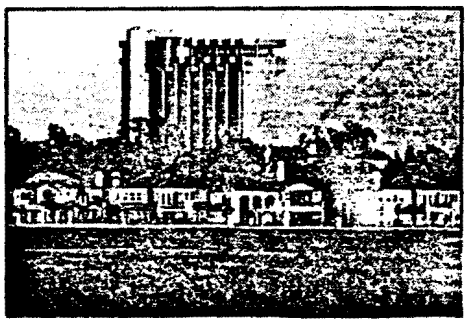
Irvine Co.'s development of burial site legal; stronger limits needed

California long has been accused of paving over its history. The state is filled with markers denoting that a structure now considered of historical importance "once stood here." That can be said of the Newport Beach cluster of expensive homes known as Harbor Cove. Men and women lived there anywhere from 4,000 to 9,500 years ago, and the land was a burial site for Native Americans.

The Irvine Co., which owned the property, obtained the necessary permits from Newport Beach and the California Coastal Commission in developing the project. It also offered the land for sale.

But four years ago a city ballot measure to buy the property was rejected. Those in favor of city ownership stressed not history but open space. Despite occasional news stories about findings of bones and ceramic artifacts during excavation, the historical importance of the site never registered strongly.

Anthropologists and other scientists now are expressing surprise at the high number of Native American remains discovered, perhaps 600 or more. Had the site not been developed, scientists would have had a chance to study how people lived so many millenniums ago.



The expensive homes of Harbor Cove are built on what was once a historical site.

The remains were reburied elsewhere, heeding the demands of Native Americans whose ancestors occupied the site. But many artifacts remain to be studied and cataloged. Above all, they should be displayed.

The public will not be able to walk the ground where they were discovered. But a museum would still offer a glimpse into the past, a reminder of what existed before orange groves, high-rises and malls swept across the county.

Many people understandably are outraged about what happened at Harbor Cove. At least two historians have said that if the California Environmental Quality Act had functioned well, the site would have been spared. The Irvine Co. appears to have met its legal obligations. The question is whether the environmental act as constituted can really be counted on to protect such sites.

The act requires developments to offset any harm they do, including degrading air or water quality. It also encourages preservation of important archeological sites, such as Harbor Cove. But it might be time to look at the act again to see if it can be strengthened so that important sites are saved.

G50

SUNDAY
NOVEMBER 9, 1997
LOS ANGELES TIMES

LETTERS TO THE TIMES

Save Bolsa Chica Archeological Site

■ Thank you for the Nov. 2 article about the archeological site, ORA-64, that was once in Newport Beach's Back Bay area. The Bolsa Chica Land Trust agrees that it is most regrettable that such an important and meaningful site has been destroyed.

At this time, it is very important to note that there is an equally important site in Orange County, ORA-83. This site is in imminent danger of being destroyed also. This is occurring because of county government approvals and the desire of Koll Real Estate Group to maximize its use of the Bolsa Chica mesa for housing.

One thing we are supposed to learn from history is not to repeat the mistakes we have made. The Bolsa Chica Land Trust is actively opposing this needless destruction and we hope others will join with us.

NANCY DONAVEN
President
Bolsa Chica Land Trust
Huntington Beach

■ I am saddened that the Irvine Co. bulldozed one of the oldest archeological sites in Orange County, and struck by the similarities between what happened at Harbor Cove and what is happening at Bolsa Chica.

Like Harbor Cove, the site at Bolsa Chica is very old, with human bones estimated to be 8,000 years old. Like the site at Harbor Cove, the site at Bolsa Chica was approved by the State Historical Resources Commission to be placed on the National Register of Historic Places.

Like the Harbor Cove site, the paperwork for some unknown reason was never forwarded to the National Register in Washington. The Koll Real Estate Group and the Irvine Co. both employed the same Native American monitors. Perhaps some of these similarities are more than just coincidences since Don Koll is on the board of the Irvine Co.

Unlike Harbor Cove, however, there are not yet houses at Bolsa Chica. There is still time to save the remaining archeological sites on the Bolsa Chica mesa. By helping the Bolsa Chica Land Trust in its efforts to bring about the acquisition of the mesa, we can prevent Harbor Cove and Bolsa Chica from having similar houses covering similar archeological treasures.

CONNIE BOARDMAN
Huntington Beach

■ The Times editorial of Oct. 30 regarding the El Toro lack of planning was insightful: "The airport has been the choice from the beginning for a powerful group of developers and their supporters in the corridors of county government."

This is exactly the same scenario for Koll's Bolsa Chica development. Koll internal memos that were anonymously sent to the Bolsa Chica Land Trust recently confirm that, as you stated, "planning and all the decision making have been mere window dressing to support a foregone conclusion."

FLOSSIE HORGAN
Huntington Beach

TUESDAY, NOVEMBER 11, 1997

Indians' Remains

■ Your otherwise carefully researched story ("Facts of O.C. Prehistory May Be Buried Forever," Nov. 2) leaves the unfortunate and inaccurate impression that the excavation of ORA-64 in Newport Beach was performed improperly, under a cloak of secrecy and with little public notice.

In fact, our approvals to construct Harbor Cove were gained after a lengthy process of public reports and hearings open to citizens and interest groups, as well as the news media. Further, midway through the excavation we invited the media to a briefing.

For decades this general area has been well known to have archeological significance. That is precisely why our public approvals from the city of Newport Beach and the California Coastal Commission required that the Irvine Co. sponsor a sophisticated and professional effort to thoroughly excavate one site on which development was planned, report findings to the public and make artifacts available for public viewing and study at an appropriate museum or institution of higher education. Four other promising sites have been left untouched in the surrounding open space.

Further, the excavation was monitored daily by Native American tribal representatives. And the handling of human remains was overseen by Most Likely Descendants selected by the California Native American Heritage Commission. We followed their wishes with respect to the reburial of remains with appropriate ceremonial dignity.

Contrary to your headline, we believe that the Native American communities, the archeological community and the public will have a wealth of valuable new information about life adjacent to Newport Harbor as many as 9,000 years ago.

LARRY THOMAS
Senior vice president
The Irvine Co.

G51

LETTERS TO THE TIMES

Excavation Gets Some Digs

■ People were living at the edge of Newport's Upper Bay 9,500 years ago? That's 7,500 BC—three thousand years before the first pharaohs of Egypt, four thousand years before the Sumerians invented writing.

And now their burial sites have been bulldozed to make way for upscale condos?

Perhaps the most astonishing thing about your Nov. 2 article is the quote from Larry Thomas of the Irvine Co.: "If people thought [the site] was so significant archeologically that it should have been untouched, there was an opportunity to purchase it from us."

But at the time of the vote to preserve open space around the Upper Bay no one in Newport knew of the ancient burial site. The Irvine Co. kept its secret very well. Did the city know? That will be interesting to discover. Did The Times know? Apparently not. Did the state know that the most important prehistoric site in California was about to be destroyed? There are funds available for the purchase of such sites. Certainly the voters of Newport Beach didn't know.

Another curious quote in your article is that of an unnamed "archeological worker": "We kept walking around, saying, 'Where is the Smithsonian? Where is National Geographic?' . . . I guess money talks." Apparently it does. Irvine Co. money seems to have bought the silence of this "archeological worker" who never bothered to call The Times or anyone who might have tried to stop the rape of this priceless part of mankind's heritage. And how clever to use prison inmates to do the digging. Real archeologists might have talked.

Back in the 1950s I spent two years working in salvage archeology. I know the difference between the rush of salvage digging to meet a developer's deadline and the careful excavation that this site deserved. We dug from Redondo Beach to Arcadia without finding a single ancient burial. To learn that 600 burials were opened and, without even being dated, were dumped into a trench is beyond comprehension.

LEE PAYNE
Newport Beach

■ After rereading your lengthy coverage of the archeological dig on the bluff above Newport Harbor, it seems to me that the process works.

A well-regarded professional archeologist conducted a thorough excavation of the developed portion of the site, and will make public his findings and conclusions.

The Native American community will learn more about its heritage, and will have access to hundreds of artifacts that should shed light on life here as much as 9,500 years ago. And the remains of its ancestors have been reinterred according to tribal wishes, and not subjected to carbon dating that they find offensive.

And a new generation of people drawn to the beauty of the bluff above Newport Harbor is enjoying shelter in the same place that was home to the original settlers of this area.

It appears that the extensive and costly mitigation requirements of the city of Newport Beach and the Coastal Commission were carried out thoroughly and sensitively by the landowner and its archeologist.

CHRISTINE DIEMER
Executive director,
Orange County chapter
Building Industry Assn.
of Southern California

■ Thank you for the comprehensive article regarding the archeological site ORA 64.

It's regrettable that such an important anthropological resource was obliterated just to build another gated community. The only reason that the site was so easily destroyed is that no one challenged the project's approval under the California Environmental Quality Act. CEQA only works if people enforce it.

The Hellman Ranch development recently approved in Seal Beach would destroy 10 archeological sites and an extensive burial ground believed to date from the same time period, 4,000 to 8,000 years ago.

Infrared photographs of the project site have revealed what appear to be the foundations of ancient dome houses and temples. A golf course, strip mall and 70 homes would replace this invaluable record of human history.

It's time for concerned citizens to challenge the laws that have led to such shortsighted destruction.

MOIRA HAHN
Seal Beach

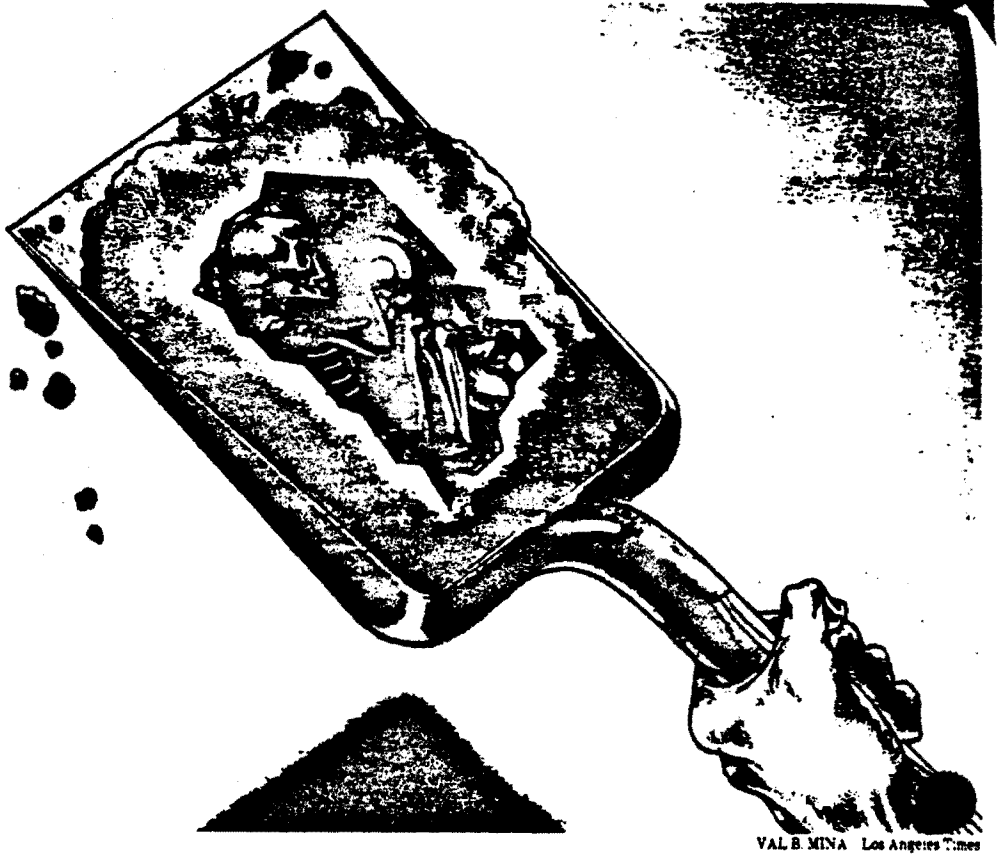
G52

ORANGE COUNTY VOICES

Controlling the Present; Selling Out the Past

Lost archeological sites in O.C. are examples of cozy relationship between developers and contract scientists.

By NICK SPAIN



VAL B. MINA Los Angeles Times

The archeological site, known as ORA-64, which sat atop a bluff overlooking Newport Bay, no longer exists. This sad fact is the result of "contract science," an all too common contractual agreement between land developers and archeologists to comply with legislative guidelines by "scientifically" investigating a prehistoric or historic site out of existence.

Harbor Cove (ORA-64), San Joaquin Hills (Newport Coast Archeological Project), Hellman Ranch, Bolsa Chica and countless other tracts cradling our region's prehistory are either under relentless attack or already have succumbed to the development industry and their facilitators, the "contract scientists."

Contract science, born in the environmental movement of the 1960s and '70s, was created as an offshoot of state and federal legislation established to protect the environment from increasing depredations by building and industry. This body of legislation was designed to "ameliorate adverse impacts" to natural, cultural and historical resources.

These efforts were supposed to ensure protection of important resources for ours and future generations. Avoidance, accommodation, conservation and preservation characterize the vocabulary and philosophy of these legislative mandates. However, in Orange County, and Southern California generally, where private property abounds and property rights hold sway, environmental issues and implementation of environmental law have in recent years deviated from this path. The best example being that of "contract archeology."

Enter the world of Orwellian "newspeak." Mitigation, the lingua franca of contract science, is the life-blood of contract archeologists and developers alike. Successfully negotiating the mitigation maze means happy hunting for the landowner/developer and full larders for the contract archeologist.

But what of the resource, the archeological site? What does "mitigation" mean for it? Extraction. Elimination. Extinction. This is the unfortunate fate for most archeological sites for which mitigation measures are applied. Preservation of the resource it seems is no longer an important part of the "cultural resource management" process where private land is concerned.

The view that scientific investigation is an acceptable alternative to the protection and preservation of sites is implicit in the day-to-day operations of most contract archeologists and is reflected in their recommendation to clients. These practitioners appear to have lost sight of one of the overarching themes in modern archeology: conservation of the resource. Good conservation requires preservation of sites, as well as thorough study. One without the other does little to enhance our knowledge and understanding of the past.

Where history is often revisionist one needs occasionally to revisit the sites to assess what information or meaning it holds for the current generation. It's much easier for those who "control the present" to "control the past" if the past no longer exists. Archeologists are in a position to contribute significantly to the maintenance of a free and democratic society by simply assuring that there is a past to be studied. Collections of artifacts and records of their extraction are only a part of that past, a part that cannot supplant the actual physical record existing in the ground. This bank of prehistory is being depleted and replaced by mutable, and often unverifiable, historical narratives.

During the last three decades, archeology by contract has increased as a portion of prehistory. The result has been the creation of an unholy trinity consisting of industry, archeologist and the past. I would argue the loser in this uneasy triumvirate is the latter. Archeologists are too willing to capitulate to the client and regularly form cozy consulting relationships with developers. In the arena of environmental preservation, these practices cannot be tolerated. They invariably compromise the archeological resources in question. Careful scrutiny is required on the part of a concerned archeological community and the public if things are to improve.

If the early promises of the environmental movement are ever to have meaning for the few remaining archeological sites of the Southern California coast, two things must happen. First, cultural resources must cease to be viewed as impediments to progress. Such an outlook only entrenches the quid pro quo between developers and contract archeologists. Under these conditions, mitigation studies seem to be mere autopsies conducted on sites pronounced dead by the real estate industry. Second, archeologists need to be cultural preservationists, first and foremost, not handmaidens to the destruction of our shared cultural heritage. We must stand actively for site preservation. Preservation, not simply mitigation, must be the goal of any true "cultural resource management."

Nick Spain is on leave as an archeology instructor at Santa Ana College. He has practiced archeology in Southern California for 25 years.

G53

14h

GABRIELENO / TONGVA TRIBAL COUNCIL

P.O. BOX 693, SAN GABRIEL, CA. 91778
(626) 286-1632 Fax: (626) 286-1262

April 7, 1998

Received at Commission Meeting

APR - 7 1998

TO: California Coastal Commission
RE: The Coastal Permit Application number 5-97-367

Honorable Commissioners;

I write on behalf of the Gabrieleno/Tongva Tribal Council ("Tribe") to acquaint you with our opposition to the development in Seal Beach proposed by Hellman Properties. We ask that you today deny the company's application for permit.

We want to be certain that you understand our specific concerns and requests. You have before you copies of our Tribal testimony at the City of Seal Beach's Final Environmental Impact Report hearing on September 22, 1997. I hope to be able to read it today, since it documents one of our many unsuccessful attempts to have a voice in this development on our homelands where there are ten known archeological sites. The Tribe believes that the Final Environmental Impact Report is inadequate under the standards required by CEQA as well as unacceptable to the tribe.

Most of our specific requests have not been adopted; most have not even been addressed. The suggestions made by the staff of the Coastal Commission also do not adequately dealt with our concerns. Listed below are most of our specific requests. Our main concern is that we be allowed to be part of this process in order that we might protect our cultural resources and heritage.

ACCORDINGLY, THE GABRIELENO/TONGVA TRIBAL COUNCIL (G/TTC) REQUESTS THAT:

1. NO ARCHEOLOGY OR EXCAVATION OF ANY TYPE BE DONE ON THE SITE UNTIL A MEETING HAS BEEN HELD TO DEVISE AN APPROPRIATE SAMPLING STRATEGY. THE TRIBE WOULD WANT TO BE INCLUDED IN THIS PROCESS.

2. THE G/TTC BE INVOLVED AT ALL LEVELS AND IN ALL ASPECTS OF THIS PROJECT, OF THE PROJECT DESIGN, WHICH MIGHT INVOLVE AND IMPACT ANY OF OUR CULTURAL RESOURCES, REVIEW ALL PLANS AND DOCUMENTS, BEFORE THEY ARE FINALIZED, FOR THE PROJECT WHICH MIGHT AFFECT ANY OF OUR CULTURAL RESOURCES; AND

G54

3. ARCHAEOLOGIST AND NATIVE AMERICAN MONITORS BE SELECTED FOR THE PROJECT WHOSE WORK IS ACCEPTABLE TO THE G/TTC;

4. CONSULTANTS (MONITORS AND ARCHAEOLOGISTS) ACCEPTABLE TO THE G/TTC BE ON THE SITE WHENEVER THERE IS ANY EXCAVATION;

5. SHOULD ANY NATIVE AMERICAN MATERIALS OR REMAINS BE ON THE SITE, THE TRIBE CLAIMS THEIR OWNERSHIP AND WOULD WANT TO DETERMINE THEIR EVENTUAL DISPOSITION.

Lastly, if today's meeting is being tape recorded, we request a transcript or a copy of the audio tape. of today's meeting. Please help us in protection our heritage.

Sincerely,

Anthony Morales, Tribal Chair
GABRIELENO/TONGVA TRIBAL COUNCIL

Read by Mary Ann Moore, Tribal Officer and Co-Chair
of the Gabrieleno/Tongva Cultural Resources Committee

G55

14h.

Topanga Anthropological Consultants
P.O. Box 826
Topanga, California 90290
(310) 455-2981

California Coastal Commission April 6, 1998

Comments Concerning Archaeological Resources Affected by the Hellman Ranch Project (Application 5-97-367) by Chester King

I am a professional archaeologist who specializes in study of the prehistory of California. I am concerned that the Hellman Ranch project will result in the destruction of significant archaeological resources. The Hellman Ranch sites are the most intact historic native settlement sites in Seal Beach. The sites will be destroyed by the planned development. The only remaining sites in Seal Beach will be fragments of five sites in Gum Grove park. The most intact sites in Seal Beach will be destroyed by the project. Significant information about the history of the region will be destroyed by the proposed project. Archaeological salvage is expensive and choice of studies is based more on present economic considerations than on satisfying the needs of future historians and social scientists. Even when well planned data salvage programs will not recover important information.

Section 30244 of the Coastal Act states: "Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required."

The mitigation measures for this project are not reasonable because there is no independent monitoring to assure compliance and they fail to acknowledge the significance of the archaeological sites that the Commission is empowered to protect. The planned development will result in the destruction of all sites identified in the project area. The project does not allow for avoidance through redesign as implied in the discussion of mitigation measures.

Absence of professional evaluation concerning the archaeological resources in the project area results in the Commission making decisions which are not based on knowledge. The evaluation of the sites necessary for a Phase 2 study for an Environmental Impact report should be prepared prior to the Commission approving the project. If the Commission has more complete knowledge concerning the sites, they may make different decisions than they will with available information.

The conditions place total responsibility for the sites in the hands of the Planning Director of the City of Seal Beach and the Executive Director of the Coastal Commission. Neither the Seal Beach or the Coastal Commission have staff with expertise concerning cultural resources. It appears that the Executive Director will rely on the peer reviewers chosen by the City of Seal Beach Planning Director. In the past, the City of Seal Beach Planning Director has relied on the archaeologist hired by the applicant to choose peer reviewers. The process results in Hellman Ranch controlling the archaeology program.

Received at Commission Meeting
APR - 7 1998

The Coastal Commission should develop an independent review process that involves peer review by experts not chosen by the applicant or interests favorable to the development.

The Coastal Commission conditions and EIR conditions do not reduce adverse impacts to archaeological resources to a level of insignificance. They are not reasonable mitigation measures.

Sincerely,

Chester King

G56

We, the undersigned, object to the approval of the Hellman Project in Seal Beach until all laws, acts, & executive orders applying to archaeological resources on the proposed site are observed. The following need to be applied to this cultural resource: Antiquities Act 1906, Historic Sites Act, Na. Historic Preservation Act, Protection of Historical Properties, Ca. Historical Preservation Act, Secretary of Interior's Standard of Historical Preservation Projects Exective Order 11593, American Religious Freedom Act, Archaeological Resources Protection Act, Act for Preservation of American Antiquities, Arch. & Hist. Preservation Act.

Name	Address
1. CARLOS BUENDIA	310 N. TOWER PL. ANAHEIM CA
2. Kathleen Chaure	7010 El Dorado Dr. #A Buena Park CA
3. Pilar T. Roybal	1250 S. Brookhurst #2041 Anaheim CA 92804
4. John Gradias	15671 Jefferson Midway City CA 92655
5. [illegible]	2150 College Place Ca. 92831
6. Ed Jovato	2013 MATHEWS #5 REDONDO BEACH, CA 90278
7. Ricardo	1028 S. Lemon st #H Anaheim CA 92805
8. Don Kulak	9014 Burnet Ave #202 N. Hills CA 91343
9. [illegible]	2650 COLLEGE Pl., Fullerton, CA 92831
10. Connie K Lester	2650 College Pl., Fullerton, CA 92831
11. Fern [illegible]	4121 Verdugo View Dr., L.A. CA 90065

Send Petition to Coastal Commission, South Dist. Office 245 W Broadway Long Beach, CA 90803

RECEIVED
APR 21 1998
CALIFORNIA
COASTAL COMMISSION

We, the undersigned, object to the approval of the Hellman Project in Seal Beach until all laws, acts, & executive orders applying to archaeological resources on the proposed site are observed. The following need to be applied to this cultural resource: Antiquities Act 1906, Historic Sites Act, Na. Historic Preservation Act, Protection of Historical Properties, Ca. Historical Preservation Act, Secretary of Interior's Standard of Historical Preservation Projects Exective Order 11593, American Religious Freedom Act, Archaeological Resources Protection Act, Act for Preservation of American Antiquities, Arch. & Hist. Preservation Act.

Name	Address
1. [illegible]	1308 N. Dwinelle Rd. Anaheim, Ca.
2. Rebecca Sanchez	1330 S. GILBERT #6 FULLERTON CA 92833
3. Helma Yanez	307 N. College St La Habra CA 90631
4. Isela Yanez	304 N College St La Habra CA 90631
5. José Negrete	311 E. Clifton Ave Apt. 15 Anaheim 92805
6. John Van Rek	126 W. Whiting Ave #6 Fullerton CA 92
7. Louise Rodelo	130 N. RAYMOND #140 FULLERTON 9283
8. GABRIEL MENDOZA	1112 ECLIPSE WAY WEST COVINA, CA. 91792
9. [illegible]	5475 Vía Mariposa Yorba Linda 9268
10. [illegible]	241 N. Lydia St. La Habra, CA 90631
11. Joseph Flores	2116 N. Harwood St. Orange 92865

Send Petition to Coastal Commission, South Dist. Office 245 W Broadway Long Beach, CA 90802

658

missing last page — May have been my 5 line description who's the monitor + enforce mon agency 5/12/1998

Post-it® Fax Note 7671	Date 5/13/98	# of pages ▶ 8
To John Auyong	From Mary Ann Moore	
Co./Dept. CA Coastal Comm	Co. G/TTC	
Phone # 562/590-5071	Phone # 626/961-1387	
Fax # 562/590-5084	Fax # " "	

GABRIELENO TONGVA TRIBAL COUNCIL

May 12, 1998

Mr. John T. Auyong
Staff Analyst
California Coastal Commission
200 Oceangate, 10th Floor
Long Beach, CA 90802-4302

Re: Hellman Ranch Project
Coastal Development Permit 5-97-367

Dear John:

Thank you for your letter of May 8th. I enjoyed meeting you at the Coastal Commission Meeting and I appreciate you taking the time to speak to Sharon Cotrell and myself.

Enclosed is a copy of the mitigation language that the Gabrieleno/Tongva Tribal Council ("G/TTC") worked out with the Los Angeles Community Redevelopment Agency ("CRA"). The G/TTC's intent in adopting this language was to avoid the problems that have plagued many archealogical projects that hire one individual as a Monitor and he is responsible for making all of the tribal decisions. The G/TTC asked the CRA to name the G/TTC in the place and stead of the Monitor wherever a decision had to be made. This document was changed to give Tribe the decision making power. The G/TTC wanted to insure that whenever a decision was to be made, the Tribe would make the decision and not the Monitor. As you will see from the language, the G/TTC representative had a role in selecting the archeologist and the monitor as well as reviewing the RFP and the Research Design.

Thank you for sending me the archaeological special conditions. I will review them and respond by separate letter. If you need to speak to me, my telephone number is 626/961-1387.

Sincerely,

Mary Ann Moore

Mary Ann Moore, Chairperson
Membership/Certification Committee

cc: Anthony Morales, Tribal Chairperson

P.O. BOX 693 ▲ SAN GABRIEL, CA ▲ 91778

659

Enforcement Agency: Department of Building and Safety
Monitoring Agency: Department of Building and Safety

2. If an underground structure is exposed during the excavation activity, all work on the site should cease. The Los Angeles Fire Department shall then be contacted for the appropriate permits and procedures for the removal of the tank and surrounding soils that may contain high levels of petroleum hydrocarbons.

Responsibility for Implementation: Project Applicant
Monitoring Phase: Post Construction
Enforcement Agency: Department of Building and Safety
Monitoring Agency: Department of Building and Safety

H. CULTURAL/HISTORIC RESOURCES (text as revised Nov. 19, 1997 and included in Council file on project)

1. The Agency, the Archbishop and the Gabrieleno/Tongva Tribal Council ("GTTC") shall each appoint one representative to a committee ("Committee") for the purpose of making certain determinations and decisions as described below. The Archbishop, the Agency and the GTTC shall each select its representative by December 1, 1997. If any representative is not appointed by December 1, 1997, the Committee shall be composed of those representatives which have been appointed until such time as each of the entities has appointed a representative. The GTTC's representative is referred to herein as the "Tribal Representative". The GTTC's representative is referred to herein as the "Tribal Representative." The GTTC's position in connection with the Project is based on GTTC's representation that it has been recognized by the Los Angeles City-County Native American Heritage ("Commission") as the appropriate organization of Native Americans to deal with Native American cultural resources which may be encountered during excavation. In the event the Commission selects a different organization for this purpose, GTTC shall be replaced in this program by the organization, which shall thereupon selects its representative within 15 days of such selection.

Responsibility for Implementation: Archbishop, Community Redevelopment Agency and GTCC
Monitoring Phase: Pre-Construction

660

Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

2. The Archbishop shall appoint an archaeologist ("Archaeologist") and a Native American monitor ("Monitor") for the Project as set forth below. The Archaeologist selected for the project must be (1) certified by the Society of Professional Archaeologists (SOPA), and (2) meet the standards for a professional and prehistoric archaeology according to the United States Secretary of the Interior's Standards and Guidelines. The role of the Archaeologist and the Monitor is to conduct pre-excavation testing, monitor all excavation activities, and conduct salvage excavations if necessary. The selection of the Archaeologist and the Monitor shall be approved by a majority of the Committee with each representative having one vote.

Responsibility for Implementation: Archbishop
Monitoring Phase: Pre-Construction
Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

3. The Archaeologist and the Monitor shall design a subsurface test excavation to determine if cultural resources or human remains are present. Based on geotechnical information and site history, this test excavation shall be conducted on that portion of the Project site ("Area of Archaeological Potential") which is more particularly described on Figure 1 which is attached hereto. It is only within the Area of Archaeological Potential where undisturbed soil layers may be present beneath artificial fill. The Excavation Design shall be reviewed with the Tribal Representative and the Agency and shall be approved by a majority of the Committee with each representative having one vote.

The purpose of the testing will be to determine whether any additional archaeological resources may be present. Any and all human remains of Native Americans, if encountered, shall be handled in accordance with State and Federal laws as decided by the Committee. Any human remains determined to be not of Native American origin shall be interred in a respectful manner. In the event GTTC desires to have any Native American human remains which may be encountered reinterred in a location which is not on the Project site, it shall notify the Archbishop and the Agency in writing by not later than January 1, 1998. The notification shall specify the location and methodology for that reinterment.

If the test excavations are determined by the Archaeologist and the Monitor to be of little or no significance, or are so small that such test excavations constitute an acceptable salvage sample, as determined by the Archaeologist and the

661

Monitor, no additional archaeological work (other than normal monitoring of excavation) shall be necessary beyond summarizing the results in a formal report. If tested deposits are determined to be significant, then archaeological salvage excavation of a representative sample may be required (see Item 6 below). In the event of a disagreement between the Archaeologist and the Monitor as to whether or not the tested samples are significant, the decisions will be made by the Peer Group (see Item 11 below).

Responsibility for Implementation:	Archbishop, Community Redevelopment Agency and GTTC
Monitoring Phase:	Pre-Construction
Enforcement Agency:	Community Redevelopment Agency
Monitoring Agency:	Community Redevelopment Agency

4. The following shall be a minimum mitigation requirement for all subsurface construction excavations on the Project site. Where geological reports and archaeological information have indicated that intact soils may be present, archaeological test excavations may be required. Such test excavations shall be ordered by a majority vote of the Committee. A physical inspection of any and all exposed prehistoric or historic archaeological deposits will be made by the Project Archaeologist and the Monitor. A determination of significance will be made following sampling analysis.

The Archaeologist and the Monitor shall be present during excavation in the Area of Archaeological Potential. The Archaeologist and the Monitor will be empowered to halt or redirect excavations away from a specific location within the Area of Archaeological Potential until they can be adequately inspected and evaluated. The Archbishop shall not be required to excavate any portion of the Area of Archaeological Potential beyond the maximum depth needed to construct that portion of the project which will be built in that portion of the Area of Archaeological Potential.

Initial excavation shall include removal of existing pavements only down to, but not exceeding, the level of obviously imported fill as determined by the Archaeologist and Monitor using the geologic testing results as a guide. After the fill material has been removed and the pre-fill ground surface has been exposed, an archaeological inspection will be made to determine if cultural deposits are present within the Area of Archaeological Potential. Such inspections shall only be made to the depth required to accommodate the lesser of the structural foundations of the Project or bedrock. Depending on what is encountered, other mitigation measures as described in the program below shall be completed prior to the remaining excavation proceeding to

G62

the maximum required depth. In the event of a disagreement between the Archaeologist and the Monitor, the disagreement will be referred to the Peer Group for a decision.

Responsibility for Implementation: Archbishop
Monitoring Phase: Construction
Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

5. As required by State and Federal archaeological mitigation guidelines, formal recording shall be undertaken of any prehistoric or historic archaeological site or deposit encountered by the Archaeologist and /or the Monitor. Such recording shall include measuring and mapping the site discovered, photographing it, and other standard data recovery and description activities which can be made on the basis of visual inspection. Such recording shall also indicate if further mitigation is necessary. In the event of a disagreement between the Archaeologist and the Monitor, the matter shall be referred to the Committee for a decision. In the event that the members of the Committee cannot reach agreement, the matter shall be decided by the Peer Group.

Responsibility for Implementation: Archbishop
Monitoring Phase: Pre-Construction
Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

6. If archaeological resources or features are determined to be significant, under the standards of CEQA, by the Archaeologist and the Monitor, or by the Committee by majority decision, upon a recommendation of one of its members, impacts to the resources may be mitigated through archaeological salvage excavations. Construction work shall be halted at the specific location for whatever time is necessary up to four weeks within the Area of Archaeological Potential to allow for excavation and removal of samples including artifacts. During such time, excavation/construction activities may proceed in all areas previously "cleared" or determined to have no archaeological significance by the Archaeologist and the Monitor. Archaeological salvage excavations shall either completely remove the deposits deemed significant, or shall remove a volumetric sample of predetermined size. Once the sample has been documented, recorded and/or removed, the salvage excavation will be considered completed, and construction work will resume under continued archaeological monitoring. The size of the salvage sample will be determined by the Committee, in advance of any salvage work beginning. The disposition of all recovered Native American materials shall be coordinated with the Tribal Representative. No final

663

disposition of any remains/artifacts shall be made until the report described in Item 8 below is completed.

Responsibility for Implementation: Archbishop
Monitoring Phase: Construction
Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

7. If human burials or human remains are found, all work at that specific location shall halt until it can be determined whether or not such remains are those of Native Americans. (During such time excavation/construction activities may proceed in all areas previously "cleared" or determined to have no archaeological significance by the Archaeologist and the Monitor.) If this proves to be the case, in accordance with California and Federal law, the Tribal Representative shall be contacted and the ultimate disposition of the remains shall be made in accordance with written directions received from GTTC prior to January 1, 1998. In the event no such direction has been received, then the Archbishop shall dispose of the remains in accordance with California and Federal law. If human remains are determined not to be those of a Native American, then the remains will be interred in a respectful manner.

Responsibility for Implementation: Archbishop
Monitoring Phase: Construction
Enforcement Agency: Los Angeles County Coroner
Monitoring Agency: Community Redevelopment Agency

8. All research and recovered finds shall be described and interpreted, and presented in a report detailing the goals, methods and results of the archaeological research effort.

Responsibility for Implementation: Archbishop
Monitoring Phase: Construction/Post-Construction
Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

9. The Tribal Representative shall be the sole determinant of what Native American materials from the archaeological deposits may be displayed, if any, and where and how they shall be prepared. Historical photographs, maps and drawings relating to changing patterns of land use in what is now downtown Los Angeles shall be displayed by the Archdiocese and shall be accompanied by cultural-historical resources study prepared for the Project.

G64

Responsibility for Implementation: Archbishop
Monitoring Phase: Post Construction
Enforcement Agency: Community Redevelopment Agency
Monitoring Agency: Community Redevelopment Agency

10. The grading permit for the project shall be issued in two phases. The initial demolition permit shall be for the removal of existing pavements only down to, but not exceeding, the level of imported fill as determined by the Project geologists, Archaeologist and Monitor. Once the fill and pre-fill ground surface has been exposed for archaeological inspection, a determination will be made on whether cultural deposits are present. This determination will be made by employing the test procedures stipulated in the preapproved excavation design for the Project. Depending on what is found, additional investigations may be required along with other mitigation measures. These procedures must be completed prior to the issuance of the final grading permit. This second permit will enable construction excavations to proceed to their maximum required depth without additional archaeological work being required beyond normal monitoring by the Archaeologist and the Monitor.

Responsibility for Implementation: Archbishop
Monitoring Phase: Pre-Construction
Enforcement Agency: Department of Building and Safety
Monitoring Agency: Department of Building and Safety

11. A Peer Group shall be appointed in order to resolve disagreements and/or disputes which may occur as described above. The Peer Group shall be composed of three representatives, all of whom shall be archaeologists and/or anthropologists satisfy at least two of the following criteria: (1) certified by the Society of Professional Archaeologists (SOPA), (2) meet the standards for professional and prehistoric archaeology according to the United States Secretary of the Interior's Standards and Guidelines and/or (3) have the advanced degree of Doctor of Philosophy (Ph.D.). One member each of the Peer Group shall be appointed by the Agency, the Archbishop, and the GTTC. The parties shall make those appointments by no later than December 1, 1997. If any party fails to appoint a qualified representative by December 1, 1997, the representatives who have been properly appointed shall constitute the Peer Group.

665

Post-it® Fax Note 7671	Date 5/14/98	# of pages ▶ 6
To John Auyong	From Mary Ann Morse	
Co./Dept. Coastal Com	Co. Gabrieleno/Tongva	
Phone #	Phone # 626/961-1387	
Fax # 562/590-5084	Fax #	

GABRIELENO/TONGVA TRIBAL COUNCIL

May 14, 1998

VIA FAX 562/590-5084

Mr. John T. Auyong
Staff Analyst
California Coastal Commission
200 Oceangate, 10th Floor
Long Beach, CA 90802-4302

Re: Hellman Ranch Project
Coastal Development Permit 5-97-367

Dear John:

Have you had a chance to read the Mitigation Language that was written by the CRA concerning the Cathedral? I believe you will understand the concerns that the Gabrieleno/Tongva Tribal Council ("G/TTC") had regarding the Cathedral and now has concerning Hellman Ranch.

On behalf of the G/TTC, I would like to respond to the Staff's recommended archaeological special conditions:

Comment on A.: I believe it is necessary to form a committee with the Gabrieleno/Tongva Tribal Council as an active participant. The Committee should review the proposed archaeological research design and approve it before it is adopted.

Comment on B.: Besides using the NAHC's "Guidelines for Monitors. . ." the G/TTC will make recommendations by submitting a list of acceptable archaeologists. The G/TTC will also recommend acceptable Native American Monitors. As you will see from my 5/12/98 letter, the purpose of choosing a Monitor is to select a Monitor that will work with the G/TTC.

Comment on C.: (a) Who has the authority to determine what is "important" archaeological resources? The G/TTC would want to make that determination. (b) Re: archaeological salvage, the G/TTC would claim whatever salvage such as artifacts and all cultural resources that are found. Although we are aware the owner of the property can claim whatever is found, the G/TTC asks that the owner give special consideration to the G/TTC by giving them whatever archaeological salvage is recovered. (c) Re: Additional Mitigation Measures, the G/TTC and the Committee should be involved in suggesting what new measures should be taken. (d) The G/TTC should be designated as the appropriate

P. O. Box [illegible] • San Gabriel, CA • 91778

G66

Native American Tribe that is responsible for the area where Hellman Ranch is located. Please see the attached documents that will identify our area of occupation and show our reasons for claiming responsibility for preserving Tribal territory and its cultural resources.

Comment on D.: "No later than one year after completion of field work a final report on the excavation and analysis shall be submitted to OHP and the Commission". This report should not take a year to complete. This time is very long and should be shortened.

Comment on E.: The G/TTC should have input as to whether something discovered is "significant". The Tribe should be consulted along with the Monitor. This will insure that the Monitor is not working alone. The Tribe must be kept informed at all times concerning discoveries.

Comment on F.(1): The G/TTC should also receive a copy of the Archaeologist's findings of archaeological resources. The G/TTC should have input regarding any changes to the mitigation measures.

Comment on F.(2): The G/TTC recommends that any human remains that are found, should be reburied on the site.

I believe we can work out an acceptable partnership regarding archaeology and cultural resources. Don't hesitate to call me at 626/961-1387 with any questions.

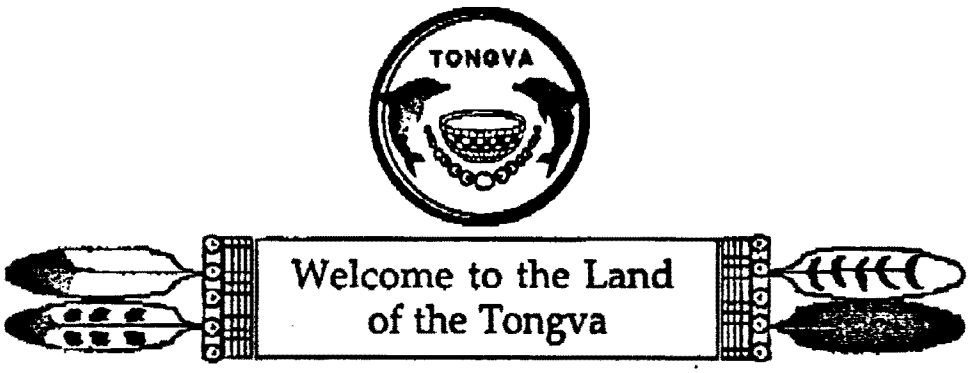
Sincerely,

Mary Ann Moore

Mary Ann Moore, Chairperson
Membership/Certification Committee

cc: Anthony Morales, Tribal Chairperson

967



WHERE DID WE LIVE?

The Tongva occupied the entire Los Angeles basin and the islands of Santa Catalina, San Nicholas, San Clemente, and Santa Barbara. From Topanga canyon to Laguna Beach, from the San Gabriel mountains to the sea, we lived throughout most of what is now Los Angeles and Orange Counties. The existence of our people on these ancestral lands has been unbroken since long before the first contact between the Tongva and Europeans.

WHERE HAVE WE BEEN?

Despite the European incursion, we have remained an integral part of the Southern California community. Our presence is well documented. Our existence is preserved in records of the three local Catholic missions and in records of local cities and both Los Angeles and Orange Counties. A mistaken notion that we were extinct developed. But we have survived! We are here!

GOALS!

- To be vigilant, effective guardians of our lands and ancestral remains.
- To be wise teachers of our youth so that they will be informed and proud guardians of the ways of our ancestors.
- To increase our efforts at cultural recovery and renewal: language, song, dance, music, basketry, story telling, ceremonial regailia, and spiritual traditions.
- To achieve federal recognition of our People.

RECENT TONGVA COMMUNITY ACHIEVEMENTS AND RECOGNITION

- The Moomat Ahiko (Breath of the Sea) made its maiden voyage on September 9th, 1995 at Catalina– the first ti'at (plank canoe) built since the 1800's.
- Defense of Puvungna, sacred birth place of Tongva religious leader Chin-ngich-nish.
- In the early 1990's Kuruvungna Springs, an ancestral Tongva village and sacred site, was rededicated as ritual land and is used for ceremonial events.
- The San Dimas Festival of Western Arts is installing a mural in San Dimas City Hall commemorating Juana Maria, the last Tongva to inhabit San Nicholas Island.
- In 1993, San Gabriel residents voted to name their new high school "The Gabrielino High School".
- The "Gabrielino Trail" was designated in the upper Arroyo Seco Canyon of the San Gabriel Mountains in 1994 by The United States Forest Service.
- The City of San Gabriel passed a resolution recognizing "the Gabrieleno-Tongva Nation as the aboriginal tribe of the Los Angeles Basin" August 24, 1994,
- The California Legislature adopted a similar resolution acknowledging its longtime relationship with the Gabrieleno/Tongva August 31, 1994.

GABRIELENO/TONGVA TRIBAL COUNCIL P.O. BOX 693, SAN GABRIEL, CA. 91776
(626) 286-1632 and Fax: (626) 286-1262
Contact Person: Anthony Morales, Tribal Chairperson

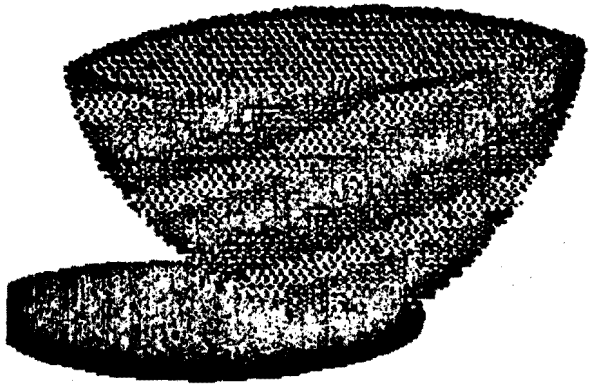
9.7.97

WELCOME TO THE LAND OF THE GABRIELENO/TONGVA!

The Gabrieleno/Tongva occupied the entire Los Angeles basin and the islands of Santa Catalina, San Nicholas, San Clemente and Santa Barbara. From Topanga Canyon to Laguna Beach, from the San Gabriel Mountains to the sea, we lived throughout most of what is now Los Angeles and Orange Counties. The existence of our people on these ancestral lands has been unbroken since long before the first contact between the Gabrieleno/Tongva and Europeans.

WHERE HAVE WE BEEN?

Despite the European incursion, we have remained an integral part of the Southern California community. Our presence is well documented. Our existence is preserved in records of the three local Catholic Missions and in records of local cities and counties of both Los Angeles and Orange Counties. A mistaken notion that we were extinct developed. But we have survived! We are here!



COMMUNITY SERVICES AMERICAN INDIAN BLOCK GRANT PROGRAM

The Gabrieleno/Tongva Tribal Council has been awarded for the first time a Community Services American Indian Block Grant (CSAIBG) from the Los Angeles City/County Native American Indian Commission Self Governance Board. Our CSAIBG Program provides emergency services to American Indians in the areas of emergency food and nutrition services, emergency shelter and housing assistance, as well as transportation assistance.

AVAILABLE SERVICES

Rent Subsidies
Grants to assist with apartment rental move-in costs

Shelter/Bed Nights
Hotel/Motel Housing Vouchers

**Food Distribution*
Brown Bag/ Food Basket distribution

Vouchers for Food
Gift certificate(s) for food at local supermarkets

Transportation for Clients
Transportation assistance in the form of bus tokens

* Holiday Food Baskets are available during the months of November & December.

QUALIFICATIONS

(1) Proof of American Indian ancestry, i.e. tribal enrollment card, certificate of indian blood, judgement roll number.

(2) Proof of Income Eligibility, i.e. general relief, letter from SSI, MediCal, AFDC.

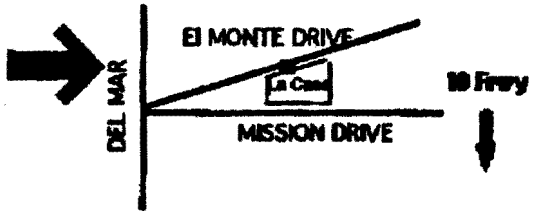
(3) Picture I.D.

For further information on the Community Service American Indian Block Grant Program, or to schedule an intake appointment, please contact our CSAIBG Program Coordinator at (626) 286-1632 ext.03.

OUR GOALS

- To be vigilant, effective guardians of our lands and ancestral remains.
- To be wise teachers to our youth so that they will be informed and proud guardians of the ways of our ancestors
- To increase our efforts at cultural recovery and renewal: language, song, dance, music, basketry, story telling, ceremonial regalia, and spiritual traditions.
- To achieve federal recognition of our People.

ENTER ON REAR
214 EL MONTE DRIVE



Native American Services

- HOUSING-Information regarding housing assistance and referral to existing community programs. Rental subsidies Motel placement and Overnight shelter.Emergency utility assistance.
- NUTRITION-Information about nutrition services and referrals to community programs,Outreach and media releases on nutrition. Food distribution (brown bags) food assistance (vouchers) and holiday food baskets.(Easter,Thanksgiving,Christmas)
- HEALTH-Information on free or low plan health services and Emergency medical transportation.
- EMPLOYMENT-Information and referral outreach and Media release on employment job fairs and occasional job placement.
- GUIDANCE-Educational fun workshops and recreational activity and other projects on Human and Personal development (topics such as: Motivation, Discipline and Self Esteem Cultural Awareness Individual social development. Provided for Youth and their families as a Family support service.

Our CSAIBG Program provides emergency services to Low Income Native Americans.-emphasizing in Families and Seniors (Verification of low Income and proper documentation being an N.A will be required.)

For more Info.call: Dee Roybal Program Coordinator:
PHONE:626-286-1212 0R 626-286-1632 X 03 FAX: 626-286-1262
214 E EL Monte St. San Gabriel Ca. 91776

G70

CAL COMP 213 328 5322 05

Service Program

Our CSAIBG Program provides emergency services to all Native Americans in need. Available services are:

❒Food Distribution
Brown Bags once a month.
(Last Thursday of each month)
Holiday food basket.
(Easter, Thanksgiving, Christmas)
Emergency food vouchers.

❒Housing
Temporary emergency shelter or motel.
Rental assistance.
Emergency utility assistance.

❒Transportation
Bus tokens.
Outing transportation.
Emergency trans. help

❒Medical
Referral information & assistance.

Language Classes

Wouldn't it be wonderful if we all can talk our native tongue. Well, now we can! Tongva Language classes are held every first Wednesday of each month. Everyone is welcome.

Cost: Free! C U THERE.

Dance & Song Classes

Come join the fun, learning the ways of our ancestors. Cultural traditions and spiritual values taught. Ceremonial and Pow-Wow dancing and singing. Many fun outings are included. Classes are held every second & third Wednesday of each month. Outings mostly on weekends.

Cost: Free!

Tribal Council Meeting

Everybody is encouraged to attend. Meetings include opening blessing, treasury reports, old and new tribal business, and announcments.

Workshops

On going classes will include some of the subjects such as:

- Beadwork- Jewelry
- Basketry- Instruments
- Regalia- Painting

Also included are storytelling, tribal history, and many more activities.

The program is active in:

- Indian Fellowship and Cultural sharing
- Family support services
- Helps build self-esteem and confidence
- Special projects and community events
- Educational
- Leadership

Cost: Free!!Browsers always welcome. If you have any special interests and/or talents please call..

ILS

Public Resources Code PRC 1998

MAY 11 1998
CALIFORNIA
COASTAL COMMISSION

agency may cause severe or irreparable damage to a Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, or may bar appropriate access thereto by Native Americans, the commission shall conduct an investigation as to the effect of the proposed action. Where the commission finds, after a public hearing, that the proposed action would result in such damage or interference, the commission may recommend mitigation measures for consideration by the public agency proposing to take such action. If the public agency fails to accept the mitigation measures, and if the commission finds that the proposed action would do severe and irreparable damage to a Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, the commission may ask the Attorney General to take appropriate legal action pursuant to subdivision (g) of Section 5097.94.

(Added by Stats.1976, c. 1332, p. 6031, § 2.)

§ 5097.98. Notification of discovery of Native American human remains, descendants; disposition of human remains and associated grave goods

(a) Whenever the commission receives notification of a discovery of Native American human remains from a county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code, it shall immediately notify those persons it believes to be most likely descended from the deceased Native American. The descendents may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American remains and may recommend to the owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and any associated grave goods. The descendents shall complete their inspection and make their recommendation within 24 hours of their notification by the Native American Heritage Commission. The recommendation may include the scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

(b) Whenever the commission is unable to identify a descendent, or the descendent identified fails to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the descendent and the mediation provided for in subdivision (k) of Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(c) Notwithstanding the provisions of Section 5097.9, the provisions of this section, including those actions taken by the landowner or his or her authorized representative to implement this section and any action taken to implement an agreement developed pursuant to subdivision (*l*) of

5-97-367

672

Section 5097.94, shall be exempt from the requirements of the California Environmental Quality Act (Division 13 (commencing with Section 21000)).

(d) Notwithstanding the provisions of Section 30244, the provisions of this section, including those actions taken by the landowner or his or her authorized representative to implement this section, and any action taken to implement an agreement developed pursuant to subdivision (*l*) of Section 5097.94 shall be exempt from the requirements of the California Coastal Act of 1976 (Division 20 (commencing with Section 30000)).

(Added by Stats.1982, c. 1492, p. 5783, § 5.)

Historical Note

Findings of legislature in Stats.1982, c. 1492, p. 5777, see Historical Note under § 5097.94.

Cross References

Human remains in a location other than a dedicated cemetery, offense of mutilation or removal, see Health and Safety Code § 7050.5.

Library References

Dead Bodies ⟹5.
C.J.S. Dead Bodies §§ 4(1) et seq., 9.

§ 5097.99. Obtaining or possessing Native American artifacts or human remains taken from grave or cairn on or after January 1, 1984; prohibition

No person shall obtain or possess any Native American artifacts or human remains which are taken from a Native American grave or cairn on or after January 1, 1984, except as otherwise provided by law or in accordance with an agreement reached pursuant to subdivision (*l*) of Section 5097.94 or pursuant to the provisions of Section 5097.98.

(Added by Stats.1982, c. 1492, p. 5784, § 6.)

Historical Note

Findings of legislature in Stats.1982, c. 1492, p. 5777, see Historical Note under § 5097.94.

G73

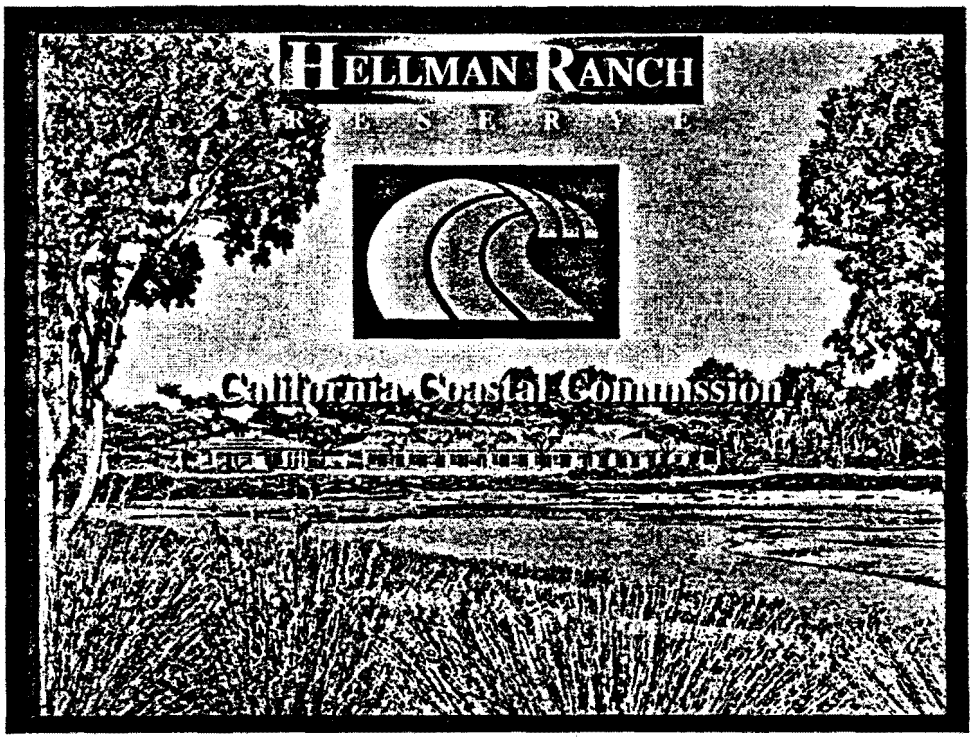
STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
SOUTH COAST AREA
245 W. BROADWAY, STE. 380
P.O. BOX 1450
LONG BEACH, CA 90802-4416
(310) 590-5071

5-97-367

hard copy of applicant's visual presentation at the April 7, 1998 Coastal Commission hearing.

G74



Notable Hellman Ranch Quotes

- "The Commission is faced with a severely degraded wetland where it is unacceptable to allow the wetland merely to continue in its present situation.—California Coastal Commission Findings, Coastal Conservancy Project #1-82, Hellman Wetlands

2

Notable Hellman Ranch Quotes

"Restoration of the wetlands natural values...may be feasibly achieved by combining restoration activities with the development of adjacent property." —California Department of Fish & Game, Determination of the Status of the Hellman Wetlands.

3

Notable Hellman Ranch Quotes

"The Fish & Game [degraded wetland] determination permits the Commission flexibility in consolidating and restoring wetlands in order to increase the productivity and viability of the wetlands." —California Coastal Conservancy Findings, Hellman Wetlands and Conservancy project 1-82.

4

Notable Hellman Ranch Quotes

"A 'no project' alternative would not be a less environmentally damaging alternative because, compared to the proposed project, it would not result in any increase in the value of the on-site degraded wetlands. Continuance of the degraded wetland values is not a preferred alternative." —California Coastal Commission Staff, Proposed Findings for the Hellman Ranch Reserve Project (5-97-367)

5

Notable Hellman Ranch Quotes

"[Developing around] and avoiding or leaving the existing degraded wetlands unrestored, would not be a less environmentally damaging alternative." —California Coastal Commission Staff, Proposed Findings for the Hellman Ranch Reserve Project (5-97-367).

6

Why are informed people making these statements?

- Because the existing severely degraded wetlands are fragmented and scattered throughout the property and are in a state of decline.
- Because the site does not have a direct tidal connection to the Pacific Ocean, but a box culvert to the San Gabriel River.
- Because 92% of the existing, severely degraded wetlands receive no tidal influence (2 acres have tidal action).

7

Existing Degraded and Severely Degraded Wetlands

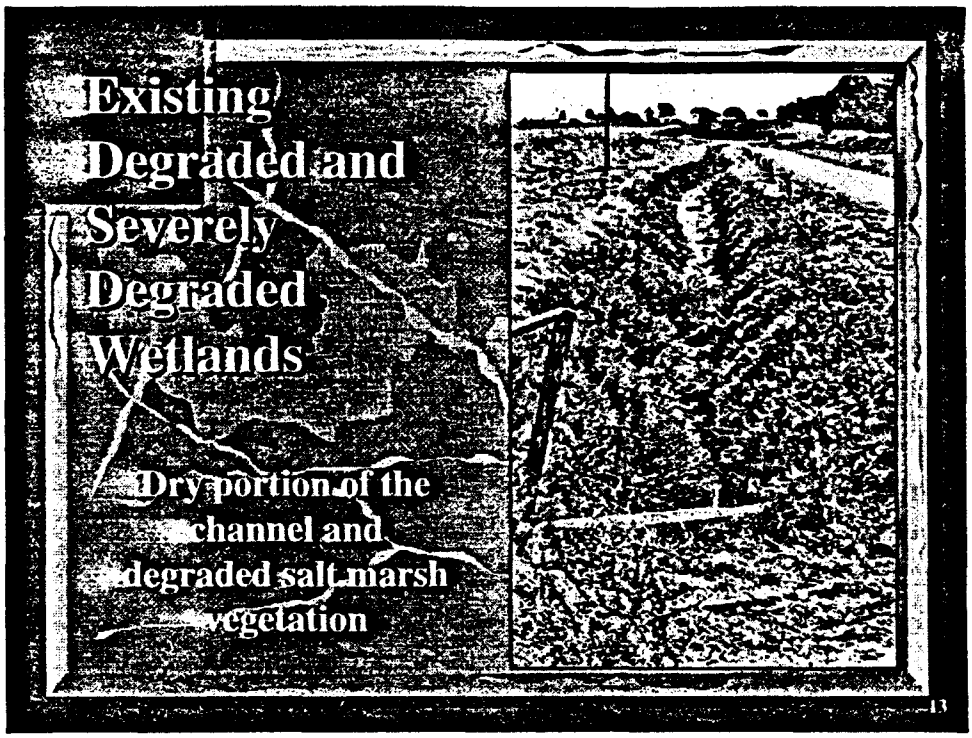
8

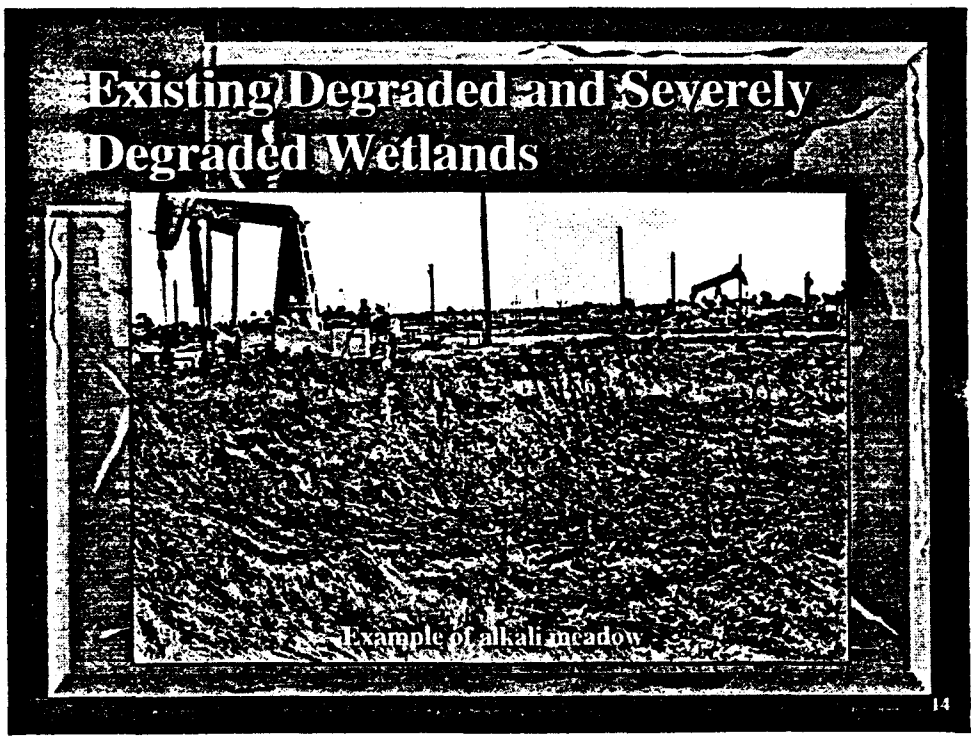
Existing Degraded and Severely
Degraded Wetlands
9

Existing Degraded and Severely
Degraded Wetlands
10

Existing Degraded and Severely Degraded Wetlands
Man-made channel on site that receives tidal influences from the San Gabriel river.
11

Existing Degraded and Severely Degraded Wetlands
12


Existing Degraded and Severely Degraded Wetlands
Dry portion of the channel and degraded salt marsh vegetation
13

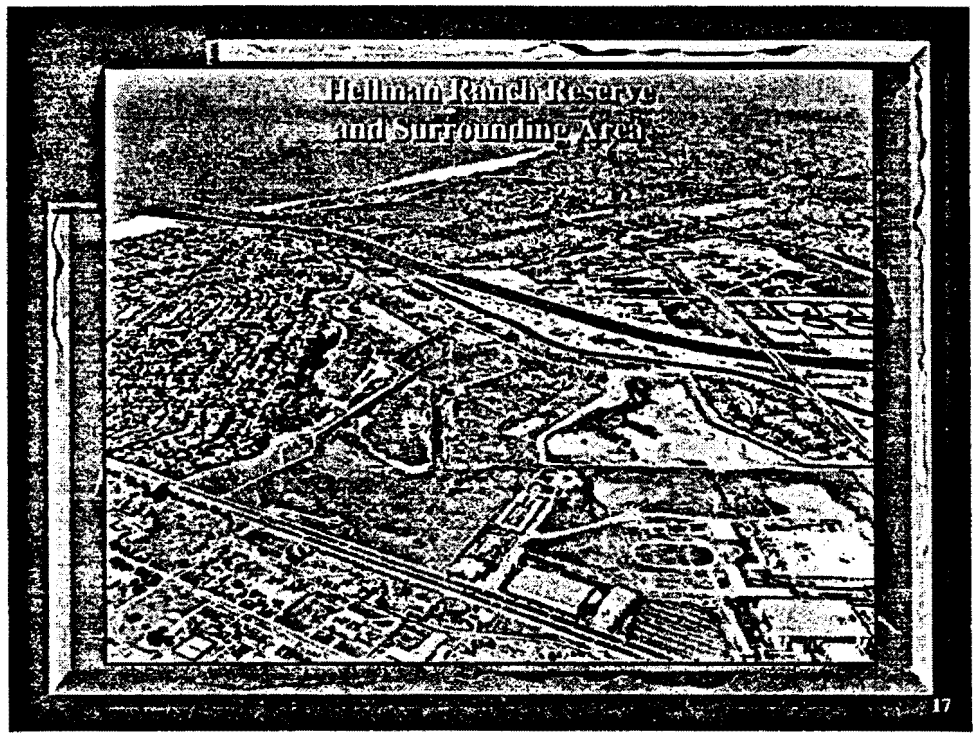

Existing Degraded and Severely Degraded Wetlands
Example of alkali meadow
14

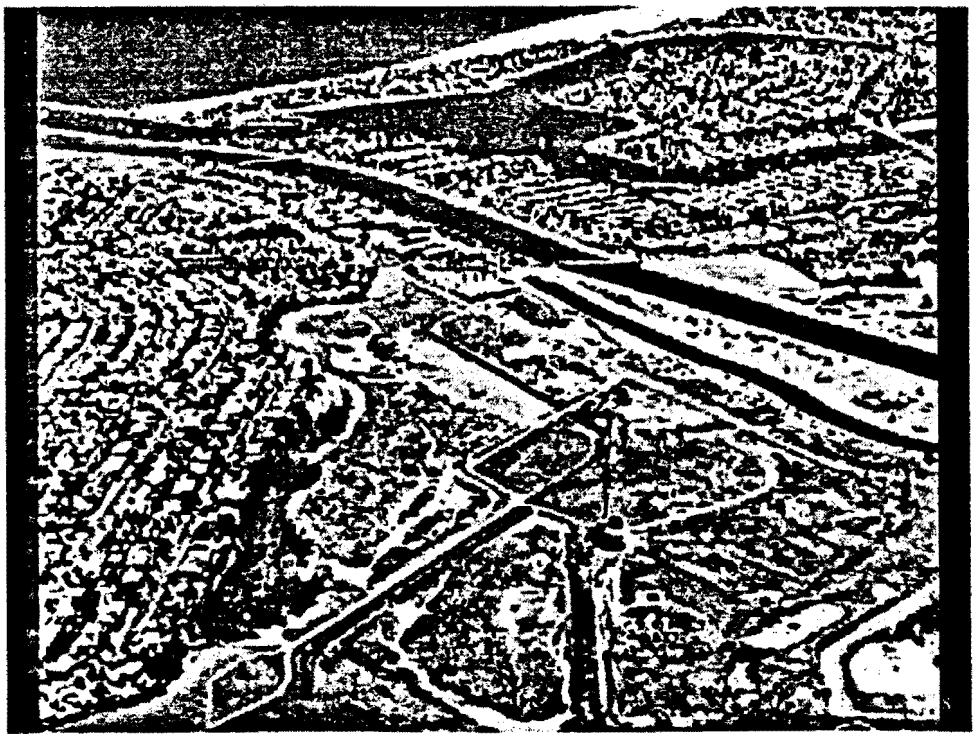
Existing Degraded and Severely Degraded Wetlands

15

Existing Degraded and Severely Degraded Wetlands

16


Hellman Ranch Reserve
and Surrounding Area
17



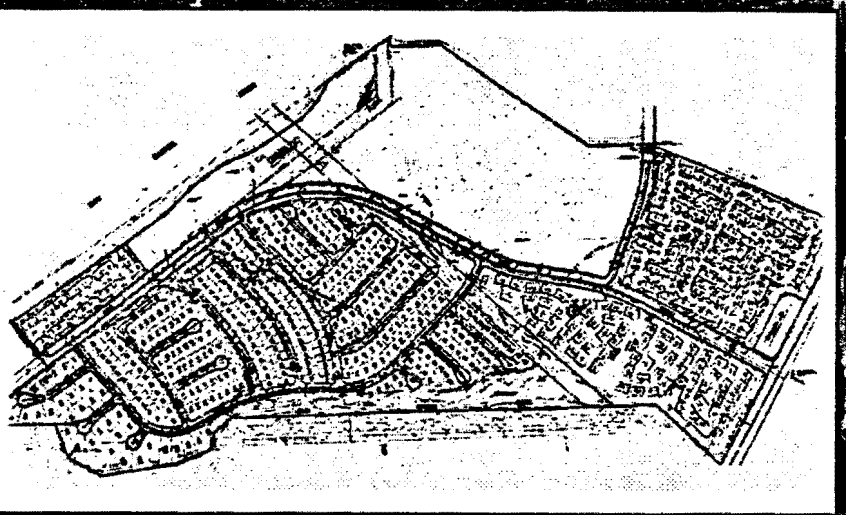
Project History

1980

Ponderosa Homes

- 1,000 residential units on 110 acres
- No provision for wetlands restoration
- Ponderosa looks to Coastal Conservancy for help

19



20

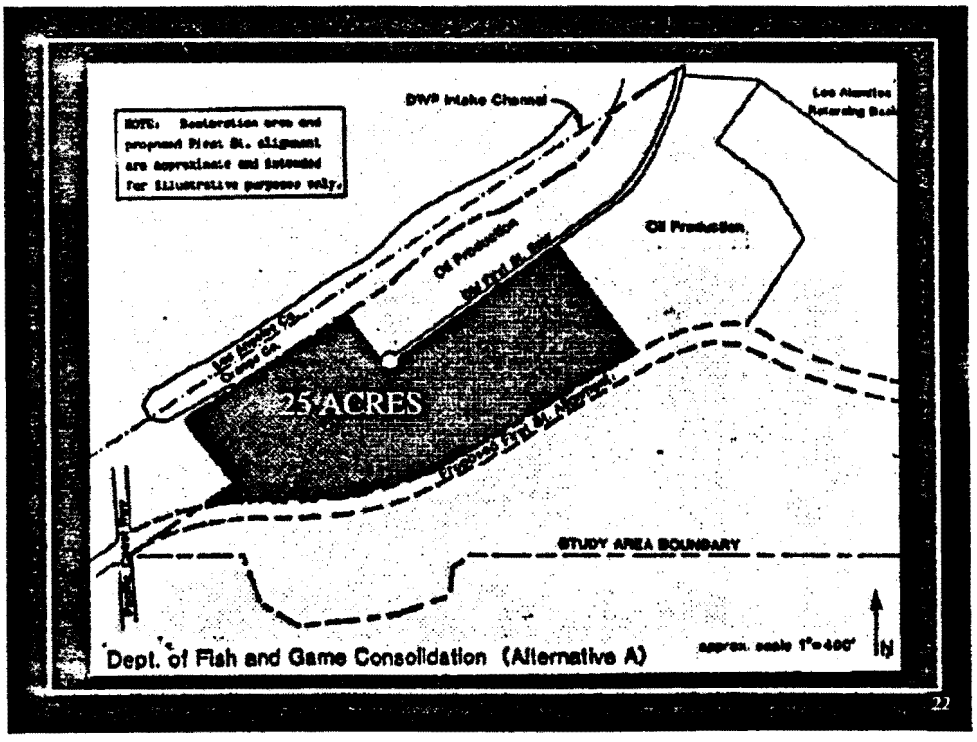
Project History

1982

Coastal Conservancy Project 1-82

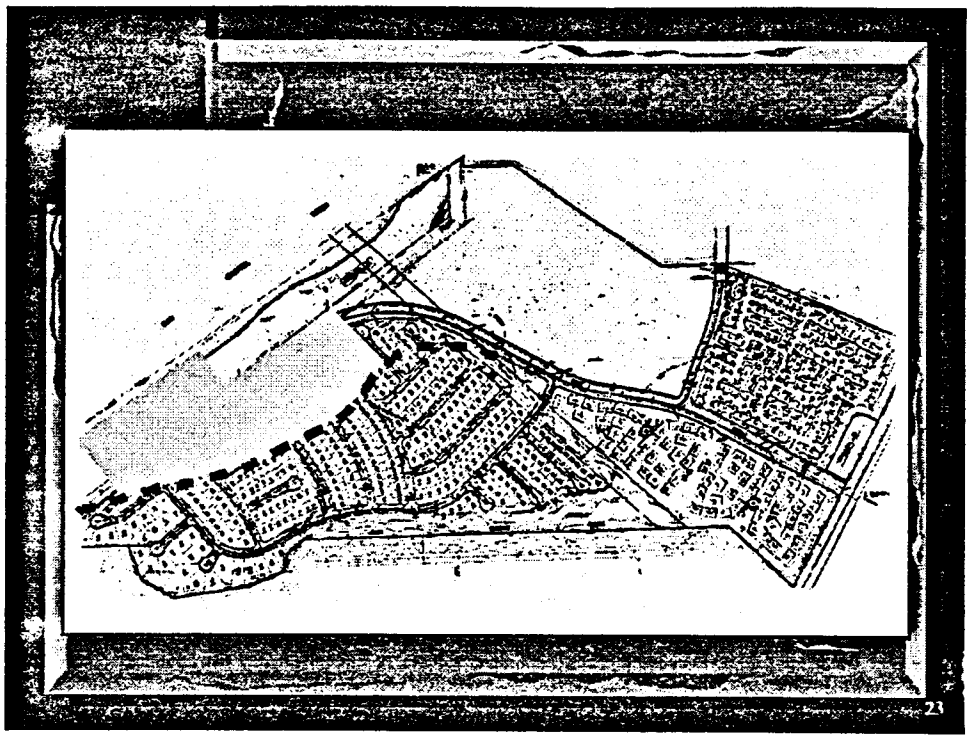
- Conservancy project proposes options that include on and off-site wetland restoration.
- Conservancy recommends restoration off-site.
- Fish & Game preferred a 25 acre on-site restoration project.
- Coastal Commission approves the Conservancy options and asks for a more detailed implementation plan.

21



Dept. of Fish and Game Consolidation (Alternative A)

22



23

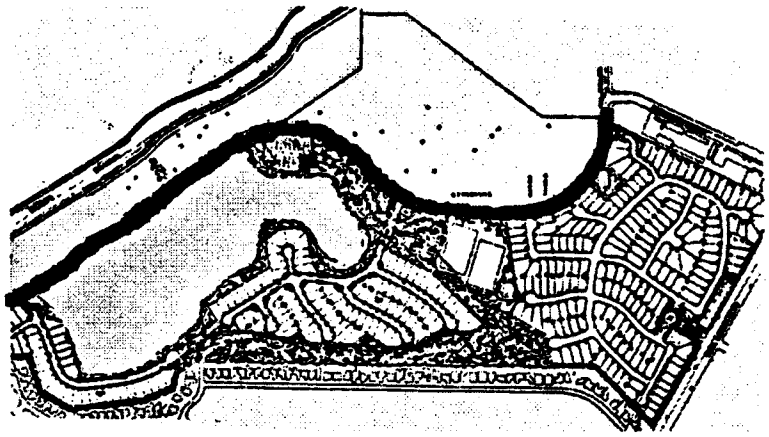
Project History

1990

Mola Development Corporation

- 329 SFR residential units approved by the Coastal Commission
- Housing units in the lowlands
- The original goal of consolidation was not provided for in the restoration plan

24



25

Project History

1998 Hellman Properties

- Wetland restoration/ consolidation and dedication of public trails per Conservancy.
- Public golf course developed & managed as an ecosystem.
- 70 SFR units on bluff; 2,500 ft. wetland setback
- Dedication of Gum Grove Nature Park
- Inclusion of State Lands
- Reduction in area designated for mineral production
- Future wetland mitigation bank

26

Hellman Ranch Reserve Land Uses

Conservation and Open Space Land Uses

- Coastal Salt Marsh Restoration
- Dedication of Public Trails
- Public Golf Course and Freshwater Marshes
- Gum Grove Nature Park
- Interpretive Facility

77% of Project

Development Land Uses

- Continued Mineral Production
- Golf Course Clubhouse & Facilities
- Single Family Residential (70 homes)
- Visitor-Serving Commercial

23% of Project

27

Hellman Ranch Reserve Land Uses

Conservation and Open Space Land Uses

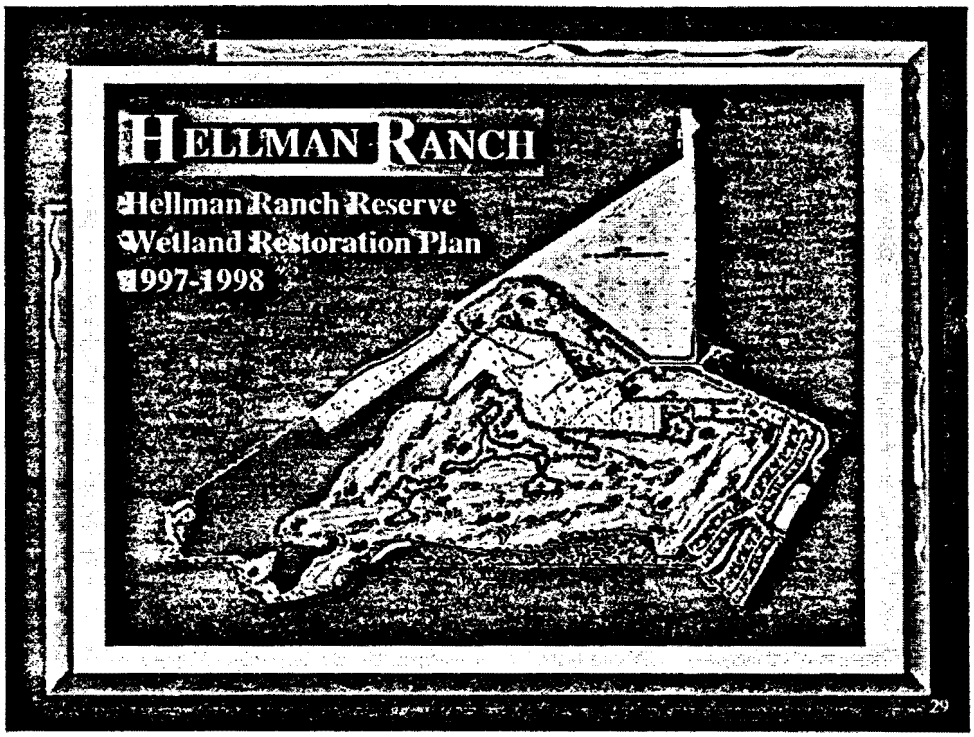
- With Wetland Mitigation Bank

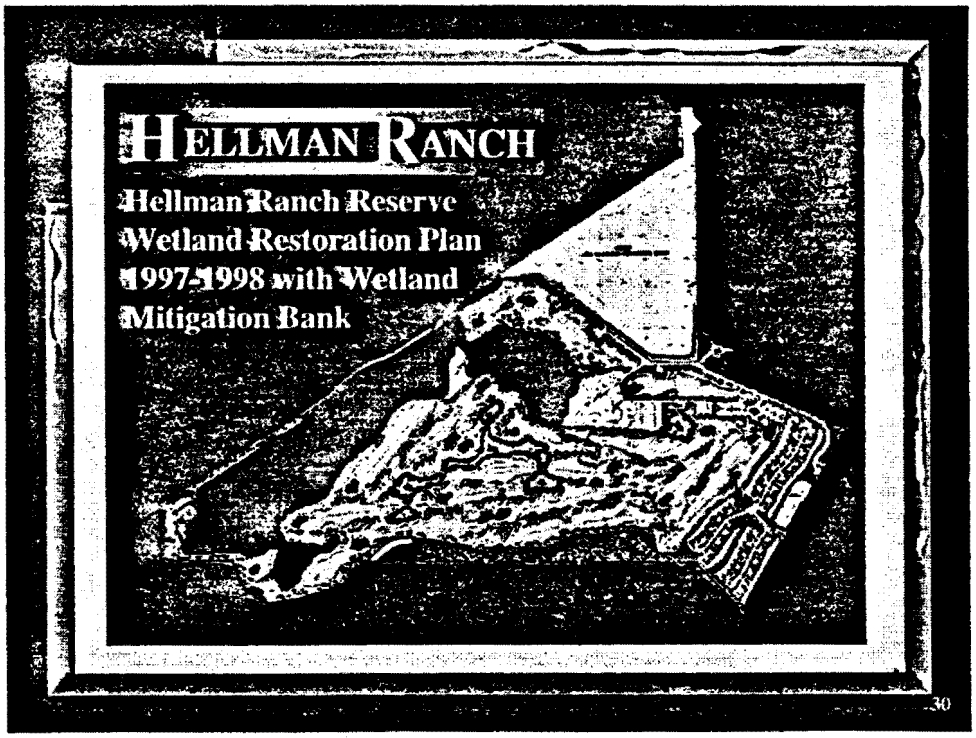
87% of Project

Development Land Uses

13% of Project

28


HELLMAN RANCH
Hellman Ranch Reserve
Wetland Restoration Plan
1997-1998
29


HELLMAN RANCH
Hellman Ranch Reserve
Wetland Restoration Plan
1997-1998 with Wetland
Mitigation Bank
30

Mitigation Ratios (Quanity)

Existing Conditions

- 27 acres of existing severely degraded, fragmented wetlands of which only 8% have tidal influence

Proposed Project

- 28 acres of restored, consolidated coastal salt marsh. 78% will have direct tidal influence

"No net loss" of existing wetland acreage

31

Mitigation Ratios (Quality)

Proposed Project

- 3.8:1 Functions and Values Mitigation Ratio

32

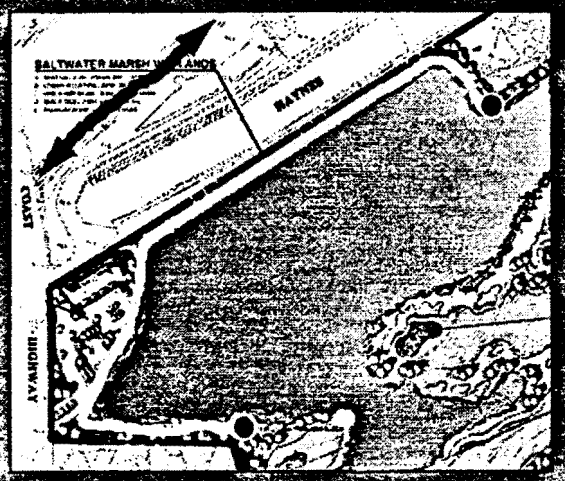
Functions and Values Analysis
Existing Conditions Compared to Restoration

Function	Existing Functional Capacity	Restored Functional Capacity	Ratio of Existing FC to Restored FC
Tidal Surge Attenuation	Not Applicable	Not Applicable	–
Sediment Deposition	1.34	8.7	6.5:1
Tidal Nutrient Removal	1.0	3.4	3.4:1
Particulate Organic Carbon Export	2.7	6.6	2.4:1
Maintain Characteristic Plant Structure and Composition	3.6	10.0	2.8:1
Resident Nekton Utilization Potential	0.62	8.7	14:1
Non-Resident Nekton Utilization Potential	0.62	8.7	14:1
Nekton Prey Pool Potential	0.71	8.3	11.6:1
Wildlife Habitat Utilization Potential	8.9	17.9	2:1
Total	19.3	73.9	3.8:1

Note: Analysis does not include wetlands restoration bank properties

Gum Grove Nature Park

- Dedication of park and trails to the City of Seal Beach
- Preservation of the park as an urban forest
- Public access to the park at Avalon Street
- Preserves "in-situ" cultural resources within the park



State Lands Commission

First Street and Pacific Coast Highway

- 10,000 feet of visitor-serving commercial
- Space reserved for Krenwinkle House and Interpretive facility.
- Dedication of public trails around perimeter of wetlands for hiking and bird watching.
- Possible connection to regional bike trail.

35

Public Access Summary

- State Lands Property (Visitor-serving commercial, interpretive facility, Krenwinkle House and regional trail connection)
- Coastal Salt Marsh and Public Trails
- Gum Grove Nature Park and Public Trails
- Hellman Ranch Reserve Public Golf Course and Golf Course Clubhouse

152 acres (77%) are designated for environmental open space and public access

36

Buffers and Edge Conditions

- Proposed homes have been sited 2,500 feet from restored wetland areas.
- Golf course serves as a buffer between the wetlands and urban environment.
- 40-65 ft. transitional habitat zone:
  - Native vegetation and wetland habitat
  - Adjacent to most of the salt marsh
  - Not part of golf course (out of play)
  - An additional 50-foot buffer adjacent to commercial/State Lands

37

Habitat Zones and Buffers

The Links at Spanish Bay, Monterey Peninsula

- Environmentally Sensitive Habitat Areas throughout the golf course
- ESHA's are directly adjacent to fairways and roughs
- Appropriate signage to keep golfers out
- The golf course is used as a buffer between the ESHA's and residential development

38

Recent Changes to Plan

(since submittal to Commission staff in November 1997)

- Increase of restored coastal salt marsh acreage by 18%, from 23.1 to 28.1 acres, without affecting quality
- Establishment of a wetland mitigation bank for the majority of the remaining oil production properties (16.2 acres), ensuring land use compatibility near restored natural resource areas

39

Recent Changes to Plan

(since submittal to Commission staff in November 1997)

- Increase of lands designated for salt marsh restoration by 44%, from 23.1 to 44.3 acres
- Golf course has been reduced from 113 acres to 110 acres

40

Coastal Act Policy Compliance

- Section 30233 (Wetlands Restoration)
- Section 30411 (Degraded Wetlands)
- Section 30210 (Public Access)
- Section 30222 (Use of Private Lands for Commercial Recreational Facilities
- Section 30230 (Wetlands Restoration)
- Section 30231 (Biological Productivity)
- Section 30244 (Cultural Resources)
- Section 30007.5 (Balance)
- Statewide Interpretive Guidelines
- Procedural Guidance for Wetland Restoration Projects

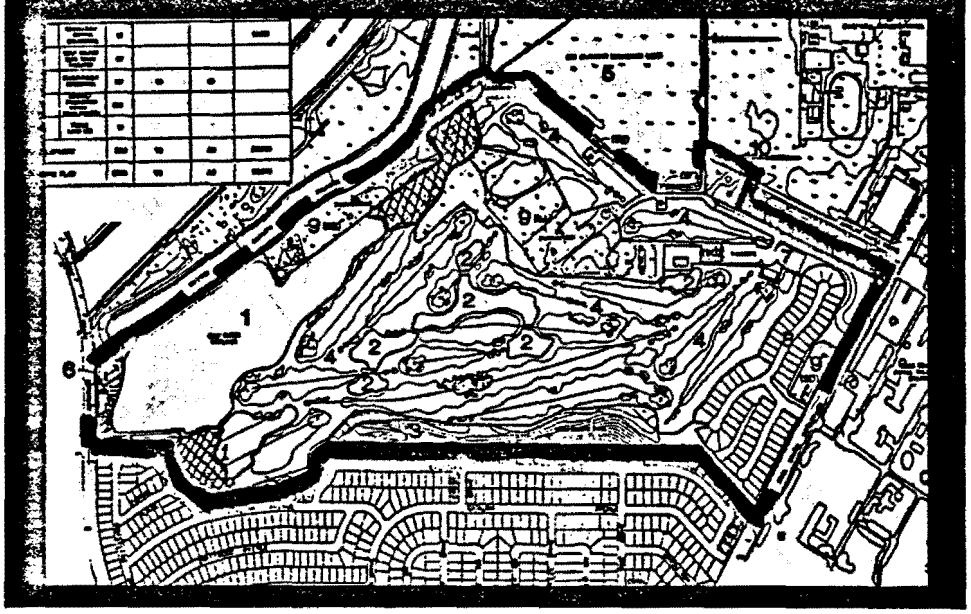
41

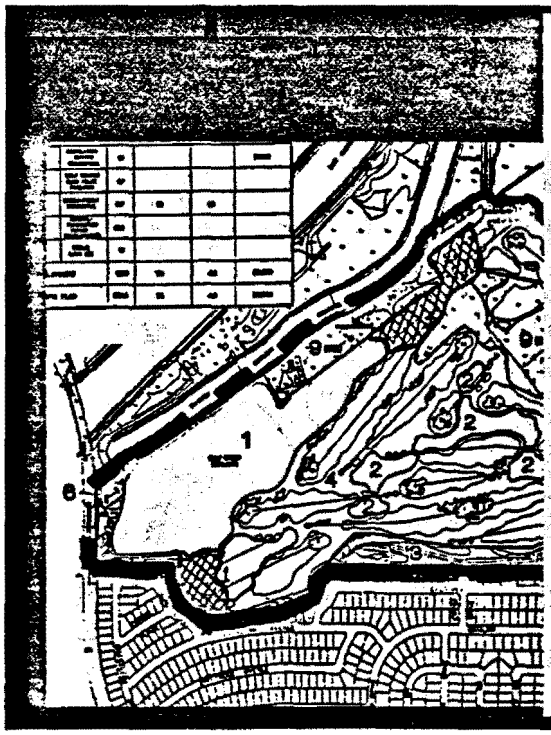
Staff Special Conditions

- Wetland Acreage
- Transitional Habitat
- Trail Linking Seal Beach Blvd. to Pacific Coast Highway
- Termination of Oil Operations in 2018
- Tentative Tract Map Lot Merger
- Timing of Construction

42

Staff Proposal for Wetlands





- Eliminates access to a mineral production area
- Moves wetlands closer to existing residential uses
- Decreases tidal range
- Increases residence time
- Impacts potential habitat diversity
- Reduces biological productivity
- Creates maintenance problems
- Eliminates 4 golf holes
- Renders the golf course & ultimately, the restoration project infeasible.

Transitional Habitat/Buffer Zone

- Should this 40-65-foot wide, 5.7 acre habitat/ buffer zone be counted as wetland mitigation acreage?

- Will support wetland habitat
- Not within golf play area
- Outside the tidal range
- 25 of the 27 acres today are outside the tidal range and are wetlands
- Once established, would be considered wetland under CDFG criteria

45

Transitional Habitat/Buffer Zone

"Dikes and berms shall only be included in calculating the newly established marsh to the extent that they will support wetland vegetation or wetland characteristics." —Michael Fischer, Executive Director, California Coastal Commission, Coastal Conservancy Project 1-82, Hellman Wetlands

46

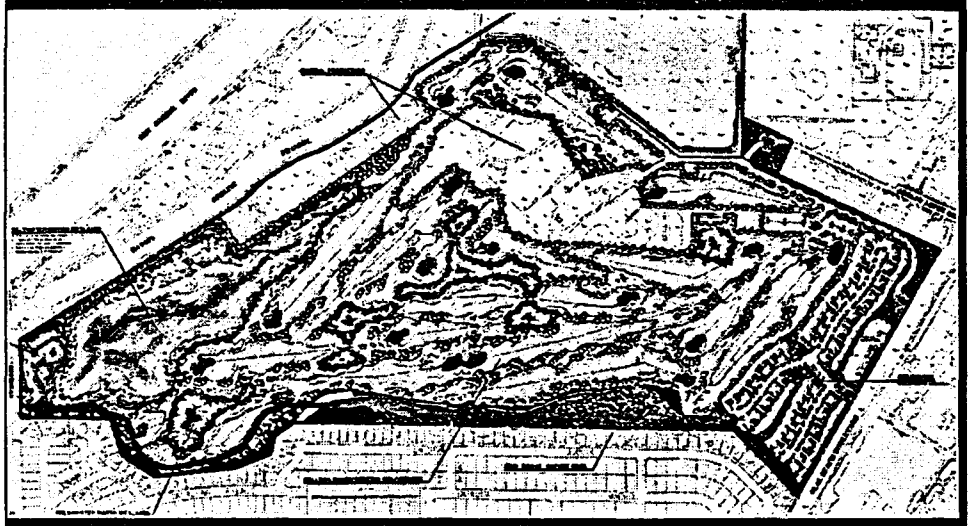
Staff Proposed Trail Connection

- Staff report conditions trail connection from Seal Beach Boulevard to Pacific Coast Highway

- Project already includes increasing public access from 6% to 77%
- Liability and safety
- City and homeowners are against it (crime)
- Proposed trail opens up no additional area to public access
- Legality of condition

47

Staff Proposal for Trail Connection



Termination of Mineral Operations in 2018

- Staff report conditions that mineral production operations cease in 20 years

- Not acceptable
- On-going use, allowed by the Coastal Act
- Life of the field may be more than 20 years, may be less
- Legality of condition

49

Lot Merger

- Staff report conditions mineral production lots and golf course lot be merged

- Landowner has the right to subdivide property as proposed
- Consistent with State Subdivision Map Act
- Two separate uses
- Not required under Coastal Act policy
- Wetland bank reserved by easement/ deed restriction
- Legality of condition

50

Timing of Construction

- Staff report conditions wetlands to be completed prior to residential construction commencement

- No wetland impacts by residential project
- Residential project is over 1/2 mile away from restoration area
- Wetlands/trails and golf course will be constructed together
- Wetlands construction will be completed prior to opening of golf course

51

Golf Courses and the Environment

Hellman Ranch Reserve Principals for Managing the Golf Course as an Ecosystem

52

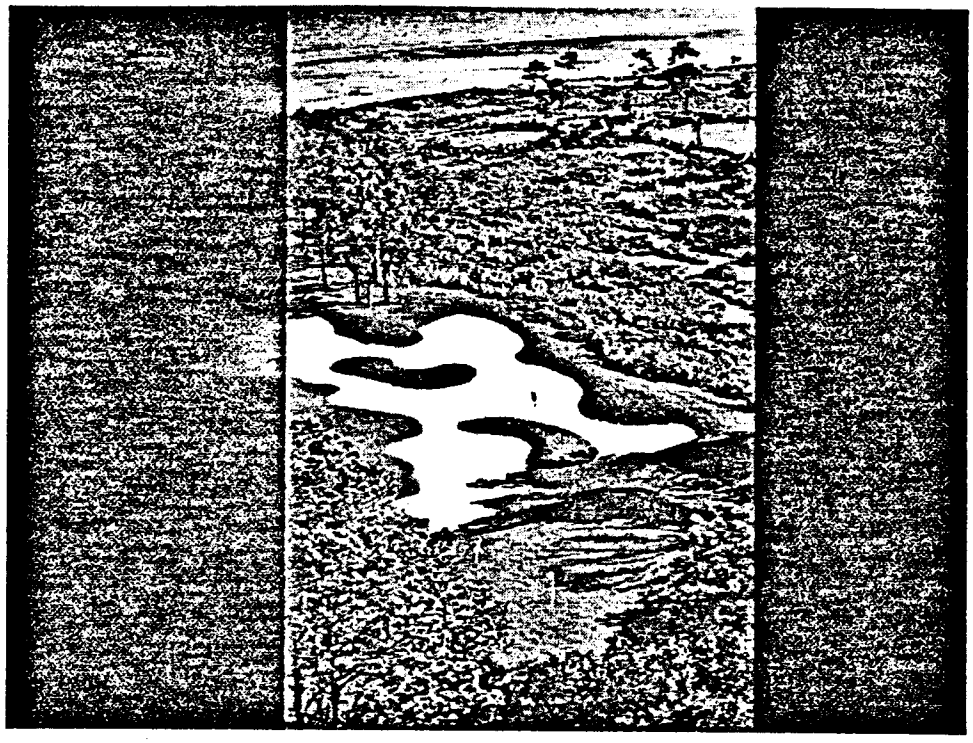
- Special Management Zones
- Ecological risk-based pesticide selection
- "Non-Spray" areas
- Slow release & water soluble materials
- Rotation and correct application of materials
- Integrated Pest Management
- Biological control of pests
- Native vegetation
- Appropriate turf grass selection
- Land absorption and drainage filtration
- Irrigation water management

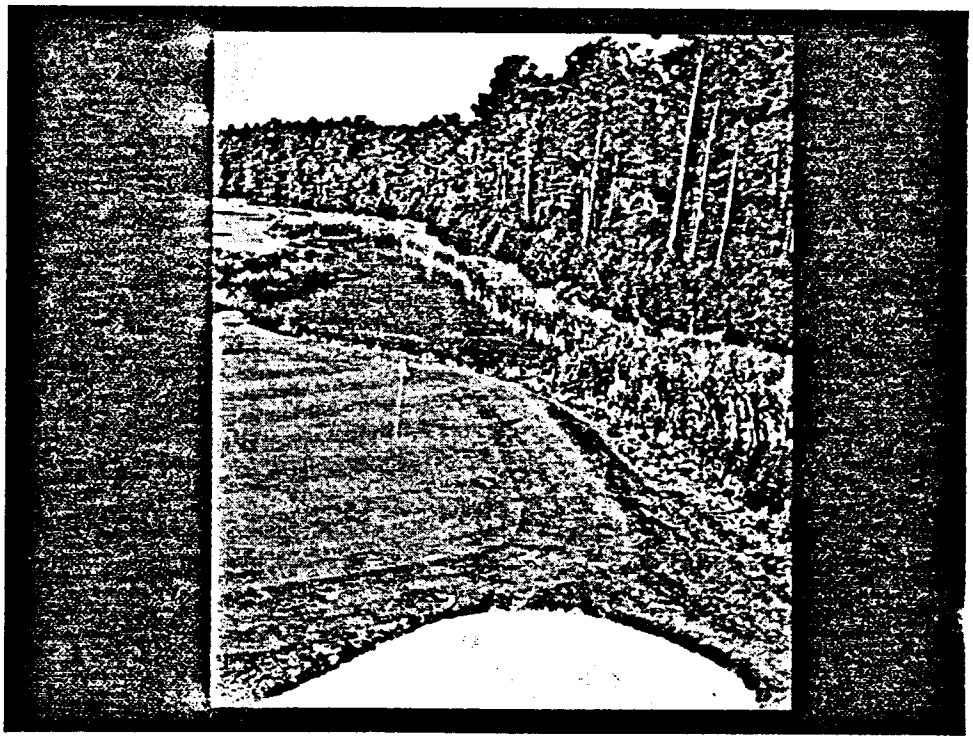
53

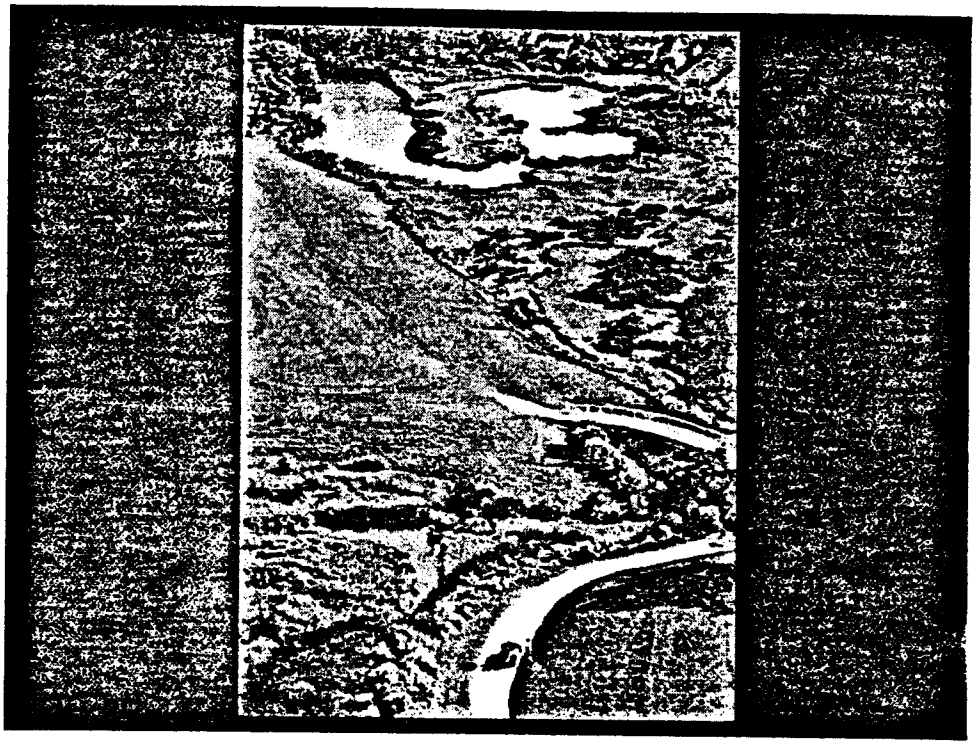
Golf Courses and the Environment

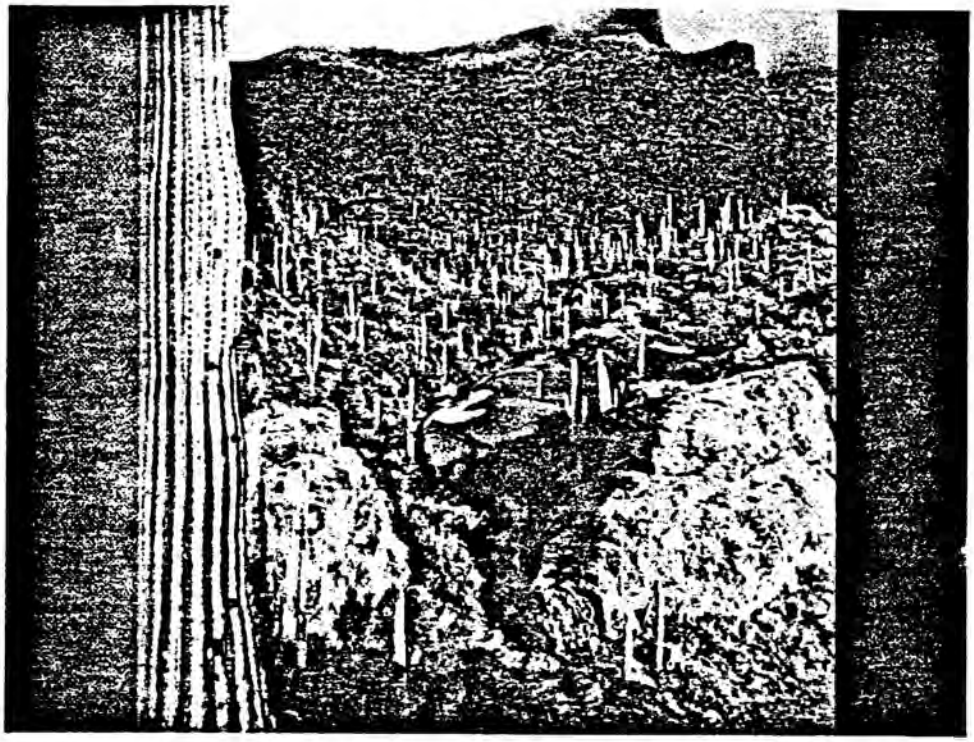
Several successful examples of golf courses and the environment working together as an ecosystem

54









Hellman Ranch Reserve Restoration Project

- Our plan implements one of the four Coastal Conservancy options for the property.
- Our plan achieves the Fish & Game goal of a 25 acre consolidated wetlands ecosystem.

62

Hellman Ranch Reserve Restoration Project

- Our plan eliminates the arterial highway through the restored wetlands area.
- Our plan eliminates residential uses in the lower elevations, adjacent to the restoration area.

63

Hellman Ranch Reserve Restoration Project

- Our plan increases the qualitative values of the wetlands by a nearly 4:1 ratio.
- Our plan includes a wetlands mitigation bank for the majority of existing oil production land.

64

Hellman Ranch Reserve Restoration Project

- Our plan preserves the majority of the property for environmental or recreational open space.
- Our plan designates 169 out of 196 acres for environmental and visitor-serving recreational uses.

65

Hellman Ranch Reserve Restoration Project

- Our plan increases public access to the property from 6% (today) to 77% with the proposed project.
- Our plan reduces the Commission approved number of residential units on the site by 80% from 329 to 70.

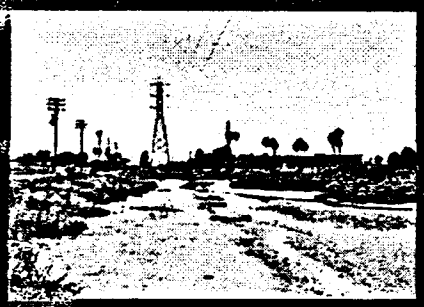
66

Hellman Ranch Reserve Restoration Project

- Our plan will make a significant contribution to the Great Pacific Flyway regional system of wetlands.
- Our plan is in compliance with all applicable provisions of Coastal Act policy.

67

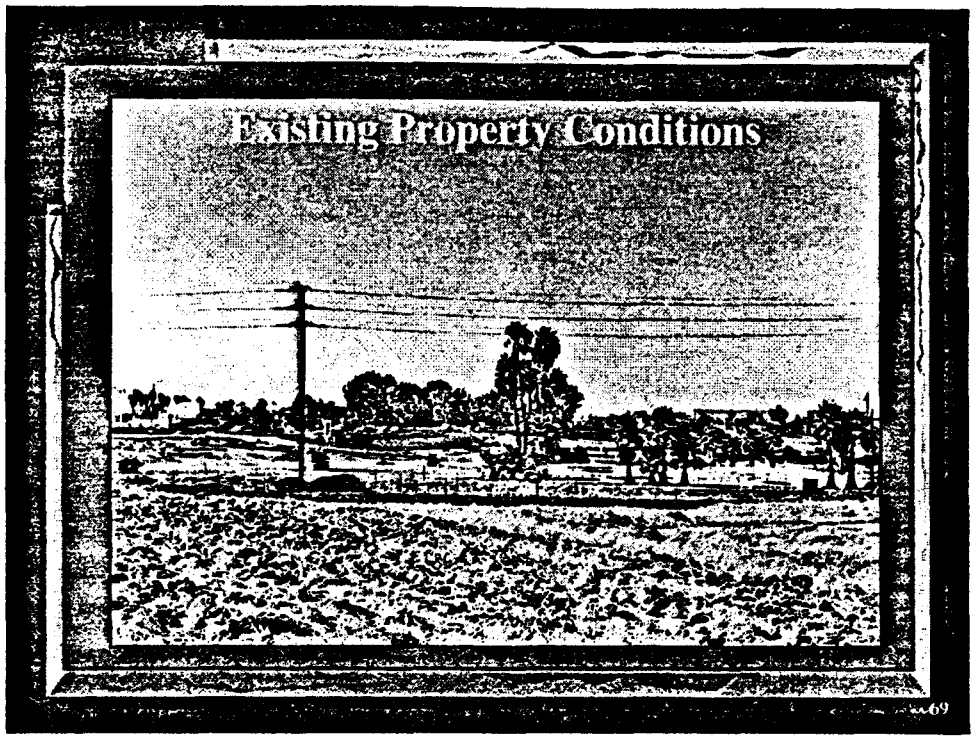
Hellman Ranch Visual Analysis

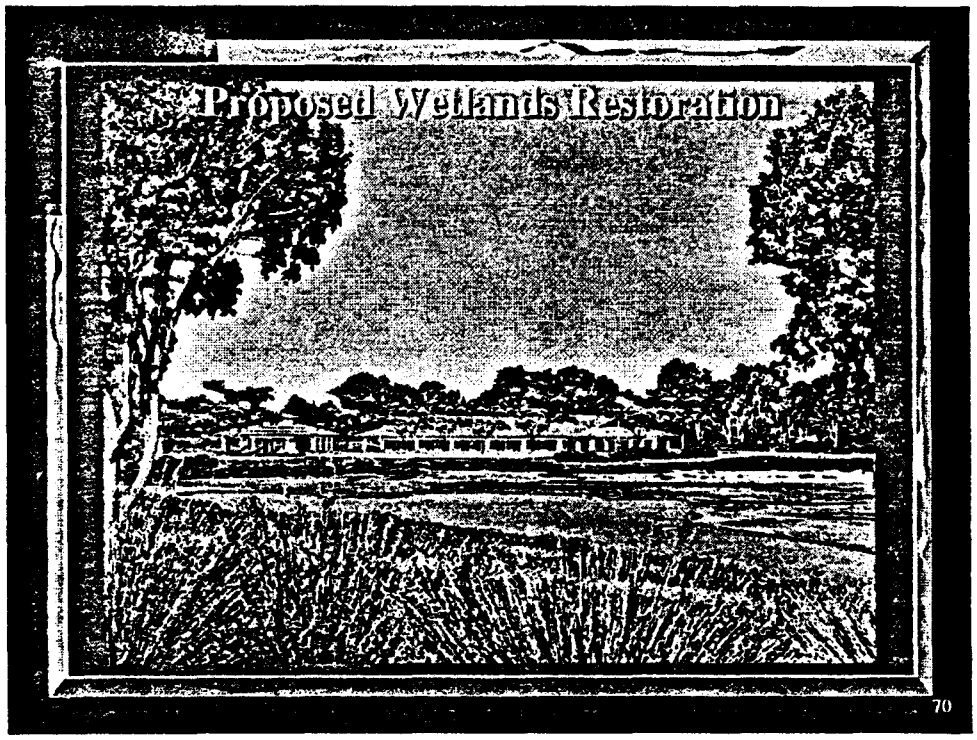


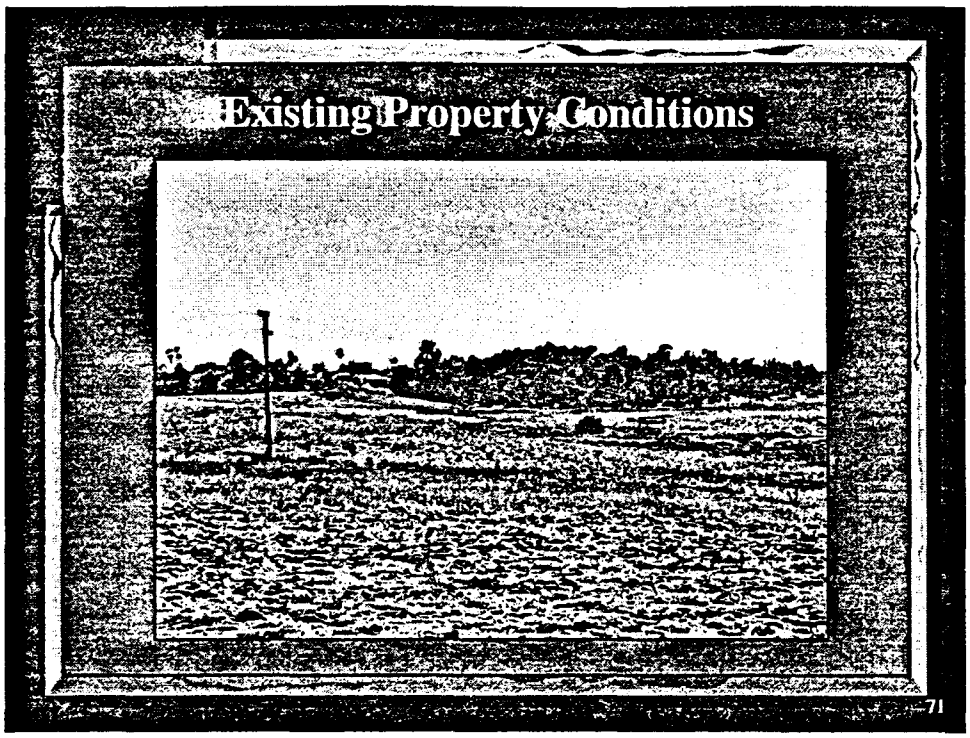
Existing Property Conditions

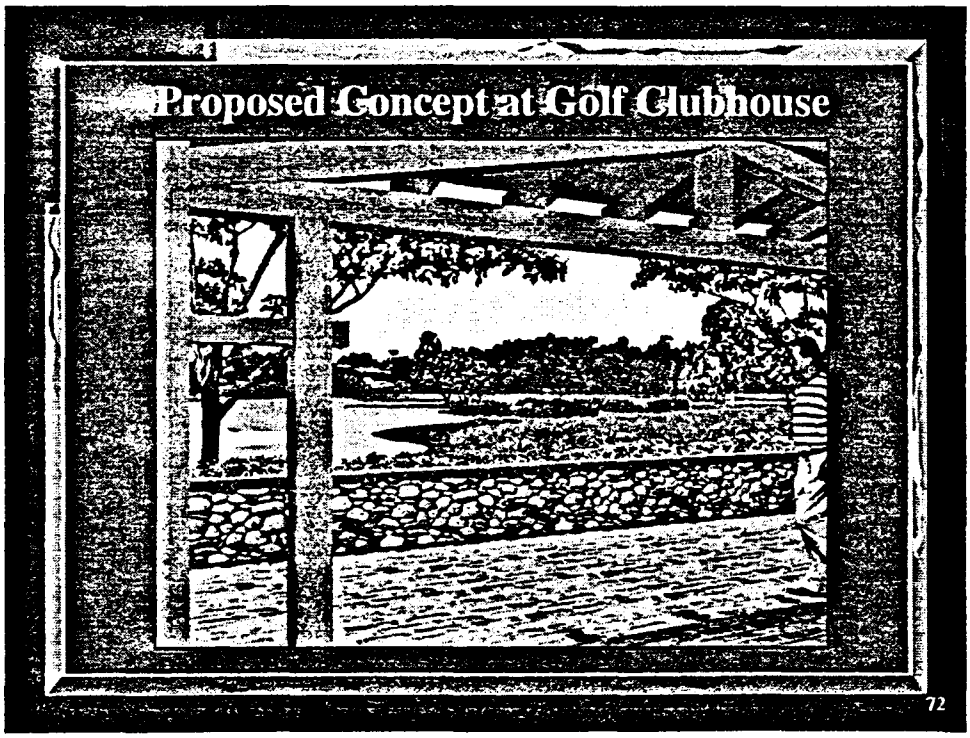
Proposed Wetlands Restoration Concept

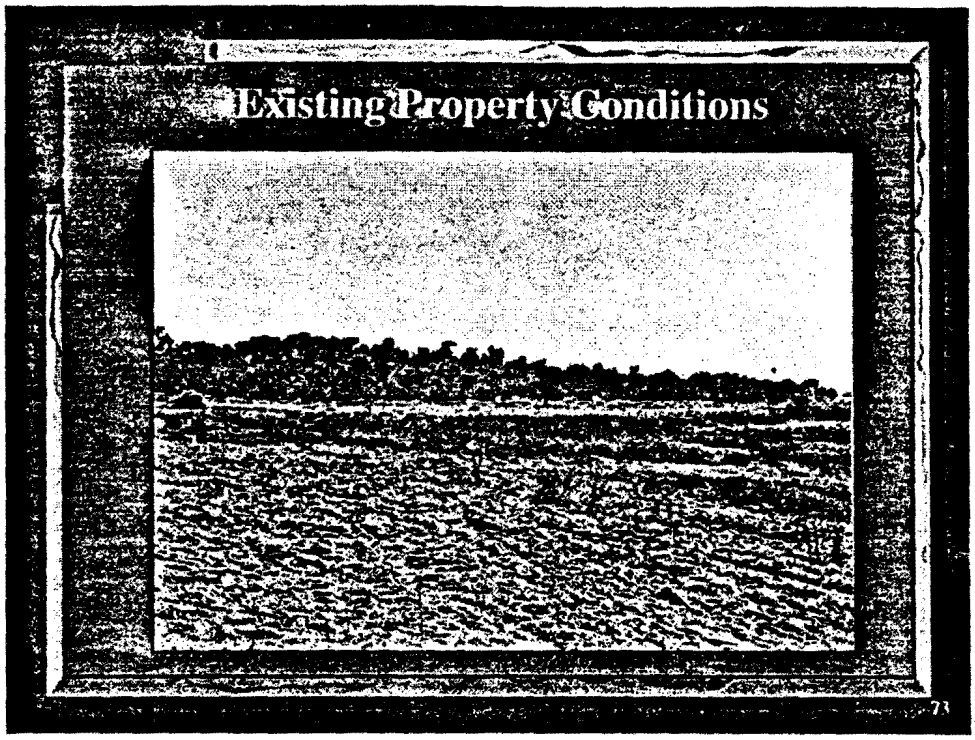
68

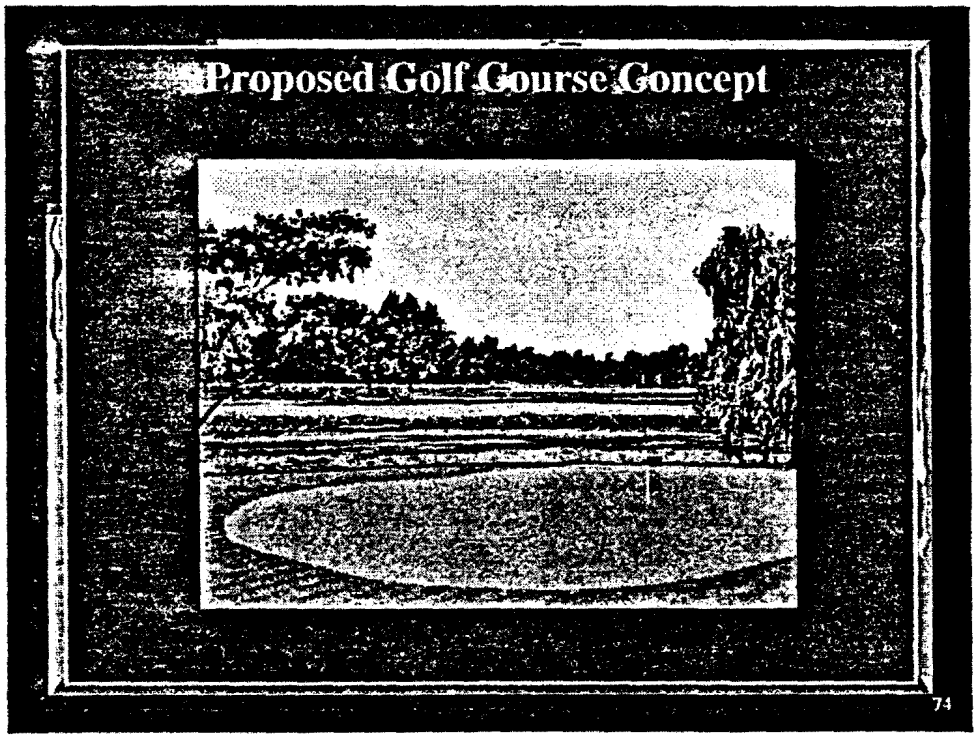

Existing Property Conditions
69

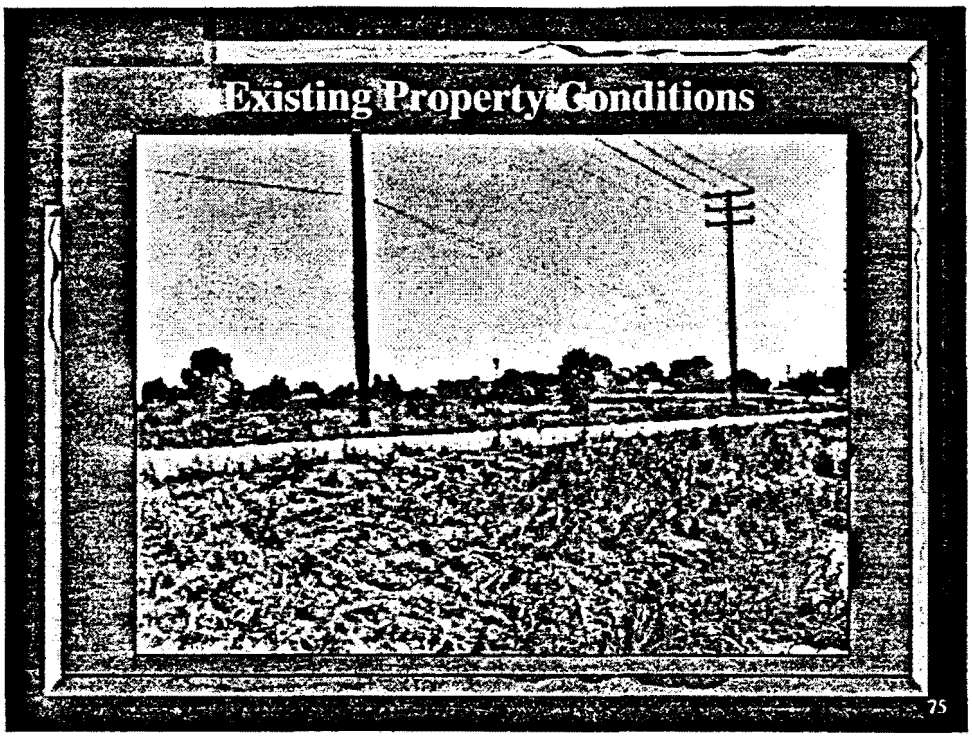

Proposed Wetlands Restoration
70

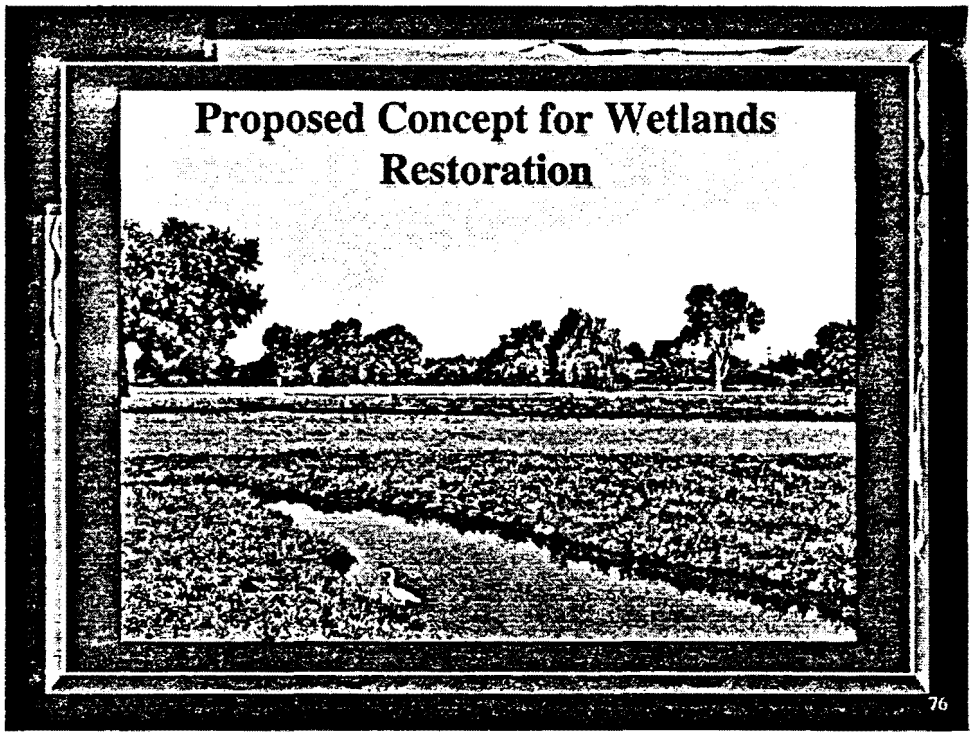

Existing Property Conditions
71

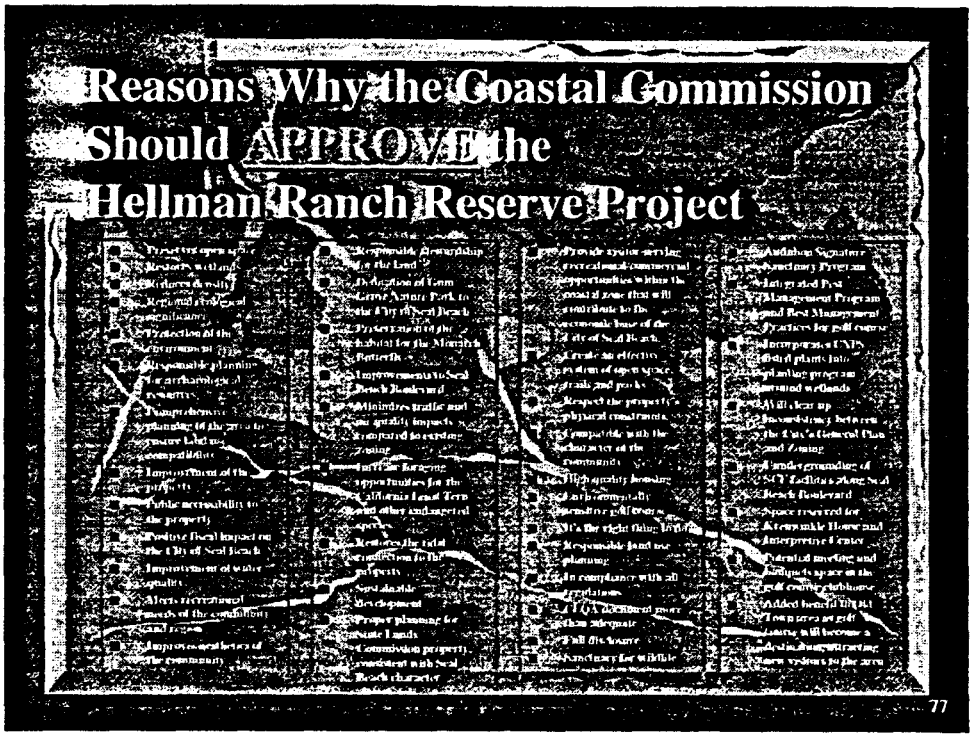

Proposed Concept at Golf Clubhouse
72

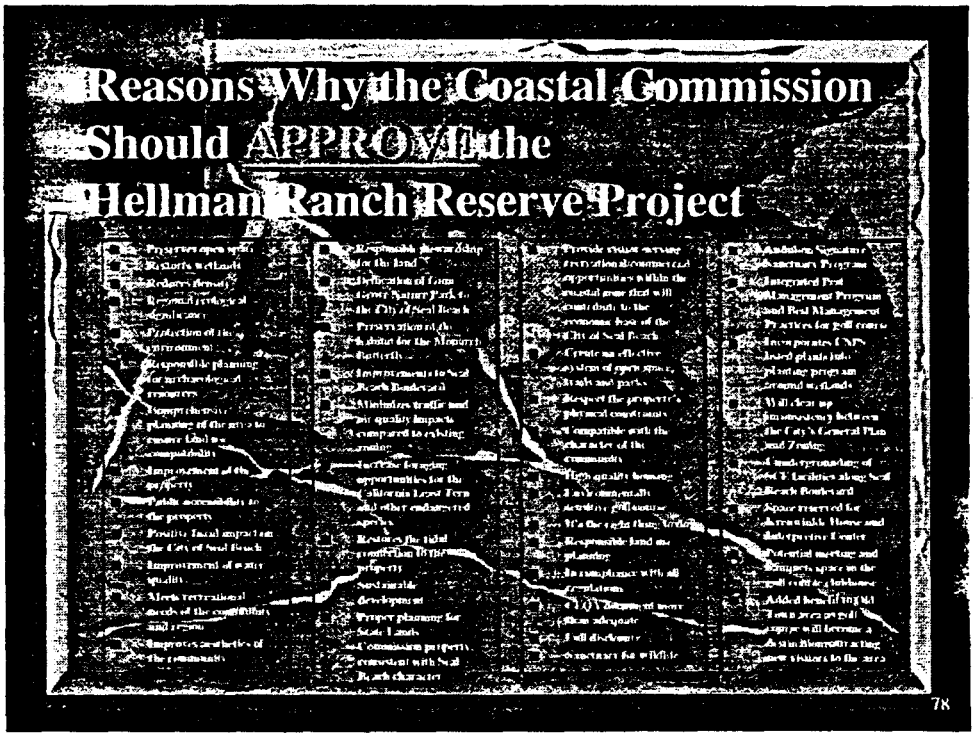

Existing Property Conditions
73

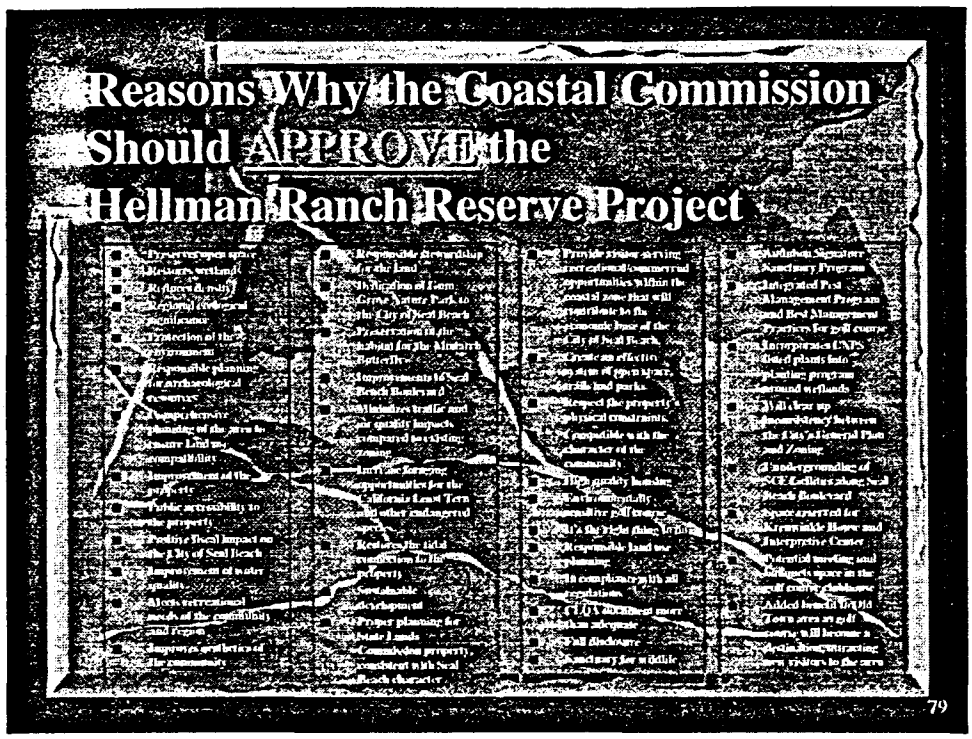

Proposed Golf Course Concept
74


Existing Property Conditions
75


Proposed Concept for Wetlands Restoration
76


Reasons Why the Coastal Commission
Should APPROVE the
Hellman Ranch Reserve Project
77


Reasons Why the Coastal Commission
Should APPROVE the
Hellman Ranch Reserve Project
78


Reasons Why the Coastal Commission
Should APPROVE the
Hellman Ranch Reserve Project
79

Reasons Why the Coastal Commission
Should APPROVE the
Hellman Ranch Reserve Project
80

Reasons Why the Coastal Commission Should APPROVE the Hellman Ranch Reserve Project

81

Dave's Top Ten Reasons why the Coastal Commission should approve this project

(as proposed by Hellman)

10. Compliance with Coastal Act policy and the severely degraded wetlands finally get restored.
9. Significant increases in biological and wildlife functions and values (3.8:1 mitigation ratio).
8. Preserves the majority of the site (77%) as open space.
7. No net loss in wetland acreage
6. Public accessibility to the property increases from 6% to nearly 77%.

82

Dave's Top Ten Reasons why the Coastal Commission should approve this project

(as proposed by Hellman)

5. Residential uses on only 15 acres of a 196 acre project (80% reduction in density from the previously approved Commission project).
4. The golf course will be a major visitor-serving recreational use for this region of the coastal zone.
3. The project implements the Conservancy's option for a 25 acre on site restoration/consolidation project for this site.
2. The "no project" alternative is not acceptable.

83

Dave's No. 1 Reason Why the Coastal Commission should approve this project

(as proposed by Hellman)

1. The Hellman family will exile me and Jerry Tone to the mineral production graveyard shift if it's not approved.
1. The project is the most feasible, the most protective of coastal resources and is the least environmentally damaging alternative.

84