MONTEREY PENINSULA
WATER MANAGEMENT DISTRICT
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FINAL ENVIRONMENTAL IMPACT REPORT

WATER ALLOCATION PROGRAM

FIVE-YEAR MITIGATION PROGRAM FOR OPTION V -- 16,700 AF CAL-AM PRODUCTION

Adopted by the MPWMD Board

November 1990

Prepared by MPWMD Staff

FIVE-YEAR MITIGATION PLAN FOR OPTION V

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MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

FINAL FIVE-YEAR MITIGATION PLAN FOR OPTION V -- 16,700 AF CAL-AM PRODUCTION

November 1990

INTRODUCTION -- CEQA PROCESS

In April 1990, the Water Allocation Program Final EIR was prepared for the Monterey Peninsula Water Management District (MPWMD) by Larry Mintier and Associates. On November 5, 1990, the MPWMD Board certified the Final EIR, adopted findings which included the mitigations contained in this plan, and passed a resolution that set Option V (16,700 AF Cal-Am production) as the new water allocation limit for the Cal-Am system. This document is the final mitigation plan that was adopted by the District Board. It serves as the blueprint for a comprehensive mitigation program that will be carried out over the next five years.

According to the California Environmental Quality Act (CEQA), the basic purpose of an EIR is to (1) inform governmental decision-makers and the public about potential, significant environmental effects of proposed activities, (2) identify ways the environmental damage can be avoided or significantly reduced, and (3) prevent significant, avoidable environmental damage by requiring changes in projects through the use of feasible alternatives or mitigation measures.

When an EIR shows that a project (or program) would cause substantial adverse changes to the environment, a governmental agency must respond by either changing the proposed project, imposing conditions on its approval, adopting plans or ordinances to avoid adverse changes, choosing an alternative way of meeting the same need, or disapproving the project. CEQA states that projects that entail significant environmental effects should not be approved if there are feasible alternatives or mitigation measures available that would substantially lessen these adverse effects.

The definition of "feasible" is important, because an agency can find that changing or altering a project is not feasible. In deciding what "feasible" means, an agency may consider economic, environmental, legal, social, and technological factors. An agency can also find that a project with significant environmental effects may be approved if (1) it publicly discloses that there is no feasible way to lessen or avoid the adverse effects, and (2) it specifically identifies how expected benefits from the project outweigh the general policy to avoid or reduce significant environmental impacts. This is done via a "Statement of Overriding Considerations," which becomes part of the project approval record.

CEQA states that agency decision-makers have an obligation to balance environmental objectives with economic and social factors, "in particular the goal of providing a decent home and satisfying living environment for every Californian." The MPWMD Board weighed the environmental impacts of the water supply options and water distribution alternatives analyzed in the Water Allocation Program Final EIR against the socio-economic impacts of each alternative. Part of their consideration included the feasibility and economic ramifications of this mitigation plan.

This final mitigation plan is judged to be technically feasible by District staff. Based on the cost estimates and other information provided by staff at two public workshops in August and September 1990, the Board has determined that this final plan is feasible in light of economic, social and legal factors.

SUMMARY OF FINAL FIVE-YEAR MITIGATION PLAN

The following sections outline the final mitigation plan for Water Supply Option V (16,700 AF Cal-Am production). Each mitigation measure recommended by the authors of the Water Allocation Program Final EIR was assessed by District staff for technical accuracy and feasibility. Staff then developed specific mitigation programs that would be necessary to implement the mitigations recommended in the EIR. The District Board then determined whether the specific mitigation should be implemented or amended, based on socio-economic factors and institutional feasibility.

The mitigations described herein will be funded and implemented by MPWMD over a five-year period. After five years, the allocation program as a whole, including the mitigation program, will be reassessed, based on results of the mitigation monitoring studies, development of new water supplies, and other factors. Necessary amendments to the program would be made at that time.

It should be noted that most of the mitigations described for the 16,700 AF option would be identical for other water supply options. The main difference would be the greater frequency that a mitigation would be needed with larger water supply options. This would be especially true for fishery mitigations. Capital costs would remain the same, but O&M costs could be significantly higher for supply options greater than 16,700 AF Cal-Am production. Mitigations are recommended whenever the EIR states that a water supply option would have "potentially significant" or "significant" impacts. It should be noted that the consultant often designated an impact as "potentially significant" when the degree of the impact was unknown or when the success of a mitigation measure couldn't be predicted.

Exhibit 1 summarizes the major Board-approved mitigations for each impact topic. Exhibit 2 provides a rough estimate of capital costs and O&M costs for each program as approved by the Board. The total program costs include annual costs of existing District environmental programs in addition to capital and annual costs of

new Board-approved mitigations stemming from the Allocation Program EIR. Capital costs for the comprehensive District program would total about $442,700. Annual costs would total about $638,100 per year for most of five years. The Board-approved mitigation program would entail hiring four new permanent staffmembers (riparian program manager; three fishery technicians at 75% time) in addition to several seasonal river maintenance workers. Two additional fishery technicians would be needed during drought years.

REPORT STRUCTURE

The following pages outline the different impact topics and mitigations. For each topic, an introduction provides a brief summary of the consultant's conclusions about impacts in the Water Allocation Program Final EIR and his recommended mitigations. A brief description of existing District programs that address the issue is provided. Key assumptions that were included in the allocation EIR analyses are also noted, where applicable. Staff comments on the consultant's recommendations are provided, and the specific mitigation measures that were approved by the Board are enumerated.

To the extent possible, mitigations for each impact topic are discussed as follows: (1) description of existing District activities, (2) brief description and purpose of the mitigation, (3) implementation and facilities, (4) frequency of use, (5) monitoring and reporting program, (6) permits required, and (7) preliminary cost estimates.

Exhibit 1

SUMMARY OF MPWMD FINAL FIVE-YEAR MITIGATION PROGRAM
November 1990

FISHERIES

Continue existing programs
Capture and transport emigrating smolts in spring
Prevent stranding of fall/winter juvenile migrants
Rescue juveniles downstream of Robles del Rio in summer
Modify spillway and transport smolts around Los Padres Dam

RIPARIAN VEGETATION AND WILDLIFE

Continue existing programs
Conservation and water distribution management
Prepare and oversee Riparian Corridor Management Plan
Implement Riparian Corridor Management Program
Expand soil moisture and vegetative stress monitoring

LAGOON VEGETATION AND WILDLIFE

Continue existing programs
Assist with lagoon enhancement plan investigations
Expand long-term lagoon monitoring program
Identify feasible alternatives to maintain adequate lagoon volume

AESTHETICS

Restore riparian vegetation (see above)

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Exhibit 2

COST ESTIMATES FOR FINAL MITIGATION PROGRAM FOR OPTION V
November 1990

(Values shown are fully funded by MPWMD for five years.)

MITIGATION PROGRAM	CAPITAL COST			ANNUAL COST		
	Existing	New	Total	Existing	New	Total
Fisheries	$ 9,000	407,700	416,700	$ 12,800	200,100	212,900 (1)
Riparian Vegetation and Wildlife	$ 0	10,000	10,000	$295,000	121,000	416,000
Lagoon Vegetation and Wildlife	$ 26,000	25,000	51,000	$ 1,200	2,000	3,200
Aesthetics	$ 0	0	0	$ 6,000	0	6,000
GRAND TOTAL	$ 35,000	$442,700	$477,700	$315,000	$323,100	$638,100
ESTIMATED TOTAL COST OF BOARD APPROVED NEW PROGRAMS		**$442,700**				**$323,100**
ANNUAL FUNDS NEEDED TO CONTINUE EXISTING ENVIRONMENTAL PROGRAMS		**N/A**				**$315,000**
TOTAL MITIGATION PROGRAM COST		**$442,700**				**$638,100**

NOTE 1: Annual cost estimates for fishery resources are averages; the annual costs could be as high as $382,000 in individual critically dry years and as low as $78,700 in wet years.

u/henri/wp/allocir.mitprog2

FINAL FIVE-YEAR MITIGATION PROGRAM FOR FISHERIES -- OPTION V

SUMMARY: The Water Allocation Program Final EIR found that all water supply options, including 16,700 AF Cal-Am production (Option V), would have significant adverse impacts to the fishery resource of the Carmel River without mitigations. Discussion of the mitigation program, which focuses on steelhead salmon, is found on page IV-91 of the document. The following mitigations were recommended by the consultant:

1. Juvenile rescue program downstream of Robles del Rio in summer and fall; includes holding facility near San Clemente Dam.

2. Partially reconstruct fish ladder and alter spillway gates at San Clemente Dam to facilitate adult and juvenile migrations.

3. Additional modifications to Los Padres Dam spillway to prevent fish injuries during emigration.

4. New wells in AQ4 to reduce pumping in AQ2, thereby preserving flow in this river reach.

5. Expand downstream smolt rescue and transport program in spring.

6. Capture and transport fall/winter migrants to prevent stranding in the lower river.

7. Attraction facility to capture and transport spawners to Narrows when there is insufficient flow at the river mouth, but adequate flow at the Narrows.

The consultant concluded that the impacts of Option V would be reduced to a less than significant level if these mitigations were implemented.

Existing District Programs: Ongoing District programs already address some of the environmental impacts of existing water supply practices on the steelhead resource of the Carmel River. The District engages in the following activities:

1. As part of the Interim Relief Program, employs half-time fisheries biologist to monitor steelhead status, conduct habitat assessments and coordinate rescue operations.

2. Rescues juvenile steelhead as waters recede, and transports them to safe habitat during critical flow periods.

3. As part of the Interim Relief Program, rescues smolts during critically dry years, transports them to

acclimation facilities, then releases them into the sea.

4. Designed and constructed emergency fish ladder in winter 1990 to attract spawning adults into the river for subsequent transport to safe habitat upstream.

5. Rehabilitates critical migration riffles.

6. As part of the Interim Relief Program, negotiates an agreement with Cal-Am and California Department of Fish and Game regarding diversion and releases from San Clemente Dam.

7. Submits annual report to State Water Resources Control Board on Interim Relief Program activities.

8. Works diligently towards a long-term water supply project that would result in improved streamflow conditions.

The existing fisheries program is modest in terms of cost, due partly to volunteer labor provided by the Carmel River Steelhead Association. About $45,200 was expended in FY 1989-90 for specific fisheries projects, including the experimental fish ladder described in District activity #4 above.

Key Assumptions: The fisheries analysis in the Allocation Program EIR was based on the following key assumptions:

1. A dredging program funded and implemented by Cal-Am would keep the Los Padres Reservoir at its existing usable storage of 1,968 AF.

2. Cal-Am's Carmel Valley filter plant could be operated at 1 to 3.5 cfs when inflow to San Clemente Dam is less than 8 cfs.

3. The existing practice of signing an annual agreement, with quarterly review and amendments, depending on the river inflow conditions, would be continued.

Amendments to Consultant's Fisheries Mitigation Program: Given that the text describing the fisheries mitigations in the Water Allocation Final EIR (page IV-91) was somewhat vague, District staff expanded on six of the seven mitigation measures recommended by the consultant. The facility design, cost estimates, and operations and maintenance are described in detail in the Draft Fisheries Mitigation Plan (Dettman, 1990).

Staff deleted the consultant's mitigation #4 (drilling new wells in aquifer subunit 4) because the results of CVSIM indicate the wells would have been needed only at the end of the 1976-77 drought. In addition, the new wells would exacerbate the environmental impacts identified for riparian vegetation in the

lower Carmel Valley.

The District Board reviewed the staff interpretation of the consultant's mitigation program in terms of cost and institutional feasibility. It solicited comments on proposed mitigation facilities from regulatory agencies such as the California Department of Parks and Recreation (CDPR) and Fish and Game (CDFG), which would need to approve permits for these facilities. Based on their comments and other information, the Board deleted the consultant's mitigations #2 and #7, and modified mitigations #3 and #5.

The consultant's mitigation #2 (partially reconstruct the fish ladder and alter spillway gate operation at San Clemente Dam) was deleted by the District Board because it does not own and operate the dam. The District would consider contributing to a study of the effectiveness of passage at San Clemente Dam if such a study were deemed by CDFG as <u>essential</u> to maintaining the steelhead population. It should be noted that Cal-Am will be altering the spillway gates in the next few years to comply with the State Department of Water Resources -- Division of Safety of Dams requirements.

The consultant's mitigation #3 (additional modifications to the Los Padres Dam spillway) was amended by the Board to entail funding of a five-year study of the effectiveness of the spillway modifications made in 1986, based on a design by CDFG engineers. The District will request that CDFG help pay for the study as well. If the study indicates that additional modifications are necessary, the District assumes that construction will be funded by Cal-Am and CDFG.

The consultant's mitigation #5 (expand downstream smolt rescue and transport program) was altered slightly by the District Board. Instead of a formed, in-place (unmovable) concrete structure in the river, the smolt trap design was changed to consist of portable structures, which are less expensive. Also, the river channel itself has been known to move significantly after large storms; thus a portable unit would be more reliable. The effectiveness of the program would not be diminished by this change.

The consultant's mitigation #7 (attraction facility for spawning adults) was deleted by the Board due to questions about water availability, durability of the structure, institutional feasibility and cost. It is uncertain whether water could be appropriated to pump from an upstream location on the river to an attraction facility on the coast (especially in dry years); whether such diversions would be allowed if the State Water Resources Control Board (SWRCB) decides to adjudicate the basin in response to water rights complaints; and whether the diversion would impact aquatic habitat near the diversion site. The institutional feasibility appears unlikely, as CDPR (a key permitting agency) has indicated significant reservations about the concept. In a letter dated August 15, 1990, CDPR questioned whether "anyone wants to see

an essentially wild run of fish becoming dependent upon the proper operation of a fish ladder at the mouth of the Carmel River." The cost of an attraction facility would be about $1.7 million, which is considered excessive, given questions about the durability of a fish ladder in the surf zone in winter.

Elements of District's Fisheries Mitigation Program: The above alterations and deletions to the consultant's fishery mitigation concepts by the District staff and Board result in the following specific fisheries mitigation measures that would be carried out by MPWMD. These mitigations would supercede most of the existing District programs:

1. Expansion of the existing program to capture emigrating smolts and transport them downstream during critical years; includes trapping and holding facilities.

2. A program to prevent stranding of early fall and winter migrants by capturing and transporting them to permanent habitat or a temporary holding facility, whenever a risk of stranding exists.

3. A permanent, fully funded program to rescue juveniles from the reach downstream of Robles del Rio to transplant them into permanent habitat or a holding facility below San Clemente Dam.

4. An experimental program to trap and transport steelhead smolts around Los Padres Reservoir to test the effectiveness of modifications to the spillway, and to measure mortality of fish that migrate through Los Padres Reservoir and over Los Padres Dam.

The following pages include a brief description of each mitigation measure and its purpose, implementation or facilities needed, the frequency of use with Option V, monitoring and reporting program, permits needed and preliminary cost estimates for the construction and operation of each measure. A more detailed description of the facility designs and operations is found in the Draft Fisheries Mitigation Plan (Dettman, 1990).

The total estimated capital cost of this Board-approved fisheries mitigation program would be $407,700 for the first five years. Average annual O&M costs for the first five years are estimated at $212,900 per year. Annual costs for individual critically dry years could be as high as $382,200, and as low as $78,700 in wet years. The fisheries mitigation program costs include funding for the existing fisheries biologist plus three permanent 75% time resource technician positions and two intermittent 100% time resource technicians during drought years. This cost information is summarized in Exhibit 3.

It should be noted that the fisheries mitigation program for the Allocation Program EIR would supercede and expand upon the existing

Interim Relief Program fisheries activities.

The MPWMD Board has adopted a Statement of Overriding Considerations in relation to the fisheries mitigations proposed by Larry Mintier and Associates as interpreted by the District fisheries biologist. With the four Board-approved measures, most impacts to the steelhead population would be reduced to a less than significant level. However, the overall impact of Water Supply Option V on the population will be significant because the impacts to the spawning adults will remain unmitigated (see discussion of consultant's mitigation #7 above). The run of returning adults would be denied access to the Carmel River in parts of January, February and March when flows upstream of the Narrows are suitable for adult migration, and when fish would have migrated in earlier decades with lower levels of municipal water demand and production. This scenario would occur in 21 out of 30 years (two-thirds of the time) for an average of 21 days per year, according to CVSIM output with 16,700 AF of Cal-Am production (Option V). The main effect would be compression of the run in time, which would lead to increased competition by adults and fry, lower survival rates, and a reduced steelhead population.

Exhibit 3

COST ESTIMATES FOR FINAL FISHERIES MITIGATION PROGRAM -- OPTION V
November 1990

(Values shown are fully funded by MPWMD for five years. These mitigations would encompass and supercede existing efforts for each measure.)

MITIGATION PROGRAM		CAPITAL COST			ANNUAL COSTS		
		Existing	New	Total	Existing	New	Total
1.	Expand program to capture emigrating smolts in spring	$ 9,000	110,200	119,200	$ 6,200	49,100	55,300
2.	Prevent stranding of early fall and winter migrants	$ 0	95,200	95,200	$ 3,600	75,300	78,900
3.	Rescue juveniles downstream of Robles del Rio in summer	$ 0	173,100	173,100	$ 3,000	54,600	57,600
4.	Experimental smolt transport at Los Padres Dam	$ 0	29,200	29,200	$ 0	21,100	21,100
	TOTAL COST	$ 9,000	407,700	416,700	$ 12,800	200,100	212,900 (1)
	ESTIMATED TOTAL COST WITH BOARD-APPROVED PROGRAM		**$407,700**				**$212,900**

NOTE 1: Annual cost estimates are averages. Individual dry years may cost up to $382,200 per year, while wet year annual costs may be as low as $78,700 per year.

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FISHERIES MITIGATION #1: EXPAND PROGRAM TO CAPTURE EMIGRATING SMOLTS IN SPRING

Existing District Program

Under terms of the Interim Relief Program agreement, the District rescues and transports smolts during critically dry years. During the past two years, District staff, members of the Carmel River Steelhead Association (CRSA) and CDFG staff have rescued about 500 smolts from the lower Carmel River. The fish were transported to the ocean, to an acclimation facility at the Monterey Bay Aquarium or to a rearing facility at CDFG's Granite Canyon Marine Laboratory. District costs for this program totalled about $15,200 during FY 1989-90. Three District staffmembers were involved in this program for two months at one-quarter time.

Description and Purpose

The program to capture emigrating smolts and transport them to the ocean during critical years would be expanded to include all years when March, April and May flows are too low for successful smolt emigration. In addition to expanding the number of years when the program operates, the District would design, construct, and operate several facilities to improve the operation and overall success of the program. These include a seasonal trapping facility near Schulte Road or the Scarlett Narrows, and holding facilities near Schulte Road and at the Carmel River Lagoon. The purpose of the program is to increase the survival of steelhead smolts and the number of smolts which successfully emigrate to the ocean.

Implementation and Facilities

The District would improve the current program for transporting and holding smolts by designing and operating three facilities: (1) a smolt trap in the river near Schulte Road or the Scarlett Narrows, (2) holding facilities near Schulte Road and (3) holding facilties in the Carmel River Lagoon. Conceptual designs for these facilities are discussed in the Draft Fisheries Mitigation Plan (Dettman, 1990). As noted in the introduction of this section, the smolt traps have been changed to portable, rather than the in-place concrete structures described in the Draft Fisheries Mitigation Plan.

Frequency of Use

Studies have shown that the survival of emigrating of smolts is jeopardized as flows decline below 20 cfs. For this reason the District plans to trap and transport smolts during March, April, and May, when flows recede below 20 cfs at the USGS Near Carmel gage. Based on this plan and daily streamflows simulated by CVSIM, the District would operate the smolt emigration facility an average of 40 days per year. During extreme droughts, such as 1976-77, the facility would operate for a maximum of 92 days (March 1 - May 31).

Monitoring and Reporting

A marking program would test the effectiveness of rescuing and transporting juvenile steelhead downstream. As fish are captured at the facility near Schulte Road, District personnel will mark groups of juveniles with coded wire nose tags and release them at several locations and times to compare the survival of rescued, non-rescued, transported and non-transported fish. These comparisons will be made by sampling outmigrating juveniles at the mouth of the Carmel River as well as marked fish upon their return as adults. Annual monitoring reports will be provided to CDFG, SWRCB and the U.S. Fish and Wildlife Service (USFWS).

Permits Required

To construct and operate an expanded smolt trapping program, permits will be needed from Monterey County, CDFG, SWRCB, CDPR and the California State Coastal Commission (CSCC).

Preliminary Cost Estimates

The estimated costs for constructing a facility to trap, temporarily hold, and transport smolts to the ocean totals $110,200 (costs are shared with Mitigation #2). Operating costs would average about $55,300 per year and range from zero to $115,500 per year. These costs include the existing District activities, which would be superceded by this mitigation measure. On average, staff would be needed to run this program for 40 days per year, and up to 98 days (including clean-up) in dry years.

FISHERIES MITIGATION #2: PREVENT STRANDING OF EARLY FALL AND WINTER MIGRANTS

Existing District Program

There is no formal District program to prevent stranding of early fall and winter migrants. However, staff recognized this problem in the Carmel River, and as time allowed, staff conducted several rescues or coordinated CRSA rescues. District costs for this minimal program during FY 1989-90 were $3,600. Two staffpersons spent a total of 2-3 weeks on this program.

Description and Purpose

As in other Central California streams, juvenile steelhead in the Carmel River move downstream into lower reaches of the river well ahead of the peak emigration of smolts. There is a high risk that presmolts and other juvenile steelhead will be stranded following early fall and winter storms, which increase flows and stimulate the fish to move downstream into habitat that is subsequently dewatered after the storm peak passes. This risk could be reduced by a program to trap and capture downstream migrants during the high risk period of October through February.

Implementation and Facilities

A program to capture juvenile steelhead before they are stranded would rely on a combination of methods. During and following small fall and early winter storms, the trap and holding facilities for the smolt transport program would be used to intercept fish before they move into habitat that will dry up. Following larger storms that produce flows in excess of 40 cfs at the Schulte trapping facility, District staff will electrofish with backpack and streamside shockers to capture fish in the reach below the trap.

Frequency of Use

With Option V (16,700 AF production) the facility would operate an average of 57 days per year. The most frequent use would occur during and following dry periods. For example, during the simulated 1961-64 period the facility would have operated 94 days in 1961, 79 days in 1962, 126 days in in 1963, and 101 days in 1964.

Monitoring and Reports

Monitoring for this program would entail tabulating the annual number of fish rescued from drying reaches of the Carmel River downstream of the Narrows. The District would also initiate a marking program to test the effectiveness of rescuing and holding juvenile steelhead which migrate downstream into drying reaches. The protocol of this marking program would follow the monitoring design for smolts as described in Mitigation #1 above. As fish are

rescued, District staff will mark groups of juveniles with coded wire nose tags and release them at several locations and times to compar the survival of rescued, non-rescued, held and non-held juveniles. Tallies of the number of marked fish which outmigrate at the mouth of the Carmel River will be the basis for comparing the survival of different groups. Annual monitoring reports will be provided to CDFG, SWRCB and USFWS.

Permits Required

To construct and operate a program to prevent stranding of early juvenile emigrants, permits will be needed from Monterey County, CDFG, and SWRCB.

Preliminary Cost Estimates

The estimated costs for constructing a facility to trap, temporarily hold, and transport juveniles totals about $95,200. Operating costs would average about $78,900 per year and range from zero to $188,000 per year. These costs include the existing program, which would be superceded by this mitigaiton measure. On average, staff would be needed to run this program for 57 days per year, and up to 151 days in dry years.

FISHERIES MITIGATION #3: RESCUE JUVENILES DOWNSTREAM OF ROBLES DEL RIO IN SUMMER

Existing District Program

There is no formal MPWMD program to rescue juvenile steelhead during summer months. CRSA has rescued several thousand juveniles during the past five years when water withdrawals isolated juvenile steelhead in pools throughout the lower river. In recognition of this problem, staff conducts rescues whenever conditions and time allow. During the summer of 1989, District staff, CDFG and CRSA rescued 130 juvenile steelhead and released them in safe habitat upstream of Robles del Rio. The District costs for these activities in FY 1989-90 totalled about $3,000. Two District staffmembers worked about two weeks on the rescues.

Description and Purpose

About 1.8 miles of juvenile rearing habitat between Boronda Road and Robles del Rio dry up nearly every summer. The District has proposed a program to rescue, transplant, and rear juvenile steelhead that are stranded during the dry season from June through December. The purposes of the program are to rescue juvenile steelhead from drying reaches, to transplant juveniles to permanent habitat below San Clemente Dam (if it is available), and to rear young-of-the-year steelhead in a facility below San Clemente Dam.

It should be noted that CVSIM results in the Allocation EIR determined that flows could be maintained at the Narrows in all years, except at the end of the most extreme droughts. However, this finding is based on two important assumptions: (1) Cal-Am would maintain the existing storage in both reservoirs via a dredging program, and (2) the Carmel Valley Filter Plant could be operated between 1.0 and 3.5 cfs.

Implementation and Facilities

Pending approval and agreement with Cal-Am, the District would construct a facility to hold and rear wild juvenile steelhead below San Clemente Dam, near the Sleepy Hollow Weir. The preliminary design consists of several holding pools and an artifical stream channel. The facility could hold and rear a maximum of 64,000 fish to a weight of about 13 grams, equivalent to the size of fish reared under natural conditions in the Carmel River. The fish would be allowed to naturally emigrate out of the holding facility, if habitat is available in the river.

Frequency of Use

The program to rescue and transplant juvenile steelhead will be used every year because a 1.8 mile reach between Boronda Road and Robles del Rio and the 9-mile reach between Highway 1 and the Narrows dry up about 97 percent of the time.

Monitoring and Reports

The program to rescue juveniles stranded in the Carmel River will be monitored by keeping accurate records of the number and size of fish rescued. Groups of juveniles will be marked, weighed and their survival to the smolt stage and returning adults will be compared to naturally reared smolts. Annual monitoring reports will be provided to CDFG, SWRCB and USFWS.

Permits Required

To construct and operate a program to rescue and rear stranded juvenile steelhead, permits will be needed from Monterey County, CDFG, SWRCB, and ACE. A focused EIR may be required.

Preliminary Cost Estimates

The District purchased most of the equipment for capturing and transporting juvenile steelhead as part of the Interim Relief Program, so no major capital expenditures are needed for fish capture equipment. Preliminary estimates of costs for construction of the holding and rearing facility total $173,100. Annual operating costs are expected to total about $57,600 per year. The O&M costs include the existing program, which would be superceded by this mitigation measure. This program would run from June through December each year, and staff would be needed for 214 days per year.

FISHERIES MITIGATION #4: EXPERIMENTAL SMOLT TRANSPORT PROGRAM AT LOS PADRES DAM

Existing District Program

No District program is presently in place to measure the survival of smolts past Los Padres Dam. The District fish biologist and other biologists and engineers have visited the dam, and have noted that conditions over the spillway may reduce survival of emigrating smolts.

Description and Purpose

No downstream fish passage facilities were built at Los Padres Dam when it was constructed in 1949. The situation is probably detrimental for emigrating smolts because the rough spillway abrades fish, and at low flows, fish fall onto the rocks below. In 1986 the spillway at Los Padres was modified to improve passage conditions. To date, no experimental releases of fish have been made to test whether these improvements reduce mortality. Recent photographs indicate that mortality still may occur at low flows.

The purpose of this program is to assess how well the previous spillway modifications are functioning. The mortality of fish emigrating over the spillway and through the reservoir versus the mortality of fish transported around the reservoir would be compared. Depending on the outcome of the experiments, a permanent program could be implemented to transport fish around the reservoir and past the dam.

Implementation and Facilities

The experiments to test mortality of emigrating smolts would be similar to a 1988 USFWS study of salmon smolts in the Sacramento - San Joaquin Delta. Groups of marked smolts are released at different locations and intensively sampled at a point downstream. The number of smolts from the upper release site divided by the number from the lower site is an index of survival. With the proposed experiments at Los Padres Dam, three groups of fish would be marked. Groups would be released at the head of the reservoir, at the top of the spillway and at the base of the spillway. The population of smolts would be intensively sampled at the Bedrock Chutes and at Syndicate Camp, located about 0.5 miles and 2.0 miles downstream of Los Padres Dam, respectively. A survival index would be developed based on the sampling data.

Frequency of Use

The experiments to determine mortality of emigrating smolts would extend over a period of 5 years. If a smolt transport program is needed, it would occur annually from late February through May.

Monitoring and Reporting

Monitoring will consist of annual reports to CDFG, USFWS, National Marine Fisheries Service and Cal-Am which describe the experimental results. After five years of study, a final report will identify whether additional modifications to the spillway are needed, and if so, the nature of the modifications. If modifications are made to the spillway, the monitoring should be extended to determine the success of the modifications. It should be noted that this information is also applicable to the long-term water supply project.

Permits Required

A permit from CDFG will be needed to trap and experimentally mark steelhead.

Preliminary Cost Estimates

Estimated capital costs for conducting mortality experiments would total $29,200 and annual O&M costs would total $21,100 for each of the five years. The smolt experiments would occur between late February and May each year. On average, staff would be needed to run this program for 30 days per year.

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FINAL FIVE-YEAR MITIGATION PROGRAM FOR RIPARIAN VEGETATION AND ASSOCIATED WILDLIFE -- OPTION V

SUMMARY: The Water Allocation Program Final EIR found that all water supply options, including 16,700 AF Cal-Am production (Option V), would have significant adverse impacts to the lower Carmel River (AQ3 and AQ4) riparian resource without mitigations. Option V would result in potentially significant effects in AQ2 in dry years, but adverse effects would be expected only near the Los Laureles wells. It should be noted that wildlife dependent on riparian vegetation would be similarly affected without mitigations. Discussion of the mitigation program is found on pages IV-52 through IV-54 of the Final EIR. The following mitigations were recommended by the consultant:

1. Implement a conservation program that retains water in the river and increases ground-water storage available to riparian vegetation. Entails inspection of yearly allocation amounts.

2. Identify existing riparian areas of greatest extent, and control drawdown to minimize the onset of water stress. Guarantee that no more than 10% would be lost due to drawdown. If plants die, replace with 300 trees/acre and ensure 70% survival. If 70% standard not met after 3 years, replant again. Identify and inspect sites at least two times per year.

3. Prioritize existing stands to be irrigated; continue and expand the present irrigation program. Guarantee no loss greater than 10%; replant if standard not met with standards in #2. Identify and preserve areas that may be destroyed or disturbed by urban or agricultural development.

4. Implement revegetation plan by creating new riparian habitat to replace lost habitat in lower terraces. Use 70% survivorship standard in 3 years; replant as necessary; monitor results as needed, and continue quarterly inspections after first three years; use qualified personnel for all these tasks.

5. As part of revegetation plan, purchase conservation easements on upper floodplain terraces for riparian revegetation of sycamores and valley oaks. Planting densities of 200 trees/acre with 70% survival. Inspections as noted above.

6. Identify sites where non-riparian/non-natives can be removed without threatening bank stability, and replant with riparian species as part of the above plans.

7. In droughts, increase irrigation to meet plant demands. Deep irrigation would be an objective. Where feasible, increase irrigated area in droughts. Replace vegetation that dies in a drought.

The EIR consultant stated that it was unknown whether these mitigations would reduce impacts to a less than signficant level. Based on this uncertainty, the consultant concluded that the mitigations would result in a potentially significant impact to riparian vegetation and dependent wildlife.

Existing District Programs: Ongoing District programs already address the environmental impacts of existing water supply practices on the riparian resource of the Carmel River. The District engages in the following activities:

1. Installs, operates and maintains drip irrigation systems to irrigate all major stands of riparian vegetation along nearly 6 miles of river between Via Mallorca Bridge and Cal-Am's Scarlett well. To date, about 450,000 lineal feet of drip irrigation line have been installed under the auspices of the Interim Relief Program and Irrigation Program, totalling about 75 acres of riparian land under irrigation.

2. Expands and renovates previously installed riparian irrigation systems.

3. Implements the Carmel River Management Program, which entails extensive vegetative plantings and irrigation of willows associated with erosion control projects.

4. Has retained a consulting agronomist to test the effectiveness of the District's irrigation system, assess application rates and refine irrigation schedules.

5. Installs permanent standpipes to monitor soil moisture profiles in several areas.

6. Has expanded the Emergency Irrigation Program to cover much of the 2-mile reach from near the Carmel River lagoon to Rancho Canada. Another 130,000 lineal feet of drip line are anticipated to irrigate vegetation in this reach. Four additional seasonal employees were hired in 1990 to implement the expansion.

7. Regularly monitors water levels, riparian plant stress, and soil moisture.

8. Implements comprehensive conservation program to reduce per capita use by 15% by the year 2020; develops annual MOA with Cal-Am and CDFG, and conducts the Water Supply Strategy and Budget process to retain water in the river as much as possible.

9. Works diligently towards development of a long-term water supply project that would provide improved streamflow conditions.

As shown in Exhibit 4, the existing riparian programs are substantial in terms of cost. About $295,000 is expended annually by the District to fund the Carmel River Management Program, the Interim Relief Program (emergency irrigation), the annual MOA and Water Supply Strategy and Budget process, and irrigation around four Cal-Am wells in lower Carmel Valley. The latter program, which costs about $50,000 per year, is partially funded by Cal-Am (up to $7,000 annual contribution) as part of the permit conditions for the four wells. Four members of District staff are involved in existing programs, including the District Engineer, two river maintenance workers, and an Associate Hydrologist.

Amendments to Consultant's Riparian Mitigation Program: District staff assessed the recommended mitigations for technical accuracy and feasibility. Based on this work, the seven mitigations recommended by the consultant have been altered as follows:

The consultant's mitigation #1 is already in effect as part of the District's comprehensive water conservation program. The recommendation to carry out "inspections of yearly allocation amounts" was unclear. Staff interprets this to mean "monitor yearly production amounts," which is already done by the District.

The consultant's mitigation #2 entails control of drawdown near sensitive riparian areas. MPWMD cannot control drawdown from wells. It can, however, work with Cal-Am to develop pumping schedules that better regulate the rate of drawdown, which is the critical factor for riparian health. This is done through the Water Supply Budget and Strategy process, in addition to well rotation of the four lower Carmel Valley wells.

The consultant's mitigation #3 includes a provision for MPWMD to identify and preserve riparian areas that may be destroyed or disturbed by urban development. Staff disagrees with the consultant for two reasons: (1) land preservation is an appropriate function for a park district, city or county -- not the MPWMD, and (2) given county zoning regulations and FEMA insurance constraints, it is very unlikely that future development would occur along the riparian corridor.

The consultant's mitigation #4 entails creation of new riparian habitat (by revegetation and irrigation) to replace vegetation losses in lower terraces along the Carmel River. The consultant does not identify a revegetation rate (acres per year) or total acreage that should be revegetated. Staff believes that creation of new riparian habitat is not as desirable as preservation of existing stands for two reasons. First, riparian habitat loss in Carmel Valley has occurred primarily due to farming and existing development, rather than withdrawal of ground water and diversion

of surface flows. Second, survival of new riparian plantings in the lower terraces cannot be assured. Vegetation would be planted on the unconsolidated alluvium that makes up the lower terraces. This material is subject to erosion and removal during even moderate stormflows. Due to the high potential of loss in major storms, revegetation of denuded areas will not be an integral part of the riparian mitigation program approved by the District Board. The District efforts will focus on protection and enhancement of existing riparian habitat.

The consultant's mitigation #5, which entails purchase of conservation easements on upper floodplain terraces for riparian revegetation, is not warranted. The Water Allocation Program Final EIR does not identify damage to riparian vegetation on upper terraces due to any water supply option, nor any connection between vegetation on the upper terraces and lower terraces along the river.

The consultant's mitigation #6 entails removal of non-riparian and non-native species along the river unless bank stability would be threatened by the removal. Given that many private property owners have planted and maintain such species on their land, this mitigation should include replacement/removal of non-riparian and non-native species only if their presence threatens bank stability.

The consultant's mitigation #7 entails increased irrigation of riparian vegetation during droughts, which is already done by the District. Thus, this mitigation is not considered as a separate measure in the Board-approved final mitigation program.

Elements of the District's Riparian Mitigation Program: The above alterations and deletions to the consultant's riparian mitigation concepts by the District staff and Board result in the following specific measures that would be carried out along with existing District programs:

1. Conservation and water distribution management to retain water in the river.

2. Prepare and oversee Riparian Corridor Management Plan; design projects; obtain access agreements.

3. Implement Riparian Corridor Management Programs; expand irrigation and planting programs; drill wells

4. Expand monitoring program for soil moisture and vegetative stress.

The following pages provide a brief description of each mitigation measure and its purpose, implementation and facilities needed, the frequency of use, monitoring and reporting program, permits needed, and preliminary cost estimates. New programs resulting from the Allocation EIR would total $10,000 in capital costs and $121,000 in annual costs. The total estimated capital cost of the Board-

approved riparian mitigation program would be about $10,000. The total annual costs (including continuation of existing programs at a cost of $295,000 per year) would be about $416,000. Exhibit 4 summarizes the riparian mitigation cost data. The riparian mitigation program would entail hiring one additional full-time staffperson (program manager) and several additional seasonal river maintenance workers.

The four Board-approved mitigations, in addition to existing riparian programs, would reduce impacts of Supply Option V to riparian vegetation, but it is unknown whether impacts would be reduced to a less than significant level. Thus, the District program would result in potentially significant impacts to riparian vegetation and dependent wildlife.

Exhibit 4

COST ESTIMATES FOR FINAL RIPARIAN MITIGATION PROGRAM -- OPTION V
November 1990

(Values are fully funded by MPWMD for five years)

MITIGATION PROGRAM		CAPITAL COST			ANNUAL COSTS		
		Existing	New	Total	Existing	New	Total
1.	Conservation and water distribution management to retain water in river	$ 0	0	0	$ 3,000 (1)	0	3,000
2.	Prepare and oversee Riparian Corridor Management Plan; design projects; obtain access agreements	$ 0	0	0	$ 0	60,000	60,000
3.	Implement Riparian Corridor Management Program; expand irrigation and planting programs; secure irrigation water	$ 0	0	0	$287,000 (2)	60,000 (3)	347,000
4.	Expand monitoring program for soil moisture and vegetative stress	$ 0	10,000	10,000	$ 5,000	1,000	6,000
	TOTAL COST	$ 0	10,000	10,000	$295,000	121,000	416,000
	ESTIMATED TOTAL COST WITH BOARD-APPROVED PROGRAM		**$10,000**				**$416,000**

NOTE 1: The District conservation program entails annual costs on the order of $300,000. Given that its purpose is broader than riparian vegetation mitigation, only activities associated with retaining water in the river are itemized here.

NOTE 2: Existing programs include the Carmel River Management Program, irrigation around four Cal-Am wells, and Interim Relief Program irrigation activities (emergency irrigation).

NOTE 3: Costs for implementation of the Riparian Corridor Management Program are anticipated to start in the second or third year, after the plan has been developed.

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RIPARIAN MITIGATION #1: CONSERVATION AND WATER DISTRIBUTION MANAGEMENT TO RETAIN WATER IN RIVER

Existing District Program

The District has carried out a comprehensive, long-term conservation program successfully for several years. The goal of this $300,000 per year program is 15% reduction in per capita water use by the year 2020. Long-term savings of about 9% have already been achieved. Aspects of the program include extensive public education, water saving kit distribution, drought tolerant landscape seminars and other activities. In order to retain water in the river, the District forges a Memorandum of Agreement (MOA) with Cal-Am and CDFG and develops a Water Supply Strategy and Budget for the Cal-Am system. In addition, Ordinances #19 and #41 limit diversions from San Clemente Dam to allow more water to flow downstream. The MOA and Budget processes cost about $3,000 per year in staff time and entail the work of several staffmembers for a few days each quarter in dry years (only once a year in normal years).

Description and Purpose

This mitigation would focus on aquifer subunit 2 (AQ2), where relatively small production from wells may have an impact on riparian vegetation during dry periods. The District would continue its conservation program, and its work with Cal-Am via the MOA and Water Supply Strategy and Budget processes to reduce production and/or the rate of drawdown in AQ2. This region would also be considered when developing a protocol for rationing in droughts. The purpose of this mitigation would be to maximize ground-water levels and river flows in the AQ2 region. CVSIM analysis has shown that conservation would not yield similar benefits in other aquifer subunits.

Implementation and Facilities

General conservation would be implemented via the Water Conservation Plan. Production reduction in AQ2 would be implemented as part of the annual MOA process with Cal-Am and CDFG. One component would be quarterly audits of Cal-Am operations, and management strategies that reduce pumping or the rate of drawdown in AQ2. The District would develop a specific rationing protocol that describes the mechanisms for when rationing would be initiated. An integral component or criterion would be the potential impact of water use on AQ2. Another would be a specific drought reserve that would be necessary to preclude rationing. The need for rationing would be assessed annually or quarterly in the District's Water Supply Strategy and Budget review, and monthly during droughts via a Water Supply Status Report.

Frequency of Use

General conservation and protection of the AQ2 area would be continual, with most attention during dry periods. Rationing would occur only during extended dry periods. Detailed statistics are not available.

Monitoring and Reporting

Monitoring would consist of annual reporting of water conservation activities and results, and monthly review of water production data from AQ2.

Permits Needed

No permits would be required to implement this program.

Preliminary Cost Estimate

This mitigation would not result in significant additional costs because elements are already part of ongoing programs. Thus, the total cost would remain at $3000 per year. Staff time would be necessary to develop the rationing criteria and mechanism.

RIPARIAN MITIGATION #2: PREPARE AND OVERSEE RIPARIAN CORRIDOR MANAGEMENT PLAN

Existing District Program

Several District programs that address the riparian corridor of the Carmel River are described in the following section (Riparian Mitigation #3). There is presently no Riparian Corridor Management Plan, although the Carmel River Management Plan (CRMP) addresses several riparian concerns.

Description and Purpose

Most of the mitigations proposed in the Allocation EIR (as described and amended above) would form the basis of a Riparian Corridor Management Plan along the Carmel River. The purpose of the plan would be to coordinate the many mitigation activities that are required so that they can be implemented in an orderly, cost-effective manner. An additional District staffperson with a background in botany/revegetation/irrigation would be hired to write and implement the plan.

Subcomponents of the Riparian Corridor Management Plan would include the existing erosion control program (CRMP), the new riparian mitigation projects described in the Water Allocation Program Final EIR (as amended herein) and continued irrigation around four Cal-Am wells and in other areas. Only the costs for the new mitigation activities are shown below.

Implementation and Facilities

The Riparian Corridor Management Plan would (1) identify and prioritize the existing vegetation that must be protected, (2) determine the location and design of irrigation systems, and (3) identify areas in which to selectively remove vegetation from the active channel bottom to reduce the risk of bank erosion, as well as water loss due to evapotranspiration. Agreements with property owners would be obtained to allow mitigation projects on their land. The District staff would be responsible for the completion of the plan and the necessary agreements to begin implementation.

Frequency of Use

Development of the plan is anticipated to require 1-2 years, depending on the level of cooperation by property owners and regulatory agencies.

Monitoring and Reporting

During development of the plan, progress would be reported annually. Once the plan is developed, monitoring would be carried out as described under Riparian Mitigation #3.

Permits Required

Permits would not be required for development of the plan. Permits from Monterey County, CDFG and/or the U.S. Army Corps of Engineers (USACE) may be required for specific activities recommended in the plan.

Preliminary Cost Estimates

No capital cost is listed for this mitigation. The annual cost is estimated to be $60,000 per year for an additional District staff person (program manager), including salary and benefits. The new program manager would work closely with existing District staff who are responsible for Carmel River management activities. Other costs for plan development would be included in ongoing District programs.

RIPARIAN MITIGATION #3: IMPLEMENT RIPARIAN CORRIDOR MANAGEMENT PROGRAM

Existing District Programs

As noted in the introduction of the riparian mitigation section, there are several ongoing District programs that address the environmental impacts of existing water supply practices on the riparian resource of the Carmel River. The District has installed and maintains drip irrigation systems for all major stands of riparian vegetation along nearly 6 miles of river between Via Mallorca Bridge and Cal-Am's Scarlett well. To date, about 450,000 lineal feet of drip irrigation line have been installed under the auspices of the Interim Relief Program and Irrigation Program, totalling about 75 acres of riparian land under irrigation. Previously installed riparian irrigation systems have also been expanded and renovated.

The Carmel River Management Program, which began in 1984, entails extensive vegetative plantings and irrigation of willows associated with erosion control projects in several areas along the river. These projects prevent loss of riparian habitat due to erosion.

Due to the severity of the current drought, the Emergency Irrigation Program was expanded to cover much of the 2-mile reach from near the Carmel River lagoon to Rancho Canada. Another 130,000 feet of drip line are anticipated to irrigate vegetation in this reach in 1990, and four additional seasonal employees were hired to implement the expansion. A consulting agronomist was also hired in 1990 to assess the effectiveness of the District's riparian vegetation programs to date, as well as refine irrigation rates and application schedules.

These existing programs total about $287,000 annually, and entail 6-8 staffmembers (4 full-time, and 2-4 parttime or on an intermittent basis).

Description and Purpose

Once a Riparian Corridor Management Plan (RCMP) is developed, the next step is implementation of the plan to carry out the recommended projects in order of priority. Note that existing programs will become subcomponents of the RCMP.

Implementation and Facilities

The Riparian Corridor Management Program will consolidate and expand upon existing MPWMD programs. The principal new activities being proposed initially are to increase the areas of riparian vegetation under irrigation, especially during droughts, and to maintain adequate channel capacity by selective removal of vegetation from the channel bottom. Given the extent of this program, combined with existing vegetation and irrigation programs,

the District should consider drilling small irrigation wells in AQ3 and AQ4 instead of purchasing treated or untreated Cal-Am water. The water would be filtered to avoid clogged drip emitters. The District could secure an area along the river to establish a cottonwood and willow nursery for the projects. Alternatively, existing commercial nurseries could be contracted to provide a certain number of plants each year. Several seasonal river maintenance staff would be hired to assist the program manager. In areas where vegetation has encroached on the active channel bottom, vegetation would be selectively removed to reduce the risk of bank erosion, as well as water loss due to evapotranspiration.

Frequency of Use

This program would likely begin in the second or third year, after completion of the Riparian Corridor Management Plan. This program would be carried out annually until a new water supply project that provides improved streamflow conditions is developed.

Monitoring and Reporting

An annual report would be prepared on activities under the Riparian Corridor Management Plan, in accordance with the recommendations in the Allocation EIR. Parameters include number of plantings, nursery activities, survival rates, acreage irrigated, irrigation water applied, inspection results and vegetation removal data.

Permits Required

Permits from several agencies, including Monterey County, CDFG and/or USACE, may be required for some aspects of the program.

Preliminary Cost Estimates

No capital costs would be incurred for this mitigation. Annual O&M, including funds for seasonal river maintenance workers, overhead, vehicles, irrigation water and irrigation maintenance is estimated at $60,000 per year. These annual costs are anticipated to begin in the second or third year. This estimate includes $10,000 per year for irrigation water, an amount that could be reduced if wells are drilled. If it becomes necessary to acquire land or easements for the program, additional costs could be significant. The combined cost of existing and new programs would total $347,000 per year.

RIPARIAN MITIGATION #4: EXPAND MONITORING PROGRAMS FOR SOIL MOISTURE AND VEGETATIVE STRESS

Existing District Program

The District has installed permanent access tubes to monitor soil moisture profiles in selected areas in lower Carmel Valley. The District regularly monitors water levels, riparian plant stress and soil moisture. These activities cost about $5,000 per year and entail one staffmember working intermittently.

Description and Purpose

This mitigation entails an expanded monitoring program with additional locations for neutron probe access tubes, pressure bombing sites and canopy rating sites. This will allow the District to better assess the impact of prolonged depression or rapid drawdown of the water table. Conversely, the beneficial impacts of the mitigation programs described above could be documented.

Implementation and Facilities

The expanded monitoring program would entail analysis of data already collected and identification of new sites for continuous baseline data collection. In addition to measurements of soil moisture and vegetative moisture stress, the expanded program would include data analysis, weather monitoring and irrigation scheduling for drip lines already in place in the riparian corridor.

Frequency of Use

Once the new sites are located, monitoring and data analysis would be an onoing program. The frequency and location of monitoring would be determined in the Riparian Corridor Management Plan.

Monitoring and Reporting; Permits Required

An annual report on the results and findings of this monitoring program would be prepared and made available to interested agencies or members of the public. No permits would be required for this program.

Preliminary Cost Estimates

An estimated capital cost of $10,000 would be needed for new monitoring sites, equipment and calibration, and infrared photographs. Annual costs are expected to increase from $5,000 to $6,000 per year for the monitoring program. Additional personnel are not expected to be needed for this mitigation measure.

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FINAL FIVE-YEAR MITIGATION PROGRAM FOR LAGOON VEGETATION AND WILDLIFE -- OPTION V

SUMMARY: The Water Allocation Program Final EIR found that all water supply options would have potentially significant impacts on lagoon vegetation and dependent wildlife, even though a reduced impact is recognized for 16,700 AF production (Option V). Discussion of the mitigation program for lagoon vegetation is found on page IV-54 and IV-55 of the document. It should be noted that Option V would result in less than significant impacts to lagoon hydrology. The following mitigations for vegetation and wildlife were recommended by the consultant:

1. Reduce production from the MPWRS by providing additional supplies of water, thus allowing additional surface inflow into the lagoon. Pump water from the aquifers for release into the lagoon during the dry seasons. Additional volume into the lagoon should be recorded and should equal conservation savings.

2. An extensive monitoring program is described that entails vegetation mapping, ordinary high water mark, and soil salinity measurements. Monitoring would be performed every two years to compare status to the baseline. If more than 10% increases in vegetation type or coverage occurred, additional measures would occur (see #3-5). If these measures are not successful, implement a wetland restoration project with a goal of 110% of baseline acreage.

3. Increase reinvestment of conserved water to the lagoon.

4. Injection wells to recharge AQ4.

5. Grout curtain near lagoon to create a coastal barrier.

The consultant could not determine whether the above mitigations would lessen impacts to a less than significant level. The consultant concluded that the impacts would remain as potentially significant with mitigations.

Existing District Programs: Ongoing District programs already address the environmental impacts of existing water supply practices on the Carmel River lagoon. MPWMD activities include:

1. Provides $25,000 to co-fund Carmel River Lagoon Enhancement Plan, which is in progress. The plan entails detailed mapping of vegetation, soils and survey data, lagoon history and compares alternative enhancement activities. Cosponsors include County Flood Control, State Parks, and California Coastal Conservancy.

2. Conducts regular monitoring of lagoon water quality parameters and other data.

3. Actively seeks major new water supply that would provide year-round river flow to the lagoon in most years.

4. Implements comprehensive long-term water conservation program, which would reduce overall demand on the water resource system.

As shown in Exhibit 5, the existing lagoon programs are modest in temrs of cost. About $1,200 is expended annually for lagoon monitoring, primarily by two District staff on a intermittent basis. In addition to the monitoring activities, the District has contributed $25,000 to the Carmel River Lagoon Enhancement Plan ($15,000 cash and $10,000 as in-kind services), and $1,000 towards monitoring. Thus, capital costs expended to date total $26,000.

Amendments to Consultant's Lagoon Mitigation Program: District staff evaluated the consultant's proposals for technical merit and feasibility. Staff concluded (and the Board agreed) that the recommended mitigations should be amended or deleted as follows:

The consultant's mitigation #1 entails pumping water from the lower Carmel Valley aquifers into the lagoon during dry seasons to maintain freshwater levels. District staff notes that this mitigation may exacerbate impacts to riparian vegetation and is not consistent with riparian mitigations. It also entails "reducing production in the MPWRS by providing additional supplies of water," which makes sense only if importation or desalination are water sources. The District has pursued importation and desalination as water supply alternatives, but they have not proven to be institutionally feasible to date. For these reasons, the District will not pursue this mitigation concept.

The consultant's mitigation #2 entails monitoring every two years. Due to the significant fluctuations in year-to-year weather patterns and streamflow, the baseline survey will be repeated during the next normal year and every five years thereafter.

The consultant's mitigation #3 entails increased reinvestment of conserved water to the lagoon if monitoring shows significant changes. This assumes that conservation savings would equal a specific volume of water to the lagoon, which would not be true. Instead, the District will determine the amount of water needed to maintain an adequate habitat for fish and wildlife, and explore alternative means to transport it to the lagoon. Preliminary studies indicate that the amount would be relatively small.

The consultant's mitigation #4 entails injection wells to recharge AQ4. A reliable source of injection water was not identified by the consultant. Unless a reliable source can be identified, the effectiveness of this mitigation is questionable. It should be

noted that reclaimed wastewater could be an injection source if institutional constraints did not exist.

The consultant's mitigation #5 entails a grout curtain near the lagoon to create a coastal barrier. This would be a very expensive solution to the problem and has attendant technical concerns. A comprehensive engineering assessment would be needed prior to implementation of this measure. A more reasonable alternative would be to determine how to bring in the small amount of water that the lagoon needs to provide adequate habitat.

Elements of Lagoon Mitigation Program: The above alterations and deletions to the consultant's lagoon mitigation concepts by the District staff and Board result in the following specific measures that would be carried out in addition to existing District programs:

1. Assist with lagoon enhancement plan investigations.

2. Expand long-term monitoring program.

3. Identify feasible alternatives to maintain adequate lagoon volume.

The following pages include a brief description of the mitigation measure and its purpose, implementation and facilities needed, frequency of use with Option V, monitoring and reporting, permits required and a preliminary cost estimate. New programs resulting from the Allocation EIR would total $25,000 in capital costs and $2,000 in annual costs. The total estimated capital cost of the Board-approved program would be $25,000. Annual costs would be $3,200 per year. No additional staff would be needed to implement these mitigations. This information is summarized in Exhibit 5.

The three Board-approved mitigations, in addition to the existing lagoon programs, would reduce the impacts of Supply Option V, but it is unknown whether impacts would be reduced to a less than significant level. Thus, the District program would result in potentially significant impacts to lagoon vegetation and wildlife.

Exhibit 5

COST ESTIMATES FOR FINAL LAGOON MITIGATION PROGRAM -- OPTION V
November 1990

(Values are fully funded by MPWMD for five years)

MITIGATION PROGRAM		CAPITAL COST			ANNUAL COSTS		
		Existing	New	Total	Existing	New	Total
1.	Assist with Lagoon enhancement plan investigations	$ 25,000 (1)	0	25,000	$ 0	0	0
2.	Expand long-term monitoring program	$ 1,000	20,000	21,000	$ 1,200	2,000	3,200
3.	Identify feasible alternatives to maintain lagoon volume	$ 0	5,000	5,000	$ 0	0	0
	TOTAL COST	$ 26,000	25,000	51,000	$ 1,200	2,000	3,200
ESTIMATED TOTAL COST WITH BOARD-APPROVED PROGRAM			$ 25,000				$ 3,200

NOTE 1: The District has contributed a one-time amount of $25,000 for the completion of the Lagoon Enhancement Plan.

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LAGOON MITIGATION #1: ASSIST WITH LAGOON ENHANCEMENT PLAN INVESTIGATIONS

Existing District Program

The District, County Flood Control, State Parks and the Coastal Conservancy presently co-fund the Carmel River Lagoon Enhancement Plan. The District will contribute $25,000 to this effort by the completion of the plan ($15,000 in cash and $10,000 as in-kind lagoon water quality monitoring services). The Plan, which is in preparation, is being written by Phillip Williams and Associates. District staff participate on a plan review committee, which meets on an as-needed basis.

Description and Purpose

A key aspect of the Lagoon Enhancement Plan is to identify alternative means to restore and enhance the lagoon environment. As part of the lagoon mitigation program, the District would continue to contribute staff expertise for enhancement plan investigations, and assistance in developing a final plan.

Implementation and Facilities

PWA is scheduled to complete a final Lagoon Enhancement Plan in 1991. The document would entail extensive review and input by District and other agency staff, as well as the public. Once a final plan of action is selected, the District could contribute staff expertise to implement the plan.

Frequency of Use

Completion of the Plan and implementation of projects would occur once, though other enhancement activities could be spread over a series of years.

Monitoring and Reporting; Permits Required

This mitigation would not entail monitoring. No permits would be required.

Preliminary Cost Estimates

No capital or annual costs are anticipated for this mitigation.

LAGOON MITIGATION #2: EXPAND LONG-TERM MONITORING PROGRAM

Existing District Program

The District has an existing program to monitor water quality, streamflow, sediment transport and changes in bedrock geometry in the lagoon on a monthly basis when the Carmel River flows into the lagoon. Water quality measurements (dissolved oxygen, carbon dioxide, specific conductance and temperature) are taken on a quarterly basis when there is no flow into the lagoon. This has been the case in the past three drought years. The annual cost in these years has been about $1,200 in staff time.

Description and Purpose

The lagoon habitat would be monitored as described in the Allocation EIR (mitigation #2) to quantify its existing status and the long-term response to ground water pumping. Major studies such as vegetative mapping and soil surveys would occur every five years. The purpose of the monitoring is to determine if specific changes in plant species distribution, diversity, acreage etc occur over time, and to implement additional mitigations if vegetative changes begin to occur.

Implementation and Facilities

Monitoring performed by District staff would be continued and expanded. Consultants would be retained to perform the detailed mapping and surveys similar to those being performed for the Lagoon Enhancement Plan.

Frequency of Use

Monitoring would be performed on a regular basis. Major mapping and survey studies would be performed every five years after an initial survey during the next normal water year.

Monitoring and Reporting; Permits Required

Annual reports with the findings of the monitoring program would be provided to interested agencies and members of the public.

Preliminary Cost Estimate

The cost for consultant mapping and surveys would be $20,000 every five years. Annual costs for monitoring by District staff would be increased by $2,000 per year from $1,200 to $3,200 annually.

LAGOON MITIGATION #3: IDENTIFY FEASIBLE ALTERNATIVES TO MAINTAIN ADEQUATE LAGOON VOLUME

Existing District Program

There is no existing program to calculate adequate lagoon volume.

Description and Purpose

In conjunction with mitigation #2 above, the volume required to keep the lagoon in a stable situation that can adequately support plants and wildlife would be identified. Alternative means to achieve and maintain the desired volume would be compared, and the most cost-effective means selected.

Implementation and Facilities

Identification of the needed volume would be done in conjunction with the monitoring studies noted above and the findings of the Lagoon Enhancement Plan. Development of alternative means to provide adequate volume would be coordinated with the implementation of the selected alternative in the final Lagoon Enhancement Plan. It should be noted that construction of a large surface reservoir would provide inflow to maintain adequate lagoon volume in most years. The District is pursuing construction of a dam as soon as possible.

Frequency of Use

This study would not begin until the end of 1992, or whenever a final lagoon enhancement program is determined.

Monitoring and Reporting; Permits Required

No monitoring or permits are associated with this mitigation.

Preliminary Cost Estimates

The one-time capital costs within the first five years to assess the volume of water needed to maintain adequate habitat in the lagoon would be $5,000. No annual costs are anticipated.

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FINAL FIVE-YEAR MITIGATION PROGRAM FOR AESTHETICS -- OPTION V

SUMMARY: The Water Allocation Prorgam EIR found that all water supply options, including 16,700 AF Cal-Am production (Option V) would have significant impacts to aesthetics associated with riparian vegetation. According to the consultant, Option V would have potentially significant impacts due to the "brown lawn effect" if water supplies were limited. Discussion of this issue is found on page IV-107. The following mitigations were recommended:

1. For aesthetic impacts related to riparian vegetation, implement the riparian mitigations described previously.

2. For the brown lawn effect, plant drought-resistant landscaping and vegetation.

The consultant determined that, with these mitigations, there would still be potentially significant asthetic impacts associated with riparian vegetation. Aesthetics associated with the brown lawn effect would be reduced to a less than significant level.

Existing District Programs: Ongoing District riparian programs are described in the riparian vegetation section. Programs relating to landscaping aesthetics include:

As part of the District's comprehensive water conservation program, seminars, educational materials and resource lists are provided to the public about drought-tolerant plants and water conserving irrigation techniques (e.g., drip, cisterns). This program costs about $6,000 annually.

Amendments to Consultant's Aesthetics Mitigation Program: District staff evaluated the consultant's recommendations for technical accuracy and feasibility, and found that mitigation #2 entails reasoning that is unclear. A reduction in the amount of water available for growth would result in fewer instances of brown lawn in droughts because fewer people will be using the water supply. The brown lawn danger would occur only if all conservation savings went to new growth, thus increasing drought vulnerability. The EIR recommends that this not occur, and the District Board has adopted policies to preclude such action. Thus, this mitigation concept will not formally be part of the Board-approved mitigation program. It should be noted, however, that this mitigation is actually being performed as part of the District's ongoing conservation program.

Elements of District's Aesthetics Mitigation Program: The following Board-approved mitigations will be carried out by the District to mitigate aesthetic impacts of Option V:

1. Implement riparian mitigation programs discussed above.

The costs for this program are described in the riparian mitigation section. They would reduce aesthetic impacts relating to riparian vegetation from significant to a potentially significant level.

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