INITIAL STUDY/NEGATIVE DECLARATION

FOR THE

PRADO CONSTRUCTED WETLANDS

MODIFICATION PROJECT

PREPARED BY:

THE KEITH COMPANIES

APRIL 1996

TABLE OF CONTENTS

I. INTRODUCTION

This Initial Study/Negative Declaration evaluates the potential environmental impacts of the Prado Constructed Wetlands Modification Project, in the Prado Flood Control Basin, County of Riverside.

According to Section 15063 of the California Environmental Quality Act Guidelines, the purposes of an Initial Study are to:

- Provide the Lead Agency with information to use as the basis for deciding whether to prepare an EIR or Negative Declaration.
- Enable an applicant or Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a Negative Declaration.
- Assist in the preparation of an EIR, if one is required, by:
    1. Focusing the EIR on the effects determined to be significant;
    2. Identifying the effects determined not to be significant; and
    3. Explaining the reasons for determining that potentially significant effects would not be significant.
- Facilitate environmental assessment early in the design of the project.
- Provide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment.
- Eliminate unnecessary EIRs.
- Determine whether a previously prepared EIR could be used with the project.

The Keith Companies approach to this Environmental Initial Study involved: 1) review of pertinent plans, permits and documents, 2) field reconnaissance of the project site, 3) consultations with Orange County Water District staff, and 4) impact assessment and consideration of Mitigation Measures, as necessary.

As described herein, significant prior environmental evaluation of the proposed project has occurred pursuant to 1) an approved U.S. Army Corps of Engineers 404 Permit (No. 93-00572-RRS); 2) the U.S. Fish and Wildlife Service Biological Opinion and Conference Report (1-6-94-F-47) on the project; 3) an approved Habitat Conservation Plan (HCP) dated April 5, 1994; 4) Habitat Mitigation and Monitoring Proposal Guidelines (March, 1994) and 5) other reference documents listed in this Environmental Evaluation.

These plans, permit and prior studies comprise the primary data base, and basis for conclusions and findings of no significant impact associated with this project.

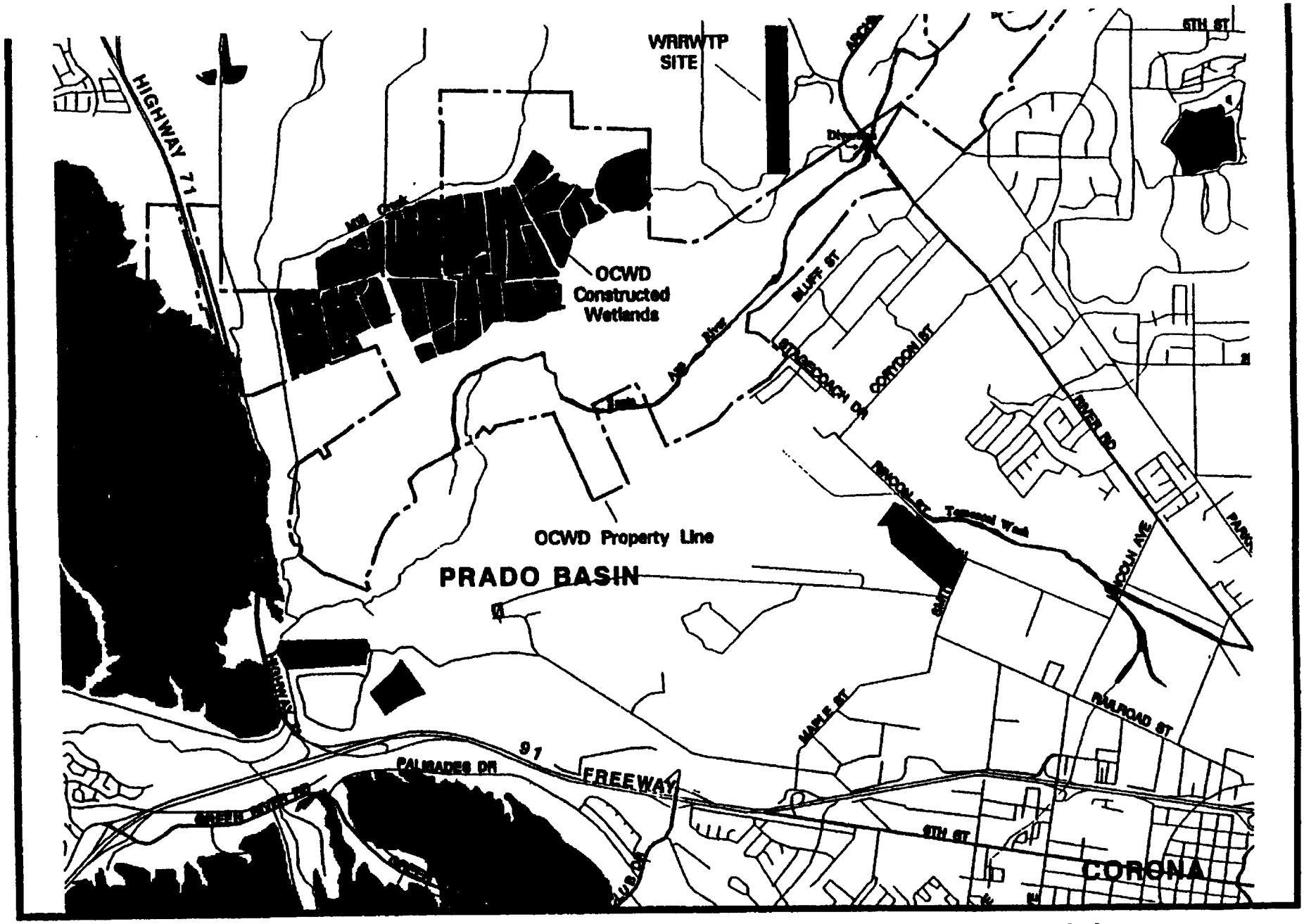
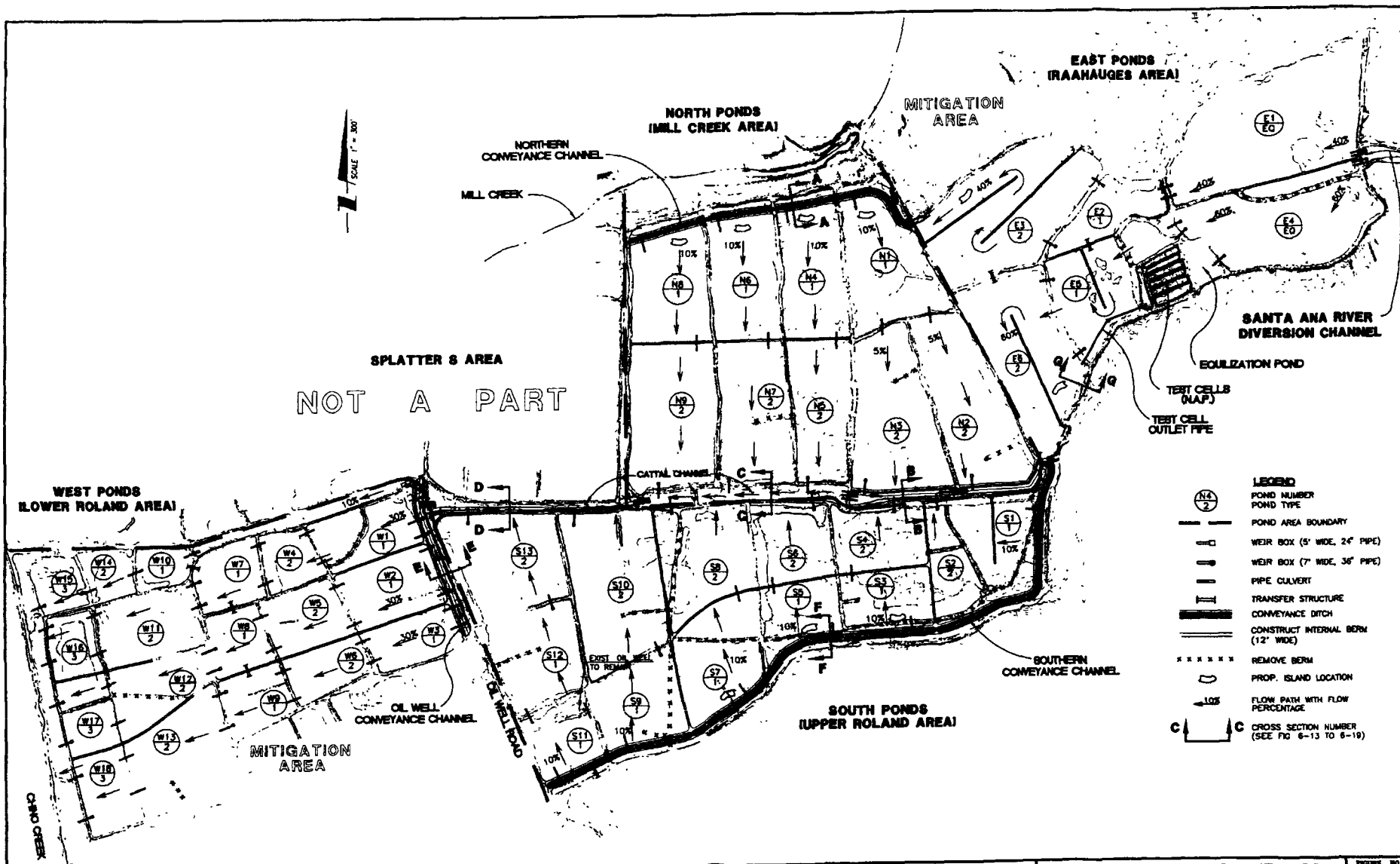


FIGURE 1
Project Location Map
Prado Constructed Wetlands Modification



REV.	DATE	DESCRIPTION	APP

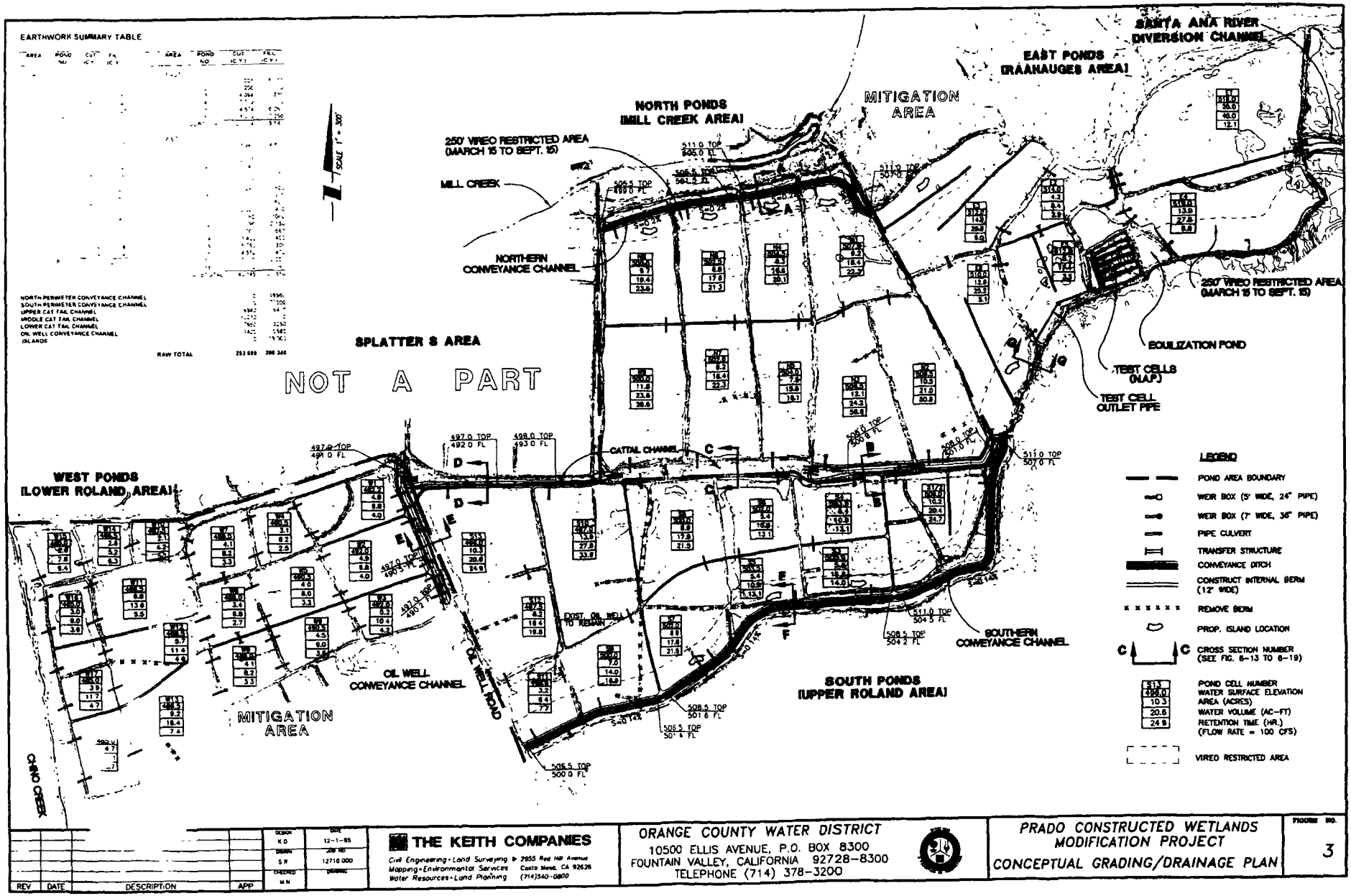
DESIGN K O | DATE 12-1-95
DRAWN JOB NO. S R 12710.000
CHECKED M N | SHEET NO.

THE KEITH COMPANIES
Civil Engineering • Land Surveying
Mapping • Environmental Services
Water Resources • Land Planning
2955 Red Hill Avenue, Costa Mesa, CA 92626
(714)540-0800

ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVENUE, P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA 92728-8300
TELEPHONE (714) 378-3200

PRADO CONSTRUCTED WETLANDS MODIFICATION PROJECT
PROPOSED IMPROVEMENTS/LAYOUT

FIGURE NO. 2



REV	DATE	DESCRIPTION	APP

DESIGN K.D. DATE 12-1-95
DRAWN S.R. JOB NO. 12710.000
CHECKED M.N. DRAWING

THE KEITH COMPANIES
Civil Engineering • Land Surveying • Mapping • Environmental Services • Water Resources • Land Planning
2955 Red Hill Avenue, Costa Mesa, CA 92626 (714)540-0800

ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVENUE, P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA 92728-8300
TELEPHONE (714) 378-3200

PRADO CONSTRUCTED WETLANDS MODIFICATION PROJECT
CONCEPTUAL GRADING/DRAINAGE PLAN

FIGURE NO. 3

Please see the more complete description of the OCWD Prado Basin Duck Ponds Improvements Design in Appendix A.

9. **Surrounding land uses and setting:** (Briefly describe the project's surroundings)

The Orange County Water District owns about 2,150 acres in the Prado Basin in Riverside County. Within this area lies about 465 acres of constructed wetlands (i.e. the project site) originally developed and utilized for waterfowl hunting, but more recently for water treatment (Figure 1). Lands surrounding the project site are used for open space/wildlife habitat, recreational and agricultural purposes.

The Santa Ana River runs along the east and south sides of the duck ponds in a general east to west flow pattern. Mill Creek flows along the north side of the ponds, while Chino Creek is located on the western edge. Mill Creek flows into Chino Creek near the northwest corner of the ponds. Water from the ponds flows into Chino Creek which flows into the Santa Ana River downstream of the ponds, but upstream of Prado Dam. Mill Creek primarily drains local agricultural land to the north of the duck ponds. Chino Creek carries drainage from both rural and urban sources. The Santa Ana River carries drainage water primarily from urban sources.

10. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.)

A Section 404 permit has been issued by the Corps of Engineers for this project. A 404 permit is required for any dredging or fill operation in a jurisdictional wetlands, such as the project area. An approved permit (No. 93-00572-RRS) was obtained in April, 1995.

OCWD has also received a Clean Water Act Section 401 certification from the California Regional Water Quality Control Board (Santa Ana Region 8), and a Section 1601 Streambed Alteration Agreement with the California Department of Fish and Game.

The Orange County Water District ("District") also holds a 404 permit which allows for diversion of up to 50% of the instanteous flow of the Santa Ana River (SAR). As a separate, related action, the District intends to apply for a modified permit which requests increased diversions above the 50% level from the SAR and diversion of Mill Creek flows as well.

Funding for capital costs estimated at $1.5 million will be provided entirely by OCWD. All operating expenses will be paid by OCWD.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checklist below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Land Use and Planning	☐ Transportation/Circulation	☐ Public Services
☐ Population and Housing	☐ Biological Resources	☐ Utilities and Service Systems
☐ Geological Problems	☐ Energy and Mineral Resources	☐ Aesthetics
☐ Water	☐ Hazards	☐ Cultural Resources
☐ Air Quality	☐ Noise	☐ Recreation
	☐ Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☑ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a significant effect(s) on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because all potentially significant effects a) have been adequately in an earlier EIR pursuant to applicable standards, and b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project.

Signature William R Mills Jr. Date **April 10, 1996**

Printed name **William R. Mills, Jr.** For **ORANGE COUNTY WATER DISTRICT**

EVALUATION OF ENVIRONMENTAL IMPACTS

A brief explanation is provided below for all answers except "No Impact" answers that are supported by the information sources cited in the parentheses following each question. A checklist response indicated by an asterisk (*) indicates a potential beneficial impact of the proposed project.

Following this evaluation section are listings of 1) the referenced information sources, and 2) any mitigation measures necessary to reduce Potentially Significant Impacts to Less than Significant Impact Levels.

ENVIRONMENTAL IMPACTS

I. LAND USE AND PLANNING. *Would the proposal:*	*Potentially Significant Impact*	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) Conflict with general plan designation or zoning? (1,5)	☐	☐	☐	☑
The project will reconstruct the existing wetland pond system. No change of zone is required.				
b) Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project? (1,2,5)	☐	☐	☐	☑
By allowing increased nitrate removal of Santa Ana River waters, and by providing new mitigation habitat for waterfowl and least Bell's Vireo, the project will implement environmental plans and policies of agencies such as RWQCB and USFWS.				
c) Be incompatible with existing land use in the vicinity? (1)	☐	☐	☐	☑
The project is consistent with existing use.				
d) Affect agricultural resources or operations (e.g., impacts to soils or farmlands, or impacts from incompatible land uses)? (1,5)	☐	☐	☐	☑
There are no agricultural resources or operations in the site vicinity.				
e) Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)? (1)	☐	☐	☐	☑

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
II.	**POPULATION AND HOUSING.** *Would the proposal:*				
a)	Cumulatively exceed official regional or local population projections? (1)	☐	☐	☐	☑
b)	Induce substantial growth in an area either directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructures)? (1)	☐	☐	☐	☑
c)	Displace existing housing, especially affordable housing? (1)	☐	☐	☐	☑
III.	**GEOLOGIC PROBLEMS.** *Would the proposal result in or expose people to potential impacts involving:*				
a)	Fault rupture? (5)	☐	☐	☐	☑
b)	Seismic ground shaking? (5)	☐	☐	☐	☑
c)	Seismic ground failure, including liquefaction? (5)	☐	☐	☐	☑
d)	Seiche, tsunami, or volcanic hazard? (5)	☐	☐	☐	☑
e)	Landslides or mudflows? (5)	☐	☐	☐	☑
f)	Erosion, changes in topography or unstable soil conditions from excavation, grading, or fill? (1, 6)	☐	☐	☑	☐

The project will require approximately 250,000 CY of cut material and 200,000 CY of fill material for excavation of ponds and channels, and berm and perimeter levee construction.

Pond levees will serve as wave and erosion buffers. Vegetation on the levee banks and tops will reduce erosion affects. Levees will periodically require grading to offset erosion damage.

Erosion and accretion patterns will not change with the implementation of the proposed project. Water from the Santa Ana River is diverted at a sufficiently low velocity during normal operations to eliminate accretion of material in the pond system. Additionally, the flow velocities in the ponds are slow enough that sediments cannot be held in suspension. Accretion occurs only during back water conditions and significant storm events. During project construction the ponds will be dried out to prevent sediment from leaving the system.

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
	The project will be constructed pursuant to a "blanket" National Pollutant Discharge Elimination System (NPDES) Permit held by OCWD. The permit assures that Best Management Practices (BMPs) to reduce potential storm water erosion and sedimentation effects will be incorporated with construction activities. No further mitigation measures are required.				
g)	Subsidence of land? (5)	☐	☐	☐	☑
h)	Expansive soils? (5)	☐	☐	☐	☑
i)	Unique geologic or physical features? (6)	☐	☐	☐	☑
IV.	**WATER.** *Would the proposal result in:*				
a)	Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? (1,6) Diversion of water to the constructed wetlands will result in evapotranspirative losses which otherwise would not occur. The combined losses due to groundwater infiltration and evapotranspiration will average about 11 cfs. However, since the 8 cfs infiltration loss emerges as rising groundwater reentering the river elsewhere in the Prado Basin, only the 3 cfs evapotranspirative loss is truly lost from the system. This loss is less than significant. The current (normal) operating water surface elevation of the duck ponds is not expected to change as a result of the improvements. Thus, the amount of flood storage available in Prado Basin will not be impacted and should remain approximately the same. Circulation patterns in the ponds will be altered by the addition of levees and conveyance channels. The changes to the circulation patterns will have no impact to the drainage patterns of the Prado Basin.	☐	☐	☑	☐
b)	Exposure of people or property to water related hazards such as flooding? (1) Pond reconstruction activity will not occur during periods of flooding.	☐	☐	☐	☑

	Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
c) Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity? (1,6)	☐	☐	☑	☐

The Engineers Report in the proposed project (Reference Item #1) predicts measurable changes in the discharges to Chino Creek and ultimately Prado outflow, in three (3) water quality constituents -- total dissolved solids (TDS), total organic carbon (TOC) and nitrogen.

TDS. Evapotranspirative losses due to diversion of water to the constructed wetlands will have a concentrating effect on dissolved constituents, which may result in a measurable increase in TDS concentrations in the water discharged to Chino Creek, and ultimately the Prado outflow, especially during periods of low flow. The constructed wetlands project, however, will have no discernible impact on the TDS mass of the combined Prado outflow below Prado Dam. No significant adverse impact is anticipated.

Total Organic Carbon. The State Department of Health Services (DHS) is currently developing regulations for groundwater recharge of treated wastewater. Under these future regulations, the total organic carbon (TOC) content could limit the amount of wastewater recharged for reuse. Of primary concern to the DHS are the possible public health impacts of organic carbon of wastewater origin.

The base flow Santa Ana River as it enters the Prado Basin at River Road is comprised of about 50% treated wastewater from upstream publicly-owned treatment works (POTWs). TOC levels average about 4 mg/L at River Road. The origin of the TOC, whether naturally occurring or of wastewater origin, is unknown.

Increased TOC levels do occur in the diverted water as it flows through the constructed wetlands. TOC levels have increased from about 4 mg/L in the diverted water to over 8 mg/L in the discharge to Chino Creek. Since the source of the TOC increase is most likely from decaying vegetation, it does not represent a significant public health impact.

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
	Nitrogen. The Prado constructed wetlands pond system has been demonstrated to effectively remove nitrogen from river water. Peak removal efficiencies up to 100% of nitrate nitrogen have been documented, while sustained rates, of as much as, 88% total nitrogen have been documented for an annual average. The hydraulic capacity of the Prado constructed wetlands system is currently limited to treating 60 cfs. Proposed project modifications increasing the capacity to 200 cfs would enable treatment of projected base flows, comprised principally of wastewater, and will result in significant additional removal of nitrates in diverted river flows. This is both the primary purpose and a significant beneficial impact of the proposed project. Turbidity. The proposed project will provide no increase in the turbidity of the flows through the duck ponds. The flow velocities in the proposed project will be substantially unchanged from the existing pond systems. There will be a minor, temporary increase in turbidity during the initial filling of the ponds following the proposed construction activities.				
d)	Changes in the amount of surface water in any water body? (1,6) The project will increase the hydraulic capacity of the wetland pond system. However, there will be no significant change to the amount of surface water in the Santa Ana River within the Prado Basin.	☐	☐	☐	☑
e)	Changes in currents, or the course or direction of water movements? (1) Waterflow through the pond system, itself, will be altered, though no impact outside the pond system will occur.	☐	☐	☐	☑
f)	Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capability? (1,6) The current groundwater level ranges from pond bottom to a few feet below pond bottom, depending on the time of the year. In general, the ponds will recharge between 5 and 10 cfs into the groundwater basin during the spring and summer months. During the winter months groundwater discharge to the ponds occurs at about the same rates, but only in the lower ponds.	☐	☐	☑	☐

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
	All flows which pass through the project area rejoin the Santa Ana River and continue through Prado Dam to the OCWD recharge facilities in Anaheim. Potential water supplies are lost in the project area through evaporation and groundwater recharge. The pond reconstruction may result in slightly higher rates of groundwater infiltration than with the current pond system. However, due to the hydrogeology of the Prado Basin, there is significant rising water at the Dam. Any water lost through groundwater recharge in the ponds is believed to rise before the Dam and rejoin the Santa Ana River baseflow. Therefore, there is no significant impact to water supplies through groundwater recharge.				
g)	Altered direction or rate of flow groundwater? (1,6)	☐	☐	☑	☐
	See IV.f above.				
h)	Impacts to groundwater quality? (1,6)	✱	☐	☐	☐
	The project will have a significant beneficial impact on groundwater quality. The project will enable OCWD to remove nitrate from an additional 58,000 acre-feet per of drinking water supplies drawn from downstream Santa Ana River Basin recharge areas.				
I)	Substantial reduction in the amount of groundwater otherwise available for public water supplies? (1,6)	☐	☐	☐	☑
	See IV.h above.				
V.	**AIR QUALITY.** *Would the proposal:*				
a)	Violate any air quality standard or contribute to an existing or projected air quality violation? (1)	☐	☐	☑	☐
	The wetlands reconstruction will require approximately 250,000 CY of earthwork within the project area, which has the potential to result in locally increased particulate dust emissions and Total Suspended Particulates (TSP). However, there are no sensitive receptors in the vicinity. Grading will be phased over a minimum one-year period. Also, project area soils are typically saturated, further mitigating against dust emissions.				
	The project will be required to comply with SCAQMD Rule 403, requiring regular watering and other dust preventive measures. No significant air quality impact will occur, and no mitigation measures are required.				

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
b)	Expose sensitive receptors to pollutants? (1,5)	☐	☐	☐	☑
	There are no sensitive receptors in the project vicinity.				
c)	Alter air movement, moisture, or temperature, or cause any change in climate? (1)	☐	☐	☑	☐
	Evapotranspirative (ET) losses resulting from diversion of water to the constructed wetlands has been calculated at 3.8 cfs during the summer months, with reduced losses during the remainder of the year. This is not a significant effect.				
d)	Create objectionable odors? (1)	☐	☐	☐	☑
VI.	**TRANSPORTATION/CIRCULATION.** *Would the proposal result in:*				
a)	Increased vehicle trips or traffic congestion? (1)	☐	☐	☑	☐
	The project will require construction employee commutes to the job site. The number of vehicle trips associated with this activity is not significant. Wetland pond operational and maintenance-related vehicle trips are few and infrequent.				
b)	Hazards to safety from design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? (1)	☐	☐	☐	☑
c)	Inadequate emergency access or access to nearby uses? (1)	☐	☐	☐	☑
	Wetland pond access will be maintained.				
d)	Insufficient parking capacity onsite or offsite? (1)	☐	☐	☐	☑
	Wetland reconstruction will not require additional parking capacity. Temporary parking for construction employees and construction equipment staging will occur within the project limits.				
e)	Hazards or barriers for pedestrians or bicyclists? (1)	☐	☐	☐	☑
f)	Conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)? (1)	☐	☐	☐	☑
g)	Rail, waterborne or air traffic impacts? (1)	☐	☐	☐	☑

	Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
VII. BIOLOGICAL RESOURCES. *Would the proposal result in impacts to:*				
a) Endangered, threatened or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds? (1,2,3,4)	☐	☐	☑	☐
The project is in conformance with conditions of U.S. Army Corps of Engineers Permit 93-00572-RRS, and stipulated terms and conditions of the project Biological Opinion and Conference Report (USFWS 1-6-94-F-47), designed to preserve, protect and enhance individuals and habitat of listed species. Species of concern are: 1) the federally and State listed endangered least Bell's Vireo; 2) the State-listed endangered and federally-proposed endangered southwestern willow flycatcher; and 3) the federally-listed endangered southern bald eagle.				
Construction activities will be phased to occur both during the vireo season (March 15 to September 15) and non-vireo season. During the vireo season, construction activities will be limited to areas a minimum of 250 feet from known vireo habitat.				
Following less than significant construction phase impacts, the project will have a longer term beneficial impact to endangered species and their habitat. No additional mitigation measures are required beyond the stipulated permit conditions (see Appendix B).				
b) Locally designated species (e.g., heritage trees)? (2,3)	☐	☐	☐	☑
c) Locally designated natural communities (e.g., oak forest, coastal habitat, etc.)? (1,2,3)	☐	☐	☐	☑
Habitat restoration on perimeter levees and designated mitigation areas will include willow riparian and willow woodland habitat suitable for least Bell's Vireo occupation. Please see the Habitat Mitigation and Monitoring Proposal Guidelines incorporated with the approved 404 permit application, and included in Appendix C.				

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
d)	Wetlands habitat (e.g., marsh, riparian, and vernal pool)? (1,2,3)	☒	☐	☐	☐
	The project is expected to have a long term significant beneficial impact on wildlife, since it includes a significant wildlife habitat restoration component. This component is a requirement imposed by the Corps and the U.S. Fish & Wildlife Service as a condition to issuance of the 404 permit. The project will provide for a means to deliver a reliable supply of fresh water to the ponds so that a wetlands habitat may be maintained. Pond depths will be modified to provide habitat for wading birds, dabbler ducks, and diver ducks. Islands, within selected ponds, will be constructed to provide habitat, safe from predators, for waterfowl nesting. Circulation patterns in the ponds and around the islands will be designed to avoid stagnation problems. In total, about 35 acres of wildlife habitat will be created through the construction of islands, perimeter levees, and through allowing selected ponds to revert to natural vegetation. Please see the Habitat Mitigation and Monitoring Proposal Guidelines incorporated with the approved 404 permit application, and included in Appendix C.				
e)	Wildlife dispersal or migration corridors? (1)	☐	☐	☐	☑
VIII.	**ENERGY AND MINERAL RESOURCES.** *Would the proposal:*				
a)	Conflict with adopted energy conservation plans? (1)	☐	☐	☐	☑
b)	Use nonrenewable resources in a wasteful and inefficient manner? (1)	☐	☐	☐	☑
c)	Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State? (1)	☐	☐	☐	☑

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
IX.	**HAZARDS.** *Would the proposal involve:*				
a)	A risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation)? (1)	☐	☐	☐	☑
b)	Possible interference with an emergency response plan or emergency evacuation plan? (1)	☐	☐	☐	☑
c)	The creation of any health hazard or potential health hazard? (1)	☐	☐	☐	☑
d)	Exposure of people to existing sources of potential health hazards? (1)	☐	☐	☐	☑
e)	Increase fire hazard in areas with flammable brush, grass, or trees? (1)	☐	☐	☑	☐
	Project construction activity could increase risk of fire to surrounding willow woodland areas. However, all construction activity will be confined to the limits of the wetland reconstruction project. No significant fire risk is anticipated.				
X.	**NOISE.** *Would the proposal result in:*				
a)	Increases in existing noise levels? (1,2)	☐	☐	☑	☐
	Construction activity will result in temporarily elevated noise levels. There are no noise-sensitive receptor uses in the project vicinity. No construction activity will occur within 250 feet of known least Bell's Vireo habitat during least Bell's Vireo season (March 15 to September 15). No significant noise impacts will occur.				
b)	Exposure of people to severe noise levels? (1,5)	☐	☐	☐	☑
XI.	**PUBLIC SERVICES.** *Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas:*				
a)	Fire protection)? (1)	☐	☐	☐	☑
b)	Police protection? (1)	☐	☐	☐	☑
c)	Schools? (1)	☐	☐	☐	☑

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
d)	Maintenance of public facilities, including roads? (1)	☐	☐	☐	☑
e)	Other government services? (1)	☐	☐	☐	☑
XII.	**UTILITIES AND SERVICE SYSTEMS.** *Would the proposal result in a need for new systems or supplies, or substantial alterations to the following utilities:*				
a)	Power or natural gas? (1)	☐	☐	☐	☑
b)	Communications systems? (1)	☐	☐	☐	☑
c)	Local or regional water treatment or distribution facilities? (1)	☐	☐	☐	☑
d)	Sewer or septic tanks? (1)	☐	☐	☐	☑
e)	Storm water drainage? (1)	☐	☐	☐	☑
	The project will divert Santa Ana River baseflows, but will not alter storm water drainage facilities.				
f)	Solid waste disposal? (1)	☐	☐	☐	☑
g)	Local or regional water supplies? (1)	☐	☐	☐	☑
	By removing nitrate in Santa Ana River flows, the project improves the quality of regional water supplies ultimately recharged to downstream groundwater basins. This is a significant beneficial impact.				
XIII.	**AESTHETICS.**				
a)	Affect a scenic vista or scenic highway? (1)	☐	☐	☐	☑
b)	Have a demonstrable negative aesthetic effect? (1)	☐	☐	☐	☑
c)	Create light or glare? (1)	☐	☐	☐	☑
XIV.	**CULTURAL RESOURCES.** *Would the proposal:*				
a)	Disturb paleontological resources? (1,5)	☐	☐	☐	☑
	The project will reconstruct existing wetland ponds. There are no known paleontological or cultural resources in the project area. No impacts are anticipated.				
b)	Disturb archaeological resources? (1,5)	☐	☐	☐	☑
	See XIV.a above.				

		Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
c)	Have the potential to cause a physical change which would affect unique ethnic cultural values? (1,5)	☐	☐	☐	☑
d)	Restrict existing religious or sacred uses within the potential impact area? (1,5)	☐	☐	☐	☑

XV. RECREATION. *Would the proposal:*

a)	Increase the demand for neighborhood or regional parks or other recreational facilities? (1)	☐	☐	☐	☑
b)	Affect existing recreational opportunities? (1)	☐	☐	☑	☐

The Prado Basin Duck Ponds are commonly used for recreational purposes, especially in the Raahauge area. The following recreational activities will occur in the duck ponds.

1) General hunting on all ponds, except pond mitigation areas, between October 15 and January 31; 2) Dog training in Raahauges ponds 1 to 4 between January 31 and October 15; and 3) Potential future fishing in small boats with trolling motors in Raahauges ponds 1 to 4 between January 31 and October 15.

In addition, no recreational vehicular traffic will be permitted on the Mill Creek and Upper Roland perimeter conveyance ditch roads during the vireo season. All pond areas outside of Raahauge ponds 1 to 4 will be off-limits to recreational uses during the vireo season.

These recreational activities will be maintained, to the extent practical, through pond reconstruction phases. No significant impacts to recreational opportunities will occur.

	Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
XVI. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number of, restrict the range of, a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☑	☐
b) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	☐	☐	☐	☑
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☐	☑
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

III. REFERENCES

The following references were utilized in the preparation of the preceding Environmental Evaluation. Copies of those documents are available for inspection at Orange County Water District, 10500 Ellis Avenue, Fountain Valley, CA 92728 (see previously identified contact person).

1. Engineers Report on the Prado Constructed Wetlands Modification Project, (October, 1995): Orange County Water District.

2. Department of the Army Permit 93-00572-RRS, Prado Reconstructed Wetlands Project (April, 1995); including Habitat Mitigation and Monitoring Proposal Guidelines.

3. Biological Opinion and Conference Report on the Prado Basin Water Treatment Project (1-6-94-F-47); U.S. Fish and Wildlife Service (December 23, 1994).

4. The Status and Management of the Least Bell's Vireo within the Prado Basin, California, 1986-1994; prepared for the Nature Conservancy by James Pike, Steve Morris and Loren Hays, M.S. (November, 1994).

5. County of Riverside Comprehensive General Plan (amended through 1989); Environmental Hazards and Resources Element

6. Draft Environmental Assessment 404(b)(1) Evaluation, Public Interest Review; Permit Application 93-00572-RRS; Orange County Water District.

IV. MITIGATION MEASURES

The proposed project will comply with terms and conditions of U.S. Army Corps of Engineers 404 Permit (No. 93-00572-RRS), including U.S. Fish and Wildlife Service Biological Opinion and Conference Report (1-6-94-F-47). These terms and conditions are part of the proposed project, and no further mitigation measures are necessary.

See Appendix B for a listing of these Terms and Conditions.

V. APPENDICES

APPENDIX A

Orange County Water District
Prado Basin Duck Ponds
Improvements Design

Introduction

The Orange County Water District (OCWD) owns about 465 acres of wetland area in the Prado Basin (see Figure 1). This acreage is leased to private parties and serves as duck ponds for hunting and wildlife habitat. This duck pond area is divided into approximately four areas which are further divided into a total of 46 ponds. Water for the wetlands is diverted from the Santa Ana River under an existing 404 permit issued by the Army Corps of Engineers (CORPS). This permit allows OCWD to divert up to 50 percent of the Santa Ana River flow through July 1994 when the permit expires. Currently, OCWD diverts about 20 to 25 cfs through the ponds. More flow is available in the river for diversion, but the flow through the ponds is limited by the capacities of hydraulic structures in the ponds. It is estimated that the current hydraulic capacity of the ponds is about 25 cfs.

Water that leaves the duck ponds blends with other water sources in the Prado Basin. These other water sources include Chino Creek, Mill Creek (also known as Cucamonga Creek), Temescal Wash, and Santa Ana River water. These blended flows are temporarily stored behind Prado Dam prior to being released through the dam and pass downstream to OCWD spreading grounds where it is recharged to the groundwater basin for eventual use as the primary source of municipal and industrial supply. Data suggests that nutrients are removed as the water flows through the duck ponds; thus, the OCWD is interested in increasing flow through the ponds to maximize the nutrient removal capacity. A flow of about 100 cfs has been suggested as the ultimate flow diversion, but improvements to the ponds will be necessary to accommodate a flow of 100 cfs.

Presently, the base flow in the Santa Ana River during the summer and early fall is about 70 cfs. The baseflow in the river is expected to increase significantly in the future as the population of the Inland Empire increases resulting in increased wastewater discharges to the Santa Ana River. Under existing permit conditions, a maximum flow of about 35 cfs may be diverted from the river. OCWD is proposing to design modifications to the ponds to accommodate an ultimate flow of 100 cfs. OCWD intends to apply for a modification to the diversion permit in 1994 to allow more flow to be diverted from the Santa Ana River. The proposed improvements are expected to be built in 1993 and it is assumed that the modified diversion permit will be approved to allow this ultimate flow. In addition, if the flow diverted from the Santa Ana River is not 100 cfs, OCWD may apply for a permit to augment Santa Ana River flow by diverting water from nearby Mill Creek for water quality enhancement purposes. The combination of increased base flow in the Santa Ana River and a modified diversion permit for higher flows, and potential diversions from Mill Creek may provide the ultimate flow of 100 cfs to the duck ponds in the future.

It should be noted that flow through the duck ponds is anticipated to gradually increase each year until ultimately 100 cfs of diverted flow is available. During this interim period, water depths in the ponds may be operated at slightly shallower depths than is ultimately anticipated in the design presented in this permit application. Operating the ponds at shallower depths will enhance habitat for waterfowl.

OCWD is applying for permits necessary to complete improvements to the duck ponds. The purpose of this document is to provide support information necessary to complete the permit application. The following subjects are presented in this document.

- Existing Layout
- Proposed Layout
- Mitigation Areas
- Cell Types
- Hydraulics
- Jurisdictional Fill
- Construction Phasing
- Recreational
- Operation, Maintenance, and Monitoring
- Special Conditions

Existing Layout

The Prado Basin Duck Ponds are comprised of 5 areas commonly referred to as Raahauges, Mill Creek, Upper Roland, Splatter S, and Lower Roland (see Figure 2). The Splatter S is owned by the CORPS and comprises of 12 ponds. The remaining four areas are subdivided into 46 pond ("cells") with the following number of ponds for each area:

- Raahauges - 7
- Mill Creek - 7
- Upper Roland - 14
- Lower Roland - 18

There are also several channels that are located on the borders between the five areas. The locations of these channels are as follows:

- Between Mill Creek and Upper Roland
- Between Splatter S and Upper Roland
- Between Mill Creek and Splatter S
- Between Splatter S and Lower Roland

The first three channels listed above could be considered one channel except for the fact that they are separated by levees with flow control structures. Most of the flow control structures consist of weir boxes with weir lengths varying from 2- to 5-feet. There is usually

one. but sometimes two. flow control structures on the levee between each pond.

The Santa Ana River runs along the east and south sides of the duck ponds in a general east to west flow pattern. Mill Creek flows along the north side of the ponds. while Chino Creek is located on the western edge. Mill Creek flows into Chino Creek near the northwest corner of the ponds. Water from the ponds flows into Chino Creek which flows into the Santa Ana River downstream of the ponds, but upstream of Prado Dam. Mill Creek primarily drains local agricultural land to the north of the duck ponds. Chino Creek carries drainage from both rural and urban sources. The Santa Ana River carries drainage water primarily from urban sources.

Proposed Layout

The proposed changes to the duck ponds include the construction of new berms, removal of a few existing berms. and construction of flow control (weir boxes) and transfer structures. Figure 3 shows a plan view of the proposed changes. The following improvement types will be discussed:

- Berms
- Weir Boxes
- Transfer Structures
- Cattail Channels

It should be noted that improvements will be made in only the Raahauges, Mill Creek, Upper Roland, and Lower Roland areas. It was determined that improvements would not be made to the Splatter S area since it is not owned by OCWD.

Berms

The improvements include the removal of an existing berm between Mill Creek ponds 5 and 6 and the addition of several internal berms at other locations. Internal berms are defined as those berms that divide pond cells. There are two types of internal berms to be constructed, these being internal berms without weir boxes (narrow) and internal berms with weir boxes (wide) as shown in Figure 4. Internal berms without weir boxes are to be used to divide the pond cells but not allow vehicle traffic since they are only 5 feet wide at the top of the berm. The internal berms with weir boxes will have a top width of 12 feet to allow vehicle traffic in order to more easily access and adjust weir boxes.

The new berms will be constructed so the top of the berm is a maximum of 1 foot above the normal upstream pond water surface elevation. Constructing a berm just slightly above the water surface elevation will allow waterfowl to fly from one pond to another without a major obstruction.

three trains and is assumed to handle a normal flow of about 90 cfs. so each train will be designed with a capacity of 30 cfs. The bypass channel will be designed to handle a normal flow of 10 cfs through one train.

Initially, the ultimate flow of 100 cfs is expected to occur only in the winter and spring periods when there is sufficient flow in the river to divert 100 cfs while remaining in compliance with conditions of the existing diversion permit. The summer and fall periods have lesser diversion flows. Presently, the flow to the duck ponds is about 25 cfs during the summer and fall but will be increased to about 35 cfs beginning in November 1992. To provide reliability and redundancy in operation and maintenance. each area should be designed to accommodate one-half of the ultimate flow. With minor operational changes, all areas could accommodate a flow of 50 cfs except the bypass channel on the north side of the Lower Roland area. Additional flow structures will need to be added to increase the capacity of this channel from the normal 10 cfs flow to 50 cfs.

Velocities

Based on the flow rates described in the previous section. the flow velocities in the ponds will be much less than 1 foot per second (fps) under maximum flow conditions. The velocities will average about 0.1 fps in the ponds and about 0.5 fps in the conveyance ditches.

Pond Depths and Volumes

The average depths for the various duck ponds depends on the cell type. As stated earlier, the average depths for the three cell types are as follows:

- Type 1 - 1 foot
- Type 2 - 2 feet
- Type 3 - 3 feet

The volume of water in each pond cell depends on the type and surface area. In general, the total surface area and water volume under normal operating conditions in the duck ponds for each type of cell are as follows:

- Type 1 - 120 acres and 120 acre-feet
- Type 2 - 200 acres and 400 acre-feet
- Type 3 - 100 acres and 300 acre-feet

The total pond surface area is estimated to be about 420 acres with a total volume of about 820 acre-feet.

Basin Storage Volumes

The current (normal) operating water surface elevation of the duck ponds is not expected to change as a result of the improvements. Thus, the amount of flood storage available in Prado Basin will not be impacted and should remain approximately the same.

Jurisdictional Fill

Jurisdictional fill is considered any fill that is added to the wetlands regardless of the source of fill material. Fill in the jurisdictional wetlands has been defined as the fill placed below a certain elevation in the ponds. There are two cases to determine fill based on whether the pond bottom is located above or below the 500 foot elevation. The 500 foot elevation is significant since this is assumed to be the Ordinary High Water (OHW) mark.

Case 1 - For pond bottom elevations initially below 500 feet, the fill is determined by calculating the fill added to the pond below the 500 foot elevation.

Case 2 - For pond bottom elevations initially above 500 feet, the fill is determined by calculating the fill below an assumed OHW equal to the average depth of water in each pond (estimated to be 1.5 feet).

In the case where fill is added to a pond bottom that is initially below 500 feet, but is filled to an elevation above 500 feet, then the total fill is determined by adding the fill from both case 1 and case 2.

The total jurisdictional fill for the duck ponds is equal to the sum of the fills for these two cases. Figure 16 shows the estimated jurisdictional fill at various locations in the ponds. The total amount of jurisdictional fill is estimated to be about 24,000 cubic yards.

Although some new ditches with relatively steep side slopes will be added to the duck ponds, the addition of rock for erosion control will not be necessary. Investigation of existing ditches in the duck pond areas with steep side slopes show no sign of erosion due to 1) low channel velocities 2) vegetation in channels to stabilize ditches.

Construction Phasing

Construction activities under this proposed project will be phased to occur both during the vireo season (March 15 to September 15) and non-vireo season (September 15 to March 15). Construction of the perimeter conveyance ditches and pond grading close to these ditches will occur only during the non-vireo season. All other construction activities will occur during the vireo season in areas that are a minimum of 250 feet from known vireo habitat.

Recreational Use

The Prado Basin Duck Ponds are commonly used for recreational purposes. especially in the Raahauge area. The following recreational activities will occur in the duck ponds:

- General hunting on all ponds. except pond mitigation areas. between October 15 and January 31.
- Dog training in Raahauges ponds 1 to 4 between January 31 and October 15.
- Fishing in small boats with trolling motors in Raahauges ponds 1 to 4 between January 31 and October 15.
- Camping and other outdoor recreational activities by community groups in Raahauges ponds 1 to 4 between January 31 and October 15.

In addition. no recreational vehicular traffic wil be permitted on the Mill Creek and Upper Roland perimeter conveyance ditch roads during the vireo season. All pond areas outside of Raahauge ponds 1 to 4 will be off-limits to recreational uses during the vireo season. The location of these various activities are shown in Figure 18.

Operation, Maintenance, and Monitoring

Allowed operation, maintenance, and monitoring activities will depend on time and location. During the least Bell's vireo season (March 15 to September 15), no activities will be allowed within 250 feet of the perimeter ditch road except vehicular and foot traffic to adjust hydraulic conditions in the ponds and emergency maintenance and repair work to ditches, ponds, vegetation. and hydraulic structures. Normal operation, maintenance, and monitoring activities will be allowed during the vireo season outside of the 250 area around the perimeter levees. Also. normal operation, maintenance, and monitoring activities will be allow during the non-vireo season at any location in the ponds.

Normal maintenance activities in the duck ponds have been established and are as follows.

Vegetation

General

A weed control program will be established, requiring removal of competing species and weed species such as giant reed grass (*Arundo donax*), Castor bean (*Ricinus communis*), salt cedar (*Tamarix ramosissima*), and peppergrass(*Lepidium latifolia*).

Devegetation and clearing of pond sections adjacent to duck blinds will be performed.

Vegetation around the duck blinds are typically removed in a 100 foot radius around the blind.

Cattails and Bulrush (Existing Ponds)

Vegetation to be established in the ponds will consist mainly of cattails (*Typha* spp.) and bulrush (*Scirpus* spp.). Additional desirable species such as *Carex* species, arrowheads (*Sagaittaria* spp.), and *Juncus* spp. will be added to the species mix if sufficient parent material is identified within the pond areas. Currently, cattails and bulrush occur only in certain areas of the ponds, particularly in the center channel and in patches in some of the deeper ponds. These species may not be successful in the existing ponds because of the current hydrological regime and the vegetation maintenance activities that occur prior to the duck hunting season. In areas where sufficient source material is already present within the pond, weed control may be the only measure needed to ensure revegetation by cattails and bulrush. In those areas, vegetation will be monitored for the first year; if cattails and bulrush have not successfully established, then additional plantings will be undertaken as described below.

Planting of cattails and bulrushes can be undertaken in one of three ways: 1) spreading of topsoil from areas with appropriate existing vegetation; 2) spreading of cattail and bulrush seed; or 3) planting plugs, roots, or rhizomes. Water will be drawn down during planting to avoid the loss of the plant material. If top soil is used, material shall be removed from areas with appropriate vegetation and placed on the bottom surface of the new pond areas once these have been graded. If plant material is used, material should be planted on 2-3 foot centers. Seed should be collected at the appropriate time (when cattails heads are ready to scatter), and properly stored prior to broadcast seeding. Seed mixed with sand will spread more evenly. Seed should then be tamped into the topsoil layer. If seed is used, inundation must be controlled until the seedlings have become established.

Willow and Mulefat (Mitigation Areas)

A site maintenance and management plan will be prepared, covering replacement of diseased or dying plants; monitoring the need for supplemental watering; protection of plants from browsing, trampling, or competition by weed species. On-going maintenance and monitoring of the plantings will consist of minimum bi-weekly visits to review site factors such as drought stress on plants, loss of plant material through predation, natural regeneration, and weed control. With the combination of flooding from the Prado Dam and high groundwater elevations underlying the sites, the need for supplemental watering should be minimal. The revegetation sites will be monitored regularly to determine the need for supplemental watering. If the need for supplemental watering is identified, the abandoned pond mitigation sites will be irrigated temporarily either by short-term, shallow flooding using the existing weirs, or pumping water from adjacent ponds. Water levels in the island ponds will be adjusted if needed to provide additional water to the island plantings. The areas will be clearly marked as a revegetation area to avoid inadvertent

encroachment, flooding, or other damage to the plantings.

A compliance monitoring program will be established, and will include gathering data on the revegetation plan's success and submitting annual reports for a 5-year period. Success criteria will be clearly identified based on the goal densities and species mix established. The monitoring plan would require twice yearly surveys for 5 years following completion of the restoration effort. If replacement of unsuccessful plantings exceeds 20% of the original plantings, additional monitoring would be required for 5 years following that replacement. Credit will be provided for willows or mule fat that reestablish naturally in determining success based on the percent survival or density.

In the unlikely event that initial attempts at revegetation are unsuccessful, the results of the regular monitoring and twice yearly survival monitoring will be reviewed for information that would provide an understanding of the reasons for failure. Possible contributing factors could include climatic or operational factors, such as unusually high or prolonged flooding; failure to provide supplemental watering during a poor water year; poor quality or damaged nursery stock; uncontrolled competition from weed species; improper handling of plant material in the field during collection or installation phases. Only by reviewing plantings in the field, monitoring data, and patterns of survival can appropriate remedial action be taken.

Site

The levees shall be periodically mowed on a year round basis, reinforced (as needed) for erosion control, reseeded with Bermuda grass, and modified temporarily to repair or replace hydraulic structures. Periodic maintenance of duck blinds will occur.

Special Conditions

OCWD has established the following special conditions to apply to the Prado Basin Duck Ponds. These special conditions were reviewed with officials from the CORPS and USFWS on October 5, 1992.

- No work will be performed within 250 feet of the perimeter ditches during the least Bell's vireo season from March 15 to September 15 each year, except for emergency repairs to existing weirs and levees to maintain water levels. The CORPS and USFWS will be informed of any emergency work prior to commencement.

- Water will remain in at least 50 percent of the ponds at all times to maintain riparian habitat.

- OCWD will develop a weed control plan for the ponds and pond levees that will be submitted to the CORPS and USFWS for approval within a period of

three months following issuance of this permit. The plan will include a strategy for continual removal of giant reed. castor bean. and cocklebur. All herbicides used to carry out this plan will be EPA approved.

- OCWD will develop a weed control plan for its property in the Prado Basin as part of its activities within the Nature Conservancy and will submit this plan to the CORPS and USFWS within six months following issuance of this permit. The plan will include a strategy for removal of giant reed, castor bean. and cocklebur. At least 30 acres of OCWD property will be identified for Arundo removal within one year after issuance of this permit. All herbicides used to carry out this plan will be EPA approved.

- OCWD will convert approximately 35 acres of pond area to least Bell's vireo habitat as shown in Figure 8. Mule fat will be planted on ten-foot centers and willows on twelve-foot centers in this delineated area as needed to augment natural growth.

- OCWD will construct ten islands approximately 1/4 to 1/2 acre each of various design as shown in Figure 10 for vireo and waterfowl enhancement. Five of these islands will be planted with mule fat and willow on ten-foot and twelve-foot centers, respectively, as needed to augment natural growth.

- OCWD will avoid all willows in the vicinity of the project, except as they fall naturally. In the event that willows are inadvertently removed or killed, they shall be replaced at a ratio of 3:1 with one gallon or larger stock within one month. OCWD shall inform the CORPS if this event occurs.

- OCWD will obtain a State Water Quality Certification or Waiver (or furnish proof that said documentation is pending) from the Regional Water Quality Control Board pursuant to Section 401 of the Clean Water Act within six months of issuance of this permit.

- OCWD will attempt to provide a sufficient quantity of tail water, when available. to the Splatter-S Duck Club in order to fulfill the water needs of the club as requested. Splatter-S will be responsible for labor and/or other incidental expenses relating to this provision.

- OCWD will be granted the ability to alter plant material in the duck ponds as needed to enhance water quality.

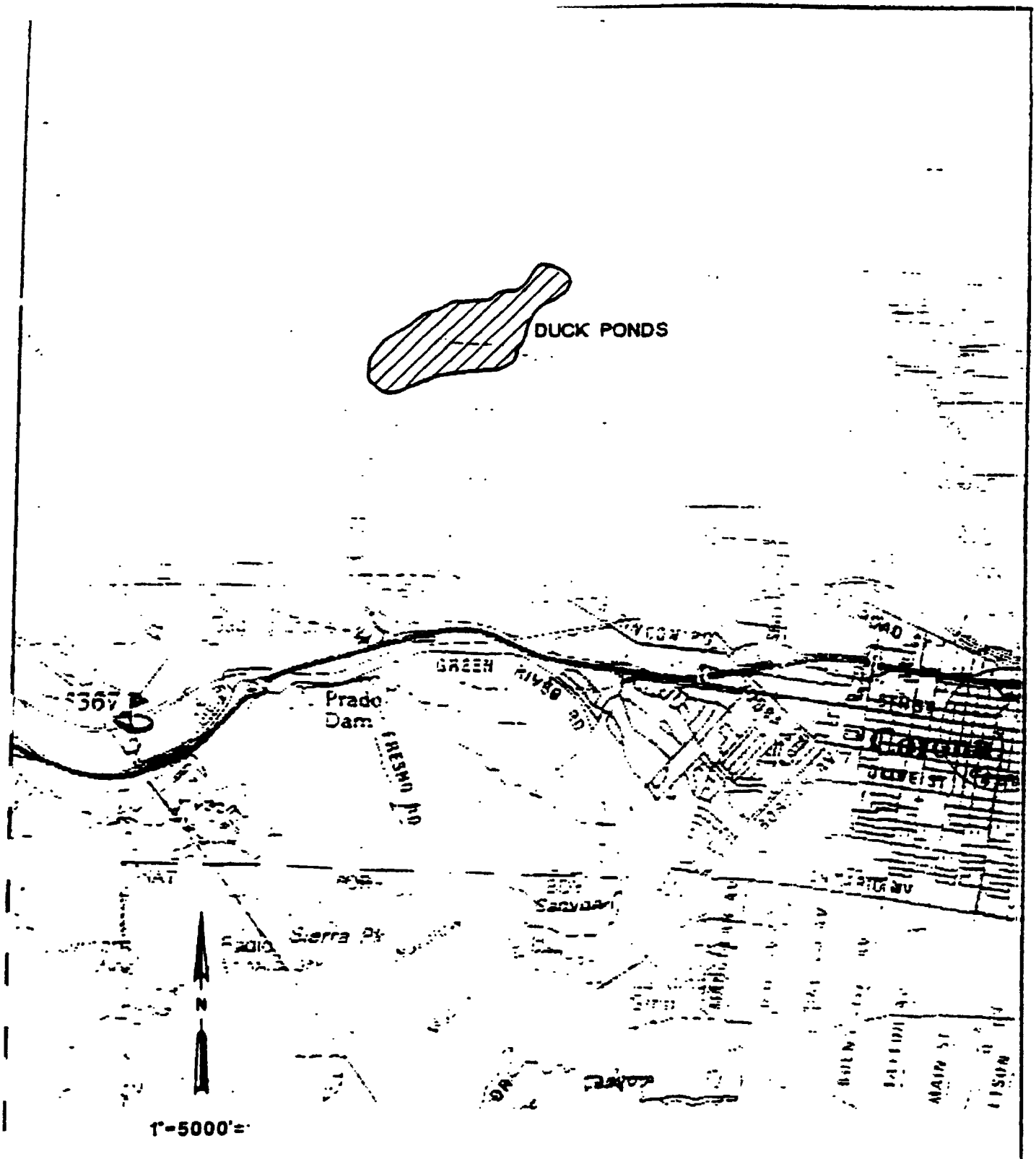
- OCWD will be granted the ability to upgrade the water conveyance system in the ponds by installation of conveyance ditches, weir boxes. pipes. and other hydraulic structures as shown in Figures 3 to 6 except as stated herein other special conditions.

- OCWD will remain an editing and approving entity for the draft Prado Flood Control Basin Waterfowl Management Plan until the plan is finalized.

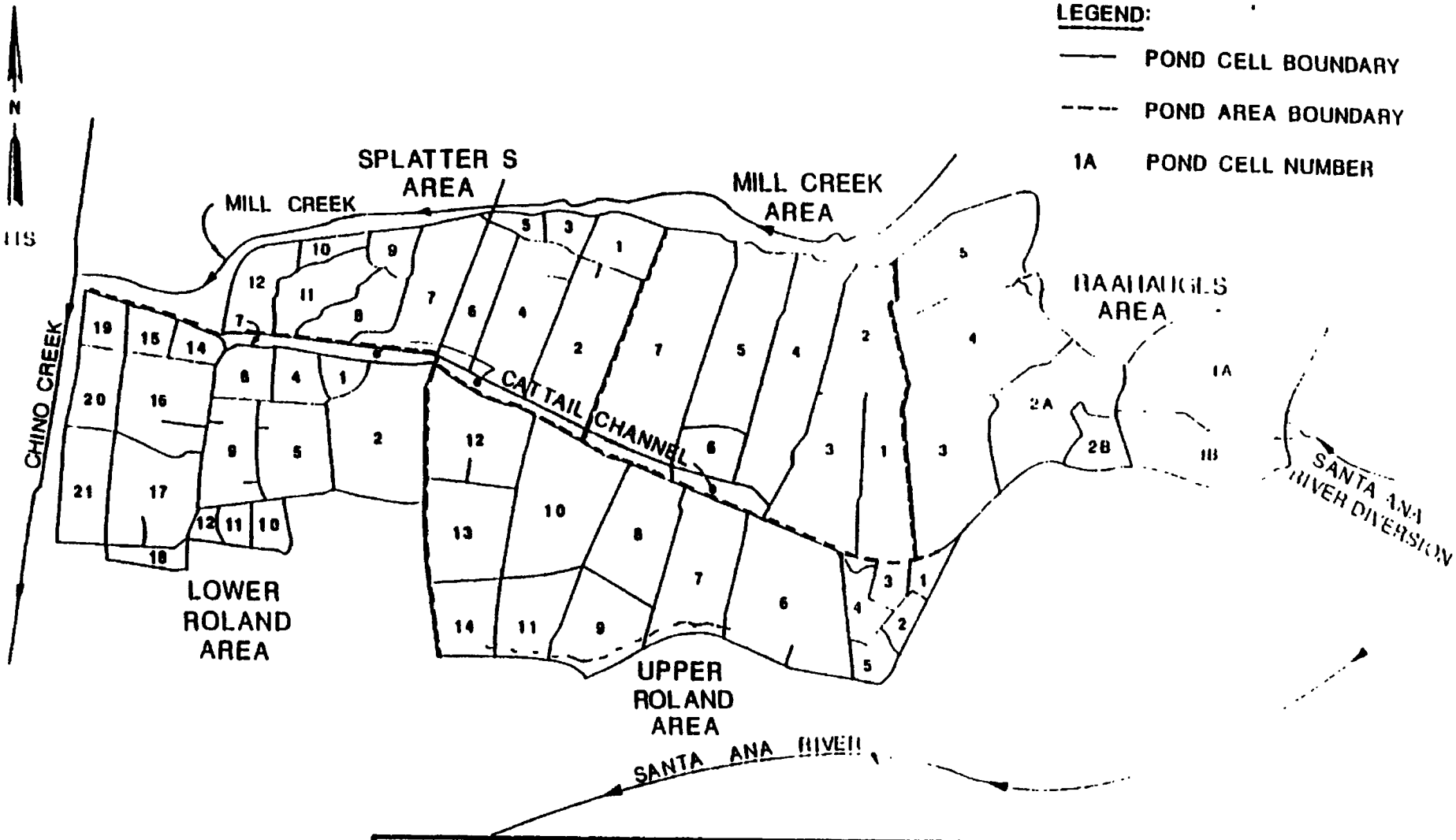
- OCWD will maintain water in all duck ponds during the bird breeding season from March 15 to August 1 except those ponds undergoing routine and emergency maintenance.

- OCWD will provide a report describing the hydrologic regime based on any new weir construction before construction begins and submit this report to the CORPS and USFWS.

- OCWD will not be obligated to continue diverting water to the duck ponds if OCWD decides to cease operations in the duck ponds prior to expiration of this permit.



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	**GENERAL LOCATION MAP**
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	**RIVERSIDE COUNTY, CALIFORNIA** OCTOBER 1992 FIGURE 1 OF 18



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS

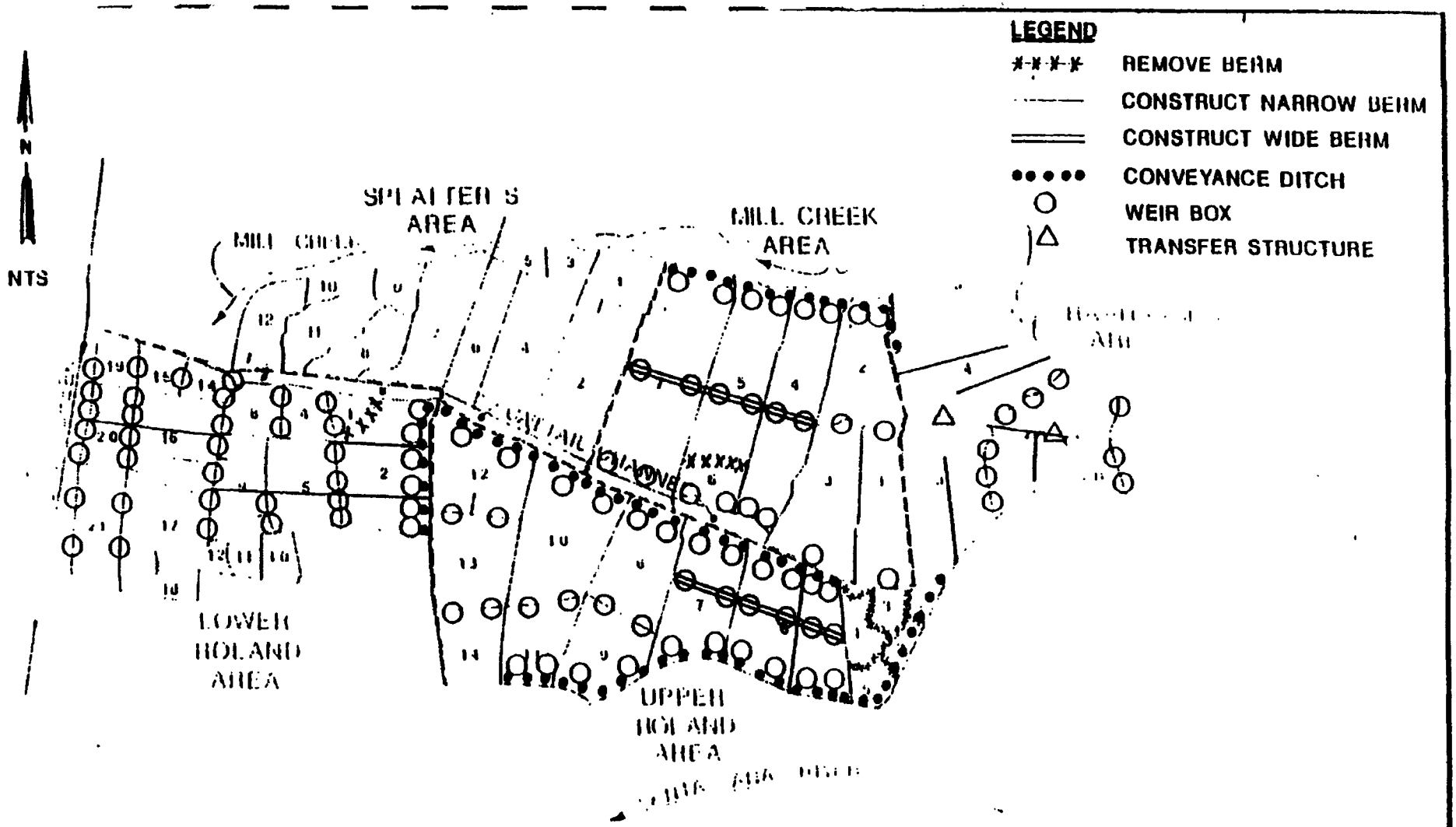
APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

EXISTING DUCK PONDS

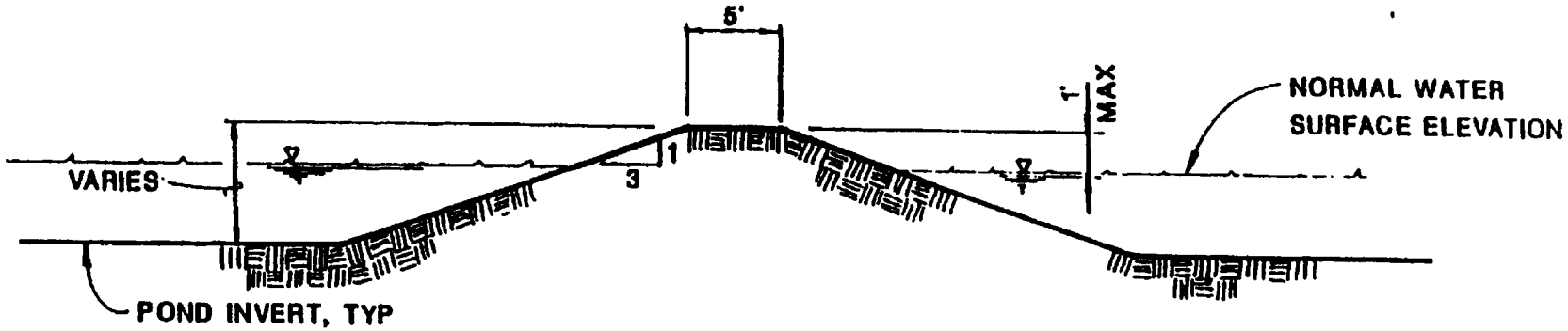
RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992 FIGURE 2 OF 16

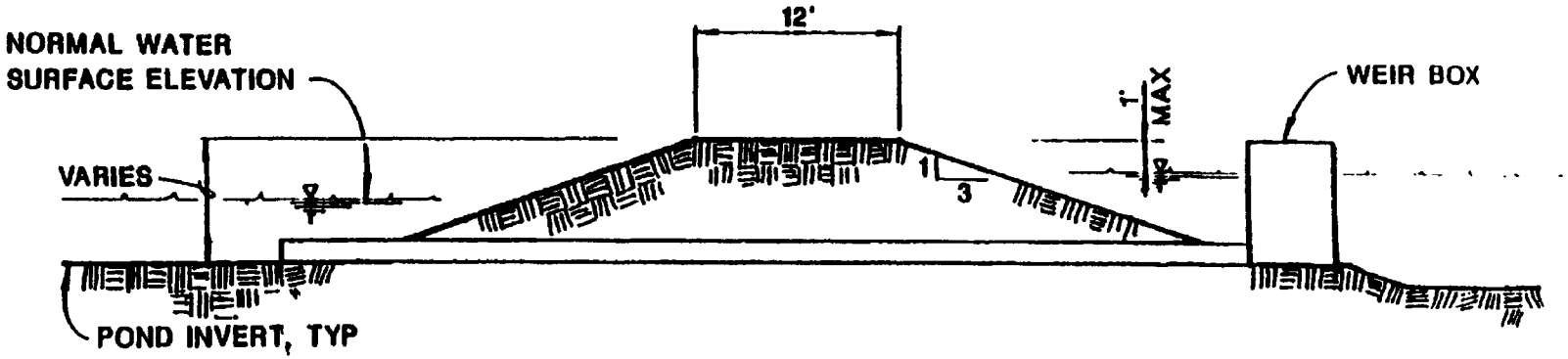
LA03 1228.HA



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	**PROPOSED LAYOUT**
APPLICATION BY: **ORANGE COUNTY WATER DISTRICT** **10500 ELLIS AVE P.O. BOX 8300** **FOUNTAIN VALLEY, CALIFORNIA** **92728-8300**	**RIVERSIDE COUNTY, CALIFORNIA** **OCTOBER 1992** **FIGURE 3 OF 18**



INTERNAL BERM WITHOUT WEIR BOX (NARROW)



INTERNAL BERM WITH WEIR BOX (WIDE)

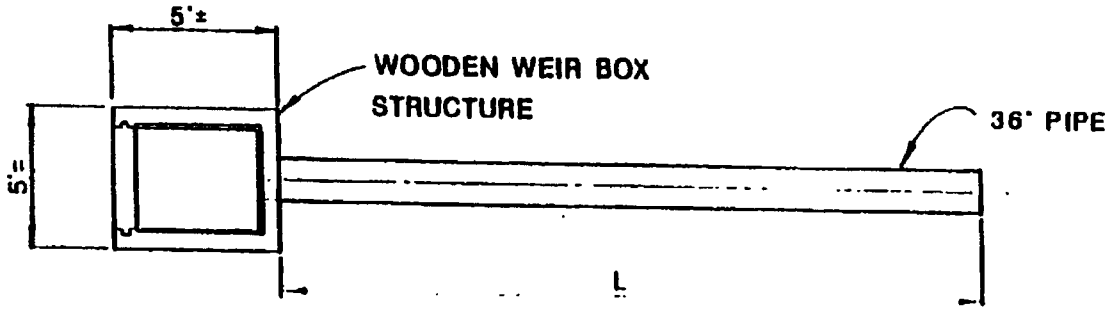
PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

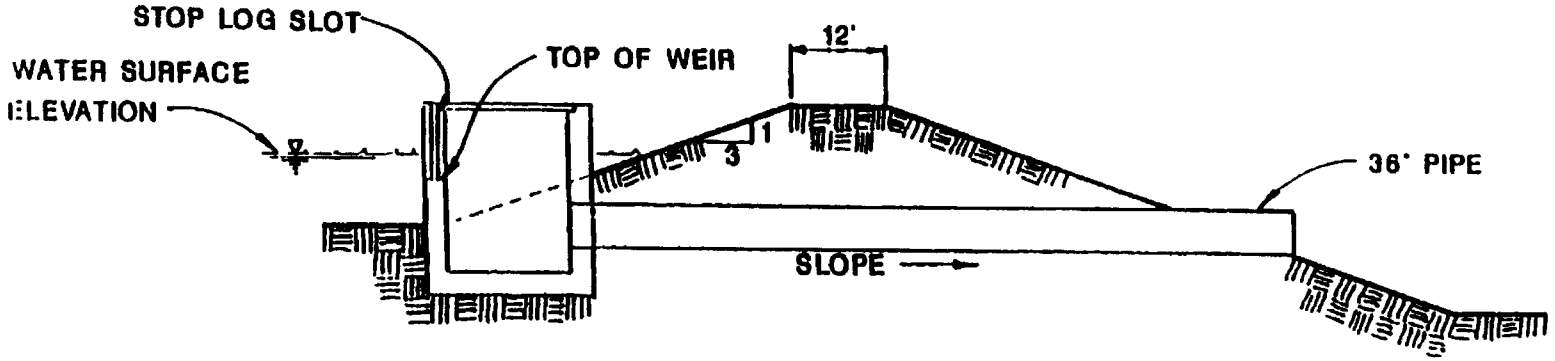
INTERNAL POND BERMS

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992

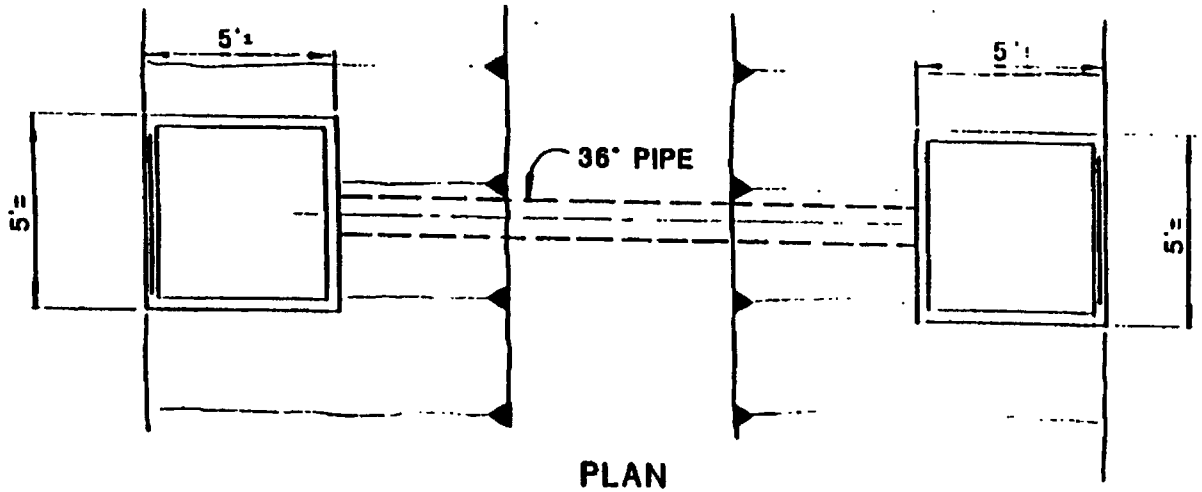


PLAN
NTS

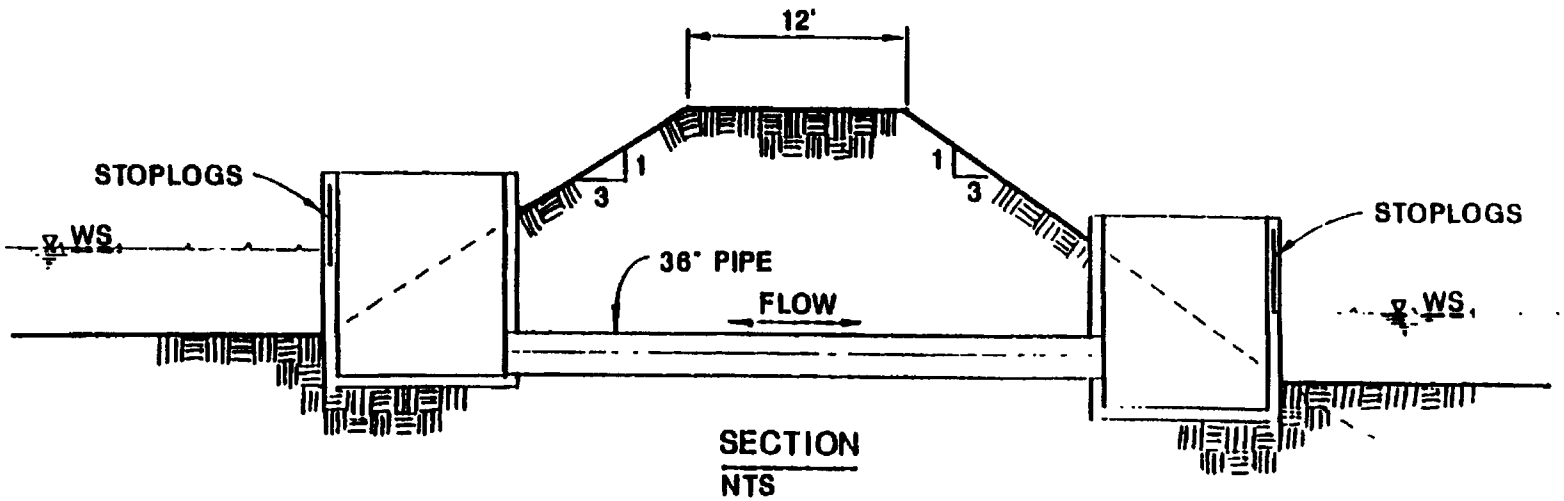


SECTION
NTS

PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	POND WEIR BOX
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 5 OF 18



PLAN
NTS



SECTION
NTS

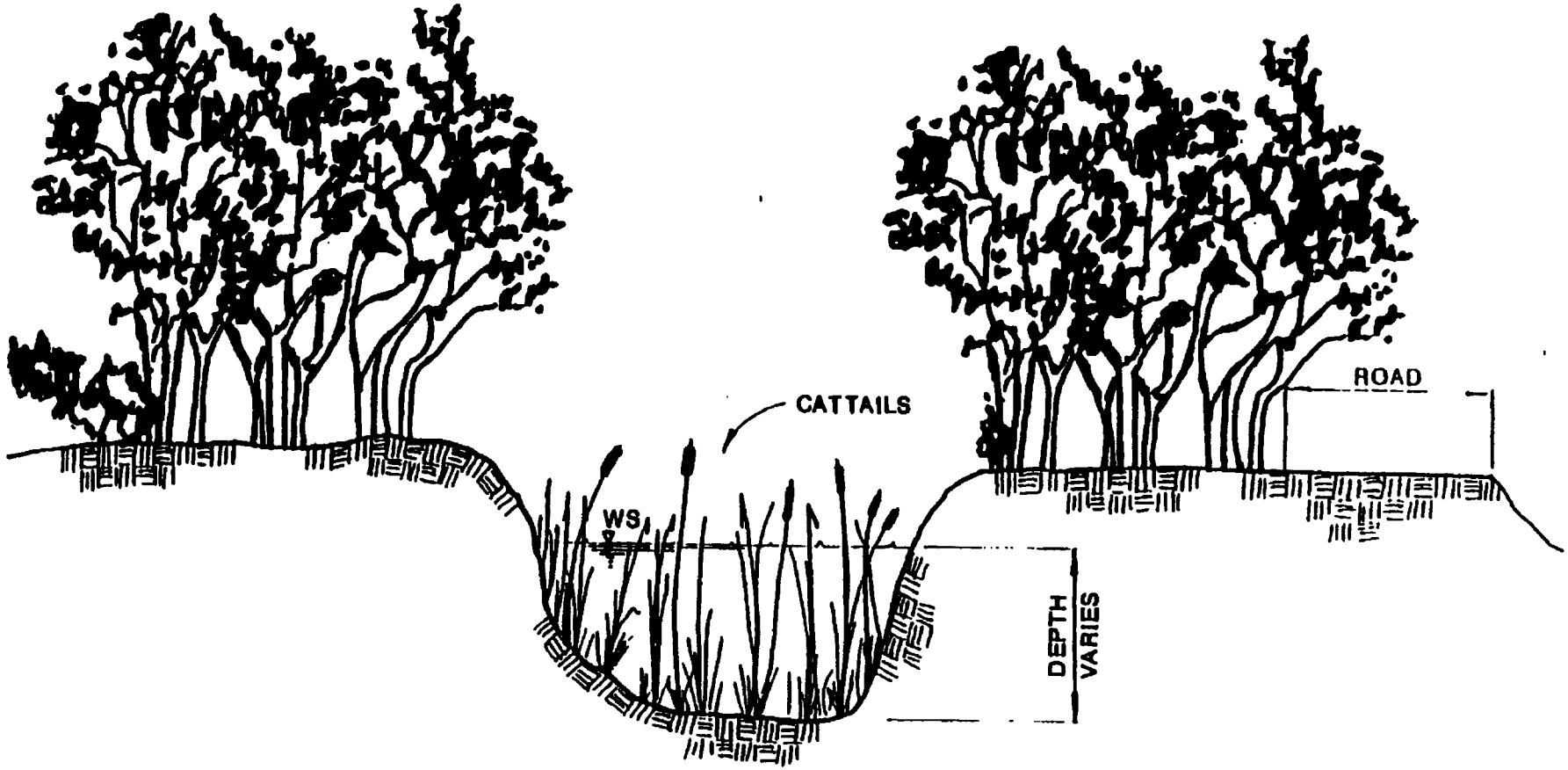
PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

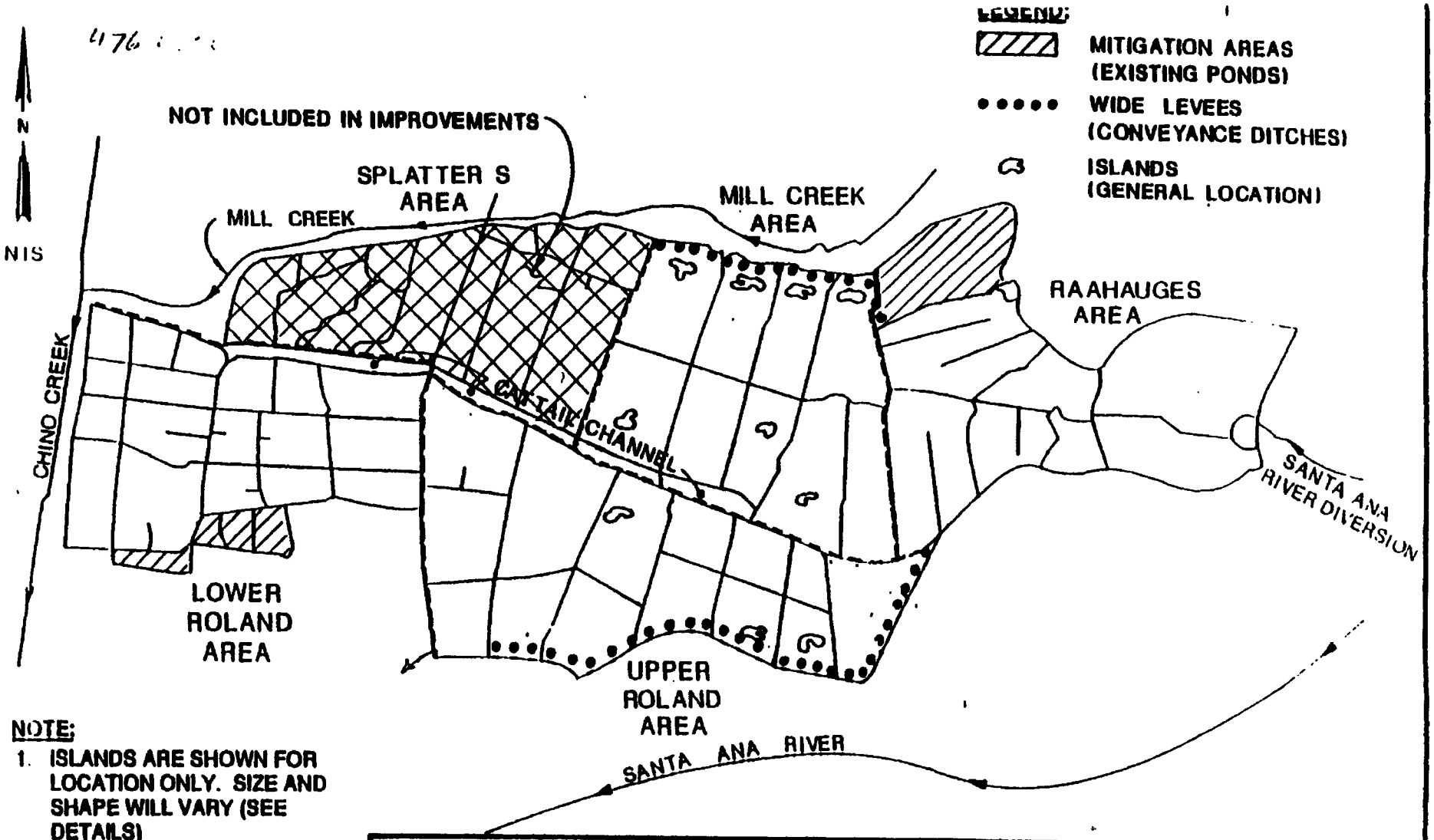
POND TRANSFER STRUCTURE

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	CATTAIL CHANNEL CROSS SECTION
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 7 OF 18



NOTE:

1. ISLANDS ARE SHOWN FOR LOCATION ONLY. SIZE AND SHAPE WILL VARY (SEE DETAILS)
2. MITIGATION AREAS CONSIST OF EXISTING PONDS, CONVEYANCE DITCHES AND ISLANDS SHOWN ON LEGEND

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

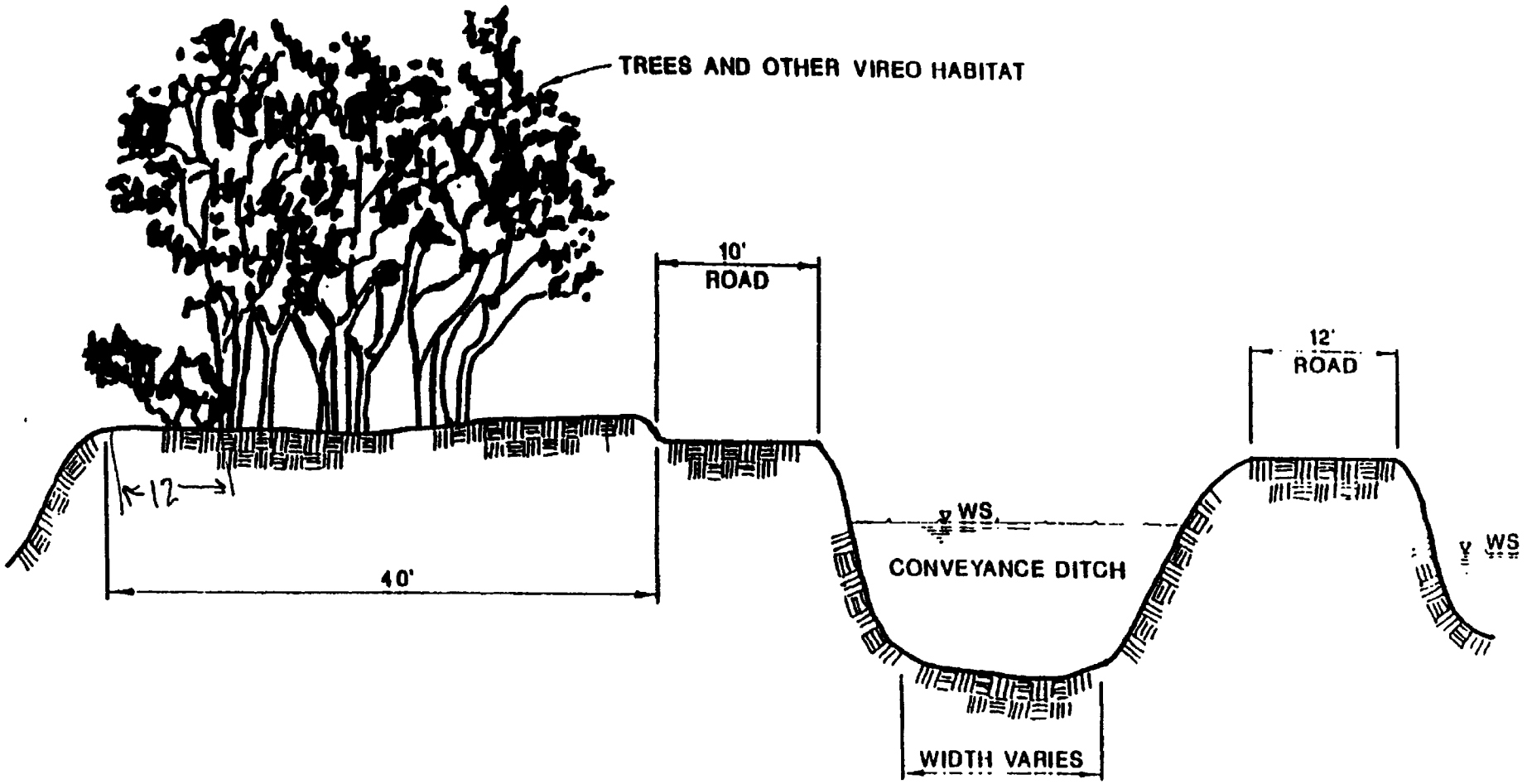
APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

MITIGATION AREAS

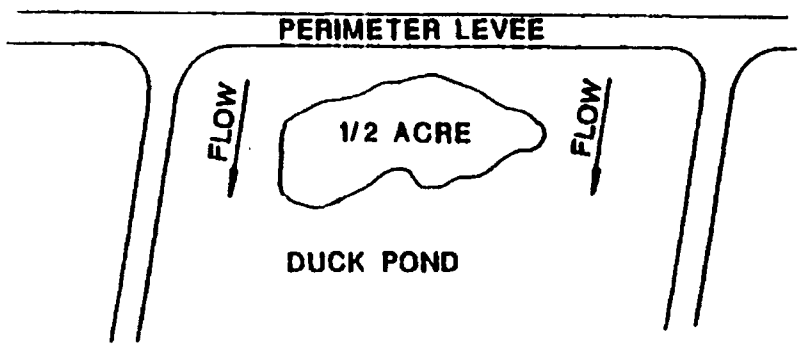
RIVERSIDE COUNTY, CALIFORNIA

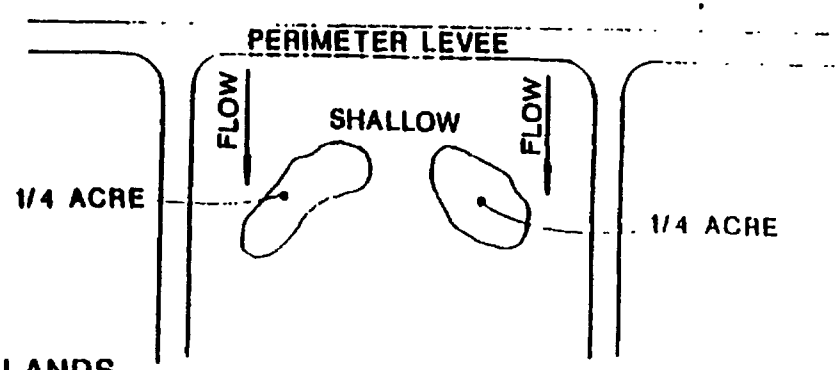
OCTOBER 1992 **FIGURE 8 OF 18**

LAO33228.HA

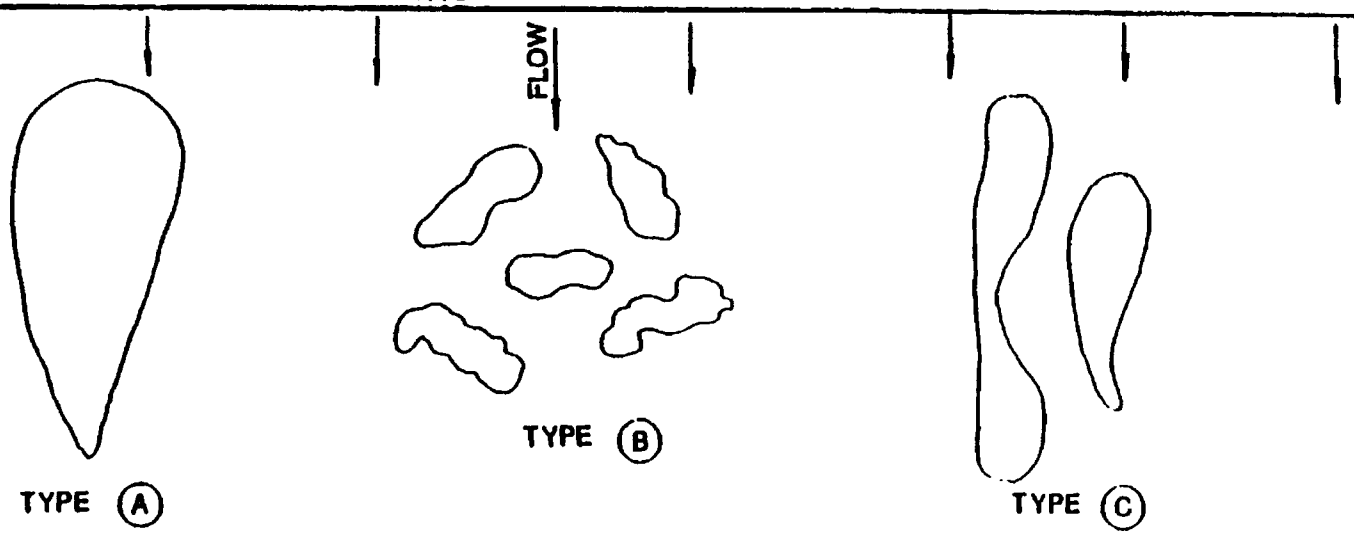


PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	MITIGATION LEVEE ALONG PERIMETER CONVEYANCE DITCH
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA	RIVERSIDE COUNTY, CALIFORNIA
	OCTOBER 1982 FIGURE 9 OF 16



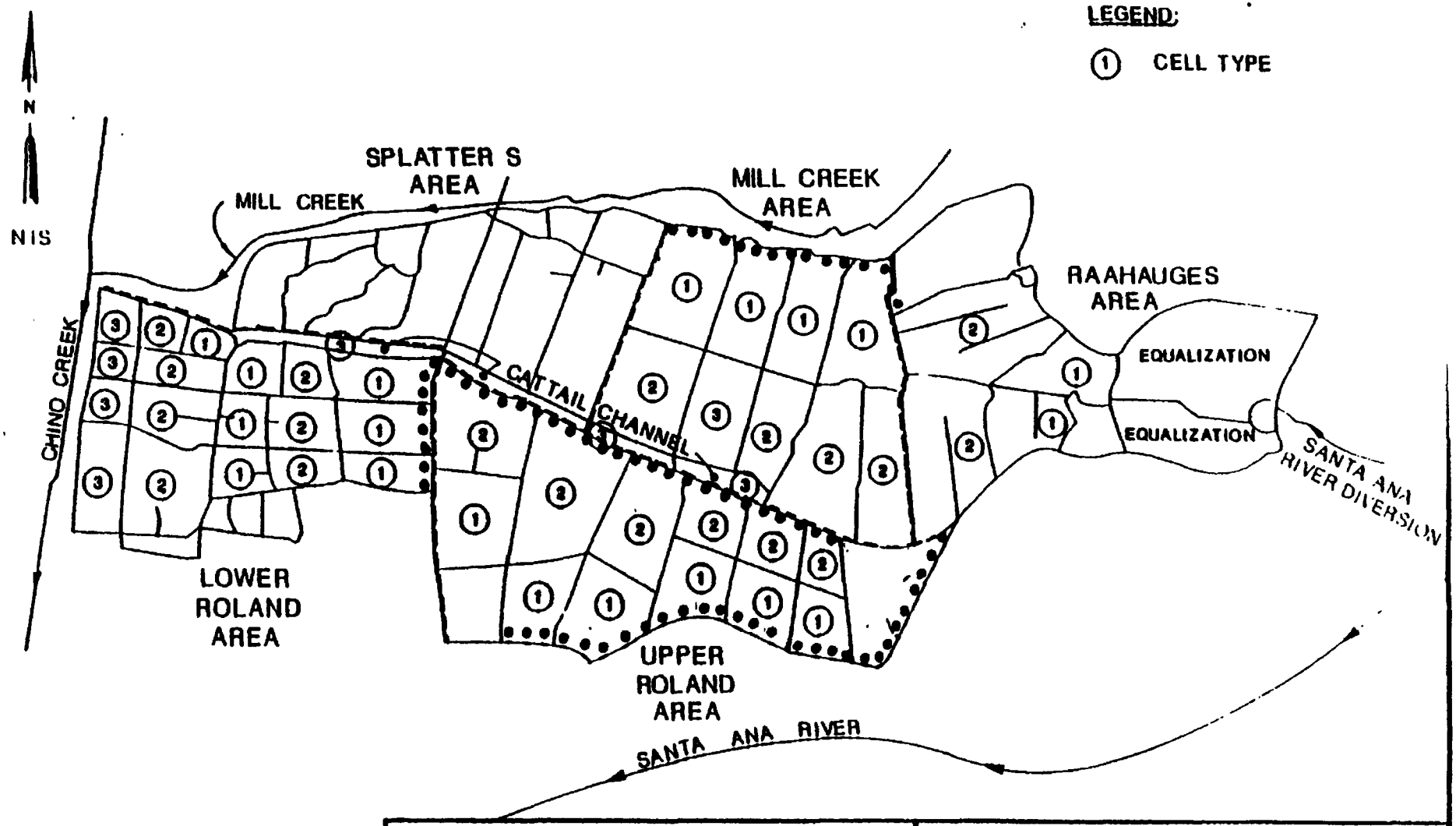


VIREO ISLANDS
NTS



WATERFOWL ISLANDS
NTS

PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	ISLANDS FOR MITIGATION
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 10 OF 10



PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

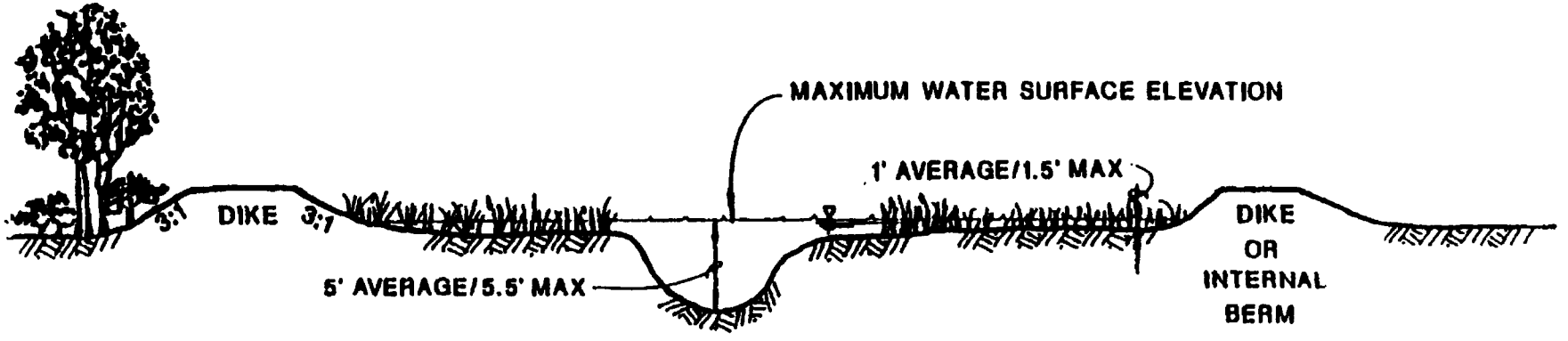
PROPOSED LAYOUT CELL TYPES

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992 **FIGURE 11 OF 18**

LA033128.HA

TYPE 1 WETLAND CELL (EMERGENT WETLAND)



EMERGENT VEGETATION

- CATTAILS
- BULRUSH

OPERATIONAL OBJECTIVES

- NUTRIENT REMOVAL
- METALS REMOVAL

POND DEPTH	% AREA	VEGETATION
5'	11	NO VEGETATION/BULRUSH
0.5'	89	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

TYPE 1 CELL

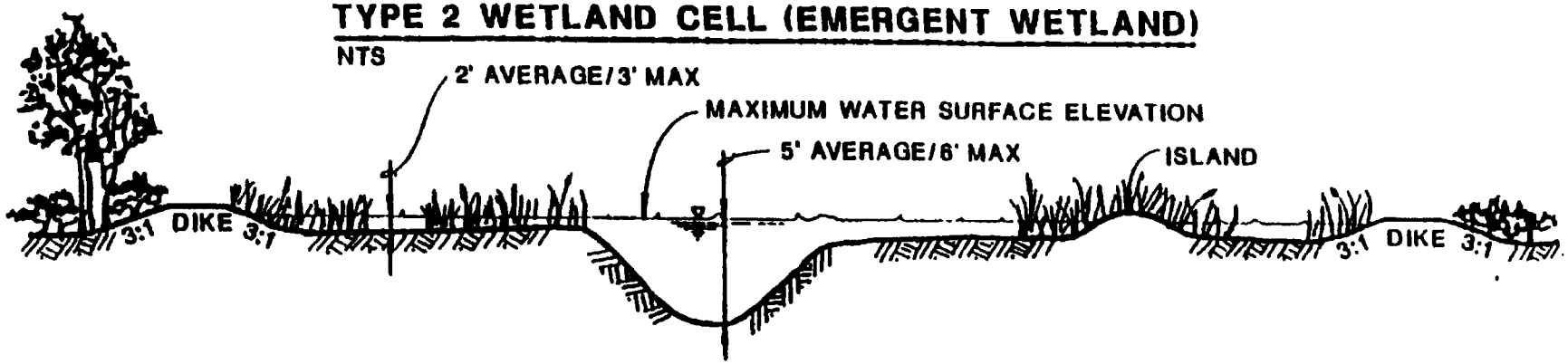
RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992 FIGURE 12 OF 18

LA033226.PR

TYPE 2 WETLAND CELL (EMERGENT WETLAND)

NTS



RIPARIAN VEGETATION | EMERGENT VEGETATION | OPEN WATER | EMERGENT VEGETATION | GRASS | EMERGENT VEGETATION | RIPARIAN VEGETATION

EMERGENT VEGETATION

- CATTAILS
- BULRUSH

OPERATIONAL OBJECTIVES

- NUTRIENT REMOVAL
- METALS REMOVAL
- SEDIMENT REMOVAL

POND DEPTH	% AREA	VEGETATION
5'	10	NO VEGETATION/DUCKWEED
2'	60	CATTAIL/BULRUSH (50%)
1'	30	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

TYPE 2 CELL

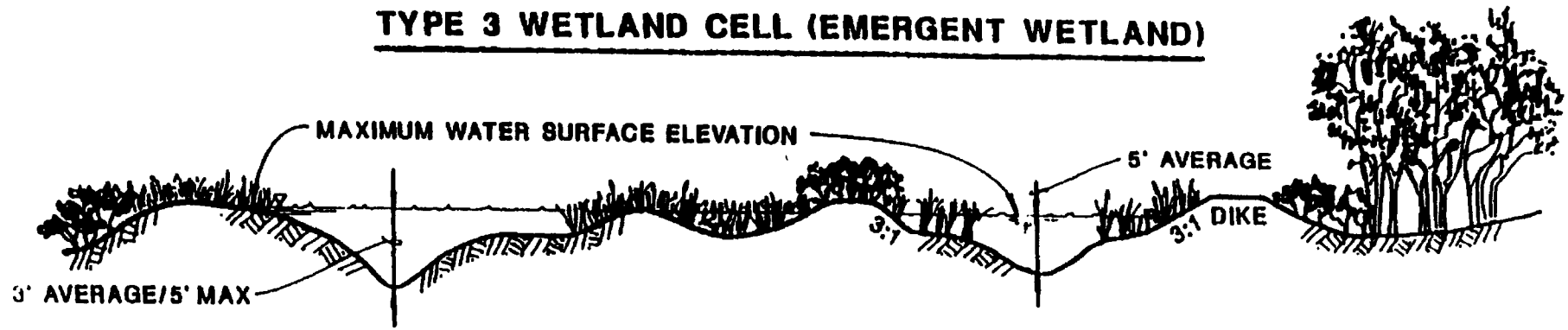
RIVERSIDE COUNTY, CALIFORNIA

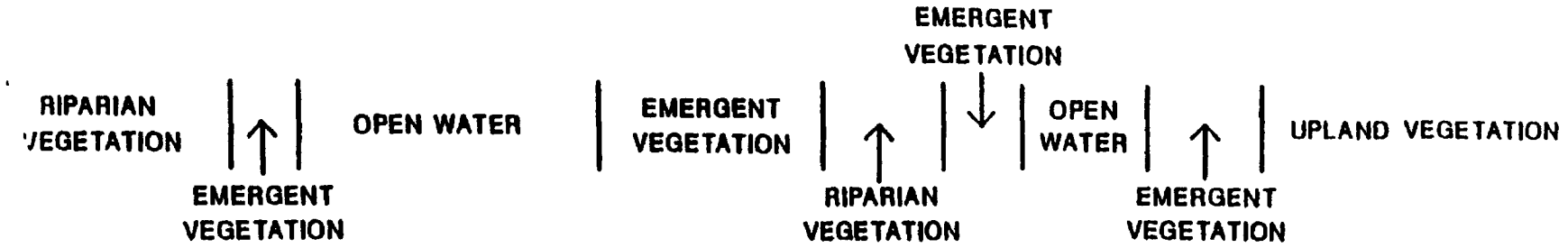
OCTOBER 1992

FIGURE 13 OF 18

LA033226.P

TYPE 3 WETLAND CELL (EMERGENT WETLAND)





EMERGENT VEGETATION

- CATTAILS
- BULRUSH
- WILLOWS

OPERATIONAL OBJECTIVES

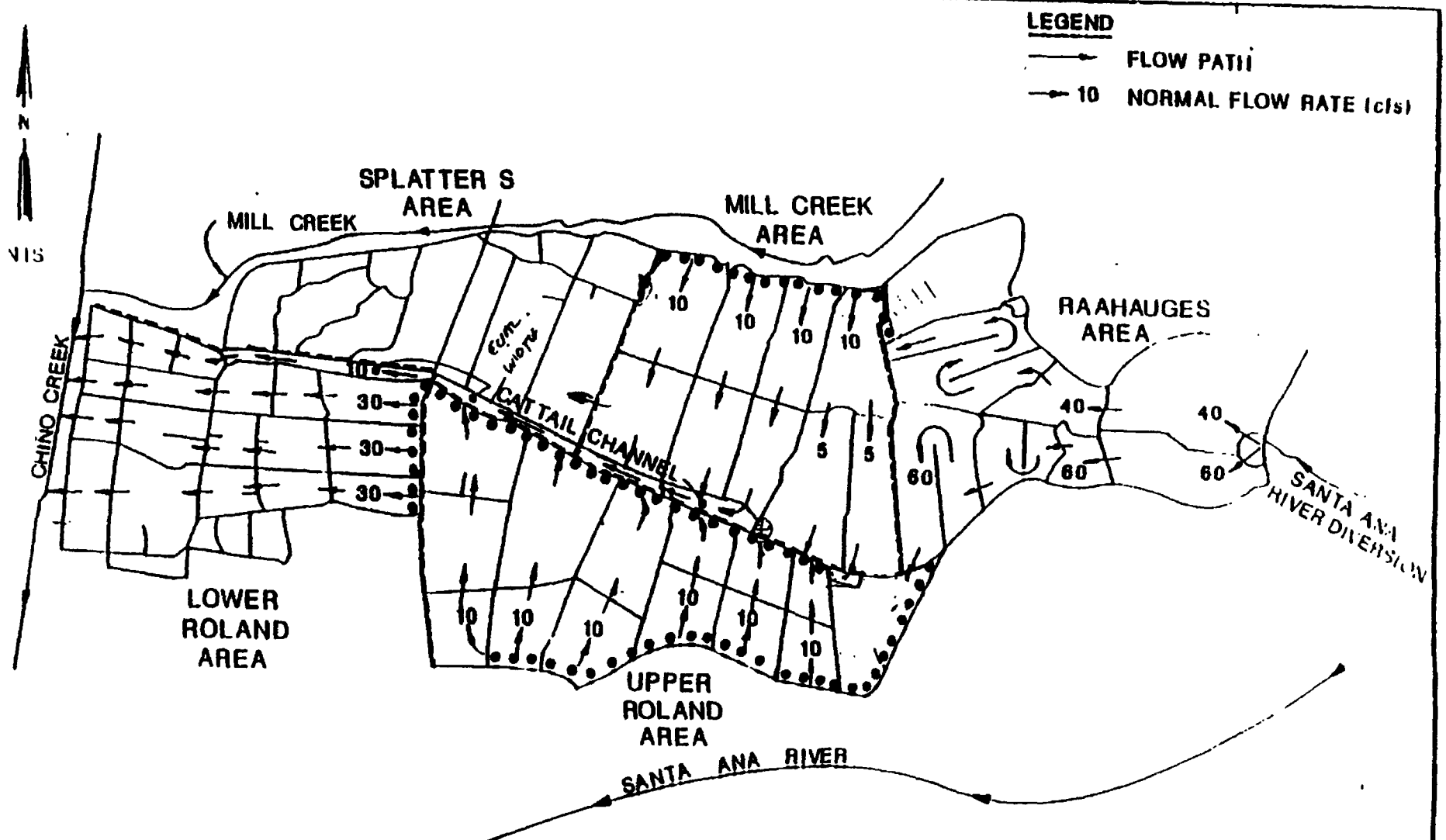
- SUSPENDED SOLIDS REMOVAL
- NUTRIENT POLISHING
- METALS POLISHING

POND DEPTH	% AREA	VEGETATION
5'	40	NO VE
2'	40	
1'		

PRADO BASIN DUCK POND
PROPOSED IMPROVEMEN

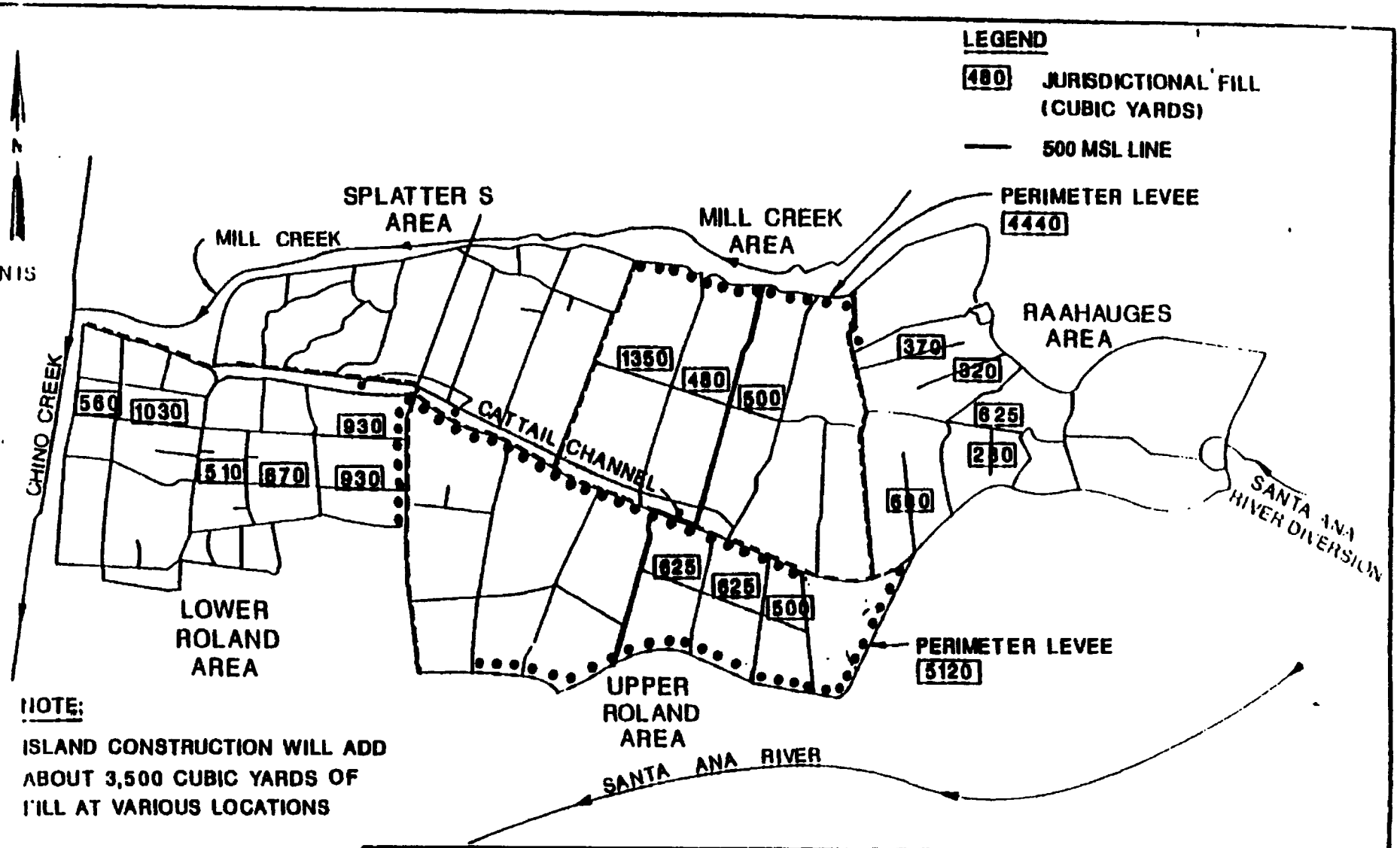
APPLICATION

ORANGE COUNTY
10500 ELLIS
FOUNTAIN 92



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	HYDRAULICS
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 15 OF 16

33228.HA



NOTE:

ISLAND CONSTRUCTION WILL ADD ABOUT 3,500 CUBIC YARDS OF FILL AT VARIOUS LOCATIONS

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

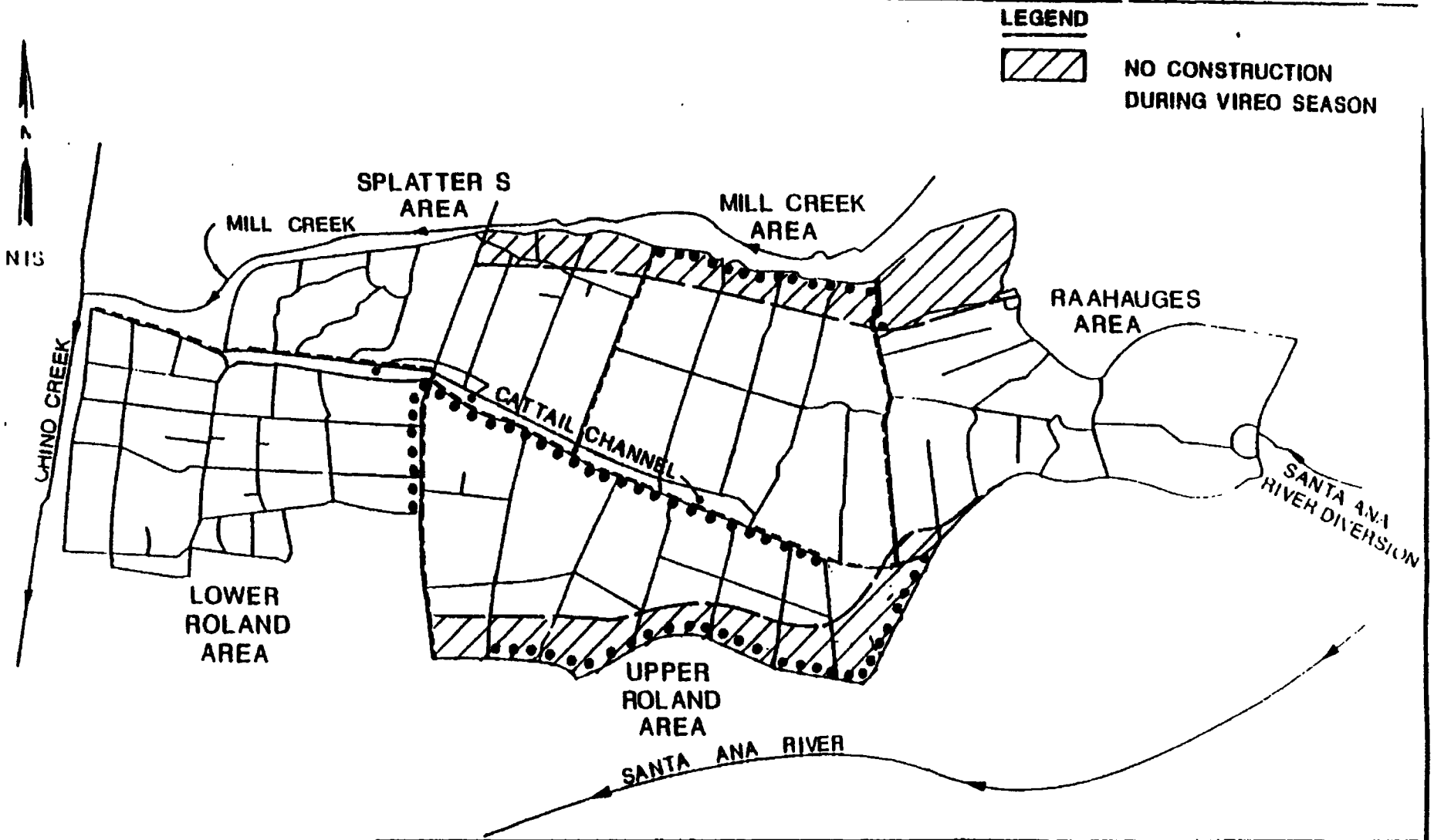
APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

JURISDICTIONAL FILL

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992 FIGURE 16 OF 16

LA033228.HA



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	CONSTRUCTION PHASING
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 17 OF 18

LA033226.HA

APPENDIX B

Permit Conditions

General Conditions:

1. The time limit for completing the authorized activity ends on April 5, 1998. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification from this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.

Special Conditions:

1. That the permittee shall implement and abide by all "compensation" (conservation) measures, reasonable and prudent measures, Incidental Take measures, and terms and conditions, of the Biological Opinion and Conference Report on the Prado Basin Water Treatment Project, Orange County Water District, Riverside County, California (1-6-94-F-47). This Biological Opinion was issued to the Corps as the Federal Agency and the permittee is solely responsible for the implementation of all measures, terms and conditions. The Corps shall insure that implementation and compliance occurs. Condition Nos. 32 of the Biological Opinion is hereby declared null and void.

2. That the permittee shall immediately notify the Corps Regulatory Branch if the permittee has or its lessees have violated the terms of the Incidental Take Statement of the Biological Opinion (1-6-94-F-47). Failure to notify the Corps within 24 hours of any violation will be grounds for suspension or revocation of this permit.

3. That the permittee shall implement the Habitat Conservation Plan (HCP) dated April 5, 1994 as prepared by the permittee. Permittee shall insure that all elements of the HCP are completed and meet all success criteria.

4. That the permittee shall not use any of the 102 acres of mitigation shown in Table 3 as mitigation for the Prado Water Conservation project.

5. That the permittee shall provide (except during emergencies) a sufficient quantity of tailwater to the Splatter S Duck Club ponds and other Corps facilities as requested by the Corps. Splatter S shall be responsible for labor and/or other incidental expenses relating to this provision.

6. That the permittee shall, prior to initiation of construction, deed as conservation easements in perpetuity for wildlife values the following areas: Raahauge's #5 and Lower Roland 10,11, 12, 18, and the ten island areas in the ponds to be used as waterfowl areas. The evidence of easement recordation shall be submitted to the Corps prior to initiation of construction.

7. That the permittee shall permanently maintain and/or rebuild after storm events the ten waterfowl islands in the ponds to be used as waterfowl habitat and nesting areas.

8. That the permittee, and/or its lessees, shall not use lead shot or any other live fire ammunition that degrades the pond water quality or wildlife habitat.

Further Information:

1. Congressional Authorities. You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

ORANGE COUNTY WATER DISTRICT

Philip L. Anthony 4-19-95

PERMITTEE President/Philip L. Anthony DATE

Mary E. Johnson

District Secretary ~~General Manager~~ Mary E. Johnson

APPROVED AS TO FORM

By _____

General Counsel for

Orange County Water District

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Diane K. Noda 4/20/95

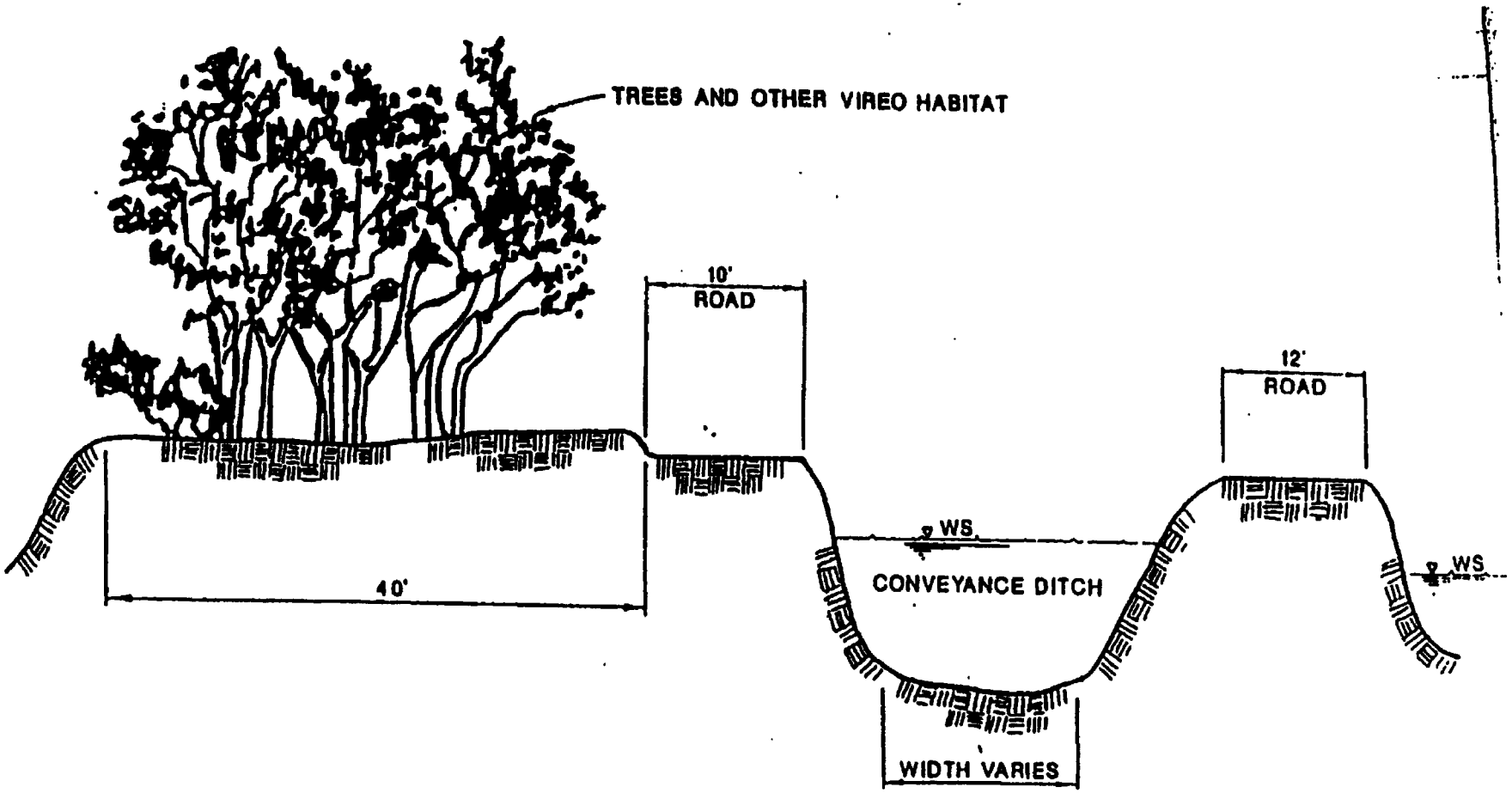
Diane K. Noda DATE

Acting Chief, Regulatory Branch

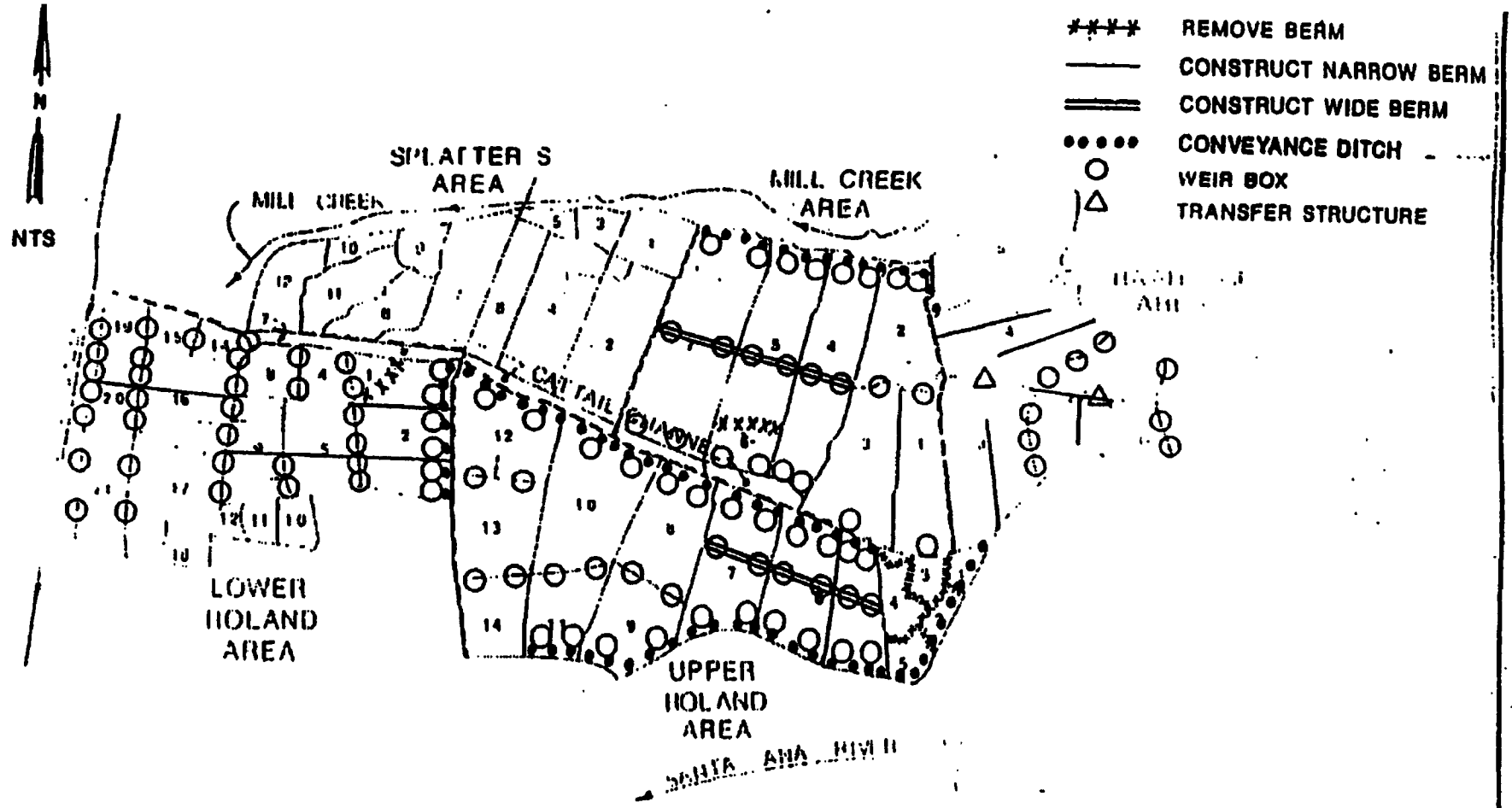
When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____

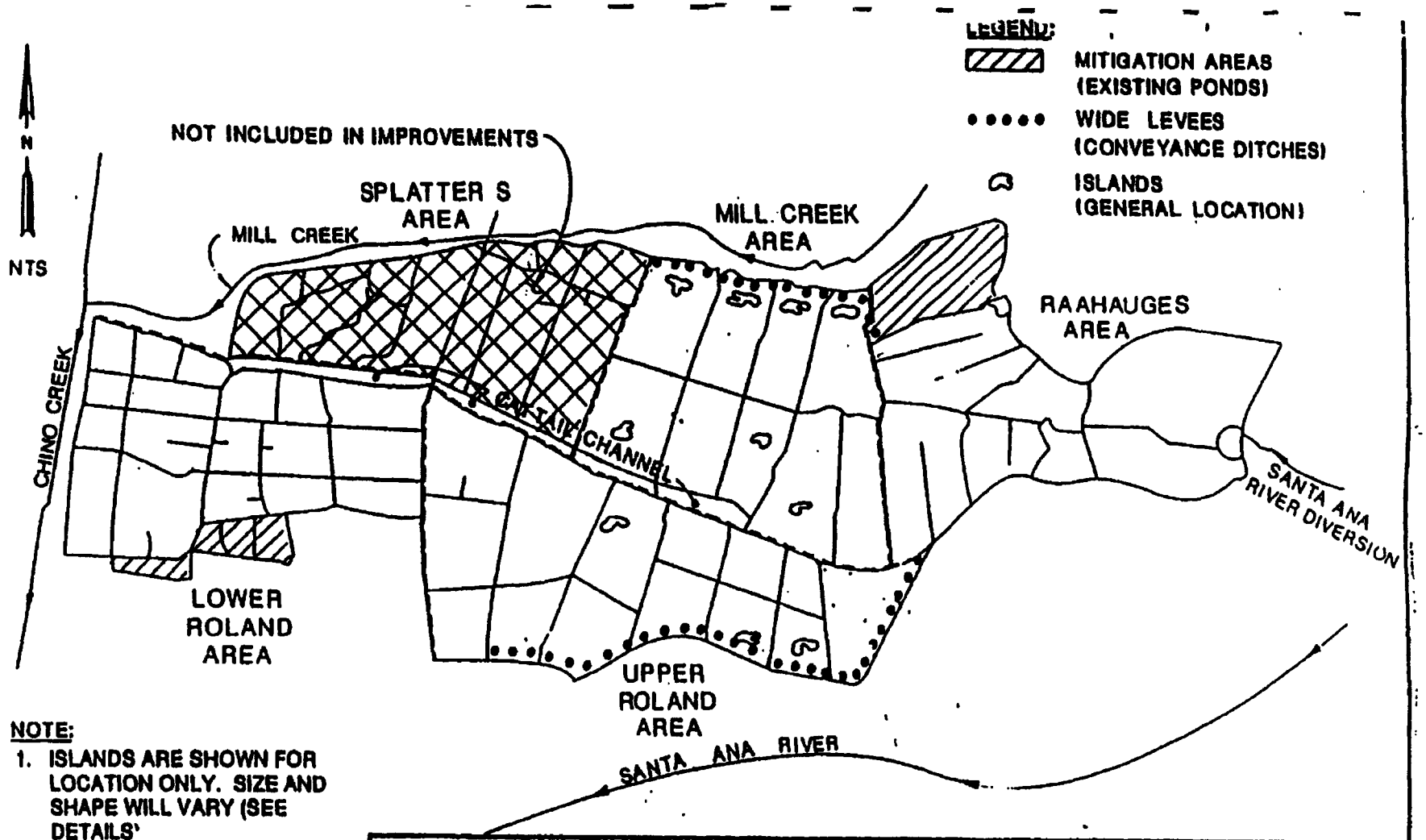
TRANSFEREE DATE



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	MITIGATION LEVEE ALONG PERIMETER CONVEYANCE DITCH
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA October 1992



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	PROPOSED LAYOUT
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 3 OF 18



NOTE:

1. ISLANDS ARE SHOWN FOR LOCATION ONLY. SIZE AND SHAPE WILL VARY (SEE DETAILS)
2. MITIGATION AREAS CONSIST OF EXISTING PONDS, CONVEYANCE DITCHES AND ISLANDS SHOWN ON LEGEND

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

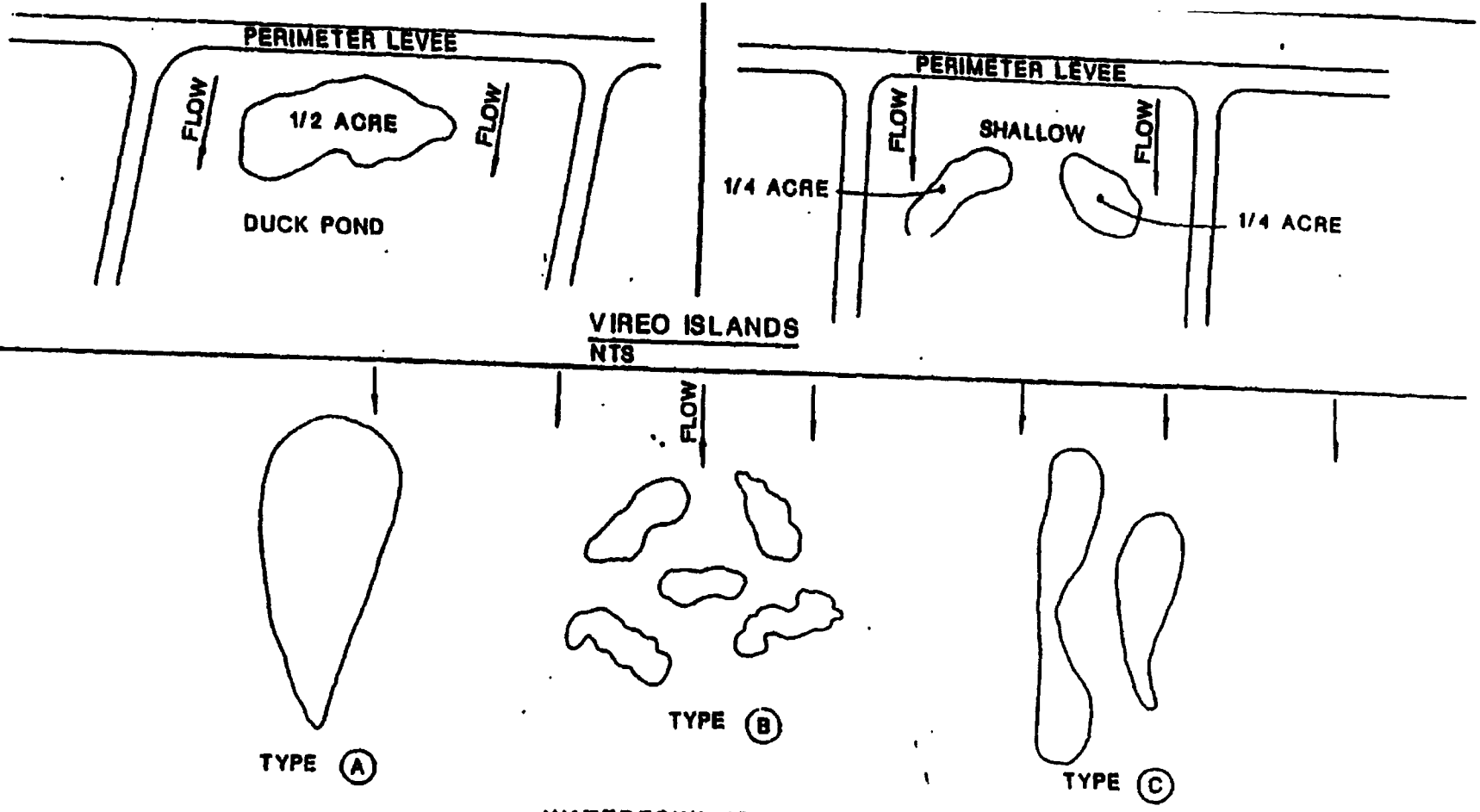
MITIGATION AREAS

RIVERSIDE COUNTY, CALIFORNIA

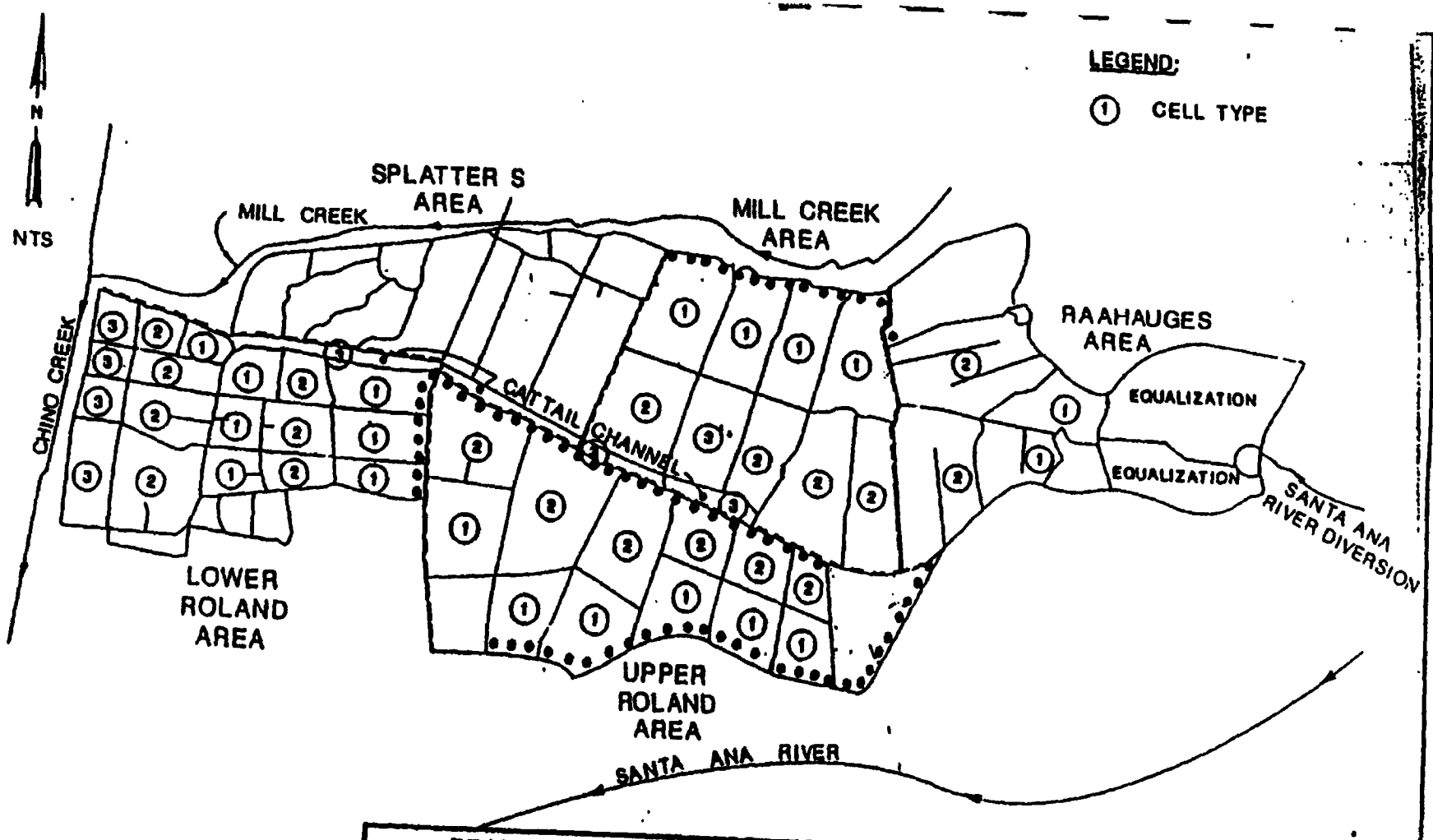
OCTOBER 1992

FIGURE 8 OF 18

LA033228.HA



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	ISLANDS FOR MITIGATION
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 10 OF 18

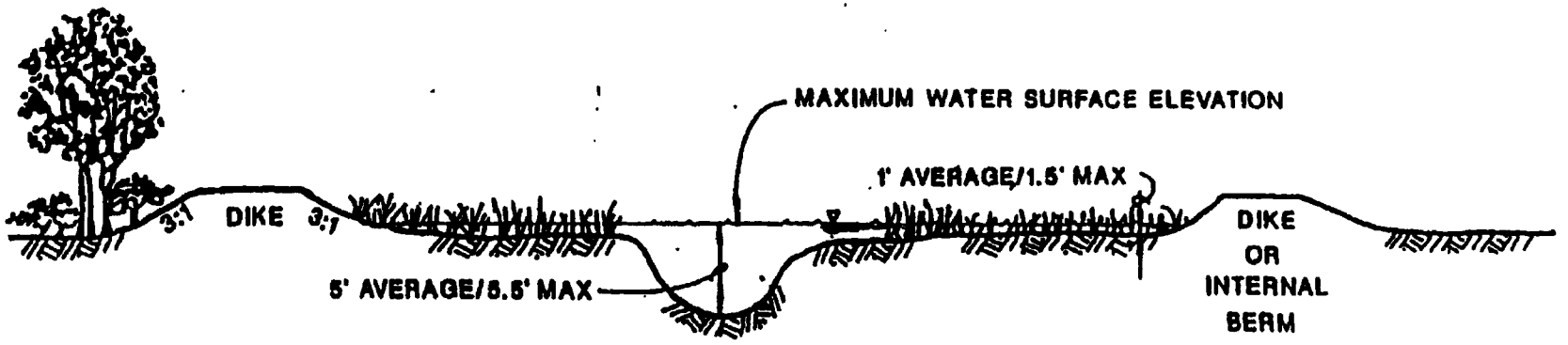


PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	PROPOSED LAYOUT CELL TYPES
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 , FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992

LAD33228.HA

FIGURE 11 OF 16

TYPE 1 WETLAND CELL (EMERGENT WETLAND)



EMERGENT VEGETATION

- CATTAILS
- BULRUSH

OPERATIONAL OBJECTIVES

- NUTRIENT REMOVAL
- METALS REMOVAL

POND DEPTH	% AREA	VEGETATION
5'	11	NO VEGETATION/BULRUSH
0.5'	89	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

TYPE 1 CELL

RIVERSIDE COUNTY, CALIFORNIA

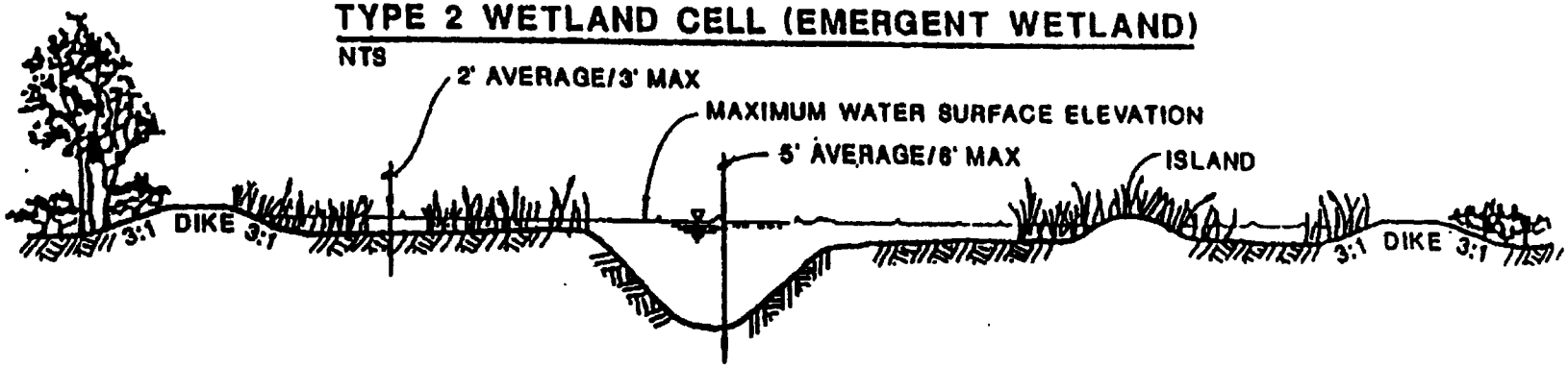
OCTOBER 1992

FIGURE 12 OF 16

AO33228.PR

TYPE 2 WETLAND CELL (EMERGENT WETLAND)

NTS



RIPARIAN VEGETATION | EMERGENT VEGETATION | OPEN WATER | EMERGENT VEGETATION | GRASS | EMERGENT VEGETATION | RIPARIAN VEGETATION

EMERGENT VEGETATION

- CATTAILS
- BULRUSH

OPERATIONAL OBJECTIVES

- NUTRIENT REMOVAL
- METALS REMOVAL
- SEDIMENT REMOVAL

POND DEPTH	% AREA	VEGETATION
5"	10	NO VEGETATION/DUCKWEED
2'	60	CATTAIL/BULRUSH (50%)
1'	30	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

TYPE 2 CELL

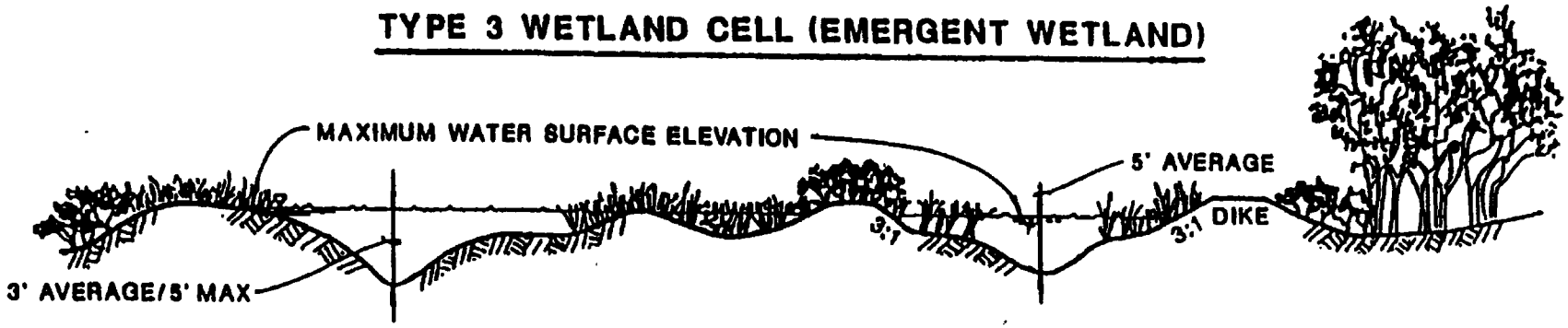
RIVERSIDE COUNTY, CALIFORNIA

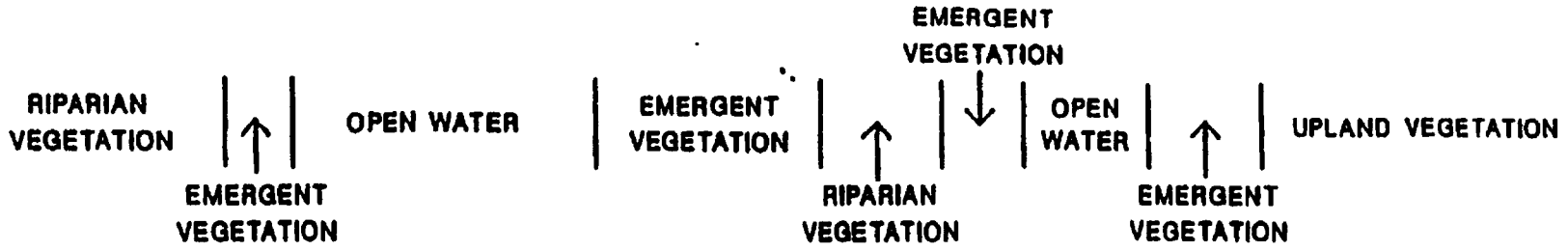
OCTOBER 1992

FIGURE 12 OF 18

033228.P

TYPE 3 WETLAND CELL (EMERGENT WETLAND)





EMERGENT VEGETATION

- CATTAILS
- BULRUSH
- WILLOWS

OPERATIONAL OBJECTIVES

- SUSPENDED SOLIDS REMOVAL
- NUTRIENT POLISHING
- METALS POLISHING

POND DEPTH	% AREA	VEGETATION
5'	40	NO VEGETATION/DUCKWEED
2'	40	CATTAIL/BULRUSH (50%)
1'	20	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

TYPE 3 CELL

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992

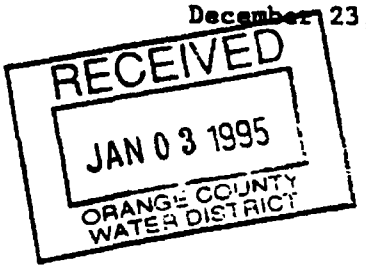
FIGURE 1 OF 8

1A011228.PR

United States Department of the Interior

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

December 23, 1994



Colonel Michal Robinson
District Engineer, Los Angeles District
U.S. Army Corps of Engineers
Post Office Box 2711
Los Angeles, CA 90053-2325

Attn: Mr. Robert Revo Smith (Regulatory Branch)

Re: Biological Opinion and Conference Report on the Prado Basin Water Treatment Project, Orange County Water District, Riverside County, California (1-6-94-F-47)

Dear Colonel Robinson:

This Biological Opinion and Conference Report responds to your request for formal consultation and conference with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973, as amended and the implementing regulations pertaining thereto (50 CFR 402). At issue are the impacts of the construction of a water treatment (pond purification) project in the Prado Basin that may affect two Federally-listed endangered species, the least Bell's vireo (Vireo bellii pusillus) and the bald eagle (Haliaeetus leucocephalus) and potentially impact the southwestern willow flycatcher (Empidonax traillii extimus), a species that is proposed as endangered (with critical habitat). The project applicant and proponent is the Orange County Water District (hereinafter also referred to as the "District").

The Biological Opinion was prepared using the following information: 1) Prado Dam Operation for Water Conservation, U.S. Army Corps of Engineers (Corps) Draft Environmental Impact Statement, October, 1992; "EIS"), 2) Fish and Wildlife Coordination Act Report dated July, 1990; U.S. Fish and Wildlife Service, Fish and Wildlife Enhancement, Laguna Niguel, California, 3) Planning Aid Letter dated July, 1987, regarding Water Conservation in Prado Reservoir; U.S. Fish and Wildlife Service, Fish and Wildlife Enhancement, Laguna Niguel, California, 4) Supplemental Biological Information, Evaluation of Potential Impacts to the Least Bell's Vireo, Prado Basin Water Conservation Study; December, 1987; Dames and Moore, Santa Barbara, California, 5) Letter from the District to the Corps dated July 15, 1993 (Subject: OCWD Response to Comments to Public Notice No. 93-572-RS) (hereinafter referred to as "District Letter"), 6) Habitat Mitigation and Monitoring Proposal Guidelines (document submitted to the Corps by the District; March, 1994; 26 pages with attachments (hereinafter referred to as the "Mitigation Proposal"), 7) the biological literature (see "Literature Cited and References" below, and 8) other communications with the Corps and the District (on file).

Biological Opinion

It is the opinion of the Service that the proposed project is not likely to jeopardize the continued existence of the least Bell's vireo (hereinafter referred to as the "vireo"). The Service further concludes that the project will not adversely modify vireo critical habitat. The project area is located entirely within the boundaries of designated vireo critical habitat.

The Service concludes further that the proposed project is not likely to jeopardize the continued existence of the bald eagle. Critical habitat has not been designated for this species.

Conference Opinion

The Service concludes that the proposed project is not likely to jeopardize the continued existence of the southwestern willow flycatcher nor adversely modify that species' proposed critical habitat. The project area is entirely within proposed critical habitat for the southwestern willow flycatcher.

Description of the Proposed Action

The project description contained in your letter request dated June 17, 1994 for the initiation of consultation and conference addressed and incorporated both the Water Treatment/Raahauge Duck Pond project (Corps permit application 93-572-RS) and the proposed construction of water treatment ponds on the Santa Ana River immediately upstream of River Road (Corps permit application 94-0572). However, during a meeting on August 11, 1994 involving the Corps, the Service and the District (the project proponent and applicant), it was ascertained that insufficient information was available to include the River Road pond project in the requested biological opinion. During that same meeting, the Service asked for additional engineering information pertaining to the Raahauge Duck Pond/Water Treatment project. The Service received the requested information on September 2, 1994; that date marked the beginning of the prescribed consultation period.

The project proponent (District) has proposed the construction and operation of 465 acres of ponds and conveyance channels within the Prado Basin, Riverside County, California. The project is fully defined and described in the Mitigation Proposal received by the Service on June 22, 1994. The District currently proposes to undertake a project that will: 1) compensate for past impacts to riparian woodland habitat in the project area and environs and 2) result in a water conveyance and filtration system that the will improve, overall, the quality of water that is eventually stored downstream of the project area in underground aquifers in Orange County, California. The District presently is the sole owner of rights to surface waters in the project area. Increased water conservation and treatment capabilities would additionally preclude or diminish the need for the District to import water from the Colorado River or elsewhere in the region.

The construction of strengthened berms and conveyance channels in the project area will enable the District to increase water flow through the refurbished

pond complex and thus facilitate the removal of nitrogen from local surface water (see Mitigation Proposal, page 12 and following pages). Proposed changes to the existing duck ponds include "...the construction of new berms, removal of a few existing berms, and construction of flow control (weir boxes) and transfer structures." The construction of new berms will largely be done to divide existing pond cells.

The construction of new berms and transfer structures will enable the District to increase water delivery into the project area. The District has concluded that maximum nitrate removal from the surface water will be achieved if the rate of flow is increased from the current maximum rate of 50 cubic feet per second (cfs) to 100 cfs.

Controlled planting of native marsh species in the ponds will facilitate the removal of nitrates. "Vegetation to be established in the ponds will consist mainly of cattails (Typha 2 spp.) and bulrush (Scirpus spp.)." "Vegetation to be established in the mitigation areas will consist of Black Willow (Salix goodingii) and mulefat (Baccharis glutinosa [salicifolia])." (Mitigation Proposal). The use of heavy equipment will be necessary to repair and maintain pond levies and control vegetation established to facilitate nitrate removal. The maintenance of pond bottoms largely will be done in fall and winter months.

The continuation of waterfowl hunting in the project area will be enabled by the construction and maintenance of the berms and other elements of the project infrastructure. Hunting in the project area is currently regulated by the Department of Fish and Game and the Service and is coordinated and organized by a lessee of the District. Also enabled by the project will be such recreational activities as boating, fishing, and dog training.

In recognition of potential impacts to the vireo resulting from their projects and as a means to conserve the species, the District funded, in part, the 1989 and 1990 California State University, Long Beach Foundation vireo monitoring and management programs in the Prado Basin at a total cost of $70,000. In addition, the District has provided $550,000 to the Nature Conservancy for habitat management and restoration in the Prado Basin and an additional $550,000 ($450,000 of which was subsequently reimbursed by the County of Orange) for the ongoing vireo management program there.

As means to avoid (or compensate for) potential, project-related impacts to the vireo, the southwestern willow flycatcher, the bald eagle, and other sensitive species resulting from the present project, the District has additionally agreed to implement the following compensation measures (see Mitigation Proposal):

- The required riparian mitigation habitat shall be created by the District according to a mitigation plan subject to review by the Service and ultimate approval of the Corps. The District shall insure that no work authorized by this permit shall begin until the Corps receives and approves a final mitigation plan for the required mitigation acreage. Because the purpose of mitigation is to replace existing habitat values lost in the project area, the intent of the revegetation effort shall be

to replace lost values as quickly as possible. Therefore, the plant palette shall include only native plant species common to the area, including understory plants. The planting of grass for levee stabilization is anticipated. The District shall provide knowledgeable personnel to supervise plant and vegetation maintenance work and such work shall be coordinated with the Service.

- The District shall insure that a minimum of 102 acres of riparian revegetation will be created or restored on District lands in designated mitigation areas.

In addition, (see District Letter):

- The District shall convert existing duck ponds ("Raahauge's #5" and "Lower Roland 10, 11, 12, and 18") to riparian habitat mitigation areas.
- The District shall insure that a total of ten island areas ranging in size from 1/4 to 1/2 acre will be built in ponds to enhance vireo and waterfowl habitat and potential nesting areas.
- The District shall maintain the pond and habitat areas in such a condition as to sustain the habitat values for the duration of the permit and subject to the availability of water. In the case of natural events such as flood or fire, efforts to protect lives and property are appropriate, but the reestablishment of habitat and habitat values would be expected to occur as quickly as natural and physical conditions allow. The District will not be responsible for habitat losses associated with natural events.
- The District shall insure that water remains in at least 50 percent of the ponds at all times to maintain riparian habitat and, from March 15 to August 1, maintain water in all duck ponds except those undergoing emergency maintenance.
- The District shall avoid all willows in the vicinity of the project. If any willows are destroyed, then the permittee shall replace them at 3:1 with cuttings or larger stock within one month. The District shall inform the Corps once this occurs.
- The District shall remove, under the supervision of the Corps and the Service, exotic, invasive vegetation from the project area, to the extent practical and feasible, for the life of the permit.
- From March 15 to September 15 or at any other time that vireos are known to be present in or near the project area, the District shall; 1) do no work within 250 feet of the perimeter ditches or within 250 feet of a vireo home range and, 2) inform the Corps and the Service of any emergency work prior to commencement of said work.
- The District shall insure that maintenance to ponds during the breeding season (March 15 to August 1) shall be coordinated with the Service and done in such a fashion to preclude adversely affecting listed species

and to prevent the unlawful take of species protected by the Migratory Bird Treaty Act. If the "take" of migratory birds is deemed to be unavoidable, then a "take" permit must be obtained from the Service law enforcement branch before work may proceed.

- The District shall restrict land uses in project area to those stated in the permit application for the life of the permit. Any deviations shall be coordinated with the Corps and the Service.

- The District shall not erect any permanent or temporary structure in the created ponds or habitat areas, excluding small structures needed to support activities approved in the permit. Such small structures include, but are not limited to, flow conveyance and monitoring structures and duck blinds.

- The District shall not construct or replace underground facilities or structures within the pond or habitat areas without replacing vegetation in all areas disturbed in accordance with planting and mitigation plans that are subject to the review of the Service and final approval by the Corps.

- The permittee or its agents shall provide a report describing the hydrological regime based on any new weir construction before construction begins and submit this report to the Service and the Corps.

- The District shall obtain the approval of the Service and Corps prior to any change in the hydrologic regime which may adversely impact a listed species or a species protected by the Migratory Bird Treaty Act.

- The District shall be obligated to continue diverting water into the project area, subject to the availability of water, for the term of this permit unless the Corps and the Service unanimously agree otherwise.

- The District shall insure that the use of all pesticides, herbicides, and fungicides, or other chemical substances is done in accordance with the general and specific requirements of the labels on said substances anywhere on District lands. Furthermore, the permittee or its agents shall consult with the Service and the Corps prior to the application of any pesticides, herbicides, or fungicides in, or within 10 feet of, the edge of pond or habitat areas. Maintenance and storage of vehicles shall be done in such a way to prevent the runoff of vehicular fluids into the ponds, habitat areas, or other wetlands or waters of the United States.

- The District shall comply with all laws concerning the discharge of wastes to waters of the State.

- The District shall take reasonable actions to insure that trash, other dumped debris, abandoned vehicles, equipment, or other potential rodent shelter is removed from the ponds and habitat areas.

- The District shall insure that no domestic animals, other than those specified in the permit, are allowed to encroach in pond and habitat areas. If such animals are found in the ponds and habitat areas, the District or its agents shall provide for the immediate removal of said animals from the project area and environs.

- The Districts or its agents shall not permit, allow or indulge any activity in the ponds and habitat areas that jeopardizes the safety of Service, Corps, Department of Fish and Game, or other persons engaged in the monitoring or management of listed species or other official business on District lands. In this regard, the Service and the Corps shall make every effort to coordinate its activities with the District.

- The District shall insure that dog-training activities are conducted only in designated ponds.

- The District shall agree that any waterfowl hunting in or on the ponds and habitat areas shall be at the direction of the California Department of Fish and Game and the Service and done in accordance with the forthcoming Prado Basin Waterfowl Management Plan (as approved by the District). The permittee or its agents shall not permit, allow, or indulge illegal hunting or hunting in prescribed safe or refuge zones that are established now, or in the future, by the Department of Fish and Game or the Service.

- To this end, the District shall not allow, permit, or indulge live fire in, or within 500 feet of, the ponds or occupied listed species habitat areas except for hunters in the legal pursuit of waterfowl during the appropriate hunting seasons, dog-trainers shooting in approved areas, and target shooters shooting in specially constructed areas approved by the District. OCWD shall consult with the Service and the Corps on the location and construction of the shooting areas. The permittee or its agents shall not allow, permit, or indulge any shooting (live fire) that "may affect" or "take" listed species or protected migratory birds.

- The District shall not permit, allow, or indulge fishing except in Raahauge ponds 1,2,3 and 4 and shall permit, allow or indulge only shore fishing and the use of small boats and trolling motors. Fishing line and hooks shall not be allowed to remain in or near the ponds or habitats subsequent to fishing activities.

- The District shall develop and enforce rules, insofar as practical and feasible, to prevent the trespass or unauthorized presence of all persons in the pond, habitat areas, and environs.

- The District shall place no lighting in or over the ponds and habitat areas without the expressed consent of the Corps and the Service.

- The Corps and the Service reserve the right to visit the ponds and habitat areas at any time to insure compliance with permit and special permit conditions. In this regard, the Service and the Corps shall make every effort to coordinate its activities with the District. The Corps

and the Service shall provide OCWD with certificates of insurance, as requested by OCWD, indemnifying the OCWD in case of accidents on OCWD property.

- The District or its agents shall provide, upon request, keys to any locks placed on fences, steel ropes, or other structures in or adjacent to the ponds and environs to Service, Corps and other regulatory agency personnel to facilitate site inspections and the management and monitoring of protected and listed species. In this regard, the Service and the Corps shall make every effort to coordinate their activities with the District.

- The District shall not permit, allow, or indulge activities that interfere with the ongoing effort to effectively manage or monitor the vireo or other Federal or State-listed species. In this regard, the Service and the Corps shall make every effort to coordinate their activities with the District.

- The District shall insure that all agents, lessees, or sublessees of the permittee shall be: a) informed of the sensitivity of the ponds, habitat areas and the presence of the listed and protected species accommodated therein, and b) instructed as to the content of the permit and special permit conditions delineated herein.

Effects of Proposed Action On Listed Species

Species Accounts

Least Bell's Vireo

The least Bell's vireo (vireo) is a small, olive-gray migratory songbird that nests and forages almost exclusively in riparian woodland habitats (Garrett and Dunn 1981; Gray and Greaves 1981; Miner 1989). Bell's vireos as a group are highly territorial (Barlow 1962; Fitch 1958; Salata 1983a) and are almost exclusively insectivorous (see, for instance, Chapin 1925 and Miner 1989).

Vireo nesting habitat typically consists of well-developed overstories, understories, and low densities of aquatic and herbaceous cover (Zembal 1984; Zembal et al. 1985; Hays 1986; Hays 1989; Salata 1983a; Regional Environmental Consultants [RECON] 1988). The understory frequently contains dense subshrub or shrub thickets. These thickets are often dominated by of sandbar willow (*Salix hindsiana*), mule fat (*Baccharis salicifolia*), young individuals of other willow species such as arroyo willow (*Salix lasiolepis*) or black willow (*S. goodingii*) and one or more herbaceous species (Salata 1983a, 1983b; Zembal 1984; Zembal et al. 1985). Significant overstory species include mature arroyo willows and black willows. Occasional cottonwoods (*Populus* sp.) and western sycamore (*Platanus racemosa*) occur in some vireo habitats and there additionally may be locally important contributions to the overstory by coast live oak (*Quercus agrifolia*).

Vireos generally begin to arrive from their known wintering range in southern Baja California and establish breeding territories by mid-March to late March (Garrett and Dunn, 1981; Salata 1983a, 1983b; Hays 1989; Pike and Hays, 1992). A large majority of breeding vireos apparently depart their breeding grounds by the third week of September and only a very few Bell's vireos are found wintering in California or the United States as a whole (see Barlow 1962; Garrett and Dunn 1981; Salata 1983a, 1983b; Ehrlich et al. 1988; Pike and Hays 1992).

Although the vireo occupies home ranges that typically range in size from 0.5 to 4.5 acres (RECON 1988), a few may be as large as 10 acres (J. Greaves, consulting biologist, pers. comm.). In general, it appears likely that areas that contain relatively high proportions of degraded habitat have lower productivity (hatching success) than areas that contain high quality riparian woodland (Jones 1985; RECON 1988; Pike and Hays 1992).

Historically described by multiple observers as common to abundant in the appropriate riparian habitats from as far north as Tehama County, California to northern Baja California, Mexico (Grinnell and Storer 1924; Willett 1933; Grinnell and Miller 1944; Wilbur 1980), the vireo currently occupies a very small fraction of its former range (e.g., United States Fish and Wildlife Service 1986) and remains a rare and local species throughout much of its historic range.

Widespread habitat losses have fragmented most remaining populations into small, disjunct, widely dispersed subpopulations. The remaining birds are concentrated in San Diego, Santa Barbara and Riverside Counties. The entire known United States population in 1992 consisted of approximately 400 breeding pairs.

The unparalleled decline of this California landbird species (Salata 1986; United States Fish and Wildlife Service 1986) has been attributed, in part, to the combined, perhaps synergistic effects of the widespread and relentless destruction of riparian habitats and brood-parasitism by the brown-headed cowbird (Molothrus ater) (Garrett and Dunn 1981). Because of this documented, drastic decline, the vireo was officially listed as endangered by State of California in 1980 and by the Service on May 2, 1986. Critical habitat for this species was listed by the Service in February of 1994. The proposed project area is entirely within designated critical habitat.

Southwestern Willow Flycatcher

The southwestern willow flycatcher (Empidonax traillii extimus [Phillips]), a relatively small, insectivorous (passerine) songbird, is approximately 15 centimeters (5.75 inches) in length. Southwestern willow flycatchers of both sexes have grayish-green back and wings, whitish throats, light gray-olive breasts, and pale, yellowish bellies. The song is a sneezy "fitz-bew" or "fitz-a-bew" and the typical call is a "breathy" "whit" (see, for instance, Unitt 1987).

The southwestern willow flycatcher is a recognized subspecies of the willow flycatcher (Empidonax traillii). Although previously considered conspecific with the alder flycatcher (Empidonax alnorum), the willow flycatcher is distinguishable from that species by morphology (Aldrich 1951), song type, habitat use, structure and placement of nests (Aldrich 1953), eggs (Walkinshaw 1966), ecological separation (Barlow and MacGillivray 1983), and genetic distinctness (Seutin and Simon 1988).

In turn, the southwestern willow flycatcher is one of five subspecies of the willow flycatcher currently recognized (Hubbard 1987; Unitt 1987; Browning 1993). The willow flycatcher subspecies are distinguished primarily by differences in color and morphology. Although the subspecific differences in color have been termed "...minor..." (Unitt 1987), P.E. Lehman (Editor, Birding Magazine and recognized expert field biologist, pers. comm.) has indicated that he feels that the southwestern willow flycatcher in California is distinguishable in the field from other forms of willow flycatchers that might be present (in migration) within the breeding range of the former. Unitt (1987) and Browning (1993) both concluded that the southwestern willow flycatcher is paler than other willow flycatcher subspecies. Preliminary data also suggest that the song dialect of the southwestern willow flycatcher is distinguishable from other willow flycatchers.

The breeding range of the southwestern willow flycatcher includes southern California, southern Nevada, Arizona, New Mexico, and western Texas (Hubbard 1987; Unitt 1987; Browning 1993). The species may also breed in southwestern Colorado, but nesting records are lacking. Records of breeding in Mexico are few and confined to extreme northern Baja California and Sonora (Unitt 1987). Willow flycatchers winter in Mexico, Central America, and northern South America (Phillips 1948; Ridgely 1981; AOU 1983; Stiles and Skutch 1989; Ridgely and Tudor 1994).

Breeding southwestern willow flycatchers are often present and singing on territories in mid-May (exceptionally in late April in southern California). Southwestern willow flycatchers are generally gone from breeding grounds in southern California by late August (The Nature Conservancy 1994a) and are exceedingly scarce in the United States after mid-October (e.g., Garrett and Dunn 1981).

The southwestern willow flycatcher occurs in riparian habitats along rivers, streams, and other wetland habitats where dense growths of willows (Salix sp.), Baccharis, arrowweed (Pluchea sp.), buttonbush (Cephalanthus sp.) or other plants of similar structure and configuration are present. The southwestern willow flycatcher nests in thickets of trees and shrubs approximately 4-7 meters (13-23 feet) or more in height with dense foliages from approximately 0-4 meters (0-13 feet) above ground. Overstories are often present in occupied habitats and composed of willows or cottonwoods (e.g., Phillips 1948, Grinnell and Miller 1944, Whitmore 1977, Hubbard 1987, Unitt 1987, Whitfield 1990, Brown 1991, U.S. Fish and Wildlife Service 1993b). Although nesting willow flycatchers of all subspecies generally prefer areas with surface water nearby (Bent 1960, Stafford and Valentine 1985, Harris et al. 1986), the southwestern willow flycatcher virtually always nests near surface water or saturated soil (e.g., The Nature Conservancy 1994b).

Throughout the known range of the southwestern willow flycatcher, occupied riparian habitats tend to be widely separated and separated by vast expanses of relatively arid lands. The southwestern willow flycatcher has suffered the extensive loss and modification of these riparian habitats due to habitat destruction or modification due to grazing, flood control projects, and other water or land development projects (see, in particular Dahl 1990, Klebenow and Oakleaf (1984), and Taylor and Littlefield (1986). The species is additionally impacted by a variety of other factors, including brood parasitism by cowbirds (Unitt 1987; Ehrlich et al. 1992; U.S. Fish and Wildlife Service 1993b). Parasitism rates of southwestern willow flycatcher nests have recently ranged from 50 to 80 percent in California (Whitfield 1990; M. Whitfield and S. Laymon, unpublished data) to 100% in the Grand Canyon in 1993 (U.S. Fish and Wildlife Service 1993b). Mayfield (1977) thought that a species (or population) might be able to survive a 24% percent parasitism rate, but that much higher losses "would be alarming."

Unitt (1987) reviewed historical and contemporary records of the southwestern willow flycatcher throughout its range and determined that the species had declined precipitously during the last 50 years. Unitt (1987) argued convincingly that the southwestern willow flycatcher is faring poorly throughout much of its breeding range (see also Monson and Phillips 1981; Garrett and Dunn 1981; Unitt 1987). Unitt (1987) postulated that the "known Willow Flycatcher population in the California range of extimus consists of 87 pairs" and that the "total population of the subspecies is well under 1000 pairs; I suspect that 500 is more likely". A composite of more current information indicates continuing declines, poor reproductive performance, and continued threats to most remaining populations (e.g., Brown 1991; U.S. Fish and Wildlife Service 1992; Whitfield and Laymon (Kern River Research Center, in litt., 1993; U.S. Fish and Wildlife Service 1993b). If these projections are essentially correct, it seems reasonable to conclude that the current, precarious status of the southwestern willow flycatcher is little different from that of the Federally-listed, endangered vireo. The willow flycatcher is listed as endangered in California and Arizona.

On July 23, 1993, the Service proposed the southwestern willow flycatcher as endangered species throughout its range (U.S. Fish and Wildlife Service 1993b (58 Federal Register 39495)) and simultaneously proposed critical habitat for the species. The project area and environs is entirely in proposed critical habitat for the southwestern willow flycatcher (hereinafter referred to as the "flycatcher").

Southern Bald Eagle

The bald eagle is large, mostly dark-brown bird of prey or "raptor". Adult bald eagles have a white heads and tails, which are developed at about four to six years of age. Juvenile bald eagles are mostly brown and can be confused with golden eagles. Females can weigh from eight to twelve pounds, and males from six to nine pounds. Bald eagles can have a wingspan of six to eight feet. Next to the California condor, the bald eagle is the largest raptor in California.

Bald eagles are the only North American representative of the fish or sea eagles. There are two recognized subspecies of the bald eagle: Haliaeetus leucocephalus alascanus or northern bald eagle, and Haliaeetus leucocephalus leucocephalus or southern bald eagle. The southern bald eagle is the locally-occurring subspecies. Bald eagles of this race are most numerous locally in the Big Bear Basin.

Bald eagles concentrate around open water where fish can be seen and where waterfowl congregate. Southern bald eagles feed primarily on fish, waterfowl, carrion, seabirds, and small mammals (largely rabbits), and rarely, other small vertebrates (Sapphos Environmental 1994). Diet and feeding habits vary according to locality, season, and availability and vulnerability of food.

The bald eagle is a visual hunter, often locating its prey from a concealed perch or while soaring. Bent (1937) identified the food habits of the southern bald eagle as mostly fish, but with a large proportion of waterfowl. Mallette and Gould (1976) identified the diet of bald eagles in California as consisting of 55% fish, 30% birds, 10% carrion, and 5% mammals. Bald eagles evidently prefer fish that are dying, dead or otherwise accessible. They will usually elect to forage in shallow water where fish are more vulnerable. In deeper waters, surface feeding fish (such as striped bass) are probably more vulnerable to bald eagle depredation than bottom dwellers (Steenhof 1978 and S. Hansen, State of California, Department of Transportation biologist, pers. comm., 1994). The primary prey of the bald eagle in the Big Bear Basin is a waterbird, the American coot (Fulica americana), followed by the common carp (Cyprinus carpio) (U.S. Fish and Wildlife Service 1993a). The diet of the bald eagles in the Prado Basin remains unknown.

Bald eagles are known to require multiple perch trees for foraging, presumably to avoid the glare of the sun off the water while searching for fish at different times of the day. Bald eagles apparently prefer tree perches compared to rock outcrops, power poles, etc., and primarily select perches near food sources such as shallow waters. Favorite tree perches near food sources may be used for 75-83 percent of the daylight hours. Most preferred tree perches are those that are bordered by an open area that provides a good view of the surrounding area; bordered by a riverbank or lake shoreline; of considerable height for visibility and accessibility; of large diameters with stout, horizontal branches that extend over open areas; and isolated from disturbance. Other trees may be used for roosting (protected loafing or resting sites).

Bald eagles tend to use high perch sites that are in close proximity to water. For instance, whereas the mean height of trees utilized by bald eagles on the Missouri River floodplain was 69 feet, the mean height of trees on the floodplain is only 45 feet (Steenhof 1978). Ninety-four percent of the bald eagles studied on a Missouri River floodplain in South Dakota perched within 33 yards of the river. Moreover, eighty-six percent perched within 16 yards of the bank, and 58 percent perched within 5 yards of the bank. Of 400 bald eagle sightings in Nebraska, only 15 were farther than 200 yards from the Platte River. Bald eagles in Glacier National Park also prefer perches near the edges of streams (Steenhof 1978).

Trees used by bald eagles also tend to be relatively large. Mean diameters of trees used by bald eagles in South Dakota was 17 inches, and the mean diameter of all trees on the wintering site was 11 inches. Although selection for large diameter is partially related to selection for height, stout, sturdy trees are also necessary to support a bald eagle's weight. Tree perching eagles tend to select stout, horizontal branches, especially those extending over open areas. These branches provide both strength and visibility. Dead trees are preferred in many areas (Steenhof 1978).

Although bald eagles typically occur in most southern California locales only in late fall, winter, and early spring, birds do summer locally and nesting has occurred. Garrett and Dunn (1981) described the bald eagle in southern California as "local winter visitant, fairly common at a few favored wintering sites around inland bodies of water but generally rare otherwise." Although generally scarce elsewhere, up to 25-30 birds are recorded annually in Big Bear Valley in the San Bernardino Mountains. Although most locally-wintering bald eagles are believed to migrate primarily from Oregon, Washington, and British Columbia, Canada, a banded bald eagle observed on February 10, 1990 in the Big Bear Basin was traced back to the Greater Yellowstone Ecosystem (U.S. Fish and Wildlife Service 1993a).

The former breeding range of the bald eagle in the region included both northern and southern California, except the deserts, and extended into Baja California, Mexico (e.g. Laguna Hanson and Guadalupe Canyon) (e.g., Bent 1937, Grinnell and Miller 1944; Garrett and Dunn 1981). Grinnell and Miller (1944) reported the southern bald eagle to be formerly common in California "and widely distributed coastwise and through the interior valleys, but now either gone or limited to vagrants or to scattered nesting pairs." Bald eagles in southern California were formerly common residents on the Channel islands and local residents along the mainland coast from Santa Barbara to San Diego County (Grinnell and Miller; Garrett and Dunn 1981). Within southern California, bald eagle breeding in the project region was also noted for Big Bear and Baldwin Lakes in the 1930's (Grinnell and Miller 1944).

By 1972, breeding bald eagles had been virtually eliminated from their southern California nesting range (Garrett and Dunn 1981; Sapphos Environmental 1994). Mallette and Gould (1976) reported that twenty-one pairs of bald eagles were known to have nested in all of California in 1974. The current breeding range of the bald eagle in California is still largely confined to the northern part of the state. Eighty-three breeding pairs were recorded for California in 1989 (Sapphos Environmental 1994).

Recent nesting attempts in southern California south of Santa Barbara County have been exceedingly rare and entirely unsuccessful. Nesting has been attempted in southern California within the last five years at Silverwood Lake, Catalina Island, Lake Skinner, and at Lake Cachuma in Santa Barbara County (Sapphos Environmental 1994). Although bald eagles were recorded as "breeding" in four southernmost California locations in 1993, all nesting attempts were unsuccessful. For instance, a pair of bald eagles nested in a tree in Miller Canyon at Silverwood Lake winter and spring of 1993. This constituted the southernmost attempt at nesting by bald eagles known in California in recent years. The bald eagles produced two eggs that did not

hatch. The eggs were collected and sent to a research laboratory in Bodega Bay for testing to determine why they were infertile; results from the analysis have not been released to the Service.

In California, breeding normally occurs from January through July, sometimes as late as August (Sapphos Environmental 1994). Bald eagles mate for life. The eagle pair typically nests in large, old growth timber or dominant live trees with open branchwork. Conifers are normally selected for nest-building in northern California. In southern California, bald eagles have traditionally used large sycamores, mature oak, eucalyptus trees (Sapphos Environmental 1994), and cottonwoods. Bald eagles normally select a nest stand or grove consisting of numerous trees, which provide shielding (Sapphos Environmental 1994). Old trees provide a location for tall nests with unobstructed views of the lakes and rivers used by the bald eagles as foraging grounds. Nests of the southern bald eagle are generally not located in trees on the shoreline. The mean distance from the nest to the shore for California nests is 0.3 miles (Sapphos Environmental 1994). However, a successful nest site at Lake Cachuma is two miles from the reservoir. The currently unsuccessful breeding location at Silverwood Lake is located very close to the lake edge. Human activity (fishing) on the water and shore probably inhibits many bald eagles from nesting on the shoreline (Sapphos Environmental 1994).

A bald eagle nest is generally located so as to provide unobstructed views of the body of water in which they hunt (Sapphos Environmental 1994). While bald eagles occasionally build more than one nest, they are site tenacious by nature and have been monitored using the same nest for up to 35 years. The breeding period is December 15 through July 15, with one to two eggs normally being laid in late winter or early spring. The incubation period is 34-36 days. The mortality rate is high between egg laying and fledgling.

Bald eagles are particularly vulnerable to disturbance during nesting, incubation, and the first five weeks of the nesting cycle. Wilderness Research Institute (1980) evaluated multiple human disturbance factors in relation to bald eagles. The institute found that bald eagle nests are more likely to be active if there is a low amount of heavy duty roads within one mile of the nest site. Unpaved roads (light traffic) have little effect on nest activity. Paved roads, and larger numbers of recreational facilities anywhere within 10 miles of the nest site increase the potential of a nest being inactive. Foot traffic near the nest (within 1000 feet) is one of the most disturbing events to a nesting pair of bald eagles. One quarter of a mile (1320 feet) is the minimum distance a facility should be located if a high degree of foot traffic is anticipated (Wilderness Research Institute 1980). If a given breeding attempt is unsuccessful, the pair may abandon the nest for the season (Sapphos Environmental 1994).

Approximately 250,000 to 500,000 bald eagles inhabited the North American continent when Europeans first arrived. Since that time, the population has, overall, decreased precipitously to the point of near extinction. Several factors led to the decline of the bald eagle population, including: chemical contamination (particularly DDT), habitat destruction, shooting, electrocution on power lines, and human activities in and around nesting sites.

By the 1950's, the California population of bald eagle has substantially decreased due to direct losses through shooting and organochlorine pesticide poisoning. Population declines have been largely attributed to the accumulation of these pesticides, which are known to induce egg-shell thinning. Defective eggs are crushed by the adult birds during incubation.

Prior to the 1970's, the pesticide dichlorodiphenyltrichloroethane (DDT) was heavily utilized in insect abatement efforts. This substance is now known to be toxic and not easily metabolized by vertebrates. The first stages of DDT breakdown result in other toxic metabolites, known as DDE and DDD (Dunne and Leopold 1978). Although the use of DDT was banned in 1972, the presence and persistence of this substance (and DDE) in the environment continue to be a major factor limiting the successful nesting of bald eagles (Ehrlich et al. 1992; Peter Bloom, Western Vertebrate Foundation raptor expert, pers. comm., 1994). Unfortunately, DDT apparently is still being produced in California and sold to other countries.

Nevertheless, the bald eagle is now increasing in numbers as a result of focused recovery and conservation efforts. A variety of ongoing recovery programs, many of them funded through section 6 of the Endangered Species Act, coupled with the 1972 ban of DDT in the United States, have helped boost eagle numbers in much of the species' range (U.S Fish and Wildlife Service 1994d). Bald eagle numbers in the lower 48 states have climbed from about 417 nesting pairs in 1963, to more than 4000 pairs of adult birds in 1993 (U.S Fish and Wildlife Service 1994d). California had 43 occupied territories in 1979, and 103 territories in 1993 (U.S Fish and Wildlife Service 1994c).

The bald eagle was listed as endangered in their range south of the 40th parallel under the Endangered Species Protection Act of 1966, on March 11, 1967. The listing was subsequently revised on February 14, 1978; the bald eagle is currently listed pursuant to the Endangered Species Act of 1973 as endangered throughout the lower 48 states except for Michigan, Minnesota, Wisconsin, Washington, and Oregon, where it is listed as threatened. Bald eagles are also protected under the Bald Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. As of July 12, 1994, the Service is currently considering a change in the listing status from endangered to threatened in all but the southwestern region, which includes southern California (U.S Fish and Wildlife Service 1994c). The bald eagles in the southwestern United States would remain designated as endangered under the proposal because the bald eagle population in this region is small (about 30 nesting pairs), isolated from other populations, and is still vulnerable to natural or human-caused, catastrophic events (U.S Fish and Wildlife Service 1994d).

Analysis of Impacts

The construction and operation of the pond system for purposes of water purification and interrelated recreational activities in wetlands or waters of the United States and the resultant, permanent loss of riparian values could have significant impacts to each of the three species considered herein. As is reflected in PN 93-572-RS and in PN 90-213-MD-ATF, District lessees or their agents apparently discharged fill into wetlands or waters of the United States while creating the existing duck-hunting ponds in the current project area and adjacent pheasant-hunting fields. Because aerial photographs reveal that the project area apparently contained willow woodland in 1979 prior to the primary construction associated with the duck pond project (see page 4, PN 90-213-MD-ATF), the berms, roads, and ponds in the project area almost certainly displaced rare willow riparian woodland habitat, which provide habitat for the vireo, the flycatcher, the yellow-billed cuckoo (Coccyzus americanus; State-listed as endangered), and a large array of other, sensitive species. Accordingly, the Service is pleased to acknowledge the commitment by the District to compensate for lost willow riparian values and to prevent the future, unmitigated loss of this habitat type.

Although several researchers had previously documented the presence of the vireo within the Prado Basin and contiguous reaches of the Santa Ana River (see, for instance, Goldwasser 1978), the local status, distribution, and breeding biology of the vireo and flycatcher remained largely unknown until field studies were conducted by Service biologists in 1983 (Zembal et al. 1985) and 1985 (Zembal 1986) and by California State University, Long Beach Foundation biologists in 1986 (Hays 1986), 1987 (Hays 1987), 1988 (Hays 1988), 1989 (Hays 1989), 1990 (Hays and Corey 1991), 1991 (Pike and Hays 1992), 1992 (The Nature Conservancy 1993), 1993 (The Nature Conservancy 1994a), and 1994 (The Nature Conservancy 1994b). Because the Prado Basin vireo population was effectively unmanaged prior to 1986, the data and analysis presented since 1986 cumulatively provide the information necessary to compare the temporal status, distribution, and reproductive productivity of this population.

Over the course of the first year (1986) of the present monitoring and management effort, 19 pairs of vireos were detected in the Prado Basin and contiguous reaches of the Santa Ana River (Hays 1986). During the course of the 1994 field surveys, 149 pairs of vireos and an additional 39 territorial males were detected in the same Prado Basin study area (the Nature Conservancy 1994b). Thus, given the substantive avoidance and compensation measures proposed by the District as part of the current project and other, past projects, the vireo appears to be safe, at least at the present time, from potentially significant, project-related, direct and indirect impacts.

By contrast, the flycatcher population in the Prado Basin is extremely small. Although flycatchers have been detected during each of the preceding 9 breeding seasons, only five flycatcher territories were detected within the Prado Basin during 1994, including two confirmed pairs (The Nature Conservancy 1994b). Three of these home ranges also accommodated flycatchers during 1993 (The Nature Conservancy 1994b).

Unfortunately, no evidence of successful breeding by flycatchers was obtained during the 1993 or 1994 breeding seasons. A flycatcher nest discovered on June 13, 1993 subsequently disappeared when the vegetation it was placed in was found to have collapsed (The Nature Conservancy 1994a). Evidence of successful flycatcher breeding has been obtained only twice in the Prado Basin during nine years of surveys (The Nature Conservancy 1994b). Two fledgling young were observed in one (West Basin) home range during the 1991 breeding season (Pike and Hays 1992) and a breeding pair of flycatchers managed to fledge at least 2 young in the North Basin in 1988 (Hays 1988).

The flycatcher is apparently vulnerable to the same factors that have caused the decline of the vireo and has almost been extirpated as a breeding species in southern California (Garrett and Dunn 1981; Unitt 1987). Clearly, the flycatcher is on the brink of extirpation in the Prado Basin. Although the potential loss of another breeding locale in southern California is highly problematical, the proposed project is not likely to directly impact established home ranges or established, local flycatcher breeding pairs. None of the known territories established during the 1993 or 1994 breeding seasons was within 300 meters of the project area.

The bald eagle is a rare but apparently regular visitor to the Prado Basin. A maximum of three birds has been observed during recent winter counts. Although little is known of the feeding, roosting, or sheltering requirements of the bald eagles in the Prado Basin and environs, it seems likely that the local birds are not atypical in terms of the habitat requirements and behavior described above in the species account.

The proposed project may expose the vireo, the flycatcher, and the eagle to a variety of impacts that are not necessarily associated with the actual construction of the project and maintenance of the project area. These include increased pressure from cowbird parasitism events, an increased human presence, increased exposure to non-native, noxious plants and animals, and increased exposure to the deleterious effects of noise.

Of these potential impacts, however, it seems likely that cowbird parasitism may be the most important. Past and project-induced alterations, reductions, or disturbances of occupied and potential vireo and flycatcher habitat and an increased human presence may induce higher rates of cowbird parasitism and, perhaps, nest depredation (see, for instance, RECON 1988; Pike and Hays 1992; the Nature Conservancy 1993). Because "female cowbirds find nests by watching other birds and by actively searching for nests" (Van Tyne and Berger, 1976: 527), nest-finding by cowbirds and predators may be facilitated in areas that are routinely disturbed in one way or another. A sustained or increased human presence in the project area could compromise the management effort to effectively control cowbirds in the vireo habitats in, and adjacent to, the project area. The vandalism of traps remains, in particular, problematical.

Cowbirds apparently have been and are particularly abundant and troublesome within the Prado Basin (see Zembal et al. 1985; United States Fish and Wildlife Service 1986; Salata 1987b; Greaves et al. 1988). The relative abundance of cowbirds within the basin may well be the result of the rather close juxtaposition of host-rich riparian habitats and expansive feeding areas

in and around nearby dairies, livestock operations, urban and suburban parks, athletic fields, and agricultural fields (see, for instance, Zembal et al. 1985 and Hays 1987).

The local vireo population has been subjected to cowbird parasitism rates ranging from 100% (Zembal et al. 1985) to an observed low of approximately 16% in 1987, the second year of the current management effort (Hays 1987). Despite 7 years of active management, the cowbird parasitism rate was approximately 36% in 1994 (The Nature Conservancy, 1994b).

However, given the relevant data presented here and elsewhere (Pitelka and Koestner 1942; Mumford 1952; Barlow 1962; Salata 1983, 1984, 1986, 1987a, 1987b; Jones 1985; United States Fish and Wildlife Service 1986), it seems reasonable to conclude that the Prado Basin population of vireos would have been subjected to much higher rates of cowbird parasitism and suffered greater rates of reproductive failure in 1986 (Hays 1986), 1987 (Hays 1987), 1988 (Hays 1988), 1989 (Hays 1989), 1990 (Hays and Corey 1991), 1991 (Pike and Hays 1992) and 1992 (The Nature Conservancy, 1993) in the absence of a management program. Without effective avoidance or mitigation measures, the proposed project could induce increases in parasitism (and nest depredation) rates, and, in turn, lowered recruitment of the vireo and the flycatcher. Given the extremely precarious local status of the flycatcher, any such impacts could contribute to the extirpation of the species from the Prado Basin.

Because project construction and maintenance will necessitate, for instance, earth-moving activities, vireos and flycatchers could be subjected, in the absence of appropriate avoidance measures, to noise and vibration impacts. Noise and vibration are thought to be potentially harmful, in general terms, to a variety of bird species (see, for instance, Gunn and Livingston 1974, RECON 1988 and Pike and Hays 1992).

Many birds have acute senses of hearing (Dooling 1978; Knudsen 1978; Fay and Feng 1983). Researchers have documented and described the negative effects of noise on avian species and wildlife as a whole. For instance, Fletcher et al. (1971) have reported that few if any of the reported or suggested effects of noise on wildlife would benefit them or increase their chances for survival whereas known, detrimental noise effects may decrease their chances for survival or even lead to their death. In the extreme, the apparent effects of noise can be devastating to wildlife populations. Dubois (1980) reported that some bird species that spend the summer in Paris can no longer breed there because of excessive noise.

Upon reviewing the body of relevant scientific research, the Environmental Protection Agency (Dufour 1980) has identified four major categories of noise effects on wildlife: auditory physiological, nonauditory physiological, behavioral, and masking. Although masking (the interference with the reception of auditory signals because of interfering, environmental noise) and behavioral considerations are of primary concern in this instance, it has been stated and documented that "as studies with humans have shown, noise has other deleterious effects (other than masking) and there is no reason to think that noise would not effect animals in the same way" (Dooling 1987). Woolf et al. (1976) have concluded that prenatal auditory stimulation can affect the

Scherzinger, W. 1979. On the relations of predators of Hazel Grouse (Bonasa bonasa). Vogelwelt 100 (6): 325-217. English translation of abstract.

Seutin, G. and J. Simon. 1988. Genetic variation in sympatric willow flycatchers (*Empidonax traillii* and alder flycatchers (*Empidonax alnorum*). Auk 105: 235-243.

Shen, J. 1983. A behavioral study of vibrational sensitivity in the pigeon (Columba livia). Journ. Comp. Physiology 152: 251-255.

Stadelman, W. 1958. Effects of sound of varying intensity on hatchability on chicken eggs. Poultry Sci. 37: 166-169.

Stafford, M.D. and B.E. Valentine. 1985. A preliminary report on the biology of the willow flycatcher in the central Sierra Nevada. California-Nevada Wildlife Transactions.

Stalmaster, M.V. 1976. The Ecology of Wintering Bald Eagles and Effect of Human Activity on Bald Eagles in the Nooksack River Valley, Washington. M.S. Thesis. Western Washington State College. Bellingham, Washington. 100 pp.

Stalmaster, M.V. and J.R. Newman. 1978. Behavioral Responses of Wintering Bald Eagles to Human Activity. J. Wildl. Management 42: 506-513.

Stalmaster, M.V. and J.R. Newman. 1979. Perch-site Preferences on Wintering Bald Eagles in Northwest Washington. J. Wildl. Manage. 43:221-222.

Steenhof, K. 1978. Management of Wintering Bald Eagles. U.S. Fish and Wildlife Service, Con. No. 14-16-0006-77-030, September 1978.

Steenhof, K. 1987. Assessing Raptor Reproductive Success and Productivity. Pages 157-170 in B.A. Giron Pendleton, B.A. Millsap, K.W. Cline, and D.M. Bird, eds. Raptor Management Techniques Manual. Natl. Wildl. Fed., Washington D.C.

Stiles, F.G. and A.F. Skutch. 1989. A Guide to the Birds of Costa Rica. Cornell University Press, Ithaca, New York. 511 pp.

Taylor, D.M. and C.D. Littlefield. 1986. Willow flycatcher and yellow warbler response to cattle grazing. American Birds 40: 1169-1173.

Unitt, P. 1987. Empidonax traillii extimus: an endangered subspecies. Western Birds 18 (3): 137-162.

U.S. Fish and Wildlife Service. 1986a. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Least Bell's Vireo, Final Rule (Federal Register 1986), United States Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1986b. Draft Least Bell's Vireo Recovery Plan. Endangered Species Office, Region 1, Portland, Oregon.

U.S. Fish and Wildlife Service. 1987. Planning Aid Letter, Water Conservation in Prado Reservoir; Fish and Wildlife Enhancement, Laguna Niguel, California.

U.S. Fish and Wildlife Service. 1990. Fish and Wildlife Coordination Act Report dated July, 1990; Water Conservation in the Prado Basin, Riverside and San Bernardino Counties, California. Fish and Wildlife Enhancement, Laguna Niguel, California.

U.S. Fish and Wildlife Service. 1993b. Notice of 90-day Petition Finding; Southwestern Willow Flycatcher (*Empidonax traillii extimus*). Federal Register 57: 39664-39668.

U.S. Fish and Wildlife Service 1993a. Biological Opinion on the Proposed Mount Doble Solid Waste Disposal Site Land Sale, San Bernardino National Forest (1-6-91-F-35R). U.S. Fish and Wildlife Service, September 25, 1991.

U.S. Fish and Wildlife Service. 1993b. Notice of Petition Finding/Proposal to List *Empidonax traillii extimus* as an Endangered Species and to Designate Critical Habitat. Federal Register 58: 39495-39522.

U.S. Fish and Wildlife Service 1994a. Fish and Wildlife Service - Region 1 News Release. U.S. Fish and Wildlife Service. No. 94-37 June 29, 1994.

U.S. Fish and Wildlife Service 1994b. Fish and Wildlife Service - Region 1 News Release. U.S. Fish and Wildlife Service. No. 94-38 June 30, 1994.

U.S. Fish and Wildlife Service 1994c. Fish and Wildlife Service - Region 1 News Release. U.S. Fish and Wildlife Service. No 94-39 June 30, 1994.

U.S. Fish and Wildlife Service 1994d. Fish and Wildlife Service News. U.S. Fish and Wildlife Service. July 1994.

Van Tyne, J. and A. Berger. 1976. Fundamentals of Ornithology. John Wiley and Sons, New York. 808pp.

Walkinshaw, L.H. 1966. Summer biology of Traill's flycatcher. Wilson Bulletin: 78: 31-46.

Walters, M., R. Tesky, and T. Hinckley. 1980. Impact of water level changes on woody riparian and wetland communities; Volume VII, Mediterranean Region, western arid and semi-arid region. U.S. Fish and Wildlife Publications, FWS/OBS-78/93. 84 pp.

Whitfield, M.J. 1990. Willow flycatcher reproductive response to brown-headed cowbird parasitism. Master's Thesis, California State University, Chico; Chico, California.

Whitmore, R.C. 1977. Habitat partitioning in a community of passerine birds. Wilson Bulletin 89: 253-265.

Wilbur, S. 1980. Status report on the Least Bell's Vireo. Unpublished report, U. S. Fish and Wildlife Service, Region 1, Portland, Oregon.

Wilderness Research Institute, 1980. An Analysis of Habitat Requirements and Site Selection Criteria for Nesting Bald Eagles in California. Prepared for the U.S. Forest Service by the Wilderness Research Institute: Arcata California.

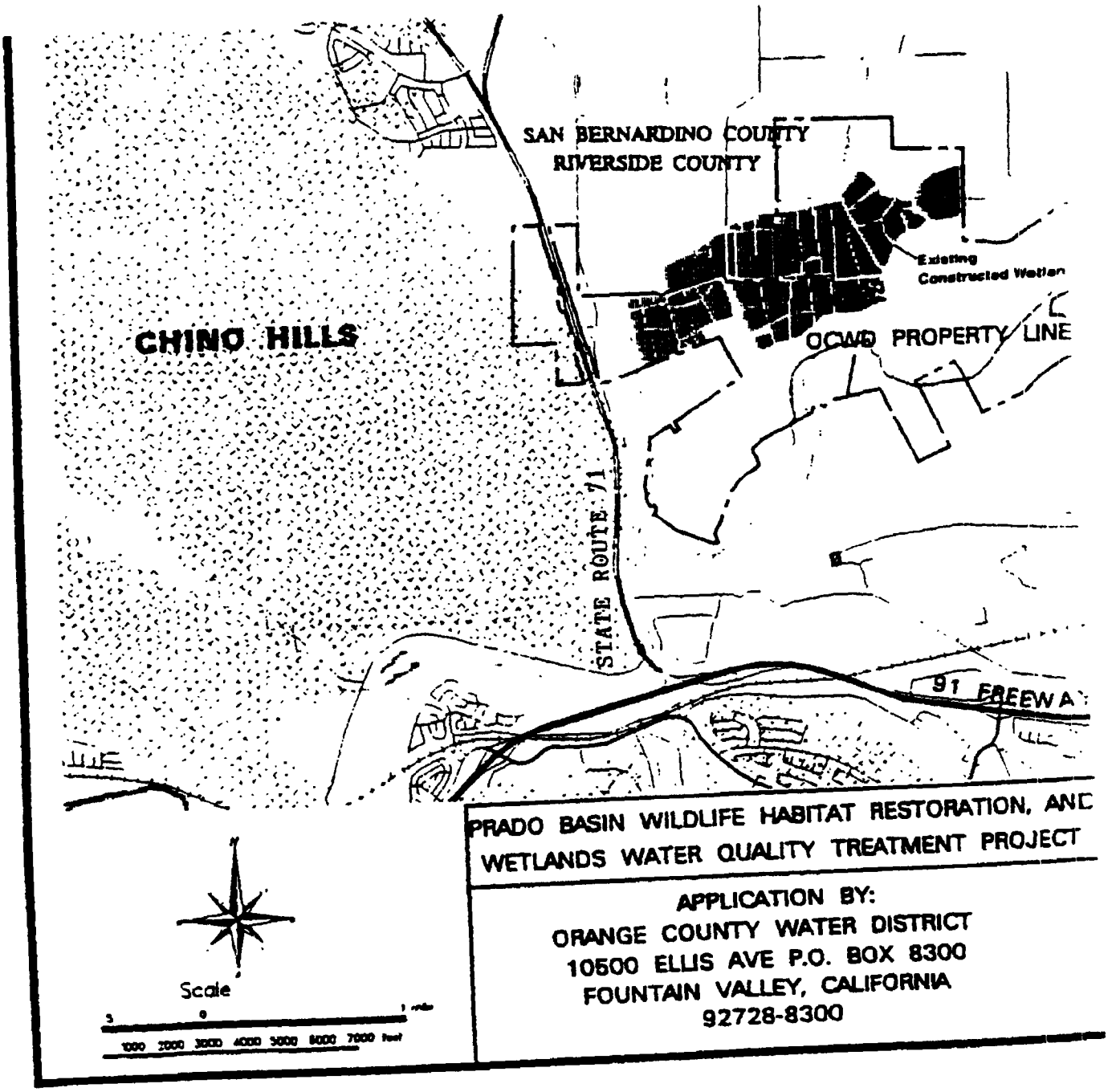
Willett, G. 1933. Revised list of the birds of southwestern California. Pacific Coast Avifauna 21: 1-204.

Woolf, N., J. Bixby, and R. Capranka. 1976. Prenatal experience avian development: brief stimulation accelerates the hatching of Japanese Quail. Science 194: 959-960.

Zembal, R. 1984 Santa Margarita River Project, San Diego County, California. Fish and Wildlife Coordination Act Report, United States Fish and Wildlife Service, Laguna Niguel, California. 91 pp. plus appendices (267 pp.).

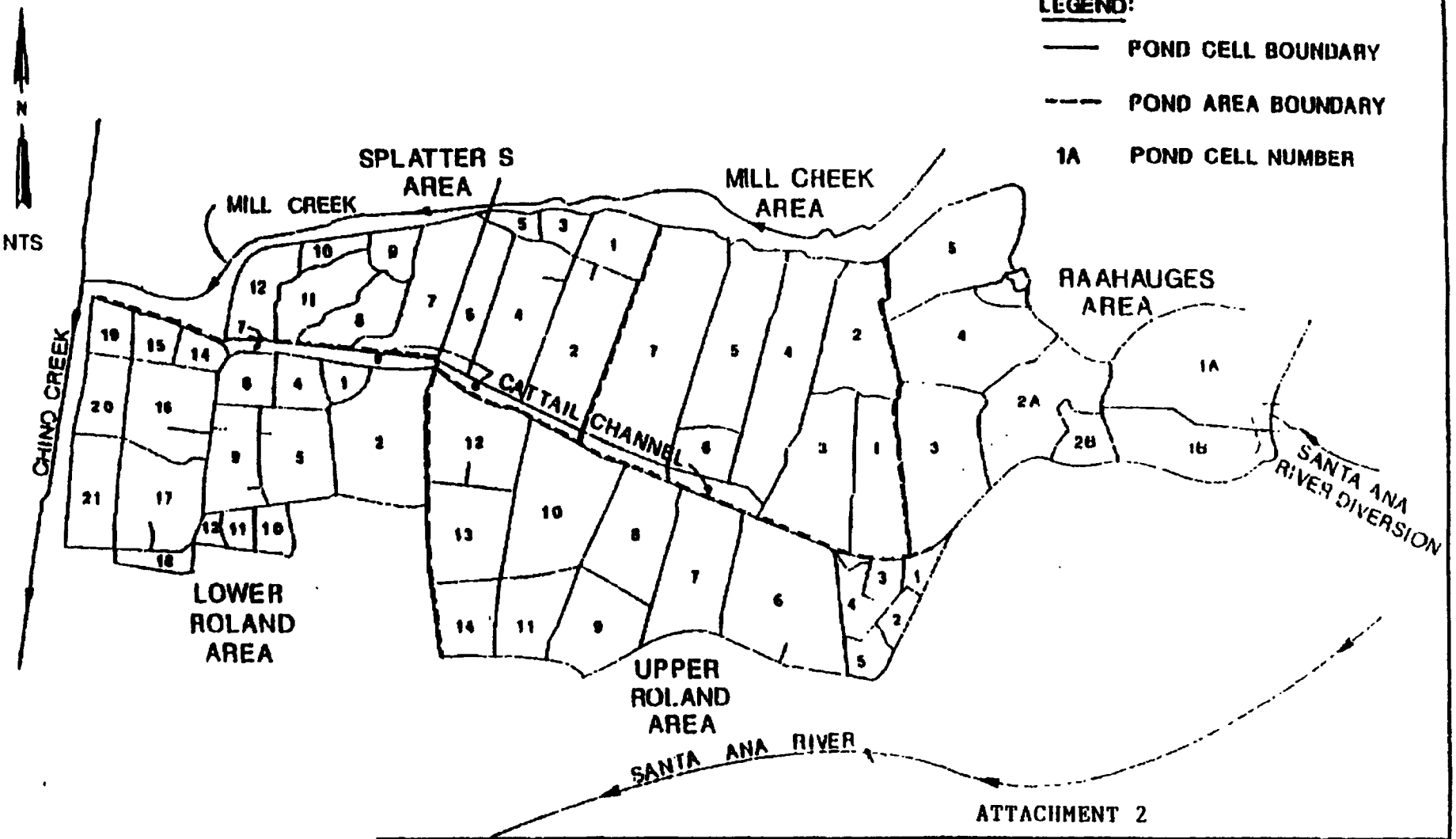
Zembal R. 1986. The Least Bell's Vireo in the Prado Basin and environs, 1985. Unpublished report, U. S. Fish and Wildlife Service, Laguna Niguel, California.

Zembal, R., K. Kramer, and R. Bransfield. 1985. Survey of Vegetation and Vertebrate Fauna in the Prado Basin and the Santa Ana River Canyon, California. Unpublished report, U.S. Fish and Wildlife Service, Laguna Niguel, California.



Attachment 1. Depiction of Project Area (SHADED).

AFTER ORANGE COUNTY WATER DISTRICT (1993)



ATTACHMENT 2

PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	LOCATION OF **EXISTING DUCK PONDS** AND POND NUMBERING SCHEMATIC
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	

AFTER ORANGE COUNTY WATER DISTRICT (1992)

APPENDIX C

HABITAT MITIGATION AND MONITORING PROPOSAL GUIDELINES
ANNOTATED OUTLINE

SUMMARY

The Orange County Water District (OCWD) owns about 465 acres of wetlands in the Prado Basin. This acreage has been leased to private parties and serves as duck ponds for hunting and wildlife habitat. This duck pond area is divided into approximately five areas which are further divided into a total of 58 ponds. Water for the wetlands is diverted from the Santa Ana River under an existing 404 permit issue by the Army Corps of Engineers (CORPS). This permit allows OCWD to divert up to 50 percent of the Santa Ana River flow through the ponds. Currently, OCWD diverts about 20 to 50 cfs through the ponds.

Water that leaves the duck ponds blends with other water sources in the Prado Basin. These blended flows are temporarily stored behind Prado Dam prior to being released through the dam and downstream to OCWD spreading grounds where it is recharged to the groundwater basin for eventual use for municipal and industrial supply. Data has shown that water quality is enhanced through nitrogen removal as the water flows through the ponds.

The wetland area within the Prado Basin consists of mostly freshwater marsh with some open water areas within constructed ponds, and surrounding riparian vegetation. The riparian vegetation provides habitat for an extensive list of species, including the endangered least Bell's vireo. As part of obtaining a CORPS 404 permit, OCWD will restore 102 acres of land within the Prado Basin to viable vireo habitat.

The mitigation areas will be restored to habitat through either natural revegetation, or control planting practices. The habitat restoration program will last from 3-5 years depending on the development of the plant species. An extensive maintenance and monitoring program will be developed and rigorously adhered to. All documentation of project progress will be in accordance with the requirements of the CORPS.

The purpose of the 404 application is to allow for reconstruction of a portion of the duck ponds to increase flow capabilities and enhance nitrogen removal rates.

I. PROJECT DESCRIPTION

A. Location of Project

1. Describe

The project area consists of approximately 465 acres of wetlands area in the Prado Basin (see Figures 1 & 2). The wetlands area is located near the Santa Ana River downstream of River Road in Riverside County, California.

B. Brief Summary of Overall Project

In one or two paragraphs, describe the overall project (not just the area to be filled). Include type of development and project size, and a brief schedule/date line of project construction.

The Orange County Water District (OCWD) owns about 465 acres of wetlands in the Prado Basin. This acreage has been leased to private parties and serves as duck ponds for hunting and wildlife habitat. This duck pond area is divided into approximately five areas which are further divided into a total of 58 ponds. Water for the wetlands is diverted from the Santa Ana River under an existing 404 permit issue by the Army Corps of Engineers (CORPS). This permit allows OCWD to divert up to 50 percent of the Santa Ana River flow through the ponds. Currently, OCWD diverts about 20 to 50 cfs through the ponds.

Water that leaves the duck ponds blends with other water sources in the Prado Basin. These other sources include Chino Creek, Mill Creek (also known as Cucamonga Creek), Temescal Wash, and Santa Ana River water. These blended flows are temporarily stored behind Prado Dam prior to being released through the dam and downstream to OCWD spreading grounds where it is recharged to the groundwater basin for eventual use for municipal and industrial supply. Data has shown that nitrogen is removed as the water flows through the ponds to maximize the nutrient removal capacity. A flow of about 100 cfs has been suggested as the ultimate flow diversion, but improvements to the ponds will be necessary to accommodate a flow of 100 cfs. Construction for improvements is scheduled for 1195 or 1996 depending on Federal funding that has been applied for in conjunction with United States Fish & Wildlife Service (USF&WS).

C. Responsible Parties

Provide name(s), title(s), address(es), and phone number(s) of applicant(s), including contact person(s) if applicant is a company, and preparer(s) of mitigation plan.

Orange County Water District
10500 Ellis Avenue, P.O. Box 8300
Fountain Valley, California 92728-8300
Telephone (714) 378-3200

Contacts: William R. Mills Jr.
Jim Van Haun
Craig Miller

D. Jurisdictional Areas to be Filled by Habitat Type, as defined in the "Corps of Engineers Wetlands Manual" (Waterways Experiment Station Technical Report Y-87-1, January, 1987) and in 33 CFR 328.3(a).

Provide topographic base map with verified Corps jurisdictional area(s) and area(s) of proposed fill outlined (see Appendix A for map format information).

See Figure 3 for locations of jurisdictional area and approved mitigation areas per the December 17, 1993 letter from the CORPS.

E. Type(s), Functions, and Values of the Jurisdictional Areas To Be Directly and Indirectly Impacted

1. Type (e.g. seasonable wetland, vernal pool, freshwater marsh, riparian, open water, eelgrass bed, etc.)

   The wetland area within the Prado Basin consists mostly of freshwater marsh with some open water areas within constructed ponds and surrounding riparian vegetation.

2. Functions and Values

   The Corps has not yet adopted formal procedures to assess functions and values of waters of the United States. Therefore, to assist in an evaluation of the project, a qualified biologist shall provide a summary of the functions and values of waters of the United States, assessing a measure of its values. In addition, multi-disciplinary expertise (e.g. hydrology, geology) may be required to evaluate the functions and values of an area on a site-specific and/or regional basis. Examples of features to be addressed are:

Water Quality

- groundwater recharge/discharge
- nutrient removal/transformation
- flood flow alteration
- sediment stabilization

A significant amount of groundwater recharge is provided by the duck ponds within the Prado Basin, which help to sustain surrounding riparian vegetation in the Spring and Summer months. A water budget conducted by OCWD indicates up to 5 to 10 cfs is recharged to groundwater for surrounding riparian vegetation use in the wetlands. Groundwater discharge to the ponds occurs in the winter months at approximately the same rates, but only within the lower lying ponds.

Nutrient removal and transformation occurs within the duck ponds and is very significant during the Spring, Summer, and Fall months. Nitrate levels within diverted Santa Ana River water fall from approximately 10 mg/l at the diversion to the ponds, to below detection limits (< 0.1 mg/l) at the pond outflows to Chino and Mill creek. Nitrate removal rates are not as significant in the Winter months, with concentrations falling to about 5 mg/l at the pond outflows.

Flood flows within the Prado Basin may be altered slightly due to levee construction around the duck ponds. In general, these levees may help to control more destructive mud and debris flows that occur within the basin during heavy rainfall. Maintaining the diversion structure may help to keep the Santa Ana River confined to its present channel, reducing chances of habitat destruction to nearby areas. Sediment within the basin is also stabilized by vegetation in and around the duck ponds.

Habitat

- rare/endangered species
- known or probable wildlife use
- plant communities
- complete species list
- known or probable fish, shellfish, and aquatic invertebrate use

The least Bell's vireo is a Federally listed endangered species that occupies critical habitat within the Prado Basin from March 15 to September 15 (Vireo season). Numerous other birds

frequent the duck ponds within the basin including Stilts and Avocets, shorebirds, blackbirds, Pelicans and Cormorants, Grebes, Plovers, Herons, Egrets, Raptors, Rails, and waterfowl. Four types of plant communities are found within and around the duck ponds. They are: 1) Submerged (water net, bushy pond weed, horned pond weed) 2) Floating (Duckweed, blue green algae, green algae, Diatoms) 3) Emergent (Bulrush, Cattail, Barnyard grass, Primrose family) and 4) Pond margins (Sedge, Willow, mule fat, Bur-marigold, Feather foil, Giant reed). Many types of fish inhabit the duck ponds including Bluegill, Black Bullhead, Largemouth Bass, Carp, and Mosquito fish, along with freshwater shellfish and clams. A complete list of species found in the Prado Basin can be found in the appendix.

Recreational Use/Public Access

- nonconsumptive (e.g. birding, walking)
- consumptive (e.g. fishing, hunting)

The Prado Basin duck ponds are commonly used for recreational purposes. These include non-consumptive uses such as dog training, birdwatching, horseback riding, and canoeing, along with field trips by local Elementary school children. Consumptive recreational uses include duck hunting and some fishing.

II. GOAL OF MITIGATION (i.e. the long-term goals, which may not be reached until some years after the applicant's mitigation responsibilities have been completed)

A. Type(s) of Habitat to be Created/Enhanced

Refer to Section I.E.1 above. If out-of-kind, present rationale. Include a Table listing the size of impact, proposed mitigation ratio, and acreage for each habitat type to be impacted.

The type of habitat created will be consistent with the existing habitat throughout the OCWD wetlands area. As stated in section I.E.1 above OCWD will be creating a riparian habitat in all mitigation areas. Refer to Table 1 and Figure 4 for a listing of the size and locations of the various mitigation areas.

B. Functions and Values of Habit to be Created/Enhanced

Refer to Section I.E.2 above. Identify, describe, and give location of any local reference site other than the waters of the United States to be filled.

All areas lie within waters of the United States.

C. Time Lapse

How many years is it likely to take for long-term goal habitat to develop?

It is estimated to take 3-5 years for viable habitat development.

D. Estimated Cost

What will cost of habitat mitigation be? Estimate the cost of design, implementation, maintenance and monitoring of the mitigation area until completion of the permittee's mitigation responsibilities.

Construction costs are estimated at $550,000 for capital improvements, and $265,000 annual operations and maintenance costs. Table 2 shows the breakdown of the estimated costs.

E. Other Aquatic Habitats

When mitigation is required for impacts to eelgrass habitat, all aspects of the Southern California Eelgrass Mitigation Policy (National Marine Fishery Service, Adopted July 31, 1991, revised August 1992) shall be incorporated.

For wetlands, such as vernal pools, in which the wetlands:upland ratio is important to the functioning of the ecosystem, the ultimate wetland:upland ratio of the mitigation site should be approximately equal to the ratio of those habitats in the area impacted by the project.

The OCWD wetland area has a uniform aquatic habitat. Therefore no special wetlands:upland ratio is critical to the establishment of the habitat.

III. FINAL SUCCESS CRITERIA

These are criteria that are proposed by the applicant for Corps approval and are used to determine completion of permittee's mitigation responsibilities. Fulfillment of these criteria for all the factors listed below should indicate whether the mitigation area is progressing well toward the habitat type, functions, and values which constitute the long-term goals of this mitigation. For mitigation plantings, final success criteria will not be considered to have been met until a minimum of two years after all human support (e.g. irrigation, replanting, rodent control, fertilization) has ceased. The criteria should be stated in such a manner that the Corps can return to the site for a compliance check and verify attributes (e.g.

measure percent cover or target canopy height) of the target functions and values. Modifications of the implementation plan will be considered by the Corps as long as the final result is successfully achieved. Major factors to be evaluated are:

A. Target Functions and Values
- target or management indicator wildlife species (i.e., invertebrates, reptiles, amphibians, mammals, fish, and birds)
- % vegetation cover by strata and/or density
- target native plant and animal species diversity and composition (if monitoring indicates a high level of non-native species diversity, corrective action will be required)
- approximate plant height and diameter at breast height (shrubs and trees)
- root development
- canopy stratification
- evidence of natural reproduction
- percent survivorship and other quantitative measures of success

The final success criteria for the habitat restoration is to develop a viable vireo habitat in all planting areas. Additionally success will be measured by the ability of the habitat restoration areas to maintain the diversity of species as is currently existing in the project area. Physical measurement of the success of the restoration can be measured by a minimum 15 foot canopy of Willow growth in addition to a dense luxurian undergrowth. Habitation of either the Yellow Breasted Chat or the Willow Flycatcher will also determine a successful habitat mitigation project. Additionally, USF&W may determine success of the restoration project through site inspection.

B. Target Hydrological Regime
- source(s) of water
- discharge points
- areas affected by seasonal flooding
- direction(s) of flow
- size (and map) of watershed
- duration, periodicity, and depth of ponding/flooding
- water quality (i.e., salinity, Ph, dissolved oxygen, temperature, etc.)
- sediment transport

C. Target Jurisdictional Acreage to be Created/Enhanced

Where applicable, a formal wetlands determination must be submitted for

Corps approval as a part of final success criteria.

IV. PROPOSED MITIGATION SITE

A. Location and Size of Mitigation Area

1. Describe location, including rationale for choice. Indicate distance from project site, if offsite.

   The mitigation sites were carefully selected through numerous meetings with the United States Fish and Wildlife Service. The mitigation sites and corresponding acreage are shown on Table 1. Figure 4 shows the location of the mitigation sites within the Prado Basin. All the mitigation sites are located onsite.

2. Provide the following maps:

   a) full-size copy of USGS quad map with mitigation location outlined

      Refer to Figure 2.

   b) site location on a road map

      Refer to Figure 1.

   c) base topographic map with proposed mitigation area(s) outlined and acreage indicated (see Appendix A for figure format information)

      Refer to Figure 7 for a topographic map of the mitigation sites.

B. Ownership Status

1. Indicate who presently owns the mitigation site. If different from permit applicant(s), what is availability of the property? Does the property carry any easements or encroachments? If on public land, what arrangements, if any, have been discussed with managing agency?

   All mitigation sites proposed in this plan are presently owned by OCWD. None of the proposed areas carry easements with the exception of a flood control easement by the CORPS.

2. Indicate expected ownership of the mitigation area following completion of the mitigation project. Who will be responsible for long-term management and protection of the area? If entity other than applicant will assume management responsibilities following completion of mitigation project, is there a signed, written agreement with the entity to manage the area in conformance with goals of the mitigation? Include copies of any agreements.

Upon completion of the proposed mitigation project, the property will remain in ownership of OCWD, maintaining responsibility for long-term management and protection of the area. No other agency or entity shall share this responsibility for these proposed mitigation areas.

3. Indicate what entity, if any, controls water flow to and/or from the site. Who maintains water control structures? What arrangements have been made to guarantee appropriate water flow in the mitigation area during and after the establishment of the mitigation project?

OCWD is responsible for flow of water from the Santa Ana River diversion near River Road, to all mitigation sites near the duck ponds. OCWD presently holds a valid 404 permit allowing for diversion of up to 50% of the Santa Ana River base flow from the CORPS (permit #89-477-MD). OCWD owns and maintains all flow control structures within the ponds, and controls outflows to the mitigation sites near the duck ponds. In addition to pond area mitigation sites, water will be diverted from the Santa Ana River for meeting revegetation needs in the PR-2 area.

4. Indicate who the point of contact is for permission to gain access to the site, or include a statement giving the Corps permanent access to the site.

The CORPS is hereby granted access to all mitigation areas at all times for purposes of determining progress and success of habitat restoration on the proposed sites.

C. Existing Functions and Values of Mitigation Area

Refer to Section I.E above.

D. Present and Proposed Users of Mitigation Area

Briefly describe all known present and proposed uses of mitigation area. Discuss non-native landscape plantings, pipelines, power lines, roads, distance and location of nearest structures, if any, etc. on property containing mitigation site. Discuss use of mitigation area after project is complete.

At present, no hunting or recreational activities are being conducted on any present or proposed mitigation areas. The mitigation areas will be planted and/or allowed to re-vegetate with only natural vegetation (Willows and mule fat) suitable as least Bell's vireo habitat.

The nearest structures to the proposed mitigation areas are further than 1/4 mile in distance, with the closest being a temporary field headquarters of OCWD and a nearby duck hunting camp, approximately 1/3 mile east of Raahauge pond 5. All other mitigation sites are greater than 1 mile from houses or other inhabited structures. A dirt road will boarder the 8 acres of proposed 40 ft. wide strip of habitat along the perimeter, however there will be minimal travel on this road during least Bell's vireo season by OCWD employees only for purpose of pond and levee maintenance or emergency repair. Mitigation sites will not be used for recreational or other purposes, and will be maintained solely as habitat for the least Bell's vireo and other wildlife.

E. Jurisdictional Delineation (if applicable)

If jurisdictional areas are already present on the mitigation site, describe. Provide base topographic map of site with jurisdictional areas (and any proposed fill) indicated. Describe probable future of mitigation area as habitat if left undisturbed.

F. Present and Proposed Uses of All Adjacent Area

Briefly describe all known present and proposed uses of all property sharing a common border with the property containing the mitigation site.

G. Zoning

Give all present and proposed zoning designations for mitigation site and adjoining properties, including city, county, etc.

The project area and all adjacent properties are zoned for flood control/agriculture. Table 3 lists all adjacent property owners.

V. IMPLEMENTATION PLAN

A. Rationale for Expecting Implementation Success

May refer to previous relevant experience of applicant and/or implementation consultant or to other similar and successful mitigation projects. Include hydrology and soils information.

OCWD has previously planted 124 acres of mitigation habitat within the project area (see Figure 8). We have also done extensive Arundo removal and habitat revegetation along the diversion channel feeding the wetlands. Both projects have been very successful. The experiences and techniques learned and utilized for these previous projects will be employed in the revegetation of all mitigation sites. Given that all mitigation areas are onsite with similar hydrologic and soil profiles we have confidence that future mitigation projects will have the same excellent results that our past projects have shown.

B. Responsible Parties

Give name(s), title(s), address(es), and phone number(s) of person(s) responsible for implementing the mitigation project.

Refer to section I.C.

C. Schedule

Provide a schedule in the form of a legible flow chart showing intended timing of site preparation and plantings.

The project schedule is shown on Table 2. Commencement of much of the mitigation work is dependent on issuance of the 404 permit by the CORPS. OCWD is also seeking a federal grant for the planned improvements to the existing pond system. The project schedule could be affected by any delays in receiving this grant.

D. Site Preparation

1. Describe plans for grading, hydrologic changes, water control structures, soil amendments, erosion control, bank stabilization, equipment and procedures to be used, site access control, etc., as applicable. Include a description of exotic vegetation control techniques, planting hole excavation methods (e.g. auguring, hand digging) and the size of the planting hole (e.g. twice size of

container).

The proposed changes to the duck ponds include the construction of new berms, removal of a few existing berms, and construction of flow control (weir boxes) and transfer structures. Figure 9 shows a plan view of the proposed changes. The following improvement types will be discussed:

- Berms
- Weir Boxes
- Transfer Structures
- Cattail Channels

It should be noted that improvements will be made in only the Raahauge, Mill Creek, Upper Roland, and Lower Roland areas. It was determined that improvements would not be made to the Splatter S area since it is not owned by OCWD.

Berms

The improvements include the removal of an existing berm between Mill Creek ponds 5 and 6 and the addition of several internal berms at other locations. Internal berms are defined as those berms that divide pond cells. There are two types of internal berms to be used to divide the pond cells but not allow vehicle traffic since they are only 5 feet wide at the top of the berm. the internal berms with weir boxes will have a top width of 12 feet to allow vehicle traffic in order to more easily access and adjust weir boxes.

The new berms will be constructed so the top of the berm is a maximum of 1 foot above the normal upstream pond water surface elevation. Constructing a berm just slightly above the water surface elevation will allow waterfowl to fly from one pond to another without a major obstruction.

Weir Boxes

OCWD has adopted a standard weir box for installation at the Prado Basin Duck Ponds. The weir box consists of a three-sided box constructed of wood with the fourth side being a slot designed to accommodate removable wooden flashboards. These flashboards act as the weir crests and are typically 5 feet in length. Adding and removing flashboards allows adjustment

of the upstream pond water surface elevation. A 36-inch diameter pipe is connected to the weir box to allow water spilling over the weir to be conveyed to the adjacent downstream pond. The length of the pipe depends on the width of the levee it is located in.

Transfer Structure

A transfer structure is used to allow flow in either direction between adjacent ponds. The structure consists of two standard weir boxes attached by a common 36-inch diameter pipe and is designed to allow flow in either direction (see Figure 10). The purpose of the transfer structure is facilitate maintenance (cleaning, repairs).

Cattail Channel

The existing cattail channel is a unique feature in the duck pond area. Most of the duck ponds consist of large ponds with an average water depth of 1 to 2 feet. The cattail channel is a collection ditch for water from the ponds and has an average water depth of 4 feet. As shown in Figure 11, trees are located on each side of the western portion of the ditch and provide a roosting habitat. Although the ditch side slopes are relatively steep, the vegetation growing on the channel has stabilized the side slopes to prevent erosion.

Mitigation areas

This section describes the mitigation areas developed as part of the duck pond improvements. Following are the three types of mitigation associated with this project:

- Pond Mitigation Areas
- Perimeter Levees
- Islands

The total mitigation area created by these three mitigation types is about 35 acres. The locations of these mitigation areas are shown in Figure 12.

Pond Mitigation Areas

There are several ponds that currently contain water, but it is

proposed that these selected ponds be converted to mitigation areas. These ponds and their respective areas are as follows:

*	Raahauge's 5	16 acres
*	Lower Roland 10 to 12, 18	7 acres
	Total Pond Mitigation Area	23 acres

Raahauge's pond 5 is located above the 500 foot elevation and adjacent to known vireo habitat. The ponds in the Lower Roland are below the 500 foot elevation and typically are inundated during a portion of the year.

Certain portions of the pond mitigation areas listed above and levees that are currently experiencing natural revegetation of willow and mule fat will be left to revegetate naturally. The remaining mitigation areas will be planted with species typical of willow woodland nesting habitat for the least Bell's vireo: black willow (Salix goodingii) and mule fat (Baccharis glutinosa). The willows will be planted on 12-foot centers, and the mule fat will be planted on 10-foot centers, using 1-gallon stock and/or cuttings. To the degree possible, plant material will be propagated from seeds or cuttings from plants on-site. As part of the revegetation plan, maintenance, weed control, and monitoring programs will be established as discussed latter in section IV.

Perimeter Levees

Many of the perimeter levees will be reconstructed to contain a conveyance ditch. The outside levee will be made approximately 50 feet wide to accommodate about 40 feet of vireo habitat (trees, brush) and a 10 foot wide road adjacent to the conveyance ditch (see Figure 13). A road will be contained on the inside levee will allow for normal traffic, while the outside levee road may be used occasionally to maintain and clean the conveyance ditch. Construction of these perimeter levees will create about 8 acres of mitigation area.

Islands

Approximately ten island areas will be created in some of the ponds to enhance both vireo and waterfowl habitat. The vireo islands will be located near existing vireo habitat and provide an

area of about 1/4 to 1/2 acre each. Providing islands for vireo to nest will provide a safe location against most predators. Since vireo habitat is typically located adjacent to perimeter levees, the islands will be located near and parallel to the perimeter levees. The mitigation area created by these islands is estimated to be about 4 acres.

Waterfowl prefer to nest on islands to avoid certain predators. However, these islands may be located anywhere in the duck ponds. The islands will by designed to allow proper water circulation patterns to avoid stagnation problems. Figure 14 shows three proposed island types for waterfowl habitat.

2. Provide base topographic maps showing planned site preparation (see Appendix A for figure format information).

   Figure 9 shows the proposed layout for the site improvements. Design is currently in progress and final design plans, including topographic maps, will be available upon completion.

3. Provide representative cross-sections of mitigation site with elevations and scale indicated.

   Figure 15 shows a plan view of the location of the proposed cell types. Figures 16, 17, and 18 show typical cross sections of the ponds. Figures 11 and 13 show cross sections of the cattail and conveyance channels used for mitigation areas.

4. Give name, title, address, and phone number of person supervising or providing biological monitoring during grading activities.

   Jim Van Haun
   Orange County Water District
   10500 Ellis Avenue
   Fountain Valley, CA 92728-8300

E. Planting Plan

1. Briefly describe planting plan and methods.

   OCWD will use the same successful planting methods used on the previous 124 acres of habitat restoration (see Figure 8).

2. Provide a table of species to be planted, including numbers, spacing,

types of propagules, pot sizes, etc. (when selecting plant species to include in the planting plan, known host associations for native invertebrates should be incorporated).

Vegetation to be established in the ponds will consist mainly of cattails (*typhia* 2 spp.) and bulrush (*Scirpus* spp.). Additional desirable species such as *Carex* species, arrowheads (*Sagaittaria* spp.), and *Juncus* spp. will be added to the species mix if sufficient parent material is identified within the pond areas. Currently cattails and bulrush occur only in certain areas of the ponds, particularly in the center channel and in patches in some of the deeper ponds. These species may not be successful in the existing ponds because of the current hydrological regime and the vegetation maintenance activities that occur prior to the duck hunting season. In areas where sufficient source material is within the pond, weed control may be the only measure needed to ensure revegetation by cattails and bulrush. In those areas, vegetation will be monitored for the first year; if cattails and bulrush have not successfully established, then additional plantings will be undertaken as described below.

Planting of cattails and bulrushes can be undertaken in one of three ways: 1) spreading of topsoil from areas with appropriate existing vegetation; 2) spreading of cattail and bulrush seed; or 3) planting plugs (cuttings), roots, or rhizomes. Water will be drawn down during planting to avoid the loss of the plant material. If top soil is used, material shall be removed from areas with appropriate vegetation and placed on the bottom surface of the new pond areas once these have been graded. If plant material is used, material should be planted on 2-3 foot centers. Seed should by collected at the appropriate time (when cattails heads are ready to scatter), and properly stored prior to broadcast seeding. Seed mixed with sand will spread more evenly.

Vegetation to be established in the mitigation areas will consist of Black Willow (*Salix goodingii*) and mulefat (*Baccharis glutinosa*). Willow cuttings would be planted on 12-foot centers and mulefat cuttings or 1-gallon stock planted on 12-foot centers. The specifications are in accordance with OCWD's previous successful habitat restoration activities. A site maintenance and management plan will be prepared covering replacement of diseased or dying plants; monitoring the need for supplemental watering; protection of plants from browsing, trampling, or

competition by weed species. Further details of the monitoring and maintenance program will be presented below in section VI.

3. Indicate source-locale of seeds, plant plugs, cuttings, etc. (plant material shall be selected from within a limited distance of the project site to preserve regional genetic diversity).

   Source cuttings and any seeds used for revegetation will come from a commercial native plant nursery used by OCWD on our previous habitat restoration projects. If available cuttings from on site materials will be utilized.

4. Show planting and species locations on a base topographic map (see Appendix A for figure format information).

   Refer to Table 1 and Figure 4 for locations of the planting areas within the project.

5. If transplanting is to be done, describe storage method and duration.

   There will be no transplanting.

6. Describe any expected volunteer native revegetation that is included in mitigation planning.

   Our experience shows that there will be extensive native revegatation throughout the project.

F. Irrigation Plan - Irrigation is used solely for the purpose of establishing the mitigation site. It is of a temporary nature. The applicant shall provide the Corps with evidence and assurances that the hydrological regime is present for the habitat to survive without irrigation in perpetuity, once the plants are established.

1. Describe irrigation method(s) and estimated frequency, duration and amount during dry months.

   Once planting areas are established, they will be irrigated with rising groundwater, or water in pond cells to meet 100% of the irrigation water requirements.

2. Indicate water source(s) for mitigation area.

3. Show planned irrigation system and/or water flow on base

topographic map (may include on planting plan map).

Irrigation of proposed mitigation areas will be performed in order for Willows, mule fat, and other natural vegetation to establish and thrive. Flood irrigation will be performed in Raahauge pond 5 (16 acres) and lower Roland's ponds 10, 11, 12, and 18 (7 acres). This will be done by existing weir boxes from nearby ponds and monitored so that water does not exceed more than a few inches in height from the pond bottoms. PR-1 (14 acres) and PR-2 (36 & 10 acres) mitigation sites will be irrigated with water from the Santa Ana River with pumps and sprinklers on a weekly basis for approximately 6 months, or until natural vegetation can be sustained by groundwater. This will also be the method employed for re-vegetation of the 40 ft. wide perimeter levee and 10 1/4 to 1/2 acre islands (8 & 4 acres) along with the 7 acre violation site where the property lessee disked a Willow/Cocklebur field and excavated an access road, and the 250 ft. area along either side of the non-authorized discharge channel.

Several monitoring wells constructed within the Prado Basin indicate groundwater levels to be shallow (Figure 19 shows groundwater levels of 0-3 feet) at all mitigation areas and capable of sustaining riparian vegetation such as Willow and mule fat. This is also evidenced by the presently thriving Willows, mule fat, and other vegetation surrounding the mitigation areas.

G. As-Built Conditions

The plan should specify that the applicant will:

1. Submit a report to the Corps within six weeks of completion of site preparation and planting, describing as-built status of the mitigation project. Submit separate reports for grading, planting work and erosion, control measures if not completed within six weeks of each other.

   OCWD will submit a report within 6 weeks of completion of site preparation describing status of mitigation project.

2. Provide topographic maps showing as-built contours of mitigation area. Indicate location of plantings and any other installations or structures.

OCWD will provide as-built maps showing contours of the mitigation area.

VI. MAINTENANCE DURING MONITORING PERIOD

A. Maintenance Activities

Describe planned maintenance activities, including irrigation system inspection, plant replacement, non-native plant control, water structure inspection, fertilization, erosion control, herbivore protection, trash removal, and/or any other such activities. Include protective measures such as signs, easements, land-use management, and access control.

Maintenance activities shall consist of manual irrigation control of mitigation areas previously described along with control of weir boxes for flood irrigation. Irrigation equipment and water structures will be inspected and adjusted on a weekly basis. Non-native vegetation growth such as Giant Reed (Arundo donax) will be monitored weekly after initial removal. If significant re-growth of non-native species poses a threat to native plants, they will be cut manually and treated with an EPA approved herbicide so as not to re-vegetate. Trash and debris from storm and flood flows will be removed from mitigation areas as conditions require.

All mitigation areas are to be off limits to all except CORPS, Fish and Wildlife, and OCWD employees. access into mitigation areas will be strictly for maintenance reasons listed above, and for purposes of estimating native vegetation re-growth and habitat value. No work shall be performed within 250 ft. of mitigation areas during least Bell's vireo nesting season once habitat has been established for any purpose other than emergency repairs. The CORPS and US Fish and Wildlife service will be notified prior to any emergency work.

B. Responsible Parties

Identify persons/entities responsible for financing and carrying out maintenance activities, including names, titles, addresses, and phone numbers.

Same as section I.C.

C. Schedule

Provide a table showing schedule of maintenance inspections.

There will be weekly inspections of the project area.

VII MONITORING PLAN

A. Performance Criteria

Provide yearly target criteria to be met, as appropriate, based on reasonably-paced progress toward final success criteria (Refer to Section III). Target criteria shall emphasize the establishment of native plant and animal species. If monitoring indicates a high level of non-native species, corrective measures shall be required.

Monitoring of all mitigation areas will be performed on a bi-weekly basis to determine how these areas are proceeding towards the target habitat within the 3-5 year time frame. The compliance monitoring program will include gathering data on the revegetation plans success and submitting annual reports for a 5-year period. These biweekly site visits will review factors such as drought stress, loss of planted material by predation, natural regeneration, weed and non native vegetation control, average willow height in specified areas, and amount of viable vireo habitat established as a percent of the mitigated acreage. Removal of Giant Reed will be performed as indicated in the maintenance activities section VI above.

B. Monitoring Methods - Monitoring is a requirement of every Corps permit mitigation plan. Monitoring assesses the attainment of yearly and final success criteria and identifies the need to implement contingency measures in the event of failure.

1. Describe monitoring methods. If using sampling methods, include sample sizes, statistical justification for sampling regime, and data analyses to be performed. If appropriate, include assessment of nature population growth by target species.

   Compliance monitoring will consist mainly of estimation of viable Vireo habitat consisting of groups of willows through aerial and ground photography of mitigation areas, along with intensive field observations. Identification of non-native species will also be conducted by these methods so that they may be eradicated. Sampling methods will not be employed for monitoring.

2. Provide samples of all proposed data sheets.

None proposed.

3. Photos shall be taken during each monitoring period. They shall be taken from the same vantage point and in the same direction every year, and shall reflect material discussed in the monitoring report. When percent cover estimates are made of herbaceous vegetation, photographs should be taken of sampling quadrants.

   All photos used in the monitoring program will comply with the above.

4. Maintain continuity within the personnel and methodology of monitoring insofar as possible to ensure comparable assessments.

   OCWD will rigorously attempt to be consistent in all monitoring methods as stated above.

C. Annual Reports

1. Annual reports shall be submitted which present monitoring results. They shall assess both attainment of yearly target criteria and progress toward final success criteria. Specify the number of reports to be submitted to the Corps.

   The OCWD monitoring plan will require twice yearly surveys following completion of habitat restoration efforts. If replacement of unsuccessful plantings exceeds 20% of the original plantings, additional monitoring would be required for 5 years following the replacement of those plantings. Credit will be provided for Willows or mule fat that reestablish naturally in determining success based on the percent survival or density.

2. Annual reports shall include the following:

   a. A list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities for that year.

   b. A copy of Corps permit, any attached Special Conditions, and any subsequent letters of modifications, as an appendix.

   c. Analysis of all quantitative monitoring data (success, failure and remedial action). Graph and table format is preferred.

d. Prints of all included monitoring photographs (colored photocopies are acceptable).

e. Maps identifying monitoring areas, transects, planting zones, etc. as appropriate (see Appendix A for figure format information).

All annual reports will conform to the above requests.

3. Copies of all field data sheets shall be available for Corps review upon request.

OCWD will comply with the above request.

D. Schedule

Since planting and/or site modification may not occur when planned, monitoring and performance criteria shall be tied to the actual implementation date rather than to predetermined years, e.g., the first annual report shall be delivered on (month, day) of the year following the first growing season after planting.

VIII. COMPLETION OF MITIGATION

A. Notification of Completion

When the initial monitoring period is complete, and if applicant believes final success criteria have been met, applicant shall notify the Corps when submitting the annual report that documents this completion. Where appropriate, a current jurisdictional delineation of the created wetland area should be submitted with the report (this delineation shall be accompanied by legible copies of all field data sheets).

OCWD anticipates completion of a successful project after a 4-5 year period. At that time the above requested documentation will be submitted.

B. Corps Confirmation

Following receipt of the report, the Corps may require a site visit to confirm the completion of the mitigation effort and any jurisdictional delineation.

IX. CONTINGENCY MEASURES

A. Initiating Procedures

If an annual performance criterion is not met for all or any portion of the mitigation project in any year, or if the final success criteria are not met, the permittee shall prepare an analysis of the cause (s) of failure and, if determined necessary by the Corps, propose remedial action for approval. If the mitigation site has not met the performance criterion, the responsible party's maintenance and monitoring obligations continue until the Corps gives final project confirmation.

OCWD will comply with the previous request.

B. Alternative Locations for Contingency Mitigation

Indicate specific alternative mitigation locations that may be used if mitigation cannot be successfully achieved at the intended mitigation site. Include current ownership information if offsite.

There are no alternative mitigation areas.

C. Funding Mechanism

Indicate what funds will be available to pay for planning, implementation, and monitoring of any contingency procedure that may be required to achieve mitigation goals.

Funding for the mitigation project will come from the General Fund of OCWD.

D. Responsible Parties

List names, addresses, and phone numbers of persons/entities responsible for implementing and monitoring contingency procedures.

Same as section I.C.

TABLE 1

Alleged Violation	Mitigation	Acreage	Map I.D.
Original construction of the ponds (Raahauge violation)	Allow natural re-vegetation to occur at the following four sites:		
	1) Raahauge Pond 5	16 acres	1
	2) Lower Rolands Ponds 10, 11, 12, 18	7 acres	2
	3) Entire PR-1 (14-acre Small Pheasant Field)	14 acres	3
	4) Portion of PR-2 (65-acre Southern Pheasant Field)	36 acres	4
	Construct about 10 islands at 1/4-1/2 acres each	4 acres	5
	Plant willow along a constructed 40-foot wide strip along perimeter levee	8 acres	6
	Remove 30 acres of Arundo		7
Construction of outlet channel from Pond Upper Roland 14 to the SAR (OCWD violation)	Allow natural re-vegetation to occur on an additional portion of PR-2	10 acres	8
Plowing of willow/cocklebur field and excavation of access road (Raahauge violation)	Plant violation site and an equal-sized adjacent area with willow (Raahauge responsibility)	7 acres	9
Total OCWD Mitigation Acreage		102 acres	

TABLE 2

PRADO CONSTRUCTED WETLANDS WATER TREATMENT
&
HABITAT RESTORATION PROJECT

CAPITAL COSTS

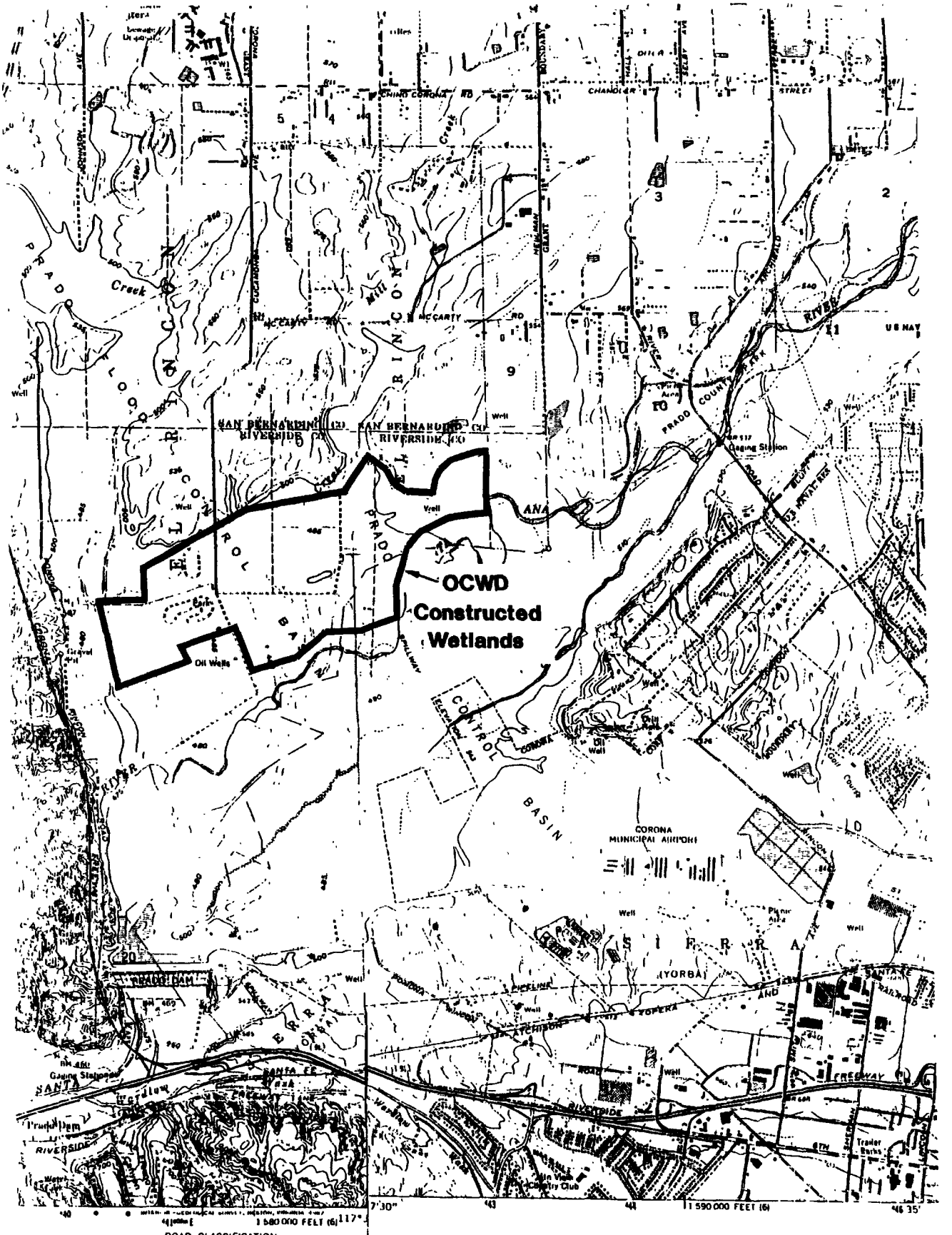
EXISTING PONDS			
Earthwork	225,000 cubic yards	$2/cubic yard	$450,000
Revegetation	30 acres	$2,000/acre	60,000
Weirs/Pipes	40	$1,000 each	40,000
TOTAL			$550,000

ANNUAL O&M COSTS

Pond Operators	1 each	$60,000/yr	$60,000/year
Heavy Equipment Operators/Maintenance	1 each	$60,000/yr	$60,000/year
Equipment Maintenance/Fuel	10% of capital	$750,000 capital	$75,000/year
Lab Analyses	200 Samples	$200/Sample	$40,000/year
Revegetation	10% of Planting	$100,000 Planting	$10,000/year
Supplies	Lump Sum	-	$20,000/year
TOTAL			$265,000/year

TABLE 3

ALLEGED VIOLATION	MITIGATION	ACREAGE	MAP ID	SCHEDULE
Original construction of the ponds (Raahauge violation)	Allow natural revegetation to occur at the following four sites:			
	1) Raahauge Pond 5	16 acres	1	Currently in progress
	2) Lower Roland's Ponds 10, 11, 12, 18	7 acres	2	May 1994
	3) Entire PR-1 (14-acre Small Pheasant Field)	14 acres	3	Currently in progress
	4) Portion of PR-2 (65-acre Southern Pheasant Field)	36 acres	4	Currently in progress
	Construct about 10 islands at 1/4-1/2 acres each	4 acres	5	Fall of 1995
	Plant willow along a constructed 40-foot wide strip along perimeter levee	8 acres	6	Fall of 1995
	Remove 30 acres of Arundo		7	Currently in progress
Construction of outlet channel from Pond Upper Roland 14 to the SAR (OCWD violation)	Allow natural revegetation to occur on an additional portion of PR-2	10 acres	8	Currently in progress
Plowing of willow/cocklebur field and excavation of access road (Raahauge violation)	Plant violation site and an equal-sized adjacent area with willow (Raahauge responsibility)	7 acres	9	May 1994
Total OCWD Mitigation Acreage		**102 acres**		



ROAD CLASSIFICATION

Primary highway, all weather, hard surface
Secondary highway, all weather, hard surface
Light duty road, all weather, improved surface
Unimproved road, fair or dry weather
Interstate Route
U S Route
State Route

PRADO DAM, CALIF

NJ3525—W11737575

1967
PHOTOREVISED 1981
DMA 2451 I NW SERIES V895

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Purple tint indicates extension of urban areas

FIGURE 1 OF 19

March 1994

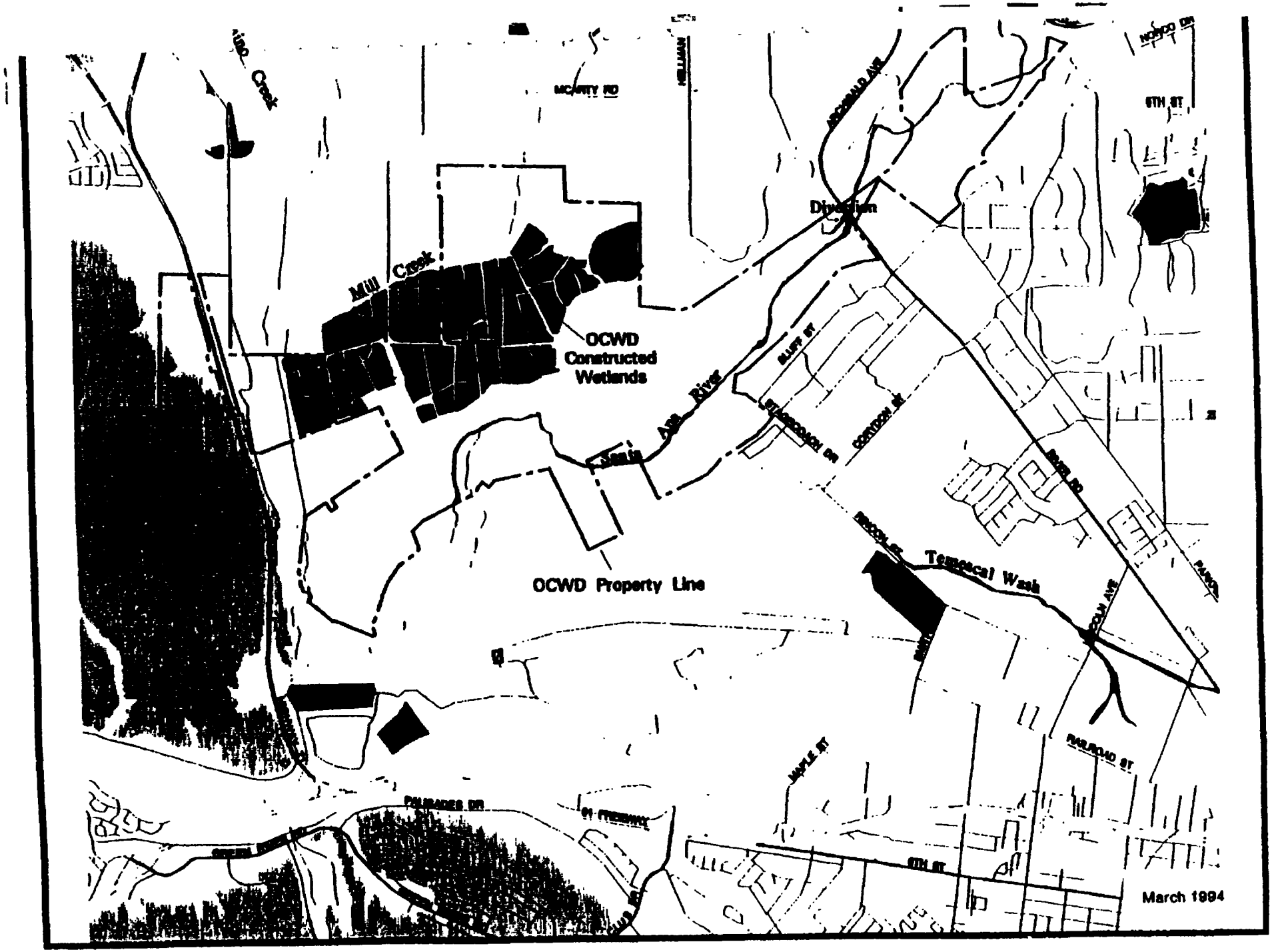
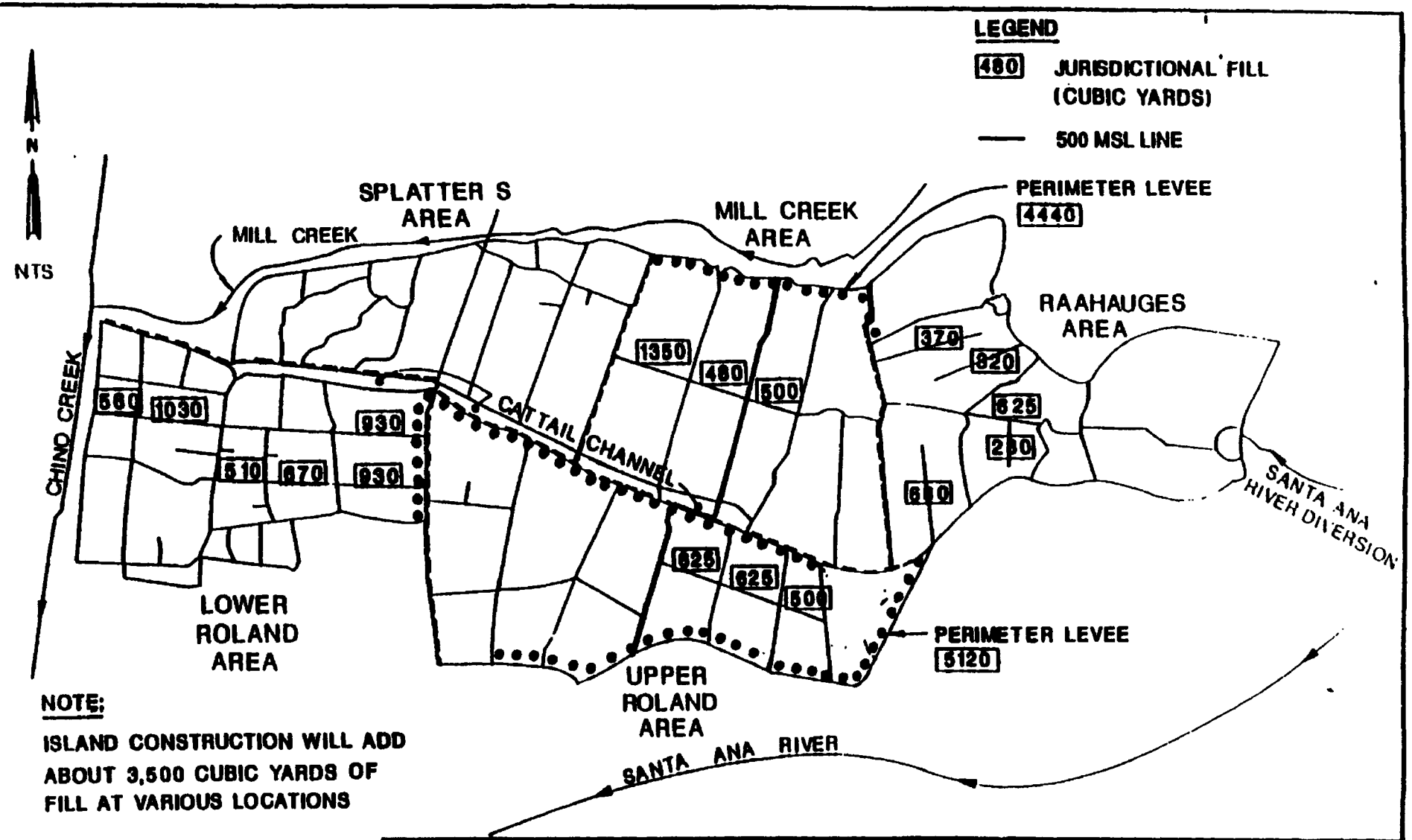


FIGURE 2 OF 19



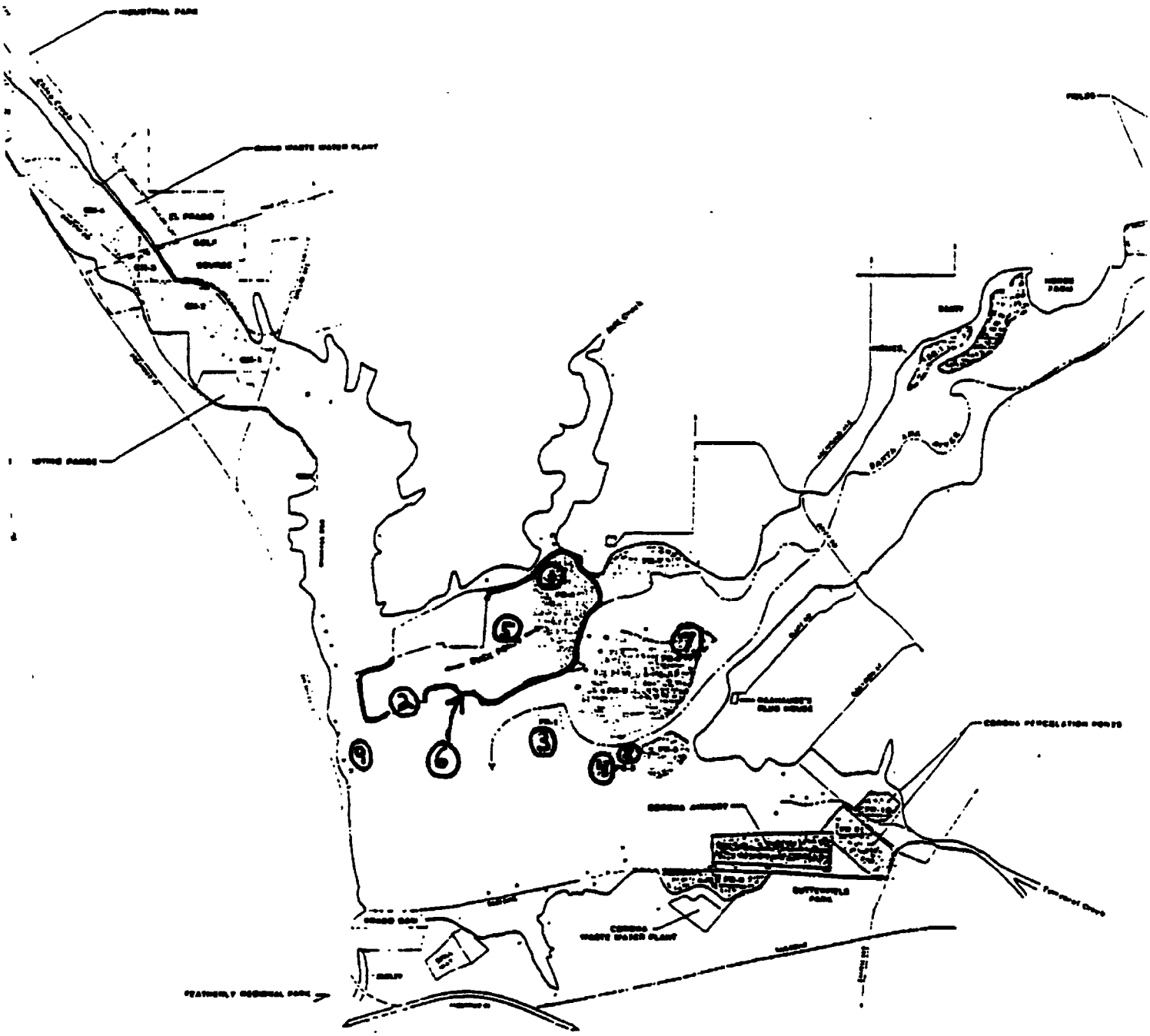
PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

JURISDICTIONAL FILL

RIVERSIDE COUNTY, CALIFORNIA

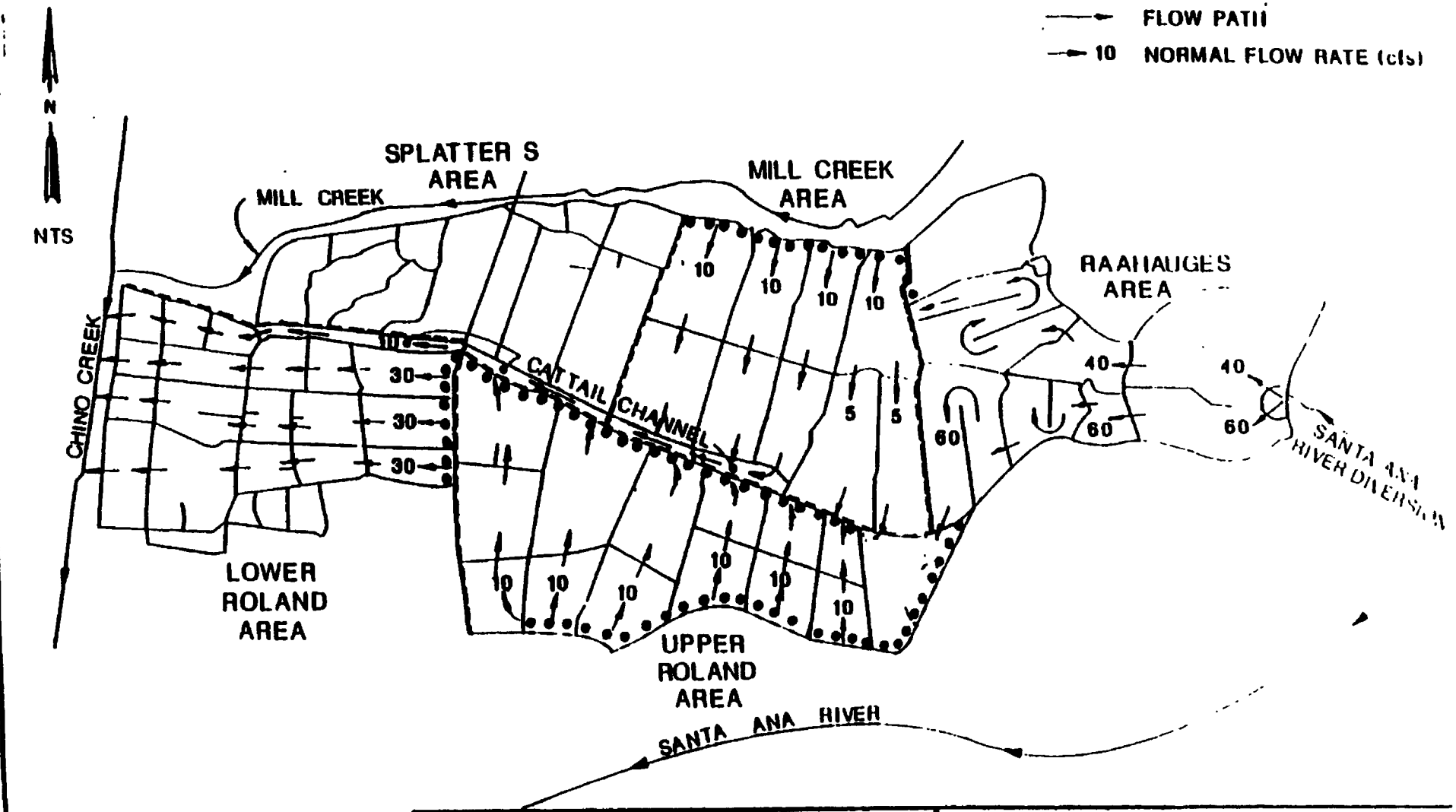
OCTOBER 1992 FIGURE 3 OF 19



tential Habitat Compensation Sites

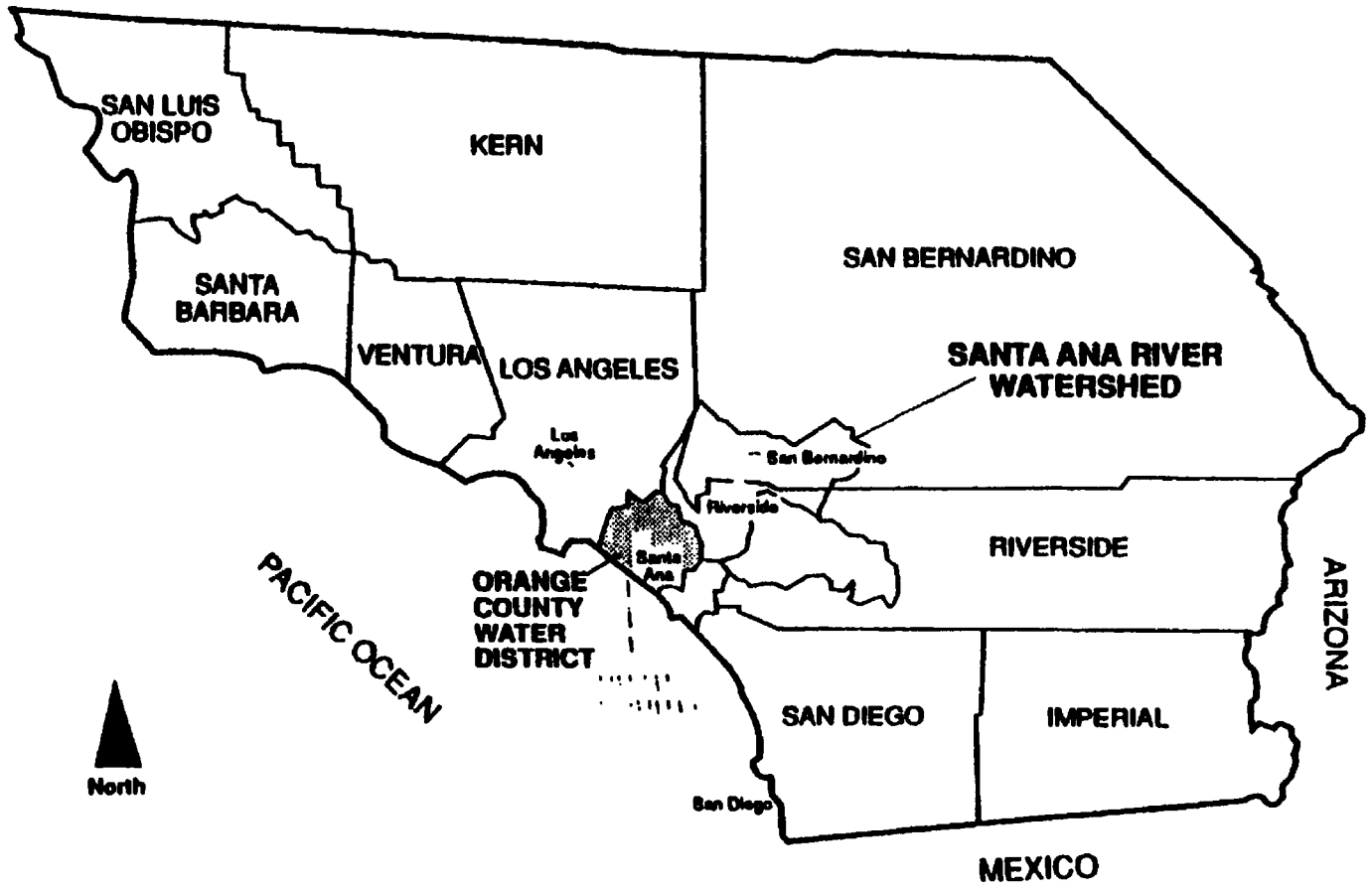
Source of base map: Prado Water Conservation EIS, October 1992

FIGURE 4 OF 19



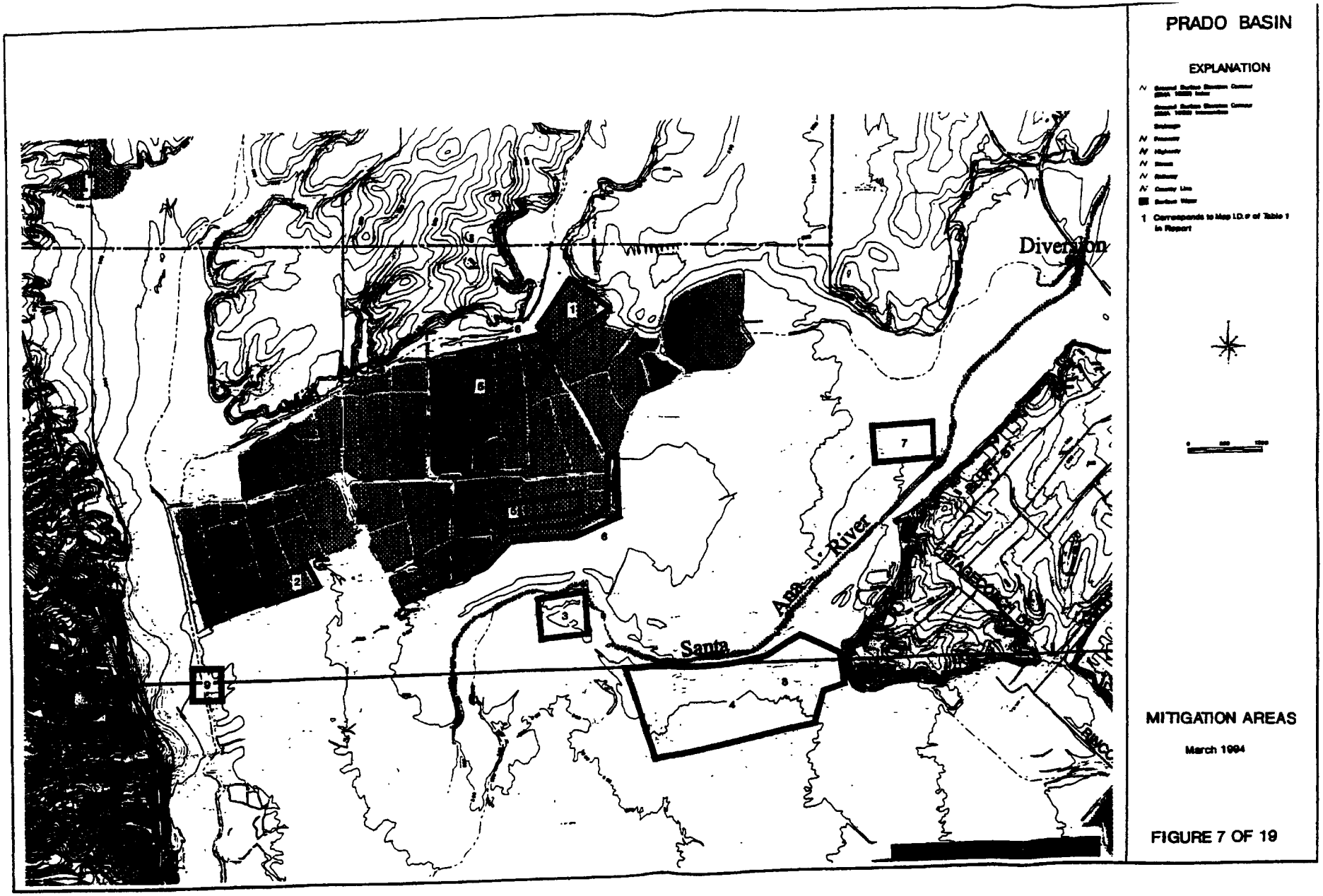
PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	HYDRAULICS
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 5 OF 19

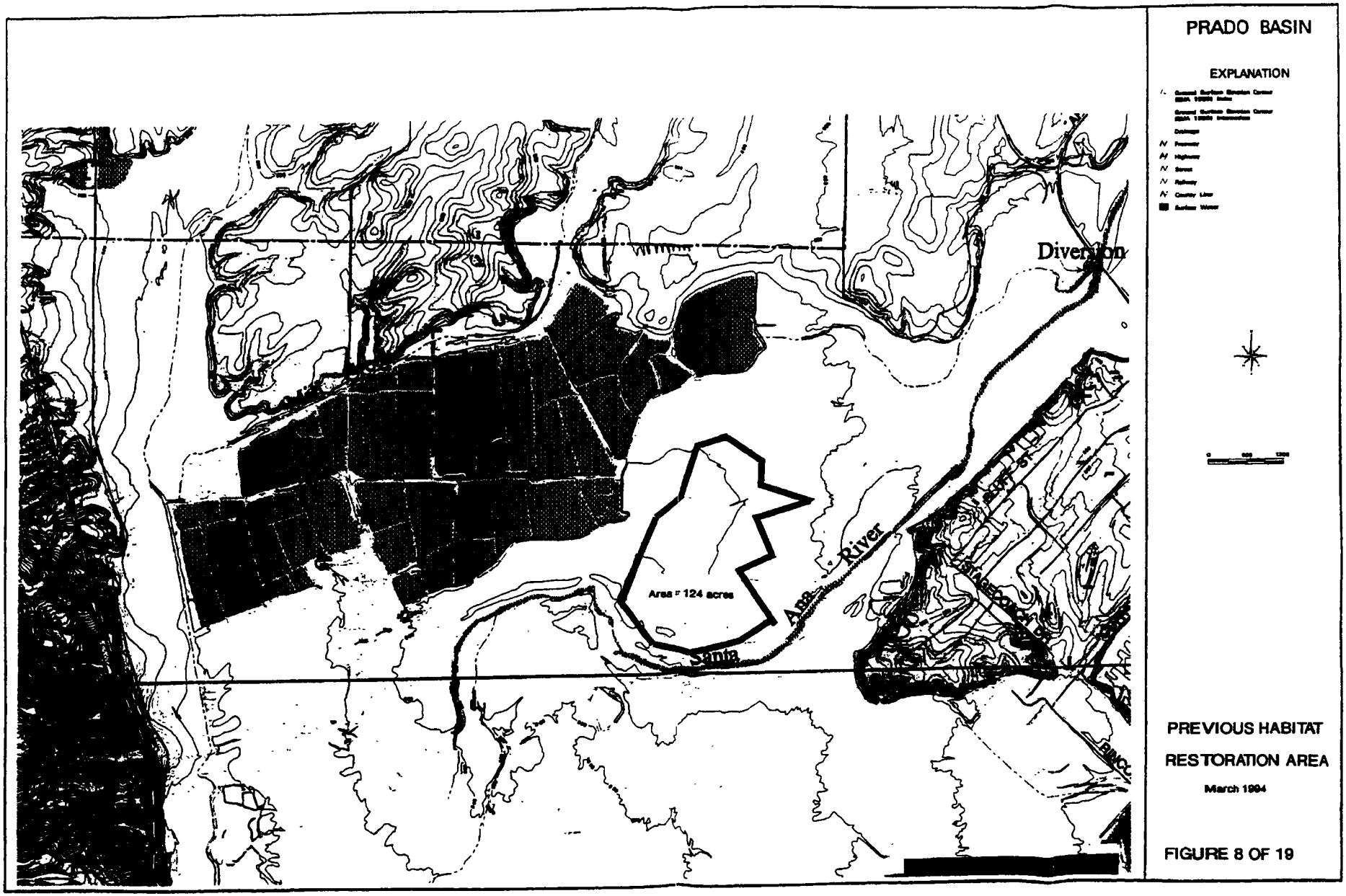
LA033228.HA

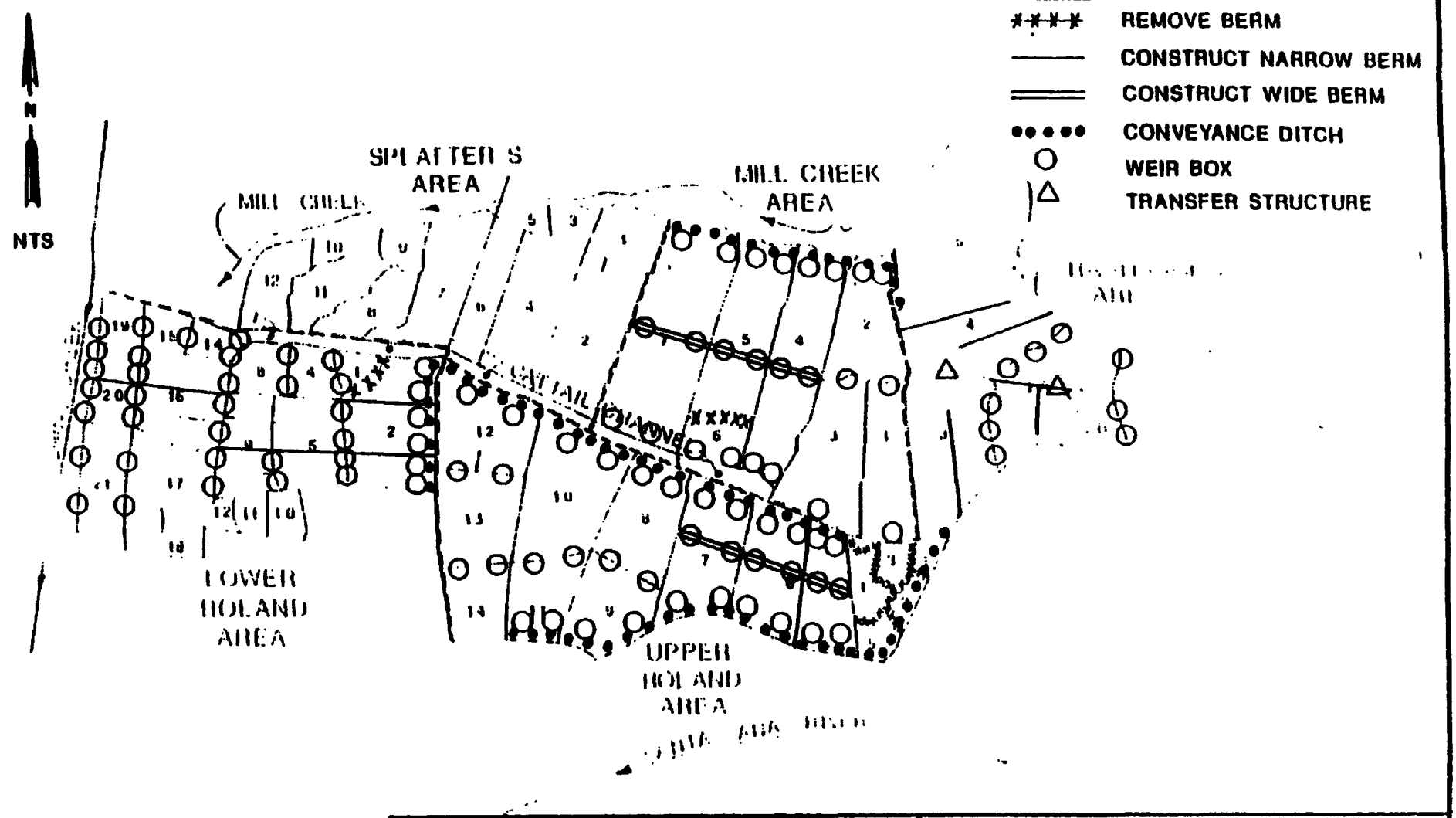


AREA OF THE SANTA ANA RIVER WATERSHED

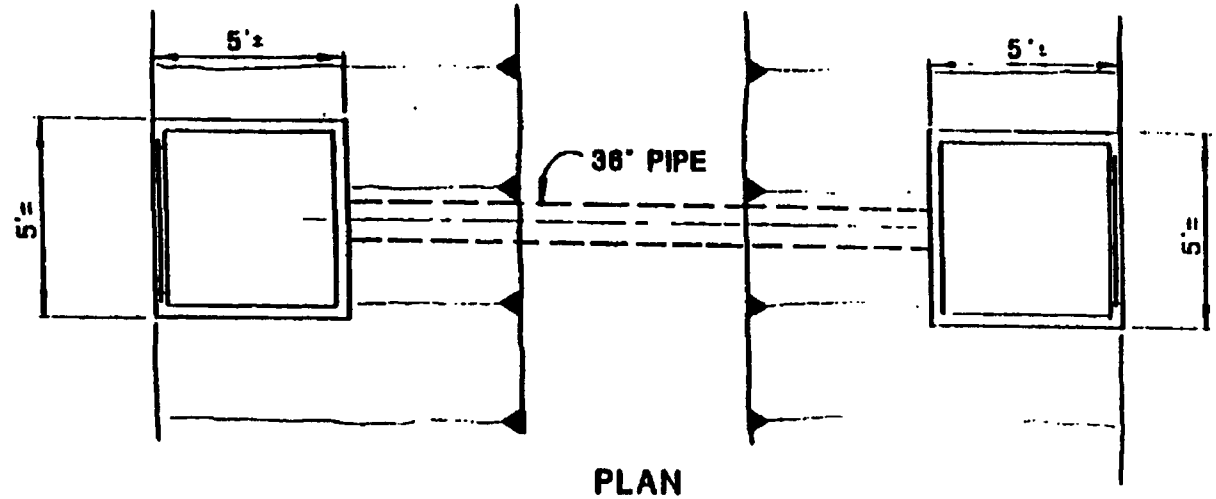
FIGURE 6 OF 19


PRADO BASIN
EXPLANATION
1 Corresponds to Map I.D.# of Table 1 in Report
Diversion
Santa Ana River
MITIGATION AREAS
March 1994
FIGURE 7 OF 19

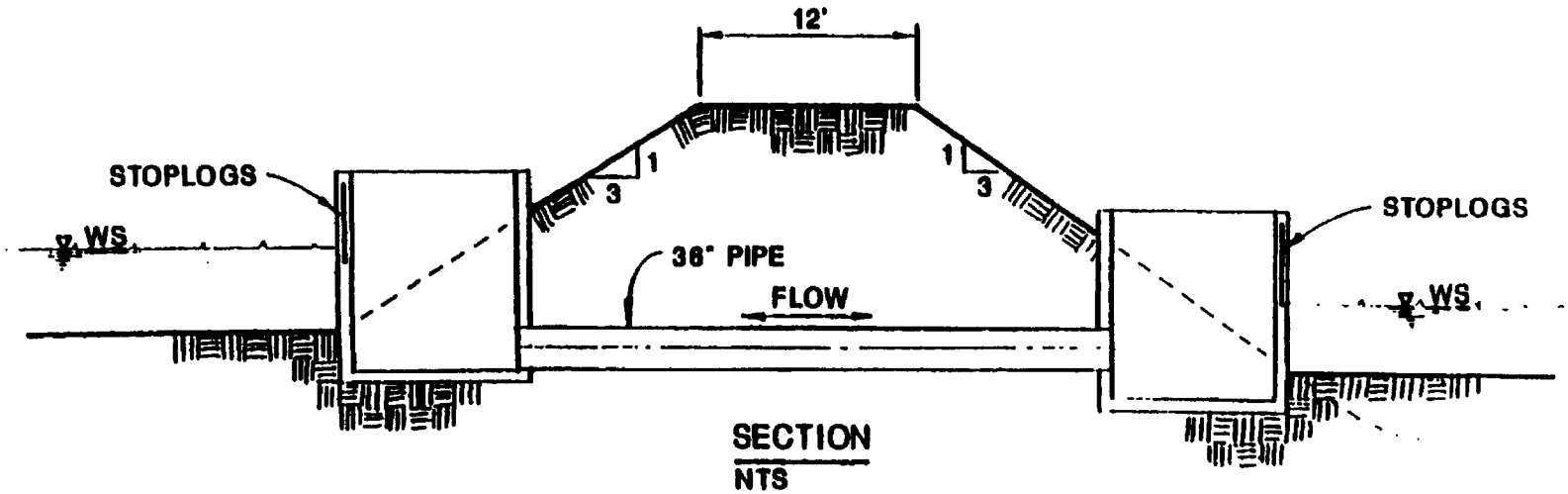

PRADO BASIN
EXPLANATION
Diversion
Area = 124 acres
Santa Ana River
PREVIOUS HABITAT
RESTORATION AREA
March 1994
FIGURE 8 OF 19



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	**PROPOSED LAYOUT**
APPLICATION BY: **ORANGE COUNTY WATER DISTRICT** **10500 ELLIS AVE P.O. BOX 8300** **FOUNTAIN VALLEY, CALIFORNIA** **92728-8300**	**RIVERSIDE COUNTY, CALIFORNIA** **OCTOBER 1992** **FIGURE 9 OF 19**



PLAN
NTS



SECTION
NTS

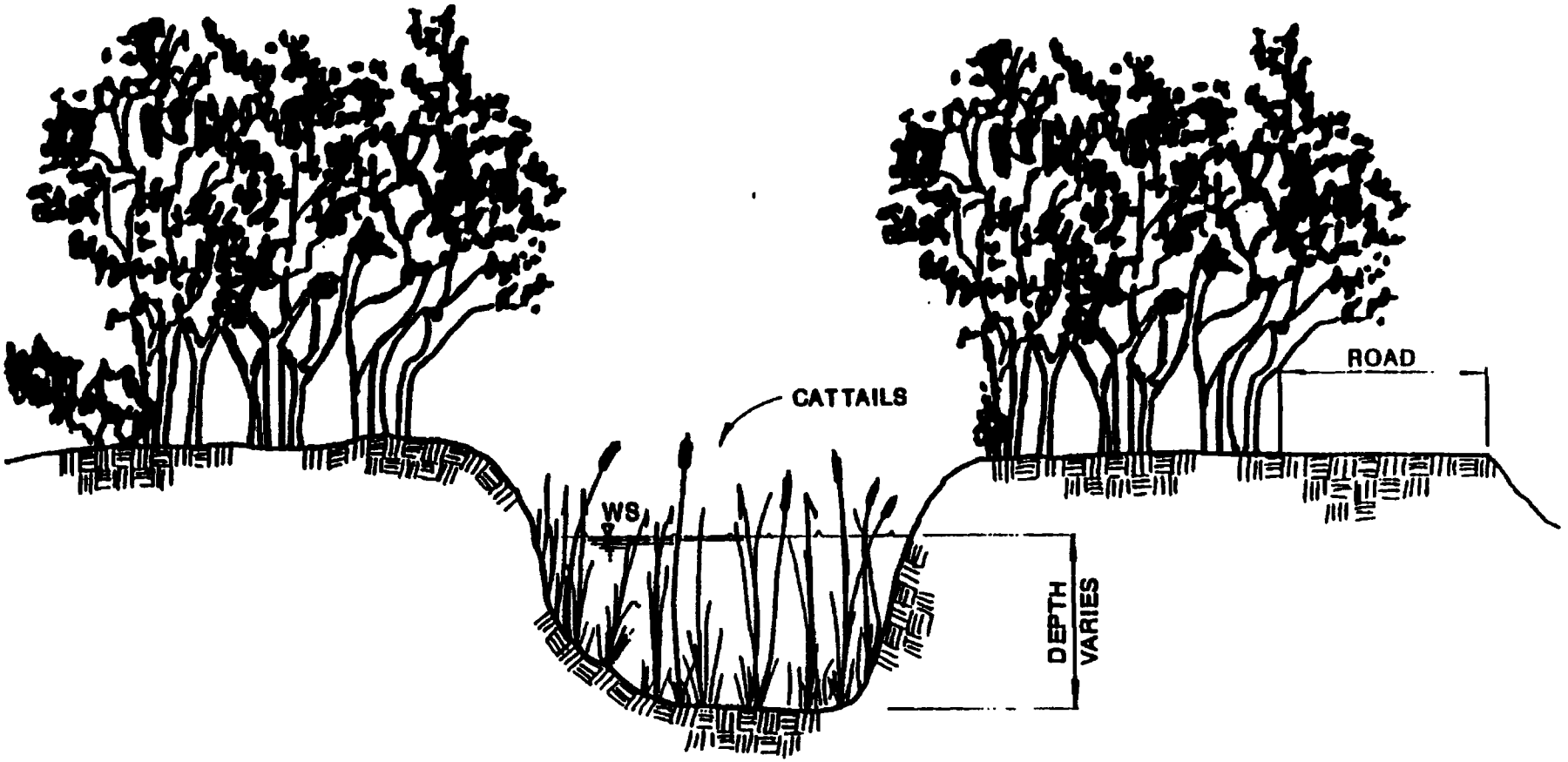
PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

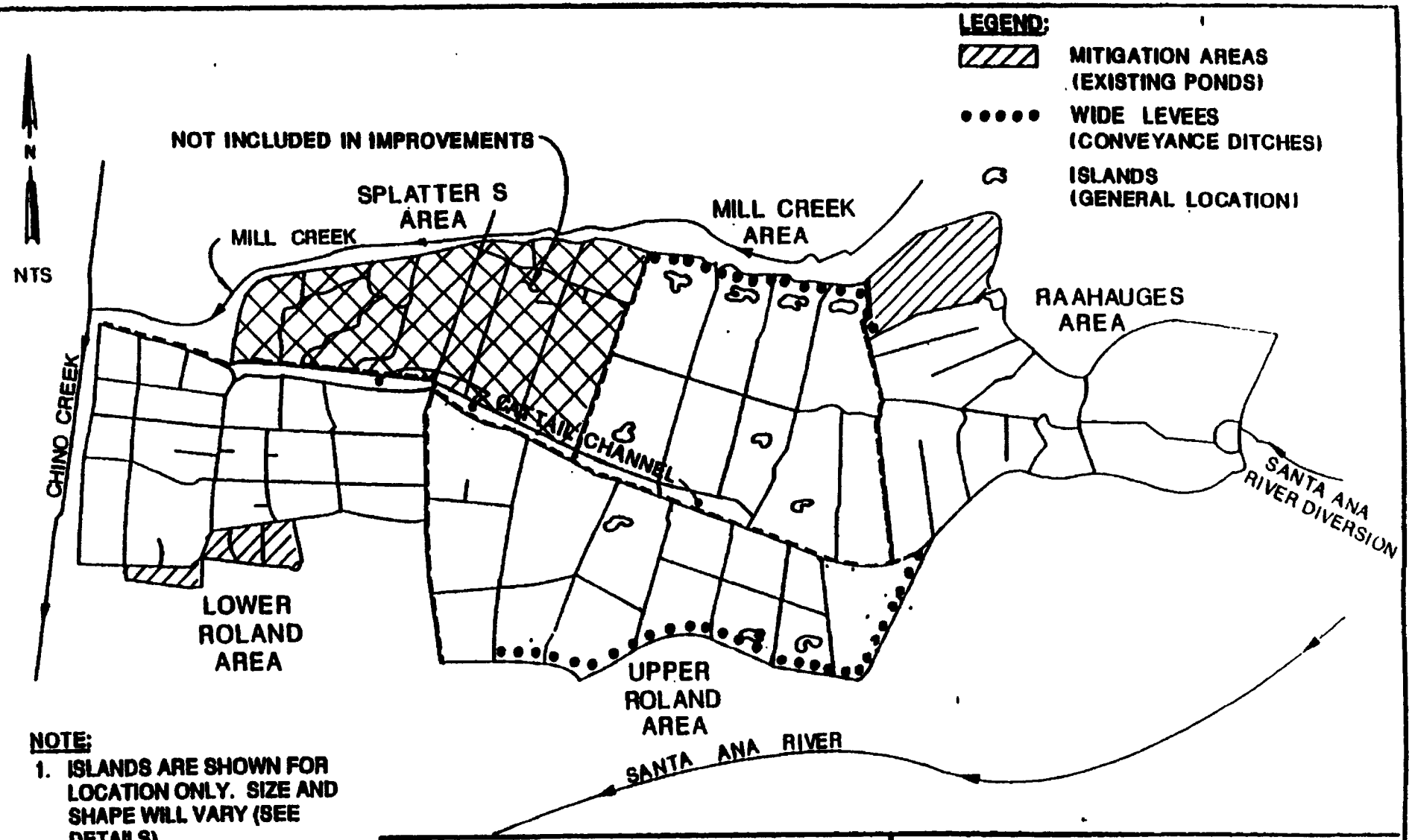
POND TRANSFER STRUCTURE

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992 FIGURE 10 OF 19



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	CATTAIL CHANNEL CROSS SECTION
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 11 OF 19



NOTE:

1. ISLANDS ARE SHOWN FOR LOCATION ONLY. SIZE AND SHAPE WILL VARY (SEE DETAILS)
2. MITIGATION AREAS CONSIST OF EXISTING PONDS, CONVEYANCE DITCHES AND ISLANDS SHOWN ON LEGEND

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

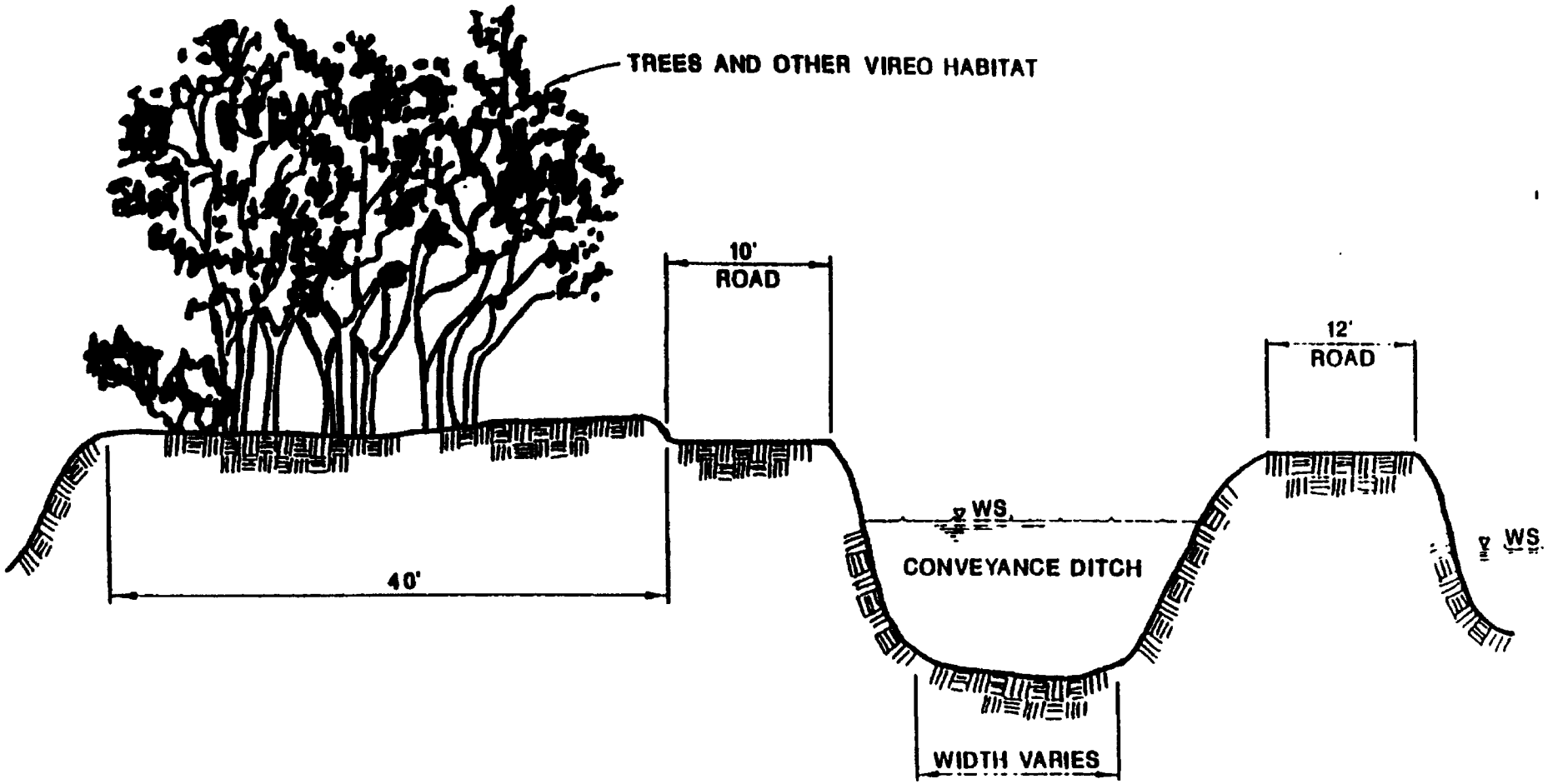
MITIGATION AREAS

RIVERSIDE COUNTY, CALIFORNIA

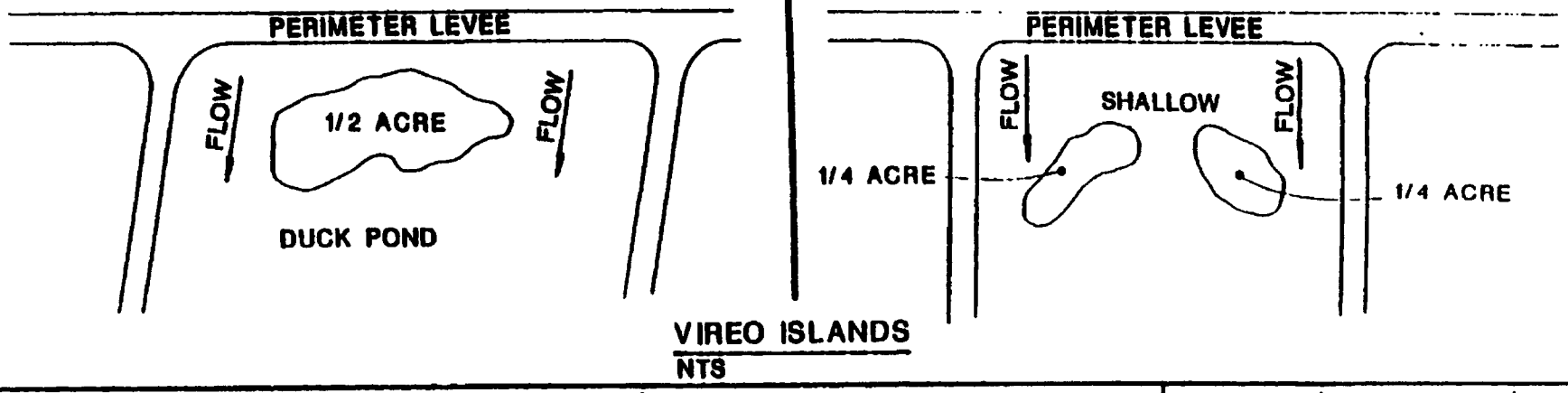
OCTOBER 1992

FIGURE 12 OF 19

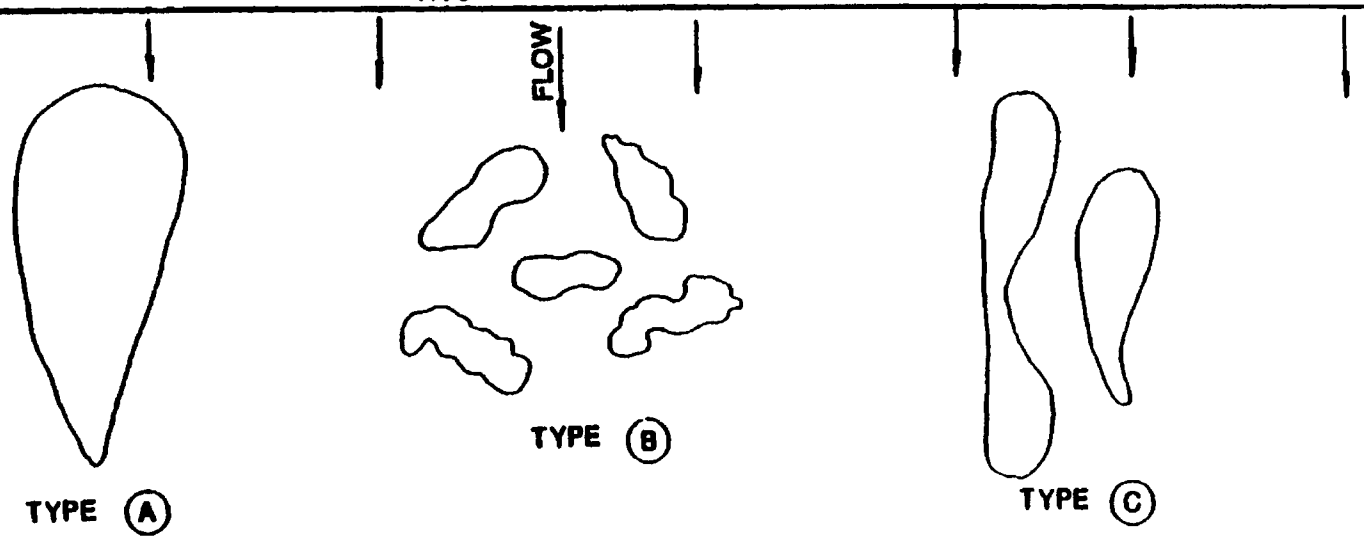
LA033228.HA



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	MITIGATION LEVEE ALONG PERIMETER CONVEYANCE DITCH
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA	RIVERSIDE COUNTY, CALIFORNIA FIGURE 13 OF 19 OCTOBER 1992

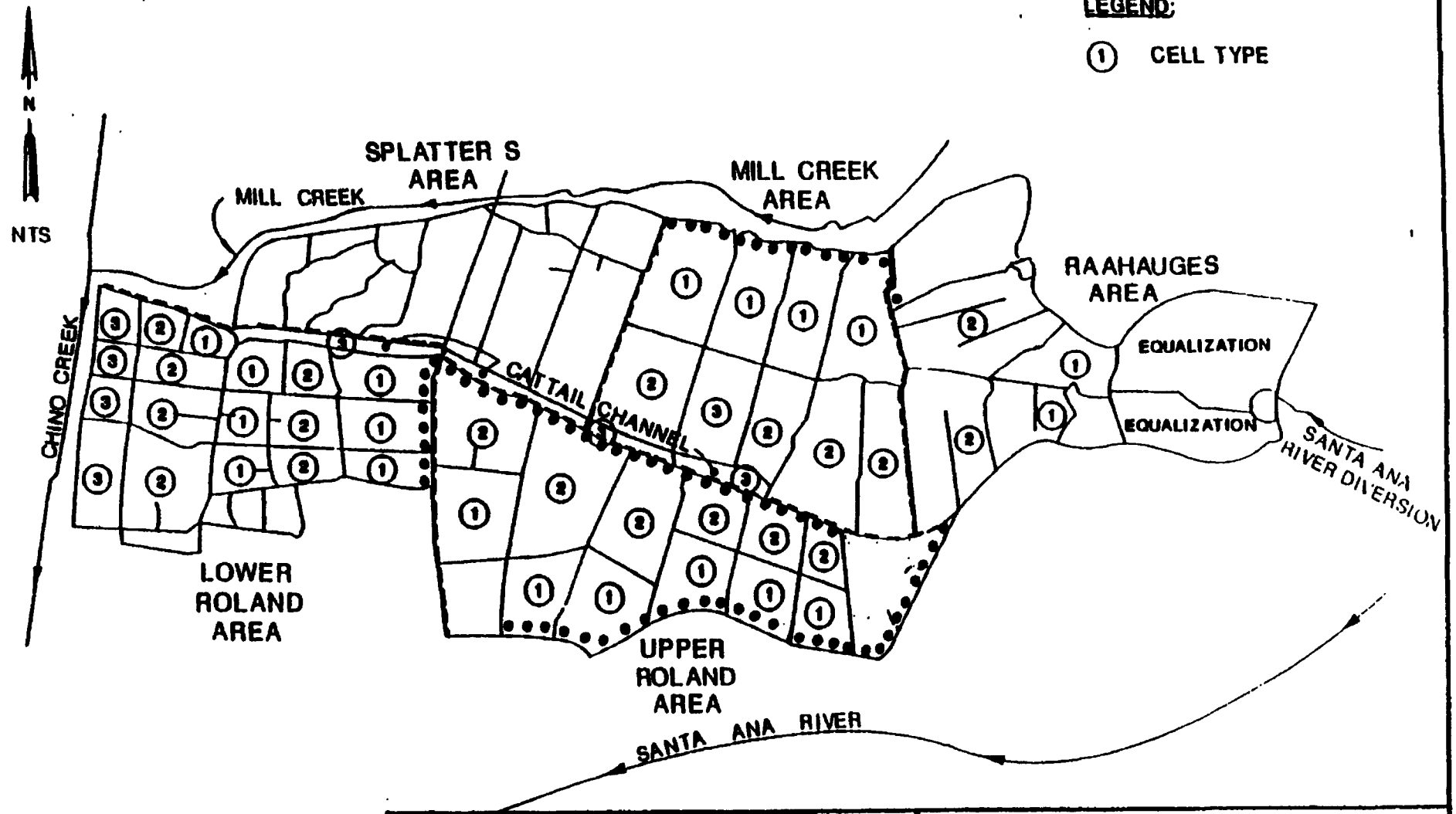


VIREO ISLANDS
NTS



WATERFOWL ISLANDS
NTS

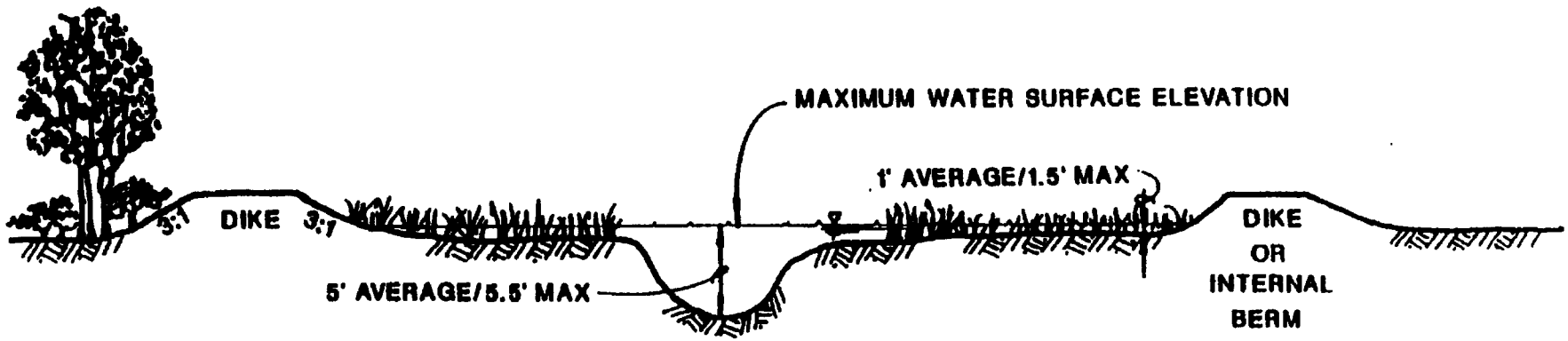
PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	ISLANDS FOR MITIGATION
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92[illegible]-8[illegible]	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 14 OF 19



PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	PROPOSED LAYOUT CELL TYPES
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 1992 FIGURE 15 OF 19

LA033228.HA

TYPE 1 WETLAND CELL (EMERGENT WETLAND)



EMERGENT VEGETATION

- CATTAILS
- BULRUSH

OPERATIONAL OBJECTIVES

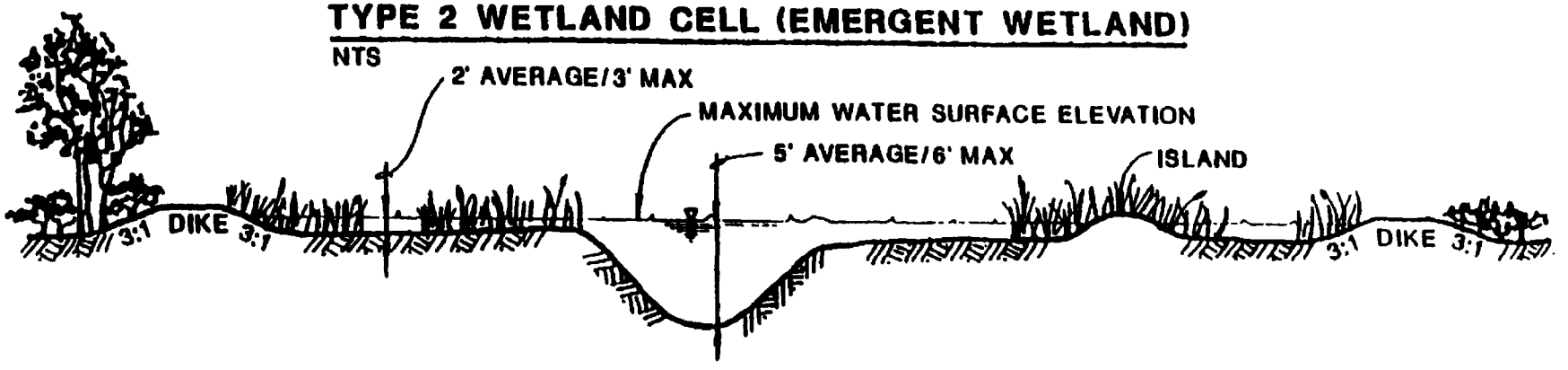
- NUTRIENT REMOVAL
- METALS REMOVAL

POND DEPTH	% AREA	VEGETATION
5'	11	NO VEGETATION/BULRUSH
0.5'	89	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND PROPOSED IMPROVEMENTS	TYPE 1 CELL
APPLICATION BY: ORANGE COUNTY WATER DISTRICT 10500 ELLIS AVE P.O. BOX 8300 FOUNTAIN VALLEY, CALIFORNIA 92728-8300	RIVERSIDE COUNTY, CALIFORNIA OCTOBER 199- FIGURE 18 OF 19

TYPE 2 WETLAND CELL (EMERGENT WETLAND)

NTS



RIPARIAN VEGETATION | EMERGENT VEGETATION | OPEN WATER | EMERGENT VEGETATION | GRASS | EMERGENT VEGETATION | RIPARIAN VEGETATION

EMERGENT VEGETATION

- CATTAILS
- BULRUSH

OPERATIONAL OBJECTIVES

- NUTRIENT REMOVAL
- METALS REMOVAL
- SEDIMENT REMOVAL

POND DEPTH	% AREA	VEGETATION
5'	10	NO VEGETATION/DUCKWEED
2'	60	CATTAIL/BULRUSH (50%)
1'	30	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

TYPE 2 CELL

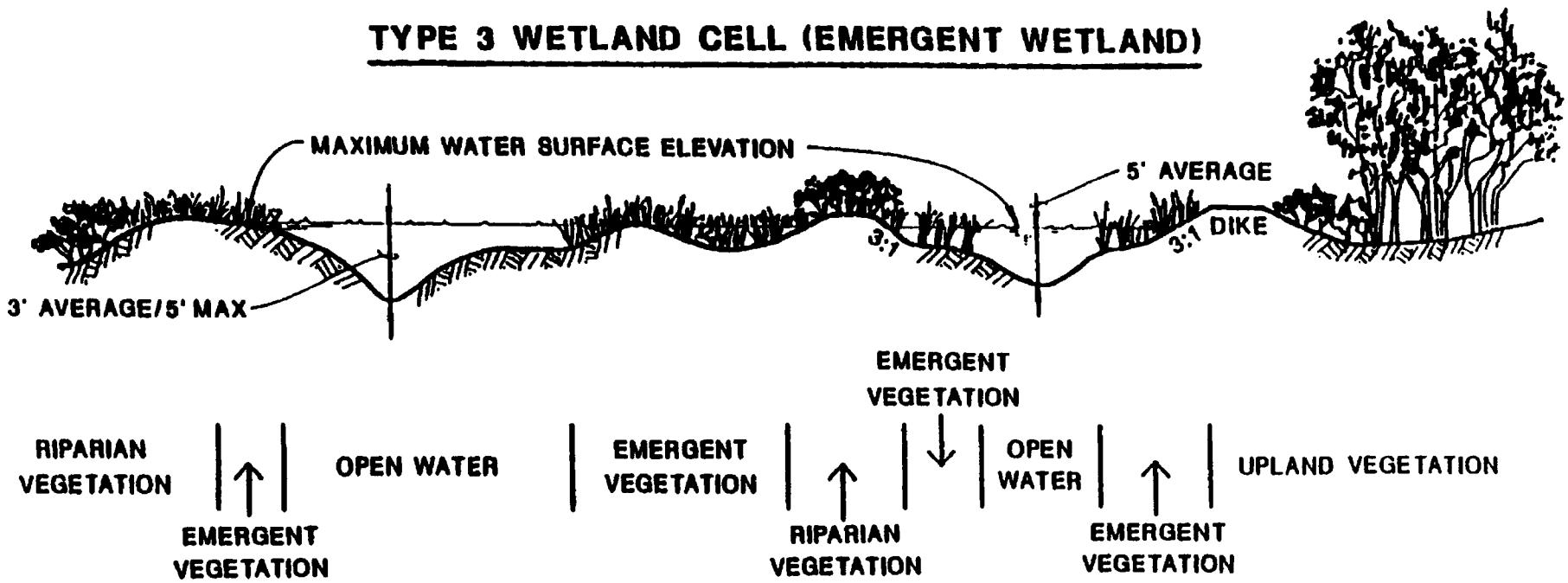
RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992

FIGURE 17 OF 19

LA033228.P

TYPE 3 WETLAND CELL (EMERGENT WETLAND)



EMERGENT VEGETATION

- CATTAILS
- BULRUSH
- WILLOWS

OPERATIONAL OBJECTIVES

- SUSPENDED SOLIDS REMOVAL
- NUTRIENT POLISHING
- METALS POLISHING

POND DEPTH	% AREA	VEGETATION
5'	40	NO VEGETATION/DUCKWEED
2'	40	CATTAIL/BULRUSH (50%)
1'	20	CATTAIL/BULRUSH (50%)

PRADO BASIN DUCK POND
PROPOSED IMPROVEMENTS

APPLICATION BY:
ORANGE COUNTY WATER DISTRICT
10500 ELLIS AVE P.O. BOX 8300
FOUNTAIN VALLEY, CALIFORNIA
92728-8300

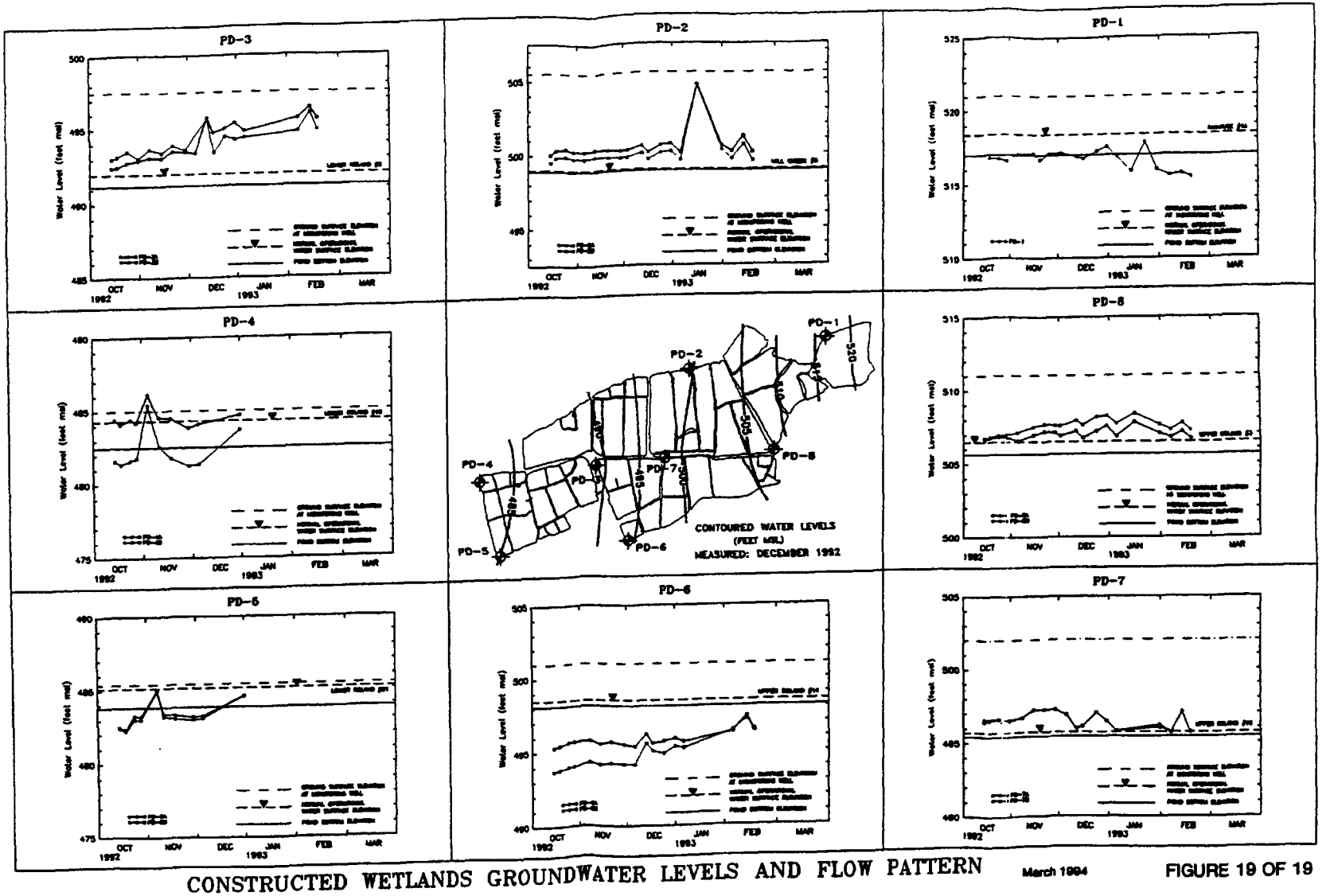
TYPE 3 CELL

RIVERSIDE COUNTY, CALIFORNIA

OCTOBER 1992

FIGURE 18 OF 19

LAO33228.PR



CONSTRUCTED WETLANDS GROUNDWATER LEVELS AND FLOW PATTERN March 1994 FIGURE 19 OF 19