AD-A262 030

(8)

EIP Associates

Supplemental Draft
Environmental Impact Report/Statement II

Monterey Peninsula Water Supply Project

VOLUME II

Monterey Peninsula Water Management District

U.S. Army Corps of Engineers
Permit Application #16516 S09
SCH # 87092203

February 1993

Printed on Recycled Paper

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Corps of Engineers #16516S09	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT REPORT/ STATEMENT II MONTEREY PENINSULA WATER SUPPLY PROJECT (~~2 volumes and an appendix~~ volume II FEBRUARY 1993		5. TYPE OF REPORT & PERIOD COVERED Supplemental Draft EIR/EIS
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) EIP Associates prepared for the Monterey Peninsula Management District and the U.S. Army Corps of Engineers		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Corps of Engineers 211 Main St. (CESPN-PE-R) San Francisco, CA 94105-1905		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS same as block #10		12. REPORT DATE 12 March 1993
		13. NUMBER OF PAGES 656
14. MONITORING AGENCY NAME & ADDRESS (If different from Controlling Office) same as block #11		15. SECURITY CLASS. (of this report) unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
water supply; dams; Section 404 permits;

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Monterey Peninsula Water Management District (MPWMD) has examined 5 alternatives with the basic project purpose of providónga minicipal water supply to the Monterey Peninsula that would provide adequate drought protection for existing residents and meet the long term water supply needs of planned growth. The overall project purpose is to provide adequate instream flow to protect the public trust resources of the Carmel River. The 5 alternaitves studied are: a 24,000 AF New Los Padres Reservoir, either alone or combined with a 3 MGD desalination plant; a 15,000 AF Canada Reservoir&3 MGD Desal Plant; a 7 MGD desal Plant; and No project.

TABLE OF CONTENTS

Page

VOLUME II

LIST OF FIGURES

LIST OF TABLES

9. VEGETATION AND TERRESTRIAL WILDLIFE

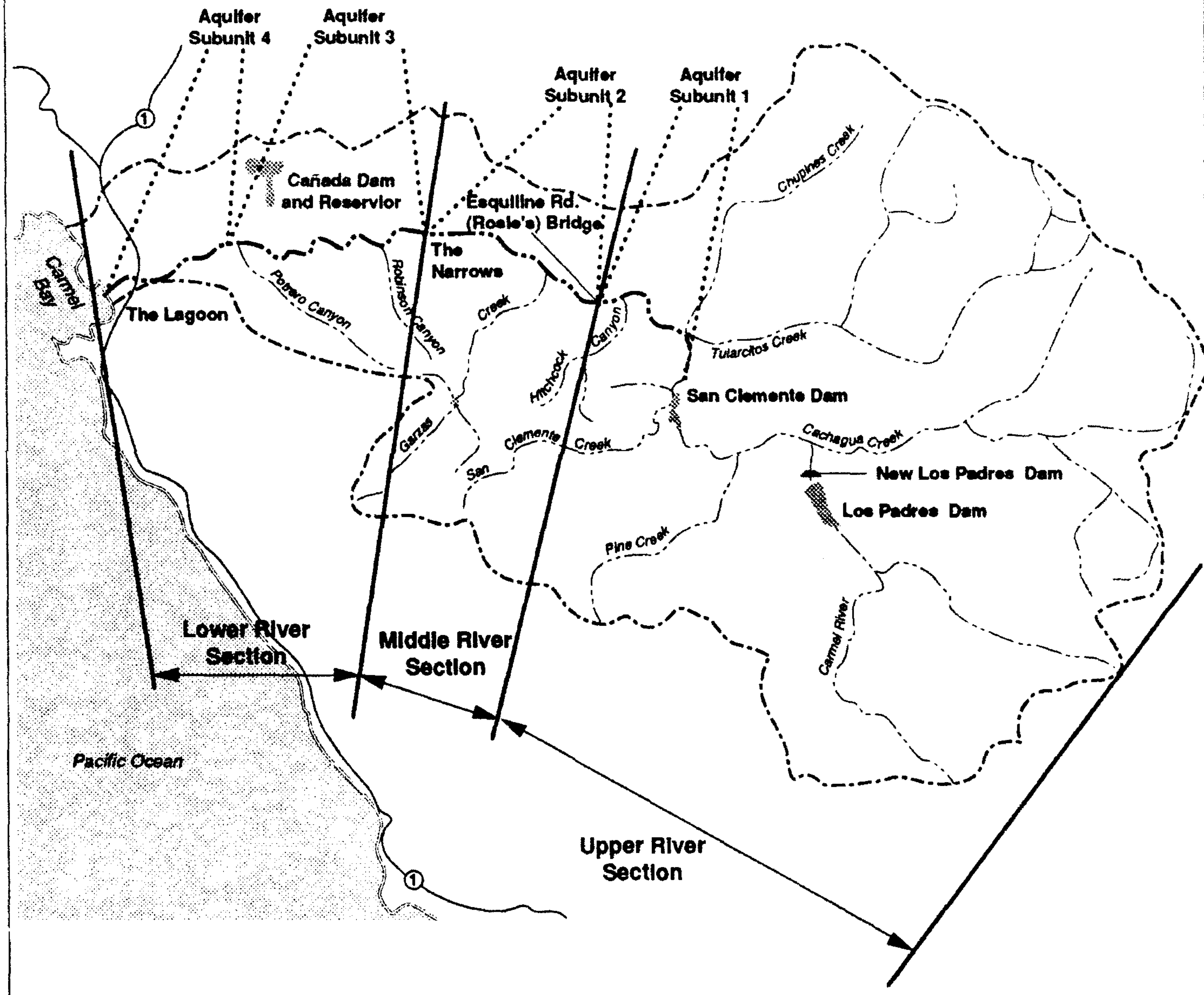
9. VEGETATION AND TERRESTRIAL WILDLIFE

9.1 SETTING

The study area to be discussed in this chapter includes that portion of the Carmel River drainage basin from approximately 3 miles upriver of the existing Los Padres Dam to the river mouth. Cañada de la Segunda, the location of the Cañada Dam and Reservoir project, is on the north side of Carmel Valley approximately five miles upriver from Carmel Bay, as shown in Figure 4-1. Two desalination plant sites are also examined, one in Sand City and one near Marina, as shown in Figure 4-1; please refer to Figures 4-8 and 4-17 for more detailed locations.

The Carmel River drainage basin encompasses about 255 square miles. The Carmel River is approximately 36 miles long and its headwaters are in the Santa Lucia Mountains. The upper 21 miles of the river pass through rugged canyons with steep slopes and small alluvial deposits in the canyon bottoms. The lower 15 miles of the river pass through the alluviated Carmel Valley and discharge at its mouth into the Pacific Ocean. In past studies the Carmel River has been divided into three general geographical and physical sections, referred to as the lower, middle and upper river sections.[1,2,3] In this chapter, the lower river is defined as the 9.5-mile section between the river mouth and the Narrows; the middle section is the 5-mile section between the Narrows and Esquiline Road (Rosie's) Bridge; and the upper section is the 21-mile section upstream of Esquiline Road Bridge (see Figure 9-1). The general vegetation and wildlife habitats associated with the study area have been classified as either riparian forest, woodland, or scrub in the Carmel Valley alluvial flood plain (lower and middle river); the typically narrow riparian-mixed hardwood forest immediately along the river banks upstream of the alluvial plain (upper river), and various brushlands, forests, and woodlands on the steep canyon slopes above the river and tributaries.

Two proposed desalination facility sites, one at the Monterey Regional Water Pollution Control Agency (MRWPCA) Treatment Plant near Marina, and the other, in Sand City, encompass six primary community types, (1) coastal sand dunes, (2) marine aquatic, (3) grassland, (4) riparian, (5)



SOURCE: MPWMD

MILES 0 2 4

recycled paper

91417

eip

freshwater aquatic and (6) anthropogenic. All habitats and pipeline routes for the alternatives that include a desalination plant were examined during timely surveys for listed plant and wildlife species; studies identified and described as completely as possible the habitat values associated with each.

A detailed description of the vegetation types within each of the alternative sites is presented in Section 9.1.1 of this chapter. The vegetation community names in parentheses correspond to the description used by the California Department of Fish and Game.[4] In general, the wildlife in the study area is composed of the common and typical species found in the vegetation types described in Section 9.1.1. A detailed description of wildlife identified during field surveys at each of the alternative sites in the study area is provided in Section 9.1.2 below. Complete lists of plant and wildlife species identified in the study area are provided in Appendices 9-A and 9-B.

9.1.1 VEGETATION

9.1.1.1 Upper River Section

The upper river section of the Carmel River drainage basin is defined here as the upper 21 miles of the Carmel River located upstream of the USGS streamflow gage at Robles del Rio, adjacent to Esquiline Road (Rosie's) Bridge. The vegetation types at the New Los Padres Dam and Reservoir site in the upper river drainage basin are mapped in Figure 9-2.

Riparian

This vegetation type is limited to the canyon bottoms that are filled with recently deposited gravel and sand between 6 and 15 feet deep, and are immediately adjacent to the canyon slopes. At the New Los Padres site along the Carmel River, this vegetation type averages approximately 100 to 150 feet wide. The vegetation structure is highly variable, ranging from typical forest communities with a tree overstory and a brush and herbaceous understory, to woodland or scrub communities of open stands of scattered trees with little understory, to dry washes with very little or no vegetation cover.

A variety of riparian forest communities may be identified within the riparian zone in this portion of the Carmel River Basin. The dominant riparian forest community is a mixture of the riparian community and the adjacent mixed hardwood forest (Central Coast Cottonwood-Sycamore Riparian Forest). The dominant tree species are sycamore (*Plantanus racemosa*), cottonwood (*Populus trichocarpa*), white alder (*Alnus rhombifolia*), and willows (*Salix* spp.) of the riparian community, and coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), and California buckeye (*Aesculus californicus*) of the mixed hardwood forest community. The brush understory is typically composed of poison oak (*Toxicodendron diversilobum*), coffeeberry (*Rhamnus californica*), wild current (*Ribes* spp.), blackberry (*Rubus vitifolius*), and stinging nettle (*Urtica holosericea*).

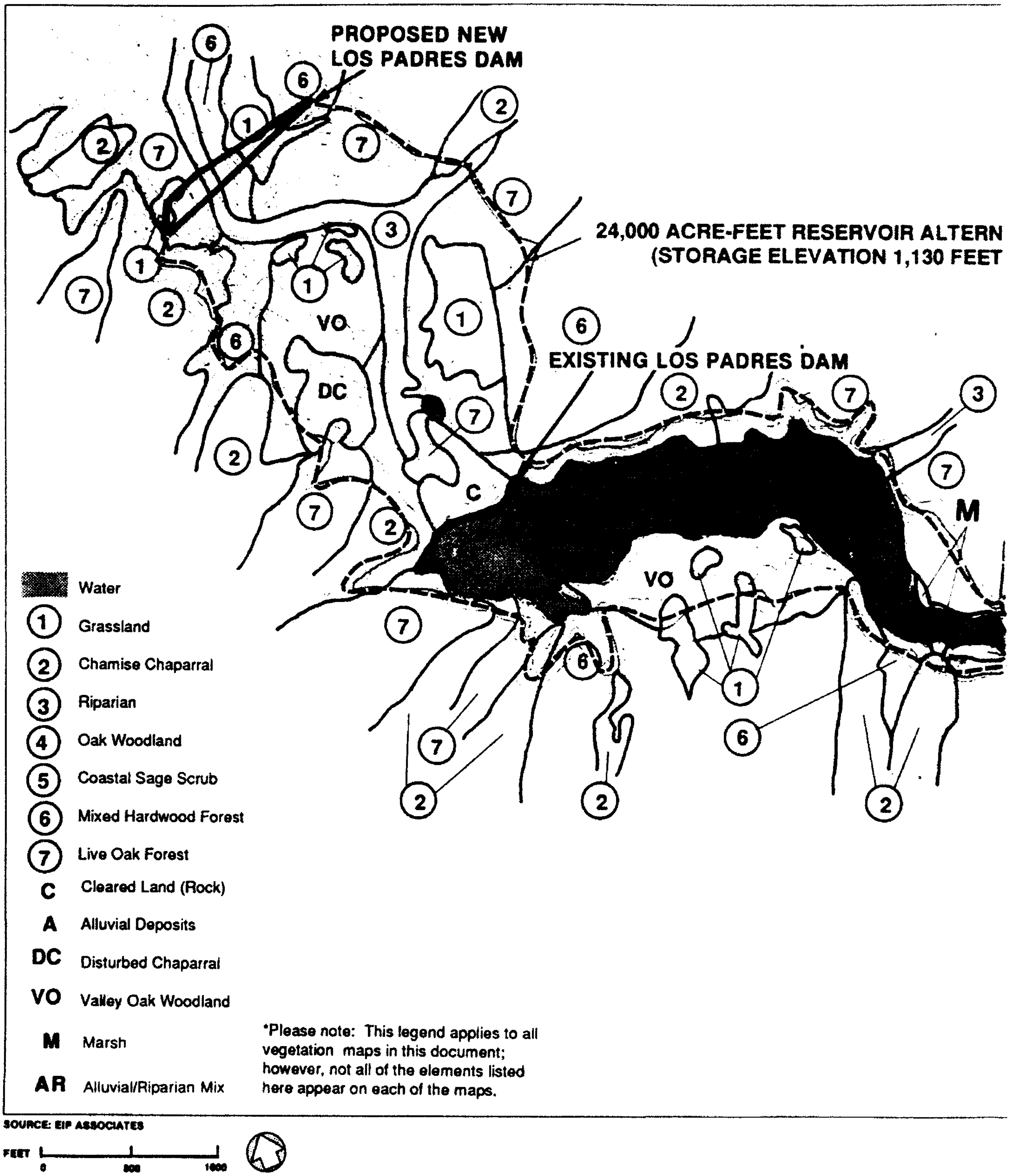
In some areas the riparian forest community is dominated by particular species, such as the white alders (White Alder Riparian Forest), located along those areas of the creeks and Carmel River where the water flow is rapid and the channel bed is composed of very coarse materials. In the drier outer floodplains along these waterways, the coast live oak may dominate (Central Coast Live Oak Riparian Forest). In sandy or gravelly soils, the Arroyo Willow (*Salix lasiolepis*) dominates as a low, dense, closed canopy forest (Central Coast Arroyo Willow Riparian Forest).

Mixed Hardwood Forest (Broadleafed Upland Forest)

This forest-type range extends into the North Coast Ranges as fragmented transitions between the Douglas Fir (*Pseudotsuga menziesii*)-Hardwood Forests and Northern Oak Woodlands and as far south as San Diego County, where it is typically restricted to mesic slopes. In the Santa Lucia Range this forest community is typically a part of a mosaic composed of oak woodlands, coastal sage scrub, chaparral, and grasslands. In the upper Carmel River Basin this community is typically found on the wetter north- and east-facing slopes. The dominant tree and brush species within this plant community are madrone (*Arbutus menziesii*) and the coast live oak. Black oak (*Q. kelloggii*) and valley oak (*Q. lobata*) are scattered within this community, along with colonies of the California buckeye (*Aesculus californica*). Creambush (*Holodiscus discolor*) and creeping snowberry (*Symphoricarpos mollis*) are common understory shrubs. The big-leaf maple (*Acer macrophyllum*) occurs both in the riparian zone and on the wetter sites up the slope in the Mixed Hardwood Forest. Mature trees stand 100 feet tall or more and occur in dense stands with 70-100 percent canopy cover.

On the drier south- and west-facing slopes, the coast live oak becomes more of a dominant species with the California bay and California buckeye (elements of the Mixed Hardwood Forest) scattered among the oaks. Various brush species from the adjacent coastal scrub and chaparral communities make up the understory in areas (Coast Live Oak Forest). This community represents a transition from the more mesic sites of the Mixed Hardwood Forest and the dryer sites of the Oak Woodland types. The Coast Live Oak Forest is common on the north- and west-facing slopes of the New Los Padres site. The coast live oak occurs in pure stands on some of the shady alluvial terraces and in

MAP OF VEGETATION-24,000 AF NEW LOS PADRES RESERVOIR

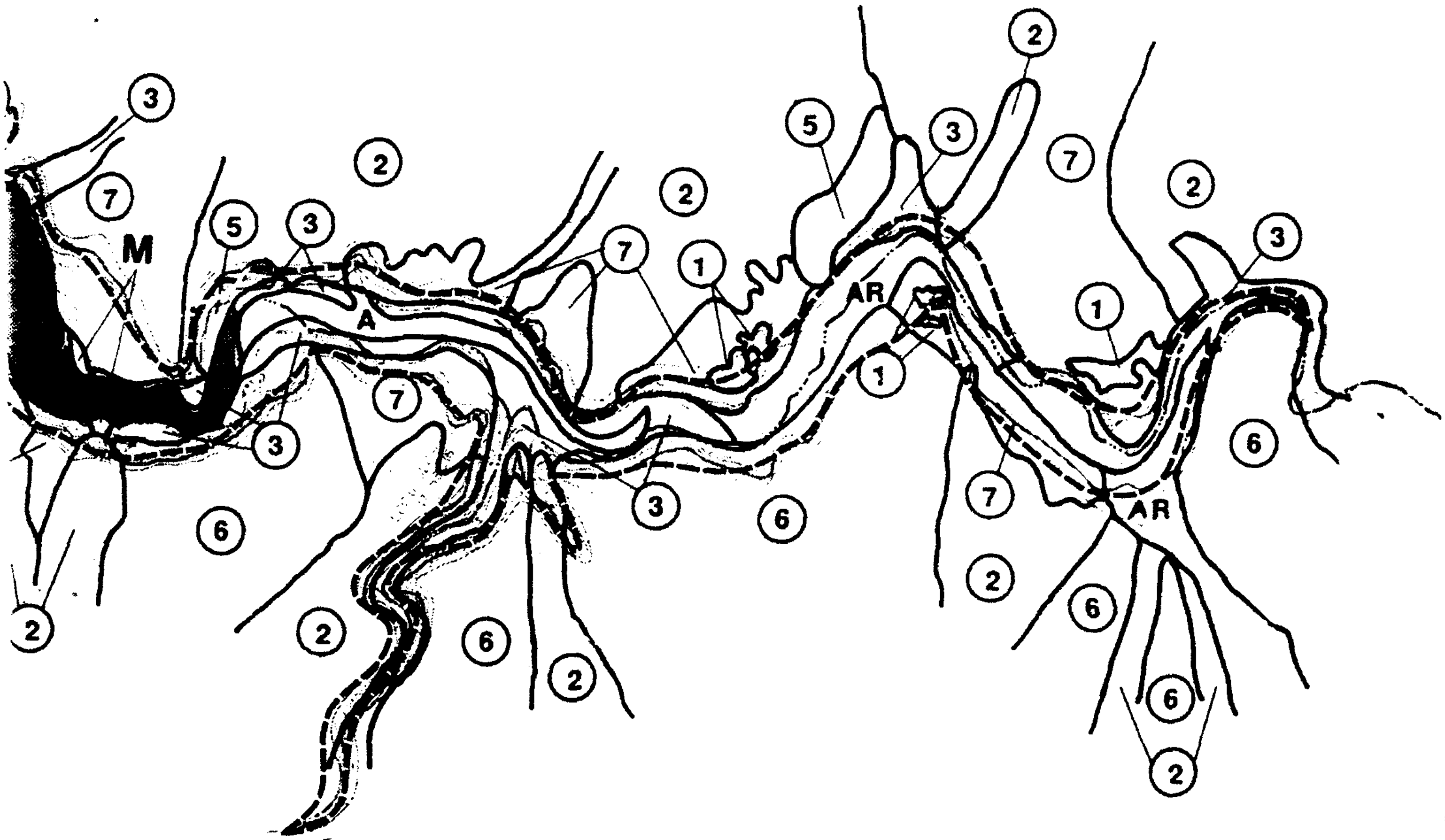


SOURCE: EIP ASSOCIATES

(2)

FIGURE 9-2

VOIR ALTERNATIVE
ƆN 1,130 FEET)



91417

the transition zones between the Mixed Hardwood Forest and the Coastal Live Oak Woodland. The California bay is scattered throughout the Mixed Hardwood Forest, but it achieves total dominance in localized areas (California Bay Forest). These bay forests have little or no understory.

Foothill Woodland (Oak Woodland)

On the drier sites on the south- and west-facing slopes and on the more level topographic areas of old alluvial terraces, many of the tree species of the Mixed Hardwood Forest thin out, and various oaks (*Quercus* spp.) dominate. This community is very similar to the Mixed Hardwood and Coast Live Oak Forests. The basic differences between these communities are that the canopy densities of the Oak Woodlands are less (30-70 percent) than in the Forest (70-100 percent) and brush cover is often less in the woodlands than in the forests. These woodlands often appear as open savannah-like areas with grasslands between the trees.

Three types of oak woodlands occur in the upper section of the Carmel River Basin: Valley Oak (*Quercus lobata*), Blue Oak (*Q. douglasii*) and Coast Live Oak Woodlands. The Coast Live Oak Woodland community is very similar to the Coast Live Oak Forests, and in many cases these two communities merge into an indistinguishable mosaic. It intergrades with the Coast Live Oak Forest on the more mesic sites and with the Coastal Scrub and Chaparral on the drier sites.

The Valley Oak Woodlands are mostly limited to the old alluvial terraces along the Carmel River at the New Los Padres site. This community is more open and park-like with a grassy understory.

Grasslands

This a naturalized plant community dominated by nonnative annual grasses and forbs (wildflowers). This annual grassland community has effectively replaced the native perennial grassland community in California. The native perennial bunch grasslands have been significantly limited as a result of livestock grazing practices in the state and through the introduction of annual grasses and forbs from other Mediterranean regions in the world. These "new natives" are now so extensive and well established in the state that it is now considered as a naturalized climax community in California.[5]

The annual grasslands vary in composition and cover depending upon soil nutrients, moisture content, aspect, and/or other special ecological factors such as grazing pressure. In general, areas dominated by forbs indicate an early successional stage of development, while a dense stand of tall grasses represents the climax stage. Annual grasslands may range from dense (100 percent) to sparse cover, and from 6 inches to 3 feet in height. The soils are generally medium to heavy in texture, granular in structure, moderate in organic content, and often 1-2 feet in depth. This herbaceous community intergrades with the Oak Woodlands and Brushland communities in this region. The common and typical plant species include wild oats (*Avena* spp.), rye grass (*Lolium* spp.), barley (*Hordium* spp.), brome (*Bromus* spp.), fileree (*Erodium* spp.), California poppy (*Eschscholzia californica*), tarweed (*Hemizonia* spp.), lupines (*Lupinus* spp.), sweet clover (*Medicago polymorpha*), owls clover (*Orthocarpus* spp.), and fescue grass (*Festuca* spp.).

Brushlands

On the dryer south- and west-facing slopes of the canyons, the vegetation is dominated by brushlands with occasional pockets of oak trees near the adjacent Mixed Hardwood Forest and Oak Woodlands. These brushlands, typical of regions with Mediterranean-like climates, may extend from the ridgetops down to the riparian zone along the river and its tributaries. Two types of brushland occur on the slopes in the Upper section of the Carmel River Basin -- Coastal sage scrub, or "soft" chaparral, and chamise chaparral, or "hard" chaparral.

The Coastal Sage Scrub (Diablan Sage Scrub) community is limited in extent in the New Los Padres reservoir site. In this area it is found on the steep slopes with the shallowest and rockiest soils. The brush is 1 to 5 feet tall, and because of the rocky ground, forms a more open community. This vegetation is sometimes referred to as "soft chaparral" because many of its dominant species are not as woody or as large as the chamise chaparral. The dominant species include California coastal sage (*Artemisia californica*), black sage (*Salvia mellifera*) and Northern monkeyflower (*Mimulus aurantiacus*).

Chamise chaparral or "hard" chaparral (Northern Mixed Chaparral) is a dense, often impenetrable brushland of 3 to 10 feet in height. In the upper Carmel River Basin area, it is the most prevalent brushland community, with chamise (*Adenostoma fasciculatum*) as the most dominant plant, forming pure stands in some sites. Other common species include wild mountain lilac (*Ceanothus* spp.), toyon (*Heteromeles arbutifolia*) and chaparral honeysuckle (*Lonicera interrupta*).

Freshwater marsh vegetation forms dense patches of herbaceous vegetation in ponds and along slow moving portions of rivers, creeks, and streams. Dominant species include cattails (*Typha* spp.), tules and bulrushes (*Scirpus* spp.), rushes (*Juncus* spp.), and sedges (*Carex* spp.). Shrub and tree willows (*Salix* spp.) may be found along the shoreline where conditions are suitable. As sedimentation continues, marsh vegetation will expand into the reservoir. Marsh vegetation is found in Los Padres reservoir and is referred to as pond or freshwater emergent vegetation elsewhere in this report.

9.1.1.2 Lower and Middle River Sections

The vegetation communities typical of this section of the Carmel River Drainage Basin are typical of large river alluvial flood plains in the central coast region. The actual study areas include that portion of the Carmel River from Esquiline Road (Rosie's) Bridge to the Narrows (middle section), from the Narrows to Carmel Bay (lower section), and the Cañada Dam and Reservoir site (see Figure 9-1). Descriptions of the vegetation communities at the Cañada site are presented below.

Cañada Dam and Reservoir Site.[6]

Seven predominant native habitat types within the Cañada Reservoir were identified in the project study area, including Monterey pine forest, coast live oak forest, buckeye woodland, coastal scrub, mixed chaparral, coastal prairie, and riparian forest. These habitat types are "native" in the sense that they are relatively unaffected by recent large-scale human disturbance. Three other habitat types that occur in the project area – disturbed grassland, farmland, and old dwelling site – are associated with ongoing or past intensive human disturbance.

Brief descriptions of all the habitat types occurring within the project area are given below. Refer to the Biological Assessment prepared for the site for more detailed descriptions.[7] Areas transitional between two habitat types which are extensive enough to be mapped separately are also briefly described. The distribution and extent of vegetation/habitat types in the Cañada Reservoir Project study area are presented in Figure 9-3.

Monterey Pine Forest. The Monterey pine forest is a relatively dense forest dominated by Monterey pine (*Pinus radiata*). Coast live oak (*Quercus agrifolia*) is the only associated tree species. Several shrub species, including poison oak (*Toxicodendron diversilobum*), evergreen huckleberry (*Vaccinium ovatum*), coffeeberry (*Rhamnus californica*), and ocean spray (*Holodiscus discolor*), are locally moderately abundant in the understory, along with the semi-woody vines, hairy honeysuckle (*Lonicera hispidula* var. *vacillans*) and Pacific blackberry (*Rubus ursinus*). Although a relatively large number of herbaceous species occur in small numbers in the Monterey pine forest, the herbaceous understory is generally sparse and poorly developed except in relatively open areas, where it is similar to that of the coast live oak woodland. In the project area, Monterey pine forest generally occurs in more protected localities on slopes and in the bottoms of small canyons. Extensive stands of Monterey pine forest occur on the generally east-facing slopes of the western half of the project area, north of the proposed dam site.

Monterey pine forest is a habitat type of very limited distribution, occurring in only three widely separated areas near the Central California coast: the Monterey Peninsula, near Cambria in San Luis Obispo County, and near Swanton and Año Nuevo Point in Santa Cruz and San Mateo Counties.

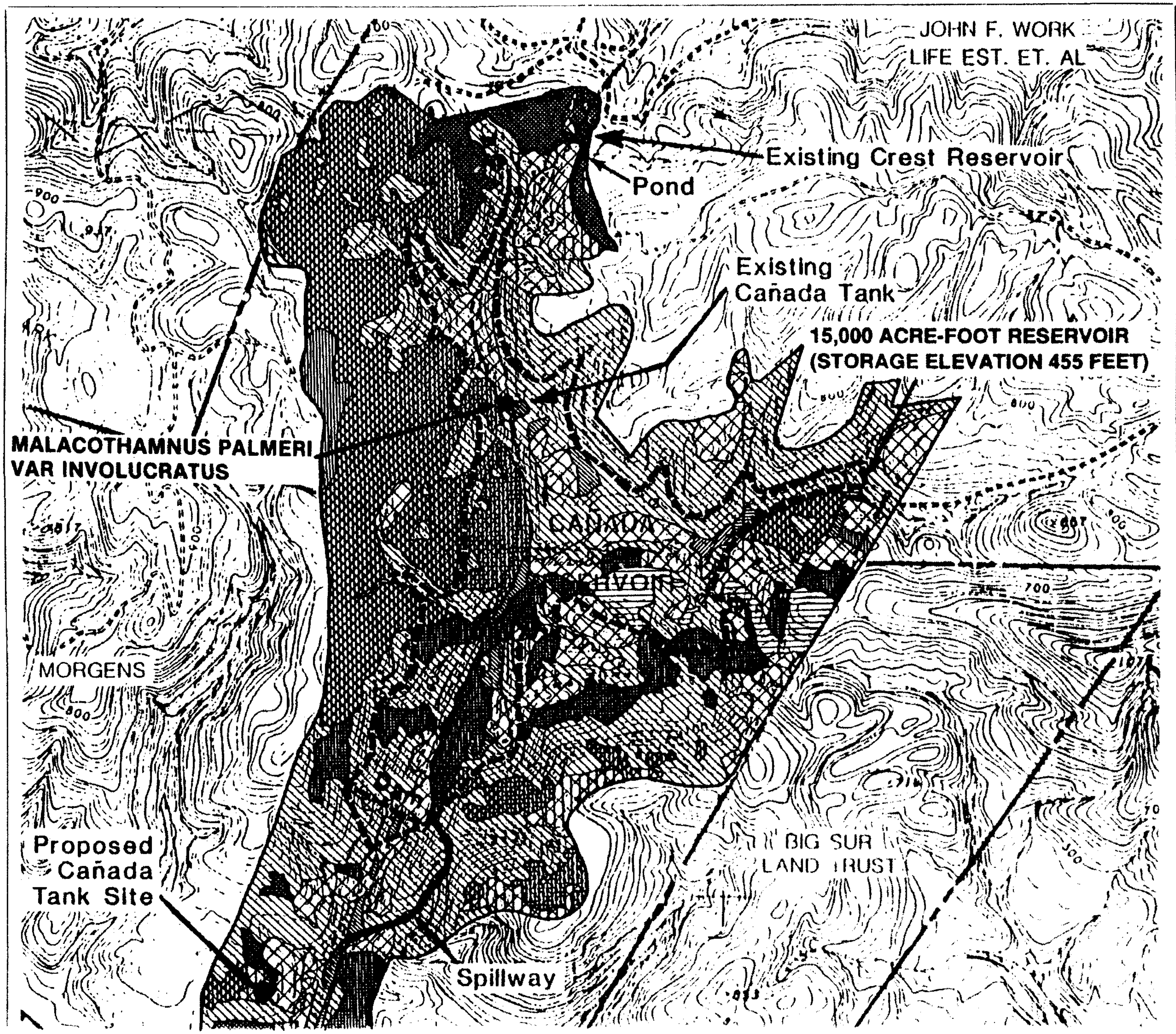
The Monterey pine forest stands in the project area are near the eastern (inland) limits for Monterey pine on the Monterey Peninsula, perhaps accounted by the tendency of Monterey pine to occur in relatively moist, protected localities within the project area. Stands of Monterey pine are generally even-aged and date from past fires, because the cones largely remain closed until they are induced to open by heat, making abundant reproduction dependent on periodic fire.

Although Monterey pine is widely planted as an ornamental and forms naturalized stands along much of the California coast, native Monterey pine forest stands are a sensitive habitat type (high-priority habitats with the California Natural Diversity Data Base (CNDDB) and listed by the California Natural Heritage program as endangered and of limited distribution in California) because they are of limited occurrence in only three areas and because urbanization and, to some extent, clearing for pasture have reduced their extent. Loss of native Monterey pine forest to urbanization has been especially severe in the Monterey Peninsula stands.

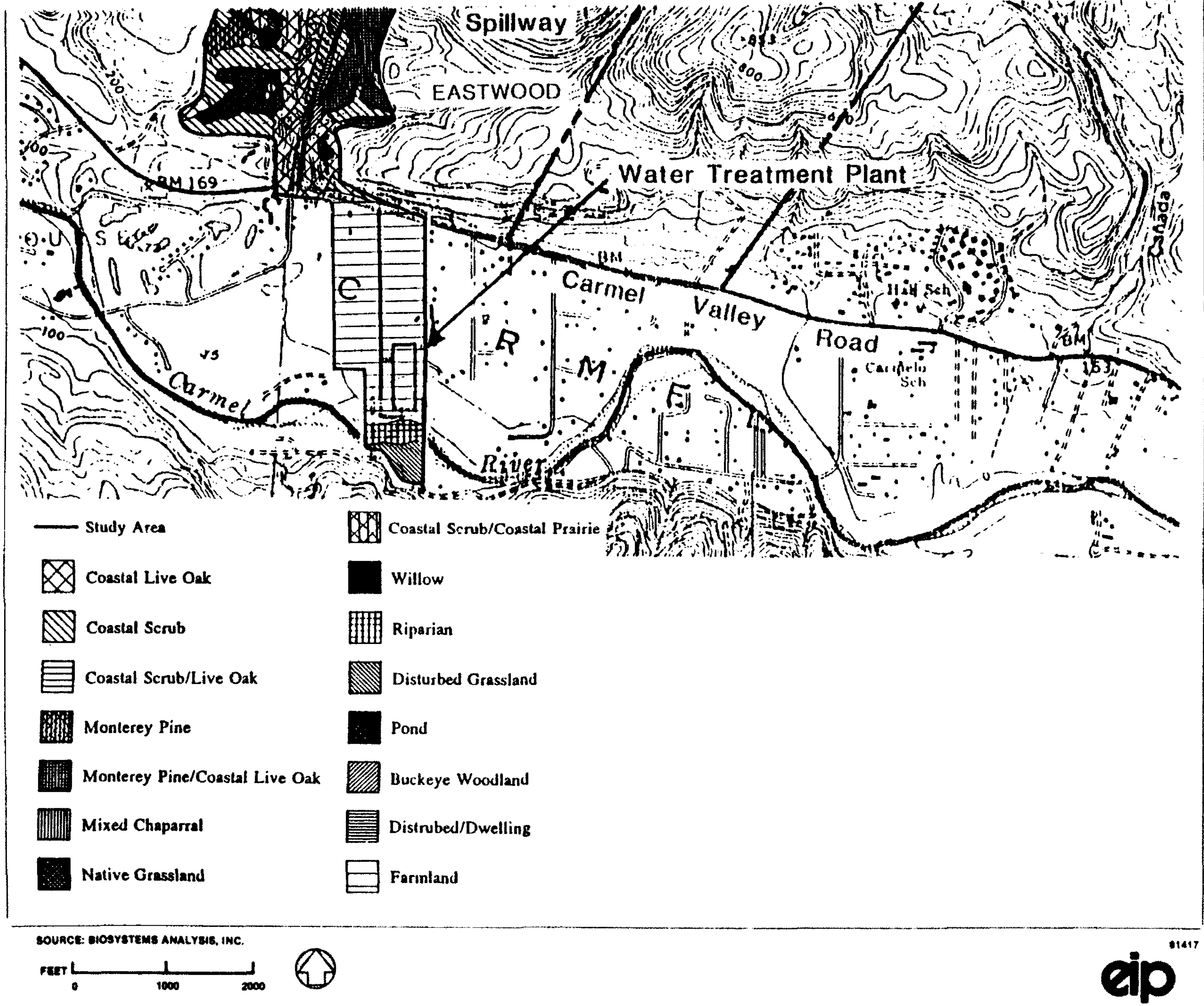
<u>Coast Live Oak Forest (Coast live oak woodland, coast live oak forest, and central coast live oak riparian forest)</u>. The coast live oak woodland and coast live oak forest are very similar, differing mainly in the canopy density of the dominant tree species, coast live oak. Since the canopy density in coast live oak-dominated habitats within the project area varies greatly over short distances/without sharp discontinuity, we do not distinguish between these two habitat types. Locally, where the coast live oak forest extends to the bottom of the main north-south canyon in the project area, it

VEGETATION / HABITAT TYPES WITHIN THE CAÑADA RESERVIOR PROJECT STUDY AREA

FIGURE 9-3



(1)



Spillway
EASTWOOD
Water Treatment Plant
Carmel Valley Road
Carmel River
BM 169
Canada
Study Area
Coastal Live Oak
Coastal Scrub
Coastal Scrub/Live Oak
Monterey Pine
Monterey Pine/Coastal Live Oak
Mixed Chaparral
Native Grassland
Coastal Scrub/Coastal Prairie
Willow
Riparian
Disturbed Grassland
Pond
Buckeye Woodland
Distrubed/Dwelling
Farmland
SOURCE: BIOSYSTEMS ANALYSIS, INC.
FEET 0 1000 2000
91417

corresponds to the central coast live oak riparian forest; however, this canyon bottom live oak forest is continuous with the forest on the adjacent slopes. Coast live oak forms pure stands in some areas; in other areas it is associated with such other tree species as Monterey pine, California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*). The shrub layer is quite variable, ranging from almost nonexistent (where the canopy cover is high) to locally dense.

Monterey Pine/Coast Live Oak Forest. This habitat type is transitional between Monterey pine forest and coast live oak forest. It is a rather dense to somewhat open forest with Monterey pine and coast live oak codominant. The associated tree, shrub, and herb species are those of the coast live oak forest. The most extensive stands of this habitat type are on slopes in the eastern portion of the project area, east of the drainage of the main north-south canyon (see Figure 9-3). Several smaller stands occur west of this drainage. It is unclear whether there is a successional trend in this habitat type, but it is likely that prolonged absence of fire would favor increasing dominance of coast live oak, while frequent fires would favor increased Monterey pine.

Buckeye Woodland. This is a fairly dense woodland consisting almost totally of California buckeye in the canopy layer. Associated shrubs include poison oak, coyote brush, Mexican elderberry, and coffeeberry. Some of the native herbs associated with the coast live oak forest (above) are also present in this habitat type, although the diversity of native herbaceous species is far less. A large number of weedy non-native herbs, including bur-chervil (*Anthriscus caucalis*), poison hemlock (*Conium maculatum*), bull thistle (*Cirsium vulgare*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), wild radish (*Raphanus sativus*), common chickweed (*Stellaria media*), lamb's quarters (*Chenopodium album*), and horehound (*Marrubium vulgare*), are relatively abundant in this habitat type, suggesting that it has developed in areas of past disturbance. Two stands of this habitat type occur in the project area, both in the bottoms of large canyons (see Figure 9-3), one south of the proposed dam site and one eastern canyon north of the proposed dam site.

Coastal Scrub (Central [Lucian] coastal scrub). The coastal scrub of the project area is a mostly rather dense, low- to medium-height scrub dominated by a number of evergreen and deciduous shrubs, including poison oak, coyote brush (*Baccharis pilularis* ssp. *consanguinea*), coast sagebrush (*Artemisia californica*), common hazardia (*Hazardia squarrosa*), black sage (*Salvia mellifera*), coffeeberry, redberry, and sticky monkeyflower (*Mimulus aurantiacus*). Coastal scrub is widespread throughout the project area (see Figure 9-3), generally occurring on higher, more exposed slopes.

In the eastern half of the project area, coastal scrub often occurs on upper slopes above forest stands on the lower slopes. Some large stands of coastal scrub, particularly on the west side of the main north-south canyon, extend all the way to the canyon bottom.

Coastal Scrub/Live Oak. This habitat type, which occurs on ridgetops and upper slopes in the east-central portion of the project area (see Figure 9-3), is transitional between coastal scrub and coast live oak forest. It is characterized by shrubs and herbs of the coastal shrub habitat type interspersed with individual trees or small groves of coast live oak, associated with shrubs and herbs characteristics of the coast live oak forest. A successional trend from coastal shrub to coast live oak may be underway in this habitat type.

Chaparral (Transitional between northern mixed chaparral and central maritime chaparral). The chaparral of the project area is a dense, tall scrub dominated by chamise (*Adenostoma fasciculatuum*) and manzanita (*Arctostaphylos tomentosa* complex). Few other shrub or herb species are associated with this habitat type. The presence of manzanitas of the *Artostaphylos tomentosa* complex, as well as the proximity of the project area to the coast, are suggestive of the central maritime chaparral community, but the relatively high abundance of chamise and the absence of other endemic manzanita species, such as *Arctostaphylos hookeri*, *A. montereyensis*, or *A. pumila*, indicate an affinity with the much more widespread northern mixed chaparral community. There are two stands of chaparral in the project area (see Figure 9-3): a relatively large stand in the northwestern part of the area and a much smaller stand near the eastern boundary in the east-central part.

Coastal Prairie (Coastal terrace prairie). The coastal prairie is a grassland community largely dominated by native perennial grasses. In the coastal prairie of the project area, these include California oatgrass (*Danthonia californica*), meadow barley (*Hordeum brachyantherum*), June grass (*Koeleria cristata*), small-flowered needlegrass (*Stipa lepida*), purple needlegrass (*Stipa pulchra*), and tall trisetum (*Trisetum canescens*). Some non-native annual grasses, including slender wild oat (*Avena barbata*), ripgut grass (*Bromus diandrus*), soft chess (*Bromus mollis*), and farmer's foxtail (*Hordeum leporinum*), are also present. A diverse assortment of native herbs is associated with the grasses. Despite the abundance of some non-native species, the overall aspect of this habitat type is of a grassland dominated by native grass and herb species. Coastal prairie stands occur in two portions of the project area: south of the proposed dam site west of the main canyon, and near the north end of the study area. These coastal prairie stands occur on nearly level, dissected coastal terrace remnants and gentle upper slopes.

Coastal prairie is a sensitive habitat type because coastal prairie grasslands have declined greatly since European settlement in California due to a number of disturbance factors, including urbanization, conversion to intensive agriculture, overgrazing, the introduction of weedy non-native species, and the cessation of frequent fires.

Coastal Prairie-Coastal Scrub. This habitat type, transitional between coastal prairie and coastal scrub, consists of native perennial and non-native annual grass species characteristic of the coastal prairie habitat, accompanied by mostly native herbs, overtopped by shrubs of the coastal scrub community at varying densities. The associated herb species are mostly species characteristic of the coastal prairie (above), but a few species, including poison sanicle (*Sanicula bipinnata*), fragrant everlasting (*Gnaphalium beneolens*), and Henderson's shooting star (*Dodecathon hendersonii*), seem to be largely confined to this habitat type within the project area. Stands of this habitat type occur scattered on ridgetops and upper slopes along the southern and eastern periphery of the main part of the project area (see Figure 9-3). The successional status of this habitat type is unclear, but it seems likely that there is a slow successional trend toward coastal scrub.

Riparian Forest (Central coast arroyo willow riparian forest). Riparian forest in the project area is mostly confined to a strip on both sides of the Carmel River in the vicinity of the proposed intake facility and pump station (see Figure 9-3). A brief description of this habitat type is presented below, and a more detailed description is presented in the Biological Assessment Report for the site. This is a sensitive habitat type because of its value to wildlife and because it has declined due to large-scale disturbances such as urbanization, stream channelization, and conversion for agriculture. In addition to the riparian forest along the Carmel River, two very small stands of this habitat type, consisting of mostly arroyo willow with few associates, occur at the bottom of the large southwest-draining canyon in the east-central portion of the project study area (see Figure 9-3).

Pond (Coastal and valley freshwater marsh). A small pond, probably artificially created, is located along the eastern boundary of the project study area near the north end (see Figure 9-3). The margins of this pond support an assemblage of species characteristic of freshwater marshes and other permanent or seasonally wet habitats. These include stipitate allocarya (*Plagiobothrys stipitatus* var.

micranthus), vernal water-starwort (*Callitriche verna*), hyssop loosestrife (*Lythrum hyssopifolia*), umbrella-sedge (*Cyperus eragrostis*), creeping spike-rush (*Eleocharis palustris*), and tule (*Scirpus acutus*).

Disturbed Grassland. Disturbed grassland areas are open areas dominated by mostly weedy, non-native grasses and herbs. Only a few native herb species are associated with this habitat type; many of these are species of ruderal tendencies. Disturbed grassland occurs in several locations on the floor and lower slopes of the main north-south canyon (see Figure 9-3), in areas heavily disturbed by past overgrazing or by grading, brush clearing, and similar activities.

Farmland. The portion of the project area between the Carmel River and Carmel Valley Road, through which the proposed transmission pipeline would run, is occupied by agricultural fields. The margins of these fields, including a narrow strip between the agricultural fields and the Carmel River riparian forest, support an assemblage of weedy, mostly non-native species similar to those found in the disturbed grassland.

Old Dwelling Sites. An old dwelling site occurs within the project study area. It is characterized by exotic trees and shrubs such as redwood (*Sequoia sempervirens*, almost certainly planted), green wattle (*Acacia decurrens*), French broom (*Cytisus monspessulianus*), and blue gum (*Eucalyptus globulus*), along with weedy, mostly non-native herbaceous species.

Carmel Valley Riparian

There have been a number of reported surveys and studies on the vegetation associated with the Carmel Valley flood plain.[8] The vegetation is classified as riparian, a vegetation community associated with water courses. The riparian vegetation of the Carmel River is typical of waterways in the Central Coastal region of California and shares the following features:

- dependency on a relatively constant supply of water from surface or groundwater;
- conspicuous zonation parallel to the waterways on gravel bars, and low and high terraces;
- marked contrast and abrupt transitions from riparian to adjacent terrestrial communities; and
- extensive ecotonal edge (i.e., transition between ecosystems) due to the linear distribution of riparian communities along river channels, and the interwoven mosaic of various riparian community types.

Although a dam and reservoir is not proposed in this section of the Carmel River, the operation of various alternatives may have an effect upon the riparian communities along these downstream sections of the river. The alternatives may change streamflow patterns or groundwater levels, which would have an effect upon the development of the riparian vegetation in the river flood plain, and at the mouth of the river.

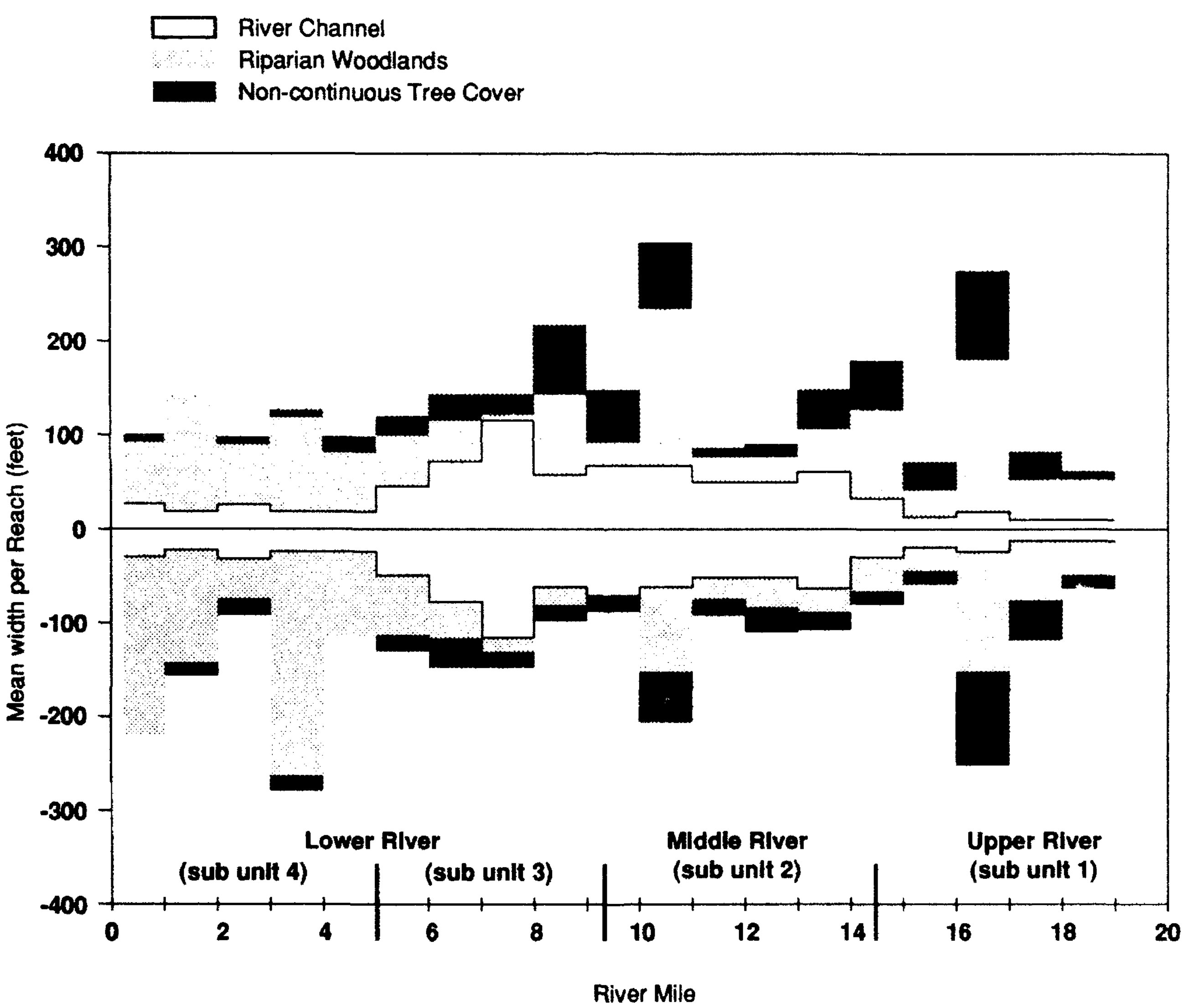
The riparian vegetation along the Carmel River used to be more extensive than it is today. Prior to the construction of the San Clemente Dam in 1921, major flood events changed the course of the Carmel River throughout the valley bottom. The construction of the dam has resulted in the establishment of a narrower, more sinuous stream channel with higher floodplain terraces. Prior to 1960, the Carmel River supported a continuous cover of riparian forest.[9] Since 1960, the riparian forest has been reduced to a discontinuous, narrow strip (seldom more than two tree crown diameters wide) lining the riverbank. This loss of riparian vegetation can generally be attributed to a combination of human activities, including urban development and agricultural practices, and lowering of the water table due to groundwater pumping. These land use practices, in combination with other natural causes, such as droughts, have created a mosaic of plant associations and habitat types. Eight riparian habitat types were described for an avian survey conducted in 1987 for this report (see Appendix 9-C) and are briefly summarized below. A schematic representation of the Carmel River riparian corridor is presented in Figure 9-4.

The lower portion of the lower river section (subunit 4, Carmel Bay to River Mile 3.6) supports a well-developed riparian forest (see Figure 9-1). This forest is dominated by large deciduous trees (30-60 feet tall) with overlapping canopies. The dominant tree species is the black cottonwood, with sycamores and willows dominating smaller areas. The understory varies from bare ground or low herbaceous cover (due to recent scouring) to a dense scrub thicket of white alders immediately along the banks or common brush species such as poison oak, wild rose and blackberry (15-35 feet tall).

Riparian woodland or thickets are the most common and extensive habitat type along the river (subunits 3 and 2, see Figure 9-1). A woodland is also dominated by large trees; however, unlike the forest type, the canopies do not overlap, and there is a wide range of tree densities. The most common tree species are identical to the forest type. A thicket is very similar to the woodland type except that these are typically dense stands of one or two tree species less than 20 feet in height.

SCHEMATIC OF CARMEL RIVER
RIPARIAN CORRIDOR (1986)

FIGURE 9-4



SOURCE: MCNIESH, 1991

91417

Common and dominant species of the thicket type are red willow (*Salix laevigata*), sandbar willow (*Salix hindsiana*), cottonwood, and alder. There is a continuum of size and structural complexity between the woodland and thicket types.

Riparian scrub is a second common habitat type throughout the middle and lower river (subunits 2 and 3, see Figure 9-1). However, it is most often very limited in extent in any given area. This habitat type is most common on gravel bars. It lacks a well-established tree canopy and is dominated by low shrubs, two of which are 10 feet in height. Common and characteristic plant species in this habitat type include mugwort (*Artemisia douglasiana*), coyote bush (*Baccharis pilularis*), blackberry, mule fat (*Baccharis viminea*), and sweet fennel (*Foeniculum vulgare*). The most extensive stands of this habitat type occur in the middle river section (subunit 2) above Garland Park.

The remaining habitat types are scattered throughout the river valley to a much smaller degree. Dry washes and barren gravel bars represent areas that have recently been scoured by the river, and all that has developed is low herbaceous growth. There are numerous examples of this habitat type in the river bed areas. Emergent vegetation occurs in and along the shallow borders of deep pools with permanent surface water. Typical plant species include sedges (*Carex* spp.), rushes (*Juncus* spp.), bulrush, and cat-tail (*Typha* spp.). At those points where the river bed is closest to the valley walls, the mixed evergreen forest-riparian type, similar to the upper river area, occurs. Remnants of this type also occur on the upper alluvial terraces. Along some small stretches of the river corridor, the native vegetation has been removed and replaced with ruderal (weedy) or nonnative vegetation. Eucalyptus groves, grass-covered banks and new rip-rap areas are examples of this habitat type.

As noted above, the riparian vegetation on the Carmel River has been suffering from a combination of factors and events, of which the most studied and analyzed are the effects of groundwater pumping. Throughout the lower and middle sections of the Carmel River, where stream flow is intermittent, the riparian vegetation must rely on groundwater for growth and survival during the dry season. The degree to which groundwater pumping depresses the water table (resulting in stresses upon the vegetation dependent upon this water) is influenced by several interrelated biological and physical site factors. However, a recent study concluded that groundwater pumping in portions of the Carmel Valley has severely stressed riparian vegetation and contributed to the loss of this community in portions of the middle and lower sections.[10]

The middle section of the Carmel River runs from Esquiline Road (Rosie's) Bridge to the Narrows (see Figure 9-1). A simulated plant stress model indicated that current levels of groundwater pumping during extremely dry years (such as 1989 and 1990) would result in severe physiological stress on 3.5 acres of riparian vegetation immediately upstream of the Narrows. Pumping would also place significant stress upon the riparian trees near the Los Laureles Wells.[11] In fact, in 1989 and 1990, relatively minor pumping from the Los Laureles Wells resulted in severe stress and death of willows and alders located in the channel bottom between and upstream of these wells.

The upper portion of the lower section (subunit 3, see Figure 9-1) is the reach of the Carmel River with the most groundwater pumping (resulting in greater than 80 percent of the total aquifer production in normal years), and an extensive section of riparian woodland has been lost in that area as well. In response to the stress on the existing riparian vegetation, MPWMD has initiated irrigation of riparian vegetation from the Scarlett Wells to the Carmel Area Wastewater District treatment plant west of Highway 1 to sustain the riparian vegetation in the lower river section. Studies have indicated that available soil water near several of the major production wells in the lower river section was typically exhausted to a depth of ten feet or more before the end of August; in addition, pumping from wells in the lower river section have resulted in signs of stress on the nearby riparian vegetation.[12]

Under current groundwater pumping levels, it is estimated that approximately 59 percent of the existing riparian vegetation in this reach of the Carmel River would suffer severe stress due to lack of water in normal water years. Nearly all vegetation would suffer in critically dry years.[13] The expected loss of riparian vegetation would be greater at the San Carlos well site, where the existing riparian vegetation is most extensive relative to other areas in this reach of the river. The existing riparian vegetation is described as "limited, discontinuous, and degraded" in the areas of the older wells.[14] The loss of riparian species often results in the invasion of more drought-tolerant and non-riparian plant species. This has occurred to some extent at the Cypress and Pearce Wells where pines and cypress line the upper banks.

The lower portion of the lower river section (subunit 4, see Figure 9-1) has one Cal-Am production well, located near the upstream end of Rancho Cañada golf course. According to the plant stress model, the greatest stress would occur in the reach between the Rancho Cañada and San Carlos

Wells. Pumping would affect 22 percent of the riparian vegetation in normal years, and 27 to 32 percent in critically dry years of varying severity.

It is evident from the discussion that the existing riparian vegetation in the Carmel River Valley is but a remnant of what used to be there as recently as 1960, and that the threat of greater losses due to groundwater pumping occurs in the lower sections from the Narrows to the lagoon.

Carmel River Lagoon

There is a brackish water marshland at the river mouth. This marshland is within the Carmel River State Beach and is proposed to be designated as a natural preserve. The marsh vegetation is composed of five distinct zones: California tule (*Scirpus californicus*), pickleweed mosaic, silverweed-rush (*Potentilla-Juncus*), highground transition, and riparian.[15]

The California tule zone is composed of virtually pure stands of this brackish water plant rooted in the seasonally inundated muds along the banks of the river channel and sloughs. This vegetation zone is a key element of the marsh community because of the large area it covers and its value as a food and cover plant for wildlife.

The pickleweed mosaic is a complex of saltwater marsh species that dominate the low-lying areas between the California tule and the somewhat higher silverweed-rush community. This community is believed to be a product of alkaline buildup in the soils due to less freshwater flushing. The habitats nearer the river channel are flushed more often with fresh water flows in the river, thereby diluting the alkalinity of these habitats. The dominant plant species typically associated with saltmarsh communities and found in the marsh were jaumea (*Jaumea carnosa*), saltgrass (*Distichlis spicata* var. *spicata*), pickleweed (*Salicornia virginica*), and fat hen (*Atriplex patula*).

The silverweed-rush zone occurs in the higher reaches of the marsh. The silverweed (*Potentilla egedii* var. *grandis*) carpets large areas of the marsh. Wire grass (*Juncus balticus*) and spike rush (*Eleochris macrostachya*) also dominate areas in the marsh.

The upland habitats within the marsh are limited in extent and are dominated by blackberry thickets, coyote brush (*Baccharis* sp.), and ice plant (*Carpobrotus* sp.). These upland areas may be areas where fill was placed at some point in the past. At the east end where the river channel enters the marsh, the channel is lined with willow and acacia shrubs.

The lagoon habitat has been degraded over the past decades as described in Chapter 7, Section 7.1.1.

9.1.2 WILDLIFE

In addition to surveys performed in 1989, wildlife resources at the proposed project alternative sites were assessed during more than 25 days of field surveys as follows:

> 24,000 New Los Padres Reservoir (24 NLP) Inundation and Construction Sites: May 28-29, 1989, May 28 - June 3 and August 31 - September 1, 1992 [Survey Days = 10];
>
> Cañada Reservoir Inundation Area: May 14, 17, 18 and 29, August 13, 19-20, 26-27, 31 and September 1, 1990 [Total Survey Days = 11];
>
> 3 DSL (Sand City) Desalination Facility and Pipeline Routes: October 30 and July 6-7, 1991 [Total Survey Days = 3], and
>
> 7 DSL (Monterey Regional Water Pollution Control Agency (MRWPCA)) Desalination Facility and Pipeline Routes: July 22, 1992 [Total Survey Days = 1].

During these efforts, each site was carefully examined on foot and, where appropriate, by vehicle to determine the types, quality and extent of suitable wildlife habitats and to identify as many wildlife species as possible. A literature search was used to generate a list of all wildlife species that could reasonably be expected to occur on the sites.[16] This list, all species positively identified during the field surveys, and the scientific names of all animals referred to in this section are presented as Appendix 9-B.

New Los Padres Reservoir Site

General Field Surveys. The information presented below represents a summary of the findings of a detailed Wildlife and Habitat Monitoring Report prepared on this site.[17] This report includes extensive and detailed studies designed to evaluate wildlife habitat values over the annual cycle and for a number of years. This long-range monitoring program is expected to provide baseline information on wildlife populations and the diversity of species in various habitats included within the study areas as well as the gain or loss of wildlife habitat values which result from the proposed project.

Wildlife resources for the New Los Padres alternative were assessed during 10 days of intensive surveys of all areas to be inundated by the proposed 24,000 AF reservoir as well as the roadways, bridges, warehouse, materials and equipment storage areas, concrete batching plant, fish passage facilities and material borrow areas required for construction of the new dam. Most wildlife species were identified during extensive daytime searches on foot throughout the study areas, during nighttime spotlight searches from a slowly moving vehicle or during a series of time-constrained bird surveys along fixed 2000-foot transects in selected habitats.

Small Mammal Live Trapping. In addition to general field observations, live traps were set in habitats near the Carmel River below the existing Los Padres Dam and in the proposed inundation and construction areas to obtain information on small mammal species and population levels. Small mammals were trapped using 200 standard, 3"x3"x9" Sherman-type, metal, live traps baited with crushed walnuts and provided with cotton nesting material. Traps were set where field signs indicated a maximum opportunity for captures. Care was taken to place traps in shaded and sheltered locations to minimize captive trap stress.

Trap lines were set in selected upland and riverine habitats to sample as wide a range of mammal species as possible. Each trap was "flagged" with orange plastic strips tied to nearby vegetation for easy identification. No traps were lost during the surveys to predation, though a number were disturbed by raccoon and other foraging predators.

Trap lines were operated for three consecutive nights to provide a total of 600 trap-nights of trapping effort. One trap set for one night equals a trap-night. They were examined early each morning. Captives were identified or standard measurements were taken, where necessary, for later identification using published keys to small mammal taxonomy.[18] Captives were marked for later identification if recaptured and released immediately at the site of capture. Sixty eight percent of captives were recaptured one or more times indicating good survivability following the trapping procedures. A summary of trapping results is provided in Appendix 9-J.

Six species of rodents were trapped in upland habitats away from the Carmel River near the Los Padres Dam. These included two typically upland species, the California pocket mouse and western harvest mouse. Four species of rodents were captured along the northern shore of the reservoir in oak-riparian habitat. Overall capture rates were very good, ranging from 9.2 to 17.5 percent. The capture rate for the riparian trap line was slightly lower than those for the upland habitats.

Based on prior experience, these trapping results show small mammal populations in all of the sampled habitats to be healthy and with expected numbers and diversity. They probably reflect the near peak, spring levels typical of the seasonally cyclic, population growth patterns observed among rodents in most California habitats.

Results. Studies in and around the proposed New Los Padres Reservoir yielded a total of 97 wildlife species, including 6 amphibians, 5 reptiles, 24 mammals, and 62 birds recorded using all sampling techniques during 10 days of surveys. Additional, reliably reported amphibian (3) and reptile (8) species were added to this list for a total wildlife inventory number of 108. These additional species were identified by other reliable biologists who had surveyed the area at different times of the year or under different survey protocols.[19] A list of species is provided as Appendix 9-B.

With the exception of the riparian habitats available along the Carmel River above and below the Los Padres Reservoir, wildlife habitats in this narrow, steep canyon occur in mosaic patterns of various vegetation types dependant on slope, soil type and physical aspect for their definition. Oak woodland occupies canyon bottoms and northwest-facing slopes. Coastal chaparral occurs on southwest slopes and some small areas of grassland occur occupy clearings and flats. This intermixing of habitat types provides a great deal of "edge effect" and permits a rich assemblage of wildlife to occupy the area. The permanent water supply of the reservoir and its tributary streams further enhances wildlife values.

Because of its increasing rarity in California and its high wildlife value, the most important wildlife habitat in the area is the narrow riparian corridor along the Carmel River. The willow/alder-dominated, sand bar riparian areas above the reservoir show the successional changes associated with natural scouring and channel movements that occur each year during flooding episodes. Young trees sprouting on shifting gravel bars and the vegetation that grows on newly deposited silt and sand provide rich food sources for a wide variety of animals dependent upon moist, micro-habitats.

Indicative of the quality of wetland and riparian wildlife habitats above the reservoir was the presence of the American bittern, yellow warbler, water ouzel (dipper) and song sparrow, all species generally found in good-quality riparian habitats. The high wildlife value of this aquatic habitat is further evidenced by the presence of a healthy population of the red-legged frogs along the river. This increasingly rare native amphibian is particularly sensitive to habitat degradations and disturbance. It is easily displaced by the Bullfrog, which usually causes wildlife habitat values to decline when it is introduced into native California aquatic habitats. Bullfrogs have not yet found their way into this reach of the Carmel River, though good numbers of them have been seen below the Los Padres Dam.

In contrast to the habitats above the reservoir, the more picturesque riparian corridor immediately below the dam is dominated by mature alder, willow, bay and sycamore trees. This portion of the river lacks many of the healthy signs of change and successional vegetation growth present above the reservoir. Since the flow of water along this reach of the river is regulated by the Los Padres Dam the vegetation tends to be more mature, the river banks more heavily vegetated, the aquatic habitats heavily silted and because of nearly complete shading by the dense canopy, there is low productivity among aquatic organisms. There is very little emergent vegetation in or near the shaded stream bed. No reptiles or amphibians were observed in this reach of the Carmel River, and few birds, except the water ouzel (dipper) and black phoebe, associated primarily with riparian habitats were seen. Bullfrogs were present in the quiet pools just below the dam during surveys in 1989 but were not found in 1992.

The rich mixture of coastal scrub and mixed evergreen woodlands that covers the walls of the surrounding steep canyon, however, provides a very diverse assemblage of wildlife habitats. Developments below the dam for access roads, pipelines and equipment storage areas have removed some wildlife habitat. However, limitations imposed on human access into the area and the resultant lack of disturbance have permitted the continued existence of an excellent assemblage of wildlife in this canyon. The availability of a perennial water source further enhances the wildlife values of the upland habitats.

Cañada Reservoir Site

The information presented below represents a summary of the findings of a report prepared on this site by a separate consultant.[20] Field surveys were conducted in the reservoir inundation area, along the pipeline route, and at the pumping station site on May 14, 17, 18 and 29, 1990. Nineteen mammal, seven reptile, one amphibian, and 75 bird species were identified during the field survey efforts (Appendix 9-B).

The wildlife habitat classification system used for this site was developed for the California Wildlife Habitat Relationships Program.[21] Correspondence between the vegetation classification and wildlife habitats is shown in Table 9-1. Table 9-2 shows the extent of each wildlife habitat type in the Cañada Reservoir Project study area and inundation zone. Much of the wildlife habitat in and surrounding the inundation area is severely degraded by sheep grazing.

Closed-Cone Pine-Cypress (CPC). Monterey pine is the dominant overstory species in the closed-cone pine-cypress habitat in the study area. The structure of this type varies from an all but fairly simple two-layer structure to a complex multilayer composition in the west and northwest portions of the project area. In addition to the diverse vegetation, these areas also contain many standing dead trees (snags) and large organic material (logs), which are very important to maintaining a diversity of wildlife species. The broad ecotones created at the interface of closed-cone pine-cypress, coastal oak woodland, and coastal scrub appear to have a particularly diverse species composition and abundance. In contrast with other habitats in this region, Monterey pine provides tall and presumably secure locations for large nesting birds.

Coastal Oak Woodland (COW). Coastal oak woodland is widespread in the project area. Structure of this habitat varies from widely scattered trees with an open canopy to thick herbaceous ground cover and rich woody shrub midstory. Intensive livestock management practices have noticeably altered the understory vegetation by removing biomass, changing growth form, simplifying plant species composition, and suppressing reproduction. This symptom is most evident on the Eastwood property. The larger canyons support a greater diversity of tree species. To many species of wildlife, these sites are functionally similar to riparian habitat and should be considered sensitive.

Coastal Scrub (CSC). Coastal scrub is the second most abundant habitat in the project area, and the dominant type within the inundation zone. To a large extent, this habitat consists of low- to moderately-sized shrubs with dense canopy cover and dense understory cover of annual grasses and forbs. Although this habitat appears to be structurally homogeneous, there seems to be a great deal of variation among stands.

TABLE 9-1

CORRESPONDENCE BETWEEN VEGETATION CLASSIFICATION AND WILDLIFE HABITAT CLASSIFICATION[1,2]

Vegetation Type	Wildlife Habitat
Monterey pine forest	Closed-cone pine-cypress (CPC)
Monterey pine-coast live oak forest	Closed-cone pine-cypress (CPC)
Coast live oak forest	Coastal oak woodland (COW)
Buckeye woodland[3]	Coastal oak woodland (COW)
Coastal scrub	Coastal scrub (CSC)
Coastal scrub-live oak	Coastal scrub (CSC)
Chaparral	Mixed chaparral (MCH)
Coastal prairie	Perennial grassland (PGS)
Coastal prairie-coastal scrub	Perennial grassland (PGS)
Riparian forest	Valley foothill riparian (VRI)
Pond	Freshwater emergent wetland (FEW)
Disturbed grassland	Annual grassland (AGS)
Old dwelling sites	Annual grassland (AGS)
Farmland	Cropland (CRP)

1 Holland, 1986.
2 Mayer and Laudenslayer, 1988.
3 Not recognized in Holland, 1986.

Source: BioSystems Analysis, Inc., 1991.

TABLE 9-2

EXTENT OF WILDLIFE HABITATS
IN THE CAÑADA RESERVOIR STUDY AREA

Wildlife Habitat	Area of Habitat (Acres)	
	Study Area	Inundation Area[1]
Closed-cone pine-cypress (CPC)	477.6	56.6
Coastal oak woodland (COW)	160.5	46.5
Coastal scrub (CSC)	415.6	88.7
Mixed chaparral (MCH)	11.2	0.0
Valley foothill riparian (VRI)	4.4	0.7
Perennial grassland (PGS)	56.6	0.0
Annual grassland (AGS)	18.0	7.5
Freshwater emergent wetland (FEW)	<0.1	0.0
Cropland (CRP)	45.2	0.0
TOTAL	1,189.2	200.2

[1] Estimates for 15,000 AF reservoir based on 1991 analysis of 25,000 AF reservoir.

Source: BioSystems Analysis, Inc., 1991.

Mixed Chaparral (MCH). Several small areas of mixed chaparral occur along the ridge on the western boundary of the project area. While no wildlife species are restricted to mixed chaparral habitat, it does provide many important wildlife forage plants such as *Ceanothus* spp., *Adenostoma fasciculatum*, and *Arctostaphylos* spp.

Valley Foothill Riparian (VRI). The only riparian habitat found within the inundation area are two narrow stringers of willows, each about 200 feet long. The willow stands are located near an old sediment basin, the northeast arm of the reservoir (Figure 9-3). Both sites are fairly homogeneous, but they add considerable spatial diversity to the surrounding areas. Only two small sites of open water were found near the stand of willows. These water holes appeared to have been dug with a backhoe; however, recognizing that there has been a drought for the past several years, we would expect to find more water in years with "normal" rainfall. Well-developed valley foothill riparian habitat is restricted to the area adjacent to the Carmel River.

Perennial Grassland (PGS). Perennial grassland primarily occurs along the ridgetops in the northern portion of the project area. Vertical structure of this habitat is typically low. However, horizontal diversity appears quite high, perhaps caused by local differences in soils. Perennial grasslands provide suitable habitat for many wildlife species.

Annual Grassland (AGS). Annual grassland habitat is scattered throughout the project area. Many of these areas have resulted from some form of disturbance (clearing brush and trees, livestock grazing, etc.). Physical structure of this habitat is dominated by low-growing forbs and grasses.

Freshwater Emergent Wetland (FEW). Freshwater emergent wetland is represented by one small catchment pond outside of the inundation zone, along the north-central portion of the project area boundary. This and several other similar areas located in the perennial grasslands appear to be man-made livestock impoundments. These sites provide wildlife with important food, cover and water resources. Although small, they greatly increase the value and influence wildlife species composition in surrounding habitats.

Cropland (CRP). Cropland habitat occurs south of Carmel Valley Road to the Carmel River. Vegetation structure of this area is simple but changes with the growing season. This location is regularly disturbed by human activities. Cultivated and ruderal plants periodically provide important food resources for many wildlife species.

General Wildlife Species. Black-tailed deer and California quail appeared to be very abundant in the study area. During late summer it was not unusual to note several coveys of 100+ quail and a few dozen deer within an hour's field observation. Dozens of striped skunk, several coyote, raccoons, opossums, domestic dogs and cats, two gray foxes, and one bobcat were sighted during spotlighting. The most abundant mammal observed in grassland habitats was the California ground squirrel. In the coastal live oak forest the dusky footed woodrat appeared to be very numerous. Feral pigs were observed several times, but were restricted to the vicinity of the open water where they had established a mud wallow. The presence of mountain lions was noted on three occasions. One solitary cat was flushed from the understory in Monterey pine habitat; the skeleton of a male mountain lion was found near the pig wallow; and a freshly killed, partially eaten deer fawn was located at the pond (freshwater emergent wetland) on the boundary of the property.

3 MGD (Sand City) Desalination Facility

This 3-million-gallon-per-day desalination facility would be located at the intersection of Catalina and Elder Streets in the western portion of Sand City in a completely urbanized and industrially developed setting. Vegetation on the site is ruderal or weedy, typical of urban/industrial locations. With the exception of the roadbed embankment for Highway 1, and a small vacant lot directly east of the proposed facility, all wildlife habitats have been eliminated for industrial development and roadways. Wildlife observed during the field survey of this area consisted of domestic pigeons, Brewer's blackbirds, house finches, European starlings, Botta's pocket gophers and western fence lizards, all species adapted for living in urban situations. A list of species found is provided in Appendix 9-B.

Some habitat remains, especially along the roadway embankment for Highway 1, which could be used by the California black legless lizard. None of the beach scrub vegetation required by Smith's blue butterfly is present anywhere in this area and none of this species would be expected.

Raw Water Collection Sites and Transmission Corridors. As presently proposed, water for desalination will be supplied from radial wells (Ranney collectors). These will be installed subsurface near the selected desalination facility site west of the Sand City site or west of the MRWPCA Treatment Plant site northeast of the City of Marina. Several possible locations have been suggested for the placement of these raw water collection installations. Each was examined on foot for its wildlife components.

The proposed sites are all located in disturbed remnants of the original Monterey Bay dunes habitat which extends from the mouth of Monterey Harbor to just beyond the mouth of the Salinas River. Historic disruptions of this delicate habitat type at each of the sites have resulted from extensive sand mining, illegal refuse disposal and the roadways needed for these activities as well as for beach access for recreation.

The marine littoral zone and narrow beach strand, under which the Ranney collectors would be located provide resting and foraging habitat for a wide variety of shorebirds and waterfowl. Among those observed during field surveys were marbled godwits, sanderlings, long-billed dowitchers, and western, California and Heermann's gulls. Brown pelicans, double-crested cormorants, and surf scooters are typical of the large numbers of marine waterfowl which were observed resting or foraging just off shore.

Seasonal variation in the numbers of birds and the species utilizing these habitats is great. Habitats in this region are probably most important during the winter. Most wintering species move away for reproduction. However, a few shore-associated birds do nest along the California coast. Most notable of these in this region is the snowy plover, a Species of Special Concern in California (CSC) and a federally Proposed Threatened species (FPT) by the U.S. Fish and Wildlife Service. The status of this species is discussed more fully under Special Status Species (Section 9.1.3).

The lack of trees or shrubbery in beach dune habitats minimizes the use of these areas by upland birds. Small numbers of house finches, Brewer's and red-winged blackbirds, western meadowlarks and horned larks were observed on and near these sites. Other upland species of interest observed in this dune habitat included Say's phoebe, loggerhead shrike, American kestrel and merlin. This latter species is considered a CSC by the Department of Fish and Game and its status is more fully discussed in Section 9.1.3.

The beach dunes provide little in the way of habitats for mammals except for species uniquely adapted for life in this system of constantly shifting sand. A few burrowing rodents such as the California ground squirrel, Botta's pocket gopher, norway rat and house mouse and the surface dwelling black-tailed jackrabbit are commonly observed components of the dunes ecosystem. Evidence was found to indicate the use of the area for foraging by the gray fox and coyote which feed upon rodents, marine birds and carrion washed onto the beaches.

In some areas beach dunes do provide habitats suitable for the existence of the Smith's blue butterfly (*Euphilotes enoptes smithi*), listed as a federally Endangered species, and the California black legless lizard, a Candidate (C2) for federal listing and a State CSC species. These species have been the subject of intense interest and study in the Monterey area and are discussed in more detail in Section 9.1.3.[22,23]

Some low quality wildlife habitat which could be occupied by the California black legless lizard remains, especially along the roadbed embankment for Highway 101 and the frontage road. None of the beach scrub vegetation required by Smith's blue butterfly is present anywhere west of the Sand City site and individuals of this species would not be expected to occur there.

Product Water Transmission Corridors. Whether for the collection of sea water for treatment or for the distribution of the product water, construction of the pipe lines probably represents the greatest potential for disruption of wildlife habitats presented by the proposed desalination sites. Approximate corridors through which these pipelines must be laid were identified and carefully surveyed for their wildlife and habitat values.

Proposed product water distribution pipeline routes along roadways were driven slowly to search for habitats which might be potentially useful to or were probably occupied by wildlife species. Particular attention was given to waterway crossings at bridges, roadside ditches or canals and to any remnants of natural vegetation such as woodlands, shrublands or wetlands which might be impacted by the proposed project. When such areas were encountered they were examined on foot and all wildlife observed or identified through artifacts such as tracks, scats, burrows or other definitive signs were noted.

As presently designed, product water from the Sand City desalination facility would be delivered directly to existing pipelines within the urban area. No disruptions of wildlife habitats would be anticipated from the construction of pipelines within this setting.

4 MGD (Monterey Regional Water Pollution Control Agency (MRWPCA)) Desalination Facility

This 4-million-gallon-per-day desalination facility would be constructed on a nine acre parcel owned by the Monterey Regional Water Pollution Control Agency (MRWPCA), as shown in Figure 4-17. The site has been cleared of vegetation through frequent disking and provides only minimal values for wildlife. The almost square shaped site is delineated on all sides by a two-lane, paved roadway. Monterey cyprus and eucalyptus trees have been planted along the perimeter fence and along some roadways to provide protection from onshore winds. Buildings which house the water treatment facility are clustered together along the east side of the site.

The trees on this site attract a variety of birds for roosting, foraging and possibly nesting and provide the only important wildlife values in the area. Red-tailed hawks, turkey vultures, common bushtits, red-winged and brewer's blackbirds, white-crowned sparrows and european starlings were among the species observed. California ground squirrels, black-tailed jackrabbits, botta's pocket gophers and several species of small rodents were found where disking has not been practiced recently and some herbaceous or shrubby ground cover is available. Feral house cats were seen and gray fox scat was found at several locations along the roadways.

Because the soils at this site are sandy and friable they could provide habitat for the California black legless lizard. While this species is primarily known to occupy areas along the coastal beach dunes, isolated records and populations are known to occur at a number of inland locations.[24] The location of the MRWPCA site, only two miles inland from the preferred dunes habitat, indicates the need for systematic searches for this species prior to any further development on the site.

Raw Water Collection Sites and Transmission Corridors. Construction of the desalination facility on the MRWPCA site would require an intake pipeline to bring raw water for treatment inland from the collection source on the shore, a distance of approximately two miles and a product water delivery connection to Del Monte Road. The alignment of these two pipelines will follow within the same narrow corridor.

The raw water intake line will be constructed through distinctly different wildlife communities, the sensitive beach dunes habitats west of Highway 1 and the urbanized areas through the city of Marina and the mostly open, grazed, gently rolling grasslands east of Highway 1. The product water line would follow the same alignment east of Highway 1 to deliver water from the MRWPCA site to the distribution pipeline at Del Monte Road.

In order to minimize disturbances to the sensitive dunes habitats, the raw water intake lines would follow existing access roadways through the dunes area eastward to Dunes Drive. They would then be collected into a single line and pass northward in the paved portion of Dunes Drive to the Marina city boundary and from there under Highway 1.

The segment of this pipeline extending from Highway 1 to the MRWPCA site, would be constructed mostly through open grasslands. Remnants of coastal sage scrub, usually less than an acre in size and heavily damaged by grazing, are all that remain of any native vegetative communities along this route. Wildlife values of this and the surrounding grasslands have been greatly reduced by grazing. Red-tailed hawks, horned larks, barn and cliff swallows, American pipits, loggerhead shrikes, house finches, grasshopper sparrows and California ground squirrels were among the species observed in this area.

Soils along the route through which this segment of the proposed pipeline would be constructed are sandy and friable and would provide suitable conditions for the existence of the California black legless lizard. The probability of encountering this species would increase in sections of this pipeline nearest the beach dunes.

Product Water Transmission Corridors. Most of the proposed pipelines for this alternative would be constructed within existing transportation corridors along roadways, railways and through urban settings where little damage to wildlife habitats would be expected. Additionally, much of the area through which the desalination product water pipeline system would be constructed, lies within agriculturally developed lands where most wildlife habitats have been eliminated.

That portion of the proposed pipeline route included in a general category of habitats with low wildlife values extends southwesterly from the MRWPCA Waste Water Treatment Plant Site to Del Monte Road and then southward along Del Monte Road and into the Fort Ord Reservation just west of Highway 1 near the city of Marina. Wildlife observed along this route included birds such as

American crows, European starlings, blackbirds and house finches which are adapted to foraging in agricultural lands and urban settings. Developments along this route have probably removed most mammal and reptile species though some small mammals may still be found.

Segments of the product water transmission corridor which could be characterized as containing habitats with relatively high wildlife values extend along the southern boundary of Fort Ord to Seaside. This segment follows the Southern Pacific Railway right-of-way, paralleling approximately 60 feet west of the railroad tracks on the west side. Near the outskirts of Seaside it would follow the eastern edge of a private access road where it would cross under Highway 1 and into the city.

Although wildlife habitats along this segment of the route have been greatly disturbed for these transportation corridors and their maintenance, a certain amount of protection from disturbance has been afforded them because of their location within the military reservation. Wildlife observed along this route included the red-tailed hawk, American kestrel, black phoebe, rough-winged swallow, northern mockingbird, western meadowlark, red-winged blackbird and California ground squirrel.

Again, as with other areas in the beach dunes, habitats along this segment of the pipeline route may provide for the existence of the Smith's blue butterfly, a federally Endangered species, and the California black legless lizard, a Candidate (C2) for federal listing and a State CSC. These species are discussed in more detail in Section 9.1.3.[25,26]

9.1.3 SPECIAL STATUS SPECIES

Pursuant to Section 7 (Consultation Procedures) of the Federal Endangered Species Act, the following actions were completed. The MPWMD requested from the USFWS a list of endangered species that could potentially be affected by the proposed New San Clemente Dam project in 1986 and all the remaining project alternatives except Cañada Reservoir in 1989. An updated list was provided on June 12, 1991. (An updated 1993 species list is currently being requested from the Service.) The USFWS identified five endangered, threatened or candidate plant and animal species in response to the 1986 request, 10 additional species in the 1989 response that are known to occur or might occur in the project area and four additional candidate species (Category C2 and C3) in the 1991 response (see Appendix 9-D). In addition to these lists provided by the USFWS, the California Department of Fish and Game provided the MPWMD with a letter in 1983 with additional species of concern (see Appendix 9-D). Prior to conducting the actual field surveys, a number of literature sources were used to generate a working list of sensitive plant and animal species with potential to occur in the project region. The lists of sensitive wildlife and plant species generated from these literature sources are presented in Tables 9-3 and 9-4.

All wildlife and plant field surveys were directed toward identifying the presence of any special-status species or any other sensitive species. Species-specific surveys at selected sites and habitats were conducted for those species considered to have the greatest potential of occurring at any of the sites. A series of meetings and written communications with the USFWS established suitable survey methods and scope of efforts for the least Bell's vireo on the Carmel River, the Smith's blue butterfly at the Alternative Reservoir and Desalination facility sites, and for the spotted owl at the Cañada Reservoir site. The results of the specific surveys for these endangered wildlife species are presented in Appendix 9-C.

This EIR/EIS and the reports in Appendix 9-C are intended to function as the Biological Assessment for these species and have been submitted to the Endangered Species Office of the USFWS in compliance with Section 7 of the Endangered Species Act. The Corps of Engineers will help to facilitate implementation of the Section 7 process. Please refer to Tables 9-3 and 9-4, and Appendix 9-C for more details on all categories of sensitive species which could possible occur in the project region. The following is a brief discussion of those State or federally listed sensitive animal and/or plant species which were recorded on Alternative Reservoir or Desalination facility sites or those with a high potential for occurrence on any of these sites.

Wildlife

Northern Harrier (*Circus cyaneus*). This raptor typically nests in open habitats associated with marshes. It is a ground nesting bird which, because of its propensity to nest in open fields, experiences high rates of nest loss when alfalfa or other crops are mowed or harvested. Suitable nesting habitat was minimal at all the reservoir sites. This bird was observed at the Cañada Reservoir site during field surveys in May of 1990. An adult male was recorded as it foraged over recently harvested artichoke fields west of Highway 101 near Carmel Lagoon in surveys related to this project in May 1992.

Black-Shouldered Kite (*Elanus caerule*). This small raptor prefers rolling foothills and margins of valleys with river bottomlands or marshes. This species was sighted at the Cañada Reservoir study

TABLE 9-3

ENDANGERED, THREATENED, OR CANDIDATE WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT REGION[1]

MAMMALS

Plecotus townsendii townsendii[2]

Pacific Western Big-eared Bat

STATUS: C2/-/CSC

HABITAT: Mesic habitats in all but subalpine and alpine regions. Needs water. Gleans from brush or trees along habitat edges. Small moths are the principal food of this species.

NOTES: Roosting habitat in caves, mines and tunnels, buildings or other man-made structures is available throughout the Carmel Valley. Intensive, timely searches would be necessary to positively identify the presence of this species on the project sites.

Antrozous pallidus[2]

Pallid Bat

STATUS: -/-/CSC

HABITAT: An uncommon resident in the coast ranges from Monterey County southward. Occurs in many open semi-arid to arid habitats including conifer and deciduous woodland, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and residential-park habitats. Prefers rocky outcrops, cliffs and crevices with access to open habitats for foraging.

NOTES: Roosting habitat in caves, mines and tunnels, buildings or other man-made structures is available throughout the Carmel Valley. Intensive, timely searches would be necessary to positively identify the presence of this species on the project sites.

Eumops perotis californicus[2]

Greater Western Mastiff Bat

STATUS: C2/-/CSC

HABITAT: Crevices in cliff faces, high buildings, trees and tunnels are required for roosting. Occurs in many open semi-arid to arid habitats including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub and residential-parklands.

NOTES: Roosting habitat in caves, mines and tunnels, buildings or other man-made structures is available throughout the Carmel Valley. Intensive, timely searches would be necessary to positively identify the presence of this species on the project sites.

Reithrodontomys megalotis distichlis

Salinas Harvest Mouse

STATUS: -/-/*

HABITAT: Occurs in both fresh and brackish water wetlands and marshes and probably in the adjacent uplands around the mouth of the Salinas River.

NOTES: The nearest and most recent recorded occurrence of this rare subspecies was at Fort Ord, 3.5 miles east of Marina in 1937. None of this subspecies has ever been recorded outside of the Salinas River.

TABLE 9-3 (continued)

Taxidea taxus[2]

American Badger

STATUS: -/-/CSC

HABITAT: This an uncommon permanent resident found throughout the State except in the north coastal region. It typically occupies a wide variety of habitats but requires friable soils for burrowing.

NOTES: While this species probably inhabited the deep soils of the Carmel Valley, its habit of digging large, deep burrows in its search for rodents and pocket gophers has probably led to its extermination by agriculturalists. No sign of this animal was found during surveys for this report.

BIRDS

Pelecanus occidentalis californicus

California Brown Pelican

STATUS: E/E/- (Nesting Colony)

HABITAT: Found in estuarine, marine subtidal and marine pelagic water along the California coast. Usually rests on water or inaccessible rocks but also uses mudflats, sandy beaches, wharfs and jetties. Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Feeds almost entirely on fish.

NOTES: Known to nest on Bird Island just off Point Lobos (USFWS 1983). Young have not been observed at that site since 1959. Observed feeding along Monterey Bay shore during surveys for this report.

Phalacrocorax auritus

Double-crested Cormorant

STATUS: -/-/CSC (rookery site); ABL 1972-81; SC 1982

HABITAT: Yearlong resident along the California coast and on inland lakes, in fresh, salt and estuarine waters. Requires undisturbed nest sites beside water on islands or the mainland. Feeds mainly on fish.

NOTES: Observed during field surveys for this report along the Monterey Bay shore.

Botaurus lentiginosus[2]

American Bittern

STATUS: -/-/ABL 1976-86

HABITAT: Rare transient and local winter resident in fresh emergent wetlands primarily west of the Sierra Nevada. Feeds in tall, fresh or saline emergent wetlands, shallow water lakes, backwaters of rivers or estuaries and adjacent shores. Diet includes insects, amphibians, fish, crayfish, small mammals, snakes and birds.

NOTES: This species recorded in the emergent wetlands near the mouth of the Carmel River as it enters into Los Padres Reservoir during surveys for this report.

TABLE 9-3 (continued)

Ardea herodias[2]

Great Blue Heron

STATUS: -/-/* (Rookery Site); ABL 1980-81; SC 1986

HABITAT: Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.

Rookery sites in close proximity to foraging areas such as marshes, lake margins, tide-flats, rivers and streams, wet meadows.

NOTES: Observed in estuarian and aquatic habitats along the Carmel River and its Lagoon and on the Cañada site during surveys for this report.

Casmerodius albus[2]

Great Egret

STATUS: -/-/*

HABITAT: Feeds in shallow water and along shores of estuaries, lakes, ditches, and slow-moving streams, salt ponds, mudflats and in irrigated croplands and pastures. Eats mainly fishes, amphibians, snakes, snails crustaceans and some small mammals. Nests in large trees at a height of 20-40 feet, usually near water.

NOTES: Recorded as a migrant near Garland Ranch at Rosie's Bridge on the Carmel River in May, 1987.(Roberson) Recorded in suitable aquatic habitats in the Cañada site during surveys for this report.

Circus cyaneus[2]

Northern Harrier

STATUS: -/-/CSC, (Breeding); ABL 1972-86

HABITAT: Open areas such as meadows, rangeland, desert sinks and especially fresh and saltwater marshes. Ground nesting species which experiences high nest losses in agricultural settings when alfalfa or other crops are tilled.

NOTES: Observed on the Cañada site during field surveys for this report.

Buteo lineatus[2]

Red-shouldered Hawk

STATUS: -/-/ABL 1972-86

HABITAT: Year-long resident in the western Sierra Nevada foothills and the Central Valley in low elevation riparian woodlands especially where interspersed with marshlands.

Forages and nests in early successional stages of valley-foothill hardwood and conifer habitats.

NOTES: Observed at several locations along the Carmel River below Los Padres Dam and in the Los Padres Reservoir area during field surveys for this report.

Elanus caerulea[2]

Black-shouldered Kite

STATUS: -/-/* (Breeding)

HABITAT: Low rolling foothills and valley margins with scattered oaks and river bottomlands or marshes adjacent to deciduous woodland. Open grasslands, meadows or marshes for foraging close to isolated, dense-topped trees for nesting and perching.

NOTES: Known to have nested in Monterey pines near Carmel in 1965. Observed foraging in open agricultural land near the mouth of the Carmel River during field surveys. None of this species recorded at the Los Padres Dam or Cañada sites.

TABLE 9-3 (continued)

Accipiter striatus[2]
Sharp-shinned Hawk
STATUS: -/-/CSC (Breeding); ABL 1972-86
HABITAT: All types of vegetation. Uses mixed-conifer, ponderosa pine and black oak. Prefers, but is not restricted to riparian habitats. North facing slopes with plucking perches are critical.
NOTES: Species observed hunting in the riparian woodland along the Carmel River west of Highway 1 and the western shore of the Los Padres Reservoir during surveys for this report.

Accipiter cooperi[2]
Cooper's Hawk
STATUS: -/-/CSC (Breeding); ABL 1972-81, 1986; SC 1982
HABITAT: Dense stands of live oak, riparian deciduous or other forest habitats near water. Principal diet items are small birds.
NOTES: Habitat of the type required by species is available along the Carmel River riparian corridor and adjacent oak woodlands. Observed foraging near Roberts Lake, Sand City during EIP field surveys in 1988. None observed during current survey efforts for this report.

Aquila chrysaetos[2]
Golden Eagle
STATUS: -/-/CSC (Breeding/Wintering)
HABITAT: Uncommon permanent resident and migrant throughout California except the Central Valley. Rolling foothills, coast range terrain, sage juniper flats or desert habitats chiefly in the upper Sonoran and transition life zones.
NOTES: An adult observed of the Quail Lodge golf course on May 19, 1987. (Roberson) None of this species recorded during the current studies.

Haliaeetus leucocephalus[2]
Bald Eagle
STATUS: E/E/- (Breeding/Wintering)
HABITAT: Ocean shorelines, lake margins, and river courses for both nesting and wintering. Usually nests within one mile of water in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.
NOTES: The presence of large impoundments of water, such as the Los Padres Reservoir, in the region which could supply areas for foraging and nesting, this wide ranging species should be considered a possible rare visitant to the Carmel Valley. None were recorded during surveys in 1987 or during the present study.

Falco peregrinus anatum[2]
American Peregrine Falcon
STATUS: E/E/-
HABITAT: Rare breeding and winter residents. Nesting sites known along the California coast north from Santa Barbara. Riparian areas and coastal and inland marshes are important habitats year-round but especially for foraging during nonbreeding seasons.
NOTES: Because of the sensitivity of th CDFG to the problem of nest disturbance of this highly prized falcon specific locational information has been suppressed in the CNDDB. None of this species was identified during surveys for this report.

TABLE 9-3 (continued)

Falco mexicanus[2]
Prairie Falcon
STATUS: -/-/CSC
HABITAT: Inhabits dry, open terrain which is either level or hilly. Breeding sites are located on cliffs. Forages far afield, even utilizing marshlands and ocean shores. Preys on a wide variety of small birds.
NOTES: Nests are known to be present in the Ventana Cones area and Big Sur as recently as 1979. Because of the sensitivity of the CDFG to the problem of nest disturbance of this highly prized falcon specific locational information has been suppressed in the CNDDB. None of this species was identified during surveys for this report.

Falco columbaris[2]
Merlin
STATUS: -/-/CSC, ABL 1972-81, SC 1982-86
HABITAT: Coastlines, open savannah, grasslands, woodlands, lakes and marshes usually in edge and early successional stages.
NOTES: A rare migrant which overwinters in California from September to May. Observed during field surveys for this report in the beach dunes area west of Marina in October 1991. This wintering bird was foraging in the area proposed for the installation of the raw water intake Ranney Collectors for desalination. None recorded at other project sites during surveys for this report.

Rallus longirostris obsoletus
California Clapper Rail
STATUS: E/E/ABL 1972, SC 1986
HABITAT: Saltwater marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds out from cover on mollusks obtained from mud-bottomed sloughs.
NOTES: Nearest population known to exist at Elkhorn Slough. Suitable habitat does not exist on the proposed project sites. Transient birds might temporarily utilize marginal areas in the Carmel River Lagoon. None were observed during this study.

Larus californicus
California Gull
STATUS: -/-/CSC (Nesting Colony)
HABITAT: Winter visitant to coastal and interior lowlands during the nonbreeding season. Omnivorous. Adults roost in large concentrations along shorelines, in landfills, pastures and on islands.
NOTES: Species observed along coast, at Moro Coho Slough (EIP field surveys in 1991) and in the Carmel Valley during surveys for this report. No nesting sites known from any of the proposed project sites.

TABLE 9-3 (continued)

Charadrius alexandrinus nivosus[2]

Western Snowy Plover

STATUS: PT/-/CSC (Breeding); ABL 1972-82, SC 1986

HABITAT: Prefers wide, flat, dry sand above ordinary wash of the tide on ocean beaches; inland, shores of salt or alkaline lakes. Eggs are laid in areas strewn with shells, pebbles, and various bits of debris, providing camouflage for eggs and young.

NOTES: Reports from numerous locations along the coast from Marina Dunes to the Pajaro River. Nesting pair with 3 eggs observed on beach near southern boundary of Fort Ord during EIP field surveys. Information reported in CNDDB, 1988. Suitable breeding habitat is available in the beach dunes areas associated with the proposed desalination alternative sites included in this project.

Athene cunicularia[2]

Burrowing Owl

STATUS: -/-/CSC (Burrow Sites); ABL 1972-1981, SC 1982, 1986

HABITAT: Found in open, dry, nearly or quite level, grassland; prairie; desert floor.

Subterranean nester, dependent upon large burrowing mammals, most notably, the California ground squirrel.

NOTES: Known to occur along Dolan Road north of Castroville and east of Moss Landing. None of this species recorded during surveys for this report.

Strix occidentalis occidentalis

California (Southern) Spotted Owl

STATUS: -/-/*

HABITAT: Generally found in densely forested, shady canyons and dense conifer and/or oak forest usually multilayered and with a high degree of canopy closure. Nests sites are usually located on lower slopes of canyons near a source of water. Hunts from elevated perches. Prey items include small mammals, birds and insects.

NOTES: No spotted owls were found during surveys conducted in the Cañada Valley between August 13 and September 1, 1990. Limited habitat for this species may exist near the Los Padres Reservoir.

Asio flammeus

Short-eared Owl

STATUS: -/-/CSC (Breeding); ABL 1976-1986

HABITAT: Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches and tall grass needed for nesting and daytime seclusion. Nests on dry ground in depression concealed in vegetation.

NOTES: Nearest reported nests from near the mouth of the Salinas River.

TABLE 9-3 (continued)

Cypseloides niger
Black Swift
STATUS: -/-/CSC (Breeding)
HABITAT: Rare, local summer resident of mountain foothill canyons. Nests in small colonies on cliffs or adjacent to waterfalls in deep canyons and on sea bluffs above the surf. Lays a single egg per season in May. Forages widely for insects.
NOTES: Known to occur and nest in the coastal belt of mountains of Santa Cruz and Monterey Counties. Several pairs observed nesting during the summer of 1981 at Pfeiffer-Big Sur State Park.

Progne subis[2]
Purple Martin
STATUS: -/-/CSC (Breeding); ABL 1975-81; SC 1982-86.
HABITAT: Uncommon to rare local summer resident in a variety of wooded, low-elevation habitats usually near water. Inhabits open forests, woodlands, and riparian areas during breeding.
NOTES: A single individual of this species was observed foraging with a flock of violet-green swallows above Los Padres Reservoir during surveys for this report in May 1992.

Riparia riparia
Bank Swallow
STATUS: -/T/- (Nesting Colony)
HABITAT: Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks or cliffs with fine-textured to sandy soils near streams, rivers, lakes, ocean to dig nesting hole.
NOTES: Reported from the mouth of the Pajaro River and from near Moss Landing. Suitable nesting habitats may be present somewhere in the Carmel River corridor. No individuals or their nesting sites were observed during this survey.

Lanius ludovicianus[2]
Loggerhead Shrike
STATUS: -/-/ABL 1972-86
HABITAT: Year-round residents of lowlands and foothills throughout much of California. Prefers open habitats with scattered shrubs, trees, fences, or other lookout posts. Highest densities occur in open-canopied, valley-foothill hardwood, hardwood-conifer and riparian habitats. Feeds on insects, small birds, mammals and reptiles but amphibians, fish, carrion and various invertebrates are also taken.
NOTES: Observed in dunes area west of Marina during field surveys October 30, 1991. None of this species observed during the present study or surveys conducted along the Carmel River in 1987 by Roberson. Recorded on the Cañada project site (Biosystems, 1991).

Sialia mexicana[2]
Western Bluebird
STATUS: -/-/ABL 1972, 1978-81, SC 1986
HABITAT: Year-round resident throughout much of California. Breed in open woodlands of oaks, riparian deciduous trees or conifers with herbaceous understories. Feed on insects which they capture in the air or on the ground from perches.
NOTES: Recorded near Los Padres Dam during surveys for this report.

TABLE 9-3 (continued)

Vireo bellii pusillus
Least Bell's Vireo
STATUS: E/E/ (Breeding); ABL 1972-82; SC 1986
HABITAT: Bell's vireos were formerly common and widespread summer residents below about 2000 feet west of the Sierra Nevada, throughout the Sacramento and San Joaquin Valleys and in the coastal valleys and foothills from southern Santa Clara County southward. Requires dense, low riparian growth of valley bottoms for breeding.
NOTES: Habitats of the type required by this species are present along the Carmel River and some of its tributaries. The nearest historic breeding area was on the Salinas River in southern Monterey County. The Carmel River is believed to be out of the range of this rare bird. None of this species was found during surveys conducted along the Carmel River in 1987 (Roberson).

Dendroica petechia[2]
Yellow Warbler
STATUS: -/-/CSC (Breeding); ABL 1973-82; SC 1986
HABITAT: Breeding resident in riparian woodlands of northern California from coastal regions to 8,000 feet in the Sierra Nevada.Usually found in riparian deciduous habitats in summer among cottonwoods, willows, alders and other small trees and shrubs typical of low open canopy riparian woodland.
NOTES: A riparian specialist which has been impacted statewide by habitat destruction and parasitism by cowbirds. Populations on the lower Carmel River were considered healthy and suggested a comparatively healthy ecosystem in the riparian corridor in surveys by Roberson in 1987. Isolated individuals were observed during EIP surveys in the Chupínes Creek area in 1989 and in the Carmel River riparian corridor during current surveys for this report.

Agelaius tricolor[2]
Tricolored Blackbird
STATUS: C2/-/- (Nesting Colony)
HABITAT: Year-round residents throughout the Central Valley and coastal districts of California. They breed near fresh water, preferably in fresh emergent wetland with dense, tall cattails or tules, but also in thickets of willows, blackberry, wild rose and tall herbs. Forages on cultivated land, edges of water grown to dense emergent vegetation.
NOTES: Limited habitat of the type required by this species is present along the Carmel River riparian corridor. None of this species was observed during surveys for this report.

AMPHIBIANS

Ambystoma tigrinum californiense[2]
California Tiger Salamander
STATUS: C2/-/CSC
HABITAT: Annual grass habitat, also in grassy understory of valley-foothill hardwood habitats; uncommonly along stream courses. Breed and lay eggs in vernal pools. Open grassland habitats at elevations of less than 1,000 feet Requires large numbers of rodent burrows and other subterranean refugia. Aquatic larvae seek cover in turbid water or clumps of vegetation; juveniles and adults utilize small mammal burrows.

TABLE 9-3 (continued)

NOTES: Museum specimens were collected from Tularcitos Ridge on Cachagua Grade approximately 7 miles southeast of Robles Del Rio in 1953. Several additional specimens were collected between 1958 and 1963 at Rancho Tularcitos, approximately 6 miles southeast of Carmel Valley.

Rana boylei[2]

Foothill Yellow-legged Frog

STATUS: -/-/CSC

HABITAT: Found in or near rocky streams in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types. Rarely encountered far from permanent water.

NOTES: None of this species was found along the Carmel River below San Clemente Reservoir during surveys for this report. A single tadpole was identified near the mouth of the Carmel River at its entrance into Los Padres Reservoir in 1989. No adults or other larvae have been found anywhere in the Carmel River or its tributaries during subsequent surveys for this report. The earlier inclusion of this species in the known biota of the project area may have resulted from a taxonomic error.

Rana aurora draytoni[2]

California Red-legged Frog

STATUS: C1/-/CSC

HABITAT: Quiet pools of streams, marshes, and occasionally ponds, usually below 4000 feet. Highly aquatic; prefers shorelines with extensive vegetation. Usually escapes to water 3 feet deep or more. Red-legged frogs are generally absent from ponds and streams occupied by bullfrogs (*Rana catesbeiana*) which prey upon them.

Notes: Aquatic habitats all along the Carmel River and its tributaries support scattered local populations of this species which were identified and recorded during this study. Reproducing populations of this frog occur in the lateral ponded areas along the Carmel River upstream of the Los Padres Reservoir.

REPTILES

Clemmys marmorata marmorata[2]

Western Pond Turtle

STATUS: C2/-/CSC

HABITAT: Preferred habitats include ponds, marshes, rivers, streams and irrigation ditches with rocky or muddy bottoms. Food is mainly aquatic plants, insects, and carrion. Watercress, cattails and lilies are used for cover.

NOTES: Habitats of the type required by this species are available throughout the Carmel River drainage. Reproducing populations of this turtle were identified in the Carmel River and Los Padres Reservoir during surveys for this report.

TABLE 9-3 (continued)

Phrynosoma coronatum frontale[2]

Coast Horned Lizard

STATUS: -/-/CSC

HABITAT: Uncommon to common in suitable habitats. Occurs in valley-foothill hardwood, conifer, riparian habitats, pine-cypress, juniper and annual grassland habitats. They forage on the ground in open areas, usually between shrubs and often near ant nests.

NOTES: None of this species was recorded anywhere along the Carmel River below San Clemente Reservoir, however, because of their reliance on camouflage for protection and their tendency to remain motionless when approached, they are exceedingly difficult to find. Juveniles of this species were found above San Clemente Reservoir on upper San Clemente Creek during 1989 surveys for this report.

Anniella pulchra nigra[2]

Black Legless Lizard

STATUS: C2/-/CSC

HABITAT: Sand dunes and sandy soils in the Monterey Bay and Morro Bay regions.

Inhabits sandy soil and dunes areas with bush lupine and mock heather as dominant plants.

NOTES: Known to inhabit coastal dunes habitats along Monterey Bay from north of the Salinas River into Santa Cruz County. Precise location information is suppressed. Specimens observed northwest of Sand City during EIP field surveys in 1988.

BUTTERFLIES AND MOTHS

Danaus plexippus[2]

Monarch Butterfly

STATUS: -/-/* (wintering sites)

HABITAT: Winter roosts extend along the coast from northern Mendocino county to Baja California. Roosts are located in wind-protected tree groves (blue gum, Monterey pine, and Monterey cypress), with nectar and water sources nearby.

NOTES: Nearest known roost is at the Lester Rountree Memorial Arboretum on Hatton Drive just above Carmel Art Institute in Carmel. Habitat at this location is native *Pinus radiatia* forest. This is one of the very few roosting sites located on the Monterey Peninsula but with usually less than 20 monarchs observed in only a few trees it is considered a minor site. Occasional individuals of this species were seen during surveys for this study at a number of locations along the Carmel River.

TABLE 9-3 (continued)

Euphilotes enoptes smithi[2]

Smith's Blue Butterfly

STATUS: E/-/-

HABITAT: Coastal sand dunes of Monterey County and inland dunes of Santa Cruz County. Host plant is *Eriogonum latifolium* and *E. parvifolium*. These species are used by both adults and larvae.

NOTES: Occurs in suitable habitats from near Monterey to the Salinas River. Known recently from the Fort Ord Military Reservation near Highway 1, the beach dunes near Marina and the Monterey "Sand Hills" near Seaside (Arnold 1977). Known to occur also in chaparral-woodland habitats near the Vasquez Knob Colony, 3 miles west of Carmel Valley Village (Arnold, 1978) and in chaparral covered cliffs near Carmel Valley Village (USFWS, 1984)

---

[1] = Sources:

Arnold, R. A., 1978. *Survey and Status of Six Endangered Butterflies in California.* California Department of Fish and Game, Inland Fisheries Branch report. 95 pp.

BioSystems Analysis, Inc. 1991. *Cañada Reservoir Project Biological Assessment*, Prepared for the Monterey Peninsula Water Management District, February.

----------------, 1990. *Cañada Reservoir Spotted Owl Surveys Results*, October 22, Letter Report.

California Natural Diversity Data Base (CNDDB). 1992. Computer printout for nine surrounding 7.5 minute quadrangle USGS maps in the project region (Spreckels, Seaside, Monterey, Rana Creek, Carmel Valley, Mt. Carmel, Chews Ridge, Ventana Cones, Big Sur). July 14.

California Department of Fish and Game, 1978. *Bird Species of Special Concern in California*, No. 78-1 (June).

________________, 1986. *Mammalian Species of Special Concern in California*, Report 86-1. June.

________________, 1991. *Special Animals List.* August.

Roberson, D. and R. Roberson, 1987. *Carmel River Bird Survey*, Prepared for the Monterey Peninsula Water Management District and EIP Associates.

The Audubon Society, 1986. *Blue List and the List of Species of Special Concern*, American Birds, vol. 40(2):227-236. Summer.

[2] = Habitat and/or resources required for reproduction and/or maintenance present within project boundaries.

STATUS = Federal/State/Other (CNPS R-E-D codes)

Federal Status Codes [Federal Endangered Species Act of 1973, as amended]

TABLE 9-3 (continued)

E	=	Listed as endangered
T	=	Listed as threatened
PE	=	Proposed endangered
PT	=	Proposed threatened
C1	=	Candidate for listing and enough data is on file to support federal listing
C2	=	Candidate for listing but threat or distribution data is insufficient to support listing at this time
C3a	=	Extinct
C3b	=	Taxonomically invalid
C3c	=	Too widespread or not threatened

State of California Status Codes [California Endangered Species Act (1984), Native Plant Protection Act (1977) and the California Environmental Quality Act (CEQA)]

E	=	Endangered
T	=	Threatened
R	=	Rare
C	=	Candidate for listing

Other Status Codes [Section 15380 of the California Environmental Quality Act [CEQA (September, 1983)] has a discussion regarding non-listed (State) taxa. This section states that a plant (or animal) must be treated as Rare or Endangered even if it is not officially listed as such. If a person (or organization) provides information showing that a taxa meets the State's definitions and criteria, then the taxa should be treated as such in an EIR.]

ABL = Audubon Society Blue List of birds of special concern

CFP = A California Department of Fish and Game "fully protected" species, as described in Section 4700 of Chapter 8, Section 5050 of Chapter 2, Division 6, Chapter 1, Section 5515.

CSC = California Department of Fish and Game "Species of Special Concern"

FSS = Bureau of Land Management and U.S. Forest "Sensitive Species"

* = Taxa listed with an asterisk fall into one or more of the following categories:
- Taxa considered endangered or rare under Section 15380(d) of CEQA guidelines.
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range.
- Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation in California.
- Taxa closely associated with habitat that is declining in California (e.g. wetlands, riparian, old growth forest, desert aquatic systems, native grasslands.)

The California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants (1985).

List 1 = Plants of Highest Priority.
List 1A = Plants presumed Extinct in California.
List 1B = Plants Rare or Endangered in California and elsewhere.
List 2 = Plants Rare or Endangered in California, more common elsewhere.
List 3 = Plants for which more information is needed.
List 4 = Plants of limited distribution (a watch list).

TABLE 9-4

ENDANGERED, THREATENED, OR CANDIDATE PLANT SPECIES KNOWN TO OCCUR IN THE PROJECT REGION[1]

Allium hickmanii [Amaryllidaceae]
Hickman's Onion
STATUS: C1-//List 1B Habit: perennial
HABITAT: Closed-Cone Forest, Chaparral, Valley Grassland
COUNTIES: MNT, SLO
BLOOM TIME: April
NOTES: Known from fewer than 20 occurrences. Not found on any of the alternative sites.

Arctostaphylos hookeri ssp. *hookeri* [Ericaceae]
Hooker's Manzanita
STATUS: -/-/List 3 Habit: shrub
HABITAT: Closed-Cone Forest, Chaparral & Coastal Scrub (sand dunes & woods)
COUNTIES: MNT, SCR
BLOOM TIME: February to April
NOTES: Not found on any of the alternative sites.

Arctostaphylos hooveri [Ericaceae]
Hoover's Manzanita
STATUS: [2] -/-/List 4 Habit: shrub
HABITAT: Chaparral
COUNTIES: Monterey (MNT), San Luis Obispo (SLO)
BLOOM TIME: January to March
NOTES: Most often associated with stands of *Pinus ponderosa* at elevations greater than 1,300 feet. Suitable habitat for this plant was not found at any of the alternative reservoir sites. All the *Arctostaphylos* plants found in the alternative sites were identified except for one at the New Los Padres site. A check of this plant in January of 1990 was inconclusive.

Arctostaphylos montereyensis [Ericaceae]
Toro Manzanita
STATUS: C2/-/List 1B Habit: shrub
HABITAT: Chaparral, Coastal Scrub, Foothill Woodland
COUNTIES: MNT, SLO
BLOOM TIME: March to April
NOTES: This plant is typically associated with Pleistocene sand dunes, a habitat type not found at any of the alternative reservoir sites.

Arctostaphylos pumila [Ericaceae]
Sandmat Manzanita
Synonym: *Arctostaphylos uva-ursi* ssp. *pumila*
STATUS: C2/-/List 1B Habit: shrub
HABITAT: Closed-Cone Forest, Chaparral, Coastal Scrub (coastal dunes)
COUNTIES: MNT

TABLE 9-4 (Continued)

BLOOM TIME: February to April
NOTES: Known historically from Fort Ord and the Seaside/Marina area.

Ceanothus rigidus [Rhamnaceae]
Monterey Ceanothus
STATUS: C2//List 4 Habit: shrub
HABITAT: Closed-Cone Forest & Coastal Scrub (sandy hills & flats)
COUNTIES: MNT, SCR
BLOOM TIME: February to April
NOTES: Not found on any of the alternative sites.

Centrostegia vortriedei [Polygonaceae]
Vortriede's Spineflower
STATUS: -/-/List 4 Habit: annual
HABITAT: Foothill Woodland (dry places)
COUNTIES: MNT, SLO
BLOOM TIME: June to September
NOTES: Suitable habitat for this plant consists of sandy and/or chalky soils on dry sites within Woodland communities. Although suitable habitat for this plant occurs at all of the alternative sites, it was not found during the surveys conducted during its blooming season.

Chorizanthe douglasii [Polygonaceae]
Douglas' Spineflower
STATUS: -/-/List 4 Habit: annual
HABITAT: Foothill Woodland, Conifer Forest (sandy or gravelly slopes), below 5,000 ft.
COUNTIES: MNT, SLO, San Benito (SBT)
BLOOM TIME: April to July
NOTES: See text.

Chorizanthe pungens var. *pungens* [Polygonaceae]
Monterey Spineflower
STATUS: PE/-/List 1B Habitat: annual
HABITAT: Coastal Dunes
COUNTIES: ALA, MNT, SCR
BLOOM TIME: April to June
NOTES: Known from the dunes between Seaside and Marina.

Chorizanthe robusta [Polygonaceae]
Robust Spineflower
STATUS: PE/-/List 4 Habit: annual
HABITAT: Coastal Scrub, Coastal Strand, below 1000 ft.
COUNTIES: ALA, MNT, SCR, SMT
BLOOM TIME: May to September
NOTES: Not found on any of the alternative sites.

TABLE 9-4 (Continued)

Clarkia lewisii [Onagraceae]
Lewis' Clarkia
STATUS: -/-/List 4 Habit: annual
HABITAT: Coastal Scrub
COUNTIES: MNT
BLOOM TIME: May to July
NOTES: See text.

Cordylanthus rigidus ssp. *littoralis* [Scrophulariaceae]
Seaside Bird's-beak
Synonym: *Cordylanthus littoralis*
STATUS: C1/E/List 1B Habit: annual
HABITAT: Chaparral, Closed-Cone Forest, Coastal Scrub (sandy soil)
COUNTIES: MNT, SBA
BLOOM TIME: July to September
NOTES: Reported historically from sand hills between Seaside and Marina.

Cupressus macrocarpa [Cupressaceae]
Monterey Cypress
STATUS: C2/-/List 1B Habit: tree
HABITAT: Closed-Cone Forest (exposed headlands)
COUNTIES: MNT
BLOOM TIME:
NOTES: Known from only 2 native occurrences in the Monterey area. Not found on any of the alternative sites.

Ericameria fasciculata [Asteraceae]
Eastwood's Ericameria
STATUS: C2/-/List 1B Habit: shrub
HABITAT: Closed-Cone Forest, Chaparral, Coastal Scrub
COUNTIES: MNT
BLOOM TIME: July to October
NOTES: See text.

Eriogonum nortonii [Polygonaceae]
Pinnacles Buckwheat
STATUS: C3c/-/List 1B Habit: annual
HABITAT: Chaparral, Valley Grassland (dry rocky slopes, often after fire), 1,500-4,000 ft.
COUNTIES: MNT, SBT
BLOOM TIME: March to May
NOTES: Not found on any alternative.

Erysimum ammorphilum [Brassicaceae]
Coast Wallflower
STATUS: C2/-/List 4 Habitat: biennial
HABITAT: Coastal Dunes

TABLE 9-4 (Continued)

COUNTIES: MNT, SCR, SDG
BLOOM TIME: February to May
NOTES: Known from Monterey Bay but not found on any alternative sites.

Erysimum menziesii [Brassicaceae]
Menzies' Wallflower
STATUS: C1/E/List 1B   Habitat: biennial
HABITAT: Coastal Strand (sand dunes)
COUNTIES: HVM, MEN, MNT
BLOOM TIME: March to June
NOTES: Known from the dunes between Seaside and the Salinas River.

Fritillaria falcata [Liliaceae]
Talus Fritillary
STATUS: C2/-/List 1B   Habit: perennial
HABITAT: Chaparral, Foothill Woodland, & Conifer Forest (serpentine talus), 1,000-3,000 ft.
COUNTIES: MNT, SBT, Alameda (ALA), Santa Clara (SCL), Stanislaus (STA)
BLOOM TIME: March to May
NOTES: See text.

Fritillaria liliacea [Liliaceae]
Fragrant Fritillary
STATUS: C2/-/List 1B   Habitat: annual
HABITAT: Coastal Scrub, Grassland (often serpentine)
COUNTIES: Widespread in Coast Range counties
BLOOM TIME: February to April
NOTES: Not found on any alternative sites

Galium californicum ssp. *luciense* [Rubiaceae]
Cone Peak Bedstraw
STATUS: C2/-/List 1B   Habit: perennial
HABITAT: Mixed Evergreen Forest, Conifer Forest
COUNTIES: MNT
BLOOM TIME: March to July
NOTES: An endemic plant of Monterey County. Suitable habitat consists of Mixed Evergreen and Coniferous Forests above 3,500 feet. Suitable habitat does not occur at any of the alternative sites, and it was not found during the field surveys.

Galium clementis [Rubiaceae]
Santa Lucia Bedstraw
STATUS: C3c/-/List 4   Habit: perennial
HABITAT: Conifer Forest (dry rocky places), 3,200-5,800 ft.
COUNTIES: MNT
BLOOM TIME: June to July
NOTES: Suitable habitat for this plant does not occur at any of the alternative sites, and it was not found during the field surveys.

TABLE 9-4 (Continued)

Gilia tenuiflora ssp. *arenaria* [Polemoniaceae]
Sand Gilia
STATUS: C1/T/List 1B Habitat: annual
HABITAT: Coastal Scrub, Coastal Strand
COUNTIES: MNT
BLOOM TIME: April to May
NOTES: Known from the dunes between Seaside and Marina.

Horkelia cuneata ssp. *sericea* [Rosaceae]
Wedge-leaved Horkelia
STATUS: C2/-/List 1B Habit: perennial
HABITAT: Coastal Scrub & Closed-Cone Forest (sandy & gravelly places)
COUNTIES: ALA, MRN, MNT, SBA, SCR, SFO, SLO SMT
BLOOM TIME: April to September
NOTES: Not found on any of the alternative sites.

Juglans hindsii [Juglandaceae]
Northern California Black Walnut
STATUS: C2/-/List 1B Habit: tree
HABITAT: Riparian Forest, Riparian Woodland
COUNTIES: Napa (NAP), Contra Costa (CCA), Sacramento (SAC)
BLOOM TIME: April to May
NOTES: Planted specimens were found in the New San Clemente site but are not considered sensitive because these trees were introduced into the area and do not represent native populations.

Lomatium parvifolium [Apiaceae]
Small-leaved Lomatium
STATUS: /-/List 4 Habit: perennial
HABITAT: Closed-Cone Forest, Maritime Chaparral
COUNTIES: MNT, SCR, SLO
BLOOM TIME: February to May
NOTES: Not found on any of the alternative sites.

Lupinus abramsii [Fabaceae]
Abram's Lupine
STATUS: -/-/List 3 Habit: perennial
HABITAT: Conifer Forest, Mixed Evergreen Forest (open woods), 2,000-5,000 ft.
COUNTIES: MNT, SLO
BLOOM TIME: May to June
NOTES: Not found on any alternative.

Lupinus cervinus [Fabaceae]
Santa Lucia Lupine
STATUS: C3c/-/List 4 Habit: perennial
HABITAT: Conifer Forest, Oak Woodland (dry places), 1,000-4,500 ft.

TABLE 9-4 (Continued)

COUNTIES: MNT, SLO
BLOOM TIME: May to June
NOTES: See text.

Malacothamnus abbottii [Malvaceae]
Abbott's Bush Mallow
STATUS: C2/-/List 1A Habit: shrub
HABITAT: Riparian Scrub
COUNTIES: MNT
BLOOM TIME: June to October
NOTES: Thought to be extinct, known only from the type collection along the Salinas River in 1889. Not found at any of the alternative sites.

Malacothamnus palmeri var. *involucratus* [Malvaceae]
Carmel Valley Bush Mallow
STATUS: C2/-/List 1b Habit: subshrub
HABITAT: Chaparral, Foothill Woodland
COUNTIES: MNT, SLO
BLOOM TIME: May to August
NOTES: See text.

Malacothamnus palmeri var. *lucianus* [Malvaceae]
Arroyo Seco Bush Mallow
STATUS: C2/-/List 1B Habit: subshrub
HABITAT: Chaparral, Mixed Evergreen Forest (especially after fires)
COUNTIES: MNT
BLOOM TIME: May to August
NOTES: Similar to *M. palmeri* var. *involucratus*. Not found on any of the alternative sites during the field surveys.

Malacothrix saxatilis var. *arachnoidea* [Asteraceae]
Carmel Valley Malacothrix
STATUS: C2/-/List 1B Habit: subshrub
HABITAT: Chaparral, Coastal Sage Scrub (Monterey shale substrate)
COUNTIES: MNT, SBA
BLOOM TIME: June to December
NOTES: Not found on any alternative.

Microseris decipiens [Asteraceae]
Santa Cruz Microseris
STATUS: C2/-/List 1B Habit: annual
HABITAT: Coastal Prairie, Valley Grassland, Mixed Evergreen Forest, Closed-Cone Forest & Chaparral
COUNTIES: MNT, MRN, SCR
BLOOM TIME: April to May
NOTES: Known from the Seaside area.

TABLE 9-4 (Continued)

Monardella undulata var. *undulata* [Lamiaceae]
Curly-leaved Monardella
STATUS: -/-/List 4 Habit: perennial
HABITAT: Chaparral, Coastal Scrub, Coastal Dunes
COUNTIES: MNT, MRN, SBA, SCR, SLO, SMT, SON
BLOOM TIME: May to July
NOTES: Not found on any of the alternative sites.

Pinus radiata [Pinaceae]
Monterey Pine
STATUS: -/-/List 4 Habit: tree
HABITAT: Closed-Cone Forest
COUNTIES: MNT, SLO, Santa Cruz (SCR), San Mateo (SMT)
BLOOM TIME: April
NOTES: Native stands occur in the Cañada Reservoir site.

Quercus lobata [Fagaceae]
Valley Oak, California White Oak
STATUS: -/-/List 4 Habit: tree
HABITAT: Oak Woodland (valley bottoms & slopes), Riparian Forest, below 2,000 ft.
COUNTIES: Widespread
BLOOM TIME: February to April
NOTES: See text.

Raillardella muirii [Asteraceae]
Muir's Raillardella
STATUS: C3c/-/List 1B Habit: perennial
HABITAT: Conifer Forest, Chaparral (open slopes) 4,000-7,000 ft.
COUNTIES: MNT, Fresno (FRE), Kern (KRN), Tulare (TUL)
BLOOM TIME: July
NOTES: Known from Ventana Cones. Not found at any of the alternative reservoir sites during the field surveys.

Ribes divaricatum var. *publiflorum* [Grossulariaceae]
Straggly Gooseberry
STATUS: -/-/List 4 Habit: shrub
HABITAT: Mixed Evergreen Forest, North Coast Conifer Forest
COUNTIES: Widespread
BLOOM TIME: February to May
NOTES: See Text.

TABLE 9-4 (Continued)

Ribes sericeum [Grossulariaceae]
Santa Lucia Gooseberry
STATUS: -/-/List 4 Habit: shrub
HABITAT: Redwood Forest, Oak Woodland, Mixed Evergreen Forest (along streams), below 1,000 ft.
COUNTIES: MNT, SLO
BLOOM TIME: February to April
NOTES: See text.

---

[1]Sources:

California Natural Diversity Data Base (CNDDB). Computer printout for the following USGS 7.5-minute quadrangle maps: Chualar, Spreckels, Seaside, Rana Creek, Carmel Valley, Mt. Carmel, Chews Ridge, Ventana Cones and Big Sur, June 10, 1989, and Moss Landing, Marina, and Seaside July 8, 1991.

See Appendix 9-D.

Biosystems Analysis, Inc., February 1991.

See Table 9-3 for complete list of STATUS definitions.

area during field surveys in May of 1990. An adult bird was recorded while foraging over recently harvested artichoke fields west of Highway 101 near Carmel Lagoon in surveys related to this project in May 1992.

Sharp-Shinned Hawk (*Accipiter striatus*). This hawk prefers to nest in dense stands of conifers usually near water. An adult was observed near the San Clemente Reservoir and a male and female were observed below the dam during 1989 surveys related to this project. Adult birds were also observed in the dense oak woodlands along the upper northern shores of the Los Padres Reservoir and in the Carmel River riparian corridor immediately inland from the Carmel Lagoon. Because of their use of very dense woodland habitats for hunting and nesting, it is likely that these scattered sightings indicate a much wider distribution and higher population level for this species throughout the Carmel River drainage system.

Golden Eagle (*Aquila chrysaetos*). This large raptor is a fully protected species in California. It is unlawful to take this bird or destroy its nesting sites without a special permit from the California Department of Fish and Game. A nest was located in a Monterey pine tree outside the reservoir inundation area at the Cañada site. Two adults and two young fledglings were observed at this nest in 1989. However, no eagles were observed at this nest during a second visit in 1990.

Peregrine Falcon (*Falco peregrinus*). This bird is listed as Endangered by both the USFWS and the CDFG. It is a rare winter migrant and very rare breeder in Monterey County. This bird was once much more common in the Monterey area. Its numbers have decreased due to pesticide poisoning, shootings, and nest-robbing for falconry. A recent effort to protect known nests and a captive-bird release program has successfully reversed this downward trend. The historical and known existing nesting areas in Monterey County are along the coast and in wilderness areas, and do not include the Carmel River drainage.[27]

Peregrine falcons may occur throughout Monterey County but are most often seen in areas that have flocks of shorebirds or ducks. These birds typically breed near marshes, lakes, rivers or other water features, and on ledges or potholes on high cliffs with a commanding view. They will nest occasionally in tree hollows or in old raptor nests. Peregrine falcons have a cosmopolitan distribution pattern and occur in a wide variety of habitats.[28]

A male bird was observed in flight and perched on a large sycamore snag in the vicinity of the existing San Clemente Reservoir in 1985. An adult female was observed during surveys related to this report in early September 1992 as she hunted shore birds at the Carmel River Lagoon. These birds may were probably migrating or may have been wintering in the area. It is unlikely, although possible, that they breed somewhere in the area, though there are no suitably isolated cliff areas in the immediate vicinity of the reservoir or the lagoon.

Merlin (*Falco columbaris*). The merlin is a rare migrant which overwinters in California from September to May. Individual wintering birds remain in areas where prey is abundant. It is found in most of the western half of California below 3,900 feet in habitats such as coastlines, open savannah, grasslands, lakes and marshes. They feed primarily on small birds but also on small mammals and insects. They frequent shorelines in the winter where they prey on shorebirds. They search while flying rapidly at low altitude and attack with a short dive from above.

There are no records of merlins breeding in California. Breeding occurs in Alaska and Canada. There are no data on their establishment or defense of wintering territories but they are intraspecifically aggressive and will drive away potential avian predators, particularly competing accipiters, as soon as they enter their territory.

A merlin was observed on October 30, 1991 as it hunted along the beach dunes near the proposed raw water intake sites northwest of the city of Marina. It was carrying a small prey item believed to be a shorebird. Later, it was observed harassing a pair of American kestrels in what appeared to be an attempt to drive them from its winter foraging territory. Because of this territorial display it is probable this merlin was a winter resident of the beach and dunes area.

It would be expected that activities proposed for the construction of raw water intakes and pipelines in the beach dunes area could cause birds of this species to alter their hunting patterns and winter foraging territories. Displaced territories would probably be reestablished during subsequent winters.

Snowy Plover (*Charadrius alexandrinus nivosus*). During July and August snowy plovers migrate from northwest Oregon to as far as Baja California. They remain on wintering grounds from September through March. They can be found on sandy marine and estuarine shores where they glean insects and amphipods from the dry sand of upper beach slopes. When disturbed, adults as well as newly hatched chicks, crouch motionless on sandy substrates and rely on camouflage for concealment.

These secretive shore birds require sandy, gravelly or friable soil substrates for nesting. Nests are shallow depressions in the sand sometimes lined with small pebbles, glass fragments or gravel. They frequently locate nests near or under objects such as driftwood, rocks or defoliated bushes along the upper reaches of broad beach strands above high tide lines. Wherever they are left undisturbed in suitable habitats, such as those along the Monterey Bay shoreline, they flourish.

A nest of this species was located and photographed on the beach northwest of Sand City near the southern boundary of Fort Ord during surveys conducted be EIP in 1988.[29] The location and description of this nest site was submitted to the CNDDB.

The status of the western snowy plover has been recently changed to "Proposed Threatened" by the U.S. Fish and Wildlife Service. The nesting habitat of this small bird has been decimated by human disturbances especially the use of off-road vehicles, predation by introduced species such as the red fox and house cats, and increasing dense growths of European beachgrass.

It would be expected that activities proposed for the construction of raw water intakes and pipelines in the beach areas would cause birds of this species to alter their foraging and nesting patterns. Displaced birds may reestablish themselves on restored beach areas during subsequent seasons.

California Spotted Owl (*Strix occidentalis occidaentalis*). This owl is a resident of dense, old-growth forests and woodlands. The nearest active roosting/nesting sites are in the Chews Ridge-China Camp area and in Robinson Canyon. Don Roberson (noted birder of Monterey County) has visited the New Los Padres alternative site and reports that he is doubtful that this owl occurs there due to a limited amount of suitable habitat.[30] Mr. Roberson has never seen or recorded the spotted owl in bird surveys he has conducted in that area, however, he cautioned that he did not use taped calls of this owl during these survey efforts.

A total of four nocturnal surveys (approximately 22.5 hours) of the Cañada study area were conducted (see Appendix 9-C). These surveys were conducted on August 13, 19-20, 26-27, and 31, and September 1, 1990. The presence of owls was determined by eliciting vocal responses from owls to broadcasted tape recordings of spotted owl calls. Although most calling stations were located in the inundation area, several adjacent sites were also surveyed. No California spotted owls were located at the Cañada site, which is the only site where surveys were conducted using taped owl calls. Based on vegetation structure and topographic features, several portions of this project area appear to provide at least marginal habitat for the California spotted owl. The limited extent and fragmented pattern of forest stands on the site may, however, reduce the value of the Cañada site for this rare species.

Great-horned owls were found in almost all forested sections of the Cañada project area. Great-horned owls are known to be one of the few predators of spotted owls. While the two species do coexist, the abundance and wide spread distribution of great-horned owls in the proposed reservoir area also reduces the site's suitability for spotted owls.

Least Bell's Vireo (*Vireo bellii pusillus*). This small passerine bird is classified as endangered by the USFWS. It was once considered common to abundant in riparian ecosystems throughout much of California, but it is now limited to just 300 breeding pairs in California.[31] The decline of this bird is believed to be related to the loss of riparian habitat throughout the state and to increased parasitism by the brown-headed cowbird. There does not appear to be any published information indicating that this bird ever nested on the Carmel River.[32]

Least Bell's vireo was known to occur on the Salinas River in southern Monterey County in the first part of this century. Subsequent surveys in the 1970s did not locate the species; however, a small breeding population was rediscovered in the early 1980s around Bradley.[33] Because there appeared to be suitable habitat for the species on the Carmel River, and vagrant males have been sighted in the Monterey Peninsula area, a specific survey was conducted.[34] No least Bell's vireos were found during this survey effort. The best potential habitat for this rare bird occurs near and just downstream of the Cal-Am water filter plant along the Carmel River. The entire survey report is presented in Appendix 9-C.

Yellow Warbler (*Dendroica petechia*). This bird nests in riparian habitats dominated by willow trees. It was recorded at the Cañada (May 14) and New Los Padres (May 28) sites in 1989. Several birds were also observed in the dense willow riparian woodland bordering Garland Park on the Carmel River during August of 1992 during surveys related to this report. All of these areas included suitable nesting habitats for this bird and because of the timing of the sightings nesting was probably occurring in the areas of observation.

Red-Legged Frog (*Rana aurora draytoni*). This small frog inhabits quiet pools, streams, marshes and occasionally ponds in the coastal region of California. Populations have been declining throughout its range due to the loss of suitable habitat and predation by introduced exotic species, in particular the bullfrog (*Rana catesbeiana*). It is presently a federal candidate species, but could be proposed for listing prior to project implementation. Adults and larvae were observed in San Clemente Creek from just above San Clemente Reservoir upstream to the man-made pond on the Dormandy Ranch on July 2 and August 6, 1989. Additional sightings of this species are reported to occur along the Carmel River below the existing San Clemente Dam, downstream of Pine Creek and upstream of the Los Padres Dam in the Danish Creek area.[35] Good numbers of adults of this species were observed during surveys for this report in the Carmel River just above the Los Padres Reservoir. Vocalizations from this species were heard as several locations along the lower Carmel River but no adults or larvae were found during systematic searches. Populations of the bullfrog dominate most suitable habitat along the lower Carmel River drainage.

Foothill Yellow-Legged Frog (*Rana boylei*). This small frog is typically found in or near streams with a rocky bed. Populations of this species have been on the decline in California due to the loss of its preferred habitat. A single larvae of this species was reported in the upper reaches of the Los Padres Reservoir where the Carmel River enters the reservoir on May 27, 1989.

Careful searches for adults or larvae in the Carmel River and its tributary streams during surveys for this report were completely unsuccessful. It is now believed that original report may have resulted from an erroneous identification of the only tadpole found in 1989. The identification at that time was made as the tadpole lay in several inches of water in the reservoir. It was not collected in hand and thus a small red-legged frog tadpole may have been mistakenly identified as a yellow-legged tadpole.

Southwestern Pond Turtle (*Clemmys marmorata pallida*). This turtle prefers the quiet waters of ponds, small lakes and sluggish streams but may also be found in rivers, marshes and reservoirs. It is presently a federal candidate species, but could be proposed for listing prior to project implementation. Adult pond turtles were observed basking in a number of locations along the

Carmel River and in Los Padres Reservoir during surveys for this report. As many as 9 individuals, including small specimens less than 3-4 inches in length, were observed basking on logs near the entrance of the Carmel River into Los Padres Reservoir. Adults were observed in the body of the Reservoir itself.

Basking individuals of this species were recorded in the upper Carmel River above the San Clemente Reservoir on July 1, 1989. Dave Dettman (Fisheries Biologist) for the MPWMD reports seeing large concentrations of pond turtles in the Carmel River just upstream of the Narrows and in the Garland Park area. As many as three large adults were observed basking in the Carmel River just below Big Oak Flat and as many as nine basking turtles, including several young specimens were observed near the entrance of the Carmel River into Los Padres Reservoir during surveys for this report.

Coast Horned Lizard (*Phrynosoma coronatum frontale*). This lizard occupies a variety of habitat types in the Central Coast region. It is common in some areas and uncommon in others. It was recorded by EIP biologists along San Clemente Creek August 6, 1989. While none of this species was observed during surveys for this report, this secretive and elusive reptile is reported by many landowners along the Carmel River. A probable sighting was made along the Carmel River bank just below Big Oak Flat but the animal could not be found for positive identification.

Black Legless Lizard (*Anniella pulchra nigra*). The black form of the California legless lizard is about the size and shape of a pencil with a maximum length of nine inches. It has no external legs and the entire body is smooth, facilitating its burrowing lifestyle. This snake-like lizard has movable eyelids, a physical characteristic which snakes lack. Adults feed on small insects, larvae of insects, spiders, and other small food items. They are live-bearing, and one to four young (usually two) are born between September and November. Young and adults spend most of their time underground, but may rest just under the surface of the sand or leaf litter layer.

Habitat requirements for this lizard include relatively undisturbed areas of moist sand or sandy loam soils covered primarily with natural vegetation such as sagebrush, lupine and mock heather.[36,37] Most areas in the dune coastal scrub habitat, except those completely altered by sand mining, extensive off-road vehicle use, and the construction of buildings or roads, are considered suitable habitat. Dune areas along the Monterey coast may be critical habitat for this species.

Historically, the black legless lizard had a continuous distribution along coastal sand dunes from the Salinas River to the Carmel River. However, habitat has been greatly reduced and fragmented by human activities such as urban development, vegetation destruction through human trampling and off-road vehicle use, sand mining, and the introduction of ice plant. Paved roads, buildings, and areas of bare earth are absolute barriers to the movement of black legless lizards. Small areas of suitable substrate without habitat may also limit the presence of this species.

It is known to occur on both the RMC Lone Star and Granite Rock sites.[38] It is also known to be present in the immediate vicinity of the Carmel River Lagoon.[39] Specimens were found near the Tioga Avenue overpass of Highway 101 in Sand City during EIP surveys for this species in 1988. It would be expected that activities proposed for the construction of raw water intakes and pipelines in the beach dunes areas and perhaps in other more marginal inland areas around the proposed MRWPCA Desalination facility could disrupt habitats and result in the destruction of some individuals of this species.

Smith's Blue Butterfly (*Euphilotes enoptes smithii*). Smith's blue is a small lycaenid butterfly. The underside of the wing is pale grey speckled with black dots and there is a reddish-orange band on the hind-wing border. The upper side of the male's wing is a lustrous blue, whereas the female has a brown upper side with a band of orange bordering the hind wing. Larvae are slug-shaped and vary in color from cream to pale yellow or rose, changing according to the color of the flowerheads on which they are feeding.[40]

Smith's blue is found along the coastal dunes of Monterey County, where it has historically fed on the seacliff buckwheat, (*Eriogonum parvifolium*). After the construction of Highway 1, the introduction of African ice plant severely reduced seacliff buckwheat populations, prompting federal listing of the butterfly as an endangered species. The butterfly has since been documented on coast buckwheat (*Eriogonum latifolium*), which is widely distributed.[41] The location of colonies of the Smith's blue butterfly usually correspond to the distribution of buckwheat plants used by this species, although not all suitable habitats are occupied.[42] Almost all areas of the dunes that support buckwheat also support the butterfly, and populations of Smiths's blue are known to occur on the RMC Lone Star and Granite Rock sites.[43]

Because Smiths's blue depends on buckwheat throughout its life cycle (mating, egg-laying, larval development, nectaring), butterfly densities vary from year-to-year based on fluctuations of its host plant resources. Smiths's blue can find basic requirements within a very small range of host plant growth and can colonize and maintain population on habitat areas as small as a few acres. However, even with high buckwheat density, small areas may not be able to support enough butterflies to avoid extinction due to random fluctuations in butterfly population size.

Gene flow among Smith's blue colonies helps prevent low genetic variability that may lead to eventual extinction. The butterfly is thought to have a stepping-stone dispersal pattern that allows gene flow between adjacent habitat areas throughout the populations' distribution. However, the butterfly's weak flying ability may functionally isolate colonies in patches of detached habitat. Any area without habitat and is wider than 50 feet may act as some barrier to dispersal. Where there is no visual continuity of habitat, as with areas of urban development or plantings of shrubs and trees, the barrier is likely to be significant.

Surveys for the Smith's blue butterfly were conducted around the Los Padres Reservoir in 1989 by Dr. Richard Arnold. The Cañada Reservoir site was surveyed by Thomas Reid Associates. Please refer for details on the survey methods and life history information on this species to the reports prepared by these consultants provided in Appendix 9-C. The following is a brief summary of results and conclusions presented in the reports noted above.

Dr. Arnold did not find any specimens of Smith's blue butterfly at the Los Padres Reservoir site. He found that the New Los Padres Dam site does support large populations of the California buckwheat. However, Dr. Arnold concluded that the probability of the Smith's blue butterfly inhabiting the site is relatively low, due to the fact that this secondary food plant of the butterfly occurs in chamise chaparral rather than the preferred coast scrub communities, and that the closely related Tilden's blue butterfly (*E. e. tildeni*) was found at the site. Dr. Arnold recommended that follow-up surveys be conducted in July or early August to make a more definitive conclusion on the presence or absence of this species. Surveys of the New Los Padres site during the week of July 14, 1991, failed to locate any specimens of Smith's Blue although a number of individuals of Tilden's Blue were found. Dr. Arnold feels that it is highly unlikely that Smith's Blue occurs on this site.[44]

Surveys at the Cañada Reservoir site located patches of the dune buckwheat in the grassland areas around the periphery of the project site which were large enough to support a population of the Smith's blue butterfly. Follow up field checks of these patches during optimal conditions for adult flight resulted in no observations of the Smith's blue butterfly. Field surveys at other known locations for this rare species of butterfly during the same time period were positive, however, indicating and verifying the negative findings at the Cañada site.

The Desalination alternatives include the installation of pipelines and radial wells that would be sited in the Marina Dunes area. Smith's blue butterfly is known from the Marina Dunes near Marina to the Lone Star plant. The entire area is considered prime habitat for this species and supports one of the largest remaining colonies of Smith's blue.[45]

The greatest numbers of sensitive wildlife species were recorded in the Los Padres (7) and Cañada (5) sites. Only 4 sensitive wildlife species were found at the Desalination sites. This finding is a reflection the greater diversity of the habitats available on the proposed reservoir sites and the survey efforts expended. It also reflects the importance of the proposed project site to a particular sensitive species. A species may be present but future disruptions of the site for development will not have an adverse affect on it. This is the case for several of the marine birds, such as the California brown pelican, which can be identified with the marine dunes areas but which use them only casually.

In some cases sensitive status is applied only to one or two aspects of a species use of a particular area (i.e., nesting colony, wintering, burrow site, etc.). In these cases, even when the species is found on a site, the significance of this finding is not great if that the critical aspect of its annual cycle is not satisfied in the area. An example is the California gull, which is a species of special concern in California but only when it is associated with its nesting colony.

Of those sensitive wildlife species found at the various alternative sites, the species with the most sensitive status are the Smith's blue butterfly, western snowy plover, red-legged frog, black legless lizard and the southwestern pond turtle. The occurrence of these species on any site would contribute to its significance as a suitable site for development in comparison to the other alternative sites. A summary of the sensitive wildlife species found at each alternative site is provided in Table 9-5.

TABLE 9-5

PROBABILITIES OF OCCURRENCE OF ENDANGERED, THREATENED CANDIDATE OR WILDLIFE SPECIES OF SPECIAL CONCERN ON PROPOSED ALTERNATIVE RESERVOIR SITES MONTEREY COUNTY, CALIFORNIA

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
MAMMALS					
Pacific Western Big-eared Bat (*Plecotus townsendii townsendii*)	C2/-/CSC	L	L	O	O
Pallid bat (*Antrozous pallidus*)	-/-/CSC	M	M	O	O
Greater Western Mastiff Bat (*Eumops perotis californicus*)	C2/-/CSC	M	M	O	O
Salinas Harvest Mouse (*Reithrodontomys megalotis distichlis*)	-/-/*	O	O	O	L
American Badger (*Taxidea taxus*)	-/-/CSC	O	O	O	L
BIRDS					
California Brown Pelican (*Pelecanus occidentalis californicus*)	E/E/-	O	O	L	L
Double-crested Cormorant (*Phalacrocorax auritus*)	-/-/CSC, ABL	L	O	L	L
American Bittern (*Botaurus lentiginosus*)	-/-/ABL	P	O	O	O
Great Blue Heron (Rookery Site) (*Ardea herodias*)	-/-/*, ABL	L	L	O	O
Great Egret (Rookery Site) (*Casmerodius albus*)	-/-/*	L	L	O	O
Northern Harrier (Breeding) (*Circus cyaneus*)	-/-/CSC	O	L	O	L

TABLE 9-5 (Continued)

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
Red-shouldered Hawk (*Buteo lineatus*)	-/-/ABL	P	H	L	L
Black-shouldered Kite (Breeding) (*Elanus caerulea*)	-/-/*	O	L	O	L
Sharp-shinned Hawk (Breeding) (*Accipiter striatus*)	-/-/CSC,ABL	H	O	O	O
Cooper's Hawk (Breeding) (*Accipiter cooperi*)	-/-/CSC,ABL	M	L	O	O
Golden Eagle (Breeding/Wintering) (*Aquila chrysaetos*)	-/-/CSC	H	H	O	L
Bald Eagle (Breeding/Wintering) (*Haliaeetus leucocephalus*)	E/E/CFP	M	O	O	O
American Peregrine Falcon (*Falco peregrinus anatum*)	E/E/CFP	M	M	O	O
Prairie Falcon (Breeding) (*Falco mexicanus*)	-/-/CSC	M	L	O	O
Merlin (*Falco columbaris*)	-/-/CSC,ABL	L	L	M	M
California Clapper Rail (*Rallus longirostris obsoletus*)	E/E/ABL	O	O	O	O
California Gull (*Larus californicus*)	-/-/CSC	L	O	H	H
Western Snowy Plo r (*Charadrius alexandrinus nivosus*)	PT/-/CSC,ABL	O	O	M	M
Burrowing Owl (Burrow Site) (*Athene cunicularia*)	-/-/CSC,ABL	O	O	O	L
California (Southern) Spotted Owl (*Strix occidentalis*)	-/-/*	L	O	O	O
Short-eared Owl (Breeding) (*Asio flammeus*)	-/-/CSC	L	L	O	O

TABLE 9-5 (Continued)

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
Black Swift (Breeding) (*Cypseloides niger*)	-/-/CSC	L	O	O	O
Loggerhead Shrike (*Lanius ludovicianus*)	-/-/ABL	L	H	O	L
Western Bluebird (*Sialia mexicana*)	-/-/ABL	P	L	O	O
Least Bell's Vireo (Breeding) (*Vireo bellii pusillus*)	E/E/-	L	L	O	O
Yellow Warbler (Breeding) (*Dendroica petechia*)	-/-/CSC	P	P	O	O
Tricolored Blackbird (Nesting Colony) (*Agelaius tricolor*)	C2/-/-	L	L	O	O
AMPHIBIANS					
California Tiger Salamander (*Ambystoma tigrinum californiense*)	C2/-/CSC	L	L	O	O
Foothill Yellow-legged Frog (*Rana boylei*)	-/-/CSC	L	L	O	O
Red-legged Frog (*Rana aurora draytoni*)	C1/-/CSC	P	L	O	O
REPTILES					
Southwestern Pond Turtle (*Clemmys marmorata pallida*)	C2/-/CSC	P	L	O	O
Black Legless Lizard (*Anniella pulchra nigra*)	C2/-/CSC	O	O	H	H
Coast Horned Lizard (*Phrynosoma coronatum frontale*)	-/-/CSC	M	M	O	O

TABLE 9-5 (Continued)

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
INSECTS					
Monarch Butterfly (Wintering Sites) (*Danaus plexippus*)	-/-/*	L	L	O	O
Smith's Blue Butterfly (*Euphitoles enoptes smithi*)	E/-/-	O	L	M	M

[1] See Table 9-3 for complete list of status definitions.

[2] Sites:
NLP = 24,000 AF New Los Padres Reservoir
CAN = 15,000 AF Cañada Reservoir
3DSL = 3-million-gallon-per-day desalination alternative (Sand City)
7DSL = 7-million-gallon-per-day desalination alternative (Sand City and MRWPCA site, near Marina)

KEY:
O = absent
L = low probability
M = moderate probability
H = high probability
P = known to be present

A combination of criteria was used to rate the potential for each alternative site to provide for the existence of sensitive wildlife species. These included:

- documented historical records of sensitive species in the project region;
- the availability within the inundation area or its immediate surroundings of habitats suitable for the maintenance and/or breeding of sensitive wildlife species;
- reliably reported sightings by local residents or other knowledgeable persons; and
- sightings of sensitive species during surveys for this report.

Using these criteria, the probability that a particular sensitive species might inhabit a particular area can be estimated. For example, the presence of good habitat, historical records of a species in the region, and sightings by reliable observers indicate a high probability that a particular sensitive species is probably present. The availability of only limited habitat plus historical records of a species presence in the area indicate a moderate to low probability that a sensitive species might be present.

The lack of any positive criteria indicates the probable absence of a species from the area. Thus, as in the case for this study, if Smith's Blue Butterflies and the buckwheat plants on which they feed were not found, it was assumed that the species did not occur on the site. However, the availability of less preferred buckwheat food plants might indicate a low probability that this endangered species might be present under marginal conditions. Obviously, if a sensitive species was observed during any field survey for this report it was listed as present.

Using this subjective method of analysis, the Los Padres site is estimated to contain the greatest potential (moderate to high) of providing the ecologic requirements for the most sensitive species. The Cañada and Desalination Alternative sites probably support lower numbers of sensitive wildlife species. A summary of the potential of each proposed alternative reservoir site to contain sensitive species is provided in Table 9-5.

In considering both the number and status of sensitive wildlife species found at each alternative site and the potential of these sites to support other sensitive wildlife species, the relative sensitivity of each site may be ranked as follows: most sensitive are New Los Padres and Cañada, the least sensitive are the Desalination Alternative sites.

Observations along the entire pipeline route of the two Desalination Alternatives on July 6-7, 1991 indicated that habitats capable of supporting sensitive wildlife species might be affected.

The sensitive species most likely to be encountered at some point along the proposed pipeline routes would be the black legless lizard. The probability of their occurrence is very high in sandy loam habitats along Reservation Road, through the Fort Ord dunes area and in the beach dunes area proposed for the radial well seawater collectors. Lower probabilities exist for other areas along the pipeline routes to and from the existing MRWPCA Water Treatment Plant proposed as a possible site for the desalination facility.

Beach habitats seaward of the dunes in the area proposed for the radial wells appear to be ideally suited for the nesting of the snowy plover. This species is known to nest on isolated beaches in the immediate area.

Plants

Eastwood's Goldenweed (*Ericameria fasciculata*). This stout dense shrub is a Monterey County endemic that is restricted to the sand dunes and coastal strand of Monterey and Carmel Bays. It is classified as a candidate for listing by the USFWS, and has sufficient biological information to support a proposal to list at the present time. The reservoir alternatives are expected to have very little, if any, effect upon the preferred habitat of this species and thus a specific survey effort for this plant was not conducted. A limited survey of the immediate dunes at the mouth of the Carmel River did not locate this plant. Surveys conducted for the desalination alternative failed to locate this species.

Carmel Valley Bush-Mallow (*Malacothamnus palmeri* var. *involucratus*). This perennial shrub grows from 3 to 6 feet in stature. It is endemic to the interior portions of the Santa Lucia Mountains in Monterey County. It is listed by the U.S. Fish and Wildlife Service as Category 2, indicating further study is needed before a final ruling on its legal status can be made. It favors chaparral or oak woodland habitats and is reported to be common after a burn.[46] Although this plant has been found in the Carmel Valley, it is also reported to be much more common in the Jolon area and on the Salinas Valley side of the Santa Lucia Mountains.[47] During the field surveys for this report, known localities for this plant were visited throughout its blooming season. This plant was located within the project study area of the Cañada Reservoir site. Suitable habitat does occur at the New Los Padres site, and isolated individuals may occur within the reservoir inundation area. However, since this plant is typically rather large, it is believed that if this plant were to occur within the chaparral, it would have been noticeable.

Douglas' Spineflower (*Chorizanthe douglasii*). This plant occurs downstream of the New Los Padres Dam and would be affected by dam construction. It has a wide distribution in the Santa Lucia in Monterey County, and also occurs in the Salinas Valley and the Gabilan Mountains. It blooms from April to June. It is on the CNPS List 4.

Monterey Spineflower (*Chorizanthe pungens* var. *pungens*). The Monterey spineflower is a small annual plant that occurs in coastal dunes. It is a federally Proposed Endangered (PE) species and is on the CNPS List 1B. It is recorded from Seaside to the dunes at the mouth of the Pajaro River north of Moss Landing. Some of these records are historical and those populations may now be extirpated. The species is known from the Marina dunes in several locations and could be affected by a desalination plant at the MRWPCA site.[48] Field surveys found dense populations in an area that would be affected by the 7 DSL alternative.

Robust Spineflower (*Chorizanthe robusta*). A small annual which occurs in mostly dry sandy places below 1000 feet in elevation along the coastal strand from Alameda to Monterey County. It is usually associated with Northern Coastal Scrub habitats and blooms from June through August. While none of this species was identified within any of the alternative sites its recent elevation in status from CNPS List 4 to a Federal Proposed Endangered listing indicates that its sensitive status is acute.

Lewis' Clarkia (*Clarkia lewisii*). This plant occurs on the New Los Padres Dam site and would be affected by the project. It has a wide distribution in Monterey County, and has recently been found to occur just inside San Benito County. In the study areas it was seen growing in disturbed soil in Chaparral and open Oak Woodland habitats. Principle blooming period is May to July. It is on CNPS List 4.

Valley Oak (*Quercus lobata*). This tree occurs on the New Los Padres Dam site. It was found to be virtually ubiquitous in the other study areas. At the New Los Padres study area, the abundant *Q. lobata* "yearlings" (from acorns germinated this year) seen in June were *all* gone when the area was re-examined in September, presumably due to the grazing which occurs there. This plant is found on CNPS List 4.

Santa Lucia Gooseberry (*Ribes sericeum*). This brush plant occurs in the Santa Lucia Range from Hastings Reservation south into San Luis Obispo County. Its habitat is redwood forest, oak woodland, and mixed evergreen forest. These two habitats are present in the New Los Padres study area, but no examples of the plant were seen there. It blooms from February to April, and is on CNPS List 4.

Straggly Gooseberry (*Ribes divaricatum* var. *pubiflorum*). Straggly gooseberry is on List 4 of the CNPS. It is not listed by the U.S. Fish and Wildlife Service or the State of California. Straggly gooseberry (var. *pubiflorum*) occurs in the Coast Ranges from Santa Barbara County to southern Oregon. It is a weakly ascending or trailing shrub generally found in or around the margins of rich, moist forests. Unlike the typical variety [*R. divacaricatum* var. *divaricatum*], var. *pubiflorum* does not have large sections of undisturbed habitat. However, recent field work by botanists indicates that straggly gooseberry is relatively common. A large, concentrated population occurs in the riparian forest on the north bank of the Carmel River in the vicinity of the proposed intake facility and pump station of the Cañada site. A much smaller colony, consisting of only a few plants, occurs on a nearby small island in the Carmel River channel. This plant was also found at the New Los Padres site.

Talus Fritillary (*Fritillaria falcata*). This perennial herb typically occurs on talus slopes and on serpentine soils in chaparral, oak woodlands and Lower Montane Coniferous Forest communities. Serpentine soils and Lower Montane Coniferous Forest habitats do not occur at any of the alternative reservoir sites. Talus slopes in Oak Woodlands and Chaparral habitats do occur at both the New Los Padres and Cañada site, however this plant was not found during a field survey of the New Los Padres Site during the blooming period of this plant.

Fragrant Fritillary (*Fritillaria liliacea*). Fragrant fritillary is a perennial bulb species that is found in coastal scrub and grassland in a number of coastal California counties where it is often associated with serpentine derived soil. It is a federal candidate species and was not found on any of the alternative sites.

Santa Lucia Lupine (*Lupinus cervinus*). This perennial plant typically occurs in Lower Montane Coniferous Forests and Oak Woodlands above 1,000 feet. The Oak Woodlands and Mixed Hardwood Forests that occur at all the alternative sites could support this plant, even though these sites occur at the lowest end of this species' elevation range. A field survey of the New Los Padres site during this plant's blooming period failed to locate any populations within the site.

Sandmat Manzanita (*Arctostaphylos pumila*). This low, prostrate shrub is known historically from the dunes from Seaside north through Fort Ord. A number of populations of the species have been extirpated by road building and military activities. Field surveys located a small population on Ft. Ord along the pipeline route for the 7 DSL alternative. These plants could probably be avoided.

Seaside Bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*). This annual member of the Snapdragon Family is historically known from one location in the sand hills north of Seaside. This population has not been seen recently and may be extirpated. It was not found in the Marina Dunes Habitat Conservation Plan (HCP) but habitat along the desalination pipeline routes could support this species. Surveys did not find this species along the pipeline route.

Menzies' Wallflower (*Erysimum menziesii*). This biennial species grows in the coastal strand community at locations from Humboldt to Monterey County. It has been nearly extirpated from the Monterey Peninsula but it is known both historically and currently from the dunes between Seaside and the Salinas River. It is reported from the Marina Dunes Habitat Conservation Plan.[49] Field surveys did not find this species.

Sand Gilia (*Gilia tenuiflora* ssp. *arenaria*). Sand Gilia grows in the dunes of the coastal strand and coastal scrub communities of Monterey County. It is known from Monterey to the Salinas River and is found in the Marina Dunes.[50] Field surveys located a small population of this species along the pipeline route for the 7 DSL alternative that would be eliminated by the planned pipeline.

Santa Cruz Microseris (*Microseris decipiens*). This annual member of the daisy family is known from coastal prairie and valley grassland communities among others. It is known from one location just east of Monterey and habitat along the desalination pipeline routes could support this species, although no plants were found during field surveys.

Additional Plants of Interest. Two anomalous plants were seen during the surveys: A Lomatium, which may be *L. parvifolium* var. *parvifolium*, was found along the Carmel River Trail on the west side of the river one-quarter mile northwest of Bluff Camp. Although well above the inundation area, this location may be heavily impacted by the proposed service road, which would extend to Bluff Camp. *L. p.* var. *parvifolium* is on CNPS List 4; however, the material seen at the project site varied considerably from the typical form. A specimen was sent to Dr. Lincoln Constance, at the University of California Herbarium, for determination because the plant is not clearly referable to any typical lomatiums. About 12 specimens were seen growing in an area 4 feet by 10 feet in semishaded Oak Woodland. To date no final identification of these specimens has been made and it is suspected that they represent two local variants of the subspecies *L. p. parvifolium*. The other plant, a bedstraw, was seen in the Bluff Camp area only. This location, also above the inundation area, would be the terminus of the proposed road and would have a fishery-related facility as well. The bedstraw found here, which could be a hybrid of *Galium californicum* ssp. *californicum* x *G. c.* ssp. *flaccidum* (both of which occur in the study area), does not satisfactorily compare to the morphology of known taxa, and a specimen was sent to Dr. Lauramay Dempster of the U.C. Herbarium.

A combination of criteria was used to rate the potential for the existence of sensitive plant species at each alternative reservoir site. These included:

- documented historical records of sensitive species in the project region;
- the availability within the inundation area or its immediate surroundings of habitats suitable for the maintenance and/or breeding of sensitive wildlife species;
- sightings of sensitive species during surveys for this report.

Using these criteria, the probability that a particular sensitive species might occur at a particular site was estimated. For example, the presence of good habitat, historical records of a species in the region, and sightings in the vicinity of the site indicate a high probability that a particular sensitive species occurs in the area. The availability of only limited or marginal habitat plus historical records of a species' presence in the area indicate a moderate to low probability that a sensitive species might be present.

The lack of suitable habitat indicates the probable absence of a species from the area. Obviously, if a sensitive species was observed during any field survey for this report it was listed as present.

A summary of the rare plant survey results and the evaluation of occurrence potential is provided in Table 9-6.

TABLE 9-6

PROBABILITIES OF OCCURRENCE OF SENSITIVE PLANT SPECIES
IN PROPOSED ALTERNATIVE RESERVOIR SITES

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
Hickman's Onion (*Allium hickmanii*)	C1/ /List 1B	O	O	O	O
Hooker's Manzanita (*Arctostaphylos hookeri* ssp. *hookerii*)	/ /List 3	L	O	O	L
Hoover's Manzanita (*Arctostaphylos hooveri*)	1/List 4	L	O	O	O
Toro Manzanita (*Arctostaphylos montereyensis*)	C2/List 1B	O	O	O	L
Sandmat Manzanita (*Arctostaphylos pumila*)	C2/ /List 1B	O	O	O	P
Monterey Ceanothus (*Ceanothus rigidus*)	C2/ /List 4	O	O	O	O
Vortriede's Spineflower (*Centrostegia vortriedei*)	/ /List 4	O	O	O	O
Douglas' Spineflower (*Chorizanthe douglasii*)	/ /List 4	O	O	O	O
Monterey Spineflower (*Chorizanthe pungens* var. *pungens*)	PE/ /List 4	O	O	L	P
Robust Spineflower (*Chorizanthe robusta*)	PE/ /List 4	O	O	L	M
Lewis' Clarkia (*Clarkia lewisii*)	/ /List 4	P	O	O	O
Seaside Bird's-Beak (*Cordylanthus rigidus* ssp. *littoralis*)	C1/E/List 1B	O	O	O	M
Monterey Cypress (*Cupressus Macrocarpa*)	C2/ /List 1B	O	O	O	O
Eastwood's Ericameria (*Ericameria fasciculata*)	C2/ /List 1B	O	O	O	M

TABLE 9-6 (Continued)

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
Pinnacles Buckwheat (*Eriogonum nortonii*)	C3c/ /List 1B	O	O	O	O
Talus Fritillary (*Fritillaria falcata*)	C2/ /List 1B	O	O	O	O
Fragrant Fritillary (*Fritillaria liliacea*)	C2/ /List 1B	L	L	O	O
Cone Peak Bedstraw (*Galium californicum* spp. *luciense*)	C2/ /List 1B	O	O	O	O
Santa Lucia Bedstraw (*Galium clementis*)	C3c/ /List 4	O	O	O	O
Wedge-Leaved Horkelia (*Horkelia cuneata* ssp. *sericea*)	C2/ /List 1B	O	O	O	O
Northern California Black Walnut (*Juglans hindsii*)	C2/ /List 1B	O	O	O	O
Small-Leaved Lomatium (*Lomatium parvifolium*)	/ /List 4	O	O	O	O
Abram's Lupine (*Lupinus abramsii*)	/ /List 3	O	O	O	O
Santa Lucia Lupine (*Lupinus cervinus*)	C3c/ /List 4	O	O	O	O
Abbott's Bush Mallow (*Malacothamnus abbottii*)	C2/ /List 1A	O	O	O	O
Carmel Valley Bush Mallow (*Malacothamnus palmeri* var. *involucratus*)	C2/ /List 1B	L	P	O	O
Arroyo Seco Bush Mallow (*Malacothamnus palmeri* var. *lucianus*)	C2/ /List 1B	L	O	O	O

TABLE 9-6 (Continued)

Taxa	Status[1]	Site[2] NLP	CAN	3DSL	7DSL
Carmel Valley Malacothrix (*Malacothrix saxatilis* var. *arachnoidea*)	C2/ /List 1B	O	O	O	O
Santa Cruz Microseris (*Microseris decipiens*)	C2/ /List 1B	O	O	O	M
Curly-Leaved Monardella (*Monardella undulata* var. *undulata*)	/ /List 4	O	O	L	M
Monterey Pine (*Pinus radiata*)	/ /List 4	O	P	O	O
Valley Oak (*Quercus lobata*)	/ /List 4	P	O	O	O
Muir's Raillardella (*Raillardella muirii*)	C3c/ /List 1B	O	O	O	O
Straggly Gooseberry (*Ribes divaricatum* var. *publiflorum*)	/ /List 4	P	P	O	O
Santa Lucia Gooseberry (*Ribes sericeum*)	/ /List 4	O	O	O	O

[1] See Table 9-3 for complete list of status definitions.
[2] Sites:
NLP = 24,000 AF New Los Padres Reservoir
CAN = 1,500 AF Cañada Reservoir
3DSL = 3-million-gallon-per-day desalination alternative (Sand City)
7DSL = 7-million-gallon-per-day desalination alternative (Sand City and MRWPCA site near Marina)

KEY:
O = absent
L = low probability
M = moderate probability
H = high probability
P = known to be present
* = present but not native populations

In considering the presence, status and potential for occurrence of sensitive plant species at each alternative reservoir site, the relative sensitivity of each site is as follows: The 7 DSL alternative is the most sensitive, the Cañada alternative is the second most sensitive, and the New Los Padres alternative is the least sensitive.

9.2 STANDARDS OF SIGNIFICANCE

For the purposes of this chapter, potential effects on the following biotic resources were considered:

- locations and/or principal concentrations of rare and/or endangered species;
- the loss of riparian and wetland habitats at the alternative sites;
- impacts to the native riparian plant communities in Carmel Valley; and
- native upland plant communities and wildlife habitats at the alternative sites.

A significant impact to biotic resources is one which results in a reduction in the population of a State or federally listed endangered or threatened plant or wildlife species, the loss of riparian habitats (a Category 2 Natural Resource as defined by the USFWS) due to inundation, or the loss of riparian habitats due to significant, chronic groundwater drawdown in the Carmel Valley aquifer (even in normal water years).

9.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

This section of the chapter identifies those impacts to vegetation communities, wildlife habitats and sensitive species associated with the construction and placement of project features. At this time, preliminary designs and construction plans have been prepared on the various project alternatives.[5] For many of the alternatives, certain project features, such as access roads and borrow sites, have been described but the location has not been finalized. These project features are addressed in this impact evaluation, to the level of detail possible.

9.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Impact 9.3.1-1

The 24,000 AF New Los Padres Dam and Reservoir would inundate and eliminate 166.2 acres of native upland vegetation and wildlife habitat.

The estimated acreage of each vegetation type that would be inundated by the reservoir is presented in Table 9-7. Prior to completion of the proposed dam, vegetation within the proposed reservoir inundation area would be cleared in consultation with responsible resource agencies.[52] Waste materials from the construction of the dam would be deposited on the reservoir floor upstream of the proposed dam. After the dam construction is completed, inundation of the reservoir would eliminate the remaining upland wildlife habitat and vegetation within the reservoir inundation area. This loss of upland habitats and their conversion to aquatic habitats will influence the composition and relative abundance of the wildlife species in the project area. The large reservoir will favor some wildlife populations while adversely affecting others. For example, certain waterfowl, shorebirds and wading birds could benefit from the larger water body.

The dam construction- and operation-related impacts would result in the removal of approximately 166.2 acres of upland vegetation and wildlife habitats (excludes open water, marsh, riparian and valley oak woodland acreages). Resident wildlife currently within the reservoir inundation area would move out of the area and onto adjacent lands as the existing habitats are destroyed. Some of these species would be able to populate suitable habitats in the surrounding areas provided that the surrounding areas are not already fully occupied or at carrying capacity. When the surrounding areas are at or near capacity, competition for food, increased predation and disease would reduce the successful relocation of some species.

It is very difficult to estimate the population size of each wildlife species now residing within the reservoir area that would survive the loss of this habitat. A conservative assumption would be that the surrounding lands are at or near the same population levels as the inundation areas, and any additional competition for food and cover would probably result in some reduction in population levels for the area as a whole. The loss of these upland habitat areas is not expected to jeopardize the continued existence of any single species of wildlife or plant in the region. The U.S. Fish and Wildlife Service rated these upland habitats as "being of lesser value" to wildlife and being more plentiful on a statewide basis (compared to valley oak, riparian wetlands and instream habitats) and placed these habitats in resource Category 4.[53] For this reason, the impacts associated with the loss of these upland habitats is considered less than significant but would contribute to a cumulative loss of available habitat to those species that utilize these habitats in the region.

TABLE 9-7

APPROXIMATE ACRES OF VEGETATION TYPE LOSS
DUE TO RESERVOIR INUNDATION
(SURFACE AREAS IN ACRES)

Alternative Site	Vegetation Community	Acres
24,000 AF New Los Padres (Spillway Elevation 1,130 ft)	Mixed Hardwood Forest	28.3
	Live Oak Forest	81.6
	Valley Oak Woodland	6.7
	Grassland	18.7
	Chamise Chaparral	20.7
	Disturbed Chaparral	13.4
	Coastal Sage Scrub	3.5
	Marsh	2.2
	Open Water (Ex. Res.)	53.3
	Riparian[1]	38.0
	Total	266.4
15,000 AF Cañada Reservoir[2] (Spillway Elevation 455 ft)	Monterey Pine Forest	25.9
	Monterey Pine-Coast Live Oak	30.6
	Coast Live Oak Forest	44.4
	Buckeye Woodland	2.0
	Coastal Scrub	81.8
	Coastal Scrub-Coast Live Oak	7.1
	Mixed Chaparral	0.0
	Coastal Prairie	0.0
	Coastal Prairie-Coastal Scrub	0.0
	Riparian Forest	0.0
	Willow Riparian	0.8
	Pond	< 0.1
	Disturbed Grassland	6.5
	Farmland	0.0
	Dwelling	1.1
	Total	200.2

[1] The riparian designation includes combined river alluvium/riparian habitat, and is therefore a maximum estimate.

[2] Estimates for 15,000 AF reservoir based on 1991 analysis of 25,000 AF reservoir.

Mitigation Measure 9.3.1-1

To minimize the loss of upland habitat values, every effort would be made to contain the areas of vegetation clearing and disturbance. A Clearing and Grubbing Plan will be developed in consultation with resource agencies.

The stated mitigation goal of the USFWS for Resource Category 4 Habitats is to minimize the loss of habitat values. To achieve this mitigation goal, the proposed project should be designed to minimize the area of impact and measures should be implemented during construction to avoid excessive and unnecessary disturbances. Every effort would be made to contain the area of vegetation clearance and disturbance.

Impact 9.3.1-2

Dam construction and inundation would eliminate 6.7 acres of valley oak woodland and would be considered a significant impact.

Besides the 166.2 acres of coastal oak woodland and other vegetation, construction of the New Los Padres Dam, and subsequent inundation of the site would eliminate 6.7 acres of valley oak woodland. This habitat is considered a sensitive habitat by the CDFG because agriculture and suburban expansion have eliminated much of its former extent.

Mitigation Measure 9.3.1-2

The District will implement a Valley Oak Woodland Mitigation Plan.

The District has prepared a Draft Valley Oak Woodland Mitigation and Monitoring Plan in cooperation with the interagency Vegetation Working Group (VWG), which reviewed and approved of the document. A copy of this Draft Plan is included as Appendix 9-E. In summary, the District proposes to enhance 22 acres of valley oak woodland just downstream of the New Los Padres Dam site at a location known as Big Oak Flat. "Enhance" means to increase the habitat value per acre within the mitigation site to a similar level of habitat value per acre that occurs in the area that will be lost; this may be a higher value than what occurred historically at the mitigation site. Specific goals will be developed in consultation with the VWG.

The mitigation area contains a remnant valley oak woodland in which many of the trees are old and dying. There is on the site, however, a number of saplings of both valley and coast live oak. The District will eliminate cattle and horse grazing on the site and will protect some saplings from herbivore pressure by caging. Yearly monitoring will take place for the first five years of the project and at five year intervals for an additional 25 years. Please refer to the plan in Appendix 9-E for monitoring and data gathering details. Implementation of this plan would reduce the impact of the 24 NLP alternative on valley oak woodland to a less than significant level.

Impact 9.3.1-3

Project features associated with the construction and operations of the proposed dam and reservoir, including paved access roads, quarry site(s), and fish collection facilities, would result in the removal and degradation of an additional 23.1 acres of upland native vegetation and wildlife habitat areas outside of the reservoir inundation area. There would be a temporary loss of about 15-19 acres in the construction staging area.

A number of project features, primarily those associated with construction, would occur outside the inundation area and would result in the loss of additional upland vegetation and wildlife habitat. Features such as roads would result in the permanent loss of approximately 7.7 acres and woodland and chaparral habitat. Storage sites and sedimentation basins would result in a temporary loss of 15.0 acres of upland vegetation and associated habitat values. A total of 18.8 acres would be associated with the construction staging area. These features are shown in Figure 4-5 and the approximate acreage of each component is shown in Table 4-1. An additional 4.3 acres would be affected by roads outside of the staging area or inundation zone of the reservoir. The impact would be less than significant for the reasons described under Impact 9.3.1-1.

The proposed fish facilities would result in the loss of one acre of riparian habitat. This acreage is discussed under impacts to riparian vegetation.

Mitigation Measure 9.3.1-3

During final design, the District, in consultation with the Vegetation Working Group, will develop a detailed Restoration Plan for upland vegetation and habitat values that are temporarily lost in the construction staging area. Every effort will be made to minimize permanent or temporary damage to habitat values; for example, a 200-foot wide greenbelt of native riparian and oak woodland adjacent to the river would be protected.

The District will develop a Final Restoration Plan based on the Conceptual Restoration Plan included in Appendix 9-F, once design details for the construction staging area are known. The goal of the restoration program is to reestablish the vegetation and wildlife values that existed on the site prior to disturbance. Disturbance to riparian vegetation would be minimal due to the 200-foot wide greenbelt zone adjacent to the river that would be protected. If needed, riparian mitigation opportunities are available downstream at Garland Ranch Regional Park (see Mitigation Measure 9.3.1-4).

Impact 9.3.1-4

The proposed 24,000 AF New Los Padres dam and reservoir would inundate and eliminate approximately 38 acres of riparian habitat, a habitat type the USFWS has identified as a resource Category 2, and an additional 1.0 acres of similar habitat would be eliminated by the upstream and downstream fish facilities. This 39-acre loss would be considered a significant impact. The agency mitigation goal is no net loss of in-kind habitat values.[54]

Estimations of the habitat values of the riparian communities that would be lost with this alternative were made by using a simplified USFWS Habitat Evaluation Procedure (HEP).[55] This simplified form of HEP, referred to as a Habitat Assessment (HA), was used in this analysis with the agreement of the MPWMD and the various state and federal resource agencies. A basic component of the HA was the determination of habitat values or Habitat Suitability Index (HSI) for all passerine birds in this case. The HSI values were determined by each member of the HA team consisting of a biologist from the USFWS, the California Department of Fish and Game (CDFG), and the EIR/EIS consultant. The HA team visited representative stretches of the riparian communities at each project site and in the proposed mitigation sites and assigned an HSI value ranging from 1.0 (highest habitat value) to 0.0 (lowest habitat values) based upon their experience and professional opinions. The average of these three values was then applied to each site evaluated. These HSI values were then used to calculate the relative habitat values of each riparian area using the HEP accounting system which simply multiplies the HSI value by the acreage of the habitats evaluated (HSI x Acreage = Habitat Units [HU]). The HEP accounting system defines habitat values in terms of Habitat Units (HUs) per year. For instance, a riparian area of 50 acres with an HSI value of 0.5 would represent 25 HUs/year. A detailed description of the methods used and the data collected to support the findings reported here are presented in Appendix 9-G.

Using the analysis described above and in greater detail in Appendix 9-G, the habitat value of the riparian communities that would be inundated by this alternative was calculated to be about 30.45 HUs per year.

Mitigation Measure 9.3.1-4

The MPWMD will implement a Riparian Habitat Mitigation Plan within Garland Ranch Regional Park along the Carmel River. Quantified project benefits to riparian wildlife habitat in the lower Carmel River will be confirmed in order to develop final mitigation acreage requirements, in consultation with the interagency Vegetation Working Group (VWG).

The HA methods used to determine the values of the riparian habitat within the inundation area were used to determine that the 50.5 acres of restored riparian habitats at Garland Ranch Regional Park would compensate for the loss of the 39 riparian acres associated with the project. "Restore" means to increase the habitat value per acre within the mitigation site to the same (or similar) level of habitat value that is believed by experts to have once occurred in the area; specific goals will be developed in consultation with the VWG. A detailed description of the mitigation measures is provided in Appendix 9-H (the Draft Riparian Habitat Mitigation Plan). The District has a preliminary agreement with the Monterey Peninsula Regional Park District to implement this mitigation plan which was developed in cooperation with the Interagency Vegetation Working Group; the group reviewed and approved of the Draft Plan. The Plan entails trail relocation, extensive revegetation and partial exclusion of the public from the mitigation area.

As described under Mitigation measure 9.3.1-7(b), studies of Carmel Valley riparian wildlife species diversity in different seasons were conducted in 1992. These studies indicate that at least a 15 percent improvement in riparian wildlife habitat value occurs due to the beneficial effect of the presence of streamflow. Thus, the potential beneficial effects of the New Los Padres Project on streamflow, and therefore downstream habitat value, need to be factored into equations used by the VWG to determine final mitigation acreage required for project impacts.

A HEP or similar procedure approved by the VWG will be conducted on the riparian habitat inundated or affected by the selected project. Based on consultations with resource agencies, the timing of the study will be determined (e.g., in Final EIR/EIS or as part of the state or federal permit conditions). Based on the HEP or other approved procedures, a final Mitigation Plan will be developed that includes more detailed information on acreage to be restored, planting density, plant species, scope of monitoring, maintenance, etc. Implementation of this Riparian Habitat Mitigation Plan would reduce this loss to a less than significant level.

Impact 9.3.1-5

The 24,000 AF New Los Padres Reservoir would inundate 2.2 acres of marsh at the upper end of the existing Los Padres Reservoir.

The existing marsh at the existing Los Padres Reservoir is due to sediment buildup at the upstream end. When sediment-laden river water enters the reservoir, sediment drops out of the water column because water velocity is suddenly reduced. This sediment buildup provides the substrate for emergent wetland vegetation. Because this same phenomenon is expected to occur at the upstream end of the New Los Padres Reservoir, it is reasonable to assume that a new, similar marsh would develop. Thus, the adverse impact on marsh habitat is expected to be less than significant.

Mitigation Measure 9.3.1-5

Approximately 20 acre-feet of sediment is carried into Los Padres Reservoir each year. The District would implement a five-year monitoring program and performance standard to monitor sediment deposition and establishment of emergent vegetation at the upper end of the New Los Padres Reservoir. If monitoring results show that insufficient sediment is being deposited, or that emergent vegetation establishment does not achieve the goals of the monitoring program (i.e., performance standards), the District could take the following actions: (1) design and install a small, temporary check dam to increase sediment capture, and (2) plant appropriate species of emergent vegetation similar to those inundated. It also should be noted that the volume and quality of the Carmel River Lagoon and Wetland would be improved by flows provided by the 24 NLP alternative.

Impact 9.3.1-6

The proposed 24,000 AF New Los Padres Dam and Reservoir, and associated facilities would eliminate populations of three sensitive plants (Lewis' clarkia, Douglas' spineflower, and valley oak) and displace three populations of sensitive wildlife sensitive species (red-legged frog, southwestern pond turtle and yellow warbler) known to occur within the project inundation area.

The displacement of three sensitive wildlife populations is not expected to endanger or threaten the continued existence of these species in the region. The red-legged frog is listed as a species of special concern to the California Department of Fish and Game (CDFG). The principal population of this frog is located in the upper reaches of the existing reservoir and farther upstream into the Danish

Creek area where they occupy slowly moving water habitats along the rivers and creeks. As the proposed reservoir gradually fills and the inundation zone extends up into the preferred riverine habitat areas, it is probable that the populations will move upstream. However, displacement of existing populations into habitats already occupied by this species could expose individuals to increased competition. The greater the distance the population has to be displaced, the greater crowding and the risk to predation. Even if eliminated by the inundation of the reservoir, however, the local loss of these populations is not expected to endanger the continued existence of this species in the region.

Concerns regarding the red-legged frog are, in most regards, similar to those which apply to the southwestern pond turtle, a species of special concern to the CDFG, which also occupies similar habitats at the upper end of the Los Padres Reservoir and into the Carmel River upstream. In contrast to the frog, however, the pond turtle prefers ponded waters and appears to be thriving in the reservoir situation as well as in the ponds formed along the river. This reptile is well adapted to the regulated water flows which would result from the proposed project and no loss of critical habitat for this species is likely to be caused by the project. Loss of these populations, if any, would not represent a significant threat to the continued existence of this species.

The yellow warbler is also a species of special concern to the CDFG. It was recorded in the riparian habitats of the Carmel River within the reservoir inundation area. Its occurrence there suggests that the habitat values of these riparian areas are relatively high. Populations of this bird are believed to be on a decline due to the loss of riparian habitats and its susceptibility to cowbird parasitism. The loss of these riparian habitats would reduce the habitats for this bird at this site, but would not jeopardize the continued existence of the species in this region.

The Lewis' clarkia, Douglas' spineflower, and valley oak are listed as "watch" species (List 4) by the California Native Plant Society, and those populations within the reservoir inundation area would be eliminated. Populations of these sensitive plant species are rather large and extensive at this site, however, all three species are found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time.

Ten additional sensitive wildlife species with protection under various categories of State, federal or other agency status were judged to have a moderate to high probability of occurring at this site and thus could be affected by the project. Of these, two are listed as endangered by both the State and federal government (peregrine falcon and bald eagle) and three are listed as candidates for federal listing (pallid and greater western mastiff bats, sharp-shinned and Cooper's hawks and prairie falcon). The proposed reservoir is not expected to adversely affect any nesting sites for the raptorial bird, and the enlarged reservoir would actually provide more feeding habitat for them.

The pallid and greater western mastiff bat are known to occur in this region and may well occur in small numbers at or near this site. The proposed reservoir is not expected to affect any large roosting sites of either species.

In summary, as many as 16 sensitive plant and animal species listed as Endangered or as candidates for listing by State or federal agencies or considered sensitive by other organizations, could be adversely affected by the proposed project. Impacts to each of these species are expected to be less than significant; this assessment will be confirmed upon completion of the Section 7 Consultation process.

Mitigation Measure 9.3.1-6(a)

Although the impacts to these sensitive species are not considered to be significant and thus do not warrant any mitigation measures, the mitigation measures suggested in 9.3.1-1 through 9.3.1-5 would minimize the potential impacts to some of these species.

Mitigation Measures 9.3.1-1, 9.3.1-2 and 9.3.1-3 would minimize the effects on the Lewis' clarkia and the valley oak. Measures 9.3.1-4 and 9.3.1-5 would minimize the effects of this project upon the yellow warbler and red-legged frog and southwestern pond turtle. Proposed riparian restoration efforts at Garland Ranch Regional Park would improve habitat quality and create nesting opportunities for the yellow warbler in this portion of the Carmel River. Wetland habitats are expected to become naturally reestablished at the upper limits of the reservoir inundation zone and should be repopulated by the sensitive frog and turtle species. The flooding of side channels and creeks above the present level of the reservoir may actually increase the area of useable habitat available for these species. In addition, the Conceptual Restoration Plan (Appendix 9-F) and the proposed Valley Oak Woodland Mitigation Plan (Appendix 9-E) are intended to reduce impacts to the three sensitive plant species.

Mitigation Measure 9.3.1-6(b)

The loss to inundation of preferred red-legged frog habitats upstream of the present Los Padres Reservoir could be partially or wholly offset if additional riverine habitats for this species were provided elsewhere in the region. While it is impractical to develop new creek or river habitats, it would be possible to increase the range of this sensitive species into existing riverine habitats rendered uninhabitable throughout the Carmel River drainage. This could be accomplished through the development by the District of a program to (1) control the bullfrog population in the drainage and (2) reintroduce red-legged frogs into their historic breeding areas.

Present day populations of the red-legged frog occupy only isolated and fragmented remnants of their former range throughout the Carmel River drainage. This increasingly rare frog has recently been elevated to a Federal C1 status indicating its continued decline throughout California. Most of this decline is a response by this native amphibian to the loss of suitable river and creek riparian habitats to which it is specifically adapted, preferring the slowly moving water to that of ponded waters. While it will adapt to life in ponds this habit exposes it and its larvae to increased predation from fish and in particular from the introduced bullfrog, a very large competitor which prefers pond habitats.

When ponds or reservoirs are interposed into rivers and creeks and bullfrog are introduced purposefully or by accident, this aggressive species quickly eliminates native frogs by outcompeting them for food and breeding sites and more directly by eating them and their larvae. Once established in ponds and reservoirs, the very mobile bullfrog gradually extends its range into its less preferred, but usable, riverine habitats. This process, which can completely eliminate native frogs from a drainage, is not yet complete in the Carmel River drainage and can still be reversed if the bullfrog is removed and red-legs are reintroduced.

Present populations of red-legged frogs above the Los Padres Reservoir appear to be squeezed between the bullfrog populations in the Reservoir and those upstream below the San Clemente Reservoir. In like fashion the introduction of bullfrogs into a small reservoir on San Clemente Creek at the Dormody Ranch has trapped and isolated a small population of red-legs downstream between this empoundment and the Reservoir. Similar fragmentations of the gene pool of this frog are occurring throughout the drainage which will lead eventually to the elimination of the native species.

The removal of adults and larvae of the bullfrog would permit the extension of the red-legged frogs range back into suitable habitats throughout the drainage, thereby increasing the available habitat for this species and offsetting to some degree the losses of suitable habitat which will result from this project. The reintroduction of this native frog into habitats previously occupied by the bullfrog, and a continuing program to monitor and maintain a bullfrog free system could be a beneficial result of this project for this species.

Impact 9.3.1-7

In normal years, there would be a beneficial effect of the 24 NLP alternative to about 116 acres of riparian vegetation along the lower Carmel River due to river flow and groundwater recharge that would not occur in the existing or No Project situation. However, in critically dry years, significant or severe drawdown would adversely affect about 119 acres, similar to the No Project situation. Overall, the 24 NLP alternative would significantly improve downstream conditions and result in a beneficial effect to the riparian corridor in the lower Carmel Valley.

The method of analysis used to identify downstream riparian impacts for various water supply alternatives was defined in a study conducted by Charles McNiesh for the MPWMD using data from the Carmel Valley Simulation Model (CVSIM), a general aquifer drawdown model adapted for the Carmel Valley Aquifer, and well pumping rates in the Carmel Valley.[56] The 1991 SD EIR/EIS summarized results of this analysis method for 11 water supply alternatives evaluated in a second report.[57] Appendix 9-I provides results of this method for the five alternatives considered in this SD EIR/EIS-II, based on 1992 operations scenarios. A summary of the assumptions and theory used in this analysis is provided below to give the reader some understanding of the results. A summary of the results is provided in the discussion of each alternative below. For further details, refer to the reports cited above.

A schematic representation of the Carmel River riparian corridor is presented in Figure 9-4. The analysis in this SD EIR/EIS-II considers two different water-year scenarios at a buildout demand of 22,750 AF Cal-Am production: normal and critically dry. These are defined as follows:

- Normal Year – Median (50 percent exceedance frequency) inflow volume for the period 1902-1991.
- Critically Dry Year – Less than 12.5 percent of the range of simulated annual inflow in the period 1902-1991.

A critical assumption of this evaluation was that seasonal drawdown in the Carmel Valley Aquifer due to groundwater pumping directly impacts the riparian vegetation in the vicinity of the pumps. The study was concerned primarily with those times the Carmel River "dries up," or when a water deficit occurs and there is no surface water flowing down the Carmel River channel. A single impact threshold for groundwater drawdown does not typically exist due to other environmental variables, such as other direct and indirect causes of tree death, environmental factors that exacerbate or mitigate the direct effects of groundwater drawdown, and the rapidity of drawdown. Based on studies by McNiesh, a "mild stress" threshold of a 4-foot drawdown during the dry season was used to define significant impacts, and a drawdown of the groundwater table of greater than 20 feet defines a severe impact.[58] A drawdown of less than 4 feet was considered a less than significant impact. The Carmel Valley aquifer was divided into four subunits, as shown in Figure 9-1. A water balance calculation was run on each alternative for each water year and for each subunit of the aquifer. Mapped contours of drawdown levels were then constructed and related to areas of riparian vegetation and lengths of river channel that would be affected. The projected acreages affected by groundwater drawdown for each alternative are shown in Figure 9-5. Aquifer subunits 1 and 2 are not discussed as they are not significantly affected by any alternative in normal or critically dry years.

The 24,000 AF reservoir at the New Los Padres site is large enough to provide sufficient storage to maintain year-round flow and recharge the aquifer along the entire river in most water years (see Chapter 7, Section 7.3.1). However, during critically dry conditions, this alternative would not be able to meet municipal demands without significant effects upon approximately 119 acres of riparian vegetation in the lower Carmel River, similar to the No Project scenario. This alternative, along with the 24 NLP/D and 15 CAN/D alternatives, would result in the least overall impacts to the downstream riparian habitats when compared to the 7 DSL and No Project alternatives.

Mitigation Measure 9.3.1-7(a)

The 24 NLP alternative is expected to provide beneficial effects to the riparian habitat downstream of the proposed dam in at least 50 percent of water-years (normal conditions), thus requiring no mitigation measures. During 12.5 percent of water-years (critically dry conditions), the riparian vegetation can be irrigated under current MPWMD programs.

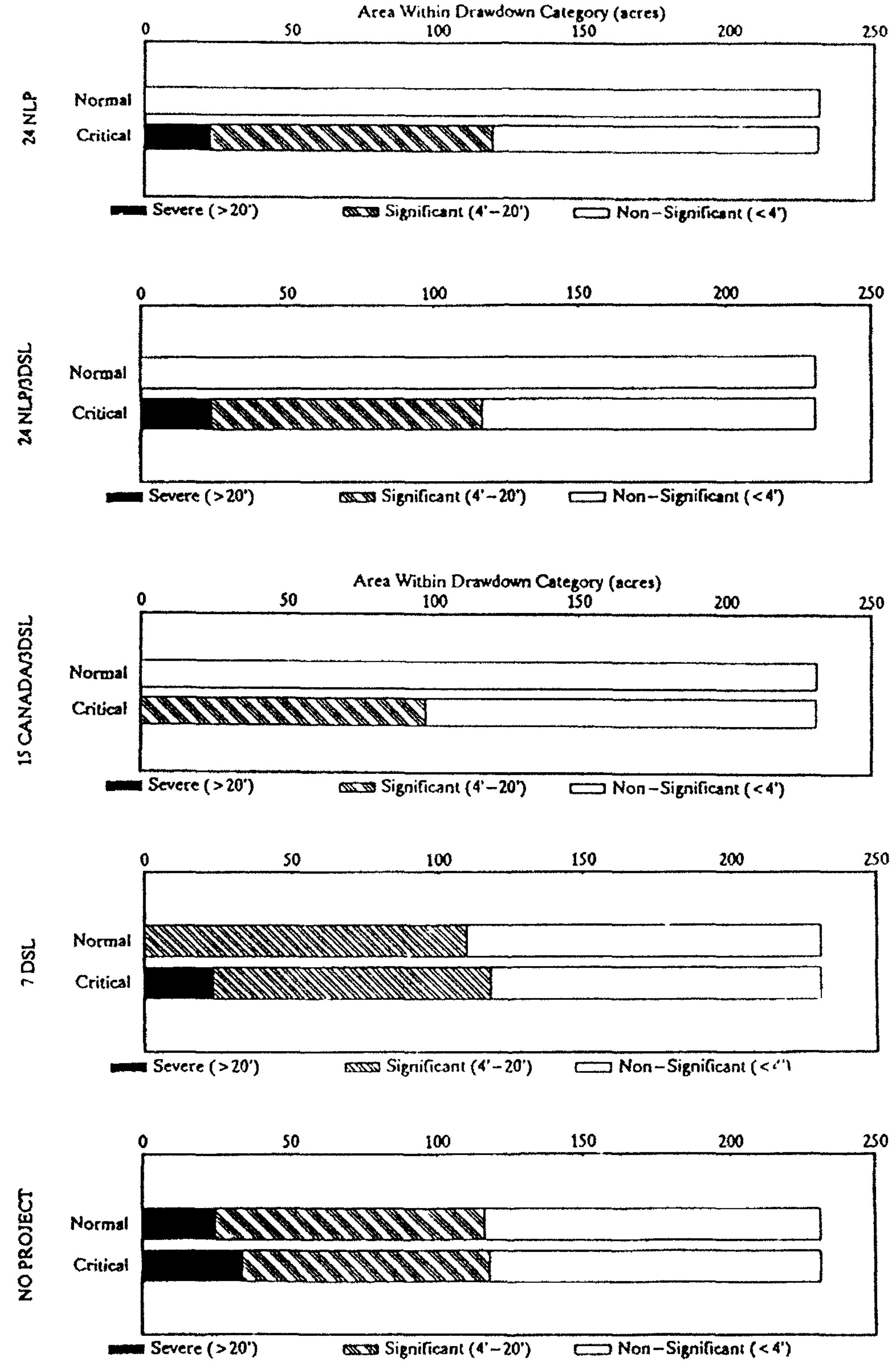
Existing mitigation measures adopted by the MPWMD Board as part of the Water Allocation Program include the following:

1. Conservation and water distribution management to retain water in the Carmel River.

Elements of this mitigation measure are already in place via an existing comprehensive, long-term conservation program and a Memorandum of Agreement (MOA) with the CDFG and Cal-Am, which

ACREAGES OF RIPARIAN VEGETATION AFFECTED BY GROUNDWATER DRAWDOWN

FIGURE 9-5



recycled paper

SOURCE: MPWMD

91417

eip

calls for a water supply strategy and budget for the system to retain water in the river. In addition, Ordinances Nos. 19 and 41 limit diversions from the San Clemente Dam in order to allow more water to flow downstream. This mitigation measure is expected to primarily affect groundwater levels and river flows in the middle section (subunit 2) of the Carmel Valley.

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

To date, the existing Carmel River Management Plan (CRMP) has addressed many of the issues that will be addressed in the new Riparian Corridor Management Plan (RCMP). The purpose of the RCMP is to coordinate the many mitigation activities that are required along the Carmel River. The RCMP will include the existing erosion control program of the CRMP, and will identify and prioritize existing riparian vegetation for protection, irrigation, and/or removal to reduce the risk of bank erosion. An additional District staffperson (Riparian Projects Coordinator) was hired in 1991 to write and implement the RCMP. The RCMP is in preparation, and will be completed in mid-1993.

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

The RCMP will consolidate and expand existing MPWMD programs. The principal new activities being proposed initially are to increase the irrigation areas, and to selectively remove vegetation from the channel bottom. It may be necessary for the District to develop its own irrigation wells in the lower section of the Carmel River, and establish a larger nursery for plant materials to be used in the revegetation efforts. Seasonal staff members will be hired as needed to assist the Riparian Projects Coordinator.

4. Expand the monitoring program for soil moisture and vegetation stress.

This involves the expansion of the existing soil moisture and vegetation stress monitoring being done by the District. This program not only involves additional monitoring sites, but also includes weather monitoring and irrigation scheduling already in place along the Carmel River.

Mitigation Measure 9.3.1-7(b)

To better quantify anticipated beneficial effects of the 24 NLP alternative upon aquatic and riparian habitats in the lower Carmel River, the District has designed and initiated a long term monitoring program. This program involves the collection of baseline data on wildlife resources *currently utilizing the lower Carmel River riparian corridor, where existing ground water pumping and low summer river flows have caused a degradation of wildlife habitats over the past thirty years.*

It is evident that the existing riparian vegetation in Carmel Valley is but a remnant of what used to be there as recently as 1960, and that the threat of greater losses due to groundwater pumping occurs in the lower sections from the Narrows to the Lagoon. The riparian corridor along the middle and lower section of the Carmel River has been suffering from a combination of factors and events, of which the most studied and analyzed are the effects of groundwater pumping. Throughout the lower and middle sections, where annual stream flow is only intermittent, the riparian vegetation must rely on groundwater for growth and survival during the dry season. The degree to which groundwater pumping depresses the water table, resulting in stresses on the vegetation, is influenced by several interrelated biological and physical factors which have contributed to the severe loss of critical wildlife habitat in portions of the middle and lower river sections.

It is anticipated that increased summer and fall streamflow in the lower Carmel River, which will occur in most years as a result of the proposed project, will bring about a significant improvement in wildlife values of riparian habitats in this area. The monitoring program was designed in part to quantify potential project benefits to the lower river as partial mitigation for wildlife habitat losses in the project construction and inundation areas. The information is also intended for use in assessing the long-term improvements in wildlife values and species diversity which should occur along the Carmel River after project completion.

The Wildlife Habitat Monitoring Program was initiated in the spring of 1992. It involves detailed studies of wildlife populations and species diversity at nine specific locations along the lower Carmel River from the Los Padres Dam to Carmel Lagoon. Sampling methods include the analysis of avian species diversity obtained from time constrained surveys along fixed transects, small mammal live trapping, nighttime spotlighting surveys, and wildlife records from fixed transect observations. Each reach of the river is monitored three times per year – in the spring, when river flows are still present; late summer, when under present conditions the river is completely dry; and in the late winter when river flows are highest. The results of this study to date are provided as Appendix 9-J; the final report is available in the District office.[59]

Preliminary results of this study show a reduction in wildlife values of riparian corridor habitats along the lower Carmel River of approximately 15 to 17 percent from the spring-wet to the summer-dry period. Significant declines in the species diversity of birds and the numbers of small mammals using the riparian corridor were the principal indicators used to determine this estimate of declines in habitat suitability. Future increases in habitat use, which would result from increased annual flows in the river provided as mitigation for the proposed project, would be expected to be greater as wildlife communities stabilize. Continued monitoring would measure these increases and provide the baseline information with which to assess the success of the mitigation measures described previously.

9.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Impacts of the 24 NLP/D alternative would be similar to the potential plant and wildlife impacts associated with the 24,000 AF NLP Reservoir, discussed in Section 9.3.1 (see Impacts 9.3.1-1 through 9.3.1-7). Impacts and mitigation measure associated with the 3 MGD desalination plant are discussed below:

Impact 9.3.2-1

The desalination project could result in the take of nesting habitat of the snowy plover (a federally Proposed Threatened species).

Snowy plovers have been known to nest along the beaches in the Sand City area. Grading and construction activities during the nesting season could interfere with reproduction in this secretive, beach nesting species by causing the abandonment of established nests or by discouraging nesting along traditional nesting beaches in the area. If construction is scheduled to take place on the beach between March 15 and September 15, MPWMD shall conduct a survey for nesting snowy plovers. Any disruption of reproduction in this species would constitute a significant impact. The taking of snowy plover habitat may require approval by the USFWS under the Endangered Species Act.

Mitigation Measure 9.3.2-1

Construction shall not take place in plover habitat if nesting plovers are present; all disturbed beaches shall be restored to their natural contours after construction. A preconstruction survey for the snowy plover and all species of concern would be conducted.

Full implementation of the following mitigation measures could prevent the accidental "taking" of snowy plover nesting habitat during construction of the desalination project and reduce impacts to this species to a less than significant level.

Snowy plovers are present at nesting sites from April through August. They are solitary nesters, selecting isolated beaches for their reproduction. When disturbed, the male bird, which does most of the incubation and nest protection, slips quickly away from the nest and through a series of exaggerated behaviors, attempts to lure the approaching potential predator away from the nest site. He will not return to the nest until the disturbance is completely abated and the intruder has left. Continued disturbances, therefore, expose the eggs to the heat of the sun which may adole the eggs or force the nesting pair to abandon the site.

Disturbances caused by construction activities would, therefore, constitute harassment of nesting plovers, even if the nests themselves were not taken. To avoid the incidental "taking" of plover breeding habitat, all construction activity on the beaches for the installation of Ranney collectors should be completed during the period of September 15 through March 15. If construction takes place during the plover nesting season (March 15 to September 15), the area shall be surveyed for nesting plovers. If nesting plovers are found, no new construction will begin nor will current construction continue until the monitoring biologist determines that it is safe to do so.

Upper beach areas that are physically disturbed during construction shall be restored to their natural contours, and all construction materials completely removed prior to the plover nesting season of April through August. Restoration of disturbed beach areas well in advance of the breeding season would allow natural wind and wave action to reshape the breeding sites.

Impact 9.3.2-2

The desalination project could result in take of the black legless lizard (a federal candidate species and a CDFG species of special concern) or its habitat.

The black legless lizard may occur in the area of the proposed intake site for this alternative. Grading and construction activities would involve the excavation of sand and sandy loam soils in the beach dunes and through other inland sites. Because these habitats, especially those with sagebrush, lupine, and mock heather vegetation are preferred by this burrowing reptile, it would be expected that individual animals as well as their habitat could be lost. Destruction of the lizard or its habitat would be considered a significant adverse impact.

Mitigation Measure 9.3.2-2

Project activities shall (1) avoid black legless lizard habitats, or (2) have a knowledgeable biologist on hand to implement one or more of the following listed measures.

Because this reptile spends most of its life cycle in subterranean habitats it is very difficult to predict with certainty the probability of its occurrence in any particular area. Full implementation of the following mitigation measures could prevent the accidental "taking" of California black legless lizard (BLL) during construction of the desalination project and reduce impacts to this species to less than significant levels.

After construction plans are available that show specific pipeline routes and new facilities sites, all affected areas, especially those with any historic evidence of the presence of BLL or that contain the sandy loam soils or the sagebrush, lupine, and mock heather vegetation preferred as habitat by this species, would be carefully surveyed by a qualified biologist familiar with BLL.

1) If possible, the project should avoid any areas where BLL are found.

2) If it is not possible to avoid areas that are known to contain BLL populations or suitable BLL habitats, construction activities involving trenching, grading, or other earth moving disturbances should proceed with caution and any BLL that are unearthed should be carefully removed and released into other nearby suitable habitats. Any BLL salvage work of this type should be performed by a qualified biologist familiar with BLL. This biologist should be present to monitor activities at any time that construction is scheduled to occur in known or suspected BLL habitats identified during the preconstruction surveys.

3) Areas disturbed during construction would be revegetated with native species, especially the sagebrush, lupines, and mock heather preferred by the BLL. Transmission routes for pipelines would be cleared of all iceplant and other exotic vegetation for a distance of 25 feet from each side of the construction corridor and revegetated with native species. Once restored, nearby BLL populations can be expected to repopulate these areas and increase in

their numbers. It is also anticipated that these enhanced corridors could offset the loss of any BLL habitat which is permanently destroyed at facility sites.

9.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 9.3.3-1

The 15,000 AF Cañada Dam and Reservoir would inundate and eliminate approximately 200 acres of native upland vegetation and associated wildlife habitat values. For an assessment of impacts associated with the 3 MGD desalination plant, see Section 9.3.2. above.

The proposed reservoir would inundate approximately 200 acres of native vegetation and wildlife habitats. The loss of these native vegetation communities at this site was not considered significant in the context of the overall distribution of these habitats in the project region. Even the loss of approximately 26 acres of the Monterey pine forest, a botanical community considered rare and declining by the California Natural Diversity Data Base, was not considered significant.[60]

The greatest loss of wildlife resources would occur in the approximately 100 acres of mature coastal oak woodland and closed-cone pine-cypress habitats in the inundation area.[61] The direct loss of these wildlife habitats is expected to result in the loss of those individuals of approximately 90 wildlife species now occupying the project site. It would also represent a cumulative loss of these habitat types in the Carmel Valley.

Mitigation Measure 9.3.3-1

To minimize the loss of upland habitat values, every effort would be made to contain the areas of vegetation clearing and disturbance.

The mitigation measures for this alternative would be similar to those presented for the 24,000 AF New Los Padres alternative (see Mitigation Measure 9.3.1-1) even though this alternative would result in a greater loss of upland habitat areas and differing habitat types.

Impact 9.3.3-2

Project features associated with the construction and operations of the proposed 15,000 AF Cañada Dam and Reservoir, including paved access roads, quarry site(s), intake facility and pump station, transmission pipeline, water treatment plant, aggregate and concrete processing plants, and spoils and equipment laydown areas would result in the removal and

degradation of additional native vegetation and wildlife habitat areas outside of the reservoir inundation area.

The identification of proposed access roads from Highway 68, borrow site(s), and construction areas and facilities has not been completed for this alternative. Consequently, the extent of habitat removal and disturbances cannot be determined at this time.

The proposed water intake and pump station would be located on the Carmel River and cover an area of approximately 3.6 acres. The existing riparian forest vegetation located on the north banks of the river in this area would be eliminated and replaced by the intake structure and pump house.

The proposed transmission pipeline would pass through farmlands, coastal live oak, buckeye woodland, coastal scrub and disturbed grassland habitats. Construction of this pipeline would disturb portions of these habitats along the proposed route.

The proposed water treatment plant would be located at the base of the proposed dam within a coastal oak woodland. Construction of this facility would likely require the removal of some oak trees.

Mitigation Measure 9.3.3-2

Specific mitigation measures for these potential impacts cannot be identified at this time. Prior to final approvals for this alternative each of the road access routes, borrow site(s), and construction facilities will have to be identified and evaluated for impacts, and the appropriate mitigation measures identified at that time. The riparian habitat eliminated at the water intake structure and pumping station will be compensated for. The habitats disturbed for the transmission pipeline and treatment plant will be replanted at these sites or in a nearby offsite location.

Some suggested mitigation approaches would be avoidance of sensitive vegetation plant communities and wildlife habitats such as the closed-cone pine forest and the coastal oak woodlands, especially the Monterey pine forests. Impacts related to construction noise could be minimized by timing those activities in periods when raptor and other sensitive species are not nesting, and by locating those activities as far away from nesting sites as possible. Disturbed areas should be revegetated with native plant species identical to those that were removed. If adequate mitigation cannot be achieved within the project area, an off-site location may be required (such as Garland Ranch Regional Park) for the riparian habitats.

Impact 9.3.3-3

The proposed 15,000 AF Cañada Reservoir would inundate and eliminate approximately 0.8 acres of riparian habitat, and the intake structure on the Carmel River would disturb an additional 3.6 acres of riparian habitats, for a total of 4.4 acres. See Impact 9.3.1-4 for more details on the methodology for this impact.

Mitigation Measure 9.3.3-3

The MPWMD would restore and enhance riparian habitat within the Garland Ranch Regional Park along the Carmel River. See the discussion on Mitigation Measure 9.3.1-4 and in Appendices 9-G and 9-H for more details on the methods used to determine the amount of mitigation area needed and the details on the proposed riparian habitat enhancement and restoration efforts.

Impact 9.3.3-4

Less than 0.1 acre of marshland would be inundated by the 15,000 AF Cañada Reservoir. This is considered to be a less than significant impact.

Mitigation Measure 9.3.3-4

No mitigation measures would be required.

Impact 9.3.3-5

The proposed reservoir would inundate and eliminate populations of two sensitive plant species (Monterey pine and Carmel Valley bush mallow). The project would improve habitat values for two sensitive wildlife species (golden eagle and norther harrier) and adversely affect the habitats for two other sensitive wildlife species (yellow warbler and black-shouldered kite) identified in the project area.

The impacts to the Carmel Valley bush mallow are considered moderate and mitigable. The adverse impacts to the yellow warbler and black-shouldered kite are considered minor and do not pose a threat to the continued existence of these species in the region.

Mitigation Measure 9.3.3-5

The Carmel Valley bush mallow population may be transplanted to a site outside of the inundation zone. The proposed riparian restoration efforts at Garland Ranch Regional Park would improve habitat quality for the yellow warbler in this portion of the Carmel River.

Bush mallows are easily propagated and are used in garden landscapes throughout the Monterey Bay region. To further improve the habitat quality for the yellow warbler, it is suggested that a predator control program similar to that proposed in Mitigation measure 9.3.1-6 be incorporated into the resource management plans for the area.

Compared to the other alternatives, this alternative would have a moderate impact to sensitive plant and wildlife species.

Impact 9.3.3-6

The 15 CAN/D alternative would have similar impacts to the Carmel River riparian corridor as the 24 NLP/D alternatives (Impact 9.3.1-7) except that about 97 acres of riparian woodland would be significantly affected in critically dry years. Overall, the 15 CAN/D alternative would result in a beneficial effect when compared to the existing situation.

In normal years, this alternative would benefit about 116 acres of the riparian habitats of the Carmel River Valley compared to the No Project. In critically dry water-years, approximately 97 acres of the riparian woodland habitats in the lower region would be affected (see Figure 9-5).

Mitigation Measure 9.3.3-6(a)

See Mitigation Measure 9.3.1-7(a) for efforts needed in critically dry years.

Mitigation Measure 9.3.3-6(b)

Please refer to Mitigation Measures 9.3.1-7(b) regarding a long-term riparian habitat monitoring program.

9.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impacts and mitigation measures associated with the 3 MGD desalination plant are discussed in Section 9.3.2. This section addresses the impacts and mitigation measures for the 4 MGD desalination plant at the MRWPCA site.

Impact 9.3.4-1

Construction of a 4 MGD desalination plant at the MRWPCA site and associated pipelines could adversely affect sensitive plant species.

The project could result in the loss of seaside bird's-beak and Menzies' wallflower (both State-listed Endangered species) and sand gilia (a State-listed Threatened species). Menzies' wallflower, seaside bird's-beak, and sand gilia are known to occur in the dunes west of Highway 1; the latter two occur on sites proposed for water intake facilities. In addition, there is the possibility that any of the three could occur in the coastal scrub grassland areas east of Highway 1 and north of Marina. Prior to construction, the MPWMD would need to conduct surveys for these species according to guidelines established by the CDFG.[62]

The project could result in the loss of the sandmat manzanita and Eastwood's ericameria (federal candidate species) as well as the Monterey spineflower, a federally Proposed Endangered species. Additional surveys would be required in order to determine the presence or absence of these species along pipeline routes or facility sites. Habitat for the sandmat manzanita and Eastwood's ericameria is present along the route and facility sites. Monterey spineflower does occur on the Granite Rock site, but these locations would be away from project activities. Loss of sensitive plant species would result in a significant impact.

Mitigation Measure 9.3.4-1

Project activities shall avoid all sensitive plant species.

If Endangered or Threatened species are found as a result of preconstruction surveys, avoidance is the recommended procedure. Avoidance can consist of boring under plant populations or moving the pipeline away from the plants. If any of the potential sensitive species are found along the route, their populations are likely to be small and easily avoided. Other potential mitigation acceptable according to CEQA when impacts cannot be avoided include reducing impacts, restoring existing, low quality habitat, and compensating for loss of sensitive species. Each of these measures allows some loss of sensitive species or habitat and permit such activities as transplanting and reseeding. Mitigation other than avoidance would need to be negotiated with State and federal agencies and would be subject to a strict mitigation monitoring program. Compensation for some species may not be available, and restoration can be expensive while resulting in low success rates. Because transplanting and other methods of moving plants is largely untested and therefore unreliable, the CNPS and most professional botanical societies are on record as opposing transplanting as mitigation for loss of sensitive species.

Avoiding sensitive species would result in less than significant impacts.

Impact 9.3.4-2

The project could result in take of the black legless lizard (a federal candidate species and a CDFG species of special concern) or its habitat.

The black legless lizard may occur in the area of the proposed intake sites for this component, and/or along the proposed pipeline routes. Mitigation measures for this impact are identical to those presented for the 3 MGD desalination plant at Sand City; please refer to Impact 9.3.2-2.

Mitigation Measure 9.3.4-2

Please refer to Mitigation Measure 9.3.2-2.

Impact 9.3.4-3

The project could result in the take of nesting habitat of the snowy plover (a federally Proposed Threatened species).

Snowy plovers have been known to nest along the beaches in the area of the proposed intake sites for this component. Mitigation measures for this impact are identical to those presented for the 3 MGD desalination plant at Sand City; please refer to Impact 9.3.2-1.

Mitigation Measure 9.3.4-3

Please refer to Mitigation Measure 9.3.2-1.

Impact 9.3.4-4

The project could result in the take of winter foraging habitat for the merlin (considered a raptorial species of special concern by the CDFG and the Audubon Society).

Grading and construction activities during the winter months could interfere with normal foraging activities of this species in the beach dunes areas and could disrupt hunting territories. Because winter foraging territories are transient and this species can alter its behavior without undue effect, probably reestablishing its traditional territories once the disturbance has been removed, any such disturbance would constitute a less than significant impact.

Mitigation Measure 9.3.4-4

None required or recommended.

Impact 9.3.4-5

In both normal and critically dry years, the 7 DSL alternative would result in significant adverse impacts to riparian woodland in the Lower River Section (Subunits 3 and 4). This alternative would have a significant impact to 109 acres of the downstream riparian habitats in the Carmel River Valley in normal years, and 118 acres in critically dry years.

This alternative would result in groundwater drawdowns of 4 to over 20 feet in normal and critically dry years in the lower section of the river and would affect riparian woodlands in this area. In normal water years, these impacts would affect about 109 acres of the riparian woodlands (Figure 9-5). In critically dry water years these impacts would increase to about 118 acres in this stretch of the Carmel River. Overall, the 7 MGD alternative would result in a slight increase in the area impacted, compared to existing conditions, and would be adverse and significant. Refer to Impact 9.3.1-7 above for a discussion on the methods, assumptions, and data used in this analysis.

Mitigation Measure 9.3.4-5

The existing program described in Mitigation measure 9.3.1-7(a) would need to be continued in all water years. This impact would remain as potentially significant and unavoidable due to its chronic nature.

9.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

Impact 9.3.5-1

Significant or severe regional drawdown would occur in the Lower River Section (Subunits 3 and 4) in normal and critically dry water-years under this alternative. Overall, this alternative would result in a significant impact to 116 acres of riparian habitat in the lower Carmel River Valley in normal years, and 118 acres in critically dry years.

In normal years, the expected drawdown levels in the lower section of the Carmel River Valley would adversely affect 116 acres of vegetation; this would increase to 118 acres in critically dry years. The No Project alternative would entail severe impacts (greater than 20 feet drawdown) to 20-30 acres in the lower river section (See Figure 9-5).

Extensive documentation of the adverse effect of the existing situation to the riparian corridor is found in the Water Allocation Program EIR. Under the No Project alternative, streamflow in the Carmel River would be similarly reduced to zero for several months in normal and critically dry years. The lack of streamflow, in combination with lowered water tables due to pumping, would continue to damage or destroy some of the riparian vegetation during summer and fall of normal years as well as extended dry periods. With continued lowering of groundwater levels and depleted streamflow, riparian vegetation would not recover and might decline further.

Mitigation Measure 9.3.5-1

See existing program described in Mitigation Measure 9.3.1-7(a). This impact would remain a potentially unavoidable significant impact due to its chronic nature.

---

1. John Williams, Habitat Change in the Carmel River Basin, Carmel River Watershed Management Plan, Working Paper No. 1, Monterey Peninsula Water Management District, January 1983.

2. G.M. Kondolf and R.R. Curry, "The Role of Riparian Vegetation in Channel Bank Stability Carmel River, California," in California Riparian Systems, Ecology, Conservation, and Productive Management", 1984.

3. Variations in these definitions occur in the reach of the river between San Clemente Dam and Esquiline Road (Rosie's) Bridge. Williams includes the portion of this reach upstream of Camp Steffani in the upper river, while Kondolf and Curry include the reach in the middle river. For this chapter, this reach of the river will be considered within the upper river because there appear to be more physical similarities with the section of river upstream of San Clemente Reservoir.

4. California Department of Fish and Game, Preliminary Descriptions of the Terrestrial Natural Communities of California, by Robert F. Holland, Ph.D. October, 1986.

5. M.G. Barbour, and Jack Major. Terrestrial Vegetation of California. John Wiley and Sons, 1977.

6. All information presented on this alternative was derived from the following document: Biosystems Analysis, Inc., Cañad- Reservoir Project Biological Assessment, February 1991.

7. Biosystems Analysis, Inc. 1991. op. cit.

8. The studies mentioned include: J.B. Beattie and P. Murphy, Vegetation of the Carmel River Valley, Monterey Peninsula Water Management District, October, 1981.

R. Woodhouse, Baseline Analysis of the Riparian Vegetation in the Lower Carmel Valley, January 25, 1983.

G.M. Kondolf and R.R. Curry, 1984, op. cit.

E.C. Stone, The Dynamics of Vegetation Change Along the Carmel River, California American Water Company, March 1971.

P.J. Zinke, The Effects of Water Well Operation on Riparian and Phreatophyte Vegetation in the Middle Carmel Valley, Carmel Valley Property Owners Association, February 14, 1971.

F.R. Carlson and K.D. Rozell, Carmel Valley Vegetation Study, Monterey County Flood Control and Water Conservation District.

Harvey and Stanley Associates, Inc., Carmel River Riparian Corridor Baseline Study, California American Water Company, January 1984.

9. MPWMD. Water Allocation Program DEIR, 1989.

10. C.M. McNiesh. Effects of Production Well Pumping on Plant Stress in the Riparian Corridor of the Lower Carmel Valley, Vol. I., 1986.

11. MPWMD. 1989. op. cit.

12. MPWMD. 1989. op. cit.

13. MPWMD. 1989. op. cit.

14. MPWMD. 1989. op. cit.

15. California Department of Parks and Recreation, Carmel River Lagoon and Wetland Resource Summary, May 1985.

16. W.E Grenfell, Jr. and W.F. Laudenslayer, Jr., eds. The Distribution of California Birds, California Wildlife/Habitat Relationships Program. Publ. #4, California Department of Fish and Game, Sacramento, and USDA Forest Service, San Francisco, CA. 1983.

17. EIP Associates, 1992. A Wildlife and Habitat Monitoring Program for the Los Padres Reservoir and Lower Carmel River Riparian Corridor. A draft report prepared for MPWMD, 1992.

18. Hall, E. R. and K. R. Kelson, 1959. The Mammals of North America, Vols. I and II, The Ronald Press Company, New York.

Ingles, L. G., 1965. Mammals of the Pacific States, Stanford University Press, Stanford, California.

Jameson, E. W., Jr. and H. J. Peeters, 1988. California Mammals, University of California Press, Berkeley, California.

19. Griffin, J. R., 1991. Natural History of Hastings Reservation, Carmel Valley, California, Hastings Natural History Reservation, Museum of Vertebrate Zoology, University of California, Berkeley and Natural Reserve System, University of California. Hastings Reservation Report Number 1.

20. BioSystems Analysis, Inc. February 1991. op. cit.

21. K.E. Mayer and W.F. Laudenslayer Jr., (eds.). 1988. A Guide to Wildlife Habitats of California, California Resources Agency, Department of Fish and Game. Rancho Cordova, CA, 1988, 166 pp.

22. Thomas Reid Associates. 1987. Sand City Biological Field Surveys for Rare Plants, Smith's Blue Butterfly, Black Legless Lizard. Final Report. September 1987.

23. Arnold, R. A. 1987. Biological Assessment Report for the Sands of Monterey Project Site in Sand City, California. February 19, 1987.

24. Bury, Bruce R., 1985. Status Report: ANNIELLA PULCHRA NIGRA Black Legless Lizard in Central California, U.S. Fish and Wildlife Service, Portland, Oregon.

25. Thomas Reid Associates. 1987. Sand City Biological Field Surveys for Rare Plants, Smith's Blue Butterfly, Black Legless Lizard. Final Report. September 1987.

26. Arnold, R. A. 1987. Biological Assessment Report for the Sands of Monterey Project Site in Sand City, California. February 19, 1987.

27. D. Roberson, Monterey Birds: Carmel. Monterey Peninsula Audubon Society, 1985.

28. California Department of Fish and Game, Species Note, Unpublished, Sacramento, California, March, 1982.

29. EIP Associates, Sands of Monterey EIR, prepared for the city of Sand City. [EIP #87257], 1988.

30. D. Roberson, personal communication, February 11, 1991.

31. U.S. Fish and Wildlife Service, Least Bell's Vireo Management Plan. Unpublished draft, Portland, Oregon, 1986.

32. Don and Robin Roberson, Carmel River Bird Survey, June 1987.

33. S. Goldwasser, D. Gains and S.R. Wilbur, "The Least Bell's Vireo in California: A de facto Endangered Race." Am. Birds 34:742-745, 1980.

D. Roberson, 1985, op. cit.

34. L. Williams, List of the Birds of the Monterey Peninsula Region, Carmel: Monterey Peninsula Audubon Society, 1974.

35. Dave Dettman. Fisheries Biologist, Monterey Peninsula Water Management District, personal communication, February 12, 1991.

36. Stebbins, R. C. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Co. 1985.

37. Thomas Reid Associates, Sand City Biological Field Surveys. 1987.

38. Thomas Reid Associates, Marina Dunes Habitat Conservation Plan. Draft, March 1991.

39. California Department of Parks and Recreation, 1985. op. cit.

40. Thomas Reid Associates, 1987, op. cit.

41. Arnold, R. A., Smith's Blue Butterfly Habitat Assessment Report for the New San Clemente Dam Project in Monterey County, California. February 1990.

42. U.S. Fish and Wildlife Service, Smith's Blue Butterfly Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 87 pp. 1984.

43. Thomas Reid Associates, Marina Dunes Habitat Conservation Plan. 1991.

44. R.A. Arnold, Letter dated July 21, 1991.

45. Thomas Reid Associates, 1991, op. cit.

46. California Native Plant Society (CNPS), Rare Plant Status Report, 1977.

47. James Griffin, local botanical expert, phone conversation, January 1986.

48. Thomas Reid Associates, 1991, op. cit.

49. Thomas Reid Associates, 1991, op. cit.

50. Thomas Reid Associates, 1991, op. cit.

51. Bechtel Civil, Inc., Monterey Peninsula Water Supply Project, New Los Padres, New San Clemente And San Clemente Creek Projects, Preliminary Design And Cost Estimates, June 1989.

Converse Consultants. New San Clemente Project, Preliminary Design and Cost Estimate. November 1986.

Converse Consultants. New San Clemente Project, Preliminary Design and Feasibility Study, August 1982.

52. Bechtel Civil, Inc. 1989. op. cit.

53. U.S. Department of the Interior, Fish & Wildlife Service. Mr. James McKevitt, Field Supervisor. Letter dated August 20, 1986.

54. U.S. Fish and Wildlife Service, 1986. op. cit.

55. U.S. Fish and Wildlife Service, Habitat Evaluation Procedures ESM 102, Division of Ecological Services. Washington D.C. 1976 and revised in 1980.

56. C. M. McNiesh, A Methodology for Predicting Riparian Vegetation Impacts Due to Pumping the Carmel Valley Aquifer. October 5. Unpublished Report to the MPWMD. 1988.

57. C.M. McNiesh, Projected Riparian Vegetation Impacts along the Carmel River under Eleven Water Supply Project Alternatives, prepared for MPWMD, 1991.

58. Ibid.

59. EIP Associates, 1992, op. cit.

60. Biosystems Analysis Inc., Cañada Reservoir Project Biological Assessment, February 1991.

61. K.E. Mayer and W.F. Laudenslayer Jr. (eds.). A Guide To Wildlife Habitats Of California. California Resources Agency, Department of Fish and Game. Rancho Cordova, 1988.

62. State of California, Department of Fish and Game. Guidelines for Assessing Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities. Unpublished copy May 4, 1984.

10. TRAFFIC

10. TRAFFIC

10.1 SETTING

This section addresses only the direct effects on traffic levels that would result from the construction and operation of the alternative water supply facilities. Chapter 19 discusses the secondary effects on traffic that would result from growth within the Monterey Peninsula.

10.1.1 RESERVOIR ALTERNATIVES

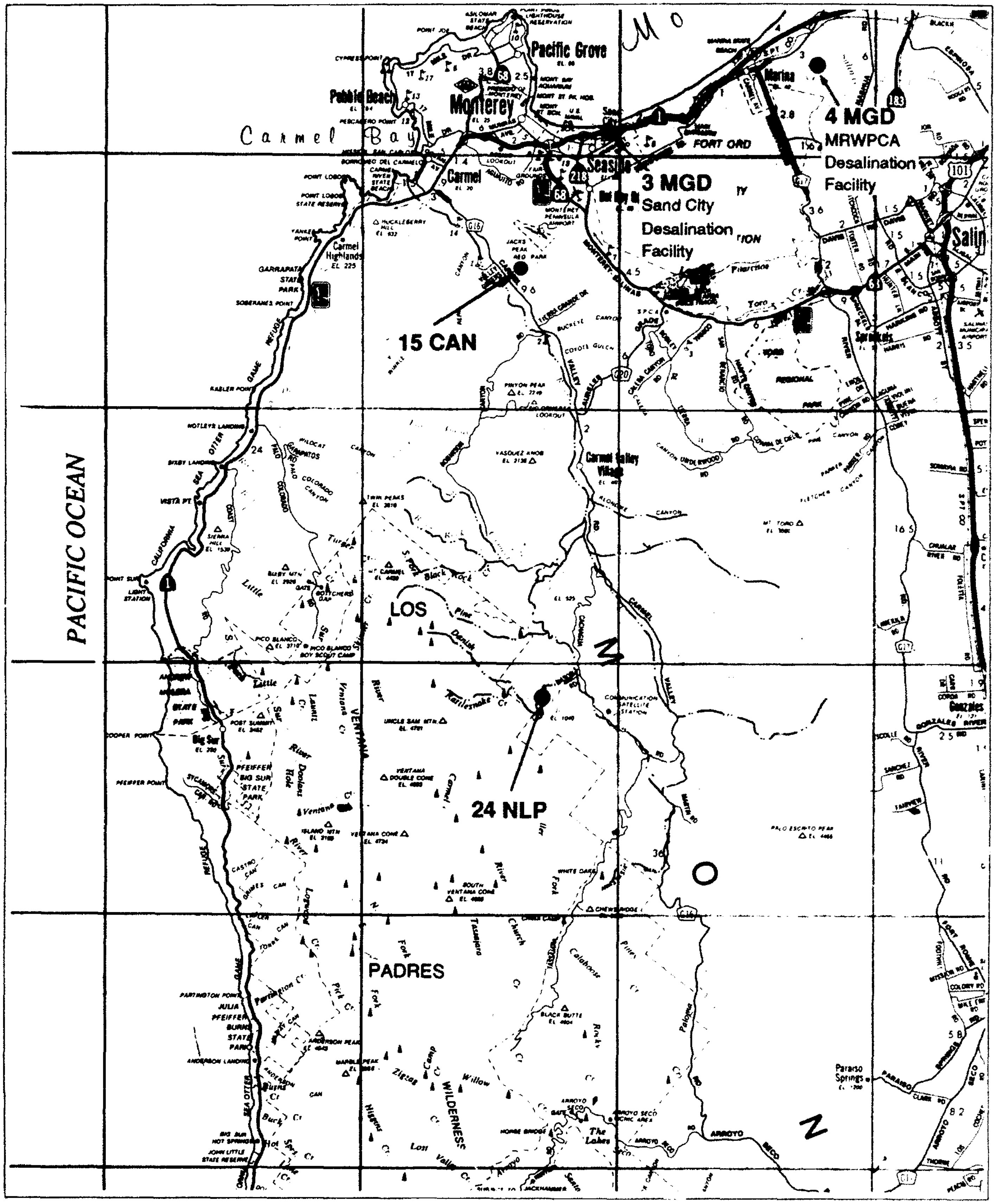
As shown in Figure 10-1, each of the reservoir alternatives would be accessible via Carmel Valley Road and, most likely, Highway 1. Highway 68 is a major transportation link between Salinas and the Monterey Peninsula, which would provide access to Cañada Reservoir.

Carmel Valley Road is a rural highway that extends about 50 miles from Highway 1 in Carmel to Highway 101 in Greenfield. Carmel Valley Road consists of four lanes at the mouth of Carmel Valley but narrows to two lanes toward Carmel Valley Village. The four-lane section begins at Carmel Rancho Boulevard and ends just west of Rancho San Carlos Road; this road segment includes improved shoulders and a landscaped median that contains left-turn pockets at intersections. The road segment from Rancho San Carlos Road to Laureles Grade is a two-lane roadway with improved shoulders and left-turn pockets at most intersections. The pavement narrows east of Laureles Grade, with only one left-turn pocket at Ford Road. East of Esquiline Road, Carmel Valley Road narrows further, with no left-turn pockets and undeveloped shoulders.

Traffic control on Carmel Valley Road is generally exercised by stop signs on entering streets. The intersection of Carmel Valley Road and Carmel Rancho Boulevard is controlled by a multi-phase traffic signal providing left-turn phasing for east- and westbound vehicles. Carmel Valley Road is controlled by a yield sign at the T-intersection with Highway 1. However, at this intersection turning movements are limited to northbound right turns and southbound left turns from Highway 1 to Car-

VEHICULAR ACCESS FOR PROPOSED WATER SUPPLY ALTERNATIVES

FIGURE 10-1



SOURCE: CALIFORNIA STATE AUTOMOBILE ASSOCIATION

91417

MILES 0 2 4

eip

mel Valley Road and westbound right turns from Carmel Valley Road to Highway 1. In order to travel south on Highway 1 from westbound on Carmel Valley Road, it is necessary to make a left turn at Carmel Ranch Boulevard, a right turn at Rio Road and then a left turn at Highway 1.

Table 10-1 presents recent traffic count data collected by the Monterey County Department of Public Works. It is apparent that there is little through traffic on Carmel Valley Road. The trip between Carmel and Greenfield can be more easily made using Highways 68 and 101. Most of the traffic on Carmel Valley Road east of Highway 1 enters and leaves via Highway 1 or is purely local.

The heaviest traffic on the section of Carmel Valley Road occurs east and west of its intersection with Carmel Rancho Boulevard, just east of Highway 1. The majority of the traffic is generated by commercial development near this intersection.

The County of Monterey is presently revising its Carmel Valley Master Plan, and has prepared a Subsequent EIR to the 1986 Carmel Valley Master Plan EIR.[1] This Supplemental EIR is evaluating a number of revisions to the land use and transportation policies of the existing Carmel Valley Master Plan. The primary objectives of the revised master plan are to balance growth with transportation improvements that are feasible both physically and economically, and to provide a circulation improvement program, including physical improvements and cost allocation principals.

Specific improvements to Carmel Valley Road that are being evaluated at a program level include:

- provision of a traffic signal at the intersection of Rio Road and Carmel Valley Road;
- widening the 4.4-mile section from Via Petra to Robinson Canyon Road from two to four lanes;
- preservation of the existing two-lane road from Robinson Canyon Road to Ford Road, with the addition of paved shoulders and left-turn channelization; and
- shoulder improvement and possible curve realignment east of Esquiline Road.

In addition, the plan recommends that Highway 1 be widened from two to four lanes between Carmel Valley Road and Rio Road in conjunction with the proposed Hatton Canyon Freeway project. The plan also calls for the monitoring of traffic conditions on Carmel Valley Road.

TABLE 10-1

EXISTING TRAFFIC VOLUMES AND PEAK HOUR LOS DATA
WITHIN THE PROJECT AREA

Segment	1990[1] AADT	Peak[2] Hour	Peak Hour LOS
Highway 1			
North of Carmel Valley Road	42,000[3]	4,600[3]	F
South of Carmel Valley Road	20,900[3]	2,300[3]	F
Carmel Valley Road			
Highway 1 to Carmel Rancho Boulevard	21,030	2,100	F
Carmel Rancho Boulevard to Rio Road	24,486	2,450	A
Rio Road to Rancho San Carlos Road	17,849	1,780	A
Rancho San Carlos Road to Schulte Road	15,300	1,530	D
Schulte Road to Robinson Canyon Road	13,688	1,370	D
Robinson Canyon Road to Laureles Grade	10,637	1,060	D
Laureles Grade to Ford Road	11,941	1,190	D
Ford Road to Esquiline Road	9,129	910	C
Esquiline Road to Cachagua Road[3]	2,000	200	B
Cachagua Road to Martin Road[3]	600	60	B
Laureles Grade			
North of Carmel Valley Road	5,000	500	D
South of Highway 68	5,800	580	D
Highway 68			
Highway 1 to Josselyn Canyon	20,200	2,020	A
Josselyn Canyon to Olmstead	20,200	2,020	E
Olmstead to Highway 218	20,200	2,020	E
Highway 218 to York	17,900	1,190	E
York to Toro Park Intersection	16,700	1,670	E
East of Toro Park Intersection	19,600	1,960	A
Cachagua Road			
Tassajara Road to Carmel Valley Road	500	50	--

[1] AADT means annual average daily traffic.
[2] Estimated at 10 percent of AADT.
[3] 1985 AADT.

Source: Caltrans. Traffic Volumes on State Highways, 1989.

The schedule for implementation of these elements is uncertain at the time of writing. However, for this section it is assumed that these road improvements will not be completed prior to the start of any dam construction.

A common measure of a road or intersection's performance is the level of service (LOS) provided during the heaviest traffic flow. The LOS is defined as the ratio of the volume of traffic to the capacity of the intersection or road segment. LOS is defined by letter grades: LOS A refers to completely uncongested traffic flow, while LOS F refers to extreme congestion. LOS C (light congestion with occasional back-ups) is considered the minimum level of service that should be provided by an intersection or road segment during peak hour demands; it has been established as the minimum service standard for Carmel Valley Road.[1] LOS B refers to stable traffic flow with slight restrictions, while LOS D refers to traffic approaching unstable flow. Tables 10-1 and 10-2 presents the existing peak hour LOS data for pertinent portions of Carmel Valley Road. In general, unacceptable level of service standards exist for the portion of Carmel Valley Road near the intersection with Highway 1.

As shown in Figure 10-1, each of the reservoir alternatives would affect different portions of the existing road network. The New Los Padres alternative is accessible via Cachagua Road (from both directions) to Nason Road. The Cañada Reservoir alternative would affect about 5.7 miles of Carmel Valley Road; access to the Cañada Dam construction site would also occur via Highway 68.

10.1.2 DESALINATION ALTERNATIVES

Highway 1 is the main arterial within the study area, oriented in a north-south direction along the coast. Highway 1 is composed of a two-lane, unrestricted access roadway from north of Moss Landing south to the intersection with Highway 156; from this point south, Highway 1 is a four-lane, limited access roadway south to Carmel, where it again becomes a two-lane, unrestricted access roadway. Other important roadways in the project area include Highway 156, Highway 218 and Highway 68.

Traffic count data are presented in Table 10-3 for the portions of Highway 1 that could potentially be affected by project construction. In addition to Highway 1, portions of the project alternatives would affect local roadways within developed portions of Marina, Seaside and Sand City. Traffic counts for roadways within Seaside are presented in Table 10-4, while traffic counts for Marina are

TABLE 10-2

INTERSECTION PEAK-HOUR LEVELS OF SERVICE

Location	Peak-Hour LOS
Highway 1 and Carmel Valley Road	F[1]
Highway 1 and Rio Road	F[1]
Carmel Valley Road and Carmel Rancho Boulevard	D
Carmel Valley Road and Laureles Grade	A/F[2]

[1] Blocked by downroad congestion on Highway 1 from Ocean Avenue to the intersection with Carmel Valley Road.

[2] Unsignalized intersection: LOS=A for eastbound to northbound left turn; LOS=F for southbound to eastbound left turn.

Source: Planning Analysis and Development, Draft Environmental Impact Report Carmel Valley Road Improvement Plan, December 1990.

TABLE 10-3

1990 TRAFFIC COUNTS FOR STATE HIGHWAYS

		ADT	
Highway 1	Peak Hour	Peak Month	Annual Average
North of Dolan Road	3,850	38,000	33,000
Dolan Road to Molera Road	3,250	33,500	28,500
Molera Road to Jct. Rte. 183	3,150	32,500	27,500
Jct. Rte. 183 to Jct. Rte. 156	2,000	20,300	17,400
Jct. Rte 156 to Nashua Road	4,250	44,000	37,500
Nashua Road to Del Monte Blvd.	3,850	41,500	36,000
Del Monte Blvd to South Marina Int.	3,550	38,000	33,500
South Marina Blvd to Ft. Ord (12th Street)	6,700	73,000	66,000
Ft. Ord (12th St.) to Ft. Ord (Main Int.)	6,000	65,000	60,000
Ft. Ord (Main Int.) to Ord Village Int.	6,800	73,000	69,000
Ord Village Int. to Rte. 218	5,500	57,000	55,000
Highway 156			
East of Highway 1	2,200	23,600	21,000
East of Highway 183	2,400	26,000	23,000
Highway 183			
South of Highway 1	1,150	13,000	11,300
South of Highway 156	2,050	23,700	21,600
North of Espinosa Road	1,700	16,500	15,000

Source: Caltrans, 1990 Traffic Volumes on California State Highways.

TABLE 10-4

TRAFFIC COUNT DATA
CITY OF SEASIDE

Location	ADT, July 1990
Fremont Boulevard	
Intersection with Highway 1	27,212
South of Del Monte Boulevard	18,906
at Playa Avenue	18,839
at Echo Avenue	20,767
at Trinity Avenue	27,479
North of Canyon Del Rey Boulevard	30,238
South of Canyon Del Rey Boulevard	35,242
Del Monte Boulevard	
South of Fremont Boulevard	9,311
at La Salle Avenue	9,654
at Tioga Avenue	12,967
at Palm Avenue	24,182
North of Canyon Del Rey Boulevard	28,184
Canyon Del Rey Boulevard (SR 218)	
North of Del Monte Boulevard	22,867
South of Del Monte Boulevard	19,744
North of Fremont Boulevard	10,760
South of Fremont Boulevard	11,220

Source: Narayan Thadani, City of Seaside, Department of Public Works, personal communication, February 27, 1992.

presented in Table 10-5. Figures 10-2 and 10-3 show the transportation conditions in Marina and Seaside/Sand City, respectively, that could be affected by project construction.

10.2 STANDARDS OF SIGNIFICANCE

A project would generally be considered to have a significant adverse impact on traffic if its construction or operation were to result in a degradation of roadway conditions to below LOS C or would add vehicular trips to a roadway already operating unacceptably (LOS D or worse), would necessitate the upgrade or expansion of the existing road network, or would cause substantial disruption or delay in existing traffic patterns, thus substantially inconveniencing a large number of motorists.

10.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

10.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Impact 10.3.1-1

Construction of the 24,000 AF New Los Padres project would result in a temporary increase in traffic levels during the 22-month construction period.

During project construction, traffic volumes on Carmel Valley Road and Cachagua Road would increase. The estimated construction traffic levels are shown in Table 10-6, while Table 10-7 presents a breakdown of the truck deliveries. Work at the construction site would occur in two ten-hour shifts per day, five days per week during the six-month peak construction phase. During the six-month peak phase of construction, about 20 truck trips each day, 10 in each direction, five days per week, would be necessary to transport construction materials and equipment to the dam site. In addition, an estimated 176 automobile trips per day would occur during the six-month peak construction period to transport workers to and from the construction site. It is assumed that all of these trips would occur on Carmel Valley Road between State Highway 1 and the site, although it is possible that a few workers might use Laureles Grade from Highway 68. Average daily traffic volumes on Carmel Valley Road would be increased by about 33 percent near the dam site. The percentage increase would decline, moving westward, to a value of less than one percent at the Carmel Valley Road/State Highway 1 intersection.

TABLE 10-5

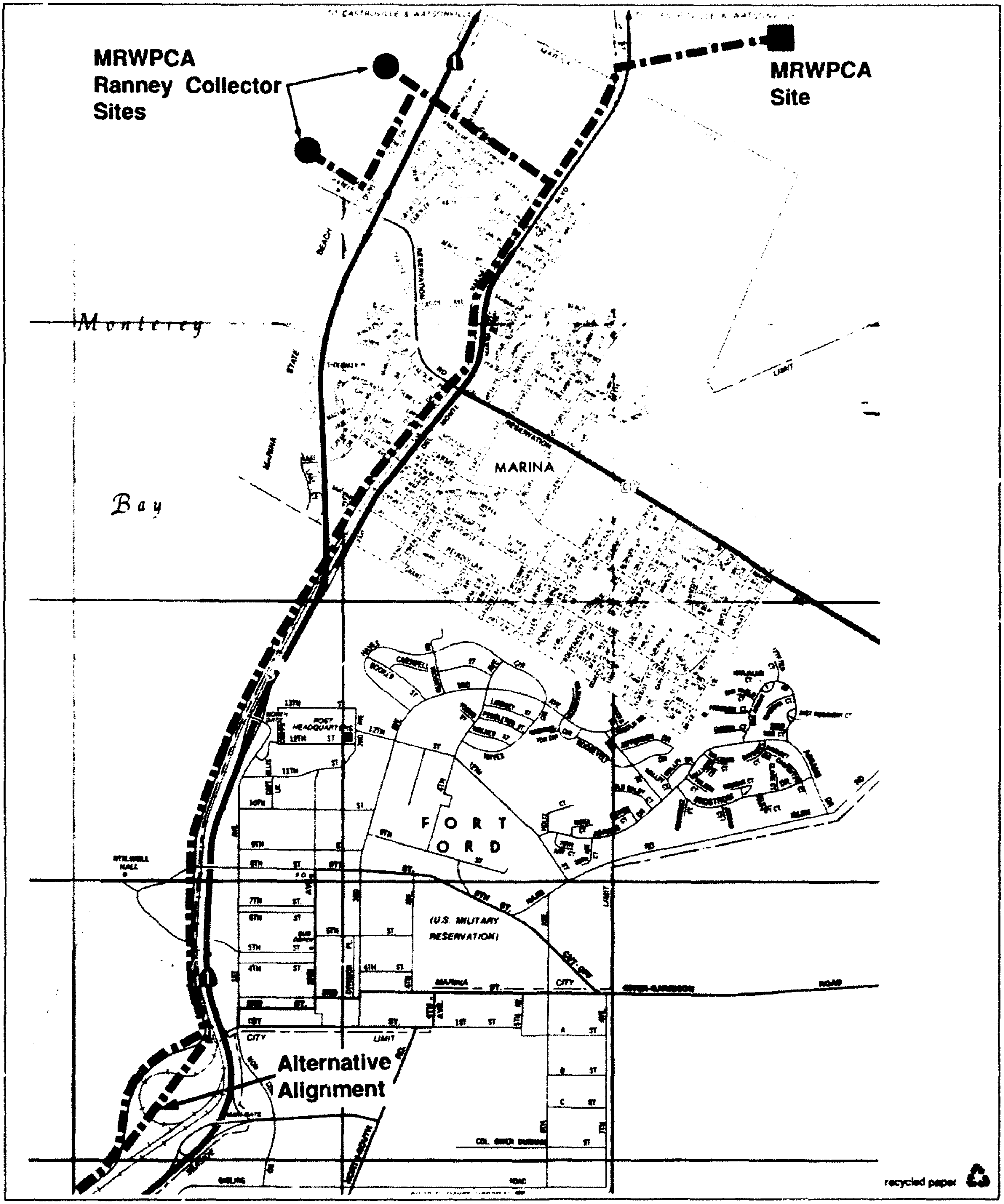
TRAFFIC COUNT DATA
CITY OF MARINA

Location	ADT	PM Peak LOS
Del Monte Avenue at Palm Avenue	27,045	B (northbound)
Del Monte Avenue, South of Reindollar Avenue	34,082	D

Source: Peter Le, City of Marina.

MARINA TRANSPORTATION SETTING

FIGURE 10-2



SOURCE: AAA, JAMES M. MONTGOMERY ENGINEERS

FEET 0 2000 4000

91417

recycled paper

SOURCE: AAA AND JAMES M. MONTGOMERY ENGINEERS

FEET 0 2000 4000

91417

TABLE 10-6

24,000 AF NEW LOS PADRES
ESTIMATED CONSTRUCTION TRAFFIC LEVELS

Phase	Duration, Months	Vehicle Trips Per Day[1] Cars[2]	Vehicle Trips Per Day[1] Trucks
Mobilization	12[3]	106	0.5[5]
Construction	4[3]	106	13
	6[4]	176	20

1 One round-trip equals two vehicle trips.
2 Assumes 1.3 workers per vehicle.
3 Five days per work week, one ten-hour shift per day.
4 Five days per work week, two ten-hour shifts per day.
5 Does not include truck trips for firewood removal.

Source: Bechtel Civil, Inc.

TABLE 10-7

ESTIMATED TRUCK DELIVERIES TO
THE NEW LOS PADRES DAM CONSTRUCTION SITE

Material	Duration (Months)	Intensity (Loads/Month)	Total Trips
Cement	4	100	400
	6	300	1,800
Steel	10	2	20
Lumber	6	1	6
Dynamite	10	1	10
Fuel	20	4	80
TOTAL			2,256

Source: Bechtel Civil, Inc.

Although the percentage change in average daily traffic volumes resulting from the project would be small, particularly west of Ford Road, the additional truck traffic would be noticeable. During the off-peak hours, the impact would be primarily visual and would not materially affect traffic flow. Traffic resulting from a shift change at or near midnight might also be noticeable because existing traffic flows at that time are light.

A shift change at the construction site during the afternoon peak hour (typically 5:00 to 6:00 pm) would generate up to 60 additional vehicular trips; truck deliveries of equipment or materials could also add a few trips to peak-hour traffic volumes. At present, Carmel Valley Road operates at LOS D between Rancho San Carlos Road and Ford Road, a distance of about eight miles (see Table 10-1). Worse yet, Highway 1 operates at LOS F both north and south of Carmel Valley Road. Thus, the addition of any peak-hour vehicular trips to either Carmel Valley Road or Highway 1 would constitute a significant impact.

While the existing Levels of Service are not expected to change substantially in the near future, it is possible that the road improvements planned for Carmel Valley Road and Highway 1 (see Section 10.1 for a description of these improvements) could be completed prior to the start of construction of the proposed dam. In this case, the level of service provided by the road network would be improved considerably, as compared to the present conditions. If the planned road improvements were completed when dam construction commenced, the significance of the impacts on traffic levels would be correspondingly reduced.

East of Carmel Valley Village, Carmel Valley and Cachagua Roads become narrow, steep and winding. It would prove difficult for the larger trucks to negotiate some small radius turns without entering the opposing traffic lane

The areas to be inundated would need to be cleared and grubbed prior to filling the reservoir. Timber harvesting could generate up to three lumber truck trips per day for the three month period when the lumber and firewood is being transported out from the reservoir site.

Mitigation Measures 10.3.1-1

The following measures are suggested to mitigate the effects of project construction on traffic safety and traffic flow on Carmel Valley Road, Cachagua Road and Highway 1.

a) *The number of workers' vehicles using Carmel Valley and Cachagua Roads could be reduced by establishing a work camp at or near the site.*

b) *Working hours would be set so as to avoid shift changes during peak hours; for example, normal working hours of 6:00 a.m. to 3:30 p.m. could be established.*

c) *A worker parking area and shuttle buses could be provided to reduce the volume of traffic on Carmel Valley and Cachagua Roads. The parking area would need to be about one-half acre, and could be located in the western portion of Carmel Valley, or outside the Valley altogether. Potential parking areas include a vacant field, or possibly a church parking lot for use during the week; alternatively, a lot could be developed that would have civic use after project construction was completed.*

d) *Trucks delivering construction materials or supplies would be prohibited from traveling to or from the site during peak traffic flow periods, and would be limited to daylight hours only.*

e) *Heavy trucks traversing the narrow and winding sections of Carmel Valley and Cachagua Roads near the dam site would be accompanied by a flagman or pilot vehicle to improve traffic safety.*

f) *Trucks hauling timber and firewood from the reservoir inundation area would be scheduled to avoid peak hour traffic periods.*

g) *Any damage to the roadbed of Carmel Valley Road, Cachagua Road, and any other roads caused by the passage of construction vehicles would be repaired.*

Because traffic levels on Carmel Valley Road and Highway 1 are presently operating below LOS C, any addition of traffic would be significant. Therefore, while the mitigation measures provided would lessen the impacts of dam construction on traffic, and the remaining impacts would not be permanent, the overall impact of dam construction would be significant and unavoidable, but not permanent.

Impact 10.3.1-2

Operation of the proposed New Los Padres Reservoir would result in a slight increase in long-term traffic volumes in the vicinity of the dam site.

The proposed New Los Padres Reservoir would be visited twice daily by operation and maintenance personnel, for a total of four vehicle trips. In addition, the New Los Padres alternative would include the truck transport of anadromous fish for about eight months per year, with an annual average of about five trips per day from upstream of the dam to downstream of the dam. This amount of vehicular traffic would not affect the level of service provided by the existing road network, and therefore would have a less than significant impact on traffic.

Some degree of channel clearing and maintenance would also be associated with this alternative, as described in Chapter 7. These operations would be essentially gravel mining operations conducted during the low-flow summer months. There could be brief periods of relatively intense activity (i.e., 10 to 15 truckloads per day for one to two weeks), but the overall effect would be less than significant. In addition, there would be a few truck trips per year associated with this alternative to replenish spawning gravels to the river; this impact would also be considered less than significant.

Mitigation Measure 10.3.1-2

Truck trips associated with cleaning and maintenance would be scheduled between the hours of 9 a.m. and 4 p.m. to avoid peak traffic periods.

The overall impact on traffic would be less than significant.

10.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Impact 10.3.2-1

Construction of the 24,000 AF New Los Padres Dam would result in temporary increase in traffic levels during the 22-month construction period.

This would be identical to that described under Impact 10.3.1-1.

Mitigation Measure 10.3.2-1

See Mitigation Measures 10.3.1-1.

Impact 10.3.2-2

Operation of the proposed New Los Padres Reservoir would result in a slight increase in long-term traffic volumes in the vicinity of the dam site.

This would be identical to that described under Impact 10.3.1-2.

Mitigation Measure 10.3.2-2

See Mitigation Measures 10.3.1-2.

Impact 10.3.2-3

Construction of the 3 MGD desalination plant would result in a temporary increase in traffic levels during the construction period.

As described in the Desalination Project EIR, project construction would have a temporary adverse impact on traffic flow in the vicinity of the project site, lasting for the duration of construction, or about 15-18 months. Existing traffic levels would be increased by the delivery of materials and equipment to the project site and by workers commuting to and from the site on a daily basis. The main access to the Sand City plant site would be from Highway 1 and Del Monte Avenue in Seaside, and local streets in Sand City.

Pipeline construction would be accomplished by a trench-and-fill operation that would be limited to the vicinity of the desalination plant, Catalina Street and Sand Dunes Drive. Pipeline construction occurring in public roadways would necessitate the closure of one lane of traffic in the vicinity of active construction. Alternating one-way traffic flow around the construction site would be necessary, although complete closure of roads may be necessary for some periods of time. During construction, access to driveways would be temporarily blocked. Pipeline construction would proceed at an average rate of about 200 feet per day; thus, no one access point would be blocked for more than a few hours.

These traffic impacts would inconvenience motorists, but would be temporary, and alternative routes are available for through traffic. While these impacts are considered to be less than significant, a number of measures are recommended to lessen the potential impacts of project construction.

Mitigation Measure 10.3.2-3

(a) *Adequate off-street worker parking should be provided at the desalination plant site.*

(b) *Truck deliveries should be scheduled to avoid peak-hour traffic as much as possible.*

(c) *Pipeline construction should be expedited so that disturbances would be as short as possible.*

(d) *At least one lane of traffic should be kept open whenever possible. While trenching across a cross street, only one-half of the roadway should be under construction at any time; this would allow cross traffic to flow, although at a restricted rate.*

(e) *Flagman or signal-controlled one-way operation should be provided where two-way operation is impractical or unsafe.*

(f) *Roadway disturbances should be minimized during non-working hours; open trenches should be covered with steel plates or by the use of temporary backfill.*

(g) *Temporary steel plate trench crossings should be provided as needed to maintain access to homes, businesses, etc.*

(h) *Construction sites should be posted with appropriate warning signage and lighting, and advance warning of construction should be provided to allow motorists to select an alternative travel route.*

(i) *Construction staging areas should be provided to minimize storage of equipment and materials in the traffic lanes.*

(j) *All paved surfaces disturbed during construction should be repaved when work is complete.*

(k) *Contractors should provide traffic control and diversion plans for review and approval by the Monterey County Department of Public Works.*

Impact 10.3.2-4

Operation of the proposed Sand City desalination plant would result in a slight increase in traffic volumes on local streets in Sand City, and Del Monte Boulevard and Highway 1 near Seaside.

Operation of the desalination plant would involve some additional vehicular trips on an on-going basis. Four to five workers would commute to the site, and materials and chemicals would be delivered to the site. An estimated 10 vehicular trips and one truck trip per day would be expected at the site, on average. Overall, this impact would be considered less than significant.

Mitigation Measure 10.3.2-4

None required or recommended.

10.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 10.3.3-1

Construction of the 15,000 AF Cañada Dam and Reservoir would result in a significant increase in traffic levels.

A separate traffic study was performed to evaluate the construction impacts of the 25,000 AF Cañada Reservoir alternative for the 1991 SD EIR/EIS.[2] This study concluded that traffic impacts could be reduced by constructing an access road to the construction site via Highway 68 rather than accessing the site from Carmel Valley Road.

Construction activities for the 15,000 AF Cañada Reservoir would last for an estimated three years. Dam construction would involve an average work force of 55 persons, with a peak of 80. This would mean that an average of about 160 vehicle trips per day would occur, with up to 29 peak hour vehicular trips per day. At the peak of construction, about 240 vehicle trips per day would occur.

A total of about 943,000 cubic yards of material would need to be imported to allow the construction of this alternative. This material would likely come from quarries near Aromas, Soledad and Marina, and access to the dam site would be via Highway 68. A total of about 55,000 truck trips would be necessary to transport this material, or a total of about 110,000 one-way trips. Assuming that the material would be imported over a period of three years, there would be an average of 60 truck trips per day, six days per week. For a ten-hour day, this would equal one trip every 10 minutes.[3] Up to 20 additional truck trips per day would be necessary to deliver equipment, fuel, materials and supplies to the site.

In addition to the Cañada Dam, a water treatment facility would also be constructed as part of this alternative. Access to this project would be via Highway 1 and Carmel Valley Road. Water treatment plant construction would involve a peak of 50 workers and 150 vehicular trips per day, and an average of 170 truck trips per day. A summary of the traffic volumes associated with this alternative is presented in Table 10-8.

No change in level of service is expected to occur as a result of construction of this alternative.[4] The project would, however, contribute vehicular trips to road segments that are presently operating below LOS C; for this reason, the project impacts are considered significant.

Mitigation Measures 10.3.3-1

(a) *Highway 68 shall be used as much as possible for construction access in order to avoid Highway 1 and Carmel Valley Road.*

TABLE 10-8

ESTIMATED CONSTRUCTION TRAFFIC LEVELS
15,000 AF CAÑADA DAM AND RESERVOIR

Element	Peak Vehicle Trips Per Day		Total Vehicle Trips	
	Car	Truck	Car	Truck
Dam	240	90	144,000	65,000
Water Treatment Plant	150	170	94,000	19,000
		TOTAL	238,000	84,000

Source: Brown and Caldwell Consultants.

(b) *Upon completion of construction, all roadways in the project vicinity shall be restored to pre-project conditions, or an equivalent amount of funding would be contributed for roadway repair and upgrade.*

(c) *Funding would be provided for the channelization and traffic control at access points on Carmel Valley Road and Highway 68. This could include signalization, left- or right-turn channelization, or widening of the approach roads.*

(d) *A work zone traffic control plan would be prepared for both Highway 68 and Carmel Valley Road.*

(e) *Workers could be transported to the construction site via carpools, vanpools or shuttle bus with satellite parking, if possible.*

Even with the implementation of these mitigation measures, the impacts on traffic that would result from this alternative would be significant and unavoidable, for a period of three years.

Impact 10.3.3-2

Operation of the proposed Cañada Reservoir would result in a slight increase in long-term traffic volumes in the vicinity of the dam site.

Operation of the proposed Cañada Reservoir would employ an estimated 10 people. In addition, about one truck trip per week would be generated, for a total of about 31 daily trips and four peak hour trips.[5] This amount of vehicular traffic would not affect the level of service provided by the existing road network, and therefore would have a less than significant impact on traffic.

Some degree of channel clearing and maintenance would also be associated with this alternative, as described in Chapter 7. These operations would be essentially gravel mining operations conducted during the low-flow summer months. There could be brief periods of relatively intense activity (i.e., 10 to 15 truckloads per day for one to two weeks), but the overall effect would be less than significant. In addition, there would be a few truck trips per year associated with this alternative to replenish spawning gravels to the river; this impact would also be considered less than significant.

Mitigation Measure 10.3.3-2

Truck trips associated with cleaning and maintenance would be scheduled between the hours of 9 a.m. and 4 p.m. to avoid peak traffic periods.

Impact 10.3.3-3

Construction of the 3 MGD desalination plant would result in a temporary increase in traffic levels during the construction period.

This would be identical to that described under Impact 10.3.2-3.

Mitigation Measure 10.3.3-3

Please refer to Mitigation Measures 10.3.2-3.

Impact 10.3.3-4

Operation of the proposed Sand City desalination plant would result in a slight increase in traffic volumes on local streets in Sand City, and Del Monte Boulevard and Highway 1 near Seaside.

This would be identical to that described under Impact 10.3.2-4.

Mitigation Measure 10.3.3-4

None required or recommended.

10.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impact 10.3.4-1

Construction of the 3 MGD desalination plant would result in a temporary increase in traffic levels during the construction period.

This would be identical to that described under Impact 10.3.2-3.

Mitigation Measures 10.3.4-1

Please refer to Mitigation Measures 10.3.2-3.

Impact 10.3.4-2

Operation of the proposed Sand City desalination plant would result in a slight increase in traffic volumes on local streets in Sand City, and Del Monte Boulevard and Highway 1 near Seaside.

This would be identical to that described under Impact 10.3.2-4.

Mitigation Measure 10.3.4-2

None required or recommended.

Impact 10.3.4-3

Construction of the proposed MRWPCA alternative would result in a temporary increase in traffic volumes in the vicinity of project construction, and a disruption of traffic flow in the vicinity of pipeline construction.

Project construction would have a temporary adverse impact on traffic flow in the vicinity of the project site, lasting for the duration of construction, or about 15 to 18 months. At the proposed MRWPCA site, existing traffic levels would be increased by the delivery of materials and equipment to the project site and by workers commuting to and from the site on a daily basis. The peak-construction workforce is expected to comprise about 50 workers. Assuming 1.3 workers would occupy each vehicle, and that they stay at the site for the entire day, an estimated 80 vehicular trips per day would be generated by the commuting workers. Trips generated by the delivery of equipment and materials would vary, and would depend on the construction methods selected by the contractor. Typically, construction delivery trucks to the site would likely average about 10 trips per day, with a peak of about 50. The main access to the MRWPCA plant site would be from Highway 1, Del Monte Avenue and Reservation Road.

Pipeline construction would be accomplished by a trench-and-fill operation that would proceed along roadways during much of the route. Where pipeline construction would occur in public roadways, it would necessitate the closure of one lane of traffic in the vicinity of active construction. Alternating one-way traffic flow around the construction site would be necessary, although complete closure of roads may be necessary for some periods of time. During construction, access to driveways would be temporarily blocked. Pipeline construction would proceed at an average rate of about 200 feet per day; thus, no one access point would be blocked for more than a few hours.

These traffic impacts would inconvenience motorists, but would be temporary and, for much of the proposed pipeline route, alternative routes are available for through traffic. While these impacts are considered to be less than significant, a number of measures are recommended to lessen the potential impacts of project construction.

Mitigation Measure 10.3.4-3

Mitigation measures 10.3.2-3 also would be applicable to this alternative.

Impact 10.3.4-4

Operation of the proposed MRWPCA desalination plant would result in a slight increase in traffic volumes on Del Monte Avenue and Highway 1 near Marina.

Operation of the desalination plant would involve some additional vehicular trips on an on-going basis. Four to five workers would commute to the site, and materials and chemicals would be delivered to the site. Thus, an estimated 10 vehicular trips and one truck trip per day would be expected at the site, on average. Overall, this impact would be considered less than significant.

Mitigation Measure 10.3.4-4

None required or recommended.

10.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

The No Project alternative would have only a minor amount of associated construction, with less than significant construction-related traffic impacts, and no mitigation measures would be required.

Impact 10.3.5-1

The No Project Alternative would result in no increase in long-term operational traffic levels.

The existing dams are visited twice a day by operation and maintenance personnel, and these visits would continue. However, no degradation of level of service, and hence no significant impact, would occur as a result of the No Project alternative.

Mitigation Measure 10.3.5-1

None necessary.

---

1. Planning Analysis and Development, Draft Environmental Impact Report Carmel Valley Road Improvement Plan, December 1990.

2. Keith B. Higgins & Associates, Inc., Cañada Reservoir Traffic Analysis Report, Monterey County, California, February 1991.

3. Brown and Caldwell, Cañada Reservoir Project Phase 3 Analysis of 15,000 Acre-Foot Reservoir, Draft Report, November 1992.

4. Ibid.

5. Ibid.

11. CLIMATE AND AIR QUALITY

11. CLIMATE AND AIR QUALITY

A major concern regarding dam construction involves the potential impacts to air quality from project construction and operation. Air quality impacts include both short-term and long-term primary impacts, as well as secondary impacts. Short-term primary impacts include emissions from both mobile and stationary sources during the construction period, including vehicle emissions, blasting, clearing, burning, quarrying, aggregate preparation, and road dust. Long-term primary impacts include vehicle emissions, road dust, watershed management and emissions from increased electrical energy generation. Secondary impacts may result as various types of emissions combine to form secondary pollutants. The effects of each of the project alternatives on energy supplies is discussed in Chapter 16.

11.1 SETTING

The Carmel River drains a basin of 255 square miles on the Central California coast, entering the Pacific Ocean at Carmel Bay. The upper watershed is extremely rugged with steep, narrow canyons and peaks up to 5000 feet. Orographic effects are pronounced; mean annual precipitation varies from about 16 inches at sea level near the river mouth to over 40 inches in the high peaks of the southern part of the basin. Precipitation is almost entirely rain, with the majority falling between the months of November and March.

The climate of the Monterey Region is generally mild, with warm, dry summers and cool, wet winters. On the coast, monthly average maximum and minimum temperatures range from 61° F average maximum and 44° F average minimum during the winter to 68° F average maximum and 51° F average minimum in the summer, with summer temperatures kept low due to the frequent coastal fog. Temperatures are more extreme farther inland. At Carmel Valley Village, average monthly maximum and minimum temperatures range from a low of 64° F and 39° F in January to a high of 80° F and 50° F in September.

This climate is primarily the result of a semi-permanent high pressure cell in the eastern Pacific, known as the Pacific High. During the summer, the Pacific High causes persistent west and northwest winds along the coast. Descending warm air in the Pacific High forms a stable temperature inversion over a cool layer of coastal air. This warmer air tends to inhibit vertical air movement, although good air quality is generally maintained by the strong on-shore flow of cool air.[1]

During the winter months, the Pacific High migrates southward and has less influence on the region. Northwest winds are still dominant, although easterly winds become more frequent. The general absence of deep, persistent inversions and the cleansing effect of storm systems tend to maintain good air quality in the area during the winter and early spring.

In the fall, surface winds diminish, and an occasional air flow reversal allows pollutants to collect over a period of days. Also, winds may develop that transport pollutants from either the San Francisco Bay area or the Central Valley to the Monterey region.

The northwest-southeast trend of the mountain ranges in the Monterey area tends to channel the on-shore air flow along the valley floors, although in the upper Carmel River watershed the more complex terrain may create localized conditions which differ markedly depending on the surrounding topography.

REGULATORY AGENCIES

A number of federal, State, regional, and local agencies are involved in the planning process for the protection of the air quality of this region. In addition, major construction projects, such as dam building, would require permits from several agencies.

At the federal level, the Environmental Protection Agency (EPA) is charged with administering the Clean Air Act and other air quality related legislation. The EPA must approve state implementation plans as required by the Clean Air Act.

In 1971, the EPA established federal standards for five major criteria air pollutants: photochemical oxidants (ozone), carbon monoxide (CO), suspended particulate matter (originally the standard applied to particulates of any diameter, termed total suspended particulates or TSP, but the standard was changed in 1987 to apply only to particulates less than 10 microns in diameter, termed PM_{10}), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). State ambient air quality standards were first established for California in 1969, pursuant to the Mulford-Carrell Act. The federal and State standards, given in Table 11-1, provide acceptable concentrations for specific contaminant levels in order to protect public health and the public welfare (to prevent damage to vegetation, property, and visibility). State standards are more stringent than federal standards, as shown in Table 11-1.

At the State level, the California Air Resources Board (CARB) is responsible for coordinating State and federal programs. CARB sets State air quality standards and coordinates local and regional plans.

At the regional level, the Monterey Bay Unified Air Pollution Control District (MBUAPCD) shares responsibility with CARB for ensuring compliance with State and federal ambient air quality standards within the North Central Coast Air Basin (NCCAB) which is comprised of Monterey, Santa Cruz, and San Benito Counties. The MBUAPCD has primary responsibility for the control of air pollution from stationary sources, which includes issuing permits and inspecting for certain types of activities. The MBUAPCD is also responsible for monitoring ambient air quality.

HISTORICAL AIR QUALITY

The NCCAB is designated as nonattainment for the State and federal ozone standards and nonattainment for the State PM_{10} standards. The more stringent California standards for ozone are exceeded on a more frequent basis than the federal standards. Table 11-2 presents data on ozone violations for both federal and State standards from 1978-89 for nine monitoring stations operated by the MBUAPCD within the NCCAB.

Similar to ozone, State PM_{10} standards are more stringent than federal standards. Although monitoring of PM_{10} has only been conducted since 1985, no violations of the federal standards have been reported, however, the State standard is exceeded regularly. Table 11-3 lists the location and dates for the PM_{10} violations in the NCCAB.

The MBUAPCD currently operates four air monitoring stations in the NCCAB in Salinas, Hollister, Carmel Valley, and Santa Cruz. At the Carmel Valley station, the State ozone standard was exceeded for three days in 1989, with exceedances also occurring at the Hollister and Davenport stations. No exceedances of the State ozone standard were reported at the Carmel Valley station in 1990.

TABLE 11-1

FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standard[3]	Federal Standards[2] Primary[4]	Secondary[5]
Ozone	1-hour	0.09 ppm (180 ug/m^3)	0.12 ppm (235 ug/m^3)	0.12 ppm (235 ug/m^3)
Carbon Monoxide	1-hour	20.00 ppm (23 mg/m^3)	35.00 ppm (40 mg/m^3)	35.00 ppm (40 mg/m^3)
	8-hour	9.00 ppm (10 mg/m^3)	9.00 ppm (10 mg/m^3)	9.00 ppm (10 mg/m^3)
Nitrogen Dioxide	1-hour	0.25 ppm (470 mg/m^3)	--- ---	--- ---
	Annual Average	--- ---	0.053 ppm (100 ug/m^3)	0.053 (100 mg/m^3)
Sulfur Dioxide	1-hour	0.25 ppm (655 mg/m^3)	--- ---	--- ---
	3-hour	--- ---	--- ---	1300 ug/m^3 (0.5 ppm)
	24-hour	0.05 ppm[6] (131 ug/m^3)	365 ug/m^3 (0.14 ppm)	--- ---
	Annual Average	--- ---	80 ug/m^3 (0.03 ppm)	--- ---
Suspended Particulate Matter (PM_{10})	24-hour	50 ug/m^3	150 ug/m^3	150 ug/m^3
	Annual Geometric Mean	30 ug/m^3	---	---
	Annual Arithmetic Mean	---	50 ug/m^3	50 ug/m^3
Sulfates	24-hour	25 ug/m^3	---	---
Lead	30-Day Average	1.5 ug/m^3	---	---
	Calendar Quarter	---	1.5 ug/m^3	1.5 ug/m^3
Hydrogen Sulfide	1-hour	0.03 ppm (42 ug/m^3)	--- ---	--- ---
Vinyl Chloride	24-hour	0.010 ppm (26 ug/m^3)	--- ---	--- ---
Visibility-Reducing Particles	1 Observation	Visibility $\leq$ 10 miles[7]	---	---

TABLE 11-1 (Continued)

---

[1] Concentrations expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees C and a reference pressure of 760 mm of mercury. Note: ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas. ug/m^3 = micrograms per cubic meter.

[2] National Standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

[3] California standards for ozone, carbon monoxide, sulfur dioxide (1 hour), nitrogen dioxide and particulate matter - PM_{10}, are values that are not to be exceeded. The sulfates, lead, hydrogen sulfide, vinyl chloride, and visibility-reducing particles standards are not to be equaled or exceeded.

[4] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

[5] National Secondary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.

[6] At locations where the State standards for ozone and/or suspended particulate matter are violated. National standards apply elsewhere.

[7] Prevailing visibility is defined as the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.

Source: California Air Resources Board.

TABLE 11-2

OZONE HOURLY AVERAGES EXCEEDING STATE OR FEDERAL AMBIENT AIR QUALITY STANDARDS

	Salinas		Monterey		Aptos		Hollister		Scotts Valley		Carmel Valley		Santa Cruz II		Gonzales		Davenport	
Year	Days	Hours	Days	Hours	Days	Hours	Days	Hours	Days	Hours	Days	Hours	Days	Hours	Days	Hours	Days	Hours
Hourly Average of Greater Than 0.09 ppm (State Standard)																		
1978	7	10	0	0	1	1	4	13	0[1]	0	–	–	–	–	–	–	–	–
1979	0	0	0	0	0	0	3	3	–	–	0[2]	0	–	–	–	–	–	–
1980	1	3	1	1	4	9	12	32	5[1]	8	4	10	–	–	–	–	–	–
1981	0	0	0	0	0	0	7	24	3	3	0	0	–	–	–	–	–	–
1982	0	0	1	1	0	0	1	1	0	0	0	0	–	–	–	–	–	–
1983	0	0	0	0	1	1	4	9	–[1]	–	1	2	–	–	–	–	–	–
1984	0	0	0	0	0	0	6	8	–	–	1	1	–	–	–	–	–	–
1985	0	0	–	–	–	–	11	20	–	–	1	2	2	6	–	–	–	–
1986	0	0	–	–	–	–	1	1	–	–	0	0	0	0	0[3]	0	–	–
1987	0	0	–	–	–	–	7	15	–	–	0	0	0	0	0	0	0	0
1988	0	0	–	–	–	–	4	5	–	–	0	0	0	0	0	0	0	0
1989	0	0	–	–	–	–	1	1	–	–	3	7	0	0	–	–	1	2
1990	0	0	–	–	–	–	3	7	–	–	0	0	0	0	–	–	1	1
Hourly Average Greater Than 0.12 ppm (Federal Standard)																		
1978	0	0	0	0	0	0	0	0	0[1]	0	–	–	–	–	–	–	–	–
1979	0	0	0	0	0	0	0	0	–	–	0[2]	0	–	–	–	–	–	–
1980	0	0	0	0	0	0	1	3	0[1]	0	1	2	–	–	–	–	–	–
1981	0	0	0	0	0	0	2	4	0	0	0	0	–	–	–	–	–	–
1982	0	0	0	0	0	0	0	0	0	0	0[1]	0	–	–	–	–	–	–
1983	0	0	0	0	0	0	0	0	–	–	0	0	–	–	–	–	–	–
1984	0	0	0	0	0	0	0	0	–	–	0	0	–	–	–	–	–	–
1985	0	0	–	–	–	–	0	0	–	–	0	0	0	0	–	–	–	–
1986	0	0	–	–	–	–	0	0	–	–	0	0	0	0	0	0	–	–
1987	0	0	–	–	–	–	0	0	–	–	0	0	0	0	0	0	0	0
1988	0	0	–	–	–	–	0	0	–	–	0	0	0	0	0	0	0	0
1989	0	0	–	–	–	–	0	0	–	–	1	1	0	0	–	–	0	0
1990	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

1 Closed 3/16/78, reopened 7/1/80, closed 9/30/82.
2 Closed 3/31/76, reopened 3/7/79.
3 Opened 9/86.

Source: California Air Quality Data Summary of Air Quality Data, Gaseous and Particulate Pollutants, California Air Resources Board.

TABLE 11-3

RECORDED VIOLATIONS OF THE PM_{10} CALIFORNIA AAQS
IN THE NORTH CENTRAL COAST AIR BASIN

Station	Date	Concentration (ug/m^3)
Hollister	February 25, 1986	52
Santa Cruz	April 21, 1987	58
Salinas	June 2, 1987	52
Santa Cruz	September 6, 1987	54
Hollister	September 6, 1987	50
Salinas	September 18, 1987	52
Santa Cruz	September 30, 1987	52
Hollister	September 30, 1987	58
Santa Cruz	October 6, 1987	82
Salinas	October 6, 1987	54
Hollister	October 18, 1987	53
Santa Cruz	November 11, 1987	52
Santa Cruz	January 26, 1988	50
Santa Cruz	August 25, 1988	56
Santa Cruz	September 30, 1988	52
Santa Cruz	October 30, 1988	50
Salinas	December 5, 1988	51
Hollister	December 5, 1988	58
Santa Cruz	December 5, 1988	64
Hollister	January 28, 1989	58
Santa Cruz	June 21, 1989	51
Salinas	June 21, 1989	54
Salinas	December 12, 1989	51
Salinas	January 5, 1990	56

Source: MBUAPCD

Major sources of air pollutant emissions in Monterey County are fuel combustion by industrial, manufacturing, and electric utilities, solvent use, pesticide application, farming operations, construction and demolition, entrained road dust (paved and unpaved), unplanned fires, and vehicles.[2] Conditions are expected to be considerably different at the proposed project site (compared to the air quality monitoring sites) due to the relatively few sources of pollutants in the upper Carmel Valley area. The area is sparsely populated, with no industry other than several vineyards in the Cachagua Valley. In Carmel Valley, air quality is primarily influenced by vehicle emissions, including entrained dust from both paved and unpaved roads. There is little industry and only a small amount of agriculture in Carmel Valley.

Although the NCCAB is in compliance with most air quality standards, the federal ozone standard was exceeded at Hollister and Carmel Valley in 1980 and at Hollister in 1981. For this reason, the air basin was designated a non-attainment area for ozone in the 1982 Air Quality Plan for the NCCAB. The Federal Clean Air Act requires that all non-attainment areas prepare a Plan that demonstrates attainment of the standard by 1987. While it would appear that the stationary source controls implemented as part of that plan have been effective (since only two violations have been recorded since 1981), the recent violations recorded at the Pinnacles Station by the National Park Service and the violation at the Carmel Valley station in 1989 have led to the continuation of non-attainment status for the NCCAB by the EPA. The MBUAPCD 1989 Air Quality Management Plan (AQMP) addressed interim guidance provided by the EPA. The 1991 AQMP is designed to meet state standards and is expected to meet pending federal requirements as well since state ozone standards are more stringent than federal standards. The MBUAPCD has identified air pollution within the NCCAB as serious according to the California Clean Air Act because they do not anticipate achieving the state ozone standards until December 31, 1997.

Sensitive Receptors

The federal and state ambient air quality standards are designed to protect sensitive receptors from the health effects of air pollution. Sensitive receptors are land uses where the most sensitive members of the population would spend a substantial portion of their time. Sensitive receptors are normally considered to be residences, schools, hospitals and convalescent homes. There are numerous sensitive receptors of this type within the study area. Because people in residential districts are often at home for extended periods, the exposure times to air pollutants are quite long. Recreational land uses are moderately sensitive to air pollution. Although exposure periods are generally short in such places, vigorous exercise associated with recreation places a high demand on the human respiratory functions, which air pollution can impair. Sensitive receptors in the project vicinity include residential and recreational land uses along the Carmel River from the proposed dam site down to the aggregate storage area, including the Cachagua Community Center and other residential properties.

BASIS FOR IMPACTS

Air pollutants can be classified as primary or secondary, based upon the manner in which the pollutants are formed. Primary pollutants are emitted directly from a source into the atmosphere. Examples include nitrogen oxides (NO_x), carbon monoxide (CO), sulphur dioxide (SO_2), PM_{10}, and various hydrocarbons (HC). Secondary pollutants are created over time in the atmosphere through chemical and photochemical reactions that often involve primary pollutants. Ozone is the most common example, involving a complex chemical reaction of reactive organic gases (ROG) and nitrogen oxides (NO_x) in the presence of sunlight.

Air quality within the project area during construction would be a function of the primary pollutants emitted locally, the existing regional ambient air quality, and the meteorological and topographical factors influencing the intrusion of pollutants into the area from pollutant sources outside the immediate area. Two types of air pollutant sources must be considered with respect to the proposed project: stationary sources and mobile sources. Stationary sources include on-site emissions during the various aspects of project construction. Mobile sources include construction equipment and vehicle emissions during the construction phase. Construction emissions are generally considered to be short-term emissions, lasting only for the duration of construction.

Dam construction produces three types of air contaminants: exhaust emissions from vehicles and construction equipment, smoke from burning during reservoir clearing and grubbing, and fugitive dust generated by various construction activities, including vehicle travel on unpaved roads, quarrying, blasting, aggregate preparation, and other forms of soil movement.

11.2 STANDARDS OF SIGNIFICANCE

According to CEQA, a project would have a significant effect if it would exceed criteria air pollutant emission levels, or expose sensitive receptors to substantial pollutant concentrations. For the purposes of this EIR, impacts that would exceed primary federal standards which are designed to safeguard public health, secondary federal standards which are established to safeguard public welfare, or state standards that were developed by the California Air Resources Board (CARB) are considered significant adverse impacts. Additionally, a project would be considered to have a significant effect if it would violate any MBUAPCD standards.

The MBUAPCD has significance criteria to determine the potential effect of project-generated air pollutants on regional air quality. The MBUAPCD considers a net increase of 550 lb/day of CO, 150 lb/day of HC or NO_x, or 86 lb/day of PM_{10} to be thresholds of significance. The MBUAPCD has no significance thresholds for the remaining criteria air pollutants, SO_x and lead (Pb).

Also, as required by CEQA, the consistency of the project with the 1991 AQMP for the MBUAPCD will be addressed. According to the 1991 AQMP:

> **Consistency of direct emissions associated with equipment or process operations of a proposed, commercial, industrial or institutional facility subject to District permit authority is determined by assessing whether the emission source complies with all applicable District rules and regulations including emission offset and emission control requirements. Emission from sources not subject to APCD permit authority may be deemed consistent with the AQMP if such emissions are forecasted in the AQMP emissions inventory.**[3]

Impacts of project construction would be considered short-term impacts, lasting for the duration of construction, or 20 months. A project would normally have a significant adverse impact on air quality if it were to result in a violation of federal or state air quality standards, if it would violate any MBUAPCD standards, or expose sensitive receptors to substantial air pollutant concentrations.

Impacts of project operation would be considered long-term impacts, lasting for the duration of the project's useful life, or at least 50 years. A project would normally have a significant adverse impact on air quality if it were to result in a violation of federal or state air quality standards, if it would violate any MBUAPCD standards, or expose sensitive receptors to substantial air pollutant concentrations.

11.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

11.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Impact 11.3.1-1

Construction of the 24 NLP reservoir would result in significant air pollutant exhaust emissions generated by vehicles and construction equipment.

Vehicular and construction equipment exhaust emissions are generated by a variety of gasoline and/or diesel-powered equipment. Exhaust emissions would include those associated with the transport of workers, machinery, and supplies to the project site, as well as those produced on-site by the equipment used for foundation excavation, drilling, quarrying, aggregate and RCC concrete mix preparation, vegetation clearing, and road construction.

Table 4-1 lists the projected on-site equipment necessary during the construction of the project. Appendix 11-C presents construction information, for each of the different alternatives, on acres to be cleared, trip lengths and volumes of materials to be moved. The major material deliveries expected during the course of construction are described in Chapter 10. These categories are combined to give an average number of truck loads per day. The estimated exhaust emissions from off-site travel are shown in Table 11-4.

By combining the haul distance with the number of cubic yards to be hauled, for example, the number of miles travelled by dump trucks can be calculated. This result is then broken down into miles travelled on paved or unpaved roads. The results of this analysis for exhaust emissions from on-site equipment are shown in Table 11-4. Off-site exhaust emissions would consist of the delivery of construction materials and equipment, and employee travel to the work site. It is unknown at this time how many employees would stay on-site in work camps or trailers during construction.

For the purposes of this analysis, it is assumed that all workers will commute to the site daily. It is estimated that about 110 persons per shift would travel to and from the site, not including suppliers representatives, civic leaders and government agency personnel, and visitors.

TABLE 11-4

CALCULATION OF OFF-SITE VEHICLE EMISSIONS
AND ON-SITE CONSTRUCTION EQUIPMENT

Off-Site Vehicle Emissions[1]

Alternative	Car: Round Trip Miles	Car: Number Per Day	Truck: Round Trip Miles	Truck: Number Per Day	ROG (Tons Per Day)	CO (Tons Per Day)	NO_x (Tons Per Day)
24 NLP 24 NLP/D	56	100	122	15	0.0099	0.0804	0.0400
15 CAN/D	18	100	80	320	0.1287	1.0452	0.5200

On-Site Construction Equipment Emissions[2]

Alternative	CO	HC	NO_x	SO_x	Part
24 NLP 24 NLP/D	0.077	0.021	0.272	0.029	0.023
15 CAN/D	0.673	0.182	2.383	0.251	0.205

[1] Emission factors calculated by MBUAPCD staff using EMFAC7D guidelines. For employees and visitors it was assumed to be a 60-mile round-trip. For heavy duty diesel trucks delivering construction materials, it was assumed to be 110 miles round-trip. For diesel trucks 30-minute idle time was assumed, with idle emission factors from MBUAPCD. Assumes two employees per vehicle.

[2] The emission factors for heavy duty diesel equipment were calculated by averaging the values presented in EMFAC7C Table II-7.1 for the various types of equipment. The MPWMD engineering consultants estimated that the on-site equipment would total about 5,000 hp maximum total output, while a reasonable estimate of the actual total output would be about 60 percent of the rated output, or about 3,000 hp. Assuming an eight-hour day, the brake specific horsepower per day would be 24,000 hphr. This figure is multiplied by the emission factor to yield the emissions by type per day during the construction period. The emissions were first calculated based on equipment used in the construction of the 23 NSC alternative. These emissions were then adjusted based on the relative volumes of materials hauled to arrive at emissions for the other alternatives, (see Notes to Table 11-5).

3 Data for reservoir construction only. Desalination projects not included.

Source: MPWMD

Air pollutant exhaust emissions generated by vehicles and construction equipment would result in a short-term significant adverse air quality impact. The following mitigation measures are recommended to lessen the air quality impacts from this source of air pollution.

Mitigation Measure 11.3.1-1

The potential air quality impacts from vehicle and construction equipment emissions would be reduced by the implementation of the mitigation measures detailed below:

(a) *Off-site exhaust emissions from material deliveries would be reduced by the contractor selecting trucking firms that have an active exhaust inspection and maintenance program.*

(b) *On-site emissions would be reduced by minimizing idling time for all heavy equipment and frequent exhaust system inspections and maintenance. Facilities would be established to perform on-site maintenance of all vehicles and equipment.*

(c) *Off-site exhaust emissions from employee commuting would be reduced in the following ways:*

- *The contractor could establish a work camp at the project site.*
- *Carpooling for employees could be required such that there would be at least two persons per vehicle.*
- *The MPWMD would coordinate with Monterey County to establish a staging location from which workers would be transported by bus. Potential locations would be Carmel Valley Road at Los Laureles Road, and Highway 68 at Los Laureles Road. After the completion of construction, the parking site could become a park and ride facility. Alternatively, the contractor could lease existing unused parking space from private individuals, such as in Carmel Rancho Shopping Center or Del Monte Center. Either of these methods would greatly reduce the traffic and emissions impacts. It is estimated that transporting the workers by bus from a central staging area could reduce off-site vehicle exhaust emissions by at least 50 percent.*

Implementation of these mitigation measures would lessen the air quality impacts of project construction, but the impact would remain significant and unavoidable.

Impact 11.3.1-2

Construction of the 24,000 AF New Los Padres reservoir would result in significant air pollutant emissions generated by smoke from burning during reservoir clearing and grubbing.

Construction of a dam necessitates the clearing of substantial amounts of vegetation. This is necessary for road construction, clearing of the foundation and quarry areas, siting of the aggregate crushing plant and concrete batch plant, equipment storage and warehousing. In addition, much of the reservoir inundation area would be cleared to reduce the formation potential of trihalomethanes (THMs). THMs are organic chemicals formed when water containing organic matter is chlorinated; these chlorinated organic chemicals are thought to be carcinogenic. As a result, the acreages shown in Appendix 11-E for each alternative would need to be cleared. While each dam and reservoir location is different to some degree in the type and amount of vegetation to be cleared, in general there are small areas of riparian trees and shrubs and larger areas of oak tree and chaparral communities. Burning of vegetation would greatly reduce the amount of time and energy necessary, as compared with other techniques of vegetation removal. However, as discussed below, there are a number of other factors that must be considered such as the effect of burning on air quality.

If burning was selected as the method of vegetation removal, permits for this action would be required from the California Department of Forestry and the MBUAPCD. This would require the submittal of a detailed plan that must address site preparation, weather conditions, fuel moisture, smoke management, and other factors. Each of the alternative dam sites are located in 'extreme" fire hazard areas due to a combination of average daily temperatures, humidity, terrain, and fuels.[4] MBUAPCD Rule 422 requires a minimum 60 day drying time for wood wastes prior to burning, and prohibits burning from April through December. Dam site and reservoir areas would be cleared and the spoils placed in large piles surrounded by adequate firebreaks. Materials would be allowed to dry sufficiently to create efficient combustion. Ashes and non-combustibles would be buried beneath fill in the reservoir area.

A review of the literature regarding smoke generated from wood waste burning indicates a number of potentially significant impacts. First, poison oak is an extremely common component of oak woodland under story, and when burned is known to produce toxic smoke. Second, the combustion products of wood waste include carbon monoxide (CO), oxidants such as ozone, a diverse range of hydrocarbons (HC), and particulates.[5] Emissions and combustion products vary widely depending upon fire behavior and fuel conditions. Each of the major combustion products is discussed in more detail below.

Carbon monoxide is the most abundant air pollutant from forest fire or wood waste burning. It may be a direct hazard to human health depending on duration, concentration, and the level of physical activity during exposure. Concentrations as high as 200 ppm have been measured close to flames, but these levels were reduced to less than 10 ppm within 100 feet of the fire.[6] CO yields have been reported in the range of 35 to 195 pounds per ton of fuel burned, with rates as much as 500 pounds per ton from smoldering damp fuels.[7]

Smoke produced by burning agricultural wastes contains minor amounts of constituents that react in sunlight to form photochemical smog, typified by ozone concentrations several times higher than the ambient background level of 0.03 ppm.[8] Radke et al (1978) measured ozone concentrations of up to 0.9 ppm in plumes from broadcast slash burning.[9]

Hydrocarbons are an extremely diverse class of compounds containing hydrogen, carbon, and sometimes oxygen. Air quality standards and emissions inventories usually lump all gaseous HC's together, although the majority of HC pollutants may have no harmful effect.[10] On the other hand, trace constituents may be the most important constituents to photochemical smog production and affecting human health. There are literally hundreds of different organic gases and vapors from fires and this area has only recently begun to be examined. The presence of polynuclear aromatic hydrocarbons (PAH) in the combustion products is well known, however, and one of these, Benzo (a) pyrene (BaP) is a known carcinogen. Total HC's measured range from 10 to 40 pounds per ton of fuel burned.[11]

Particulates are probably the most important combustion product of fires from an emissions perspective. They are the major cause of reduced visibility and may aggravate respiratory conditions in susceptible individuals. Air pollution effects from particulates depends primarily on the sizes of the particles present. Fine particles (less than 3 microns) have a much greater impact on human health then larger ones, and BaP may be associated with the smallest particles from combustion sources.[12,13] Emission rates of particulates depends heavily on fire type, intensity and phase. Emissions per ton of fuel burned are in approximately inverse proportion to fire intensity.[14] For a given fire, emission rates during the smoldering phase can be up to eight times higher than in the flaming phase. Published emission rates range from 4 to 150 pounds per ton of fuel burned (Appendix 11-F).

Appendix 11-G presents a summary of average emission factors suggested for use in emission inventories. Using the factors shown at the bottom of the table, the amount of emissions in each category for each alternative were calculated. These are shown in Table 11-5. It should be noted that these estimates are most likely a worst case, because most of the research done in this field has been on forest fuels, while the fuels involved in reservoir clearing operations would be thoroughly dried and piled up to improve combustion efficiency. The proposed reservoir sites are in relatively remote areas with few residents in the immediate vicinity.

Air pollutant emissions generated by smoke from burning during reservoir clearing and grubbing would result in a short-term significant adverse air quality impact. The following mitigation measures are recommended to lessen the air quality impacts from this source of air pollution.

Mitigation Measure 11.3.1-2

The potential air quality impacts from smoke generated by burning during reservoir clearing and grubbing would be reduced by the implementation of the mitigation measures detailed below:

(a) *Clear poison oak and under story with goats. Poison oak in the riparian zone and in locations inaccessible to goats or which could not be fenced would be removed by equipment and buried.*

(b) *All merchantable wood would be harvested and hauled off site for sale.*

c.) *All slash, small limbs and leaves would be chipped and used as mulch on exposed slopes to promote revegetation and reduce soil erosion and downstream sedimentation impacts.*

d.) *Stumps would be buried in reservoir area beneath at least 10 feet of soil.*

e.) *All construction activities would be halted during burning for reservoir clearing. This would reduce cumulative air quality impacts due to burning emissions and the vehicle exhaust and fugitive dust emissions from construction emissions.*

Implementation of these mitigation measures would lessen the effects of burning on air quality, but this impact would remain significant and unavoidable.

Impact 11.3.1-3

Construction of the 24,000 AF New Los Padres reservoir would result in significant air pollutant emissions from fugitive dust generated by various construction activities.

TABLE 11-5

POTENTIAL EMISSIONS FROM THE BURNING OF VEGETATION
CLEARED FROM RESERVOIR AND QUARRY AREA BY ALTERNATIVE

Alternative Location	Inundation Area (Acres)	TSP	CO	HC	NO_x
		(Tons)			
24 NLP 24 NLP/D	260	75.6	302	56.7	7.6
15 CAN/D	300	87.3	349	65.5	8.73

Notes:

The following emission factors were used:

TSP:	20 lbs/tons burned
HC:	15 lbs/tons burned
CO:	80 lbs/tons burned
NOX:	2 lbs/tons burned

The amount of tons of fuel for each alternative was calculated using the following fuel loading values for each type of vegetation cover within the area to be cleared. Acreage of the various cover types was determined by EIP Associates.

Grassland	1	tons/acre
Coastal Sage Scrub	6	tons/acre
Oak Woodland	50	tons/acre
Riparian Woodland	30	tons/acre
Chamise Chaparral	25	tons/acre
Mixed Evergreen Forest	40	tons/acre

Average values from Green (1981).

Source: MPWMD

Atmospheric dust would be generated by the mechanical disturbance of the land surface in the project area as a result of vegetation clearing, road construction, foundation excavation, and excavation at the quarry sites. In addition, vehicle travel over paved and unpaved roads, hauling from the quarry sites to stockpile locations, movement of material and vehicles at the stockpile sites, processing of aggregate material (sorting, crushing, and screening) and the operation of the concrete batch plant would contribute to dust generation. A portion of the fugitive dust would be entrained in the atmosphere and contribute to increased levels of PM_{10}. Table 11-6 presents the fugitive dust emissions projected for each of the reservoir alternatives.

For the sources listed above, dust generation is caused by either the pulverization and abrasion of surface materials by mechanical force such as wheels or blades, or by entrainment of dust particles through turbulent air currents at a speed of 12 miles per hour or greater. The impact of fugitive dust on ambient air quality depends upon the quantity of dust particles and their drift potential, which is related to particle size. For example, large dust particles generally settle out close to their source, while finer particles can be dispersed over much greater distances.

The potential drift distance of a dust particle depends on the initial injection height of the particle, its settling velocity, and the degree of atmospheric turbulence. Emission factors for fugitive dust include only those particles smaller than 30 microns. Particles larger than 30 microns settle out within a few hundred feet of the source and, as such, create more of a local nuisance problem than an impact on ambient air quality. Emission factors are presented for both TSP and PM_{10}. The quantity of dust emissions primarily depends on the particle size, moisture content of the material, and atmospheric conditions. Each major potential source of fugitive dust is discussed below.

Paved Roads. Dust emissions from paved roads are a major source of particulate matter, primarily due to the large number of vehicles travelling over them. The emission factors are small (pounds per vehicle mile travelled, VMT) but the sheer number of vehicles makes this by far the largest source for TSP and PM_{10}. In the 1987 emissions inventory for the NCCAB prepared by the MBUAPCD, entrained paved road dust was estimated to comprise 57 percent of the total TSP emissions, and 45 percent of the PM_{10} emissions.

A distinction must be made between the paved roads travelled to the project sites, and those paved roads within or immediately adjacent to the construction areas. Dust emissions from industrial paved

TABLE 11-6

SUMMARY OF FUGITIVE DUST SOURCES DURING DAM CONSTRUCTION BY ALTERNATIVE
(Tons/Day)

Alternative	Paved Road		Unpaved Road		Batch Plant		Processing Plant		Total Dust Emissions	
	PM_{10}	TSP	PM_{10}	TSP	PM_{10}	TSP	PM_{10}	TSP	PM_{10}	TSP
24 NLP 24 NLP/D	0.059	0.166	0.048	4.238	1.526	0.978	0.282	0.154	1.915	5.605
15 CAN/D	0.009	0.024	NA	2.472	0.890	NA	NA	NA	0.899	2.496

Source: MPWMD

roads have been found to be a major component of atmospheric particulates in the vicinity of these operations. This is due to vehicles entering from unpaved roads tracking or depositing dust on the roadway, vehicle travel on the shoulder of the road for passing, and spilled material. Dust emissions from paved roads near construction sites depends upon the fraction of silt in the surface material, the amount of surface dust loading, the number of traffic lanes, and the weight of the vehicles. For light duty trucks, for example, TSP emissions were about 10 times higher on paved roads near the construction site as compared to normal road travel. Appendix 11-H presents paved road emission factor for PM_{10} for normal roads away from the construction site roads. Appendix 11-J shows calculations of dust emissions for on-site paved roads for all project alternatives based upon estimates of the miles of paved roadway in or adjacent to the project site and the VMT.

Unpaved Roads. The amount of dust emissions from unpaved temporary construction roads is much higher per VMT than from paved roads. Unpaved roads during dam construction would exist in the vicinity of the quarries, along the haul route to the aggregate processing site and waste material deposition, and during the reservoir clearing and foundation excavation phases. The emission factors and calculations of the fugitive dust for each alternative are shown in Appendix 11-I and Appendix 11-L.

Aggregate Processing. A large volume of aggregate is necessary for the construction of a RCC dam. Aggregate processing involves the following operations: quarrying or excavation, loading, unloading, screening, crushing, and load out to either a stockpile or the next phase of the construction operation such as a concrete batch plant. Uncontrolled construction aggregate processing can result in significant levels of particulate emissions. If the materials are wet or moist, process emissions are often negligible. When dry materials are involved emissions are generally at least 10 times greater. Rock crushing also tends to produce more dust as compared to screening and sorting. Aggregate storage piles may also contribute dust emissions as a result of loading and unloading and disturbance by strong wind currents. The movement of vehicles in the stockpile area may also contribute substantial amounts of dust. Emission factors are shown in Appendix 11-K for the various components of aggregate processing, while the estimates of emissions are presented in Appendix 11-L for the various project alternatives. Major differences exist between projects due to the large variation in the amount of aggregate needed for each.

Concrete Batch Plants. Construction of the New Los Padres Dam would necessitate the construction of a large concrete batch plant capable of producing 100 cubic yards of RCC per hour. During the actual construction of the dam, RCC production would occur continuously. Emissions during the preparation of the RCC would consist primarily of cement dust, although loading of sand and aggregate, vehicle traffic, and wind erosion from stockpiles would contribute some dust. Uncontrolled particulate emissions from the entire process has been estimated at 0.20 pounds per cubic yard of concrete. Appendix 11-L presents the amount of fugitive dust from this phase of the construction for each alternative.

Air pollutant emissions from fugitive dust generated by various construction activities would result in a short-term significant adverse air quality impact. The following mitigation measures are recommended to lessen the air quality impacts from this source of air pollution. Appendix 11-L presents estimates on emission reduction based upon Mitigation Measures 11.3.1-3.

Mitigation Measures 11.3.1-3

A carefully coordinated program of dust abatement would reduce potential impacts to a level of insignificance. Appendix 11-L presents estimates on emission reduction based upon the following mitigations.

a) *A dust abatement officer would be on-site during all construction phases. The officer would be responsible for inspecting sources of fugitive dust and coordinating control measures. Two water trucks and a vacuum road sweeper would be available at the site.*

b) *Little can be done about fugitive dust generated off-site by travel over paved surfaces. However, for those paved roads on-site, there would be a periodic washing and sweeping of the roadways, and all trucks hauling soil would be covered with tarps prior to leaving the project site. Truck beds would be hosed down to reduce soil spillage on paved roads.*

c) *Temporary construction roads would be re-wetted frequently with water to maintain the dust control efficiency. Chemical stabilizers would not be used due to potential off-site impacts on water quality and plant and animal life.*

d) *For aggregate processing, wet suppression techniques involving spray systems at conveyor feed and discharge points, transfer points, and around storage piles would be used to reduce emissions from 70 to 90 percent (Jutze and Axetell 1974). For long-term aggregate storage, the application of chemical wetting agents would be used to reduce particulate emissions up to 90 percent.*

e) *Controls to be used during operation of the concrete batch plant include water sprays, enclosures, hoods, and movable and telescoping chutes. Dust generated by vehicle movement around the aggregate and concrete batch plant areas would be reduced by watering all surfaces a minimum of several times per day, depending on how quickly the surface dries which is in turn dependent upon the daily temperatures.*

Implementation of these mitigation measures would lessen the air quality impacts of project construction, but the impact would remain significant and unavoidable.

Impact 11.3.1-4

The proposed dam project would result in a slight long-term increase in traffic levels as a result of project operation and consequently an increase in traffic-related air pollutant emissions.

Long-term impacts are those associated with the operation of the project over the expected project life. The MPWMD engineering consultant has prepared estimates of annual operation and maintenance costs for the project. The estimates include the number of vehicle trips for dam inspectors. Additionally, operation of the fish passage facilities, both upstream and downstream, would involve numerous vehicle trips. Other trips would involve flow monitoring, road maintenance, and visits by government agency personnel. Overall, however, the number of vehicles and the vehicle miles travelled would be quite small, and no long-term significant impacts to air quality are expected. Table 11-7 shows estimates of the long-term primary air quality impacts associated with operation of the dam. Traffic-related air pollutant emissions from the operational phase of the proposed project would have a less than significant impact on air quality.

Mitigation Measure 11.3.1-4

None required or recommended.

Impact 11.3.1-5

Operation of a large reservoir could alter the climate in the vicinity of the reservoir.

While a large reservoir would have no effect on regional climatic conditions, there could be a slight alteration of the climate in its immediate vicinity. The local effects stem from the fact that the large body of water would exert a moderating influence on temperature. During hot summer days, the mass of cool water in the reservoir would lower the air temperature above it. On cold winter nights, the water mass would warm the air. Studies at other reservoirs suggest that the moderating influence would result in air temperatures downwind of the reservoir less than 1° F different from upwind air temperatures most of the time, although the temperature difference could be as much as 5° F under

TABLE 11-7

EMISSION ESTIMATES FOR LONG-TERM DAM OPERATION

Alternative	Daily VMT Car / Truck	Tons/Day ROG	CO	NO_x	TSP	PM_{10}
24 NLP 24 NLP/D	110 / 26	.00018	.0016	.00054	.0035	.0012
15 CAN/D	36 / –	.00003	.0004	.00005	.0005	.0002

Notes:

Assumes 2 light-duty vehicle trips per day based on mileage from Monterey.

Truck trips are for fish transport with the following assumptions: 5 trips/day for 3 months; 2 trips/day for 7 months; and 1 trip/day for 2 months, with round trip mileage for Los Padres of 10 miles, with the values averaged over the entire year.

Assumes average car speed 35 mph, truck speed 25 mph.

Assumes only on paved roads.

Source: MPWMD

extreme circumstances.[15] The humidity of air passing over the water may also be increased slightly. No reports were found in the literature that indicate that the humidity rise is sufficient to increase the frequency of fog. The smaller reservoirs would be expected to have proportionally less effect on the local climate; however, even for the largest reservoir, impacts to the local climate are expected to be less than significant.

Mitigation Measure 11.3.1-5

None required or recommended.

11.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Impact 11.3.2-1

Construction of the 24 NLP reservoir would result in increased emission of air pollutants.

See discussion under Impact 11.3.1-1 through 11.3.1-3.

Mitigation Measure 11.3.2-1

See Mitigation Measures 11.3.1-1 through 11.3.1-3.

Impact 11.3.2-2

Construction of the desalination facility and associated pipelines would temporarily increase PM_{10} concentrations and could lead to violations of the federal and state 24-hour average PM_{10} standards and significant air quality impacts.

Clearing, excavation and grading operations construction vehicle traffic on unpaved ground, and wind blowing over exposed earth surfaces, all generate dust. It is not possible to estimate accurately the PM_{10} concentration that would occur at or adjacent to the construction site because such concentrations are very sensitive to local meteorology and topography, to variations in soil silt and moisture content, and to the level of equipment use. However, EPA measurements made during apartment and shopping center construction provide a rough indication of the maximum rate of particulate emissions. These measurements indicate that approximately 1.2 tons of dust are emitted per acre per month of construction activity.[16] Approximately one-half of the dust would be comprised of large particles (i.e., diameter greater than 10 microns) which settle out rapidly on nearby horizontal surfaces and are easily filtered by human breathing passages. This dust is of concern as a soiling nuisance rather than a health hazard. The remaining fraction (PM_{10}) would be sufficient to violate the federal and state PM_{10} standards in the vicinity.

The MBUAPCD threshold for significance for particulate emissions is 86 pounds per day (lbs/day). Assuming construction activities would occur 20 days per month, the EPA emission factor of 1.2 tons/acre/month would translate to 120 lbs/acre/day. Therefore, construction activities on 0.72 or more acres of land per day would constitute an exceedance of the MBUAPCD threshold and would be a significant air quality impact

Construction vehicles/equipment would exhaust air pollutants at the construction sites. Large numbers of such vehicle/equipment operating or idling in a small area may cause spot violations of the CO standards. Odors of construction equipment exhaust would probably be noticeable in the environs of the project site for the duration of the construction.

Mitigation Measure 11.3.2-2

To reduce the potential for nuisance due to dust and odors, all construction contracts should require dust and odor controls.

Conditions of approval would require watering twice daily with complete site coverage. The frequency of watering would increase if wind speeds exceed 11 mph. Dust emissions related to construction can be reduced approximately 50 percent by watering exposed earth surfaces during excavation, grading and construction activities. Reclaimed water would be used for dust control, if available.

Conditions of approval would also require daily cleanup of mud and dust carried onto street surfaces by construction vehicles. Throughout construction activities, haul trucks would use tarpaulins or other effective covers. Upon completion of construction, contractors should take measures to reduce wind erosion. Replanting and repaving should be completed as soon as possible.

Construction activities should be scheduled so that they do not contribute to peak periods of vehicular traffic, previously discussed as a major contributor to PM_{10} exceedances. To reduce the potential of spot violations of the CO standards and odors from construction equipment exhaust unnecessary idling of construction equipment should be avoided. Equipment should also be kept in good condition and well-tuned, to minimize exhaust emissions.

Implementation of the above mitigation measures should reduce the impact of construction activities on air quality to a less than significant level.

Impact 11.3.2-3

The proposed dam project would result in a slight long-term increase in traffic levels as a result of project operation and consequently an increase in traffic-related air pollutant emissions.

See discussion under Impact 11.3.1-4.

Mitigation Measure 11.3.2-3

None required or recommended.

Impact 11.3.2-4

Operation of a large reservoir could alter the climate in the vicinity of the reservoir.

See discussion under Impact 11.3.1-5.

Mitigation Measure 11.3.2-4

None necessary.

Impact 11.3.2-5

Operation of the 3 MGD desalination plant would consume considerable electric power, the generation of which would affect ambient air quality in the Monterey Bay area.

The estimated emissions from the Moss Landing Power Plant (MLPP) due to operation of the 3 MGD power plant would be less than the MBUAPCD threshold for significance of 150 pounds per day and no permit violations at MLPP would be expected. Therefore the additional air pollution emissions associated with the desalination plant would be expected to result in a less than significant impact. Please refer to the Final EIR for the Near-Term Desalination Project for the specific air quality analysis.

Mitigation Measure 11.3.2-5

None recommended or required.

Impact 11.3.2-6

Operation of the proposed desalination plant would be inconsistent with the 1991 AQMP.

Emissions estimates are projected through the year 2010 for the Moss Landing Power Plant in the 1991 AQMP. MLPP will be required to comply with all applicable MBUAPCD rules and regulations including emission offset and emission control requirements. PG&E will be required to reduce their emissions of NO_x by 90% in the next ten years. Since the project emissions are not as direct as those associated with population growth, motor vehicle trips or other emissions that have been accounted for in the forecasted emissions inventories, a project-specific determination of consistency must be made by the MBUAPCD. According to the MBUAPCD, the project is inconsistent with the 1991 AQMP projections.[17] The AQMP includes emissions forecasts related to the infrastructure necessary to support the level of growth projected in the AQMP. The generation of emissions associated with a Desalination Project are not included in the infrastructure forecasts within the current AQMP; therefore, the Desalination Project is inconsistent with the plan, which is considered a significant impact. However, emissions associated with a Desalination Project could be included in a future amendment to the AQMP, which would be appropriate after the Project is approved.

Mitigation Measure 11.3.2-6

The MPWMD could work with the MBUAPCD to have the desalination project written into the forecasted plan emissions inventory, if the project is approved by the MPWMD. This would mitigate the impact to a less than significant level.

Impact 11.3.2-7

Operation of the proposed desalination plant could result in an increase in emissions in neighboring air basins as a result of project energy production.

PG&E operates fossil fuel burning power plants within their grid system. These facilities are located within the North Coast Air Basin, the North Central Coast Air Basin, the San Luis Obispo Air Basin and the Bay Area Air Basins. Therefore, energy production as a result of this project would likely increase emissions within these respective Air Pollution Control Districts. Many of these Districts are currently designated as non-attainment for ozone and additional, unplanned emissions of NO_x could represent a significant impact.

Currently there are no guidelines for determining impacts of a project within another air basin. While the criteria for significance varies between Districts, the Bay Area is one of the strictest districts and also has a threshold for significance for NO_x of 150 lbs/day.[18] Based on the emissions estimated for the 3 MGD plant and considering that all the fossil fuel plants are permitted stationary sources, it is unlikely that a significant impact would occur in a neighboring air district as a result of additional emissions from a fossil fuel plant due to the plant. Please see the Near-Term Desalination Project EIR for more a specific analysis.

Mitigation Measure 11.3.2-7

None required or recommended.

11.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 11.3.3-1

Construction of the 15,000 AF Cañada Dam would result in increased emissions of air pollutants.

The air quality impacts for the 15 CAN/D Alternative would be similar to those discussed for the 24 NLP Alternative. (See Impacts 11.3.1-1 through 11.3.1-3). The nearest sensitive receptor to the construction site is a single family residence approximately 2,500 feet from the site.

Mitigation Measure 11.3.3-1

See Mitigation Measures 11.3.1-1 through 11.3.1-3.

Impact 11.3.3-2

Construction of the desalination facility and associated pipelines would temporarily increase PM_{10} concentrations and could lead to violations of the federal and state 24-hour average PM_{10} standards and significant air quality impacts.

See discussion under Impact 11.3.2-2.

Mitigation Measure 11.3.3-2

See Mitigation Measure 11.3.2-2.

Impact 11.3.3-3

The proposed dam project would result in a slight long-term increase in traffic levels as a result of project operation and consequently an increase in traffic-related air pollutant emissions.

See discussion under Impact 11.3.1-4.

Mitigation Measure 11.3.3-3

None required or recommended.

Impact 11.3.3-4

Operation of a large reservoir could alter the climate in the vicinity of the reservoir.

See discussion under Impact 11.3.1-5.

Mitigation Measure 11.3.3-4

None necessary.

Impact 11.3.3-5

Operation of the 3 MGD desalination plant would consume considerable electric power, the generation of which would affect ambient air quality in the Monterey Bay area.

See discussion under Impact 11.3.2-5.

Mitigation Measure 11.3.3-5

None recommended or required.

Impact 11.3.3-6

Operation of the proposed desalination plant would be inconsistent with the 1991 AQMP.

See discussion under Impact 11.3.2-6.

Mitigation Measure 11.3.3-6

See Mitigation Measure 11.3.2-6.

Impact 11.3.3.-7

Operation of the proposed desalination plant could result in an increase in emissions in neighboring air basins as a result of project energy production.

Mitigation Measure 11.3.3-7

None required or recommended.

11.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impact 11.3.4-1

Construction of the 7 MGD desalination project and associated pipelines would temporarily increase PM_{10} concentrations and could lead to violations of the federal and state 24-hour average PM_{10} standards and significant air quality impacts.

The impacts described under Impact 11.3.2-2 apply for both facilities included in the 7 MGD desalination project.

Mitigation Measure 11.3.4-1

See Mitigation Measure 11.3.2-2.

Impact 11.3.4-2

The 7 MGD capacity desalination project would result in increased energy demand, the generation of which could affect ambient air quality in the Monterey Bay area.

The effects of the 7 MGD project on energy supplies are described in Chapter 16. The source of project electricity would be the PG&E service grid, and resulting emissions from fossil fuel generators would be distributed accordingly. The PG&E electrical generating facilities that would serve this project are permitted facilities, including air pollution permits, as applicable. Operation of a 7 MGD desalination project would create a 7 Mw energy demand.

The Moss Landing Power Plant (MLPP) is the only fossil fuel plant in the NCCAB and provides a fraction of the total energy demand for the PG&E service territory (see Chapter 16). In 1990, MLPP provided a total of 8.6 percent of the PG&E electrical power demand, although the day to day percentage varied as did the resulting emissions of NO_x. The MLPP would not be the sole source of energy for the desalination plant at any time, regardless of the power plant's proximity to the proposed desalination plant (See Energy, Chapter 16).

Due to local concern regarding potential emissions from the MLPP, two emission scenarios for MLPP are provided for comparison: 1) the first scenario assumes that the desalination plant power would be obtained from the PG&E grid and that of the 24.6 percent of the grid that is supplied by fossil fuel plants, all would be from MLPP; 2) the second scenario also assumes that the desalination plant power would be obtained from the PG&E grid, of which MLPP would provide 8.6 percent of the total grid demand, which was the case for the year 1990. Scenario One represents the "worst case" situation for air quality impacts analysis, whereas Scenario Two represents the expected or historic condition.

Both scenarios utilize an emission factor of 4.9 pounds of NO_x per Megawatt-hour (lbs/Mwh) from MLPP turbine generator 7, when it is fired by natural gas. This emission factor was derived by the MBUAPCD and represents an hourly rate of NO_x emissions during an incremental increase in demand from 80 to 100 percent turbine capacity. Turbine generators 6 and 7 are base load power demand generators. These generators operate all year round, while turbine generators 1-5 are fired only during peak demand. The desalination facility represents a baseload power demand because it would operate constantly throughout the year, except during winter months of normal and wet years. Therefore, the use of an incremental emissions factor for turbine generator 7 is applicable for calculating emissions resulting from this project and represents a "worst case" analysis since turbine generator 7 experiences greater incremental emissions.

Under Scenario One, the estimated cumulative daily increase in NO_x emissions from MLPP as a result of the 7 MGD capacity project is approximately 202 lbs of NO_x. Under Scenario Two the estimated cumulative emissions from MLPP are approximately 71 lbs NO_x/day due to operation of the 7 MGD capacity project. (See Table 11-8 for a tabular listing of the emissions estimated by each scenario.)

TABLE 11-8

NO_x EMISSION SCENARIOS FOR PG&E MOSS LANDING POWER PLANT DUE TO 7 MGD DESALINATION PROJECT

Scenario	Estimated Daily Emissions (lbs NO_x/day)
	7 MGD at MRWPCA & Sand City (7 Mw x 24 hrs./day)
One All fossil fuel power from MLPP (24.6% of PG&E demand)	
(EF = 4.9 lbs/Mwh)	202
Two MLPP provides 8.6% of PG&E demand	
(EF = 4.9 lbs/Mwh)	71

Note: Emission of 150 lbs/day or more would be considered significant.

The emissions estimated for Scenario One exceed the threshold for significance set forth by the MBUAPCD. However, as discussed above and detailed in the Near-Term Desalination Project EIR, this scenario would be very unlikely to occur. The estimated emissions under Scenario Two, the most realistic "worst case" scenario, would be less than the MBUAPCD threshold for significance of 150 lbs No_x/day and no permit violations of the MLPP would be expected.

MLPP is fired almost exclusively with natural gas. Generators 1-5 could never be fired by oil. Only MLPP generators 6 and 7 would ever be fired by oil, and this would be only be in an emergency situation (i.e. natural gas pipeline rupture).[19] Therefore, oil-fired emissions are very unlikely to occur.

It should be noted that within the next 10 years, PG&E will be required to reduce NO_x emissions from MLPP by 90% through retrofitting of existing equipment and NO_x control technologies. The 4 MGD MRWPCA component of the 7 MGD project will be built after this 10 year reduction period. Due to these reductions, the estimated air pollutant emissions due to implementation of this project would be substantially lower than the estimates presented in Table 11-8 as the emissions associated with the MLPP generators are reduced dramatically. Therefore, the air pollution emissions associated with the 7 MGD capacity project would result in a less than significant air quality impact.

Mitigation Measure 11.3.4-2

None required or recommended.

Impact 11.3.4-3

Operation of the proposed desalination facilities would be inconsistent with the 1991 AQMP.

See discussion under Impact 11.3.2-6.

Mitigation Measure 11.3.4-3

See Mitigation Measure 11.3.2-6.

Impact 11.3.4-4

Operation of the proposed desalination facilities could result in an increase in emissions in neighboring air basins as a result of project energy production.

See discussion under Impact 11.3.2-7. Based on the emissions estimated for the 7 MGD desalination project and considering that all the fossil fuel plants are permitted stationary sources, it is unlikely that a significant impact would occur in a neighboring air district as a result of additional emissions from a fossil fuel plant due to the plant.

Mitigation Measure 11.3.4-4

None required or recommended.

11.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

There would be no construction-related air quality impacts associated with the No Project alternative. The No Project alternative would have no impact on local or regional air quality.

11.4 SUMMARY

Tables 11-4 through 11-6, Table 11-8, and supporting appendices, indicate the amount of air pollutant emissions expected during the construction phases for the various alternatives in a major water supply project. It must be remembered that these estimates are for uncontrolled operations; the mitigation measures for these potential air quality impacts are described above. Table 11-9 summarizes the potential air quality impacts of each reservoir alternative by pollutant during the short-term or construction period.

TABLE 11-9

SUMMARY OF POTENTIAL SHORT-TERM PRIMARY IMPACTS[1]
DUE TO DAM CONSTRUCTION
(Tons/Day)

Alternative	ROG	CO	HC	NOx	SOx	TSP	PM_{10}
24 NLP 24 NLP/D	0.0099	1.84	0.429	0.354	0.029	5.605	1.915
15 CAN	0.0017	3.41	0.346	0.773	0.022	2.496	0.899

Notes:

Potential emissions from the burning of vegetation during clearing operation shown in Table 11-7 were divided by 180 days to obtain a tons/day value for the period of time in which burning would occur.

Heavy equipment emissions derived in Table 11-6 were adjusted by a factor that was calculated from the relative volumes of material hauled for a given project compared to the New San Clemente alternative for which the original equipment estimates were made. Volume estimates are shown in Appendix 11-C.

Alternative	Factor
24 NLP 24 NLP/D	1.3
15 CAN	11.4

Source: MPWMD

1. MBUAPCD, Air Quality Management Plan, Salinas, CA, 1989.

2. Ibid.

3. Monterey Bay Unified Air Pollution Control District, Draft 1991 Air Quality Management Plan for the Monterey Bay Region, September, 1991.

4. MPWMD, Technical Memorandum 89-05, Preliminary Timber Harvest and Fire Prevention Plan for the Monterey Peninsula Water Supply Project, 1989.

5. D.V. Sandberg, J.M. Pierovich, D.G. Fox, and E.W. Ross, Effects of Fire on Air--A State of the Knowledge Review, USDA Forest Service, Gen. Tech. Report WO-9, 1979.

6. P.W. Ryan, Quantity and Quality of Smoke produced by Southern Fuels in Prescribed Burning Operations, Proc. of the Natl. Conf. on Fire and Forestry Meteorol., April 2-4, 1974, Lake Tahoe, CA, 1974.

7. P.W. Ryan, and C.K. McMahon, Some Chemical and Physical Characteristics of Emissions from Forest Fires, Paper presented at 69th Annual Meeting of the Air Pollution Control Assoc., Portland, OR, 1976.

8. D.V. Sandberg, et al, 1979, op. cit.

9. L.F. Radke, J.L. Stith, D.A. Hegg, and P.V. Hobbs, Airborne Studies of Particles and Gases from Forest Fires, J. Air Pollution Control Assoc., 28(1):30-34, 1978.

10. D.V. Sandberg, et al, 1979, op. cit.

11. P.W. Ryan, and C.K. McMahon, op. cit.

12. J.K. Burchard, Significance of Particulate Emissions, J. Air Pollution Control Assoc., 25(2):99-100, 1975.

13. P.W. Ryan, and C.K. McMahon, 1976, op. cit.

14. D.V. Sandberg, et al, 1979, op. cit.

15. S. Gregory, and K. Smith, Local Temperature and Humidity Contrasts Around Small Lakes and Reservoirs, December 1967.

16. BAAQMD, Air Quality and Urban Development, November 1985, Table VI-C-2, p. VI-18.

17. Douglas Quetin, MBUAPCD, personal communication, March 10, 1992.

18. This threshold is currently under review by the BAAQMD and is expected to change to a value below 100 lbs/day. Henry Hilken, Planner, BAAQMD. Personal communication, March 5, 1991.

19. Randy Livingston, PG&E. Personal communication, March 17, 1992.

12. NOISE

12. NOISE

12.1 SETTING

12.1.1 INTRODUCTION

Environmental noise is measured in decibels (dB). The A-weighted decibel (dBA), refers to a scale of noise measurement which approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 3 dBA to about 140 dBA. A 10 dBA increase in the level of a continuous noise represents a perceived doubling of loudness; a 3 dBA increase is just noticeable to most people.

Human response to noise is subjective, and varies considerably from individual to individual. The effects of noise can range from interference with sleep, concentration, and communication, to physiological and psychological stress, and, at the highest levels, to hearing loss. The sound level of speech is typically about 60 to 65 dBA. Sleep disturbance occurs when interior noise levels exceed 40 to 50 dBA.

Environmental noise fluctuates in intensity over time and several descriptors of time-averaged noise levels are in use. The three most commonly used are L_{eq}, L_{dn}, and CNEL. L_{eq}, the energy equivalent noise level, is a measure of the average energy content (intensity) of noise over any given period of time. L_{dn}, the day-night average noise level, is the 24-hour average of the noise intensity, with a 10 dBA "penalty" added for nighttime noise (10:00 p.m. to 7:00 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn}, but adds an additional 5 dBA penalty to evening noise (7:00 p.m. to 10:00 p.m.). In situations where vehicles are the dominant source of noise, L_{eq} for the peak commute hour, L_{dn} and CNEL of the same noise source usually differ by less than 2 dBA.

12.1.2 REGULATORY BACKGROUND

State of California

The California Department of Health Services (DHS) Office of Noise Control has studied the correlation of noise levels and their disruptive effects. As a result, the DHS has established four categories for judging the severity of noise intrusion on specified land uses. Noise in the "normally acceptable" range places no undue burden on affected receptors and would need no mitigation. As noise levels rise into the "conditionally acceptable" range, some mitigation of exposure, as established by an acoustic study, would be warranted. At the next level, noise intrusion is so severe that it is classified "normally unacceptable" and would require extraordinary mitigation measures to avoid disruption. Finally, noise in the "clearly unacceptable" range is so severe that it cannot be mitigated. The State uses L_{dn} or CNEL interchangeably to measure noise exposure.

Monterey County

The County of Monterey has adopted noise guidelines as part of the Noise Element of its General Plan, presented in Table 12-1. The Monterey County noise element identifies outdoor noise levels that are appropriate for various activities. For example, outdoor levels up to L_{dn} 50 to 55 dBA would be "normally acceptable" for single family low-density residential land uses, while levels of L_{dn} 50 to 70 dBA would be "normally acceptable" for industrial, manufacturing, utilities and agriculture.

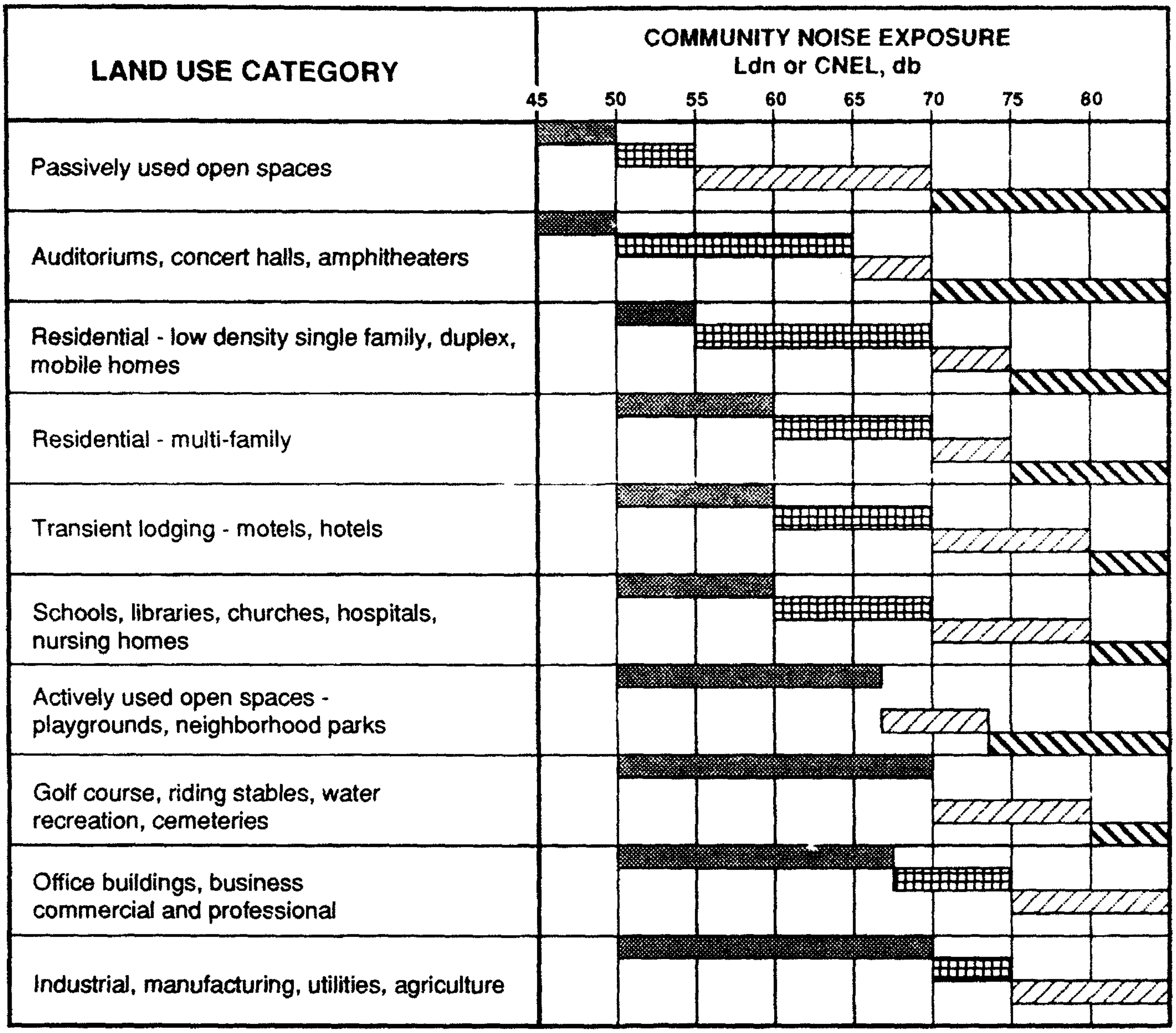
12.1.3 NOISE LEVELS AT THE PROJECT SITES

The proposed project alternatives would affect noise levels near the dam sites and near roads that would be used by construction traffic. Noise levels measured in the vicinity of the San Clemente Dam, assumed to reflect the ambient noise levels at project alternative sites, indicates L_{eq}'s ranging from 28 to 57 dBA.[1]

Existing noise levels close to Carmel Valley Road were calculated using the Federal Highway Administration's STAMINA 2.0 Noise Prediction Model. Calculated noise levels are shown in Table 12-2. They are based on the average daily traffic volumes shown in Table 10-1. From State Highway 1 to Carmel Valley Village, noise levels 100 feet from the highway centerline are estimated to be in the range of 60 to 70 decibels. Corresponding estimated noise levels for the lightly-travelled section of Carmel Valley Road near the proposed project site are in the range of 50 to 60 decibels.

LAND USE COMPATIBILITY FOR EXTERIOR COMMUNITY NOISE FOR MONTEREY COUNTY, CALIFORNIA

Table 12-1



NOISE RANGE I -- NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Indoor and outdoor will be pleasant.

NOISE RANGE II -- CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NOISE RANGE III -- NORMALLY UNACCEPTABLE
New construction of development should be generally discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

NOISE RANGE IV -- CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: Office on Noise Control, California Department of Health, 1976.

TABLE 12-2

PREDICTED NOISE LEVELS ALONG CARMEL VALLEY ROAD DURING PROJECT CONSTRUCTION

Road Segment	Noise Level 100 Feet from Roadway Centerline in Decibels: Existing	During Construction
Highway 1		
North of Carmel Valley Road	76	76
South of Carmel Valley Road	73	73
Carmel Valley Road		
Highway 1 to Carmel Rancho Boulevard	72	72
Carmel Rancho Boulevard to Rio Road	73	73
Rio Road to Rancho San Carlos Road	71	72
Rancho San Carlos Road to Schulte Road	71	71
Schulte Road to Robinson Canyon Road	70	70
Robinson Canyon Road to Laureles Grade	69	69
Laureles Grade to Ford Road	68	68
Ford Road to Esquiline Road	66	66
Esquiline Road to Cachagua Road	60	61
Cachagua Road to Martin Road	56	58
Laureles Grade		
North of Carmel Valley Road	64	65
South of Highway 68	65	65
Cachagua Road		
Tassajara Road to Carmel Valley Road	54	57

Note: Noise volumes calculated using Peak Hour Volumes from Table 10-1, assuming a fleet mix of 80 percent cars, 15 percent medium weight trucks and 5 percent heavy weight trucks.

Source: EIP Associates

12.2 STANDARDS OF SIGNIFICANCE

CEQA Guidelines indicate that a project would normally result in a significant adverse impact if it caused a substantial increase in the ambient noise level in areas sensitive to noise adjacent to the project site. The potential for significant impacts also exists where land use compatibility standards for community noise, as defined by the State of California and adopted by the County of Monterey, are exceeded.

Land use incompatibilities which may arise due to construction noise would only exist during the construction phase.

12.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

12.3.1 24,000 NEW LOS PADRES RESERVOIR (24 NLP)

Impact 12.3.1-1

During construction, noise levels adjacent to transportation corridors accessing the proposed site would be elevated as a result of increased construction traffic volumes.

Off-site construction traffic resulting from the 24 NLP alternative would not substantially increase the ambient noise levels along transportation corridors accessing the site. Table 12-2 shows the estimated noise levels that would be experienced 100 feet from the centerline of Highway 1, Carmel Valley Road, Laureles Grade and Cachagua Road. The estimates were made using the Federal Highway Administration's STAMINA 2.0 Model and are considered to be conservative (i.e., high) estimates of actual noise levels. Noise levels along access routes to the proposed dam sites would increase by 3 dBA or less. A change in noise level of 3 dBA or less is defined as barely noticeable.[2]

There would be one to three shift changes each day during construction. The volume of traffic generated during the shift changes would contribute little to average noise levels; however, individual noisy vehicles could be audible inside adjacent residences and could interfere with sleep.

Although traffic noise impacts resulting from the construction of the 24 NLP alternative would be less than significant, the following mitigation measure would further reduce the level of the impact.

Mitigation Measure 12.3.1-1

Transportation mitigation measures to reduce the volume of traffic and shift the traffic to off-peak periods would reduce the noise impacts of this alternative (See Chapter 10, Traffic, Mitigation Measures 10.3.1-1).

Impact 12.3.1-2

Noise levels near the proposed dam site would be increased by construction activities.

There would be three principal sources of noise at the 24 NLP alternative construction site: mobile and stationary construction equipment and explosive blasting. Table 12-3 shows the noise levels that might be expected 50 feet from various types of construction equipment. In addition to the equipment shown, a concrete batch plant and a rock crusher would be installed at the site. A concrete batch plant would generate approximately 67 dBA at 150 feet and a rock crusher would generate 74 to 84 dBA at 300 feet. It is estimated that the probable mix of equipment at the dam site would generate a noise level of 30 to 60 dBA at a distance of 4,000 feet, although actual noise levels would probably be lower as a result of terrain shielding. These construction activities would continue through the night during the peak construction period.

Blasting would occur at the aggregate borrow area at a frequency of two or three times each week during the construction phase. The type of blasting that would occur would be similar to that performed at surface mines and quarries. It produces noise and vibration different from traffic or construction equipment noise. Noise due to blasting is sudden, infrequent and variable in level. Taking no account of terrain shielding, the momentary blast noise peak that would be experienced 4,000 feet away would be in the range of 102 to 113 dBA. Terrain shielding would lessen actual peak noise by an unknown extent.

It has been determined that there is a strong correlation between the strength of ground vibrations from blasting and the level of community annoyance. Based on the range of charge sizes likely to be used, the range of community response to blasting was estimated.[3] The smallest charges are unlikely to annoy persons more than 1,200 feet from the site. The largest charges would annoy about 20 percent of persons at a distance of 4,000 feet from the site.

TABLE 12-3

TYPICAL CONSTRUCTION EQUIPMENT NOISE (dBA)[1]

Equipment Type	Noise Level at 50 Feet: Without Noise Control	Noise Level at 50 Feet: With Feasible Noise Control[2]
Earthmoving:		
Front Loaders	79	75
Backhoes	85	75
Dozers	80	75
Tractors	80	75
Scrapers	88	80
Graders	85	75
Trucks	91	75
Pavers	89	80
Materials Handling:		
Concrete Mixers	85	75
Concrete Pumps	82	75
Cranes	83	75
Derricks	88	75
Stationary:		
Pumps	76	75
Generators	78	75
Compressors	81	75
Impact:		
Pile Drivers	101	95
Jack Hammers	88	75
Rock Drills	98	80
Pneumatic Tools	86	80
Other:		
Saws	78	75
Vibrators	76	75

[1] Taken from Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, prepared by Bolt, Beranek, and Newman for the U.S. Environmental Protection Agency, December 31, 1971.

[2] Estimated levels obtainable by selecting quieter procedures or machines and implementing noise control features requiring no major redesign or extreme cost.

Source: EIP Associates

Single-family, multi-family and general commercial land uses exist to the north of the project site. The nearest sensitive receptor to the construction site is Cachagua Community Center located approximately 450 feet south of the construction haul road and approximately 1000 feet southeast of the batch plant. Assuming the rock crushing plant was located near the foundation of the dam and that it operated continuously, the resulting L_{dn} at the closest sensitive receptor would be approximately 78 dBA. Limiting the hours of rock crushing to the daytime would reduce the L_{dn} to 70 dBA (see Table 12-4). While an L_{dn} of 78 dBA is defined as "normally unacceptable" for residential exterior noise in Monterey County (see Table 12-1), an L_{dn} of 70 dBA would be defined as "conditionally acceptable".

Due to the proximity of noise sensitive land uses to the construction areas, significant noise impacts would result from noise generated by on-site construction activities. The following mitigation measures are offered to reduce the extent of these impacts.

Mitigation Measure 12.3.1-2

The following mitigation measures would reduce noise impacts during construction from operation of mobile and stationary construction equipment and from blasting.

a) Residents within a one mile radius of the blasting site would be given advanced warning of blasting episodes. Blasting episodes could also be announced in the news media.

b) Blasting would be performed at the end of the day shift, and no blasting would be allowed at night.

c) The borrow site and the site of the concrete batching and rock crushing plant would be selected to minimize noise levels at the nearest sensitive receptor. The rock crushing plant would only be operated during the daylight hours.

d) Construction specifications would include a provision requiring adequate mufflers on trucks and other construction equipment.

Implementation of these mitigation measures would lessen the noise impacts of project construction, but the impact would remain significant and unavoidable.

Impact 12.3.1-3

Operation of the proposed reservoir would result in a slight increase in noise in the vicinity of the dam sites and along transportation corridors accessing the sites.

TABLE 12-4

NOISE LEVELS AT SENSITIVE RECEPTORS NEAREST TO DAM SITES

Alternative	Distance to Receptor (ft.)	Rock Crushing 7 a.m. - 10 p.m.		Rock Crushing Continuous	
		L_{dn}	Land Use Compatibility	L_{dn}	Land Use Compatibility
24 NLP	1000	70	Conditionally acceptable	78	Normally unacceptable
24 NLP/D					
15 CAN/D	2,500	66	Conditionally acceptable	72	Normally unacceptable

Note: Calculations assume rock crushing plant generates noise levels of 84 dBA at 300 feet from source, ambient noise from 10 p.m. to 7 a.m. is 55 dBA and noise attenuation results in a noise reduction of 6 dBA with each doubling of distance from the source. Land use compatibilities are from the Monterey County Land Use Compatibility for Exterior Community Noise (Table 12-1) for single-family residential land uses.

Source: EIP Associates

Noise levels in the vicinity of the proposed project would be basically unaffected by the operation of the new facilities. The facility is removed from sensitive receptors and little or no noise would be generated by reservoir operation. Additionally, increased traffic resulting from maintenance and operation of the proposed project would result in an unmeasurable increase in traffic noise. This impact would be considered less than significant.

Mitigation Measure 12.3.1-3

None necessary.

12.3.2 24,000 NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Impact 12.3.2-1

During construction, noise levels adjacent to transportation corridors accessing the proposed site would be elevated as a result of increased construction traffic volumes.

See discussion under Impact 12.3.1-1.

Mitigation Measure 12.3.2-1

See Mitigation Measure 12.3.1-1.

Impact 12.3.2-2

Noise levels near the proposed dam site would be increased by construction activities.

See discussion under Impact 12.3.1-2.

Mitigation Measure 12.3.2-2

See Mitigation Measure 12.3.1-2.

Impact 12.3.2-3

Operation of the proposed reservoir would result in a slight increase in noise in the vicinity of the dam sites and along transportation corridors accessing the sites.

See discussion under Impact 12.3.1-3.

Mitigation Measure 12.3.2-3

None necessary.

Impact 12.3.2-4

Operation of the 3 MGD desalination plant would result in a slight increase in noise along transportation corridors accessing the site.

Increased traffic resulting from maintenance and operation of the proposed project, including chemical deliveries, would result in an unmeasurable increase in traffic noise. This impact would be considered less than significant.

Mitigation Measure 12.3.2-4

None recommended or required.

Impact 12.3.2-5

Nois• levels near the proposed desalination facility and pipeline alignments would be increased by construction activities.

Temporary construction activities associated with the desalination facility would increase local ambient noise levels. Both mobile and stationary construction equipment would generate noise in the vicinity of the plant and storage areas and along the feed and product pipeline alignments. Table 12-3 shows the noise levels that might be expected 50 feet from various types of construction equipment. Since noise from localized sources typically falls off by about 6 dBA with each doubling of distance from source to receptor, outdoor receptors within 1,600 feet of a construction site that would have an uninterrupted view of the site would experience noise greater than 60 DBA when noise on the construction site exceeds 980 dBA. The use of such equipment at a construction site surrounded by existing noise-sensitive receptors would result in the intermittent generation of noise far above ambient levels during the construction period and result in a significant noise impact. Some disruption of nearby noise-sensitive receptors would be expected. The following mitigation measures are offered to reduce the extent of these impacts.

Mitigation Measure 12.3.2-5

Construction adjacent to sensitive receptors (residences, hospitals, etc.) would be limited by contract from 7 a.m. to 7 p.m., Monday through Friday. Local planning authorities would also consider limiting, by contract, construction on weekends or federal holidays. Construction equipment would be required to be muffled or controlled. Local residents would be warned in advance of any extremely loud, temporal noise generation, e.g. rock blasting, through media, public noise, etc.

This impact would be reduced to some extent by the above mitigation measures, but would remain a significant and unavoidable short-term impact.

Impact 12.3.2-6

Operation of a desalination plant could result in a potentially significant increase in ambient noise levels in the vicinity of the desalination facility site.

Noise levels in the vicinity of the Sand City site are currently dominated by Highway One. Ambient noise levels in the vicinity of a desalination plant could be increased during the operation of the new facilities. Noise generated by a desalination plant would likely consist of a continuous mechanical noise generated by the operation of pumps and other equipment. Noise levels produced by the pumps would be as high as 95 dBA. Single-family and general commercial land uses exist in the vicinity of the proposed desalination plant site. The nearest sensitive receptors to the site are to the south of the project site across Elder. The increase in ambient noise levels resulting operation of the desalination plant may cause exceedances of the 55 dBA standard for residential areas and would be potentially significant.

Mitigation Measure 12.3.2-6

The desalination plant shall be acoustically designed so that noise levels generated by the operation of the plant do not exceed designated land use compatibility standards (identified in Table 12-1) for land uses that border the site. This may include sound proofing of enclosures in which the pumps are housed, in addition to shielding of other equipment to reduce noise generation. This would reduce the potential impacts to a less than significant level. In addition, exhaust fans would be placed away from nearest sensitive receptors to further reduce potential impacts.

12.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 12.3.3-1

Construction of the 15,000 AF Cañada Reservoir alternative would result in increased noise levels in the vicinity of project construction.

The noise impacts for the 15 CAN Alternative would be similar to those discussed for the 24 NLP Alternative. (See Impacts 12.3.1-1 and 12.3.1-3). The nearest sensitive receptor to the construction site is a single-family residence approximately 2,500 feet south of the site. Limiting rock crushing to the daylight hours would reduce the L_{dn} at the nearest sensitive receptor from 72 to 66 dBA (see Table 12-4).

Mitigation Measure 12.3.3-1

See Mitigation Measures 12.3.1-1 and 12.3.1-3.

Impact 12.3.3-2

Operation of the 3 MGD desalination plant would result in a slight increase in noise along transportation corridors accessing the site.

Increased traffic resulting from maintenance and operation of the proposed project, including chemical deliveries, would result in an unmeasurable increase in traffic noise. This impact would be considered less than significant.

Mitigation Measure 12.3.3-2

None recommended or required.

Impact 12.3.3-3

Operation of a desalination plant could result in a potentially significant increase in ambient noise levels in the vicinity of the desalination facility site.

See discussion under Impact 12.3.2-6.

Mitigation Measure 12.3.3-3

See Mitigation Measure 12.3.2-6.

Impact 12.3.3-4

Noise levels near the proposed desalination facility and pipeline alignments would be increased by construction activities.

See discussion under Impact 12.3.2-5.

Mitigation Measure 12.3.3-4

See discussion under Mitigation Measure 12.3.2-5.

12.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impact 12.3.4-1

Noise levels near the proposed desalination facilities and pipeline alignments would be increased by construction activities.

See discussion under Impact 12.3.2-5.

Mitigation Measure 12.3.4-1

See discussion under Impact 12.3.2-5.

Impact 12.3.4-2

Operation of the 7 MGD desalination project would result in a slight increase in noise along transportation corridors accessing the sites.

Increased traffic resulting from maintenance and operation of the proposed project, including chemical deliveries, would result in an unmeasurable increase in traffic noise. This impact would be considered less than significant.

Mitigation Measure 12.3.4-2

None recommended or required.

Impact 12.3.4-3

Operation of the desalination facilities could result in a potentially significant increase in ambient noise levels in the vicinity of the desalination facility sites.

See discussion under Impact 12.3.2-6.

Noise levels in the vicinity of the MRWPCA treatment plant are currently dominated by the MRWPCA wastewater treatment facility. Ambient noise levels in the vicinity of a desalination plant could be increased during the operation of the new facilities. Noise generated by a desalination plant would likely consist of a continuous mechanical noise generated by the operation of pumps and other equipment. Noise levels produced by the pumps would be as high as 95 dBA. The increase in ambient noise levels due to operation of the desalination plant may cause exceedances of the 75 dBA standard for industrial areas and would be potentially significant.

Mitigation Measure 12.3.4-3

See Mitigation Measure 12.3.2-6.

12.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

The No Project alternative would not affect ambient noise levels.

---

1. Westec Services, Noise Assessment, San Clemente Dam Enlargement, January 1984.

2. Planning Analysis and Development, Draft EIR, Carmel Valley Road Improvement, December 1990.

3. Fidell, Sanford, et al., Community Response to Blasting, J.A.S.A. 74(3), 1983.

13. VISUAL QUALITY

13. VISUAL QUALITY

INTRODUCTION

This section of the EIR/EIS evaluates the existing visual quality of the project sites and environs. It also analyzes the potential visual impacts associated with the proposed project alternatives on the existing visual resources of the area when viewed from public vantages.

Few objective or quantitative standards exist for accurately determining the aesthetic or visual quality of the environment because individuals respond differently to changes in their surroundings. A view considered to be unattractive by one person may be pleasing to another. The evaluation of changes in the visual environment differs to some extent according to the visual sensibility of the observer.

Existing conditions of the project sites were documented during field investigations performed in February, 1991. Photographs were taken to record existing visual quality. Many of the project sites are remote from areas of public view, and would not be visually accessible for many people residing in or travelling through the area.

13.1 SETTING

13.1.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

The Carmel River Canyon is a scenic valley characterized by narrow rugged slopes. Dominant visual features include the river and the steep canyon walls. Riparian vegetation is present on stream banks, but has decreased over time in the lower Carmel Valley due to groundwater drawdown and droughts. Until March 1991, the lower Carmel River had been dry for the previous four years. Figure 13-1 shows the existing character of the upper Carmel River Canyon as seen from Cachagua Road.

SITE PHOTO - NEW LOS PADRES PROJECT AREA FIGURE 13-1

Visual character of the Carmel River Canyon as seen from Cachagua Road.

SOURCE: EIP ASSOCIATES 91417

eip

The visual character of the New Los Padres Dam and Reservoir project area is determined by steeply sloping rugged terrain in this section of the Carmel River Canyon. Dense tree cover on the canyon slopes contributes to the visual character of the canyon. The proposed dam would be located downstream and north of the existing Los Padres Dam and Reservoir, thus inundating the existing facilities.

A staging area approximately 19 acres in size would be associated with the construction of the proposed 24 NLP Reservoir. The construction staging area would be located north (downstream) of the proposed dam site on the west bank of the Carmel River, across from the "Carmel River Guard Station." The staging area would include permanent and construction access roads, sedimentation ponds, aggregate storage areas, cement storage silos, a concrete batch plant, conveyor belts, and a compressor house (see Section 4.1.2 for further details). At this stage of the planning process, building design and height information is not available for the facilities associated with the staging area.

13.1.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

The visual character of the 24,000 AF NLP Reservoir site associated with this project alternative would be the same as discussed in Section 13.1.1. This project alternative would also include the construction and operation of a 3 MGD desalination plant in Sand City. The potential visual impacts of the Sand City desalination facility are addressed in the April 1992 DEIR entitled *Near-Term Desalination Project, Monterey Peninsula Water Management District*, prepared by EIP Associates. This document is the source of information for the visual setting of the Sand City desalination plant described in the following paragraphs.

The desalination plant associated with the Sand City site would occur on three sites: one for the desalination facilities; another for the water storage reservoir tank; and a third for the Ranney Collectors and associated pipelines. Figure 4-8 shows the location of the desalination facilities associated with the Sand City site.

The desalination facility would be assembled within an existing warehouse on the west side of Catalina Street between Elder and Ortiz Avenues in Sand City. The existing warehouse is approximately three stories tall, and windowless with a white cement exterior. The warehouse and its paved parking lot are immediately southeast of Highway 1, on a grade approximately 25 feet lower than the grade of the highway. Disturbed dunes slope from the highway to the parking lot and structure. A chain link fence, approximately 10 feet tall, borders the site along the upper portion of the dune. The warehouse is situated in an area of mixed land uses: warehouses, commercial businesses and single-family residences that create contrasting visual elements.

The water storage reservoir tank would be placed in a currently vacant lot east of the northern terminus of Catalina Street at the western terminus of Redwood Avenue. The water storage tank would be approximately one block northeast of the warehouse that is planned to house the desalination facility, immediately southeast of Highway 1. The tank site would be on the same grade as the warehouse, and would be adjacent to Highway 1. Surrounded by the mixed industrial and residential elements of this neighborhood, the visual characteristics of the two sites are very similar.

Because the project vicinity is built out with warehouses, residences and businesses oriented in a rectangular grid pattern, views of the sites are generally blocked except from the streets bordering the sites. The roof of the existing warehouse is visible from Highway 1 to persons passing by the site.

The Ranney collectors would be buried beneath the beach sand on State Park property in the vicinity of the existing inactive Sand City Waste Water Treatment Plant. Pipelines associated with the desalination facility would also be buried underground.

13.1.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

The Cañada Reservoir would be located within Cañada de la Segunda Canyon, on the north side of the Carmel Valley. An earth- and rock-fill embankment dam would be constructed within the canyon. The dam would be located in a steeply sloping portion of the hills that flank the Carmel River and Carmel Valley Road, resulting in the inundation of approximately 200 acres of land.

The project site is not visible from the primary travel corridor in the area, Carmel Valley Road. The dominant view from this road is toward the Carmel River that traverses the Carmel Valley floor (see Figure 13-2).

This alternative would also include the construction and operation of a 3 MGD desalination facility at the Sand City site as described in Section 13.1.2.

SITE PHOTO - CAÑADA RESERVOIR AREA

FIGURE 13-2

Existing visual character of the Carmel River Valley as seen from Carmel Valley Road.

SOURCE: EIP ASSOCIATES

91417

13.1.4 7 MGD DESALINATION PROJECT (7 DSL)

This alternative would involve the construction and operation of two desalination plants: one 3 MGD plant at the Sand City site, and one 4 MGD plant at the MRWPCA site.

The visual setting for the desalination facility at the Sand City site is described in Section 13.1.2. The visual setting and potential visual impacts of the MRWPCA desalination facility are addressed in the April 1992 DEIR entitled *Near-Term Desalination Project, Monterey Peninsula Water Management District*, prepared by EIP Associates. The reader is referred to this document for additional information on the visual setting of the MRWPCA desalination facility site. Figure 4-17 provides an overview of the facilities associated with the MRWPCA desalination plant.

The MRWPCA desalination plant would be located west of the existing MRWPCA treatment plant. Ranney Collectors and pipelines associated with the MRWPCA desalination plant would be buried underground. Two locations are currently under consideration for the MRWPCA water storage reservoir tank site: one on Playa Avenue across from the Playa Wells site, and one on San Pablo Avenue, behind the Kragen Auto Parts Store. Both sites are located in Seaside, east of Fremont Boulevard. Both sites are currently vacant and flat, are surrounded by a mix of residential and commercial land uses, and do not contain any significant visual resources or views.

13.1.5 NO PROJECT ALTERNATIVE (NO PRJ)

Under this alterative, the use of existing facilities would continue, and current operations would persist. Only minor modifications and additional construction of wells is proposed. All visual conditions would be similar to the present situation.

13.2 STANDARDS OF SIGNIFICANCE

For the purposes of this EIR/EIS, visual impacts are considered to be significant if they would have a substantial, demonstrable negative aesthetic impact. This determination is based on several criteria including: alteration to existing natural features and visual conditions; impact on near and far views to the project site; the ability of the landscape to absorb visual change; the introduction of compatible or incompatible visual change; the location of the observer; and, proposed restoration of disturbed areas. In addition, the loss of Carmel River flow altogether, thus exposing a dry riverbed, is considered a significant visual impact.

The following factors were taken into account in this analysis: change in existing views of the project area from public areas; extent of terrain modification proposed; impact on site vegetation; effect on downstream riparian vegetation; impact on existence of a flowing river; scale and mass of proposed facilities; clearing impacts; and the visual effect of a "bathtub-ring" around the reservoir resulting from water draw-down.

Analysis of the river flow and riparian impacts are based on Figures 7-4, 7-5, and 7-6 in Section 7.3 of Chapter 7, and Figure 9-5 in Chapter 9.

13.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

13.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

The proposed 24 NLP Reservoir alternative would establish a new water impoundment with a maximum water surface elevation of 1,130 feet. The new reservoir would completely inundate the existing Los Padres Dam and Reservoir, and extend about 2.1 miles up the Carmel River behind the new dam. The dam would be about 274 feet high and would extend about 1,600 feet along its crest.

Impact 13.3.1-1

Construction activities associated with the proposed 24 NLP reservoir and dam would result in the alteration of existing visual conditions in the project area.

The natural terrain, vegetation and visual character of the existing landscape would be permanently modified due to the project's removal of vegetation, alteration of hillslopes, inundation of the valley, and construction of the new dam. Slopes would be disturbed and vegetation would be removed within the proposed reservoir inundation area, the construction staging area, and during excavation within the proposed borrow area. The removal of vegetation would allow light to penetrate areas previously covered by grassland or dense tree cover.

The Carmel River Canyon can be seen from portions of the Los Padres National Forest, which is part of the Ventana National Wilderness Area. Rattlesnake Trail travels in a southwest-northeast direction from the Los Padres National Forest to the existing Carmel River trail near the existing Los Padres Reservoir. The Carmel River trail skirts the west shore of the existing Los Padres Reservoir. The expanded reservoir inundation area would be visible from limited viewpoints along the

Rattlesnake and Carmel River trails and from Nason Road. The borrow area may be visible from limited vantage points along Nason Road during the construction phase of the project.

Visual impacts would also occur from the 19-acre staging area, which would require grading and the clearing of vegetation. The construction staging area would be visible from Cachagua Road, Nason Road, and Princes Camp. In addition, the proposed access roads would require the clearing of trees, which would disrupt the existing visual quality. The visual impacts associated with construction of the proposed project are considered significant.

Mitigation Measure 13.3.1-1

The construction staging area shall be revegetated immediately upon completion of construction activities as described in Appendix 9-F, the Conceptual Restoration Plan. It is recommended that topsoil be stock-piled for use during revegetation.

Revegetation of disturbed areas associated with the proposed project would reduce this impact to an less than significant level.

Impact 13.3.1-2

Project construction would increase ambient light levels in the region during periods of nighttime construction.

Project construction would, at times, necessitate the use of nighttime lighting to illuminate areas after daylight hours or prior to sunrise. Construction of the 24 NLP dam (not including site preparation work) would involve a period of about six months when 24-hour construction would be necessary. During periods of night work, ambient light levels would increase dramatically, and the potential for glare to nearby residences or other sensitive receptors could increase. Also, illumination with high-powered lighting would result in a "glow" that may be visible from a distance and call attention to the project site. This impact would be considered significant.

Mitigation Measure 13.3.1-2

Lighting of nighttime construction activities would be focused and directional, and would minimize the amount of spill-over light.

Directional lighting would reduce this impact to a less than significant level. It is not anticipated that nighttime light levels associated with the operation of the dam would be significantly increased over the present nighttime lighting associated with the existing Los Padres dam.

Impact 13.3.1-3

During operation, existing visual conditions of the Cachagua Valley would be altered as a result of the proposed 24 NLP dam and reservoir.

The proposed dam site would not be readily visible to the public due to the rough terrain and difficulty in accessing the site. However, the proposed dam site would be visible from Prince's Camp, a residential trailer park, located approximately one-half mile to the north, and may be visible from limited vantages on Cachagua Road, and from homes on adjacent hillsides.

The proposed dam may also be visible from limited vantage points along the Carmel River Trail which skirts the west side of the valley. (Note: Most of the Carmel River trail would be inundated by the proposed 24 NLP Reservoir, but it would be rebuilt to parallel the existing trail outside the inundation area). The proposed enlarged inundation area (266 acres) associated with this project would be visible along viewpoints from the Carmel Valley and Rattlesnake trails after project construction. The completed project would also be noticeable when viewed from aircraft flying directly over the project area.

The proposed 24 NLP alternative would affect views from private lands that are presently undeveloped. Opinions would differ as to whether views from these lands would be impaired or enhanced. Some people may believe that the conversion of river canyon to reservoir is undesirable, while others may feel it is visually beneficial and adds interest. The loss of visual resources would be considered less than significant in this area due to current site conditions and the proximity of the site to the existing dam and reservoir.

Water levels below full capacity of the impoundment would reveal barren soil between the water surface and vegetation of the high water rim. The ring of bare earth would visually contrast with the woodland setting of the valley hillsides and appear out of character with the setting. However, because the proposed NLP Reservoir would represent an expansion of an existing land use, and dropping water levels represent existing conditions at the Los Padres Reservoir, objections to this visual condition would be expected to be less than significant after project construction.

Mitigation Measure 13.3.1-3

None necessary.

Impact 13.3.1-4

The 24 NLP Reservoir would result in overall beneficial impacts to the aesthetic quality of the Carmel River and the riparian corridor downstream of the existing San Clemente Dam, as well as the Carmel River Lagoon.

The project as proposed would result in increased downstream releases, which would maintain a continuous flow of water in the Carmel River for 11 to 12 twelve months of the year in most situations (75 percent of the time). Presently, the river dries up for several miles for at least five months, even in normal years. Any change to the existing riparian vegetation along the banks of the Carmel River would affect the visual quality of the river corridor downstream of the proposed dam. As discussed in Chapter 9, the increased flows and high water tables resulting from the project would preserve and enhance riparian vegetation. In addition, continuous inflow would increase the area and volume of the Carmel River Lagoon, a popular area for birding. In critically dry years (about 13 percent of the time), river flow would cease for about 7 months, which is still an improvement over the existing condition. Thus the 24 NLP alternative would be considered beneficial overall.

Mitigation Measure 13.3.1-4

None necessary. In critically dry years, the District would continue its riparian corridor irrigation activities.

13.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Construction and operation of the 24 NLP Reservoir in this project alternative would have the same visual impacts as described in Section 13.3.1 (see Impacts 13.3.1-1 through 13.3.1-4 and related Mitigation Measures). The 24 NLP/D alternative would also incorporate a 3 MGD desalination plant at the Sand City site.

Impact 13.3.2-1

The Sand City desalination facility may result in changes to existing visual conditions.

The desalination plant would be built within an existing warehouse; consequently, the existing visual quality of the warehouse site would not be affected. As described in Section 13.1.2, the visual quality of the project area is characterized by inconsistent aesthetic elements related to industrial, residential and commercial uses. The internal renovation of the warehouse and the addition of external facilities associated with the desalination facility would not significantly change the existing visual quality of the area from street level in the project vicinity. The external facilities adjacent to the warehouse would not be taller than the existing warehouse, and would not significantly alter the visual quality of the area as viewed from Highway 1. However, development of the water storage tank on a vacant lot one block from the warehouse would alter the existing visual character, and would be the most visually dominant aspect of the project, because it would be visible from Highway 1. Because of the industrial nature of the area, the impact is considered to be less thar. significant.

Mitigation Measures 13.3.2-1

(a) *Disturbed areas that are not directly a part of the project shall be revegetated immediately following construction.*

(b) *The proposed water storage tank shall be painted in a muted earth tone and landscaped to lessen the visual impacts.*

Impact 13.3.2-2

During operation, nighttime lighting would increase ambient light levels and create glare in the vicinity of the 3 MGD desalination plant site and in the immediate vicinity of the water storage tank associated with the desalination plant.

Lighting may be needed to illuminate these areas after daylight hours or prior to sunrise. Because the desalination site occurs in an area of mixed residential and industrial uses, the potential for glare to nearby residents may occur. In addition, high-powered lighting would result in a "glow" that may be visible from Highway 1 and could call attention to the project site. Uncontrolled lighting would be considered a significant impact.

Mitigation Measure 13.3.2-2

All light sources emanating from the project site shall be directed onto the site and/or screened to prevent overflow illumination of adjoining areas. The use of exterior lights shall be kept to a minimum. Exterior spot- or flood-lighting shall be directional to avoid impacts to surrounding natural habitats. This would result in a less than significant impact.

13.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

The 15 CAN/D alternative would involve the construction of an off-stream pump storage reservoir. Excess flows would be captured and transmitted to a storage reservoir for municipal use. This alternative would also include a 3 MGD desalination facility at the Sand City site, a river intake, pump and transmission facilities. Some of the project components would be located on the south side of Carmel Valley Road and would be visible from the road.

The proposed project would have normal maximum water surface elevation of 455 feet. The dam would be about 227 feet above the existing streambed, and would have a crest length of 1,310 feet. The inundation area would cover about 200 acres. As the project would be in a narrow valley on private land, no visual impact would be expected to occur with regard to views from public roads or other public viewpoints in the area.

Impact 13.3.3-1

Construction activities associated with the proposed 15,000 AF Cañada Project would result in the alteration of existing visual conditions in the project area.

The natural terrain, vegetation and visual character of the existing landscape would be permanently modified due to the project's removal of vegetation, alteration of hillslopes, inundation of the valley, and construction of the new dam. Slopes would be disturbed and vegetation would be removed within the proposed reservoir inundation area, the construction staging area, and as material is quarried from the proposed borrow area. The removal of vegetation would allow light to penetrate areas previously covered by dense tree cover. No visual impacts would occur from construction of the proposed access road to the dam, as it would be located along the right-of-way of an existing unimproved road. Dam construction activities would not occur at night.

Due to the steep topography, dense forest vegetation, and the lack of any public roads or other viewpoints in the project area, the visual impacts associated with construction of the proposed 15 CAN reservoir and dam are considered less than significant.

Mitigation Measure 13.3.3-1

The construction staging area shall be revegetated immediately upon completion of construction activities. It is recommended that topsoil be stock-piled for use during revegetation.

Impact 13.3.3-2

The existing visual conditions in the project area would be permanently altered during the operation of the 15 CAN reservoir and dam.

The proposed earthen dam and reservoir would cover an estimated maximum 200 acres. The downstream face of the dam would appear as a flat, sloping plane with a slope of 5:1 within the canyon walls. Because of the area's topography, most vantage points of the dam and reservoir area offer only partial views of the dam and reservoir. The dam would be most visible to those property owners immediately downstream (south) of the dam. While the dam would not be visible from Carmel Valley Road, the project would be entirely visible during aerial flyovers of the project site.

A spillway would be included with the proposed dam that would consist of a relatively deep, narrow-bottomed cut through the ridge at the east abutment. The spillway would be lined with concrete, and would discharge to an energy dissipation structure prior to entering the natural streambed. Electric power would also be necessary at the dam, and overhead power lines would be visible. However, each of these elements would be small in relation to the size of the dam and are considered less than significant.

The water level within the reservoir would fluctuate substantially as river flow is stored during the winter months and released during the summer and fall. As the water level drops from its highest elevation, exposed soils of the shoreline would be visible to the residents of a proposed development that would surround the reservoir. Partial views of the reservoir surface would be available from areas surrounding the reservoir. The change would appear as a shift from the existing forested hillsides and rolling oak grasslands to views of a large body of standing water.

The significance of this alteration would differ from one individual to the next. Views of water are generally regarded as an amenity, although man-made reservoirs can result in unnatural appearances at the shoreline due to water level fluctuations. Overall, the impact is judged to be less than significant.

Mitigation Measure 13.3.3-2

None required; however, it is recommended that future developments in the vicinity of the proposed project be designed to allow for the optimum location, orientation and landscaping of future residences to maximize positive view corridors and minimize the visual impact of embankment structure.

Impact 13.3.3-3

The proposed water treatment plant would affect the visual character of the project site.

The proposed water treatment plant would be located on a relatively flat terrace adjacent to the Carmel River south of Carmel Valley Road. The plant would consist of 45,000 square feet of sludge drying beds, the water treatment plant itself and support buildings. Much of the structure would be constructed underground, and all above-grade structures would be compatible with buildings in the surrounding area, with no structures greater than 25 feet above the existing ground surface. Existing natural buffers include a row of mature cypress trees along Cypress Lane to the east, and the mature Carmel River riparian corridor to the south.

The treatment plant would be visible from seven existing homes located along Cypress Lane, and may be visible from future residences proposed on Williams Road. The plant would also be visible from Carmel Valley Road because of the open, level terrain between the road and the plant, event though the distance from Carmel Valley Road to the water treatment plant would be over 1,200 feet. Because of the large number of people that use Carmel Valley Road, the impact is judged as significant.

Mitigation Measure 13.3.3-3

(a) *Extensive landscaping would be included as part of the water treatment plant construction to filter views from Carmel Valley Road and, to the extent possible, from existing and future residences in the project area.*

(b) *Architectural design of all structures would be in accordance with policies regarding public utilities (CVAP Policy 31.1.4).*

(c) *The colors and materials used in project construction would be selected for compatibility with the structural system of project structures and with the natural surroundings, in accordance with the Carmel Valley Area Plan (CVAP Policy 26.1.31).*

(d) *Plant materials would be used to integrate the project facilities with the natural environments, in accordance with the Greater Monterey Peninsula Area Plan (GMPAP) (GMPAP Policy 7.2.3).*

Implementation of these measures would reduce the potential impacts of the water treatment plant to visual quality to a less than significant level.

Impact 13.3.3-4

The 15 CAN/D project would result in modest improvements to the aesthetic quality of the Carmel River compared to the existing situation, but visual impacts would occur due to lack of river flow at least two months each year.

Downstream flows and aquifer storage would be somewhat improved with the 15 CAN/D project, compared to existing conditions, but there would still be at least two months each year with no river flow. Flows would occur for 10 months during the year in normal years and four months per year during critically dry years. Lagoon volume would remain diminished during these periods with no flows. Overall, there would be a beneficial effect compared to existing conditions, although visual impacts would occur during periods with no river flow.

Mitigation Measure 13.3.3-4

No project mitigation would be required for the 15 CAN/D alternative. In periods with no river flow, the District would implement riparian irrigation activities.

Impact 13.3.3-5

The Sand City desalination facility may result in changes to existing visual conditions.

See Impacts 13.3.2-1 and 13.3.2-2.

13.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impact 13.3.4-1

Construction of two desalination plants with a total capacity of 7 MGD may result in visual changes as seen from public areas, but are expected to be less than significant.

Visual impacts associated with the 3 MGD Sand City desalination facility are described in Impacts 13.3.2-1 and 13.3.2-2.

The visual impacts associated with the 4 MGD MRWPCA desalination plant would be less than significant, as the desalination plant itself would be located adjacent to an existing utility plant, and the Ranney collectors and ancillary pipelines would be buried underground.

Impact 13.3.4-2

Visual impacts would occur due to lack of river flow and adverse impacts to the riparian corridor of the Carmel River and continuing degradation of the Carmel River Lagoon.

The loss of riparian habitat would be the same as with the No Project alternative discussed below. Flows would be available seven months per year during normal years (50 percent exceedance frequency) and three months per year during drought (87.5 percent exceedance frequency) years. Lagoon habitat would remain diminished as well. Significant visual impacts would occur as a result of this alternative.

Mitigation Measure 13.3.4-2

Mitigation measures as presented in the Water Allocation Program EIR should be implemented (see Measure 13.3.3-4). It is unclear whether streamflow can be improved. Thus, these impacts remain as potentially significant and unavoidable.

The measures described under Mitigation Measure 13.3.3-4 should be implemented to reduce the loss of riparian and lagoon habitat, and maintain the visual quality of the area. As noted previously, it is unclear whether visual impacts could be corrected.

Impact 13.3.4-3

During operation, nighttime lighting could increase ambient light levels and create glare in the vicinity of the MRWPCA desalination site.

Lighting may be needed to illuminate the area after daylight hours or prior to sunrise. The potential for glare to nearby residents may occur. In addition, high-powered lighting would result in a "glow" that may be visible from a distance and could call attention to the project site. Although the existing MRWPCA facility is not readily visible from points of public access, uncontrolled night lighting could create significant additional nighttime glare in a largely undeveloped area.

Mitigation Measure 13.3.4-3

See Mitigation Measure 13.3.2-2.

13.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

Impact 13.3.5-1

Visual impacts would occur due to lack of river flow and adverse impacts to the riparian corridor of the Carmel River and continuing degradation of the Carmel River Lagoon.

Presently, low flows within the Carmel River have adversely affected the visual quality of the river and the amount and diversity of riparian vegetation growing within the riparian corridor. The Carmel River Lagoon has also been degraded. Under No Project conditions, these adverse impacts would continue, resulting in significant impacts to the visual resources of Carmel Valley.

Mitigation Measure 13.3.5-1

Mitigation measures outlined in the Water Allocation Program EIR should be implemented to maintain riparian and lagoon habitat and protect visual resources. Based on that report and the inability to maintain flow, the visual impacts would be potentially significant and unavoidable.

14. HISTORY AND ARCHAEOLOGY

14. HISTORY AND ARCHAEOLOGY

14.1 SETTING

Several studies have been conducted by the firm Archaeological Consulting, Inc. for the four long-term project alternatives described in this SD EIR/EIS-II. The greatest level of detail has centered on the New Los Padres Reservoir area, as it is the proposed project identified in the Section 404 Permit application before the U.S. Army Corps of Engineers. In compliance with federal regulations, two studies mandated by Section 106 of the National Historic Preservation Act have been conducted for the 24,000 AF New Los Padres Project.

The first study, known as the "Phase I report," entailed (1) a background records search at the Northwest Regional Information Center of the California Archaeological Inventory; (2) overviews of the archaeology, history and ethnography of the project area; (3) initial contacts with the Native American Heritage Commission and local Native American representatives; and (4) a field reconnaissance of the general project vicinity and some subsurface testing to confirm the presence or absence of cultural materials (midden).[1] The Phase I report provided preliminary recommendations on whether archaeological sites would be eligible for the National Register of Historic Places (NRHP or "National Register").

The second study, known as the "Phase II report," entailed (1) more detailed overviews of history, prehistory, ethnography and ethnohistory of the project area; (2) more extensive consultation with Native American groups, including documentation of genealogies; (3) more detailed investigations and testing of sites identified as having midden materials; (4) evaluations of the significance of each cultural resource, (including traditional cultural properties) as to eligibility for the National Register; and (5) recommendations for future management of cultural resources in the project area.[2] Future work will clarify specific mitigation measures for significant adverse impacts of the project and develop a Memorandum of Agreement with responsible agencies pursuant to Section 106. The Phase

I and II reports are available for viewing in the MPWMD office; copies have been provided to responsible state and federal agencies as well as Esselen Tribe representatives.

PREHISTORIC SETTING

In prehistoric times, the region associated with the New Los Padres Reservoir lay within the territory of the Esselen Native American group. The region associated with the Cañada Reservoir and desalination sites lay within the Costanoan Native American group. The Costanoans occupied the coastal areas from the San Francisco Bay Area to Point Sur, south of Monterey. The Esselen, a much smaller group, occupied the upper Carmel River drainage and about 30 miles of the coast south of Point Sur.

New Los Padres Reservoir

The following prehistoric setting is summarized from the draft Phase II report, which contains extensive and detailed information.

The Esselen were one of the least populous groups in the state, and remain one of the least known. They are often considered the first California group to become culturally extinct. Thus, the research potential of Esselen sites must be regarded as high under both state and federal criteria. Because there is so little extant information on the Esselen, the investigation of even small cultural resources could potentially provide information important in prehistory or history.

Our primary knowledge of Esselen prehistory comes almost entirely from two sites at which test excavations have been conducted, and more importantly, for which site reports have been prepared. These two sites consisted of a burial wrapped in sheepskin (site CA-MNT-250),[3] and a deep midden, or kitchen refuse heap (site CA-MNT-44). These two sites are located in the Church Creek area, approximately eight miles southeast of the existing Los Padres Reservoir. This probably was the heartland of inland Esselen territory. While a few other Esselen sites have been examined, no other usable published reports or manuscripts are yet available.

The evidence from these two prehistoric sites indicates a long early period of occupation, beginning more than 3,300 years ago, with occupation gradually diminishing through time, and the reappearance of evidence of the Esselen society in the archaeological record during the last thousand years or so.

There is not yet enough information from these two sites to establish a cultural sequence, or to determine the degree of relationship between these two sites.

When the Esselen were located by the Spanish over 200 years ago, the Esselen lived in the rugged Santa Lucia Mountains, now a part of the Los Padres National Forest. The Santa Lucia Mountains are extremely precipitous, and are characterized by jagged peaks and steep canyons. It is estimated that the Esselen controlled an area of 750 square miles in size, and had a population of approximately 1,000 persons.

The Esselen economy was centered around hunting, fishing, and gathering, with such foods as the acorn being of paramount importance. Hunting and fishing have been documented archaeologically for the Esselen, and even at inland sites there are often moderate amounts of shell fish remains. As with surrounding groups, tule was also probably of some importance to the Esselen.

For most Esselen, shellfish were probably less important as a food resource than was the case for the Costanoans. There are two probable reasons for this. First; the Esselen appear to have been generalized foragers, rather than economic specialists like the Costanoans. Secondly, the Esselen coast is very rugged, and does not favor easy travel or resource exploitation, nor are there many suitable sites for large villages. In a response to these conditions, the Esselen appear to have utilized the ridgelines for travel, avoiding most of the narrow and steep coastal canyons, and there appears to be a reduced reliance on shellfish.

Cañada Reservoir

The region associated with the Cañada Reservoir alternative lies within the currently recognized ethnographic territory of the Costanoan (often called Ohlone) linguistic group. In brief, the group followed a general hunting and gathering subsistence pattern with partial dependence on the natural acorn crop. Habitation is considered to have been semi-sedentary and occupation sites can be expected most often at the confluence of streams, other areas of similar topography along streams, or in the vicinity of springs. These original sources of water may no longer be present or adequate.

Resource gathering and processing areas, and associated temporary campsites, are frequently found on the coast and in other locations containing resources utilized by the group. Factors that influenced the location of these sites included the presence of suitable exposures of rock for bedrock mortars or other milling activities, ecotones, the presence of specific resources (oak groves, marshes, quarries, game trails, trade routes, etc.), proximity to water, and the availability of shelter. Temporary camps or other activity areas can also be found along ridges or other travel corridors.

Desalination Sites

The region associated with the Sand City and MRWPCA desalination sites lies within the territory of the Costonoan linguistic group, which is described above for the Cañada Reservoir.

HISTORIC SETTING

The history of the upper Carmel Valley has been characterized by cultural adaptations to two rather distinctive landscapes, each of which offered different options to the people who settled within them. These adaptations have resulted in the development of at least three communities in the northern, the southern, and the western sections of the upper Carmel Valley. These communities differ in their socio-economic characters, and in their orientations to areas outside the Upper Valley itself.

The northern community, in the Tularcitos area, is tied historically to large-scale investment in agriculture and ranching. This type of land use pattern is characterized here, as in other parts of the state, by a stratified social system including owners, both absentee and resident, and their various permanent and seasonal laborers. Labor has been supplied at different times by Indians, Spanish-Mexicans, Basques, Chinese and by the squatters and homesteaders who settled the southern section.

The community of the southern section of the Upper Valley (the Cachagua and Jamesberg areas) has remained small, egalitarian, and integrated by marriage. Changes in population membership and numbers have followed the cycles of depression and inflation in the rest of the state; more recently, population changes have followed the current trend for young people to "return to the land," and to try to make their livings in the few rural refuges left in coastal California. Since its initial settlement, the southern section has been characterized by subsistence agriculture, ranching on large units of submarginal land, sporadic wage labor within or outside the community, and various dude ranches and hunting resorts.

Generally speaking, the community of the western section has been more oriented to developments in the Monterey-Carmel area than have the other two communities. Trading was more extensive here as settlers took advantage of their relative nearness to the Mission and towns. Much of the area has been owned by the Del Monte Company, and has been associated with the development of resorts on the coast.

During the last century, most of the property in the Upper Carmel Valley was associated with the operations of Del Monte Properties Company and its predecessor, the Pacific Improvement Company. Prior to ownership by these companies, the land in the Upper Carmel Valley was open to homesteading and was settled in the 1880s and 1890s.

The Pacific Improvement Company was incorporated in 1878 as a holding company and controlled the Central Pacific Railroad, which was operated by the "Big Four": Charles Crocker, Leland Stanford, Collis P. Huntington, and Mark Hopkins. In 1880-1881, Charles Crocker built the Del Monte Hotel in Monterey, a 126-acre resort/hotel/park that catered to guests from around the world.

The Del Monte Hotel and grounds, as well as other Pacific Improvement Company holdings in the Carmel-Monterey area, required a substantial water supply. This supply came from the Upper Carmel Valley. In 1881, the Pacific Improvement Company owned approximately 7,000 acres in the area surrounding the Upper Carmel River. Located below the junction of the Carmel River and San Clemente Creek, the Carmel Dam was built for this purpose by the Pacific Improvement Company in approximately 1881-1883. Today the old dam still stands underwater downstream from the existing San Clemente Dam, and serves as a foundation for a bridge over the Carmel River.

In 1915, Pacific Improvement Company holdings of approximately 10,000 acres of land were acquired by Samuel F.B. Morse and associated financiers under the name of Del Monte Properties Company. The 10,000 acres of land owned were subsequently subdivided. In 1923, various parcels of the company's lands were sold, mostly to parties from the east coast. Resorts and ranches were established throughout the Carmel River Valley in the 1920s and 1930s, although the Del Monte Properties Company retained its holdings of lands immediately surrounding the Carmel River. The existing San Clemente Dam was built during the years 1919-1921 at the junction of the Carmel River and San Clemente Creek, approximately one-third mile upstream from the 1883 Carmel Dam.

The following sections describe the cultural resources directly associated with each of the project alternatives. In some cases, the alternative sites have been studied in detail, in other cases only partial surveys have been completed.

14.1.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

The Phase I field reconnaissance was conducted between February 22 and May 27, 1992. The reconnaissance consisted of a "general surface reconnaissance" of all areas which could reasonably be expected to contain visible cultural resources, and which could be viewed without major vegetation removal or excavation. In addition, the reconnaissance included auger and shovel testing to reexamine cultural resource areas for the presence or absence of subsurface cultural deposits. The more detailed Phase II excavations were performed at four sites associated with middens between September 9 and October 29, 1992.

It should be noted that the "project area" described in the Phase I and II reports is defined by the 1,200-foot contour. The reservoir inundation area would extend to an elevation of 1,130 feet, or 70 feet lower than the "project area" in the archaeology reports. Thus, this SD EIR/EIS-II will address the impacts of only those sites that would be in the 24 NLP inundation area or affected by access roads, fish passage facilities or the construction staging area downstream of the proposed new damsite.

The following sections address three types of cultural resources evaluated in the draft Phase II report: archaeological sites, historical sites and traditional cultural properties.

ARCHAEOLOGICAL SITES

A total of 22 archaeological sites were evaluated for their eligibility for inclusion in the National Register. These sites entail one or more bedrock mortars (grinding stones), some with associated cultural materials such as beads, animal bones, chipped rock tools, pestles, and others. Of the 22 sites, 13 would be affected by the 24 NLP alternative, and are described below. Two of the remaining nine sites (CA-MNT-35/H and 36) are submerged under the existing reservoir; five sites (CA-MNT-1597, 1598, 1599, 1602 and 1606) would be outside of the inundation or construction area; and two sites (CA-MNT-596 and 1596) appear to be located within the protected "greenbelt" zone of the construction staging area.

All of the 13 sites that would be affected by the 24 NLP project may be eligible for federal listing as members of a "district"; an additional seven sites not affected by the 24 NLP reservoir may also be eligible as members of the same district. Additional information on the criteria for eligibility is provided in Section 14.2.

Much of the significance of the recommended eligible sites stems from their association with Esselen fleeing Spanish soldiers and missionaries in the early 1800s. These sites have a different character when compared to much older sites found about eight miles from the project area. The draft Phase II report indicates that these "refuge" sites are unique on the Central Coast and represent an important source of research data concerning this little-known time period.

The draft Phase II report recommended that four additional known sites (CA-MNT-34, 38, 481 AND 482) outside of the study area be included in the same district as those described above. CA-MNT-34, near Prince's Camp was described as "undoubtedly one of the most largest and most important village sites in the *Excelen* district."

The 13 cultural resources that would be impacted by construction of the 24,000 AF New Los Padres Dam and Reservoir are described below. It should be noted that maps with site locations have not been included in this SD EIR/EIS-II to protect sensitive resources, in accordance with state and federal law.

CA-MNT-37

This site was recorded on August 19, 1948. The dimensions are listed as 25 yards in diameter. This site is listed in the records as a small occupation site with an adjacent bedrock mortar (BRM) and may have been inundated. This site was reported to be at the southern limit of the existing Los Padres Reservoir, at approximatelv the high water level. No trace of this site could be discovered at the time of the Phase I study, but several additional BRMs were located. It is suspected that the shifting course of the river and the rising and falling of floodwaters since construction of the dam in the late 1940s have resulted in the destruction of this site. An area adjacent to CA-MNT-37 was identified as an Esselen ceremonial site, which is described in a subsequent section.

CA-MNT-787

This site was recorded on August 25, 1977. This site entails two large grinding basins and three BRMs. No midden was noted when it was examined in 1977, but much of the area was described as covered with silt from the existing reservoir. The two grinding basins could not be found, but two additional BRMs were located, bringing the total to five.

CA-MNT-1594

This site is located on the west side of the Carmel River approximately 0.4 miles north of the existing dam. When initially recorded, it was described as six BRMs in two loci. Three of the BRMs are located in the floodplain, and three on the first terrace above the floodplain. Sparse midden materials such as chert, quartz, obsidian, bone and shell were found during Phase II investigations. In addition, 31 artifacts, including manos, grinding implements, flaked knife blades and one glass bead (dating to the early 1800s) were recovered. This site also includes a traditional Esselen ceremonial area (a "birthing rock") which is described in a subsequent section.

CA-MNT-1595

This site is a two-hole BRM adjacent to the Carmel River approximately 2.5 miles south of the existing dam. No evidence of living debris was noted in this area, but a thick duff layer and rampant vegetation made surface observations in this area extremely difficult.

CA-MNT-1600

This site consists of a one-hole and a three-hole BRM located in and around Bluff Camp. No midden was noted. This site would be impacted by the construction of the proposed fish collection facility to be located south (upstream) of the new Los Padres Reservoir inundation area.

CA-MNT-1601

This site contains at least nine BRMs and two areas of midden, situated on two terraces. It is a large site, in a very favorable area, and appears to have functioned as a seasonal or short-term residential base, similar to CA-MNT-1594. The lower terrace would be at the upper reaches of the reservoir inundation zone; the upper terrace would not be inundated as its approximate elevation is about

1,160-1,167 feet. The draft Phase II report noted that wave-driven erosion could affect the upper terrace, but the District Engineer does not concur.

The upper midden area was examined in detail as it appeared to have greater potential to yield cultural materials. Sparse midden deposits of chert, quartz, bone and shell were found; 29 artifacts similar to those described for CA-MNT-1594 (except no beads) were recovered.

CA-MNT-1603/H

This site consists of the remains of a 1930s fishing resort. It is badly deteriorated, but otherwise appears little disturbed. There may also be the remains of a homestead in this area, but no direct evidence was located. Auger and shovel testing at the site located two BRMs above (upslope from) the historic remains. No midden was noted.

CA-MNT-1604/H

This site consists of historical remains from at least two periods. On the upper part of the site is a concrete foundation which was reportedly in use during construction of the current dam in 1948. A trough at the rear of the foundation leads to an underground pipe which drains over an adjacent bluff. The bench below this foundation contains a roughly square or U-shaped rock formation and a circle or "horseshoe" of stones. The former may be the remains of a structure, while the latter is reportedly the possible location of either two or four historic graves. The circle of stones is associated with Esselen ceremonies, and related to the birthing rock immediately across the Carmel River (see subsequent section). Finally, two BRMs were noted on the bench.

Augering and shovel testing at this site located a small area of possible midden on the sloping hill to the east of the bench. Additional investigation revealed a highly disturbed area with no prehistoric or ethnohistoric materials.

CA-MNT-1607

This site consists of a two-hole BRM. There was a remnant of a dark, ashy midden soil over the edge of the rock, but the surrounding soil was the standard red-brown for the area. It is possible that midden soil once existed, but has either been covered over or washed away by erosion.

CA-MNT-1608

This site consists of a three-hole BRM. No midden constituents were observed in the area.

CA-MNT-1609

This site consists of a single-hole BRM. No midden constituents were observed in the area.

CA-MNT-1610

This site consists of a single-hole BRM. No midden constituents were observed in the area.

CA-MNT-1611

This site was discovered during the Phase II investigation, and consists of a single BRM that was found with an associated pestle. Also present is a large boulder under which were found a biface, several glass beads believed to date to the early 1800s, and one smooth stone. The site is unusual, as it is not a "favorable" site; it is very difficult to reach in periods of high water and is surrounded by rocky steep cliffs.

HISTORIC SITES

Two historic sites (CA-MNT-1603/H and CA-MNT-1604/H) that would be affected by the 24 NLP project were evaluated; both were judged to be ineligible for listing in the National Register. Site 1603/H contains remains of structures reported to be a 1930s fishing resort; Site 1604/H contains remains of one concrete foundation reported to date to the 1940s along with an older stone circle reported to contain historical burials (homesteaders).

TRADITIONAL CULTURAL PROPERTIES

A "traditional cultural property" (TCP) is a specific location that is significant due to its association with cultural practices or beliefs of a living community that are (a) rooted in that community's history, and (b) are important in maintaining the continuing identity of the community. "Traditional" refers to beliefs, customs and practices that have been passed down through the generations. It should be noted that a TCP must be tangible (a rock outcrop, a grove of trees), but its importance is intangible; both qualities are incorporated into the evaluation process. The TCPs evaluated in the Phase II report were identified by the Esselen Tribe of Monterey County. Other properties may not have been revealed to the researchers conducting the ethnographic studies.

Thirty-five (35) traditional cultural properties in the vicinity of the 24 NLP alternative were identified by Esselen descendants and evaluated by consulting ethnographers. They include nine "sacred places", 24 "shrines/other" and two "resource procurement areas." The nine "sacred places" included features of the land such as rocky outcrops or the Carmel River itself, as well as an ancient village site (CA-MNT-34 described above). The "shrines" consist of the bedrock mortars summarized above under "archaeological sites", and were described as ancestral use areas by Esselen descendants. The "resource procurement areas" were traditional fishing and plant-gathering areas.

Of the 35 traditional cultural properties evaluated, 19 would be affected (wholly or in part) by the 24 NLP alternative. Of these 19 TCPs, five were recommended to be eligible for federal listing. The 14 TCPs considered to be ineligible consisted of the 13 archaeological sites ("shrines") described above and "*Xasauan*", the traditional name given to the entire Cachagua area. The five eligible TCPs that would be affected by the 24 NLP project include four sacred places and one resource procurement area, as described below.

Carmel River Spirit Trail (entire length of Carmel River)

According to Esselen descendants, the Carmel River is the path the spirits of the dead travel on their way to the "Western Gate," also called the "Door to the Island of the Dead" (near the headwaters of the Carmel River). The river is considered to be the abode of the spirits and a place of power.

Birthing Rock (near CA-MNT-1594)

This is a prominent rock in a terrace near the Carmel River. According to Esselen descendants, this is a "sacred rock where women went to give birth," and also contains a traditional dance area. The "Birthing Rock" is said to be ceremonially connected to the Baby Ritual Burial Area (discussed below) located directly across the Carmel River. Esselen descendants remember four or five ceremonies that took place at this site during the period 1969 to 1976; dances included the bear dance, salmon dance and brush dance. The site is currently used about four times per year.

Baby Burial Ritual Area (near CA-MNT-1604/H)

According to Esselen descendants, during the prehistoric period when a woman had a still-birth, or a baby died shortly after birth, the body was brought to this area. Certain rituals were performed, and then the body was buried. This property is said to be ceremonially connected to the Birthing Rock across the river. There is a circle of stones at this site which is described as the possible location of two or four historic era graves of homesteaders in the area.

Unnamed Ceremonial Site #3 (near CA-MNT-37)

This site is marked by a prominent rock feature overlooking the Carmel River. Esselen descendants have worshipped at an "altar" in this area for uses which were not revealed. Prior to 1977, the altar was located in an outcrop of rocks, but this was dynamited by vandals. A medicine pole, made of Santa Lucia fir, also disappeared. The site was used as recently as 1976 by tribal elders, but has not been used much since then.

Traditional Plant Gathering Area (entire length of Carmel River)

The Carmel River was described as a traditional plant gathering area. Though few Esselen descendants still exploit traditional plant and animal species, some continue to gather plants for medicinal or spiritual purposes. Medicinal plant examples include bark of alder for a tea for coughs or colds, stream willow bark tea for headaches, and snake plant poultice for wounds; spiritual use of plants may include Yerba Santa for protection or hummingbird sage for vision quests, among others. Esselen descendants chose not to divulge the names and uses of a range of plant species used for spiritual or ceremonial purposes.

14.1.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

The setting for the 24,000 AF New Los Padres Reservoir is as described above in Section 14.1.1. Based upon background research and surface reconnaissance, it was concluded that the project area associated with the 3 MGD Sand City desalination facility site does not contain surface evidence of potentially significant cultural resources, and work should not be delayed for archaeological reasons.

14.1.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Five archaeological reconnaissance surveys have been conducted in the Cañada Reservoir area.[4] The entire area has been surveyed and two potential sites identified. They are:

CA-MNT-22

A reconnaissance in 1981 failed to locate CA-MNT-22, and suggested a location to the south of Carmel Valley Road. This suggested location could be within the inundation area of the Cañada Reservoir. However, the other archaeological reconnaissance projects that have examined this area failed to locate any evidence of this resource (unless the scattered remains attributed to CA-MNT-950 represent the "gaming area" reported as CA-MNT-22).

CA-MNT-950

This site is recorded within the project area, and may be impacted by the transmission pipeline and/or pumping facilities. However, the 1988 field reconnaissance of the area failed to locate substantial evidence of this site, and recommended only an archaeological monitor during any earth-altering activities.

As stated previously in Section 14.1.2, no surface evidence of potentially significant cultural resources is associated with the proposed 3 MGD Sand City desalination site.

14.1.4 7 MGD DESALINATION PROJECT (7 DSL)

Based upon background research and surface reconnaissance, it was concluded that the project areas associated with the 3 MGD Sand City desalination facility site and the 4 MGD MRWPCA desalination facility site do not contain surface evidence of potentially significant cultural resources, and work should not be delayed for archaeological reasons.

14.2 STANDARDS OF SIGNIFICANCE

A project would normally be considered to have a significant effect on cultural resources if it would disrupt or adversely affect a prehistoric or historic archaeological site, or a property of historic or cultural significance to a community or ethnic or social group.

At the federal level, the protection of cultural resources is based on the Historic Preservation Act of 1966 (as amended), which requires that the affected federal agency identify, evaluate, and protect those sites which meet the criteria of the National Register of Historic Places (NRHP). As the proposed project falls under the jurisdiction of the U.S. Army Corps of Engineers, the criteria used for evaluation of significance by Archaeological Consulting, Inc. are those established by the NRHP. They are as follows:

> The quality of significance in American History, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and:
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

The current NRHP evaluation process typically requires documenting the eligibility of a property. For prehistoric or historic archeological sites, this usually entails some level of test excavation, as performed in the Phase I and II studies. The following evaluations are subject to review and concurrence by the California Office of Historic Preservation as well as federal agencies.

A traditional cultural property was defined earlier as being associated with the cultural practices of a living community; it must be rooted in that community's history and be important in maintaining the continuing identity of that community. To determine whether a TCP plays a significant role in the "historically rooted beliefs, customs and practices" of a community, the Section 106 guidelines as well as National Register Bulletin #38, Guidelines for Evaluating and Documenting Traditional Cultural Properties are used. They include:

1. The TCP must have a specific physical location; that is, it must be tangible. Intangible attributes that give the TCP its significance must be considered in the evaluation.

2. The TCP must be at least 50 years old.

3. The TCP must have retained its integrity.

4. The TCP must meet one or more of the four NRHP criteria of eligibility listed above for the archaeologic and historic sites.

In the draft Phase II report, the enthnographer emphasized the subjective nature of the evaluation process, which resulted in the need for "judgement calls." The draft Phase II report described "two significant problems" that exist for the New Los Padres study area. First, there is not a continuity of tradition as there is no evidence of Esselen use of the project area between 1830 (perhaps 1850) to the early 1900s. Second, most ethnographic and ethnohistoric data on the Esselen are extremely fragmentary and uneven, consisting of "many guesses and little fact." What data does exist is not specific to the New Los Padres study area. Thus, it was impossible to establish a comparative base for evaluating the claims of the Esselen descendants regarding the cultural significance of the TCPs that were identified by them.

14.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

14.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Impact 14.3.1-1

Thirteen known and other possible unknown prehistoric archaeological sites would be impacted by the 24 NLP alternative.

Thirteen cultural resource sites have been identified in the 24 NLP Reservoir project area that would be inundated/destroyed as a result of the proposed project. This is considered a significant impact as all thirteen may be eligible for listing in the National Register as members of a district. Table 14-1 presents a summary of the cultural resources in the New Los Padres Dam and Reservoir area that would be impacted by project construction.

It should be noted that each individual site alone would likely not be eligible for federal listing; the eligibility of each site in the Phase II report was described as "... in conjunction with the other prehistoric/ethnohistoric sites within the project area," or as "one member of a district." The context for each site was described as prehistoric or ethnohistoric archaeology. Specific themes represented by the sites include Esselen subsistence patterns and their development over time, or use as a post-contact "refuge" to flee from Spanish soldiers and missionaries. The level of significance was judged

TABLE 14-1

SUMMARY OF NATIONAL REGISTER ELIGIBILITY ASSESSMENTS

Property/Description	Eligible for National Register			Affected by 24 NLP
	TCP	Archaeological	Historical	
Sacred Places				
Door to the Island of the Dead	–	•	•	no
Carmel River	X	•	•	yes
Xasáuan	–	•	•	–
• CA-MNT-34	X	•	•	no
Birthing Rock	X	•	•	yes
Baby Burial Ritual Area	X	•	•	yes
Unnamed ceremonial site 1	X	•	•	no
Unnamed ceremonial site 2	–	•	•	no
Unnamed ceremonial site 3	X	•	•	yes
Shrines/Archaeological Sites				
CA-MNT-35/H	–	–	•	no
CA-MNT-36	–	–	•	no
CA-MNT-37	–	X	•	yes
CA-MNT-596*	–	X	•	no
CA-MNT-787	–	X	•	yes
CA-MNT-1594	–	X	•	yes
CA-MNT-1595	–	X	•	yes
CA-MNT-1596*	–	X	•	no
CA-MNT-1597	–	X	•	no
CA-MNT-1598	–	X	•	no
CA-MNT-1599	–	X	•	no
CA-MNT-1600	–	X	•	yes
CA-MNT-1601	–	X	•	yes
CA-MNT-1602	–	X	•	no
CA-MNT-1603/H	–	X	–	yes
CA-MNT-1604/H	–	X	–	yes
CA-MNT-1606	–	X	•	no
CA-MNT-1607	–	X	•	yes
CA-MNT-1608	–	X	•	yes
CA-MNT-1609	–	X	•	yes
CA-MNT-1610	–	X	•	yes
CA-MNT-1611	–	X	•	yes
Resource Procurement Areas				
Fishing Site	–	•	•	no
Plant gathering area	X	•	•	yes

– - Evaluated; not eligible.
X - Evaluated; eligible.
• - Not evaluated.
TCP - Traditional Cultural Property
* - Pending confirmation of location in protected zone.

to be local. As each site had no known association with significant persons or events, and entailed no standing structures, each was evaluated under NRHP Criterion 36 CFR 60.4(d), which relates to properties that have yielded, or have the potential to yield, information important in prehistory or history.

Mitigation Measure 14.3.1-1

(a) *Following revision of the draft Phase II Archaeological Report, the Corps of Engineers will request for determination of National Register eligibility for properties. When the significance of historic properties is established, and exact impacts associated with the proposed project are finalized, a draft Cultural Resources Mitigation Plan will be prepared. This document will provide the information necessary to initiate a Memorandum of Agreement among the Office of Historic Preservation, U.S. Army Corps of Engineers, MPWMD and other interested parties.*

(b) *The exact location of sites CA-MNT-596 and 597 within the construction staging must be confirmed. These sites are presently believed to be in the protected "greenbelt" zone. If they are not, it is recommended that avoidance measures be applied to sites CA-MNT-596 and CA-MNT-1596. Depending on the exact location of the floodpool and the fish collecting facilities, other sites at the southern end of the project may also be avoidable.*

(c) *Two archaeological sites containing intact midden deposits (CA-MNT-1594 and CA-MNT-1601) would be affected. If these two sites are to be destroyed, mitigation through data recovery is recommended. Initial recommendation are as follows:*

CA-MNT-1594. *Excavation techniques for CA-MNT-1594 should be designed to further explore site structure and function, and should include large-scale excavations with mechanized equipment where appropriate. The relationships between the midden deposit and the "Birthing Rock" should also be explored. Analytical techniques should focus on defining the subsistence activities and the temporal period(s) involved at both the midden deposit and the "Birthing Rock." Excavation samples should be large enough to recover sufficient bone and lithic materials for detailed analyses. Extensive radiocarbon dating, using AMS techniques if necessary, should be performed.*

CA-MNT-1601. *Excavation techniques for this site should also be designed to further explore site structure and function through large-scale excavations, but the location prohibits use of mechanized equipment. Investigations should include the lower terrace area as well as the upper terrace. Analytical techniques should focus on defining the subsistence activities and the temporal period(s) involved. Extensive radiocarbon dating, using AMS techniques if necessary, should be performed.*

The results of these excavations and analyses, along with interpretations, should be detailed in a professional-quality archaeological report, and cultural materials recovered should be curated in the public domain for use and enjoyment for future generations.

(d) *Mitigation measures will be necessary for the bedrock mortars, including those at midden sites, which would be adversely affected by the proposed project. The mitigation* *measures should include scaled photography, accurate measurement, movement out of the impact area or to a museum, and other measures deemed appropriate.*

(e) *Because the possibility always exists that unidentified cultural resources may be found during construction, the following standard language, or the equivalent should be included in any permits issued within the project area:*

> *If archaeological resources or human remains are accidentally discovered during construction, work shall be halted within 50 meters (150 feet) of the find until 1) the appropriate governmental bodies can be notified, and 2) the find can be evaluated by a qualified professional archaeologist. If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented.*

Implementation of these mitigation measures would reduce the adverse effects of the 24 NLP alternative to a less than significant level. It should be noted that seven eligible sites that would not be affected by the project would also yield valuable information.

Impact 14.3.1-2

Two known historic resources (CA-MNT-1603/H and CA-MNT-1604/H) would be affected by the 24 NLP alternative. Because both sites are not eligible for federal listing, the impact would be less than significant.

Mitigation Measure 14.3.1-2

None needed as the impact is less than significant. However, it is recommended that possible grave sites associated with CA-MNT-1604/H be exhumed, and that any remains discovered be removed and reinterred elsewhere according to law.

Impact 14.3.1-3

Nineteen known and possible unknown traditional cultural properties would be affected by the 24 NLP alternative, either wholly or in part. Five of the 19 properties may be considered eligible for federal listing.

As described below, the project would have a varying degree of impact on the five recommended eligible traditional cultural properties. The conclusions regarding significance are those of MPWMD, based on the information contained in the draft Phase II report. The impact on the remaining 14 TCPs affected by the project would be less than significant, because they are not recommended as eligible for federal listing.

Carmel River Spirit Trail. Based on the information provided by Esselen descendants in the draft Phase II report, it appears that the overall project impact could be considered less than significant, or possibly beneficial. The primary reason is the importance of water (the abode of the spirits) in the river, and the definition of the Spirit Trail as the entire length of the Carmel River. As documented in Chapter 7, the 24 NLP alternative would enhance the Carmel River by providing year-round flow to the ocean in most years, and significantly improve the degraded conditions that presently exist in the lower Carmel River. Currently, the river goes dry for about eight miles for several months, even in normal years.

It also should be noted that two dams currently exist on the river; the primary changes that would result from the 24 NLP project would be the replacement of about two miles of flowing stream with a lake and a significantly larger dam structure. These changes may be considered as disturbances by some Esselen descendants.

Birthing Rock. The project would have a significant adverse effect on this traditional cultural property as it would be inundated by the reservoir. Esselen descendants would no longer be able to perform quarterly ceremonies associated with this important sacred rock.

Baby Burial Ritual Area. The project would have a significant adverse effect on this traditional cultural property as it would be inundated by the reservoir. The draft Phase II report did not indicate present use of this area for baby burials, but it is said to be ceremonially connected to the Birthing Rock.

Unnamed Ceremonial Site #3. The project would have a significant adverse effect on this traditional cultural property as it would be inundated by the reservoir. The draft Phase II report indicated infrequent use of this area since 1976, but it is said to be ceremonially important to certain Esselen descendants.

Traditional Plant Gathering Area. Based on the information provided by Esselen descendants in the draft Phase II report, it appears that the overall project impact would be less than significant, or possibly beneficial. The primary reason is the importance of riparian species and the definition of the Gathering Area as the entire length of the Carmel River. As documented in Chapters 7 and 9, the 24 NLP alternative would enhance the Carmel River riparian habitat by providing year-round flow to the ocean in most years, and significantly improve the degraded conditions that presently exist in the lower Carmel River due to overpumping.

A letter from the Esselen Tribe to the District dated December 13, 1992 describes how riparian plants were gathered for basket-weaving "along the Carmel River from its mouth to its upper reaches." The letter further states, "We view the restoration of the Carmel River riparian habitat to the state in which it can again supply these native plant materials as an important part of revitalizing our culture." In this context, there clearly would be a beneficial effect of the project. There would be a loss of plant gathering areas due to inundation by the new reservoir, but no information was presented in the draft Phase II report that indicated plants for medicinal and spiritual uses would not be available upstream, downstream or adjacent to the new reservoir. Esselen people would have access to these plant materials in the project vicinity and possibly at District mitigation sites.

Mitigation Measures 14.3.1-3

(a) *The Esselen Tribe is a community that is undergoing rebirth and revitalization of its traditional cultural identity. Thus, the Dist. ict could assist the local Esselen community in assembling information in their own heritage and general information on California's cultural and natural resource heritage. This effort should result in a library of publications, manuscripts, fieldnotes, and other archival data that can then be used by the Esselen in their education programs. The District's participation might take the form of a grant for purchase of materials or providing personnel who locate and assemble sources.*

(b) *The District might become involved in the local Esselen's current and planned interpretive programs. The Esselen are contemplating an education and interpretive center at Garland Regional Park. The District might assist in this effort through a development grant, donation of labor, or perhaps assistance with design and engineering of interpretive facilities.*

(c) *The Esselen are currently collecting a data base on Esselen traditions by discussions with Esselen elders. The District can assist this effort by providing recording equipment to preserve interviews and demonstrations of traditional activities. The District might also provide grants for training in audio and video recording techniques, to enhance the usefulness of the recordings.*

(d) *The District can use its influence and good offices to assist the Esselen in their effort to secure rights to gather traditional resources on lands in the upper Carmel River watershed.*

(e) *The District can assist in the development of a curriculum package that describes the cultural history of the Esselen from prehistoric times to the present. This package should be designed as an adjunct to the existing Grade 4 California history program, although* *elements of the package might be excerpted for presentation to wider audiences. The District might also support a program to bring Esselen speakers to local schools as part of the curriculum.*

(f) *The District should identify key advisory groups (extant or planned) and ensure that local Esselen representatives are seated on those groups. Of particular importance are the oversight groups for visual and natural resources. These groups should be encouraged to consider and incorporate specific Native American recommendations in their decisions. The overall goal of this recommendation is to afford the Esselen the opportunity to protect vulnerable resources by working directly with planners and engineers.*

(g) *The local Esselen community should participate at the planning stage in any habitat enhancement or restoration. Their desire to establish or protect viable populations of important plants should be carefully considered, particularly when planning replacement of lost riparian habitat.*

(h) *The local Esselen community should participate in any property management oversight committee to ensure that the Esselen interests in access to resources on project property, and other landlocked parcels around the project.*

(i) *The local Esselen should be full participants in the development of mitigation plans for all archaeological sites. Their participation might include review of the treatment plan, preparation of a burial policy, and monitoring during testing or data recovery excavations.*

(j) *The District should audit current project design to determine if potentially significant resources can be avoided. This audit should be summarized and presented to the local Esselen community for discussion.*

Implementation of these measures would reduce the adverse effect of the project to a less than significant level.

14.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

The impacts and mitigation measures for the 24,000 AF New Los Padres Reservoir would be identical to those described in Section 14.3.1.

Impact 14.3.2-1

The possibility exists for the discovery of unidentified (e.g., buried) cultural resources during construction of the proposed 3 MGD Sand City desalination facility. This could be a significant impact.

Based upon background research and surface reconnaissance of the project areas associated with the 3 MGD desalination plant in Sand City, no recorded sites are known to occur and no surface evidence of potentially significant cultural resources was found.[5] There always exists the possibility that unknown subsurface resources could be discovered during project construction.

Mitigation Measure 14.3.2-1

See Mitigation Measure 14.3.1-1(e).

Implementation of the above mitigation measure would reduce this impact to a less than significant level.

14.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 14.3.3-1

There is evidence that potentially significant cultural resources would be impacted by the construction of this reservoir.

Mitigation Measures 14.3.3-1

(a) *For the area south of Carmel Valley Road, an archaeological monitor should be present during all brush or vegetation clearing, grading, trenching, pad construction, and other earth-altering activities. The monitor shall have the power to temporarily halt construction if intact or potentially significant archaeological resources or human remains are encountered.*

(b) *See Mitigation Measure 14.3.1-1(e).*

Impact 14.3.3-2

The possibility exists for unidentified (e.g., buried) cultural resources being found during construction of the proposed 3 MGD Sand City desalination facility. This could be a significant impact.

Mitigation Measure 14.3.3-2

See Mitigation Measure 14.3.1-1(e).

14.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impact 14.3.4-1

The possibility exists for unidentified (e.g., buried) cultural resources being found during construction of the proposed 3 MGD Sand City desalination facility and/or the 4 MGD MRWPCA desalination facility. This could be a significant impact.

Based upon background research and surface reconnaissance of the project areas associated with the 3 MGD desalination plant in Sand City and the 4 MGD MRWPCA plant near Marina, no recorded sites are known to occur and no surface evidence of potentially significant cultural resources was found. There always exists the possibility that unknown subsurface resources could be discovered during project construction.

Mitigation Measure 14.3.4-1

See Mitigation Measure 14.3.1-1(e).

14.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

The No Project alternative would have no effect on cultural resources.

---

1. Breschini, Gary et al, 1992. Cultural Resources Reconnaissance of the New Los Padres Dam and Reservoir Project, Carmel Valley, Monterey County (revised July 21, 1992). Prepared for Monterey Peninsula Water Management District.

2. Breschini, Gary et al, 1993. Phase II Archaeological Investigations for the New Los Padres Dam and Reservoir Project, Carmel Valley, Monterey County, California, Draft report. Prepared for Monterey Peninsula Water Management District, December 1992.

3. Cultural resources which have been formally recorded with the Regional Information Center of the California Archeological Inventory are referenced by trinomial designations. The trinomials take the form "CA-MNT-1603/H," where the first two letters designate the state and the next three the county. The numbers are sequential and represent the order in which the site was recorded within each county. The suffix "/H" indicates that both historical and prehistoric components are present at the site.

4. Denise Duffy and Associates, 1991. Environmental Assessment of the Cañada Reservoir Project, pp. 37-38. Prepared for Cal-Am Water Company, April 1991.

5. EIP Associates, Near-Term Desalination Project Draft EIR, Section 4.7, April 1992. Based on field reconnaissance by Archaeological Consulting, Inc. between February 24 and March 3, 1992.

15. PUBLIC HEALTH AND SAFETY

15. PUBLIC HEALTH AND SAFETY

This chapter deals with the potential effects on public safety that could result from the construction and operation of each of the project alternatives. Effects on public health associated with seismicity are discussed in Chapter 6, Geology and Seismicity.

15.1 SETTING

15.1.1 DAM SAFETY

Regulatory Setting

Permitting and approval for any new dam and reservoir requires that the safety of the proposed dam be evaluated. The California Department of Water Resources, Division of Safety of Dams (DSOD) is responsible for approving all plans and specifications to construct dams and reservoirs within California. In addition, the U.S. Army Corps of Engineers (COE) has criteria for its own projects and guidelines for projects owned and operated by other entities. The purpose of DSOD and COE approval is to prevent the occurrence of conditions associated with the construction and operation of dams and outlet works that could cause loss of life or property damage downstream.

When the DSOD is satisfied that a proposed dam meets all applicable standards, approval of the project plans and specifications is issued. Immediately after dam construction is complete (but prior to filling of the reservoir) the DSOD inspects the completed dam and, if the completed dam meets all requirements, issues a Certificate of Approval which then allows the filling of the reservoir. The DSOD then maintains the right to periodically inspect the structure. Anyone who believes that a proposed dam is unsafe may file a complaint with the DSOD. A site inspection will then occur to determine whether the complaint is valid. If it is determined that a dam is unsafe, the DSOD is authorized to take actions to protect public safety.

In general, dam safety criteria are a function of dam and reservoir size and the project location with respect to populated areas. The 24 NLP and 15 CAN dam/reservoir project alternatives evaluated in this document are in the "large" size category, based on dam heights greater than 100 feet. The proposed dam/reservoir projects have "high" hazard potential because of the number of residents and amount of property and improvements located downstream of the dam site.

Very few properly engineered dams have failed catastrophically in the last 50 years. Of the failures that have occurred, none has been in California. Two structurally inadequate dams in California have suffered earthquake damage severe enough to cause them to be abandoned: Lower Van Norman Dam in 1971 and Sheffield Dam prior to World War II. In neither case did the reservoir lose water, and residents of downstream areas at risk of inundation were successfully evacuated with no loss of life. The only catastrophic dam failure in the United States in recent years was the Teton Dam failure in Idaho in June 1976; failure of this dam resulted in the implementation of increasingly stringent and sophisticated design and construction techniques.

Flood Design Criteria

For a large dam with high hazard potential, the spillway must be capable of safely passing the probable maximum flood, or PMF. The PMF is defined as the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region over the life of the project. Consequently, overtopping of a dam would be an event with an extremely low probability. During the project feasibility study phase, PMF estimates were assembled for each of the project alternatives. However, if a certain dam alternative is selected, additional PMF analysis will be performed during final design and permitting.

Seismic Design Criteria

Every new dam in California must be designed to withstand the maximum credible earthquake, or MCE, without incurring serious damage. An MCE is defined as the most severe earthquake that is believed to be possible at the site based on geologic and seismological evidence. The MCE is determined by regional and local studies that include a complete review of all historical earthquake data for events sufficiently nearby to influence the project, all faults in the area, and attenuations from causative faults to the site.

Geotechnical studies for seismic considerations have been performed for the Cañada site, and to a lesser level of detail for the New Los Padres site. These studies include literature review, mapping of geologic faults in the region, review of historical earthquakes in the region, determination of MCE for the dam site, and evaluation of slope stability in the reservoir area.

Any dam/reservoir alternative selected would require additional evaluation of conditions relative to seismic design criteria as part of the final design and permitting process.

Dam Failure Analysis

Construction of any of the dam/reservoir project alternatives would increase the potential for loss of life or damage to property in the event of a dam failure. However, because of the design and construction standards in place as part of the permitting process for dams, dam failure is an extremely remote possibility.

An Emergency Action Plan is required for all dam/reservoir projects for use in case of any problem or failure that could cause injury to project operations, or to persons or property located downstream. As part of the Emergency Action Plan for a dam, inundation maps are prepared where there is potential for flooding and damage from dam failure.

The purpose of a dam failure analysis is to prepare inundation maps for inclusion in the Emergency Action Plan. Because there are several dam/reservoir projects presently being considered, analyses have not been performed for each of the proposed projects. If a specific dam project is selected, a dam failure analysis will be performed as part of the permitting process under authority of the DSOD and the State Office of Emergency Services.

The main factors affecting the nature and extent of damage from a dam failure are the dam height, reservoir volume, type of dam construction (concrete gravity, concrete arch, earthfill or rockfill embankment, etc.), and location with respect to inhabited or developed areas. In general, the higher the dam, the larger the reservoir, and the closer to populated or developed areas, the greater the potential damage. Concrete gravity or arch dams are typically assumed to breach more rapidly than earthfill or rockfill embankment dams of comparable size, resulting in a larger flood wave and greater damage potential.

15.1.2 POTABLE WATER QUALITY

Cal-Am conducts extensive water quality tests on surface water from the Carmel River and groundwater from the Carmel Valley and Seaside aquifers. Each year a summary report of the raw water quality analyses completed during the year is sent to Cal-Am customers; the 1989 report is considered to be representative and is presented in Table 15-1. The surface water quality results indicate that concentrations fall below the maximum contaminant levels for all the constituents listed that have established water quality standards. In addition to the constituents listed in Table 15-1, Cal-Am has conducted monitoring for 164 additional organic chemicals for which the California Department of Health Services and the federal Environmental Protection Agency have not yet set levels. All results for 1989 were below detection levels.[1]

Cal-Am is currently conducting studies designed to determine the level of effort needed to bring the existing surface water treatment system at the Carmel Valley Filter Plant into compliance with new State drinking water regulations. The extent of structural or operational changes that may be implemented will be determined as a result of these studies. In addition, Cal-Am is assessing the design and cost of new facilities that will be needed for surface and groundwater treatment in order to comply with recent federal drinking water regulations.

As a regulated public utility, Cal-Am treats water to consistently meet State health standards. The surface water and groundwater resources are of varying quality, and require different types of treatment with varying costs. Some treatment is necessary for taste, odor or other aesthetic considerations.

The CVSIM model may be used to determine what percentage of production would be derived from various supply sources in normal years compared to drought years. This information is most valuable to determine potential differences in treatment costs. Water quality at the tap would be similar for all alternatives, in terms of public health and safety, because all municipal supplies must be treated to meet the same state standards.

15.2 STANDARDS OF SIGNIFICANCE

A project would generally be considered to have a significant effect on public safety if it were to pose an unacceptable threat to human lives or private property as a result of unsafe design, construction

TABLE 15-1

PRIMARY STANDARDS

Mandatory Health-Related Standards Established by the State of California, Department of Health Services

Parameter	Units	Maximum Contaminant Level	Cal-Am System (1989) Surface Water Range	Surface Water Average	Groundwater Range	Groundwater Average
Clarity						
Turbidity	NTU	0.5	0.2-1	0.3	0.1-0.8	0.3
Microbiological						
Coliform Bacteria	% Tests Positive	10			0.0%-0.97%	0.48%
Organic Chemicals						
Total Trihalomethanes	mg/l	0.10	<0.0005-0.101	0.047	-	-
Endrin	mg/l	0.0002	NR	NR	NR	NR
Lindane	mg/l	0.004	NR	NR	NR	NR
Methoxychlor	mg/l	0.01	NR	NR	NR	NR
Toxaphene	mg/l	0.005	NR	NR	NR	NR
2, 4-D	mg/l	0.1	NR	NR	NR	NR
2, 4, 5-TP Silvex	mg/l	0.01	NR	NR	NR	NR
Atrazine	mg/l	0.003	NR	NR	NR	NR
Bentazon	mg/l	0.018	NR	NR	NR	NR
Benzene	mg/l	0.001	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Carbon Tetrachloride	mg/l	0.0005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
1, 2-Dibromo-3-Chloropropane	mg/l	0.0002	NR	NR	NR	NR
1, 4-Dichlorobenzene	mg/l	0.005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
1, 2-Dichloroethane	mg/l	0.0005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
1, 1-Dichloroethylene	mg/l	0.006	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
1, 3-Dichloropropene	mg/l	0.0005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Ethylbenzene	mg/l	0.680	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Ethylene Dibromide	mg/l	0.00002	NR	NR	NR	NR
Molinate	mg/l	0.02	NR	NR	NR	NR
Monochlorobenzene	mg/l	0.030	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Simazine	mg/l	0.01	NR	NR	NR	NR
1, 1, 2, 2-Tetrachloroethane	mg/l	0.001	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Tetrachloroethylene	mg/l	0.005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Thiobencarb	mg/l	0.07	NR	NR	NR	NR
1, 1, 1-Trichloroethane	mg/l	0.200	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
1, 1, 2-Trichloroethane	mg/l	0.032	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Trichloroethylene	mg/l	0.005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Vinyl Chloride	mg/l	0.0005	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Xylenes	mg/l	1.750	ND(<0.0005)	<0.0005	ND(<0.0005)	<0.0005
Inorganic Chemicals						
Aluminum	mg/l	1	ND(<0.1)	<0.1	ND(<0.1)	<0.1
Arsenic	mg/l	0.05	ND(<0.01)	<0.01	ND(<0.01)	<0.01
Barium	mg/l	1	ND(<0.1)	<0.1	ND(<0.1)	<0.1
Cadmium	mg/l	0.01	ND(<0.001)	<0.001	ND(<0.001)	<0.001
Chromium	mg/l	0.05	ND(<0.01)	<0.01	ND(<0.01)	<0.01
Fluoride	mg/l	1.4-2.4*	ND(<0.1)	<0.1	0.3-0.5	0.4
Lead	mg/l	0.05	ND(<0.005)	<0.005	ND(<0.005)	<0.005
Mercury	mg/l	0.002	ND(<0.001)	<0.001	ND(<0.001)	<0.001
Nitrate (as NO_3)	mg/l	45	ND(<1.0)	<1.0	<1.0-30	1.0
Selenium	mg/l	0.01	ND(<0.005)	<0.005	ND(<0.005)	<0.005
Silver	mg/l	0.05	ND(<0.01)	<0.01	ND(<0.01)	<0.01

TABLE 15-1 (Continued)

PRIMARY STANDARDS (Continued)
Mandatory Health-Related Standards Established by the State of California, Department of Health Services

Parameter	Units	Maximum Contaminant Level	Cal-Am System (1989) Surface Water Range	Surface Water Average	Groundwater Range	Groundwater Average
Radioactivity						
Gross Alpha Activity	pCi/l	15	0-1	0	0-2	1
Gross Beta Activity	pCi/l	50	NR	NR	NR	NR
Tritium	pCi/l	20,000	NR	NR	NR	NR
Strontium-90	pCi/l	8	NR	NR	NR	NR
Radium 226 and 228 combined	pCi/l	5	NR	NR	NR	NR
Uranium	pCi/l	20	NR	NR	NR	NR

SECONDARY STANDARDS
Aesthetic Standards Established by the State of California, Department of Health Services

Parameter	Units	Maximum Contaminant Level	Surface Water Range	Surface Water Average	Groundwater Range	Groundwater Average
Color	Units	15	<3-7	<3	ND(<3)	<3
Odor-Threshold	Units	3	<1-3	<1	ND<1	<1
Chloride	mg/l	500	10-15	11	40-140	70
Copper	mg/l	1.0	ND(<0.05)	<0.05	ND(<0.05)	<0.05
Foaming Agents (MBAS)	mg/l	0.5	ND(<0.05)	<0.05	ND(<0.05)	<0.05
Iron	mg/l	0.3	ND(<0.1)	<0.1	ND(<0.1)	<0.1
Manganese	mg/l	0.05	ND(<0.03)	<0.03	ND(<0.03)	<0.03
Sulfate	mg/l	500	20-30	26	70-120	80
Zinc	mg/l	5.0	0.5-1.0	0.7	0.5-1.0	0.7
Total Dissolved Solids	mg/l	1000	110-160	130	250-600	360

ADDITIONAL CONSTITUENTS ANALYZED

Parameter	Units	Maximum Contaminant Level	Surface Water Range	Surface Water Average	Groundwater Range	Groundwater Average
pH	Units	No standard	7.1-7.8	7.6	7.0-7.4	7.2
Hardness ($CACO_3$)	(mg/l)	No standard	90-120	100	170-300	200
Sodium	(mg/l)	No standard	10-25	15	40-100	60
Calcium	(mg/l)	No standard	20-30	25	40-80	50
Potassium	(mg/l)	No standard	2-3	2	2-5	3
Magnesium	(mg/l)	No standard	8-15	10	15-25	19

mg/l milligrams per liter (parts per million)
pCi/l picoCuries per liter
* Fluoride standard depends on temperature
ND() Not detected, detection level in parentheses
NR Monitoring not required by Health Department as of 12/31/89

or operation. In addition, a project would be considered to have a significant adverse impact if it were to increase the downstream 100-year flood elevation by 1 foot or more, or if the quality of water delivered to consumers posed an unacceptable risk to public health by violating any applicable water quality standards.

15.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

15.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Impact 15.3.1-1

Construction of the 24,000 AF New Los Padres Dam would pose a threat to worker and public safety.

There exists an inherent risk of injury or accident during the construction of a large project such as a dam. Worker health and safety is regulated by the California Occupational Safety and Health Association, or Cal OSHA; analysis of worker safety is beyond the scope of this document. The construction site could, however, pose a threat to the health and safety of unauthorized intruders.

The potential for fire would exist from vehicle or equipment accident or malfunction, or from blasting. The spillage of oils, fuels, or fluids used to operate vehicles or equipment within the construction and borrow sites could occur due to vehicular or equipment accident or malfunction, resulting in fire or contaminated soil and water. Traffic safety is discussed in Chapter 10, Traffic. Dam construction could therefore have a significant impact to public health and safety.

Mitigation Measures 15.3.1-1

(a) *Controlled access to the construction site shall be maintained at all times as part of the site security plan.*

(b) *Hard hats shall be required at all times; the construction contractor shall be required to follow a strict safety plan.*

(c) *Construction vehicles and equipment accessing the site should undergo regularly scheduled maintenance.*

(d) *All vehicles and equipment should be equipped with fire extinguishers and spark arrestors; fire extinguisher should also be available at strategic locations at the construction site.*

(e) *The use of gasoline and gasoline engines should be minimized; diesel should be the primary fuel.*

(f) *Welding, cutting and grinding should be conducted with the proper clearance of any flammable material, and with proper fire-fighting equipment nearby.*

(g) *All electrical installations shall be designed and constructed to meet or exceed all applicable safety codes.*

(h) *Telephone communications should be readily available to telephone fire-fighting authorities, if necessary.*

(i) *All blasting materials shall be stored properly in a posted, segregated area.*

(j) *Fuels and oils shall be stored in sealed tanks located in storage basins; the storage basins shall be lined with a plastic membrane and select backfill, and surrounded by protective dikes providing sufficient volume to contain any spills.*

Implementation of these mitigation measures would reduce the potential risks to public health and safety during project construction to a <u>less than significant</u> level.

<u>Impact 15.3.1-2</u>

Catastrophic failure of the proposed New Los Padres Dam would result in the inundation of private property and possibly the loss of human life.

Failure of the proposed New Los Padres Dam would be a very remote possibility; however, failure of the dam would cause significant damage in Carmel Valley. Dam failure could occur as a result of structural failure of the dam itself or its foundation. Structural failure could be promoted by groundshaking induced by seismic activity; the dam could be overtopped by a wave produced by a landslide, perhaps earthquake-induced, into the reservoir; or, damage or failure could result from overtopping and erosion during an extreme flood event.

The New Los Padres Dam site is located approximately 0.7 mile upstream of Princes Camp, a populated area near the confluence of Carmel River and Cachagua Creek. Failure of the New Los Padres Dam would severely impact Princes Camp and other nearby areas.

Existing dams located downstream of a proposed project are also subject to damage or progressive failure resulting from failure of the upstream dam. Thus, in a worst-case scenario, failure of the New

Los Padres Dam could result in the failure of the existing San Clemente Dam, thus increasing the downstream flood volume. A flood wave originating at the New Los Padres Dam would follow the Carmel River downstream, possibly causing failure of the existing San Clemente Dam; the flood wave would continue on down the Carmel River Valley for about 18 miles to the Pacific Ocean. This would be considered a significant adverse impact.

Mitigation Measures 15.3.1-2

(a) *The procedures and requirements of the California Department of Water Resources, Division of Safety of Dams, regarding the design, construction and operation of the proposed New Los Padres Dam shall be strictly adhered to. The engineering staff at the DSOD shall be consulted during final project design as to adequate safety measures to be incorporated into project design, construction and operation. During final design, determination of the PMF, the MCE and other safety-related design criteria shall be made.*

(b) *In the event that this alternative is selected for implementation, a dam failure analysis shall be performed that delineates downstream areas that would be subject to inundation under a worst-case failure scenario. An Emergency Action Plan shall be prepared by the MPWMD in order to allow the evacuation of all downstream areas that would be at risk in the event of catastrophic dam failure.*

These measures would reduce the risk to a less than significant level.

Impact 15.3.1-3

Implementation of the 24 NLP alternative could result in a narrowing of the Carmel River channel below the dam and a subsequent increase in the extent of the 100-year flood plain.

As discussed in Section 7.3, operation of the 24 NLP alternative could reduce the Carmel River channel capacity downstream of the dam. A reduction in channel capacity would result in an increase in water surface elevations during floods, thus posing an increased risk to residents and property downstream. Increases in downstream water surface elevations of one foot or more for the 100-year flood would be considered a significant impact to public health and safety. It should be noted, however, that exact prediction of future changes is rather speculative, with a number of variables entering into the analysis; the quantitative evaluation of each of the variables is subject to uncertainty. Therefore, because change in the 100-year flood elevations downstream of the proposed dam cannot be predicted with certainty, this impact must be considered potentially significant.

Mitigation Measures 15.3.1-3

As described in Mitigation Measure 7.3-4, the MPWMD would establish pre-project baseline conditions, using aerial photography and surveys of channel cross sections. Prior to project approval, MPWMD would develop a formal program to monitor changes in channel capacity downstream of the project for an extended period of years. If reduction in capacity is confirmed, MPWMD, in consultation with other responsible resource agencies, would initiate procedures to restore channel capacity. Two methods of restoring channel capacity are anticipated. Initially, the channel would be cleared of vegetation to approximately 60 feet wide. If this alone was not effective, it would be necessary to move sediment to clear the channel. This would be accomplished by physical removal (e.g., dredging or bulldozing).

The District could also prepare an annual report on the status of the monitoring program for Board receipt at a public meeting.

With these mitigation measures, the impacts are expected to be reduced to a less than significant level.

Impact 15.3.1-4

Organic materials contained within the 24,000 AF NLP Reservoir could, upon chlorination of the drinking water supply, form trihalomethanes (or THMs) in levels sufficient to affect public health.

Impoundment of water within any of the proposed reservoirs would result in the presence of naturally occurring dissolved organic substances in the water supply. These humic substances are derived from soil and decaying wood or vegetation. Upon chlorination, these humic substances react to form certain organic chemicals known as trihalomethanes, or THMs, the most common of which is chloroform.[2]

THMs are known to cause cancers in laboratory animals, although no definitive conclusions can be reached for their contribution to human cancers in small doses. The current limit for THMs in drinking water is 0.1 mg/l; this requirement applies to water systems serving over 10,000 people. The existing requirement may become more stringent (i.e., lower) in the future.

The THM-formation potential of the proposed reservoir would be highest in the first few years of operation as the inundated vegetation decays, and would gradually decrease over time. It is not anticipated that any long-term elevated levels of THMs would be present in the Cal-Am water supply.

Because the water supply would be treated by Cal-Am to meet all applicable public health standards, this impact is considered less than significant.

Mitigation Measure 15.3.1-4

It is recommended that the reservoir inundation area be cleared of vegetation and other organic debris as much as possible to reduce the THM-formation potential of the impounded water.

Implementation of these mitigation measures would reduce the potential impacts to public health and safety to a less than significant level.

15.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Construction and operation of the 24 NLP Reservoir in this project alternative would have the same potential public health and safety impacts as described in Section 15.3.1 (see Impacts 15.3.1 through 15.3.4 and related Mitigation Measures). Potential impacts associated with the 3 MGD desalination plant are presented below.

Impact 15.3.2-1

Consumption of desalinated ocean water would have no impact on public health.

The desalination facility would be designed to produce potable water with a total dissolved solids (TDS) level of 300 milligrams per liter (mg/l) or less. The majority of the TDS would be sodium and chloride. By comparison, the TDS concentration for surface and ground water sources in the Cal-Am system ranges between 110 to 600 mg/L (Table 15-1).

Without post-treatment, desalinated seawater would have a TDS level of about 190 mg/l. Because of its lack of constituents such as calcium and carbonate, and its low pH, the water would be "aggressive" and would tend to corrode pipes or other surfaces unless post-treatment were provided. Post-treatment would be included by treating the product water with lime and allowing the desalinated seawater to be exposed to the atmosphere to provide bicarbonate alkalinity. In addition, the desalinated water supply would be treated so as to meet all applicable water quality standards. Therefore, the consumption of desalted seawater would be expected to have no impact on public health.

Mitigation Measure 15.3.2-1

No additional mitigation would be necessary.

Impact 15.3.2-2

Operation of the 3 MGD desalination plant would involve the storage and use of hazardous materials and would present the danger of a hazardous spill.

The primary hazard associated with the desalination plant would be the possible release of hazardous chemicals in air or on land or water. The chemicals of potential concern are sodium hypochlorite, caustic soda (sodium hydroxide), sulfuric acid, sodium tripolyphosphate, sodium dodecylbenzene-sulfonate, lime, and carbon dioxide (see Table 15-2). Cleaning chemicals would be received in concentrated form for use at the desalination facility. Accidental catastrophic release of sodium hypochlorite could potentially adversely affect human health because this substance is toxic and is considered to be "acutely hazardous." An accidental release of sodium hydroxide, sulfuric acid, or ferric chloride could cause burns to plant personnel coming in contact with them, but would not affect the general public.

There are other chemicals that could cause some incompatibility concerns that are considered a slight risk, including antiscalant. These chemicals would be used in small quantities and are non-volatile, non-hazardous, and therefore, are not considered to present a major risk or concern.

All chemicals would be stored in designated storage areas. Federal, state, and local laws and regulations stipulate minimum standards for design of facilities, storage requirements, spill prevention procedures, emergency response and contingency plans, risk management and employee training procedures. The desalination facility would adhere to pertinent regulations including the Uniform Building Code, Article 80 of the Uniform Fire Code, and other regulations related to risk management. The design of the proposed project would include double containment piping for chemical feed lines, specially treated concrete containment structures for chemical storage areas, and monitoring of chemical feed systems. Design of chemical storage and piping would be done to minimize the potential hazards caused by pipeline breaks. None of the chemicals proposed for use are flammable.

The limited pretreatment requirements at the Sand City desalination facility would reduce the amount of chemicals that would be delivered to and stored at the site. The site would comply with all

TABLE 15-2

SUMMARY OF POTENTIAL CHEMICAL HAZARDS BY CHEMICAL TYPE

Chemical	Concentration and State	Storage	Delivery Quantity/Frequency	Potential Hazard
ANTISCALANT				
Threshold Inhibitor	100% solution, liquid	55 gallon drums	Monthly delivery of about 20 drums	
RO PROCESS CLEANING CHEMICALS				
Sodium Dodecylbenzenesulfonate	0.25% solution, liquid	55 gallon drums	Once every 6 months.	Liquid release
Sodium Tripolyphosphate	2% solution, liquid	55 gallon drums	Once every 6 months.	Liquid release
Sodium Hydroxide	1% solution, liquid	55 gallon drums	Once every 6 months.	Liquid release
Sulfuric Acid	1% solution, liquid	55 gallon drums	Once every 6 months.	Liquid release
POST TREATMENT				
Lime	93% as calcium, dry	6,000 pound capacity tank	39,000 pounds/month (3 MGD) 53,000 pounds/month (4 MGD)	
Carbon Dioxide	100% liquid	12,000 gallon tank	6,400 gal/month (3 MGD) 8,500 gal/month (4 MGD)	Liquid release during pipeline transfer.
Sodium Hypochlorite	12.5% solution	1,500 gallon tank	774 gal/month (3 MGD) 1,026 gal/month (4 MGD)	Liquid release

Source: James M. Montgomery Engineers

necessary regulations regarding the use and storage of hazardous materials and emergency response notification and would be a less than significant impact.

Preliminary design for the desalination facility specifies external storage of the carbon dioxide storage tank and the cleaning chemicals. Both internal and external storage would be evaluated during final design, and appropriate local regulatory agencies (i.e. fire department, health officials) would be consulted to ensure public safety.

Mitigation Measure 15.3.2-2

None required or recommended.

Impact 15.3.2-3

Operation of the 3 MGD desalination facility would result in the generation of spent treatment chemicals.

Aqueous chemical waste generated by plant treatment processes, RO membrane cleaning, and laboratory analyses would be relatively non-toxic and would be discharged to the sanitary sewer after use. The pH of the spent cleaning agents may have to be adjusted prior to disposal. The generation and disposal of these chemicals would be a less than significant impact.

Mitigation Measure 15.3.2-3

None required or recommended.

15.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 15.3.3-1

Construction of the 15,000 Cañada Dam would pose a threat to worker and public safety.

See Impact 15.3.1-1.

Mitigation Measure 15.3.3-1

See Mitigation Measures 15.3.1-1.

Impact 15.3.3-2

Catastrophic failure of the proposed Cañada Dam would result in the inundation of private property and possibly the loss of human life.

While this alternative would involve the construction of an off-stream storage reservoir, the risk of dam failure would still exist, and this impact is therefore considered significant.

Mitigation Measure 15.3.3-2

Mitigation Measures 15.3.1-2 for the 24,000 AF New Los Padres Reservoir would be applicable to this alternative, and would reduce the risk to a less than significant level.

Impact 15.3.3-3

Implementation of the 15 CAN/D alternative would have a less than significant impact on the channel capacity of the Carmel River below the diversion.

As discussed in Section 7.5, the 15 CAN/D alternative would be expected to have little or no impact on the flood-carrying capacity of the Carmel River at or below the point of diversion.

Mitigation Measure 15.3.3-3

None necessary.

Impact 15.3.3-4

Organic materials contained within the Cañada Reservoir could, upon chlorination of the drinking water supply, form trihalomethanes (or THMs) in levels sufficient to affect public health.

The effects on public health from THM consumption are discussed under Impact 15.2.1-4 for the 24 NLP alternative.

Mitigation Measure 15.3.3-4

Mitigation measure 15.3.1-4 for the 24 NLP alternative would be applicable to this alternative.

The potential health and safety impacts associated with the proposed 3 MGD desalination facility at the Sand City site are the same as those discussed in Section 15.3.2 (see Impacts 15.3.2-1 through 15.3.2-3).

15.3.4 7 MGD DESALINATION PROJECT (7 DSL)

The 7 MGD desalination project would have the same potential health and safety impacts as discussed in Section 15.3.2 (see Impacts 15.3.2-1 through 15.3.2-3). Chemical consumption associated with this project alternative is presented in Table 15-3.

Threshold inhibitor would be delivered to the desalination sites in returnable containers. Lime, carbon dioxide, and sodium hypochlorite would be delivered in bulk. Storage space would be provided for 20 to 30 days of chemical supply. Chemical deliveries would be at two to three week intervals.

The treatment chemicals that would be used at the MRWPCA desalination facility are similar to those described for the 3 MGD Sand City desalination facility in Section 15.3.2 (see Table 15-2). The chemicals to be used at the 4 MGD MRWPCA desalination facility and their intended use are as follows:

- Sodium Hypochlorite (12.5%) — Disinfection
- Lime ($Ca(OH)_2$ — Corrosion Control
- Carbon Dioxide — Corrosion Control
- Flocon 100 or equal — Scale Prevention
- Sodium Dodecylbenzenesulfonate — Membrane Cleaning
- Sodium Tripolyphosphate — Membrane Cleaning

The sodium hypochlorite used for disinfecting the water is the same as household bleach, though about two to three times more concentrated. It would most likely be delivered to the site in bulk and stored in cross link polyethylene tanks. Secondary containment would be provided by either placing the primary tank inside another polyethylene tank or by a concrete revetment. Piping for conveying the sodium hypochlorite would be made of polyvinyl chloride (PVC) or another suitable material.

Lime would be used together with carbon dioxide to adjust the pH and alkalinity of the water to prevent corrosion of pipeline and plumbing materials. The lime would most likely be delivered in a prehydrated ($CaOH_2$) granular form, so on-site slaking would not be necessary. The lime would be

TABLE 15-3

CONSUMPTION RATE OF CHEMICALS FOR THE
7 MGD DESALINATION PROJECT ALTERNATIVE

Item	Dose	Consumption Rate
Threshold Inhibitor	5 mg/L	730 lb/day
Lime	53 mg/L	3,100 lb/day
Carbon Dioxide	70 mg/L	4,100 lb/day
Sodium Hypochlorite	1 mg/L as Cl_2	60 gallon/day

Source: James M. Montgomery Engineers

delivered to the site in bulk and be stored in silos. The silos would include a dust control system. The silos and feed equipment would be designed to prevent spilling of the lime.

Carbon dioxide would also be delivered to the site in bulk. The carbon dioxide would be stored in a pressurized tank as a liquid. The tank would be placed outside the building and fenced to prevent unauthorized access. The carbon dioxide storage and feed facilities would be designed to prevent release of the carbon dioxide into the environment.

Flocon 100 or another suitable polyacrylate threshold inhibitor would be used to prevent scale formation on the reverse osmosis membranes. These compounds are non-toxic, biodegradable, and approved by the EPA for drinking water treatment. The threshold inhibitor would be delivered in liquid shipping containers (250 - 550 gallons) approved by the Department of Transportation. The threshold inhibitor would be fed directly from these containers. A concrete curb would be constructed around the storage area to contain the threshold inhibitor in the event of a spill.

For periodic cleaning of the reverse osmosis membranes, a solution containing sodium dodecylbenzenesulfonate (0.25%) and sodium tripolyphosphate (2.0%) would be prepared to soak the membranes. Both of these are common household cleaning chemicals. The membrane cleaning operation would be conducted on a semi-annual basis for a plant at the Sand City site. The concentrated cleaning agents would be delivered and stored at the site in 50 gallon containers. A concrete curb would be constructed around the storage area to contain any spills of these compounds.

Prior to start-up of the desalination plant, a series of training sessions would be conducted for the plant operators. Chemical handling as well as equipment operation and maintenance would be covered during these training sessions.

15.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

The No Project alternative would have no impacts on public health and safety; therefore, no mitigation is necessary.

---

1. Cal-Am Water Company, 1989 Water Quality Report

2. American Water Works Association, Water Quality and Treatment, Fourth ed., 1990.

16. ENERGY

16. ENERGY

16.1 SETTING

16.1.1 INTRODUCTION

This section discusses the energy implications of the operation and construction of the various water supply alternatives. The available energy supplies are compared with the energy demands associated with the construction and operation of the project alternatives. The energy demands of the alternatives are then assessed to determine if they would result in a significant adverse impacts.

16.1.2 REGULATORY BACKGROUND

Both the federal government and the State recognize the importance of energy conservation and have addressed the issue through legislation. The most encompassing energy legislation in the State is the Warren-Alquist Act. The Warren-Alquist Act, in effect since January 7, 1975, established the California Energy Resources Conservation and Development Commission (CEC) and gave it certain powers to certify power plants, conduct research and development of alternative energy sources, develop energy conservation measures, and, in general, consolidate various State functions related to energy resources. The Act goes on to state the following:

> The present rapid rate of growth in demand for electric energy is in part due to wasteful, uneconomic, inefficient, and unnecessary uses of power and a continuation of this trend will result in serious depletion or irreversible commitment of energy, land and water resources, and potential threats to the state's environmental quality. It is further the policy of the State and the intent of the California Legislature to employ a range of measures to reduce wasteful, uneconomical, and unnecessary uses of energy, thereby reducing the rate of growth of energy consumption, prudently conserve energy resources, and assure statewide environmental, public safety, and land use goals.

The assessment of energy impacts are also addressed in the California Environmental Quality Act (CEQA), and provides that Environmental Impact Reports (EIRs) state the possible mitigation measures "to reduce wasteful, inefficient, and unnecessary consumption of energy."

Description of Energy and Conventional Sources

Energy is the capacity for doing work. There are several forms of energy, and one form may be changed to another, such as burning coal to produce steam to drive a turbine which produces electricity. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat. Energy is measured in terms of the work it is capable of doing. Electric energy is usually measured in kilowatt hours (kWH); natural gas in BTU's. BTU is an abbreviation for British thermal unit and is the quantity of heat necessary to raise the temperature of one pound of water one degree Fahrenheit. A kilowatt is a measure of power, or heat flow rate, and equals 3,413 BTU per hour.

Virtually every California community is dependent on three major types of energy: petroleum fuels, natural gas, and electricity. Of these three, oil and gas are considered "primary" sources of energy. Except for hydroelectric power, production of electricity requires the consumption of primary energy sources.

Petroleum Fuels. Petroleum fuels consist primarily of gasoline and diesel fuel for vehicles, fuel oils for industry and electrical power generation, and a variety of other liquid fuels, such as kerosene for jet fuel. Petroleum fuel is measured in gallons and contains approximately 12,500 BTU/gallon.

Natural Gas. Natural gas is usually produced in conjunction with oil production. Natural gas is measured in cubic feet and contains approximately 1,050 BTU/cubic foot.

Electricity. In contrast to oil and gas, most electricity is produced by "consuming" other resources. After these primary energy sources are converted to electricity, the electricity is transmitted through a vast network of transmission and distribution lines. The loss of energy at the power plant and transmission losses amount to about two-thirds of the energy required to supply electricity, with the remaining one-third of the energy available for end-use by the consumer. Electricity is measured in kilowatt hours.

Energy Supply and Consumption

Supply. Oil supplies approximately 57 percent of California's total energy. In 1989, 590.6 million barrels of petroleum products were supplied to California. Unleaded gasoline continually represents the largest component of petroleum products supplied at 41.9 percent. California's oil supply is provided almost equally from in-state and Alaska production and is expected to decline slowly over the next 20 years, forcing the state to import foreign oil to make up the difference and to meet increasing demand.[1]

Pacific Gas & Electric (PG&E), servicing 94,000 square miles of Northern and Central California, is the utility supplying electricity and natural gas to the Monterey area. PG&E is dependent on a variety of energy sources to meet its energy demands. Table 16-1 shows the sources and volumes of electricity and natural gas produced by PG&E in 1990. PG&E operates with a grid distribution system that channels all energy produced at the different sources into one large energy pool for distribution throughout the service territory. Table 16-2 shows the electrical generating and transmission capacity of PG&E's individual energy producing sources. In 1990, PG&E operated with a net peak-electrical capacity of 21,397 megawatts (Mw) and maintained a reserve margin of 10.3 percent above the peak demand.[2]

PG&E's fossil fuel plants are fired almost exclusively by natural gas. As shown in Table 16-3, fossil fuel plants supplied approximately 25 percent of the PG&E's total electrical demand in the year 1990. For the year 1990, the Moss Landing Power Plant, located in Monterey County, supplied approximately 8.6 percent of the total electrical demand for the PG&E service territory.

Consumption. Industry depends on oil for approximately one-third of its energy consumption. Transportation depends on oil for almost 100 percent of its energy.[3] California's transportation system is the biggest energy end-use in the state, consuming approximately 50 percent of the state's total energy. In the year 2004, on-road vehicles are projected to consume approximately 80 percent of California's transportation energy demand, a 10 percent increase from current demand.[4] Cars, trucks, and buses account for nearly all of the on-road fuel consumption, 90 percent of which is gasoline.[5]

Table 16-4 reflects energy consumption of natural gas and electricity in the PG&E service area in 1990 for a variety of different classes of service. Within the PG&E service area, the average person consumes about 2.3 megawatt hours (Mwh) of electricity per year.[6]

TABLE 16-1

SOURCES OF ENERGY SUPPLIED BY PG&E IN 1990

Electricity	kWH (in millions)	MBTU[1] (in millions)	% of Total
Generated:			
Hydroelectric Plants:	8,008	82	4.5
Thermal-electric Plants:			
Fossil Fueled	24,496	251	13.8
Geothermal	7,324	75	4.1
Nuclear	16,274	166	9.2
Total Thermal Electric Plants	48,094	492	27.1
Wind Plants	–	–	–
Received from Other Sources:[2]	46,682	478	26.4
Total Gross System Output	102,784	1,050	58.0

Natural Gas	MCF[3] (in thousands)	MBTU (in millions)	% of Total
Purchased:			
From California:	77,935	82	4.5
From other States:	273,981	288	15.9
From Cañada:	372,421	391	21.6
Total Purchased	724,337	761	42.0
Grand Total		1,811	100.0

[1] MBTU - An abbreviation for one million BTU's.

[2] Includes energy supplied through PG&E's system by the City and County of San Francisco for San Francisco's own use and for sale by San Francisco to its customers, by the Department of Energy for government use and sale to its customers and by the State of California for California Water Project pumping.

[3] MCF - Million cubic feet.

Source: Pacific Gas & Electric, Form 10-K For the Fiscal Year Ended December 31, 1990.

TABLE 16-2

PG&E UTILITY OPERATIONS
ELECTRIC GENERATING AND TRANSMISSION CAPACITY

As of December 31, 1990, PG&E owned and operated the following generating plants, all located in California, listed by energy source:

Generating Plant	County Location	Number of Units	Net Operating Capacity (Kw)
Hyd oelectric:			
Conventional Plants	16 Counties in Northern and Central California	111	2,691,600
Helms Pumped Storage Plant	Fresno	3	1,212,000
	Hydroelectric Subtotal	114	3,903,600
Fossil Fueled:			
Contra Costa	Contra Costa	7	1,260,000
Humboldt Bay	Humboldt	2	105,000
Hunters Point	San Francisco	4	429,000
Kern	Kern	2	180,000
Morro Bay	San Luis Obispo	4	1,002,000
Moss Landing	Monterey	7	2,060,000
Oakland	Alameda	3	165,000
Pittsburg	Contra Costa	7	2,022,000
Potrero	San Francisco	4	363,000
Mobile Turbines[1]	Contra Costa and Humboldt	3	45,000
Geothermal:			
The Geysers[2]	Sonoma and Lake	18	1,302,000
Nuclear:			
Diablo Canyon	San Luis Obispo	2	2,160,000
	Thermal Subtotal	63	11,093,000
Total		177	14,996,600

[1] Listed to show capability; subject to relocation within the system as required.
[2] PG&E intends to retire four geothermal units representing 78 Mw in 1992.

Source: Pacific Gas & Electric, Form 10K for Fiscal Year Ended December 1990.

TABLE 16-3

THE TOTAL AMOUNT OF CAPACITY AND GENERATION PROVIDED BY VARIOUS SOURCES DURING THE YEAR ENDING DECEMBER 31, 1990

Sources of Electric Generation	Kw	Percentage
Company-Owned Plants:		
Fossil Fueled	7,634,000	51
Geothermal	1,302,000	9
Nuclear	2,160,000	14
Total Thermal	11,096,000	74
Hydroelectric	3,877,000	26
Solar	0	0
Total Company-Owned Capacity	14,973,000	100
Less Unavailable Capacity	(1,534,000)	
Total Company Available Capacity	13,439,000	63
Capacity Received from Others:		
QF Producers (available)	2,315,000	11
Area Producers & Imports	5,643,000	26
Capacity from Others	7,958,000	37
Total Available Capacity	21,397,000	100
Less Total Area Demand[1]	19,400,000	
Reserve Margin[2]	1,997,000	10.3
Electric Generation:		
Company-Owned Plants:		
Fossil Fueled:	24,496,393	25
Geothermal	7,323,960	8
Nuclear	16,273,963	17
Total Thermal	48,094,316	50
Hydroelectric	8,007,631	8
Solar	35	0
Total Company Generation	56,101,982	58
Helms Pumpback Energy	(395,772)	(1)
Net Company Generation	55,706,210	57
Generation Received from Others:		
QF Producers	17,066,960	18
Area Producers and Imports	24,783,195	25
Generation from Others	41,850,155	43
Total Area Generation	97,556,365	100

[1] The maximum area peak demand to date was 1[illegible] 400,000 Kw which occurred in August 1990.

[2] The reserve capacity margin at the time of the 1990 peak for the control area, taking into account short-term firm capacity purchases from utilities located outside PG&E's service area.

Source: Pacific Gas & Electric, Form 10K for Fiscal Year Ended December 1990.

TABLE 16-4

NATURAL GAS AND END-USE ELECTRICAL ENERGY CONSUMPTION IN THE PG&E SERVICE AREA IN 1989

Class of Service	Customers	kWH (in millions)	MBTU[1] (in millions)	% of Total
Electricity				
Residential	3,604,327	23,222	238	18.9
Commercial	440,670	25,867	265	21.1
Industrial	1,102	16,271	166	13.3
Agricultural	98,131	4,702	48	3.8
Public Street/Highway Lighting	14,979	376	4	0.3
Other Electric Utilities	20	3,619	37	3.0
Total	4,159,229	74,057	758	60.4

Class of Service	Customers	MCF[2] (in thousands)	MBTU[1] (in millions)	% of Total
Natural Gas				
Residential	3,214,424	204,433	215	17.1
Commercial	194,596	102,579	108	8.6
Industrial	2,154	133,930	141	11.2
Other Gas Utilities	16	31,604	33	2.6
Total	3,411,190	472,546	496	39.6
GRAND TOTAL			1,254	100.0

[1] MBTU - An abbreviation for one million BTU's.
[2] MCF - Million Cubic Feet

Source: Pacific Gas & Electric, Form 10-K For the Fiscal Year Ended December 31, 1990.

16.2 STANDARDS OF SIGNIFICANCE

According to the CEQA Guidelines a project would have a significant effect on the environment if it encourages activities that result in the use of large amounts of energy or uses energy in a wasteful manner. For the purposes of this EIR/EIS, it is assumed that a project would be considered to have a significant impact on energy consumption if it were to consume a substantial amount of energy when compared to the PG&E reserve capacity margin. The reserve capacity margin is defined as the surplus capacity at peak-day demand. Also, significant impacts would occur if construction of a project was especially energy intensive or if energy was utilized in a wasteful manner.

16.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

16.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Impact 16.3.1-1

Construction of the proposed New Los Padres Dam would consume energy for equipment and material transport, operation of construction equipment and processing of materials used in construction.

Energy impacts related to project construction would require a one time energy expenditure, lasting for the duration of construction. Energy would be consumed for a variety of different functions related to dam construction. Energy would be consumed by construction equipment required to haul construction materials and waste and for the excavation of the foundation. Indirectly, energy would be consumed in the processing of construction materials, predominately concrete and steel used in the construction of the dam. Off-site transportation of workers, materials and equipment would constitut an additional energy expenditure related to the construction of the reservoirs. Construction of the proposed New Los Padres Dam would necessitate the expenditure of an estimated 154 billion BTUs, consisting of 108 billion BTUs for hauling and excavation, 44 billion BTUs for materials manufacture, and 2 billion BTUs for offsite transportation.

Considering the size of the project, energy consumed for the construction of the New Los Padres Dam would not use large amounts of energy or use energy in a wasteful manner, and therefore this impact would be less than significant.

Mitigation Measure 16.3.1-1

Energy consumption could be reduced through the use of energy efficient vehicles and regular inspection and maintenance.

Impact 16.3.1-2

Operation of the New Los Padres Dam would consume a minimal amount of energy.

Operation of the 24 NLP alternative would consume a minimal amount of energy for operation of the appurtenances (outlet valves, fish passage facilities, lighting, etc.) and for general maintenance. Fuel would be consumed by maintenance personnel visiting the dams. However, the amounts of energy consumed during the operation of these dams would be considered less than significant.

Mitigation Measure 16.3.1-2

None required; however, it is recommended that the District purchase and use vehicles that have a high fuel efficiency, and inspect and maintain vehicles to ensure fuel efficiency.

16.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Impact 16.3.2-1

Construction of the proposed New Los Padres Dam would consume energy for equipment and material transport, operation of construction equipment and processing of materials used in construction.

Impact and mitigation measures for 24 NLP dam component are the same as discussed in Section 16.3.1 under 24 NLP Alternative.

Mitigation Measure 16.3.2-1

Energy consumption could be reduced through the use of energy efficient vehicles and regular inspection and maintenance.

Impact 16.3.2-2

Operation of the New Los Padres Dam would consume a minimal amount of energy.

Impact and mitigation measures for 24 NLP dam component are the same as discussed in Section 16.3.1 under 24 NLP Alternative.

Mitigation Measure 16.3.2-2

None required; however, it is recommended that the District purchase and use vehicles that have a high fuel efficiency, and inspect and maintain vehicles to ensure fuel efficiency.

Impact 16.3.2-3

Construction of the proposed 3 MGD desalination plant in Sand City would consume energy for equipment and material transport, operation of construction equipment and processing of materials used in construction.

Construction of the desalination plant would result in the consumption of energy. Energy would be consumed primarily by construction equipment required in the facility construction and pipeline trenching and backfilling activities. Indirectly, energy would be consumed in the processing of manufacturing construction materials. Energy consumed during construction activities would not use an unusually large amount of energy, or use energy in a wasteful manner. Construction of the desalination plant would have a less than significant impact to energy supplies.

Mitigation Measure 16.3.2-3

None required; however, energy consumption could be reduced through the use of energy efficient vehicles and regular inspection and maintenance.

Impact 16.3.2-4

Operation of the 3 MGD desalination plant at Sand City would consume electrical energy.

The estimated average annual electrical energy demand of the 3 MGD plant at the Sand City site would be approximately 16,000 Mwh per year, assuming an annual production of 2,400 AF/year.[7] Based on the average residential energy consumption in the PG&E service area, the 3 MGD desalination plant would consume the electric energy of about 2,500 residential customers.

Energy to operate the desalination plant would come from the PG&E distribution grid.[8] As described earlier, the distribution grid is supplied by a variety of sources, each of which has been approved and permitted, including air quality permits, as applicable. The energy would not come directly from the local Moss Landing Power Plant (8.6 percent of total demand in 1990). According to PG&E, there is sufficient capacity within the grid to supply 3.0 Mw of electrical power over the life of the project without adding any new generating sources. PG&E has reported that in August 1990 their peak demand was 19,400,000 Kw while their total available capacity was 21,397,000 Kw. The reserve capacity margin at this time of peak demand was 10.3 percent or 1,997,000 Kw. The 3.0 Mw required for the Sand City desalination facility would be about 0.01 percent of the total available capacity and about 0.15 percent of the reserve capacity on this day of peak demand.

Operation of the proposed desalination facility would constitute a less than significant energy impact because energy use would be within the existing permitted capacity of the power generating facilities supplying power to the PG&E distribution grid.

The proposed project design includes consideration and incorporation of energy conservation measures. As described above, an energy recovery turbine would be installed as part of the RO process to recover up to 30 percent of the overall RO pumping energy. In addition, utilization of existing facilities and the location of the project components as close to sea level as possible, reduce energy requirements for construction and pumping.

Mitigation Measure 16.3.2-4

None required.

16.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Impact 16.3.3-1

Construction of the proposed Cañada Dam would consume energy for equipment and material transport, operation of construction equipment and processing of materials used in construction.

Energy impacts related to project construction would require a one time energy expenditure, lasting for the duration of construction. Energy would be consumed fo a variety of different functions related to dam construction. Energy would be consumed by construction equipment required to haul construction materials and waste and for the excavation of the foundation. Indirectly, energy would be consumed in the processing of construction materials, predominately concrete and steel used in the construction of the dam. Off-site transportation of workers, materials and equipment would constitute an additional energy expenditure related to the construction of the reservoirs.

Based on an analysis of vehicle trips during construction and construction duration times, the most energy intensive construction by far would be that of the 15 CAN/D alternative, which would consume about nine times the amount of energy than any other alternative. Construction of the 15 CAN/D alternative would be extremely energy intensive because of the large amount of earthen materials that would need to be imported by truck and the duration of the construction period. Therefore, construction of the 15 CAN/D alternative would have a significant impact to energy supplies because considerably less energy intensive alternatives are available.

Mitigation Measure 16.3.3-1

None available for the construction of the 15 CAN/D alternative; thus, 15 CAN/D would consume a significant and unavoidable amount of energy. However, energy consumption could be reduced through the use of energy efficient vehicles and regular inspection and maintenance.

Impact 16.3.3-2

The 15 CAN alternative would consume electrical power by pumping water to the off-stream storage reservoir.

Operation of the 15 CAN alternative would commit the MPWMD to increased power consumption for the life of the project. In addition to the amount of power necessary for normal operation and maintenance of the dam, electric power would be necessary to pump water from the channel of the Carmel River to the storage reservoir. The estimated annual energy consumption for pumping water to the reservoir is approximately 4,000 Mwh per year. This would be considered a less than significant impact.

Mitigation Measure 16.3.3-2

None required; however, it is recommended that energy efficiency be considered during final project design, and that energy-efficient pumps and vehicles be included with the project.

Impact 16.3.3-3

Construction of the proposed 3 MGD desalination plant in Sand City would consume energy for equipment and material transport, operation of construction equipment and processing of materials used in construction.

Please refer to the discussion under Impact 16.3.2-3.

Mitigation Measure 16.3.3-3

None required; however, energy consumption could be reduced through the use of energy efficient vehicles and regular inspection and maintenance.

Impact 16.3.3-4

Operation of the 3 MGD desalination plant at Sand City would consume electrical energy.

Please refer to the discussion under Impact 16.3.2-4.

Mitigation Measure 16.3.3-4

None required.

16.3.4 7 MGD DESALINATION PROJECT (7 DSL)

Impact 16.3.4-1

Construction of the proposed 3 MGD desalination plant in Sand City and the 4 MGD plant at the MRWPCA site would consume energy for equipment and material transport, operation of construction equipment and processing of materials used in construction.

Please refer to the discussion under Impact 16.3.2-3 for the 3 MGD Sand City alternative. Construction of the 4 MGD desalination plant would involve an additional amount of energy for similar construction activities, but energy requirements would be somewhat greater because of the longer pipelines associated with the MRWPCA alternative. Overall, construction of these two desalination plants would not involve the expenditure of an unusually large amount of energy, nor would energy be used in a wasteful use of energy; therefore, the impact would be considered less than significant.

Mitigation Measure 16.3.4-1

None required; however, energy consumption could be reduced through the use of energy efficient vehicles and regular inspection and maintenance.

Impact 16.3.4-2

Operation of the proposed 7 MGD desalination alternative would consume considerable electrical energy.

The 7 MGD capacity desalination project represents a total 7 Mw demand for electrical energy (4 Mw for 4 MGD at MRWPCA and 3 Mw for 3 MGD at Sand City). Energy to operate the 7 MGD desalination plant would come from the PG&E distribution grid. As described in Section 16.1, the distribution grid is supplied by a variety of sources, each of which has been approved and permitted, including air quality permits, as applicable. The electrical energy would not come directly from the local Moss landing Power Plant (8.6 percent of total PG&E demand in 1990).

PG&E has reported that their peak demand of 19,400,000 Kw occurred in August 1990, while their total available capacity was 21,397,000 Kw. The reserve capacity margin at this time of peak demand was 10.3 percent or 1,997,000 Kw. The 7.0 Mw required for the 7 MGD capacity project would represent about 0.03 percent of the total available capacity and about 0.35 percent of the reserve capacity on this day of peak demand.

The proposed project design includes consideration and incorporation of energy conservation measures. An energy recovery turbine would be installed as part of the RO process at both plants to recover up to 30 percent of the overall RO pumping energy. In addition, utilization of existing facilities and the location of the project components as close to sea level as possible, reduce energy requirements for construction and pumping.

The estimated average annual electrical energy demand of the 7 MGD desalination alternative would be approximately 38,000 Mwh per year, assuming an annual production of 5,500 AF per year. For the maximum annual production of 7,000 AF per year from the project, the annual electrical energy consumption would be approximately 48,000 Mwh per year. Based on the average residential energy consumption in the PG&E service area, operation of the 7 MGD desalination project would consume the electrical energy of about 5,900 residential customers.

According to PG&E, there is sufficient capacity within the grid to supply 7.0 Mw of electrical power over the life of the plants without adding any new generating sources. However, PG&E representatives have indicated that the District would need to provide a substation to convert transmission level power at the MRWPCA site to a more appropriate voltage level for a 4 MGD desalination plant.

Operation of the 7 MGD capacity desalination project would constitute a less than significant energy impact because energy would be within the existing permitted capacity of the power generating facilities supplying power to the PG&E grid.

Mitigation Measure 16.3.4-2

None required.

16.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

Well construction and operation associated with the No Project alternative would consume a minimal amount of energy, and no mitigation would be required.

---

1. California Energy Commission, Energy Agenda: 1989-1990 Biennial Report, p. 12.

2. Pacific Gas and Electric Company, Form 10-K, For Fiscal Year Ended December 31, 1990, pg. 15.

3. California Energy Commission, Conservation Report, October, 1988.

4. California Energy Commission, California Transportation Energy Demand: 1984-2004, April, 1985, p. 2.

5. Ibid, pp. 13-14.

6. Pacific Gas and Electric Company, op. cit.

7. For the maximum annual production of about 3,000 AF per year from the desalination plant, the annual electrical energy consumption would be approximately 20,000 Mwh per year.

8. Tom Webb, PG&E. March 30, 1992. Letter to Margo Nottenkamper, MPWMD.

17. LAND USE, PLANNING AND RECREATION

17. LAND USE, PLANNING AND RECREATION

INTRODUCTION

Land use issues for the "land use" sections of an environmental impact analysis typically fall into two general areas (1) consistency with permitted uses and development intensities specified in land use designations and zoning of applicable general and area plans and zoning ordinances, and (2) potential conflicts with adjacent land uses. Recreational issues usually focus on the need for additional recreational resources to serve new population related to a project or to the removal of recreational resources as a result of a proposed project. In the case of this project, the focus is on the proposed project's effect on the recreational resources currently at the reservoir sites of the projec. ..ernatives and on impacts to the recreational resources of the lower Carmel River and Carmel Lagoon as related to different river flows associated with the different project alternatives.

Additionally Section 15125 of the CEQA Guidelines requires that the setting section of an EIR discuss any inconsistencies between the proposed project and applicable environmental and land use plans.[1] In this EIR/EIS, each chapter of environmental analysis discusses inconsistencies with relevant environmental plans and policies as applicable. This chapter focusses on the specific land use and recreational issues related to the project alternatives as described above. However, a supplemental policy consistency analysis is contained in Appendix 17 for informational purposes. It was prepared at the request of Monterey County Planning and Building Inspection Department to assist them with their building permitting process for the proposed project. The policy consistency analysis covers the full range of environmental plans and policies applicable to the project from water quality, to visual quality, to transportation. It summarizes and references the range of environmental sections of this EIR/EIS as applicable for each policy.

17.1 SETTING

This setting section describes the existing conditions used as the baseline for the impact analysis of section 17.3. This setting section discusses land use plans and policies, existing land uses, designations and zoning related to permitted land uses and intensity of development, as well as recreational resources. The following introductory section 17.1.1 discusses some general points regarding the land use planning process and regulation in Monterey County. The balance of the setting section discusses existing conditions in the vicinities of each project alternative.

17 1.1 INTRODUCTION

Land use within all unincorporated areas of Monterey County is regulated by the County General Plan, Area Plans and the County Zoning Ordinance. The Monterey County Planning Department, and ultimately, the Board of Supervisors, are responsible for assuring implementation of the general plan, area plans and the Zoning Ordinance. In California, the General Plan is considered the "constitution" of land use regulation; all proposed development must conform with its provisions. Area Plans are typically sub-elements of the general plan and are more refined expressions of general plan policies and land use restrictions; they must retain overall conformity with general plan policies. The zoning ordinance is the most "fine grained" expression of general plan policies and provides detailed regulation of land use via provisions for issuance of use permits. Because the zoning ordinance must be shown to conform with the general plan prior to adoption, a project's compliance with applicable zoning is typically presumed to indicate compliance with the general plan. These elements of land use regulation are further described below.

All of the alternative sites of the proposed project are within Monterey County. The County's General Plan (September 1982) is the main planning policy document governing activity in the unincorporated areas of the County. The following policies of the General Plan are relevant to the land uses of the proposed project.

Water Service

Goal 53: *To promote adequate water service for all County needs.*

Wastewater Treatment Plant Facilities

Objective 54.2: *Improve groundwater recharge through the use of reclaimed wastewater in accordance with health and safety standards.*

Policy 54.2.3: *The County shall be attentive to the state of the art in reclamation technology and, where applicable and cost-effective, shall encourage implementation thereof.*

Public Utilities

Goal 56: *To promote the efficient distribution of public utilities by reserving land uses for utility sites and access corridors which provide utilities for planned population centers.*

The wastewater policies are indirectly relevant in that they address the need to improve groundwater recharge and to use state of the art technology where applicable and cost-effective, both of which are applicable to the project alternatives.

The General Plan Land Use Element and Land Use Map specify permitted types and intensities of land use within the County. Other Elements of the Plan specify supplemental goals and policies designed to guide permitted development in the unincorporated areas of the County. Development within the alternative sites must be consistent with the overall County General Plan land use designations and planning policies. The County General Plan designates eight planning sub-areas that contain background data, planning strategies, and a land use plan based on the countywide General Plan, but tailored to the specific needs of the planning area. The alternative sites fall into three of the subareas: the Greater Monterey Peninsula Planning Area, Cachagua Planning Area, and Carmel Valley Planning Area. In addition to identifying permitted types and intensity of land use, the County General Plan and the Area Plans contain policies which further define the characteristics of permitted uses.

The County Zoning Ordinance is the key land use regulatory mechanism. The Zoning Ordinance refines and specifies permitted land use within unincorporated portions of the County, consistent with the overarching provisions of the General Plan and any applicable Area Plans. Any proposed development with the County must conform to all regulations listed under the zoning ordinance. Any deviations from zone specifications would require a variance from the County Planning Department. Ultimately, a County use permit is required for new uses and specifies the conditions under which the use may occur. The County may condition the use permit to assure conformity with all pertinent requirements of the Zoning Ordinance and with policies of the General Plan and Area Plans.

17.1.2 VICINITY OF THE 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Land Use Plans and Policies (24 NLP)

The provisions discussed in the Introduction above (subsection 17.1.1) of the Monterey County General Plan and Zoning Ordinance apply to the 24 NLP Alternative. Additionally, the 24 NLP Alternative is located entirely within the Cachagua Planning Area. Policies listed in the Cachaqua Area Plan (CAP) are supplemental to the goals, objectives and policies of the countywide General Plan. CAP policy #32.1.4 is relevant to this chapter's land use analysis as follows: *Land uses adjacent to the Ventana Wilderness shall not impact the purpose of the wilderness areas.*

Existing Land Uses, Designations, and Zoning (24 NLP)

The General Plan Land Use Designation for the 24,000 AF New Los Padres Reservoir site is Resource Conservation (RC), 2,300 acre minimum parcel size and Public/Quasi-public (PQ) (Cachagua Area Plan). The RC category is intended to ensure conservation of a wide variety of the County's resources while allowing for some limited use of these properties. Uses in resource conservation areas must be in keeping with the conservation intent of this category. The PQ category includes the existing reservoir. The County zoning designation for the inundation area is "N-2000 (rural) acre minimum building site" (i.e., no greater than one unit per 2,000 acres).

Land uses within the vicinity of the 24 NLP project consist of private residences, Princes Camp (a small community), Cachaqua Community Center, a U.S. Forest Service Station, hiking trails, and Bluff Camp (a small campground). Land uses within the 24 NLP project inundation area consist of approximately 266 acres of mostly undeveloped open space, and the existing Los Padres Reservoir (56 acres). All the acreage, including the existing reservoir, is owned by California-American Water Company (Cal-Am), purveyors of water for the Monterey Peninsula. There is currently no residential development in the project inundation area.

Land uses surrounding the project site consist generally of undeveloped forested open space. The Wilderness Area stretches further south and adjacent to the project site. This area is undeveloped with some hiking trails and gravel and dirt roads. Cal-Am also owns some property to the south of the project site. Land use to the north includes very low density rural residential properties. East and west of the project site is mostly undeveloped land with some scattered rural residential use. No development has been proposed for the project site and surrounding area.[2]

Recreational Resources (24 NLP)

Reservoir Site (24 NLP). Cachagua Area Plan policy #51.1.5 would apply as follows:

> *The dedication of recreational trail easements shall be encouraged where appropriate either for establishing a planned Cachagua trails system, or where an established trail is jeopardized by impending development.*

Recreation in the vicinity of the proposed reservoir site includes hiking, equestrian use, sightseeing, picnicking, and fishing upstream of the dam. The Monterey County General Plan indicates a proposed hiking/equestrian trail stretching from the Carmel River State Beach, up the Carmel River Valley, past the San Clemente and Los Padres Reservoirs, and south into the Ventana Wilderness. The Department of Fish and Game prohibits fishing between the new dam and the San Clemente Dam. Boating in noninflatable craft, swimming, camping, and motorized vehicles are prohibited in the reservoir area. There is a hiking trail and an established campground, Bluff Camp. The hiking trail is the primary link to the Ventana Wilderness Area. Presently, fishing is allowed in the existing reservoir. However, only inflatable boats are allowed in the water.

Lower Carmel Valley/Lagoon (24 NLP). Existing recreational resources are limited due to the absence of river flows during the summer and fall months. Analyses show that under current stream flows and ground water pumping volumes, stream flow in the lower Carmel River and at the Carmel Lagoon would be absent during five to nine months during most water years (see Figure 7-5 in Chapter 7). As a result, riparian vegetation, related passive recreational resources (bird watching, hiking, etc.), and instream recreational resources (swimming, fishing, etc.) in the lower Carmel River and at the Lagoon have already been significantly degraded. These existing conditions have been analyzed in conjunction with the Final EIR on the Monterey Peninsula Water Management District's Water Allocation Program as follows.[3]

> Park and recreation facilities located adjacent to the Carmel River include Carmel River State Beach, Del Mesa Carmel County Park, Garland Ranch Regional Park, Rancho Cañada Golf Links, Carmel Valley Golf and County Club, and Carmel Valley Ranch. Most river recreation at these facilities is water-enhanced recreation (not requiring physical contact with the water, but enhanced by the presence of water). Water-enhanced recreation in the Carmel River corridor includes picnicking, hiking, golfing, nature study, and birdwatching. Thus, these activities are directly improved by the presence of water. A reduction in water would cause a reduction in vegetation, which in turn would reduce the recreation use of the river by adults and children.

> Water-dependent recreation, such as boating, fishing, and swimming, requires direct contact with water. Low flows in recent years have greatly diminished opportunities for water-dependent recreation in the Carmel River (primarily swimming and fishing).
>
> The river is open to angling from its mouth to Robles del Rio, 15 miles upstream. Access is relatively easy and the stream is often wadable along its entire length. To prevent overfishing the season is restricted to the period from November 15 through February 28. Most of the fish are taken in January and February. When streamflow is low, fish tend to crowd into a dozen or so large pools which sometimes become ringed with anglers. This diminishes the pleasures and aesthetic values of the steelhead fishing and increases the risk of overfishing. The problem has been reduced since 1985 through prohibition on angling when streamflow is below 200 cubic feet per second at the Near Carmel gauge. In 1984, a year of relatively good run and excellent conditions for angling, an estimated total of 1,442 angler days were spent on the Carmel River in January and February and an estimated 478 adult steel head were caught.

As discussed in Section 2.5, Actions Already Taken, of this EIR/EIS, the allocation limit on Cal-Am water production adopted by the MPWMD Board of Directors is 16,744 AF annually. This was found to be the least environmentally damaging water production supply option in the Water Allocation Program FEIR. As such, this level of water production within the District and its associated impacts on riparian and fish resources, and secondary impacts on recreational resources, make up the existing recreational resource conditions and trends. The current production involves significant adverse impacts to fish and riparian resources themselves and associated recreational resources.[4] However, mitigation measures proposed for riparian vegetation would lessen recreational impacts, but it was uncertain whether or not these would be reduced to less than significant levels. Additionally, mitigation measures proposed for fish stocks would reduce impacts to less than significant levels. The District Board also adopted a five year mitigation plan to address the significant impacts of the present water allocation regime. It is contained in Appendix 2-C of this EIR/EIS.

It should be noted though, that recreation impacts are considered socio-economic impacts under CEQA, and CEQA does not treat them as significant impacts on the environment.[5] They can be used as the basis for determining that an associated physical environmental impact is significant. As such, recreational impacts would not have environmental significance under CEQA, although they can be mitigated indirectly through mitigations for the associated significant physical environmental impacts. However, socio-economic impacts can be considered significant environmental impacts under NEPA's broader definition of the environment, as long as such effects are interrelated with other effects on the physical environment.[6]

17.1.3 VICINITY OF THE 24,000 AF NEW LOS PADRES RESERVOIR AND DESALINATION PLANT (24 NLP/D)

Land Use Plans and Policies (24 NLP/D)

Reservoir Site (24 NLP/D). Same as that for the 24 NLP alternative discussed above in section 17.1.2.

Desalination Plant (24 NLP/D).[7] This alternative proposes to construct a 3 MGD desalination facility in Sand City. The local coastal program would apply to the 24 NLP/D alternative due to the desalination plants location in Sand City within the Coastal Zone. A key objective of the local coastal program is to transfer to local coastal governments the responsibility for issuing coastal development permits. Each jurisdiction along the Coastal Zone develops a Local Coastal Plan (LCP) which is then approved by the State Coastal Commission. Once the LCP is approved, the jurisdiction is authorized to issue these permits. Any developmen' within the coastal zone must obtain a coastal development permit. The Sand City site lies within the coastal zone and a Coastal Development Permit would be required.

The policies of the State Coastal Act would apply. Section 30101 of the California State Coastal Act states that "Coastal-dependent development or use means any development or use which requires a site on, or adjacent to, the sea to be able to function at all." The proposed desalination plant requires three sites within about 100 feet of the surf zone from which to draw seawater. The desalination plant must be located in relatively close proximity to the intake wells to minimize energy use and costs associated with pumping the raw seawater to the reverse osmosis filters for desalination. These technical requirements define the proposed project as a coastal-dependent use as defined by the Act.

Additionally, the following policies would also apply.

Section 30255

Coastal-dependent developments shall have high priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support.

Section 30250

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

Section 30260

Coastal-dependent industrial facilities shall be encouraged to locate or expand within existing sites and shall be permitted reasonable long-term growth where consistent with this division. However, where new or expanded coastal-dependent industrial facilities cannot feasibly be accommodated consistent with other policies of this division, they may nonetheless be permitted in accordance with this section and Sections 30261 and 30262 if (1) alternative locations are infeasible or more environmentally damaging; (2) to do otherwise would adversely affect the public welfare; and (3) adverse environmental effects are mitigated to the maximum extent feasible.

Section 30211

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30240

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

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

Section 30251

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character [of] surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.

Due to the recent approval of the Monterey Bay National Marine Sanctuary (MBNMS), its regulatory policies and procedures would also apply to any uses that could affect its environmental resources or qualities. In summary, the regulatory policies of the MBNMS Master Plan state that the National Oceanic and Atmospheric Administration (NOAA) will work within the current regulatory process with the current regulatory agencies to insure that permitted uses affecting the Sanctuary contain conditions of use that prevent adverse effects to the Sanctuary.[8] A Memorandum of Understanding (MOA) has been signed by the relevant parties to formalize this approach. NOAA will be acting in an oversight capacity within the existing regulatory framework. Existing authorities set up standards, criteria and discharge requirements. NOAA will work with these existing authorities, within the existing regulatory process, to determine if the standards and criteria are sufficient to protect Sanctuary resources and qualities. NOAA will also work with desalination plant owners, operators and relevant management authorities through the Sanctuary's review and regulation procedures. A more detailed discussion of NOAA's regulatory approach is contained in Appendix 17.

Existing Land Uses, Designations, and Zoning (24 NLP/D)

Reservoir Site(24 NLP/D). Same as that for the 24 NLP alternative discussed above in section 17.1.2.

Desalination Plant (24 NLP/D).[9] The 3 MGD desalination plant would be located in Sand City. Land uses, land use designations and zoning at the Sand City site are described below. The desalination facility would be built entirely within the District's jurisdiction, in an existing warehouse located in Sand City just east of Highway 1. This site is located in a portion of the Sand City Coastal Zone for which appeals are prohibited. Uses adjacent to the site include Highway 1 to the immediate west and mixed commercial, industrial and residential uses to the north, east and south (residential uses are permitted in all Sand City zoning districts).

Ranney Collectors. Three Ranney collectors and two Ranney injectors for brine discharge would be installed in sandy beachfront within about 100 feet of the mean high waterline and about 600 feet apart. The preferred location of the three collectors is in sandy beach parcels located just south and north of the abandoned wastewater treatment plant at the end of Bay Avenue in Sand City, just west of Highway 1 and Sand Dunes Drive, and north of the Seaside border with Sand City (see Figure 2-2). The collectors would be installed in Sand City rights-of-way.

The southern area (south of Bay Avenue) is presently vacant and is zoned CZ-VSC-E (coastal visitor serving). Sand City's approved Local Coastal Program land use plan (which is also the City's land use plan for those portions of the Sand City that lie within the Coastal Zone) designates the area as a mixture of coastal visitor serving uses (hotel and ancillary uses), public recreation and dune/habitat restoration uses; this area could be the eventual site for construction of a hotel complex (in the northeast quadrant), with the remainder of the area allocated to open space and coastal recreational uses. South of the proposed location of the Ranney collector, the LCP designates an area for reestablishment of habitat suitable for reproduction of the Smith's Blue Butterfly, a federally listed endangered species. This habitat restoration site is only generally defined in the LCP. The restoration area may or may not eventually be incorporated within a Habitat Conservation Plan (HCP) presently being developed by the City in cooperation with public and private land owners and officials of the U.S. Fish and Wildlife Service.

The northern collector site is also vacant and is zoned CZ-R3 (Coastal Zone-Multi Family Residential); the general plan land use designation is High Density Residential (limited to 370 dwelling units due to extensive dune restoration and dune habitat creation requirements).

The areas proposed for the Ranney collectors have historically been subject to extensive substandard, small lot parcelization with a pattern of very diverse private ownership; both the California Department of Parks and Recreation and the Monterey Peninsula Regional Park District have recently purchased a substantial, and possibly controlling, preponderance of the property rights associated with the two coastal parcels. The Parks Department plans creation of a limited access, native dunes interpretive walkway/coastal recreation area on the southern parcel. Parking would be located adjacent to the area both to the north (in the present location of the abandoned wastewater treatment plant) and to the south in Seaside. Implementation of this plan could require an amendment to the Sand City LCP and zoning ordinance.

A gravity sewer main runs through the southern property, from south to north, to the regional sewage pump station; the line appears to lie just east but roughly parallel to the beach bluff or scarp (as surveyed by Sand City in August, 1990). The line exits the pump station as a high pressure main; the existing line jogs inland (but still west of Highway 1) prior to turning north to the MRWPCA plant in Marina.

Brine Discharge Pipeline and Injectors. For the project, brine would be routed to two Ranney collectors, one located at the west end of Tioga Avenue and the other located approximately 800 feet north, to be injected into the shallow dune sand aquifer for disposal. The brine pipeline route would pass under Highway 1 from the desalination plant, then proceed north on Sand Dunes Drive to Tioga Avenue, where it would turn west to the road's end. The pipeline to the second injector would proceed north on Sand Dunes Drive for about 800 feet beyond Tioga Road, then turning west for 300 feet to the injector.

Treated Water Pipeline. The product transmission pipeline would travel approximately 1,000 feet south along the east side of Catalina Street to the proposed Cal-Am tie-in at the intersection of Catalina Street and Olympia Street. City encroachment permits would be required.

Storage Tank. A 1.4 million gallon capacity water storage tank would be built adjacent to Highway 1, two blocks north of the desalination plant near the intersection of John Street with Redwood Avenue. This site is now vacant and is also located in the non-appealable portion of the Sand City Coastal Zone; zoning is CZ-C2 (Coastal Zone - Heavy Commercial).

Recreational Resources (24 NLP/D)

Reservoir Site/Lower Carmel River (24 NLP/D). Same as that for the 24 NLP Alternative.

Desalination Plant (24 NLP/D). Recreational resources in the vicinity of the Sand City plant site consist of high quality sandy beaches accessible to the public.

17.1.4 VICINITY OF THE 15,000 AF CAÑADA RESERVOIR AND DESALINATION PLANT (15 CAN/D)

Land Use Plans and Policies (15 CAN/D)

Reservoir Site (15 CAN/D). The 15 CAN/D Alternative is partly within the Greater Monterey Peninsula Area Plan (GMPAP). The GMPAP is one of eight area plans of Monterey County that address local issues. The GMPAP must be consistent with the County General Plan. GMPAP land use, however, supersedes the Countywide land use plan for this area. The Carmel Valley Master Plan (CVMP) is also a component of the 1982 Monterey County General Plan. The Plan includes most of the primary watershed of the Carmel River from Highway 1 to just east of Carmel Valley Village.

The 15 CAN/D alternative site is partly within this planning area. Policies listed in area plans supplement the goals, objectives and policies of the countywide General Plan. The GMPAP does not contain policies related directly to the land use issues or recreational issues of this chapter. However, the policy consistency analysis of Appendix 17 reviews all of the GMPAP's relevant environmental policies. The CVMP contains one policy directly pertinent to the land use issues of this chapter. Policy 26.1.21 states that: "It is intended that the Carmel Valley remain rural residential in character." The policy consistency analysis of Appendix 17 reviews all of the CVMP's relevant environmental policies.

Desalination Plant (15 CAN/D). The plant would be located in Sand City as would that under the 24 NLP/D alternative discussed above. Setting information would be the same as under the 24 NLP/D alternative.

Existing Land Uses, Designations, and Zoning (15 CAN/D)

Reservoir Site (15 CAN/D). Land uses within the 15 CAN/D Alternative's reservoir site include undeveloped steep land. Three parties own the site. There is no residential development on the site. Immediately north of this site is an approved subdivision of 283 single family homes which is proposed for development in the next five years. South of the site is some rural residential development. To the east is vacant undeveloped land; further east is a subdivision. West of the site the land consists of mostly open space, agricultural and residential land. A subdivision has been proposed for the project site and the surrounding area. The County General Plan Land Use Designation in the vicinity of the proposed 15 CAN/D alternative is Rural Density Residential, 10 acres per unit (Greater Monterey Peninsula Area Plan) and Low Density Residential, 2.5 acres per unit (Carmel Valley Master Plan). Zoning of the reservoir site is T-V-B-4, Rural Density Residential 10 acres/unit (Greater Monterey Peninsula Area Plan).

Desalination Plant (15 CAN/D). Same as that for the 24 NLP/D Alternative.

Recreational Resources (15 CAN/D)

Reservoir Site (15 CAN/D). There is no public recreation allowed on this site as all lands are privately owned. However, the GMAP has two polices that generally address recreational resources as follows.

51.1.4 *Riding and hiking trails should be acquired and developed with the intent of creating a coordinated, areawide trails system. All motorized vehicles shall be prohibited from using these trails.*

In supporting a coordinated areawide trails system, the County should give the highest priority to establishing the following trails systems:

a) establish a permanent riding and hiking trail from Roach Canyon to Jacks Peak Park;

b) establish an easterly ridgeline trail from Jacks Peak Park to Laureles Grade;

c) establish a major trail link which generally traverses in a south easterly direction from Carmel Valley and forms a trail connection with the Los Padres National Forest trail system; and

d) establish a connection trail from the Jacks Peak Park/Laureles Grade ridgeline trail to the entrance of Laguna Seca Recreation Area to be used as a point of departure to Toro Regional Park along Highway 68.

51.2.4.1 *Each development proposal shall be evaluated to determine the extent to which such development may help further the County's park and recreation facility goals, objectives and policies.*

Lower Carmel River/Lagoon (15 CAN/D). Same as that for the 24 NLP alternative discussed above: current stream flows and ground water pumping have significantly degraded riparian vegetation and related passive recreational resources and active instream recreational resources, and will continue to do so in the absence of increased water supply.[10]

Desalination Plant (15 CAN/D). The same as under the 24 NLP/D alternative: recreational resources in the vicinity of the Sand City site consist of high quality sandy beaches with public access.

17.1.5 VICINITY OF THE 7 MGD DESALINATION ALTERNATIVE (7 DSL)[11]

Land Use Plans and Policies (7 DSL)

The provisions discussed in the Introduction above (subsection 17.1.1) of the Monterey County General Plan and Zoning Ordinance apply to the 7 DSL Alternative.

Sand City Site (7 DSL). Same as that for the 24 NPL/D alternative.

MRWPCA (Monterey Regional Water Pollution Control Agency) Site (7 DSL). The general discussion of land use plans and policies provided for the 24 NLP/D Sand City site would also apply to the MRWPCA site.

Existing Land Uses, Designations, and Zoning (7 DSL)

Sand City Site (7 DSL). Same as that for the 24 NLP/D alternative.

MRWPCA Site (7 DSL). The 4 MGD desalination facility would be built outside the District's jurisdiction, on County property owned by and immediately adjacent to the Monterey Regional Water Pollution Control Agency (MRWPCA) treatment plant just north of Marina (see Figures 4-1 and 4-17). The County Land Use Designation and zoning are Public/Quasi-Public. The site lies at the top of a broad, undeveloped west facing slope and overlooks Highway 1 and Monterey Bay in a 180-degree arc from the northwest to the southeast. The wastewater treatment plant is part of the Monterey County Environmental Park, which also includes the County landfill north and east of the site. The slopes that descend to Highway 1 are in agricultural and grazing use ("Farmlands" General Plan designation with an "Urban Reserve" General Plan overlay district). The Lone Star Lapis sand mining plant is due west of the site, across Highway 1, on the coast.

Two Ranney collectors would be installed in the sandy beachfront of parcels located in the City of Marina owned by the Monterey Sand Company (Assessor's Parcel #133-192-33) and the Monterey Regional Park District (Assessor's Parcel #133-192-16). About 14,500 feet of pipeline would be needed to carry seawater pumped from the two Ranney collectors to the plant site. The pipeline would traverse private and public, suburban and rural land. A detailed description of the route and adjacent land use is contained in the Monterey Peninsula Water Management District, Desalination Preliminary Design Report, and is available for public review at the District's offices. As proposed, the pipeline would be mostly underground and, except during construction and in several specific locations, the pipeline would not be incompatible with, or otherwise interfere with, any uses adjacent to the route.

As described in Chapter 4, Section 4.4, the existing Cal-Am distribution facilities are not sized to accommodate flows of 7 MGD in the Seaside/Sand City area which would be produced by the 7 MGD desalination project. Consequently, a new pipeline would need to be constructed to convey the desalinated water from Seaside to the Pacific Grove area, where sufficient pipeline and pumping capacity are available for water conveyance. The exact pipeline route has not yet been determined; however, it is anticipated that it would be routed within existing City streets and rights-of-ways. The probable tie-in to the Cal-Am system is at the pump station located at the intersection of Eardley and Sinex Avenues in Pacific Grove. This distribution system improvement would not be incompatible with or interfere with any uses adjacent to the route.

Recreational Resources (7 DSL)

Sand City and MRWPCA Sites (7 DSL). Recreational resources in the vicinity consist of high quality sandy beaches accessible to the public.

17.1.6 NO PROJECT ALTERNATIVE (NO PRJ)

Land Use Plans and Policies (NO PRJ)

The existing land use plans and policies discussed above for the vicinities of the various alternatives would be the same.

Existing Land Uses, Designations, and Zoning (NO PRJ)

The existing land uses, designations, and zoning would be the same. The subdivision proposed for the vicinity of the 15 CAN/D site may be built.

Recreational Resources (NO PRJ)

Reservoir Sites (NO PRJ). Same as the existing conditions described above for each of the vicinities of the alternatives.

Lower Carmel River and Lagoon (NO PRJ). Existing conditions are the same as described in Section 17.1.2: water related recreational resources would continue to be degraded, while fishing recreation would remain significantly affected after mitigation.[12]

17.2 STANDARDS OF SIGNIFICANCE

Land Use

The CEQA Guidelines indicate that a project will normally have a significant adverse impact on the physical environment if it would conflict with adopted environmental plans and goals of the community where it is located. CEQA would not find the conflict with the plan or goal to be a significant environmental impact in and of itself. Such a conflict would be an indicator of potential impacts to the physical environmental, and CEQA would require a determination on the significance of those potential impacts to the physical environment.

The environmental land use impacts that would be significant under CEQA would be:

1) the incompatibility of the proposed use with zoning for the site and/or surrounding uses,
2) the conversion of planned and designated open space to urban/suburban uses, and
3) the displacement of one or more private residences.

A zoning ordinance "currently in effect" refers to an ordinance in effect on the beginning date of the public review period for this SD EIR/EIS-II. Land use impacts identified for each alternative site are set forth below.

Conflicts with adopted plans and zoning ordinances would be illegal on their own terms, and standard administrative and legal procedures exist to address such occurrences during the planning and development process (plan amendments, conditional use permit applications, etc.). Determination of consistency with applicable plans and policies is part of the permitting process of the agencies responsible for permitting. The Monterey County Planning and Building Inspection Department requested such a review in a comment letter received on the April 1992 draft of this EIR/EIS. This October 1992 Draft EIR/EIS contains such a review for informational purposes and the use of the Monterey Planning and Building Inspection Department. Appendix 17 contains this policy consistency analysis. Potential inconsistencies are summarized below in subsection 17.3.3.

Recreation

The project would create a significant impact on recreation if the project eliminated existing recreational resources, including the use of established recreational facilities. However, recreation impacts are considered socio-economic impacts under CEQA, and CEQA does not treat them as significant impacts on the environment.[13] They can be used as the basis for determining that an associated physical environmental impact is significant. As such, recreational impacts would not have environmental significance under CEQA, although they can be mitigated indirectly through mitigations for the associated significant physical environmental impact. However, socio-economic impacts can be considered significant environmental impacts under NEPA's broader definition of the environment, as long as such effects are interrelated with other effects on the physical environment.[14]

POLICY CONSISTENCY

Two Purposes

There are two purposes to which a policy consistency analysis in an environmental document will be put. The first is for the Lead Agency's conformance with CEQA. The second is as part of the basis for various Responsible Agency's permitting evaluations related to the development process. The policy consistency analysis is contained in Appendix 17. This policy consistency analysis fulfills the first purpose for the District and fulfills the second purpose for the Monterey County Planning and Building Inspection Department as requested in a comment letter on the April 1992 DEIR/DEIS.

Under CEQA, the District, as the Lead Agency, must determine whether the proposed project would generate significant environmental impacts. With regards to plan and policy consistency, Section 15125(b) for the CEQA Guidelines requires that "The EIR shall discuss any inconsistencies between the proposed project and applicable general plans or regional plans." CEQA also states that "A project will normally have a significant effect on the environment if it will: (a) Conflict with adopted environmental plans and goals of the community where it is located."[15] It is important to understand that the conflict with an environmental plan is not considered a significant effect on the environment in and of itself, but the associated environmental impact would need assessment as a potentially significant environmental impact. In this regards, CEQA uses inconsistency with environmental plan policies as an indicator of potential impacts to the physical environmental for which CEQA requires an assessment of significance. However, CEQA does not limit its impact assessment to only those areas of the environment for which plans and policies exist. As a result, the full range of potential environmental impacts, including a discussion of potential inconsistencies with environmental and general plans, has been assessed in the various topical chapters this EIR/EIS addressing the different dimensions of the physical environment. This fulfills the Lead Agency's requirements of CEQA regarding policy consistency.

Regarding legal determinations of policy consistency, only the Monterey County Planning Commission and/or the Board of Supervisors may make general plan consistency determinations in connection with development permits for proposed projects in unincorporated areas. In the event of an inconsistency, either the project or the policy would have to be amended prior to approval by Monterey County and issuance of necessary County permits. Under CEQA, the Monterey County Planning Department is considered a Responsible Agency with respect to project review and approval. This means the Planning Department must eventually issue grading, construction and use permits (among others) in order for the District to proceed with the project. This EIR/EIS will be used by the Department to evaluate whether environmental impacts resulting from permit issuance would be significant, and if so, whether suitable mitigation is provided as part of the project.

Summary of the Consistency Analysis (See Appendix 17)

All of the facilities associated with each of the alternatives represent Public/Quasi-Public uses. Public/Quasi Public uses represent one of the highest uses to which land may be dedicated because they directly foster the public's health and welfare. These uses are permitted uses within all land use designations and zoning districts of the County (Monterey County Zoning Ordinance, Title 20, Section 20.46.030). This represents substantial evidence that each of the alternatives conform with the Monterey County general plan, area plans and zoning ordinance. The desalination plant(s) that would be part of the 24 NLP/D, the 15 CAN/D, and the 7 DSL alternatives would all be consistent with the County General Plan, the Sand City Local Coastal Program and General Plan, the County Department of Environmental Health Desalination System Ordinance, and the California Coastal Act.

It appears that the policies of the general plan generally seek to assure that water facility uses will:

- maintain and enhance the existing open space characteristics of affected undeveloped or minimally developed alternative locations;
- preserve and enhance fisheries values of the Carmel River watershed, especially relating to riparian access and riparian corridor habitat, and;
- preserve and enhance passive and active, instream and upland recreational values of the Carmel River watershed.

In general, the reservoir facility of the two NLP alternatives and the CAN alternative appear to comply with the general objectives and policies of the County General Plan and the Area Plans as follows:

- preservation and protection of prime groundwater recharge areas;
- provision of additional water supplies (such as water reclamation projects) for planned growth;

- elimination of long-term groundwater overdrafting;
- implementation of water conservation measures for all types of land uses;
- use of public water reservoirs for multiple purposes;
- the County's designation of adequate locations for future public services and facilities;
- compatibility between surrounding land uses and multiple uses of water bodies;
- achievement of a sustained level of adequate water services; and
- the development of suitable water supplies in keeping with broad conservation goals.

Although Public/Quasi Public uses are "permitted uses" of very high public value, elements of the alternatives, including borrow pits, roads, reservoirs and desalination facilities, must also comply with other policies whose intent is to conform public use facilities as greatly as possible with the character of existing, surrounding land uses and with established land use designations and zoning districts. The policies assessed in Appendix 17 represent evidence of an investigation of the most pertinent policies. The District's planning process assures responsiveness to these broad goals. However, the more detailed policy consistency analysis of Appendix 17 identified a small set of potential inconsistencies as summarized below. Consistency of the project, including mitigation measures developed in this EIR/EIS, with such policies would need to be determined by the permit issuing agent, the Monterey County Planning and Building Inspection Department, during the building permit process.

<u>Water Supply</u>

Cachagua Area Plan (24 NLP and 24 NLP/D alternatives):

6.2.1.1 *Groundwater shall not be exported to points outside of the Planning Area boundaries.*

<u>Riparian Corridor Impacts</u>

Carmel Valley Master Plan (15 CAN/D alternative):

7.1.3 *"...development shall not occur in the riparian corridor..." in order to protect riparian vegetation, minimize erosion, and preserve the visual aspects of the river.*

16.2.2.1 *In order to protect the public health, welfare, and safety, no land located in the river channel shall be developed except for subsequently approved bridges or emergency access roads.*

Flood Control

Monterey County General Plan (all alternatives):

16.2.3 *Development requiring a discretionary permit, shall be prohibited from within 200 feet of the riverbank or within the 100-year floodway except as permitted by ordinance. No new development, including structural flood control projects, shall be allowed within the riparian corridor.*

Vegetation and Wildlife Habitats

Greater Monterey Peninsula Area Plan (15 CAN/D, reservoir)

7.1.5 *Coastal and interior wetlands should be retained as open space due to their importance as wildlife habitat and as scenic resources.*

7.1.6 *No new development or landscape alterations shall be permitted within a 100 foot setback from all wetlands.*

11.1.6 *Environmentally sensitive areas should be preserved as open space.*

Carmel Valley Master Plan (15 CAN/D, reservoir):

7.1.1.1 *Areas of biological significance shall be identified and preserved as open space.*

Soils and Geologic Hazards

Monterey County General Plan (all alternatives):

26.1.10 *The County shall prohibit development on slopes greater than 30%.*

Noise Hazards

Cachagua Area Plan (24 NPL and 24 NPL/D alternatives):

22.2.7 *Noise from major construction project sites shall not exceed 55 dBA l_{dn} as measured at affected residences.*

Park and Recreation Facilities

Cachagua Area Plan (24 NPL and 24 NPL/D alternatives):

32.1.4	*Land uses adjacent to the Ventana Wilderness shall not impact the purpose of the wilderness areas.*
51.1.5	*The dedication of recreational trail easements shall be encouraged to implement planned trail systems or to replace a trail jeopardized by development.*

The programmatic analysis contained in the topical sections of this EIR/EIS of the water supply alternatives adequately evaluates potential impacts and identifies feasible mitigation measures. These programmatic analyses are fully developed in the topical sections of the main body of this document and will not be re-elaborated here. However, an example of an environmentally protective "programmatic goal" would include the District's use of "by-pass logic" developed by the California Department of Fish & Game. This logic was used to determine optimum system operational conditions and permissible diversion levels of each alternative consonant with enhancement of Carmel River fisheries values.

State CEQA Guidelines Section 15091, provides that, for mitigation, the District may rely upon permitting authority of the host of Responsible Agencies with whom the District has consulted throughout the project planning and environmental review process. Permitting authority of these agencies is adequate to assure that programmatic goals will be met through precise conditioning of construction and operations permits. For instance, County policies specify that removal of native trees in the Cachaqua Area can only occur after preparation and submission of a timber harvest plan for County approval. The District may reasonably rely upon the County to assure implementation of this policy through conditioning of grading permits. Consequently, a detailed elaboration of the possible contents of such a harvest plan would not further the policy evaluation objectives of the CEQA process. Similarly, the District believes that the Corps "404 Permit" process, and "Section 1601" Streambed Alteration Agreements negotiated with the Department of Fish & Game, will be adequate to assure minimization of fisheries impacts and maximization of watershed enhancement.

Appendix 17 contains a more detailed discussion of policy inconsistencies and the associated environmental impacts and mitigation measures.

17.3 IMPACTS AND MITIGATION MEASURES OF PROJECT ALTERNATIVES

INTRODUCTION

The project elements reviewed for the land use and recreational impact assessment are as follows. The reservoir alternatives would involve construction of a dam and appurtenant structures. Construction of the dams would take from two to four years, which includes time estimated for clearing the inundation areas and construction of the dam structure. At times, dam construction would require 24 hour per day shifts. Clearing and grubbing of the reservoir area would occur during the first year of construction. The construction staging area across the Carmel River in the vicinity of the Cachagua Community Center is included in the assessment of the 24 NLP and 24 NLP/D alternatives. The desalination facilities' elements include the seawater intake wells or Ranney collectors, pipelines, including those used to convey intake water, finished water, and the brine discharge, the desalination facility itself, and the terminal storage tanks (up to a 1.5 million gallon tank).

17.3.1 24,000 AF NEW LOS PADRES RESERVOIR (24 NLP)

Land Use (24 NLP)

The proposed use is consistent with the General Plan land use designation of RC (Resource Conservation) as well as the Public/Quasi Public land use designation of the Cachagua Area Plan. The proposed use would conserve the areas resources, the intent of the RC designation. The proposed use is a public use. The proposed use is consistent with the wilderness and open space uses of the surrounding area, although it is a human not a natural body of water. As such, the proposed use would be considered to have a less than significant impact in terms of plan land use designations, zoning, and conflict with surrounding uses.

Impact 17.3.1-1

The 24 NLP project would affect approximately 23 acres of the Ventana Wilderness Area; this would be a significant impact.

Filling of the reservoir would inundate four of the affected 23 acres at the northern edge of the Ventana Wilderness Area which is managed by the U.S. Forest Service. The other acres would be used for access roads and buffer zones (see Figure 4-4).

Mitigation Measure 17.3.1-1

An exchange of 140 acres of private land adjacent to the Wilderness boundary for the affected 23 acres has been approved by the President. This would reduce the impact to a less than significant level.

In November 1990, President Bush signed Public Law 101-539, which allows the Ventana Wilderness land exchange. The MPWMD would donate 140 acres with high quality wilderness value in exchange for the 23 acres which would be affected by the New Los Padres project. The exchange would occur only if the New Los Padres project is selected as the overall preferred alternative in the Final EIR/EIS and is issued permits from federal and State agencies prior to the start of construction. If the New Los Padres project is not selected or approved, the land exchange will not occur.

Impact 17.3.1-2

Construction activities at the staging area across the river from the Cachagua Community Center would significantly affect the adjacent Community Center and residential uses with excessive noise and dust (see Chapters 11, Air Quality, and 12, Noise).

These construction impacts would be temporary, lasting over the two year period of construction, but significant none-the-less.

Mitigation Measure 17.3.1-2

Mitigation measures proposed for excessive construction noise and dust in Chapters 11 and 12 of this EIR/EIS should be implemented; however, impacts would remain significant and unavoidable, though temporary.

Recreation -- Reservoir Site (24 NLP)

Impact 17.3.1-3

The 24 NLP alternative would inundate a public recreational trail and camping area; this would be considered a significant impact.

The affected hiking trail is part of an established trail system which stretches from the Ventana Wilderness Area through the Carmel River Canyon. The Bluff Camp area is the only established site in the Los Padres Reservoir area. Loss of this trail and camping area would be considered significant.

Mitigation Measure 17.3.1-3

The hiking trail would be rebuilt to parallel the existing trail outside the inundation area. A campsite similar to Bluff Camp should be established near the camp's original location for hiking use. This would reduce the impact to a less than significant level.

Impact 17.3.1-4

The 24 NLP project would maintain and improve passive recreation use of the reservoir area, such as hiking; this would be considered a beneficial impact. Additional land in the area would be open to public use for recreational activities due to the land exchange.

The 24 NLP project would maintain and improve passive recreation use of the reservoir area, such as hiking. This would be considered a beneficial impact. Additional land in the area would be open to public use for recreational activities due to the land exchange resulting from mitigation measure 17.3.1-1 above. It is proposed that the recreational activities allowed at the existing Los Padres Reservoir would continue, including hiking, equestrian use, sightseeing, picnicking, and fishing upstream of the dam. It is assumed that fishing would continue to be prohibited by the Department of Fish and Game between the new dam and San Clemente Dam. Boating, in non-inflatable craft and swimming and camping at the reservoir area would be prohibited, as would all motorized activities. Access to the Ventana Wilderness would be maintained via the proposed access road on the west side of the Carmel River between Cachagua Road and the fish screening facility at the upstream end of the reservoir.

Mitigation Measure 17.3.1-4

None required.

Recreation -- Lower Carmel River/Lagoon (24 NLP)

Impact 17.3.1-5

By increasing stream flows in the Carmel River above that which would occur under the District's current water allocation program, this alternative would support riparian vegetation and improve recreational opportunities in lower river segments (including steelhead fishing, rafting, floating, waterplay), and at the Carmel Lagoon above that which would result under existing conditions; this would be considered a beneficial impact.

Presently, low or absent summer flows adversely affect recreational opportunities in the lower river and lagoon (see discussion of existing conditions in subsection 17.2.2, Vicinity of the 24,000 AF New Los Padres Reservoir, Recreational Resources, Lower Carmel Valley/Lagoon, above). Under the District's present water allocation program, including mitigation measures, overall impacts to steelhead fishing would remain significant; it is uncertain whether or not impacts to riparian and other recreational resources would be reduced to a less than significant level.

This alternative would enhance recreational opportunities in lower river segments and at the Carmel Lagoon beyond that anticipated under the District's present water allocation program due to increased stream flows designed to recharge the underground aquifer and offset groundwater pumping effects on the lower Carmel River and Lagoon. This alternative would increase flows to the lagoon throughout the summer and fall months in most years. Recreational use would be dependent upon actual flows and the public's perception of appropriate uses for the increased water flow. The lagoon volume and area would be increased and this would improve common recreational opportunities such as swimming and wading, sailboarding and birding. Thus the overall impact would be beneficial.

Mitigation Measure 17.3.1-5

None required.

17.3.2 24,000 AF NEW LOS PADRES RESERVOIR WITH 3 MGD DESALINATION PLANT (24 NLP/D)

Land Use -- Reservoir Site (24 NLP/D)

Impacts would be the same as under the 24 NLP discussed above.

Impact 17.3.2-1

The 24 NLP project would use approximately 23 acres of the Ventana Wilderness Area; this would be a significant impact.

Mitigation Measure 17.3.2-1

An exchange of 140 acres of private land adjacent to the Wilderness boundary for the affected 23 acres has been approved by the President. This would reduce the impact to a less than significant level.

Impact 17.3.2-2

Construction activities at the staging area across the river from the Cachaqua Community Center would significantly affect the adjacent Community Center and residential uses with excessive noise and dust (see Chapters 11, Air Quality and 12, Noise).

Mitigation Measure 17.3.2-2

Mitigation measures proposed for excessive construction noise and dust in Chapters 11 and 12 of this EIR/EIS should be implemented. However, the impacts would remain significant and unavoidable.

Land Use -- Desalination Facility (24 NLP/D)[16]

There are some elements of the project that would raise some issues of compatibility. However, the proposed design of this alternative adequately address these issues and no other significant impacts would result from the proposed alternative. Under this alternative, the desalination plant would be built within the District's jurisdiction, in an existing warehouse to be leased by the District. The warehouse is located at Elder Avenue and Catalina Streets in Sand City, just east of Highway 1. The building is located in the non-appealable portion of the Sand City Coastal Zone. The Sand City Local Coastal Program and General Plan land use designation for the site is Heavy Commercial; zoning is CZ-C2 (Coastal Zone-Heavy Commercial); public utility operations of the sort contemplated by the District could be allowed with a Conditional Use Permit by the City (discretionary permit). No rezoning would be needed (and thus no amendment of the Sand City LCP of which the Sand City Zoning Ordinance is an element).

Because housing is permitted in all Sand City zoning districts, the desalination facility, though located in a Heavy Commercial District, could exacerbate incompatibility of nearby existing or potential future residential uses. Desalination pumping equipment can generate excessive noise. So long as this noise does not carry beyond the building property line (see Section 4.9, Noise) the intensification of incompatible land uses represented by the project would be less than significant, especially as this mixture of land uses is explicitly permitted by Sand City zoning and policy.

Ranney Collectors/Injectors

Three Ranney collectors and two Ranney injectors would be installed in sandy beaches near the desalination plant on the west side of Highway 1. As described in the Setting section, these beach sites are the subject of detailed Sand City general plan/LCP development policies. Sand City envisions that the parcels proposed for installation of the seawater intake wells will be subject to extensive dune habitat restoration efforts in combination with intensive coastal visitor-serving and high density residential development. The State Department of Parks and Recreation and the Monterey Peninsula Regional Park District have competing plans for the areas south of Bay Avenue which would result in reservation of the area for exclusive open space recreational uses; this could require amendment of the Sand City LCP and zoning ordinance.

Preliminarily, the Ranney collectors have been sited away from the general locations shown in the LCP, for placement of visitor serving and residential structures. It would be speculative to assess interaction of the collectors with future site plans of the State Department of Parks and Recreation, and the Regional Parks District. However, the recreation plans do not call for erection of any structures within the open beach areas (with the exception of boardwalks), so collector placement would not be restricted by structural concerns. The collectors are expected to need occasional maintenance, and would therefore not represent any substantial constraint of public access or enjoyment of coastal recreational facilities that may be installed on the sites.

The Sand City LCP Policy 4.3.9(a) requires that permanent structures built in the Sand City coastal zone must be located sufficiently landward of the toe of the "blufftop or dune or beach scarp" to avoid coastal erosion for a 50 year economic life. The Ranney collectors have been sited at least 100 feet from the high-tide line, which is necessary to assure needed production rates. It is possible that sand erosion during a 50-year period could impact the collector sites. If the collectors are uncovered by erosion during this period, the top sections of the concrete caissons could be removed to maintain the below-grade placement. Alternatively, the affected facilities could be relocated further inland. Finally, the Department of Environmental Health has specified a minimum clearance of the intake collectors from the regional sewer line which traverses the site, and from the regional pumping station, and the intake collector designs conform with this clearance. Therefore, although the Ranney collectors are proposed for installation in land parcels whose future uses are somewhat in flux, they would not constrain future uses as far as can be determined at this time.

Water Storage Tank

The finished water storage tank would be built two blocks from the desalination plant, in Sand City, on property purchased by the District. Use would be permitted either as a prescriptive use (i.e., ministerial action) or as a conditional use (discretionary permit) depending on the site's zoning interpretation.

Brine Discharge

Brine discharge would occur via two Ranney injectors to be located at the end of Tioga Street and 800 feet to the north, in Sand City. The southern injector and brine pipeline would be placed within City rights-of-way. The northern injector and pipeline north of Tioga Avenue would be placed within private property that would require obtainment of easements. However, since the project facilities would be located in the perimeter of the properties, constraint of any LCP designated development projects would not occur.

Air Quality Management Plan

As discussed in Chapter 11, the proposed desalination project would be inconsistent with the 1991 Air Quality Management Plan (AQMP) because the incremental air pollutant emissions associated with the generation of electric power necessary to operate the desalination plant have not been taken into account in the AQMP. This is therefore considered a significant impact. However, this impact would be mitigated to a less than significant level by the formal revision of the AQMP. This issue is discussed in greater detail in Chapter 11, Air Quality.

Recreation (24 NLP/D)

Reservoir Site (24 NLP/D). Impacts would be the same as under the 24 NLP alternative.

Lower Carmel River/Lagoon (24 NLP/D). Impacts would be the same as under the 24 NLP alternative.

Desalination Facility (24 NLP/D). Construction of the Ranney collectors may reduce access to a small portion of the beach. Once constructed underground, they would not affect beach access. Brine discharge through injection wells is not anticipated to adversely affect ocean waters.

17.3.3 15,000 AF CAÑADA RESERVOIR WITH 3 MGD DESALINATION PLANT (15 CAN/D)

Land Use - Reservoir Site (15 CAN/D)

Impact 17.3.3-1

The 15,000 AF Cañada Reservoir would preclude the development of a subdivision at the site. This would be considered a less than significant impact.

A subdivision has been proposed for the reservoir site and some of the surrounding area. Although the proposal has not been approved, planning for the development is underway. The proposed project would prevent the development of the subdivision, assuming the eventual approval of the subdivision. However, both uses, the reservoir as a public use and the subdivision as a residential use, are permitted uses within the current general plan and area plan land use designations and zoning of the site: essentially public/quasi public and rural/low density residential. Since the public/quasi-public use of the water supply facility is accorded a higher priority use, and since the law requires compensation at fair market value for private lands needed for public project, such a potential and contingent land use conflict would be considered a less than significant impact.

Mitigation Measure 17.3.3-1

No mitigation measures would be required. However, the county should coordinate planning for the subdivision with the project sponsor to prioritize development. This would reduce this impact to an insignificant level.

Land Use - Desalination Facility (15 CAN/D)

Impacts would be the same as under the 24 NLP/D alternative discussed above: no significant impacts would be anticipated.

Recreation - Reservoir Site (15 CAN/D)

Impact 17.3.3-2

A secondary impact of this alternative is the creation of a public recreational resource from once privately owned land and this would be considered a secondary beneficial impact.

The 15 CAN/D project would create a public recreational resource of the once privately owned area. This is considered a beneficial impact. The land affected by the 15 CAN/D alternative is presently undeveloped private property, though subdivisions are planned for some parcels. The Cañada Reservoir would be publicly owned and open to the public for passive, daytime recreational use. Boating, swimming, fishing and camping at the reservoir would be prohibited, as would motorized vehicles.

Mitigation Measure 17.3.3-2

None would be required.

Recreation - Lower Carmel River/Lagoon (15 CAN/D)

Impact 17.3.3-3

Some of this alternative's water supply would offset the ground water pumping that is currently depleting water resources from the Carmel River and significantly degrading riparian and recreational resources. As such, it would increase water availability in the lower Carmel River/Lagoon area, thereby supporting riparian vegetation restoration, associated recreational resources at a higher level than do current conditions, but at a lower level than under the 24 NLP and 24 NLP/D alternatives. This would be considered a beneficial impact.

Analyses show that under the 15 CAN/D alternative, stream flow in the lower Carmel River and at the Carmel Lagoon would be similar to that described for the No Project condition during below-normal, dry, and critically dry years (see Figure 7-5 in Chapter 7). There would be some improvement in normal years. The mitigation proposed for the District's current water allocation program would not reduce overall fishing impacts to less than significant levels (see discussion under Impact 17.3.1-5). It will also improve riparian vegetation, although there is uncertainty whether or not the improvement would reduce impacts to passive recreational resources to less than significant levels (see discussion under Impact 17.3.1-5). Thus, the current significantly degraded condition and trend would continue. However, aquifer recharge under this alternative would improve the condition of riparian vegetation, although recovery would be less than that provided with the enhanced stream flow of the 24 NLP and 24 NLP/D alternatives. Therefore, although the improved conditions may not be sufficient to fully reverse the significant degradation under current water use practices, the effect of the 15 CAN/D alternative would still be beneficial, even if at a lower magnitude than the 24 NLP and 24 NLP/D alternatives.

Mitigation Measure 17.3.3-3

No project mitigation would be required for the 15 CAN/D alternative. However, the MPWMD would need to continue implementing the Riparian Corridor Management Plan and Program that was proposed as mitigation for the significant degradation to the riparian and recreational resources of the past and present water allocation program within the District, although for fewer months in each year.[17] *Under this regime stream flow would remain inadequate for instream recreational uses.*

Implementation of the District's Riparian Corridor Management Plan and five year mitigation program stipulated for the existing significant impacts of the current water allocation regime within the District would yield some improvement of lower river vegetation resources.[18] These improvements would be supplemented by the benefits derived from aquifer recharge effects of the 15 CAN/D alternative. These improvements would result in some improvement to stream flow in the lower river, but the current impairment and degradation of instream recreational opportunities would likely continue after mitigation.[19]

Recreation - Desalination Plant (15 CAN/D)

Same as under the 24 NLP/D alternative: construction would create temporary, less than significant impacts for beach users, the underground Ranney collectors would pose no operational impacts to beach users.

17.3.4 7 MGD DESALINATION PROJECT (7 DSL)[20]

Land Use - Sand City Site (7 DSL)

The land use impacts would be the same as those under the 24 NLP/D alternative: no significant impacts would be anticipated.

Land Use - MRWPCA Site (7 DSL)

No significant land use impacts would be associated with the facility at this site. The desalination facility would be fully in compliance with the regional sewage treatment plant's Public/Quasi Public zoning and general plan designation. The Ranney collectors would also be a conditionally permitted use within their zoning districts. The collectors are a coastal dependent industrial use. Although they would not support coastal visitor-serving and public uses proposed for the two beach sites, the collectors would be underground and would not interfere with public coastal access or future recreational uses. Brine discharge would be conveyed from the plant to the MRWPCA outfall for ocean disposal into Monterey Bay.

About 14,500 feet of pipeline would be needed to carry seawater pumped from the two Ranney collectors to the plant site. As proposed, the two Ranney collectors and portions of the seawater feed and treated water pipelines traverse several privately owned parcels which would require permanent easements. Since the collectors and associated pipelines will be constructed underground, it is not anticipated that they would interfere with any future use of the properties.

The treated water pipeline necessary to convey the water from the MRWPCA site south to Seaside would primarily be located within existing City rights-of-way, and/or would run parallel to an existing MRWPCA sewer force main (with a minimum separation of ten feet).

The treated water pipeline route would traverse approximately four miles of the Fort Ord Military Reservation. For the entire segment of the alignment traversing Fort Ord, the U.S. Department of the Army would require the MPWMD to obtain a land outgrant. However, with the scheduled closure of Fort Ord, the process, timing, and final approval authority for such an outgrant is uncertain at this time. Once a specific route alignment is identified, the District would need to confirm the process with the jurisdictions who have authority over the pipeline route area.

Overall, with the exception of the uncertainty regarding the pipeline easements necessary for the portion which traverses Fort Ord, no significant land use or policy impacts have been identified for the 4 MGD desalination plant at the MRWPCA site.

Recreation -- Reservoir Sites (7 DSL)

This alternative would produce no improvement of upstream recreational benefits, as is the case under each of the other alternatives, to greater or lesser extent.

Recreation -- Lower Carmel River/Lagoon (7 DSL)

Impact 17.3.4-1

The 7 DSL alternative would not increase stream flows in the Carmel River. As a result, the existing degradation to riparian and recreational resources would continue.[21] As such,

the significant environmental impacts of the District's current water allocation regime would continue.

Analyses show that under the 7 DSL alternative, stream flow in the lower Carmel River and at the Carmel Lagoon would be similar to that described for the No Project condition during both normal and critically dry years (see Figure 7-5 in Chapter 7). The 7 DSL alternative would not increase stream flows in the Carmel River. As a result, the existing degradation to riparian and recreational resources would continue.[22] As such, the significant environmental impacts of the District's current water allocation regime would continue.

Mitigation Measure 17.3.4-1

No project mitigation would be required for the 7 DSL project. However, the MPWMD would need to continue implementing the Riparian Corridor Management Plan and Program that was proposed as mitigation for the significant degradation to the riparian and recreational resources of the past and present water allocation program within the District.[23] Under this regime stream flow would remain inadequate for instream recreational uses.

Implementation of the District's Riparian Corridor Management Plan and five year mitigation program stipulated for the existing significant impacts of the current water allocation regime within the District would yield some improvement of lower river vegetation resources.[24] These improvements would not increase stream flow in the lower river though, and the current impairment and degradation of instream recreational opportunities would continue after mitigation.

Recreation -- Desalination Alternative (7 DSL)

Beach impacts for both sites would be the same as at the Sand City Site under the 24 NLP/D and 15 CAN/D alternatives discussed above: construction would create temporary, less than significant impacts for beach users, the underground Ranney collectors would pose no operational impacts to beach users.

17.3.5 NO PROJECT ALTERNATIVE (NO PRJ)

Land Use (NO PRJ)

The No Project alternative would not have direct land use impacts as none were identified in the Water Allocation Program FEIR.[25] However, depending on the location of the new wells in the

Seaside Coastal groundwater subbasin, there could be some impacts to existing land uses where the wells are sited. The location of the wells would not affect the Lower Carmel River or Lagoon.

Recreation (NO PRJ)

This alternative would continue the significant degradation of riparian and recreational resource degradation of the District's existing water allocation regime.[26] The impacts and mitigation measures would be the same as for the 7 DSL alternative as summarized below.

Impact 17.3.5-1

The No Project alternative would not increase stream flows in the Carmel River. As a result, the existing degradation to riparian and recreational resources would continue.[27] As such, the significant environmental impacts of the District's current water allocation regime would continue.

Mitigation Measure 17.3.5-1

No project mitigation would be required for the proposed project. However, the MPWMD is implementing the Riparian Corridor Management Plan and Program that was proposed as mitigation for the significant degradation to the riparian and recreational resources of the past and present water allocation program within the District.[28] Under this regime stream flow would remain inadequate for instream recreational uses.

---

1. CEQA Guidelines, Section 15125(b), p. 93, June 1992.

2. Information on proposed or approved development for all reservoir alternative sites was obtained by personal communication with Juliana Rebagliati, Planner, County of Monterey, on February 4, 1991.

3. The Monterey Peninsula Water Management District, Water Allocation Program Final Environmental Impact Report, April 19, 1990, Vol. I, pp. III-83/84.

4. Ibid, p. IV-103.

5. Ibid, p. 13, Subsection 5. Recreation, last sentence. CEQA Guidelines, Section 15131, p. 99.

6. The Federal Council on Environmental Quality Regulations, Section 1508.14.

7. Monterey Peninsula Water Management District, Near-Term Desalination Project Draft Environmental Impact Report, April 1992, Section 4.13 Land Use, Planning and Zoning.

8. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sanctuaries and Reserves Division, Monterey Bay National Marine Sanctuary, Volume I, Final Environmental Impact Statement and Management Plan, Volume II, Appendices, June 1992.

9. Op. Cit., Monterey Peninsula Water Management District, Near-Term Desalination Project Draft Environmental Impact Report.

10. Op. Cit., Monterey Peninsula Water District, Water Allocation Program Final EIR.

11. Op. Cit., Monterey Peninsula Water Management District, Near-Term Desalination Project DEIR.

12. Op. Cit., Monterey Peninsula Water Management District, Water Allocation Program Final EIR.

13. Ibid, p. 13, Subsection 5. Recreation, last sentence. CEQA Guidelines, Section 15131, p. 99.

14. The Federal Council on Environmental Quality Regulations, Section 1508.14.

15. Op. Cit., CEQA Guidelines, Supplementary Document G, Significant Effects, p. 224, June 1992.

16. Op. Cit. Monterey Peninsula Water Management District, Near-Term Desalination Project DEIR.

17. Op. Cit., Monterey Peninsula Water District, Water Allocation Program Final EIR.

18. Ibid.

19. Ibid, p. IV-103.

20. Op. Cit., Monterey Peninsula Water Management District, Near-Term Desalination Project Draft EIR.

21. Op. Cit., Monterey Peninsula Water Management District, Water Allocation Program FEIR, p. IV-103.

22. Ibid.

23. Ibid.

24. Ibid.

25. Ibid.

26. Ibid.

27. Ibid.

28. Ibid.

18. SOCIOECONOMICS

18. SOCIOECONOMICS

18.1 INTRODUCTION

This chapter provides a socioeconomic profile of the area within the MPWMD boundaries as it is today and an analysis of the direct effects of a water supply project on the socioeconomic environment. Direct effects are defined as those effects attributable to a project itself rather than to the urban growth allowed by the project. Direct effects include changes in water rates and the increase in economic activity resulting from a large construction project. The indirect environmental effects of water supply alternatives that allow urban growth are discussed in Chapter 19.

18.2 SETTING

18.2.1 POPULATION

The boundaries of the Monterey Peninsula Water Management District (MPWMD) contain six incorporated cities: Monterey, Carmel, Del Rey Oaks, Pacific Grove, Sand City, and Seaside, as well as unincorporated areas of Monterey County. Table 18-1 shows the population growth in these areas during the 1970s and late 1980s.

As shown in the Table 18-1, the District's population increased by about 22 percent in the 18 years between 1970 and 1988. The unincorporated areas showed the highest percentage increase in growth (36 percent) with the City of Pacific Grove second at 21 percent. The two smallest communities experienced population declines during this period. More than 75 percent of the District's population lives in incorporated cities.

18.2.2 EMPLOYMENT

The strong employment sectors in Monterey County as a whole are the military, services, agriculture and retail trade.[1] In 1980, these four sectors constituted nearly 70 percent of total employment in the County. The MPWMD service area, however, includes relatively little of the County's agricultural

TABLE 18-1

POPULATION IN MPWMD SERVICE AREA: 1970-1988

Jurisdiction	1970[1]	1980[2]	1988	1970-1988 Percent Change
Incorporated Cities				
Carmel	4,525	4,707	4,978	10.0
Del Rey Oaks	1,823	1,557	1,520	-16.6
Monterey	26,302	27,558	31,397	19.4
Pacific Grove	13,505	15,755	16,367	21.2
Sand City	212	190	200	-5.7
Seaside	20,165	36,567[3]	24,072	19.4
Cal-Am	N/A	N/A	21,808	N/A
Non Cal-Am	N/A	N/A	2,264	N/A
Unincorporated Areas	19,222	27,000	26,289	36.8
Cal-Am	N/A	N/A	24,094	N/A
Non Cal-Am	N/A	N/A	2,195	N/A
TOTAL	85,754	113,334	104,823	22.2

1 Monterey County Planning Department, Demographic Analysis of Monterey Count 'une, 1982.
2 1980 U.S. Census.
3 1990 population includes Fort Ord.

Source: EIP Associates

employment, but most of the military employment and the service/retail trade related to the tourist industry. The tourist industry is anticipated to be a major growth sector in this part of the County. Three military operations are located within the District, including the Presidio of Monterey, the Naval Post Graduate School, and the local Coast Guard Facility. A portion of Ford Ord is also within the District, but water management responsibilities have been assumed by the U.S. Army to date. All three operations are located within the City of Monterey. Tourism is second only to the military in its impact on the Monterey Peninsula. Besides the direct effect on employment in hotels and restaurants, travel-related expenditures create jobs in the service and retail sectors that cater to visitors. A further discussion of the tourist industry and its impacts on employment levels within the District follows below in Section 19.10. The MPWMD service area had a total employment of 39,289 in 1980 (excluding Fort Ord), about 35 percent of the County total. By 1988, total employment had increased to 46,277 persons. The distribution of total employment among Peninsula jurisdictions appears in Table 18-2.

Monterey is clearly the dominant employment center in the region, based on the total number of jobs in each jurisdiction and a comparison of jobs to housing in each community (Table 18-3). Del Rey Oaks, Pacific Grove and Seaside are largely residential communities.

18.2.3 HOUSING

Single-family dwelling units predominate within the MPWMD service area as shown in Table 19-1. Single-family units compose approximately two-thirds of the total dwelling units in the service area. The cities of Carmel and Del Rey Oaks have the highest proportion of single-family dwellings (80 and 98 percent, respectively). Other jurisdictions within the service area have lower proportions of single-family units, with Monterey having approximately 48 percent single-family units.

18.2.4 WATER RATE STRUCTURE

Cal-Am Water Company is the primary water purveyor, with rates regulated by the California Public Utilities Commission (PUC). Because the District is not a water purveyor, it does not charge for water delivery. The MPWMD does, however, levy water connection fees and an 7.125 percent water use fee on the Cal-Am bill for its conservation program as well as Carmel River environmental and erosion control projects. Water connection fees and service charges vary by type of use. Annual studies of water use in the District provide the basis for the connection fee structure. Residential

TABLE 18-2

EMPLOYMENT IN MPWMD SERVICE AREA
1980-1988

Jurisdiction	1980[1]	1988[5]
Incorporated Cities		
Carmel	3,400[2]	3,555
Del Rey Oaks	415	498
Monterey	23,615	27,175
Pacific Grove	3,858	4,444
Sand City	1,214[3]	1,550
Seaside (Cal-Am)	3,616	3,960
Seaside (Non Cal-Am)	N/A	170
Unincorporated Areas		
Cal-Am	3,171[4]	4,824
Non Cal-Am	N/A	101
Total	39,289	46,277

1 Recht Hausrath Associates, Socioeconomic Impacts of The Proposed San Clemente Dam, June, 1984.
2 Carmel-by-the-Sea General Plan, February, 1984.
3 Sand City Housing Element, June, 1985.
4 EIP Associates.
5 Ibid.

Source: EIP Associates

TABLE 18-3

JOBS/HOUSING RATIOS[1]

Jurisdiction	1980	1988
Carmel	1.09	1.11
Del Rey Oaks	0.72	0.86
Monterey	1.80	2.07
Pacific Grove	0.51	0.55
Sand City	12.91	15.98
Seaside (Cal-Am)	0.47	0.55
Seaside (Non Cal-Am)	N/A	0.16
Monterey County (Cal-Am)	0.29	0.48
Monterey County (Non Cal-Am)	N/A	0.11

[1] Ratio is determined by dividing total number of employees by total number of dwelling units in each jurisdiction. Ratios above 1.0 indicate commercial emphasis; ratios below 1.0 indicate a residential emphasis.

Source: EIP Associates, based on the following data sources: 1980 U.S. Census, Association of Monterey Bay Area Governments, Recht-Hausrath Associates.

structures are charged for the number of plumbing fixture units in the dwelling unit. For Fiscal Year 1992-93, the charge is about $73 for each of the first ten fixture units, and about $147 for each additional fixture unit; the average connection charge for a home is about $3,700. Charges for non-residential connections are based on the specific user category (e.g., restaurant, fast food, office, hotel) represented. The charge is based on a figure of $14,661 per acre-foot (1992 rate), multiplied by the projected average annual water use in each user category.

Service charges for monthly water use are made by Cal-Am and the other water suppliers in the District. Applying 1992 Cal-Am rates to the average residential use in 1987 (normal year demand of 19 units per two-month period), the average two-month bill would be about $58 dollars, or about $29 per month.[2] The average residential water use in future normal years may be less than the 1987 average due to long-term conservation efforts.

18.3 IMPACT OF PROJECT IMPLEMENTATION

18.3.1 ESTIMATED INCREASE IN RESIDENTIAL WATER COSTS

An analysis was made of how much each project would increase average residential water costs. This analysis was based on a set of assumptions, including the amount and rate of new water connections anticipated for a given project alternative, the rate of escalation of connection charges in the future, project financing costs, and rates of escalation of project construction and operation and maintenance costs in the future.

Table 18-4 summarizes the average bi-monthly increase in water costs to residential customers in the Cal-Am system due to project expenses, mitigation measures and Cal-Am system improvements that would be needed with each alternative. (See Chapter 4, Section 4.8, for information on capital and annual costs.) Costs in Table 18-4 are the average of estimated future costs for the period 1994 through the year 2020, converted to their 1992 value using a present-worth computation at five percent (5%) per year. The costs shown in Table 18-4 for projects that combine a dam with a desalination plant (24 NLP/D and 15 CAN/D) assume construction of the desalination component first, followed by the dam component.

TABLE 18-4

ESTIMATED INCREASE TO AVERAGE CAL-AM RESIDENTIAL BILL[1]
($/2-MONTH BILL/RESIDENTIAL CUSTOMER)

	24 NLP	24 NLP/D	15 CAN/D	7 DSL	NO PROJ.
MPWMD Costs[2]	$5.31	$14.90	$21.02	$18.27	$0.86
Cal-Am System Improvements[3]	$3.24	2.89	5.94	2.56	2.41
Total Increase	$8.55	$17.79	$26.96	$20.83	$3.27

[1] Average present-worth (1992) bimonthly costs, based on estimated project costs for the period 1994 through 2020. These future costs are converted to their 1992 value using a present worth computation at 5 percent per year. Assumes average residential water use at 19 units per 2-month bill. For combination projects (24 NLP/D, 15 CAN/D), costs assume construction of desalination component in year 1994, with first year of operation in 1995, followed by construction of dam in 1999-2001, with first year of operation in 2002.

[2] MPWMD costs include capital and O&M costs for constructing and operating project facilities and mitigations. These would be collected via MPWMD user fees.

[3] Cal-Am costs include improvements to the Cal-Am system: water treatment plant, pipelines, booster stations, tanks and new wells needed with each alternative to meet future demand. These costs would be incorporated in the rates changed by Cal-Am to its customers. Costs for Cal-Am improvements do not include additional facilities needed to meet recent amendments to federal water quality regulations.

Source: MPWMD

The costs presented in Table 18-4 would be in addition to the base Cal-Am bill. As noted above, Cal-Am's current (1992) rates applied to an average residential water use of 19 units per two-month period equates to about $58 every two months for the average residential customer. The average residential water use in future years is expected to be less due to the District's long-term conservation program. It should be noted that future Cal-Am rates will be significantly higher than 1992 rates, due to capital improvements planned by Cal-Am, new Cal-Am facilities required to meet recent amendments to federal water quality standards, and inflation. Assuming an eight percent (8%) per year rate increase without any additional water supply facilities, the average residential bill, based on a water use of 19 units per two-month period, would increase from $58 every two months in 1992 to about $108 every two months in the year 2000.

As shown in Table 18-4, the total average increase in bi-monthly water costs for residential users would range from about three dollars ($3) for the No Project alternative to about $27 for the 15 CAN/D alternative. It should be noted that these rates are averages, converted to their 1992 value. The actual costs experienced by each residential customer would likely be different from the costs presented here, since individual users consume different amounts of water. Cal-Am bill increases were not calculated for the commercial sector due to the widely varying amounts of water use that occurs.

18.3.2 CONSTRUCTION EMPLOYMENT

Construction of any of the proposed alternatives would result in a temporary increase in employment. The estimated number of person-years of employment that would result from each of the alternatives is presented in Table 18-5; the alternatives range from 33 person-years of employment for the No Project alternative to 925 person-years of employment for the 15 CAN/D alternative. Because this temporary construction employment would have no direct environmental effects, no mitigation measures are required.

---

1. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Washington D.C., 1983.

2. Residential average was calculated using 1992 rates applied to estimated non-rationed normal year demand (19 units per two-month billing period, gravity zone, 5/8" meter).

TABLE 18-5

CONSTRUCTION EMPLOYMENT[1]

Alternative	Person-Years Employment[2]
24 NLP	476
24 NLP/D	615[3]
15 CAN/D	925[3]
7 DSL	440[3]
NO PRJ	33

[1] Assumes that labor represents 30 percent of the construction cost estimate.
[2] Construction employment estimates are presented in terms of person-years to provide an equivalent basis of comparison due to the differing lengths of construction for the various alternatives.
[3] *To be revised with new cost estimates.*

Source: EIP Associates.

19. GROWTH AND ITS EFFECTS ON THE MONTEREY PENINSULA

19. GROWTH AND ITS EFFECTS ON THE MONTEREY PENINSULA

19.1 INTRODUCTION AND SUMMARY

The California Environmental Quality Act requires an EIR to "discuss the growth inducing impacts of the project" (Section 21100(g)). The Council on Environmental Quality regulations implementing NEPA contain a similar requirement (Section 1508.8). The State CEQA Guidelines elaborate on this requirement:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas) [Population increases] may further tax ... community service[s] ... [or] encourage ... other activities that could significantly affect the environment ... It must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment. (Section 15126(g))

The following discussion addresses these requirements. Three issues are of concern. First, do the water supply system improvement alternatives under consideration "foster economic or population growth" directly or indirectly; are they growth inducing? If so, is the level of growth significant? Finally, if significant, are the effects also adverse with respect to environmental and/or human health and welfare?

If none of the long-term water supply alternatives are built, growth that is now planned for the Peninsula would be constrained by lack of municipal water supply. Planned growth in much of the District has already been constrained by a reduced water allocation set by the District Board in December 1990, as well as by the temporary moratorium imposed by the District pending development of new supplies. Based on this evidence, it is clear that expansion of the water supply system would remove one obstacle to District growth; by statutory and judicial definition of the term, long-term water supply expansion alternatives would all be "growth inducing".

The amount of growth which could be supported by the proposed system expansion would be significant: a 31 percent increase in population, a 33 percent residential increase and a 74 percent increase in employment above 1988 levels. This represents "build out" of the District's service area as allowed under applicable general plan and zoning intensities; this level of development is considered by the District as the appropriate target for system capacity planning purposes.

Direct and indirect effects of this amount of population increase are, in most instances, anticipated and planned for by local, regional and State jurisdictions responsible for maintenance and improvement of existing environmental and quality of life conditions on the Peninsula. Thus, while adverse environmental impacts would be expected to result from anticipated population increase supported by, or induced by the project, existing regulatory/planning entities have the responsibility to mitigate these impacts. Areas of particular concern are maintenance of regional transportation system service levels and deterioration of regional air quality.

Finally, water supply is only one of many critical factors which regulate growth. While the present, restricted availability of water clearly constrains growth within the District, implementation of the proposed system supply improvements would not solely assure attainment of growth levels planned for by Peninsula jurisdictions.

19.2 POPULATION, EMPLOYMENT AND HOUSING ESTIMATES

The MPWMD has determined that the appropriate water supply goal for planning purposes should be to meet the needs of ultimate, or buildout housing and employment levels, and associated population increases, as set forth in general plans and zoning of communities within the District, rather than provision of specific year demand estimates. The ideal forum to discuss the impacts of this policy on District population growth and on the quality of life in the Monterey Peninsula would be a comprehensive land use plan for the District service area. Unfortunately, no such document exists. The Association of Monterey Bay Area Governments (AMBAG), the County of Monterey and the cities in the area all have addressed the topic of growth impacts in various documents. However, there is no land use planning agency whose jurisdiction coincides with the boundaries of the Monterey Peninsula Water Management District's service area, and therefore no agency with the authority to develop Peninsula-wide policies relating to growth. As a result, the District's first step in planning an expanded water supply was to enlist the help of local agency planners to develop population, employment and housing growth projections, at buildout, for each jurisdiction on the

Peninsula. These projections are contained in a July 1988 study conducted by EIP Associates.[1] They were updated in 1992 in response to perceptions that zoning changes in a number of the cities significantly affected the growth and buildout potential. The minor changes that resulted from the update are indicated in Table 19-1 and are described in more detail below in Appendix 19-A. The net result was a 2.2 percent decrease in residential buildout potential, from 60,379 units to 59,062 units, and a 2.1 percent decrease in population, from 140,937 residents to 137,996 residents.

Buildout refers to estimates of the employment and housing that could legally exist within the MPWMD boundaries under applicable General Plans, zoning, and applicable land use policies as of January 1988, if (1) all current General Plans, zoning, and applicable land use policies remain unchanged, (2) water and sewage treatment capacity availability is not a development constraint, (3) all property owners wished to develop their property to the maximum permissible under current plans and zoning, and (4) the cities and the County permitted every property to be developed in the most intensive manner permissible under current plans and zoning. EIP's report presents an estimate of maximum buildout potential under current policies -- it is NOT a forecast of the most likely level of ultimate development. The buildout estimates are shown in Tables 19-1 and 19-2.

EIP's analysis indicates that, at buildout, residential growth could increase by about 33 percent within the District (14,631 new dwelling units with 76 percent of the residences being multi-family units). The single-family unit increases could be especially modest in the cities. Monterey could actually experience a 5 percent loss in single-family units, while Carmel could show the largest gain at 15 percent. The increase in multi-family units in the cities could be substantial. The increases could range from 24 percent in Seaside to 91 percent in Pacific Grove. The largest absolute increase could occur in Monterey with the addition of 4,915 multi-family units.

The 34,331 new jobs estimated within the District boundaries could represent a 74 percent increase in employment levels. The employment increase could range from 30 percent in Pacific Grove to 258 percent in Sand City. Monterey could experience the largest increase in absolute terms, with 12,173 new jobs. In addition, the Monterey Research Park could provide another 8,404 new jobs at buildout.

19.3 PROJECT RELATIONSHIP TO OTHER FACTORS THAT REGULATE GROWTH

Except for the No Project alternative, all of the alternatives analyzed in this EIR/EIS are sized to meet the Peninsula's projected municipal water demand at buildout, defined as normal year Cal-Am

TABLE 19-1

DISTRICT-WIDE SUMMARY OF HOUSING & POPULATION

	Existing			Additional Potential			Buildout Total		
	1988 Study (Jan 1, 1988)[1]	1992 Adjustment[2] Number	1992 Adjustment[2] Total	1988 Study	1992 Adjustment[2] Number	1992 Adjustment[2] Total	1988 Study	1992 Adjustment[2] Number	1992 Adjustment[2] Total
Residential Units									
Single-Family Units									
Carmel-by-the-Sea	2,593			379			2,972		
Del Rey Oaks	573			3			576		
City of Monterey[3]	6,381			(313)			6,068		
Pacific Grove	5,244			232			5,476		
Sand City	74			0	+20	20	74	+20	94
Seaside (Cal-Am)[4]	4,901			295			5,196		
Seaside (Non Cal-Am)[4]	620			0			620		
County of Monterey (Cal-Am)	8,190			2,717	-682	2,035	10,907	-682	10,225
County of Monterey (Non Cal-Am)	868			887			1,755		
Subtotal Single-Family	29,444			4,200	-662	3,538	33,644	-662	32,982
					-15.8%			-2.0%	
Multi-Family Units									
Carmel-by-the-Sea	619			506			1,125		
Del Rey Oaks	9			151			160		
City of Monterey[3]	6,721			5,089	-174	4,915	11,810	-174	11,636
Pacific Grove	2,769	+169	2,938	2,661			5,430	+169	5,599
Sand City	23			2,617	-709	1,908	2,640	-709	1,931
Seaside (Cal-Am)[4]	2,516			614			3,130		
Seaside (Non Cal-Am)[4]	150			0			150		
County of Monterey (Cal-Am)	1,955			279	+59	338	2,234	+59	2,293
County of Monterey (Non Cal-Am)	56			0			56		
Subtotal Multi-Family	14,818	+169	14,987	11,917	-824	11,093	26,735	-655	26,080
		+1.1%			-6.9%			-2.4%	
Total Dwelling Units	44,262	+169	44,431	16,117	-1,486	14,631	60,379	-1,317	59,062
		+0.4%			-9.2%			-2.2%	
Population									
Carmel-by-the-Sea	4,978			1,589			6,567		
Del Rey Oaks	1,520			402			1,923		
City of Monterey[5]	31,397			10,922	-384	10,538	42,319	-384	41,935
Pacific Grove	16,367	+345	16,712	5,909			22,276	+345	22,621
Sand City	200			5,395	-1,420	3,975	5,595	-1,420	4,175
Seaside (Cal-Am)	21,808			2,673			24,481		
Seaside (Non Cal-Am)[4]	2,264			0			2,264		
County of Monterey (Cal-Am)	24,094			7,116	-1,480	5,636	31,210	-1,480	29,730
County of Monterey (Non Cal-Am)	2,195			2,107			4,301		
Total Population at Buildout	104,823	+345	105,168	36,112	-3,284	32,828	140,937	-2,939	137,996
		+0.3%			-9.1%			-2.1%	

[1] Population figures for January 1, 1988 differ slightly from those estimated by the California Department of Finance (DOF) because the dwelling unit counts used in this report differ slightly from those used by DOF.
[2] See 1992 Update discussion in text and Appendix 19.
[3] Excludes 2,520 existing and 396 future beds in military barracks.
[4] Excludes military housing at Fort Ord.
[5] Includes military population associated with 2,520 existing and 396 future beds in barracks.

Source: EIP Associates

TABLE 19-2

DISTRICT-WIDE SUMMARY OF EMPLOYMENT[1]

	Existing (Jan 1, 1988)	Additional Potential	Buildout Total
Carmel-by-the-Sea	3,555	1,409	4,964
Del Rey Oaks	498	266	764
City of Monterey (excluding Monterey Research Park)	27,175	12,173	39,348
Monterey Research Park	0	8,404	8,404
Pacific Grove	4,444	1,323	5,767
Sand City	1,550	4,390	5,940
– 1992 Revision		4,000	5,550
Seaside (Cal-Am)	3,960	4,320	8,280
Seaside (Non Cal-Am)	170	30	200
County of Monterey (Cal-Am)	4,824	1,935	6,759
County of Monterey (Non Cal-Am)	101	471	572
Total Employment	46,277	34,721	80,998
– 1992 Revision		34,331	80,608
– 1988/92 Difference		-390	-390
		-1.1%	-0.5%

[1]See Appendix 19-A.

Source: EIP Associates

production of 22,750 AF. By definition, all feasible project alternatives would "induce" growth because they would allow presently planned growth to occur without being constrained by a lack of water supply.

However, while important, water supply is only one of many factors which must successfully interact to foster growth in any particular area; wastewater treatment, roads, schools and public safety services - a pleasant climate; these factors all affect a region's growth rate. The two most important factors though, which cause (or restrain) growth, are market forces and community governments.

Without market demand, growth will not occur despite the existence of plentiful water supplies or other urban services. Without supportive local government policies, market demand cannot be realized, again despite the presence of water or other services. Market forces are difficult to predict; their analysis does not provide a sound basis for utility planning. Local government policies, on the other hand, are relatively more stable, and represent a more predictable upper limit of eventual population and service demand increase.

County and local governments influence growth by allowing or preventing construction in particular areas, or in an entire community, by means of general plan land use policies and zoning ordinances. Growth policies often indicate the buildout population that a community's land area and infrastructure can comfortably support. After public review, the plans and policies are adopted by elected officials; presumably, these officials reflect the will of the community. These same elected officials approve and veto specific development proposals. Mandatory environmental evaluation of both a community's plans and specific development proposals must discuss the growth-inducing effects of their implementation; citizens and interest groups and other government agencies have the opportunity to comment during the preparation and adoption of these plans and during the public hearings. Through these processes, communities decide where and how much growth is to occur.

Once plans are adopted by a community, the District perceives a responsibility to respond to the community's desires as expressed in the general plan; the District's water demand estimates are based on population and employment projections that are consistent with present land use plans. It uses these demand estimates to plan for its staffing and facilities. This is true of other service agencies (e.g., wastewater treatment agencies, school districts, police and fire protection departments, etc.); they must also consider the expressed development plans of the communities that they serve.

The District must also be responsive to objectives and requirements of pertinent regional bodies. To facilitate orderly development, the District would allocate expanded water supplies in five-year increments at a rate consistent with population projections contained in the 1991 Air Quality Management Plan (or subsequent Plans). The District may also be called upon to phase the water allocation to coordinate with the Traffic Congestion Management Plan now being developed by the Monterey County Transportation Commission. The allocation limit and the phasing of the allocation will be part of the project voted on by the public.

The next stage of this analysis involves applying the District's growth estimates to environmental and social factors in order to estimate potential worst case impacts on quality-of-life indicators such as traffic, air quality, wastewater and solid waste removal, schools and the fiscal health of local jurisdictions. It should be noted, because of the District's relatively limited role in the democratic formulation of community development objectives, that the effects of potential growth described in this chapter cannot be directly and solely attributed to the water supply system improvements. Growth, to the extent that it will occur in the Peninsula, will largely result from the interaction of market forces and local land use planning policies, and will be equally hindered, or helped along, by the actions of other infrastructure-providing agencies (e.g., roads, schools, etc.).

19.4 TRAFFIC

This section of the EIR/EIS analyzes the traffic implications of estimated growth on major regional transportation corridors on the Monterey Peninsula for buildout. The existing regional roadway network in the Monterey Peninsula area consists of State Route 1 (SR 1), State Route 68 (SR 68), and State Route 218 (SR 218) serving the urban areas of Monterey County.

- State Route 1. The SR 1 alignment parallels the coast, generally extending northeast to southwest through the Monterey Peninsula region. It is mainly a four-lane freeway providing regional access to all of the major jurisdictions in the area.

- State Route 68. Two separate alignments of SR 68 serve the project area. SR 68 from SR1 north to Monterey and Pacific Grove (Holman Highway) is a two-lane highway that provides the major access to the Monterey Peninsula. SR 68 from SR 1 south along the Monterey Salinas Highway is generally a two-lane highway that provides the major linkage between Monterey and Salinas.

- State Route 218. SR 218 is an approximately 2.5- to 3-mile long two-lane highway that links SR 68 (Monterey Salinas Highway) to the south with SR 1 to the north. SR 218 provides access mainly to Del Rey Oaks, Seaside, and Monterey.

The analysis indicates that significant improvements to the transportation system are necessary to accommodate future growth. (Section 19.8, Fiscal Impacts, briefly describes financing for the road improvements.)

19.4.1 METHODOLOGY

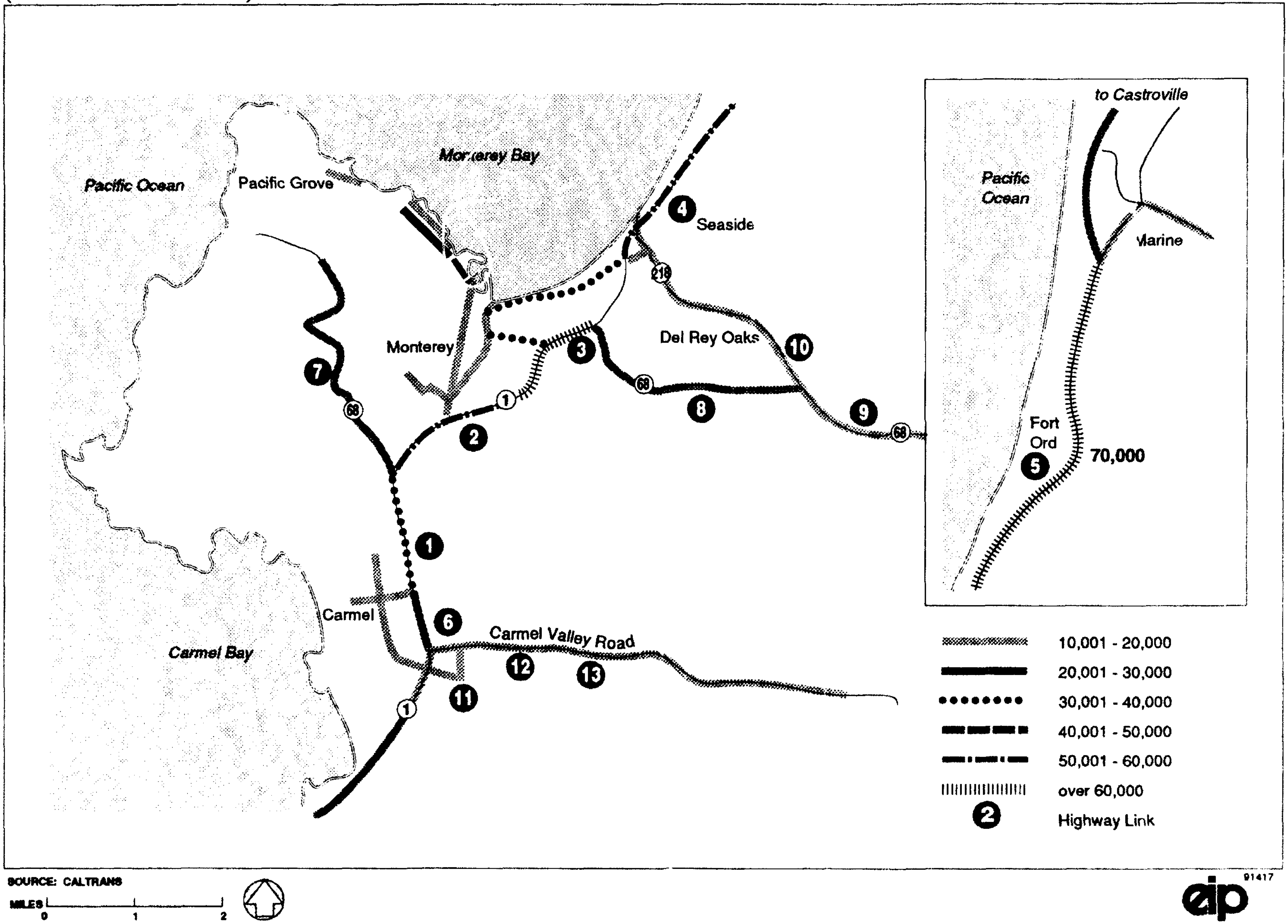
The analysis uses 1989 freeway and major roadway traffic counts (Figure 19-1) as provided by Caltrans and the Monterey County Public Works Department, to establish existing levels of service on major highways of the Peninsula (Figure 19-2).[2,3] Level of Service definitions are listed in Table 19-3. Traffic volumes were estimated by conducting travel demand forecasts for buildout. Travel demand forecasts were made in three steps: quantifying trip generation based on type of land development (including background growth in trips), calculating mode splits (e.g., figuring the percentage of people traveling by private car or transit), and assigning routes traveled. This analysis incorporated the conservative assumption that all trips are made by private auto; route assignments assumed that drivers would take routes that minimize travel distances and continuation existing traffic patterns (except that increased commuting from Salinas and Marina was explicitly taken into account due to the changing jobs/housing balance in the land use estimates). The background growth in trips is in addition to the trips calculated directly from the housing and employment growth projections, and is attributable to tourist/visitor trips among other factors.

After calculating future volumes, the analysis generates predicted highway levels of service (LOS) by incorporating proposed highway improvements. The list of improvements below was taken from the Regional Transportation Plan,[4] although some are also mentioned in draft Route Concept Reports prepared by Caltrans. The improvements assumed include:

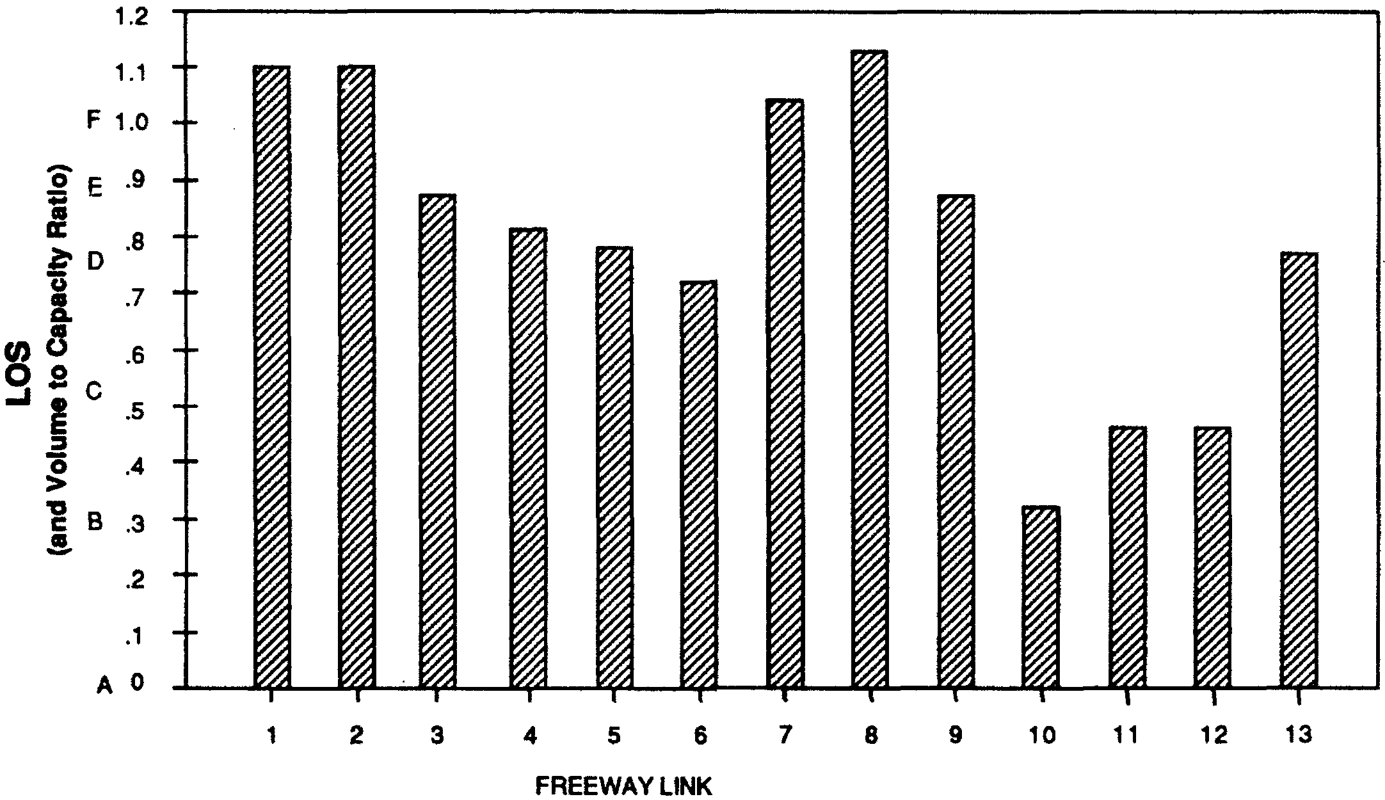
- Hatton Canyon Freeway construction;
- Carmel Valley Road widening from State Route 1 to Carmel Rancho Boulevard and from Via Petra to Valley Greens Road;
- Holman Highway widening;
- State Route 68 widening from its eastern junction with State Route 1 to Los Laureles Grade, and;
- State Route 1 widening from Route 68 to Ord Village.

1989 MONTEREY PENINSULA AVERAGE DAILY TRAFFIC
(VEHICLES PER DAY)

FIGURE 19-1



HIGHWAY LEVEL OF SERVICE (LOS)
YEAR 1989



LINK	DESCRIPTION
1	SR 1 from Carmel Valley Road to Carmel Hill
2	SR 1 from Carmel Hill to Sloat undercrossing
3	SR 1 from Sloat undercrossing to SR 68 (N)
4	SR 1 from SR 68 (N) to Ord Village
5	SR 1 from Ord Village to South Marina
6	Carmel Valley Road from SR 1 to Carmel Rancho Boulevard
7	SR 68 - Holman Highway
8	SR 68 from east junction SR 1 to SR 218
9	SR 68 from SR 218 to Los Laureles Grade
10	SR 218 north of SR 68
11	SR 1 from Carmel River to Carmel Valley Road
12	Carmel Valley Road from Carmel Rancho Blvd. to Via Petra
13	Carmel Valley Road from Via Petra to Valley Greens

LEGEND

Existing Traffic

recycled paper

SOURCE: EIP ASSOCIATES

91417

TABLE 19-3

LEVEL OF SERVICE DEFINITIONS[1]

Level of Service	Freeway
A	Free flow with vehicles virtually unaffected by other vehicles in the traffic stream. V/C = 0.00/0.35
B	Stable flow with high degree of freedom to select speed and operating conditions but with some influence from other vehicles. V/C = 0.36 to 0.54.
C	Restricted flow which remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level. V/C = 0.55 to 0.77.
D	High-density flow in which speed and freedom to maneuver are severely restricted and comfort and convenience have declined even though flow remains stable. V/C = 0.78 to 0.93.
E	Unstable flow at or near roadway capacity with poor levels of comfort and convenience. Operating speeds 30 to 25 mph or less. V/C = 0.94 to 1.00.
F	Forced flow in which the amount of traffic approaching a point exceeds the amount that can be served. Characterized by stop-and-go traffic, poor travel times, and increased accident exposure. Operating speeds less than 30 mph. V/C = > 1.00.

1 V/C = Volume-to-capacity ratio.

Source: Highway Research Board, National Academy of Sciences - National Research Council, Highway Capacity Manual, 1985.

There is some doubt about implementation of several of the proposed road improvements. The Hatton Canyon Freeway is funded and a Final EIR is proceeding through the approval process, but a lawsuit filed by a group of local citizens threatens to delay the start of construction.

The Holman Highway widening project has been temporarily suspended. It is still the intent that a project be constructed between the Community Hospital (for the Monterey Peninsula) and State Route 1 when funding becomes available.

An EIS is currently being prepared for State Route 68 widening from State Route 1 and Toro Park. Improvements could include upgrading to either a four-lane or six-lane expressway, however no funding has yet been identified for this project.

The widening of State Route 1 from State Route 68 to Ord Village is a low priority for Caltrans, thus, given this designation the project would not be completed before 2040 at a cost of $10 million.

A more complete discussion of cost estimates and funding sources is presented below in Section 19.8.3.

19.4.2 EXISTING TRAFFIC

Several highway segments on the Peninsula are currently crowded in the peak hour to the point that they are classified as having poor levels of service (Figure 19-2). "Poor" LOS is defined by Monterey County as worse than LOS C in the peak hour. "Poor" LOS is defined in the Highway Capacity Manual as worse than LOS D in the peak hour.[5] For purposes of this document, the 1985 Highway Capacity Manual definitions for LOS are used. Road links with poor LOS are as follows:

Route	Location	1989 LOS
SR 1	Carmel River to Carmel Valley Road	C/D
SR 1	Carmel Valley Road to Carmel Hill	F
SR 1	Carmel Hill to Sloat Undercrossing	F
SR 1	Sloat Undercrossing to SR 68	D
SR 1	SR 68 to Ord Village	D
SR 1	Ord Village to South Marina	C/D
CV Rd	SR 1 to Carmel Rancho Boulevard	E
SR 68	Holman Highway: Stuart to W. Jct. SR 1	E/F
SR 68	E. Jct. SR 1 to SR 218	F
SR 68	SR 218 to Los Laureles Grade	D

A number of streets in Peninsula cities have poor levels of service. These streets have not been analyzed specifically for this study, but it is important to recognize that as traffic increases in the region, conditions on these routes will degrade further. Del Monte Avenue in Seaside is operating above capacity, particularly between Highway 218 and Broadway. Traffic projections for the next ten years indicate that the volumes on the segment north of Broadway will soon exceed the capacity of the road. This northern segment must be widened to six lanes at substantial cost.[6]

Fremont Street in Seaside also experiences congestion during peak hours. In 1979, the County recommended removing parking on this street as a means of gaining adequate street capacity. This has not yet been implemented.

Carmel Valley Road, between Rancho San Carlos Road and Ford Road is currently operating at LOS D. An EIR prepared on the Carmel Valley Master Plan recommends that this segment be widened to include either four lanes or a center left-turn lane with other alignment improvements.[7] With this increase in capacity, the road segment would be able to accommodate projected traffic growth in this area.

Other major roadway links on the Peninsula maintain acceptable levels of service, as follows:

Route	Location	1989 LOS
Carmel Valley Road	Carmel Rancho Boulevard to Via Petra	B
Carmel Valley Road	Via Petra to Valley Greens	B
SR 218	North of SR 68	A/B

19.4.3 BUILDOUT CONDITIONS

Potential effects of Fort Ord's closure and reuse are not reflected in the following analysis of buildout conditions because conclusions regarding the effects would be speculative at this point. Extensive site remediation activity, endangered species and coastal habitat preservation considerations, and absence of any broad consensus regarding appropriate future use of the Fort property, indicate that trip contributions from Fort Ord to the regional highway system could be below levels previously predicted, especially in the near term. Thereafter, trips associated with alternative development of the property for civilian commercial, residential and/or institutional use may or may not exceed existing contributions. Given the conservative assumptions of the buildout conditions (i.e., 100 percent of trips via motor vehicle) and its incorporation of not insignificant existing and future trips generated by Fort activities, the analysis remains valuable as an indication of potential future buildout traffic conditions on the Peninsula.

Further development on the Peninsula would lead to higher traffic volumes on major highways. Ongoing highway widenings and other modifications are assumed, however, to lead to improved LOS at several links in the system at buildout despite heavier traffic volumes. Links that would benefit from the proposed highway construction projects include the following:

Route	Location	LOS Existing	LOS Buildout With Improvements	LOS Buildout Without Improvements
SR 1	Carmel Valley Road to Carmel Hill	F	C	F
CV Rd	SR 1 to Carmel Rancho Boulevard	E	C/D	F
SR 68	E. Junction SR 1 to SR 218	F	E	F
SR 1	Carmel River to Carmel Valley Road	C/D	C	F

Highway segments expected to undergo deteriorating LOS are as follows:

Route	Location	LOS Existing	LOS Buildout
SR 1	Sloat Undercrossing to SR 68	D	F
SR 1	Ord Village to South Marina	C/D	E/F
CV Rd	Carmel Rancho Boulevard to Via Petra	B	D
CV Rd	Via Petra to Valley Greens	B	C
SR 68	Holman Highway; Stuart to W. Jct. SR 1	E/F	F
SR 68	SR 218 to Los Laureles	D	E
SR 218	North of SR 68	A/B	D/E

In addition to the increased traffic on highways within the District due to growth in the residential sector, the growth in the commercial sector will increase the traffic volume as a result of in-commuting. The commercial sector will grow twice as much as the residential sector in cities within the District through buildout as discussed in Section 17.2.1. This relatively rapid growth in the commercial sector will increase commuting on roads within the District. Private vehicle travel accounts for 81% of the total trips on roads within the District, many of them commuters to Monterey, Salinas and Fort Ord, the communities that attract the largest proportion of home-to-work trips. These trips will increase through buildout, especially on SR 68 to and from Salinas, and SR 1 from Marina and Seaside.

Several improvements not currently planned would improve LOS on the following links:

Route	Location	LOS Existing	LOS Buildout
SR 1	Carmel Hill to Sloat UC - add 2 lanes; total 6	F	D
SR 68	Holman Highway - upgrade from 2-lane highway to 4-lane freeway	E/F	C
SR 68	E. Jct. SR 1 to SR 218 - add 4 lanes; total 6	F	C

The likelihood of these improvements being implemented is jeopardized by the funding constraints discussed in Section 19.8.3 According to current County policy, several of the links discussed would still have unacceptable LOS during the peak hour, even with construction of additional highway improvements. Portions of State Route 1 (from Carmel Hill to the south junction with State Route 68 and from Ord Village to South Marina) would experience LOS D during the peak hours. Additional highway modifications to improve traffic flow at these locations are possible if the decision-makers find that expected levels of service are unacceptable. Given the borderline "D" LOS assigned to several of these locations, however, it is unlikely that the expense of highway widenings would be justified for the small gain in expedited traffic flow.

In conclusion, growth levels which could be supported by proposed water system improvement, if realized, would contribute to reduction of LOS throughout the Peninsula, from relatively acceptable levels of A, B, C and C/D, to levels of E and F along many crucial road links. Feasible road system and intersection improvement could mostly alleviate these conditions but commitment of funding from federal, State, regional and local sources is not now apparent. The ability to enhance existing highway system capacity should not be considered adequate evidence to find that indirect traffic effects of growth supported by the proposed project would be mitigated to less than significant levels; more direct mitigation should be considered, such as linking the water allocation to local governments upon continued demonstration of fiscal commitments adequate to achieve service levels adopted in the Congestion Management Plan and/or in State mandated transportation and circulation elements of individual community general plans.

19.5 AIR QUALITY

Impacts of the Peninsula's growth on air quality were analyzed for future development in the region through buildout. Using information on existing and future traffic conditions on major Peninsula roadways, together with vehicular emission rates characteristic of California, emission totals for vehicles using these roadways were estimated. These totals are shown in Table 19-4.

Estimates of housing and commercial growth on the Peninsula are consistent with growth assumptions used in the development of the 1991 Air Quality Management Plan (AQMP) adopted by the Monterey Bay Unified Air Pollution Control District (MBUAPCD). The AQMP constitutes the State Implementation Plan applicable to the District's territory. The goal of the State's air quality regulatory programs is to accommodate locally planned residential and commercial development while simultaneously planning for achievement and maintenance of specified levels of air quality.

Chapter 14 of the AQMP specifies that projects likely to increase population shall be considered consistent with the AQMP with respect to direct and indirect air quality effects, when the population increases resulting from their implementation are consistent with AQMP population projections. The MPWMD does not project population increases for the service area although the District does figure estimates of maximum allowable water allocation. MPWMD projects that accommodate growth through water allocation are implemented in conjunction with the MBUAPCD to ensure that growth estimates correspond to AMBAG and AQMP growth projections.

The State CEQA Guidelines provide that when a project demonstrates compliance with applicable air quality standards, the Lead Agency may presume that air quality impacts of the project would be less than significant (Section 15064(i)). At a program level, this criteria would appear to be met by the project. At the same time, CEQA specifies that information indicating that compliance alone would be insufficient to render air quality effects insignificant shall be considered by a Lead Agency before making it findings.

TABLE 19-4

PROJECTED AIR POLLUTANT EMISSIONS ON MAJOR ROADS
IN THE MONTEREY AREA
(Tons/Day)

Pollutant	1986	Buildout
Total Organics	3.40	4.37
Reactive Organics	2.90	3.74
Nitrogen Oxides	1.72	1.51
Carbon Monoxide	35.51	36.20
Sulfur Dioxide	0.12	0.21
Particulates	0.26	0.41

Source: EIP Associates.

Therefore, it should be noted that, under emission control regulations in effect through 1991, reactive organic compound (ROG) emissions at buildout (i.e., after 2005) are projected to be higher than they are at present. Nitrogen oxide (NO_x) emissions are projected to exceed 1987 levels sometime after 1995. ROGs and NO_x contribute to the formation of photochemical oxidant, or smog, in the atmosphere (measured as ozone). High concentrations of oxidant impair breathing and cause eye irritation. As Table 19-5 shows, Peninsula traffic would account for 0.84 tons/day of ROG of the basin's increase at buildout; this increment amounts to an increase of 28.9 percent over the Peninsula's 1986 emissions levels. Motor vehicle emission of ROG and NO_x account for 36 percent and 50 percent of total emissions of these pollutants, respectively.

The air basin in which the Monterey Peninsula is located currently violates federal standards, and stricter State standards, for oxidant. The 1988 California Clean Air Act mandates revisions of the AQMP by December 1991. The revisions are to demonstrate compliance with applicable State (and federal) air quality standards by 1994, or, failing attainment, evidence of 5 percent annual emission

TABLE 19-5

AIR POLLUTION EMISSIONS INVENTORY
MONTEREY COUNTY AND MONTEREY PENINSULA[1,2]
(Tons/Day)

Mobile Source Pollutant	1986 Emissions	Estimated Buildout Emissions	% Change 1986-Buildout
Total Organics			
Monterey County	20.80	N/A	N/A
Peninsula	3.40	4.37	28.5
Reactive Organics			
Monterey County	19.40	N/A	N/A
Peninsula	2.90	3.74	28.9
Nitrogen Oxides			
Monterey County	23.10	N/A	N/A
Peninsula	1.72	1.51	-12.2

1 Pollutant emissions for the Peninsula calculated from freeway traffic only.
2 Assumes constant vehicle emission rate for 1986 and buildout.

Sources: Monterey Bay Unified Air Pollution Control District; California Air Resources Board.

reductions of oxidant and oxidant precursors (ROG and NO_x) until the standard is achieved. Therefore, while AQMP revisions may be adopted, they may prove inadequate to actually achieve the strict State standard for oxidant. Continued basin-wide growth may therefore be in compliance with the AQMP, but still contribute to increases in mobile- and stationary-source emissions of ROG and NO_x in the area as a whole. As a result, occasional high oxidant levels could continue to plague the air basin into the next century, especially after 2005, as a result of ROG and NO_x emissions associated with increased vehicle travel and other indirect manifestations of population growth accommodated by the project.

In contrast to the broadly distributed high oxidant levels produced by regionwide emissions of ROG and NO_x, problems associated with pollutants like carbon monoxide (CO) and particulates are generally confined to the vicinity of strong local sources, primarily heavily-traveled, congested roadways. Because of the large increases in traffic expected on local roadways as a result of growth permitted by any of the feasible water supply projects and other cumulative regional growth, CO and particulate air quality standards may be exceeded near these roadways. The Carmel Valley in particular has been an area of concern regarding CO levels. The geography of the valley and its relationship to prevailing air currents makes it especially prone to the buildup of pollutants. The air quality analysis in the Carmel Valley Master Plan EIR (May 1985) suggests that future traffic volume alone will probably not be sufficient to create CO violations, but the added effect of wood burning stoves in new homes may create unhealthful levels of CO, among other pollutants. Elevated concentrations of CO impair oxygen transport in the bloodstream, aggravate cardiovascular disease, impair central nervous system functioning and cause fatigue, headache, dizziness and confusion.

The 1991 revision of the AQMP proposes measures for reduction of particulates. Because there are few large sources of SO_2, H_2S, and sulfates in Monterey County, these pollutants are not expected to cause problems.

The vehicular emissions generated in the Monterey Peninsula region, as presented in Table 19-4, and other cumulatively substantial stationary emission sources, should be viewed in the context of future basin-wide contributions and the emission reductions and control strategies specified in the 1991 AQMP. It is not possible at present to determine how estimated yearly emissions from the Peninsula area would actually affect basin-wide ambient air pollution concentrations. The MBUAPCD is currently developing a model that would translate quantified emissions (such as those presented in

Table 19-4) into probable air pollution concentrations, but the model will not be available until sometime after adoption of the 1991 AQMP revisions. Therefore, there is no direct evidence available to the MPWMD to indicate that population increase supported by the proposed project would result in violations of applicable air quality standards.

Additionally, the MPWMD is neither a land use nor an air quality regulatory agency. It is impermissible for the agency to adopt restrictive development policies that are responsive to objectives unrelated to its legislatively mandated purposes and which supersede the proper regulatory authority of designated resource agencies. The MPWMD should coordinate with the MBUAPCD in allocation of water to local jurisdictions, consistent with population projections of the AQMP, through its successive amendments, until such time as all applicable air quality standards are securely achieved. Adoption of this strategy would appear to be an adequate basis to support a finding that indirect project affects on air quality associated with population increase supported by the project would be less than significant.

19.6 SCHOOLS

This section of the report combines information about projected school enrollment and the capacity of Monterey Peninsula public schools in order to describe when and where overcrowding will occur. Although overcrowding is expected to be serious and chronic at Salinas Union High School, the majority of Peninsula school districts will be able to serve the needs of the estimated buildout population without a substantial financial outlay. Information presented here shows that, although capacity problems are likely at some facilities, there is generally excess capacity expected at other schools within the same district. It is likely, then, that the school districts could house most of the students with minimal capital cost by reassigning groups of students from one school to another. Therefore, indirect impacts on schools of population growth supported by the project would be less than significant.

AMBAG published a study entitled School Enrollment Projections: 1980-2020 in January 1986, which projected school enrollments by school district and grade levels to the year 2020.[8] This study forms the basis of the following assessment of school capacity on the Monterey Peninsula. In order to develop projections of the school-age population, AMBAG relied upon the Economic Base Model first developed by the agency and Recht-Hausrath Associates. Assumptions incorporated into the model are discussed in several AMBAG reports; these assumptions incorporate data reflecting birth rates and the aging of the population.

As discussed previously, AMBAG's growth forecasts are not directly comparable to the land use-based estimates included in this document for two reasons: AMBAG's published projections deal with the entire Monterey County, not individual cities; and AMBAG's unpublished projections for the Peninsula cities provide population but not dwelling unit forecasts only through the year 2020. This report, on the other hand, estimates dwelling unit and employment increases for each city and unincorporated area of the Monterey Peninsula through buildout.

If one assumes that the number of persons per household in each city remains constant from 1980 through buildout, then a comparison of AMBAG figures with the estimates published in this document is possible. AMBAG population forecasts can be converted into projections of households and this household estimate can be compared to the EIP estimates. These estimates of growth are higher than AMBAG's in each of the cities and lower than AMBAG's in county areas. For the Peninsula as a whole, these estimates are slightly lower than AMBAG's.

AMBAG's school district enrollment projections can be viewed in light of the differences between the two sets of growth projections. After outlining the instances where EIP's estimates exceed AMBAG's, an average student-per-household ratio was applied to the difference in households projected by EIP and AMBAG. The number of students calculated according to these differences were then added to or subtracted from the AMBAG enrollment projections and evaluated in light of the capacity at each school district.

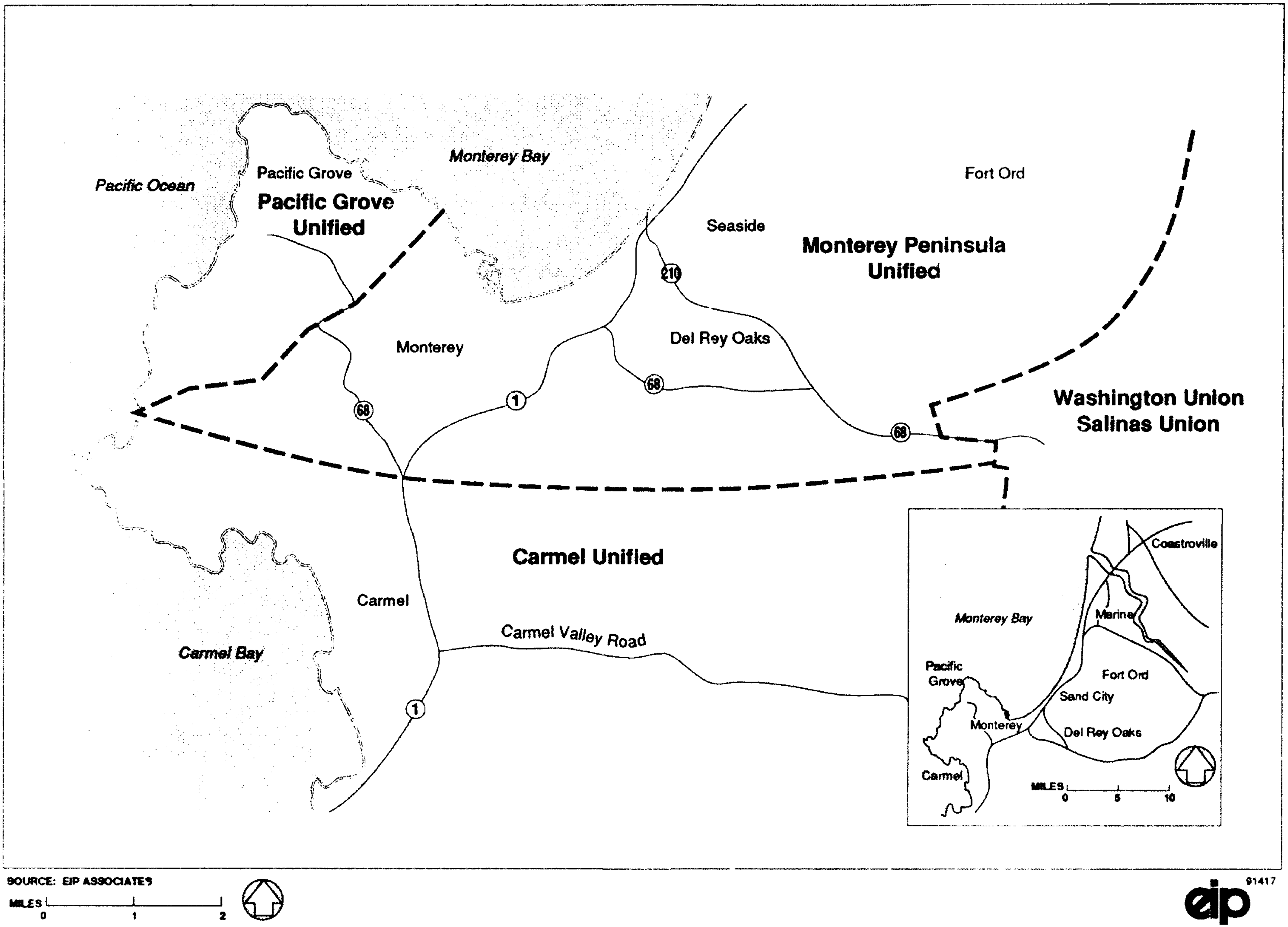
The following sections detail projected enrollment levels and capacity difficulties of each school district on the Monterey Peninsula when buildout is reached.

19.6.1 CARMEL UNIFIED SCHOOL DISTRICT

The Carmel Unified School District includes the communities of Carmel, part of Del Monte Forest, Carmel Valley and other unincorporated areas of Monterey County (Figure 19-3).

SCHOOL DISTRICT BOUNDARIES

FIGURE 19-3



Elementary Schools

Carmel Unified schools serve grades K-5 in elementary school with a total capacity of 1,150 students. With planned growth, elementary school enrollment is estimated to increase steadily through buildout and peak with approximately 1,200 students (Table 19-6). Some overcrowding will occur and measures must be taken to offset it.

The School District recently reopened Carmelo School, using five classrooms for its child development program and leasing the remaining four classrooms to a non-profit theatre group.

Reopening the four classrooms used by the theatre group would ensure sufficient capacity through buildout. The School District notes, however, that reopening the school would require a new principal and administrative staff at the school site; the expense may not be justified in light of the small number of students needing space.[9] In that case, the School District could consider renting one or two portable classrooms for as long as necessary. Local developers could be assessed impact fees to cover this additional expense. Another solution for the District would be to reassign students from the elementary schools to the middle schools to take advantage of the extra space.

Middle Schools

No capacity problems are foreseen for Carmel School District middle schools, which have combined capacity of about 910 students. Enrollment is expected to rise steadily through the year 2004, when it peaks at 74 percent of capacity before declining again. Enrollment at buildout is anticipated to be only 531 students due to the declining birth rates in the area.

High School

No problems are projected in keeping enrollment within the 1,050 student facility. Enrollment is expected to rise fairly steadily through buildout, when it peaks at about 96 percent of capacity.

19.6.2 MONTEREY PENINSULA UNIFIED SCHOOL DISTRICT

The Monterey Peninsula Unified School District serves the communities of Del Rey Oaks, Fort Ord, Marina, Monterey, Sand City, Seaside and some unincorporated Monterey County areas (Figure 19-3). A major part of the School District's service area lies outside the scope of this study; it should be noted, therefore, that decisions affecting growth on the Peninsula may not change growth rates

TABLE 19-6

SCHOOL ENROLLMENT FIGURES

	1988	Buildout	Capacity
Carmel Unified School District			
Elementary	948	1,209	1,150
Middle	416	531	910
High School	790	1,007	1,050
Total	2,154	2,747	3,110
Monterey Peninsula Unified School District			
Elementary	7,856	10,894	10,135
Middle	2,666	3,696	3,600
High School	2,862	3,968	3,100
Total	13,384	18,558	16,835
Pacific Grove Unified School District			
Elementary	1,131	1,539	1,351
Middle	486	661	600
High School	620	844	1,000
Total	2,237	3,044	2,951

Source: EIP Associates

or policies in communities further to the north and may not totally alleviate the effects of growth on the School District.

Elementary Schools

Some capacity problems are foreseen for Monterey elementary school facilities, which have combined capacity of about 10,135 students, with the recent addition of five new classrooms at Crumpton Elementary. Enrollment is estimated to reach approximately 10,890 students at buildout, exceeding capacity. It should be noted, however, that enrollment estimates are based on the assumption that the student per household ratio remains constant. The California Department of Finance projects declining birth rates for the project area, with school age children constituting a smaller percentage of the population.[10]

Middle Schools

With total capacity of about 3,600 students, slight capacity problems are foreseen for Monterey middle schools. Enrollment is expected to increase through buildout to a peak of approximately 3,696 students. One possible solution to the overcrowding would be for the District to add portable classrooms, since only a relatively small number of students would be involved. Local housing developers could be assessed impact fees to fund the temporary classroom rentals.

High School

Growth forecasts predict episodic overcrowding at the high school leading to buildout, with capacity problems at buildout. Enrollment at buildout is estimated to reach approximately 3,968 students, 128 percent of current capacity.

The overcrowding for the District as a whole may force construction of new permanent facilities to house the extra students if portable classrooms prove to be inadequate. Local housing developers could be assessed impact fees to help fund any needed capital improvement projects.

19.6.3 PACIFIC GROVE UNIFIED SCHOOL DISTRICT

The Pacific Grove Unified School District service area includes the City of Pacific Grove and a portion of Pebble Beach (Figure 19-3).

Elementary Schools

With the recent opening of the K-Center that houses 251 students, the elementary schools possess a total capacity of 1,351 students. Enrollment is expected to exceed this total at buildout when there will be approximately 1,540 students.

The School District could consider reopening one or both of the closed elementary schools, which have a combined capacity of 2,100 students.[11] This option would result in additional costs of hiring new principals and administrative staff for each school site.

Middle Schools

The Pacific Grove middle school, with total capacity of 600 students, is expected to experience overcrowding throughout the period leading to buildout. The worst overcrowding would occur in 2020, when the school would operate at about 144 percent of capacity with 860 students enrolled. By the time buildout is reached, it is estimated that enrollment would drop to about 660, 110 percent of capacity.

The School District could consider reopening one or both of the closed elementary schools (combined capacity of 2,100 students) in order to house classrooms from the middle school. The elementary schools would have the capacity to house the extra students from both the elementary and middle schools at buildout.

High School

No capacity problems are foreseen in the high school, which has capacity for 1,000 students. Estimated enrollment at buildout is about 845 students, well within the capacity of the school.

19.6.4 SALINAS UNION HIGH SCHOOL DISTRICT

The Salinas Union High School District (SUHSD) encompasses a large area around and including the City of Salinas. The SUHSD also includes a small portion of the Highway 68 area, but residents of only the Laguna Seca and Hidden Hills developments would attend this high school (Figure 19-3). Students from the study area would make up less than 4 percent of the SUHSD's enrollment during the forecast period; it is unlikely that development in the study area would significantly affect capacity at Salinas Union schools.

The Salinas high school facilities are overcrowded now and projected to become worse. AMBAG estimates that students will exceed available capacity by more than 2 to 1 by the year 2020.

Several solutions to relieve the chronic overcrowding are planned or underway. A new junior high school opened in the fall of 1988 with a capacity of 1,000 students, and the expansion of Alisal High was completed in 1988 to make room for an additional 300 students. The SUHSD has purchased a site in the northeast area of Salinas for a new school site; that facility is expected to open in 1992 with a capacity of 2,050 students.[12]

The SUHSD is also considering renting portable school classrooms or other space to relieve short-term crowding. In addition, it is possible that future attendance boundaries might change. In that case, some students, such as those in the Highway 68 area, could attend Monterey High School in the future. This last solution could exacerbate crowding at the Monterey facility unless appropriate action is taken by that school district. Regardless, another high school and middle school will be needed to accommodate the growing student population in the SUHSD.

19.6.5 WASHINGTON UNION SCHOOL DISTRICT

Washington Union School District (WUSD) boundaries encompass primarily some unincorporated areas of the County, including part of the Highway 68 area and Toro Park (Figure 19-3). Residents of the study area that would attend schools in the WUSD would live in Laguna Seca and Hidden Hills.

The WUSD has added a new building to its school site that is expected to serve the additional student population in the District at buildout.[13] If necessary, WUSD could lease portable facilities for the few years when enrollment levels may approach capacity. Local developers could be assessed impact fees to pay for this extra operating expense.

19.7 SOLID WASTE

The Monterey Regional Waste Management District (MRWMD) service district extends from Castroville to Big Sur and serves the entire Peninsula, including Fort Ord. Although Fort Ord closed its own landfill and is now served by MRWMD, negotiations are still taking place regarding Fort

Ord's financial contribution to the District. There is also the possibility the MRWMD would collect and dispose of solid waste from the Salinas area if north County landfill sites close.[14]

The MRWMD operates a landfill near Marina, which is located approximately two miles north of the City and one mile east of Highway 1. The Marina landfill has approximately 80 years of available capacity, assuming current growth rates.[15] The estimates for planned growth included in this document are consistent with the MRWMD's growth assumption, so it is evident that Monterey Peninsula planned development would not exceed the landfill's capacity within the time span of concern to this document. Finally, planning processes under the jurisdiction of the California Integrated Waste Management Board are adequate to assure provision of suitable solid waste disposal services upon eventual closure of the present landfill. Therefore, indirect impacts on solid waste facilities of population growth supported by the project would be less than significant.

19.8 WASTEWATER

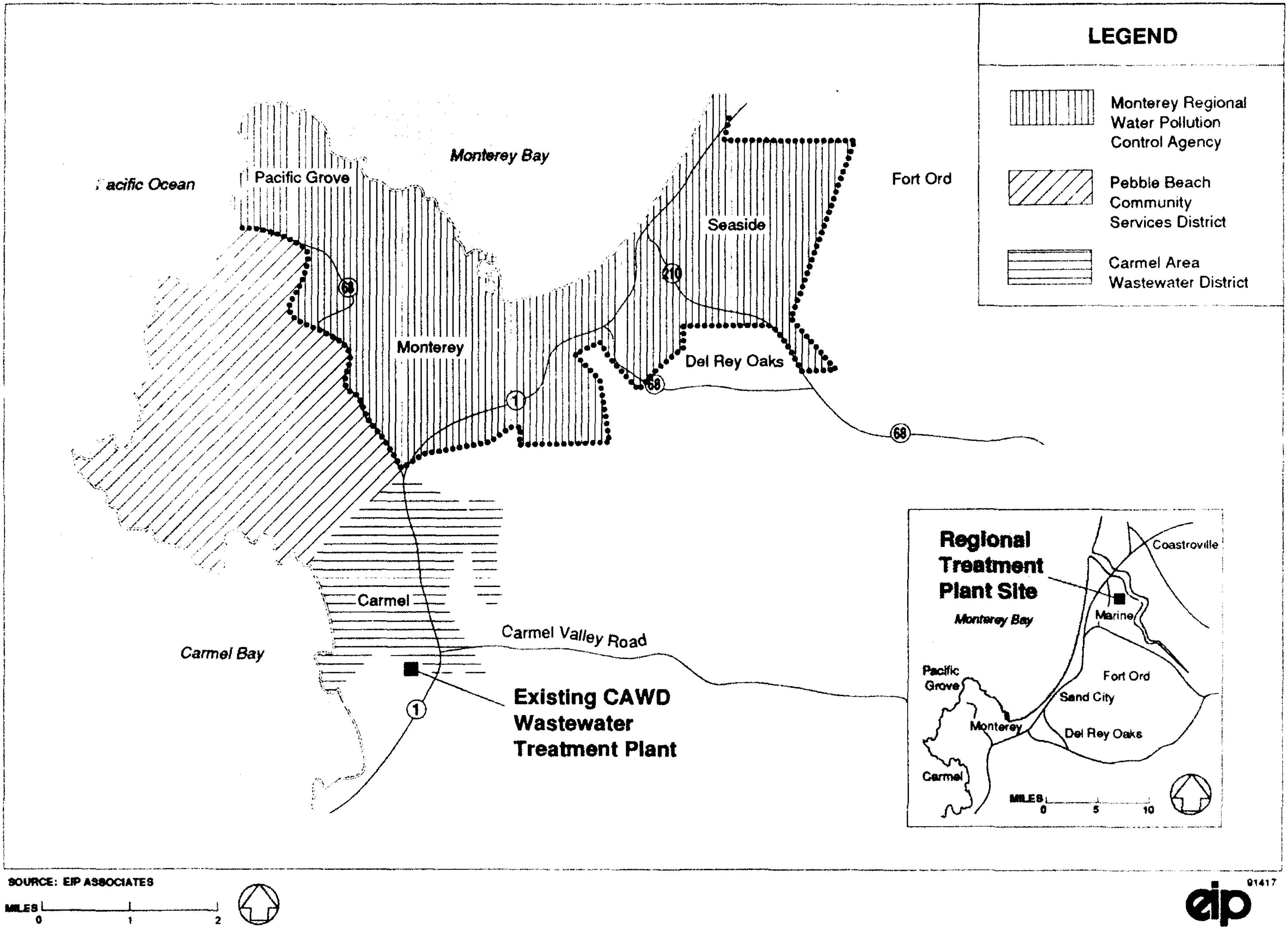
19.8.1 MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY

The Monterey Regional Water Pollution Control Agency service area (within the Monterey Peninsula Water Management District service area) includes the communities of Del Rey Oaks, Monterey, Pacific Grove, Sand City and Seaside. It also serves Boronda, Castroville, Fort Ord, Marina, areas of Monterey County, Moss Landing and Salinas (Figure 19-4).

The Agency has consolidated five treatment plants into one regional facility and added an expansion element to bring total plant capacity to 29.6 million gallons per day (MGD). Operations of the regional treatment plant are currently restricted under terms of a Monterey County conditional use permit that limits the maximum amount of sewage that can be treated to 25 MGD. An additional expansion of plant capacity to 37 MGD can be utilized when needed and if approved by the County. This additional capacity would be sufficient to treat wastewater in the Agency's service area through buildout.[16] (See Section 19.9.3 for a discussion of wastewater facility expansion financing.) The plant is also restricted in that it is not allowed to serve a greater population than is forecast in the MBUAPCD's Air Quality Plan for the Monterey Bay region. Population projections to be used in this plan are forecast by AMBAG. AMBAG has projected population growth through 2020 and this analysis examines the buildout conditions. Since it is uncertain when buildout will be reached, it is impossible to determine if the plant's future operation would be restricted.

SANITATION DISTRICT SERVICE AREAS

FIGURE 19-4



19.8.2 CARMEL AREA WASTEWATER DISTRICT

The Carmel Area Wastewater District (CAWD) service area includes the City of Carmel and unincorporated County areas south along the coast approximately to Highlands Inn and east into Carmel Valley approximately to Valley Greens Drive (Figure 19-4).

The CAWD has upgraded its treatment plant to facilitate wastewater reclamation. Plant capacity was also increased to 4.0 MGD from its previous rating of 2.4 MGD. The CAWD retains ownership of two-thirds of the plant's capacity and the remainder is used by the Pebble Beach Community Services District. The CAWD states that the plant will now accommodate all growth within the service area through buildout.[17]

As described in Section 2.5.3, the Carmel Area Wastewater District, the Pebble Beach Community Services District, the Monterey Peninsula Water Management District, and the Pebble Beach Company have cooperatively developed the CAWD/PBCSD Wastewater Reclamation Project. The project will provide approximately 800 acre-feet of treated wastewater to irrigate golf courses and open space areas in Pebble Beach, which will replace potable water now used for irrigation. Project construction began in January 1993, and is expected to be completed by June 1994.

MPWMD has provided the funding for the project through the issuance of $33.9 million in Certificates of Participation in December 1992. The Pebble Beach Company, as fiscal sponsor of the project, has guaranteed the bond repayment and payment of annual operating expenses not covered by the reclaimed water sales revenues. In return, the fiscal sponsor will receive a water entitlement of 380 acre-feet which will be dedicated to specific lots in Pebble Beach for future development. The remaining 420 acre-feet of potable water freed by the project will be available to the District for drought reserve or new development.[18]

19.8.3 PEBBLE BEACH COMMUNITY SERVICES DISTRICT

The Pebble Beach Community Services District (PBCSD) serves the Del Monte Forest Area (Figure 19-4). As noted above, the PBCSD owns one-third the capacity of the CAWD/PBCSD joint treatment plant. PBCSD officials note that growth consistent with current General Plans and the Coastal Plan will be served adequately by the expanded facility through buildout.[19] Capacity problems could occur, however, if there is extensive construction of "granny flats" senior citizens' housing in the future. Such construction would be regulated by County ordinance and is currently not authorized under County zoning regulations.

19.8.4 SEPTIC SYSTEMS

Much of the Carmel Valley area is served by septic systems. A 1982 Montgomery Engineers report detailed potential problems with groundwater contamination due to overuse of septic systems in the Valley.[20] This report stated that septic system capacity was already met in the Carmel Valley Village and Schulte Road areas. Future capacity problems could be avoided by limiting dwelling units in the Valley to 9,540 homes which is well above the 6,202 units allowed under the current General Plan for the area, avoiding development in the most sensitive areas, and supplementing septic systems or tie-ins to existing systems where necessary. As long as development of environmentally sensitive areas is avoided, as noted in the Carmel Valley Master Plan, it is not likely that there would be septic system capacity problems in the Carmel Valley.[21]

It should be noted that in addition to Carmel Valley, septic systems are also present in Sand City. It appears that these systems function properly at this time.

19.8.5 CONCLUSION

Sewage treatment capacity appears to exist that is adequate to meet State and federal treatment requirements and which can support planned buildout population of Peninsula communities. Therefore, indirect impacts on wastewater treatment infrastructure of population growth supported by the project would be less than significant.

19.9 FISCAL IMPACTS

19.9.1 INTRODUCTION

The purpose of this part of the study is 1) to provide information regarding the relative fiscal impacts of growth on the cities compared with their current fiscal status; and 2) to discuss the regional infrastructure that must be constructed to accommodate the growth.

This discussion addresses only the indirect fiscal effects associated with growth in the study area, and does not discuss the socioeconomic impacts of financing the water supply alternatives. Financing for water supply projects is addressed in Chapters 4 and 18 of this report.

19.9.2 FISCAL IMPACTS TO CITIES

In any municipal jurisdiction, new growth generates additional public revenues through increases in property valuation, retail sales, or use of services for which fees or franchise taxes are charged. New growth also increases the demand for public services and thus raises the cost of government. The cost to government will include the operating expenses that recur annually, but may also include one-time capital expenditures necessary to upgrade a city's infrastructure such as streets, water and sewer systems, or facilities like libraries or fire stations.

The relationship between annual costs and revenues generated by each land use type may remain relatively stable over time as the community grows, assuming the basic rules for collecting revenues do not change as happened when Proposition 13 was passed. However, the need for capital expenses depends upon the city's existing service capacities. Once installed, most capital projects serve a large increment of growth occurring over a number of years. Thus, the capital budget tends to be more "bulky" and less uniform across communities.

The approach in this analysis has been to separate the issue of annual operating costs from capital projects. The analysis projects the relationship between annual government costs and revenues into the future based on estimated changes in the land use mix for each of the cities in the study area. The focus is to determine whether the cities would be benefitted or adversely affected relative to their current fiscal status as a result of the growth estimated. Capital projects are discussed on the basis of information supplied by each of the cities and are not projected directly on the basis of the land use estimates done for the study. The unincorporated County areas have not been included in this analysis due to the difficulty of separating the Peninsula portion of the County out of the total County budget.

In order to estimate the annual cost/revenue impacts of growth on the cities, municipal funds were allocated by residential and commercial land uses. Table 19-7 shows an example of this exercise for the City of Carmel. The 1986-87 budget total shows the general fund budget for Carmel. The budget is approximately balanced. The ratio of revenues to costs at the bottom of the table is therefore shown as 1.00, meaning that for each dollar of expense, a dollar of revenue is shown in the budget. The ratio of 1.00 is not intended to imply that Carmel necessarily has all the revenue it needs to provide what it considers an adequate level of service; rather, the ratio simply reflects the current balance between costs and revenues.

TABLE 19-7

EXAMPLE OF BUDGET BREAKDOWN BY LAND USE
CITY OF CARMEL
FISCAL ANALYSIS
1986-87 BUDGET

	Total	Residential	Commercial
Revenues			
Property Tax	$ 712,054	$ 457,850	$ 254,204
Sales Tax	1,556,017	0	1,556,017
Utility/Franchise	63,791	45,993	17,798
Occupancy	2,525,307	0	2,525,307
Licenses/Permits	389,247	54,496	334,752
Other Agencies	360,247	360,247	0
Other	1,330,789	1,330,789	0
Total	$6,937,452	$2,249,375	$4,688,078
Costs			
General Government	$1,566,745	$1,059,120	$ 507,625
Police	1,410,224	953,311	456,913
Fire	528,713	339,962	188,751
Community Planning	334,735	226,281	108,454
Public Works	1,233,844	0	1,233,844
Capital Improvement	1,099,000	742,924	356,076
Cultural/Recreational	349,589	349,589	0
Library	414,602	414,602	0
Total	$6,937,452	$4,085,789	$2,851,663
Balance	$0	$(1,836,414)	$1,836,415
Ratio of Revenues to Costs	1.00	0.55	1.64

Since the land use estimates for the study are divided by housing units and employment, it is important to consider the contribution made by each land use to the fiscal status of Carmel. This has been done in the remaining two columns in Table 19-7. On the revenue side, certain funds are generated by only one land use type, in other cases the contribution is shared. Sales taxes and hotel occupancy taxes are generated only by commercial and hotel properties. State subventions, part of the category listed as "Other Agencies," are generally allocated on the basis of residential population. Property taxes, on the other hand, are paid by all kinds of property. The County Assessor does not keep records of the distribution of assessed value for different types of land uses. To allocate these revenues among the two land use types, EIP made assumptions regarding the average values of residential and commercial properties. The average values were then applied to 1985 land use inventory data to calculate an approximate percentage weight for commercial and residential assessed values. This weight was then multiplied by the property tax revenues shown in the budget.

The costs were allocated using average factors calculated either on the basis of relative assessed value or the relationship between population and employment in Carmel. The visitor population in hotels was also factored into the service costs attributable to the commercial sector.

The ratios shown at the bottom of Table 19-7 indicate that residential development requires more in costs for services than it returns in revenues, while for commercial development, the opposite relationship is true. The 0.55 in the residential column means that revenues generated by existing residential units is only 55 percent of the costs of current services to serve the residential population. In the commercial column, it can be seen that revenues are nearly double costs. A major reason for this result is that commercial activity generates large amounts of revenues in addition to the property tax, but does not generate extraordinary costs for services.

Similar calculations have been done for each of the cities as summarized in Table 19-8. In every case, commercial development returns a better fiscal balance than residential development. This is significant because the regional buildout estimates show relatively high levels of employment growth in relation to housing growth. Table 19-9 shows how changes occur as a result of growth. Comparison of the left hand and right hand columns, which show the 1988 and buildout ratios respectively, indicates that all of the cities improve over their current situation if planned growth occurs, with the exception that Sand City drops about 14% and Pacific Grove dips slightly due to the large increase in residential development.

TABLE 19-8

EXISTING RATIOS OF GOVERNMENT GENERAL FUND REVENUES AND COSTS GENERATED BY RESIDENTIAL AND COMMERCIAL LAND USES FOR CITIES IN THE STUDY AREA[1]

	Total	Residential	Commercial
Carmel	1.00	0.55	1.64
Del Rey Oaks	1.00	0.58	2.17
Monterey	1.05	0.41	1.81
Pacific Grove	1.00	0.67	1.98
Sand City	1.03	0.70	1.08
Seaside (Cal-Am)	1.01	0.73	2.24
Seaside (Non Cal-Am)	0.86	0.73	2.24

1 The figures in the table represent the ratio of general government revenues to costs. A ratio of 1.00 means that revenues and costs are exactly balanced. A ratio less than 1.00 (e.g., 0.61) means that costs generated by that land use exceed the revenues generated. A ratio higher than 1.00 means that revenues are higher than costs.

Source: EIP Associates

TABLE 19-9

EXISTING AND ESTIMATED RATIOS OF GOVERNMENT GENERAL FUND REVENUES AND COSTS FOR CITIES WITHIN THE STUDY AREA

City	1988 Ratio	Buildout Ratio
Carmel	1.00	1.02
Del Rey Oaks	1.00	1.06
Monterey	1.05	1.03
Monterey Research Park	0.00	1.14
Pacific Grove	1.00	0.99
Sand City	1.03	0.88
Seaside		
Cal-Am	1.01	1.16
Non Cal-Am	0.86	0.88

Source: EIP Associates

The significance of these results varies with each city depending upon the current adequacy of services and the need for capital improvements. The City of Carmel is undertaking an on-going capital improvement program for street maintenance and drainage improvements.[22] The current road and drainage system is severely under-designed to handle the volume of current traffic and development. The character of growth in the near term and the projected relationship of costs and revenues may further strain the City's ability to raise revenues for these capital projects.

The City of Pacific Grove currently is under-staffed to provide the desired level of City services.[23] The increase in Pacific Grove's costs relative to revenues through buildout will further exacerbate this situation.

The City of Del Rey Oaks was recently forced to dip into cash reserves to balance the budget.[24] The increase in hotel and commercial development should prevent the need for this in the future.

The City of Monterey has established an ambitious capital improvements program. The continued improvement in Monterey's cost/revenue balance contributed by the projected growth suggests that ample revenues can be accrued for this program.

Three military facilities are located within the City of Monterey: the Presidio of Monterey, the Naval Post Graduate School, and the local Coast Guard facility. The Presidio of Monterey, operated by the U.S. Army, houses the Defense Language Institute, a military foreign language facility. The U.S. Army recently completed a new master plan for the 400-acre installation that would consolidate its military language institutes nationwide at the Presidio of Monterey.

The U.S. Navy operates the Naval Post Graduate School as a training site for U.S. Naval Officers. The School includes learning facilities and a residential compound to accommodate an enrollment of approximately 1,850 persons. A recently adopted master plan calls for the expansion of School facilities to adapt to current enrollment pressures. The U.S. Coast Guard maintains a force of approximately 100 persons in Monterey. These personnel provide administrative support for both the Naval Post Graduate School and Coast Guard operations. No expansions of personnel or facilities are presently planned by the Coast Guard.

The land use estimates used for estimating population and employment growth in the District factored in the projected expansions at three military facilities. The military facilities pay no property tax, so the largest revenue accruing to the City of Monterey General Fund results from retail sales taxes on off-base entertainment spending by military personnel. This amount represents only a small percentage of total sales tax revenue received by the City of Monterey. The Presidio of Monterey pays the City of Monterey a sewer line maintenance fee to offset the costs of upkeep of sewer lines serving the facility.[25] Thus, the impact of the military facilities on the General Revenue and Expenditures for the City of Monterey is included in this analysis.

The City of Seaside will gain substantially from the type of commercial and hotel development planned for Seaside. However, significant capital costs will be required to implement the core of this development. For example, the dredging of the Laguna Grande lagoon is estimated to cost $3.5 million. Seaside will fund a portion of the cost with a Coastal Conservancy Grant of $1.2 million and a Tax Increment Grant from the Laguna Grande Redevelopment Area, leaving $800,000 still in escrow.[26]

While the balance of growth in jobs and housing on the Peninsula generally results in favorable fiscal results for cities there, the Salinas and Marina areas, which would supply the additional labor force, may not benefit fiscally. The growth scenarios would result in increased housing growth in these communities without necessarily boosting job growth. This situation could adversely impact the fiscal health of Marina and Salinas unless they take independent measures to plan for the influx of residents and balance their own community growth with additional economic development projects.

19.9.3 REGIONAL CAPITAL IMPROVEMENTS

Traffic Improvements

A number of major roadway improvements are forecast in order to accommodate projected traffic levels. The traffic analysis examines several planned improvements that would increase the Level of Service, although not all of these have as yet been funded. The planned improvements include:

- Hatton Canyon Freeway construction;
- Carmel Valley Road widening from State Route 1 to Carmel Rancho Boulevard and from Via Petra to Valley Greens Road;
- Holman Highway widening to four lanes;

- State Route 68 widening from its eastern junction with State Route 1 to Los Laureles Grade, and;

- State Route 1 widening from Route 68 to Ord Village.

Cost estimates have been prepared for several of these projects. The Hatton Canyon Freeway is projected to cost approximately $27 million. The widening of Holman Highway has a projected cost of approximately $15 million. Cost estimates for long-term projects include the widening of State Routes 68 and 1. The upgrading of State Route 68 to a four-lane expressway could be completed by 2030 at a cost of $60 million; and further improvement to a four-lane freeway could be implemented by 2050 at a cost of $10 million. These projects on average would cost about $2 million per lane mile. This cost would be greater on sections that involve features such as bridges and interchanges; but based on this average, $2 million per mile, the projects listed could cost about $137 million by 2010.

These improvements involve mainly highways on the Monterey Peninsula. Monterey County could reasonably expect to receive about $161 million in street and highway funding for projects throughout the County by the year 2010. Other projects in the area expected to be completed by 2010 for which cost estimates are available include the Prunedale Bypass at $88 million. The Monterey County Transportation Commission (MCTC) recently established a policy stating that at least one-half of all incoming highway project funds would be allocated toward completion of the Prunedale Bypass.

In addition to the improvements listed above, further improvements will be necessary to accommodate projected growth.

- Add two additional lanes to State Route 1 between Carmel Hill and the eastern interchange with Highway 68 (This item is listed as two separate links in the traffic analysis, Section 19.3.)

- Add two lanes on Highway 68 between the eastern interchange with State Route 1 and State Route 219.

- An additional upgrade of the Holman Highway from a four-lane highway as proposed above in the planned improvements to a four-lane freeway.

Based on the average costs of $2 million per lane mile, the first two improvements would cost approximately $36 million. The second Holman Highway improvement project would involve additional cost as well, but the potential complexity of the design does not permit any estimate of cost at this time. The cost estimates discussed here are intended only to provide illustrative information, since detailed designs of the proposed improvements have not been prepared.

Since the improvements discussed here are all on state highways, the projects would qualify for federal aid. Most of the projects could apply for Federal Aid Primary, which funds up to 90 percent of the project with federal money and 10 percent with state money. No local match of funds is required for these grants. The Holman Highway project would need to use Federal Aid Secondary funds which are ordinarily used for street improvements by the cities and the county. Under the funding process for Federal Aid Primary, each project must be included in the State Transportation Improvement Program (STIP) which sets out a five-year schedule for projects. Each new project is put in the fifth year of the program, which results in an automatic five-year lag between a project's inclusion in the STIP and its actual funding period. Currently, the only project on the Monterey Peninsula in the STIP is the Hatton Canyon Freeway.

Projects are proposed to the state by local jurisdictions so that local control is maintained for setting priorities for the expenditure of available funds. However, the amount and timing of funds is under state control as the state must balance the needs of all California jurisdictions. Currently, the top priority for Monterey County is the Highway 101 bypass in North County mentioned above (Prunedale Bypass) which is on a 10 to 15 year timeline.

There have been no indications that the Federal Aid Primary program will be substantially changed due to recent budget actions at the federal level. However, it is clear from the administrative procedures implementing the program that, at best, it is a long range funding source for the improvements discussed here.

Other local options for generating funds for highway improvements have been considered in the County, including a development impact fee and an increase in the sales tax which could be dedicated to regional transportation projects. These funding mechanisms have been implemented in other regions and have generated substantial and well-targeted revenues to complete regional and local improvements. The increase in the sales tax for transportation projects was recently rejected by the County Board of Supervisors in favor of a general sales tax increase to be spent at the discretion of the County.

Finally, gasoline tax subventions to local jurisdictions could be used to fund identified highway system improvement needs. These revenues, approved by the State's voters in June 1990 (Proposition 111 and 108) may be distributed upon development and implementation of a Congestion Management Plan (CMP) by the Monterey County Transportation Commission which has been appointed as the Congestion Management Agency (CMA) for Monterey County. Monterey County and Peninsula cities would be eligible for receipt of their portion of about $3 billion set aside for local government improvement of regional highways and principal arterials.

A CMP must contain an number of elements that will guide local development decisions:

- specification of minimum LOS standards for state highways and principal arterials reflecting specific intensities of land uses (but no less than LOS E or existing conditions if worse than LOS E);
- standards for the frequency, routing and coordination of public transit;
- a trip reduction program that promotes alternative transportation methods, improvements in the jobs/housing balance and other strategies;
- a program analyzing the regional transportation impacts of local land use decisions; and
- a seven-year capital improvement program, to maintain or improve traffic and transit, linked to regional transportation and air quality mitigation measures.

Once target service levels are established, failure of local governments to maintain them can result in a finding of non-compliance by the CMA. This finding would result in cut-off of gasoline tax subvention funds from the State controller to the local jurisdiction. Additionally, local jurisdictions in non-compliance would be ineligible to receive Flexible Congestion Relief and Urban Commuter Rail Funds, Traffic System Management Funds and other State and federal grants supporting locally oriented projects identified in Regional Transportation Improvement Programs.

In order to accommodate planned growth through buildout, the Monterey Peninsula region needs to set clear priorities for improving the transportation system, and needs to quickly set in motion the procedures for securing sufficient funds. Future growth in the District would be threatened by a lack of infrastructure improvements. Traffic problems would limit the ability of commuters to reach their places of employment in an expeditious fashion, which could hinder economic growth. Lifestyle patterns would have to be changed to adapt to the limited mobility caused by the traffic levels on highways and major arterials on the Monterey Peninsula. Resulting congestion could further impair prospects for attainment of air quality standards.

The congestion management planning and funding structure is clearly a major step in ensuring that projected buildout population increases would be matched by improvement of critical transportation system infrastructure within the region. Together with other existing road improvement programs and funding sources, including levy of developer fees, and the programs discussed above, the CMP process could provide an adequate basis to find that the indirect transportation impacts of growth supported by the project could be mitigated to a less than significant level by construction of system improvements, or phasing of, or limitation of, trip growth within the region.

Regional Sanitation Improvements

The Monterey Regional Water Pollution Control Agency (MRWPCA) and the Carmel Area Wastewater District (CAWD) have expanded their sewage treatment plants to meet the demands of increased growth on the Monterey Peninsula. The expansions needed for the sewage treatment plants were programmed from a combination of local capital reserves and federal grants. The MRWPCA recently replaced five outdated plants with one large plant that has 20.9 MGD capacity. The financing for this project came from a federal grant (69 percent) and from the agency's capital revenues.

The agency then further expanded plant capacity to 29.6 MGD. An additional expansion to 37 MGD is available and should accommodate growth through buildout. The cost of these expansions will total $11.3 million (1985 dollars). The agency plans to utilize connection fees to finance these projects.

The Carmel Area Wastewater District completed improvements to their treatment plant that will allow processing of 4 MGD, a capacity adequate for buildout projections of planned growth. The project cost $6.6 million, 88 percent of which was funded with an EPA grant, given for the purpose of upgrading the level of treatment at the plant.

Adequate funding mechanisms appear in place to complete necessary improvements to the regional sewage treatment system to accommodate planned growth allowed by a new water supply project.

19.10 SOCIAL IMPACTS

Based upon January 1988 general plan policies and the availability of suitable land, certain cities and unincorporated areas within the MPWMD appear to have more potential for growth than others.

Specific water demand projections are discussed in Chapter 2 and the following discussion generally characterizes the residential and employment growth potential in each of the communities as well as an analysis of overall residential and commercial trends in the District.

For the District as a whole, and for the Cal-Am area, it is clear that the commercial sector could grow over two times as much as the residential sector if buildout is achieved. Table 19-1 summarizes housing and population estimates through buildout for individual communities and the District. Table 19-2 summarizes employment estimates for individual communities and the District through buildout. Residential growth (single-family and multi-family units) could be about 33 percent compared to an additional 74 percent for commercial growth.

Multi-family units could dominate the growth in the residential sector. Estimates show that about 76 percent of new dwellings could be multi-family units (81 percent in Cal-Am area), resulting in a different proportion of single-family units and multi-family units than presently exists. Currently it is about 2:1 single-family; at buildout it could be closer to 1:1 (55 percent to 45 percent range). The character of the area would change if fewer families owned their homes. The density of the residential population could increase and the higher transiency rate associated with multi-family units could lead to greater turnover in the community.

In the cities, estimated single-family unit increases are modest: a 5 percent loss in Monterey to a 15 percent gain in Carmel. A notable exception is the unincorporated areas, where the number of single-family units would increase by 25 percent in Cal-Am areas and 102 percent in non Cal-Am areas if buildout is achieved.

Conversely, in cities the increases in multi-family units could be significant: an increase of 24 percent in Seaside to 91 percent in Pacific Grove. Sand City and Del Rey Oaks could increase multi-family units by 83 times and 17 times, respectively. The absolute increase (1,908) is substantial in Sand City, but is not substantial in Del Rey Oaks. The residential character of Sand City could be dramatically changed by this sharp increase in multi-family units with fewer home owners and more renters. The density of the residential population would increase with an increase in multi-family units.

Sand City is the jurisdiction whose plans call for the fastest growth of all the communities studied. Sand City's development plans include about 1,000 hotel rooms (29 percent of all new hotel rooms in the District), over 1,900 multi-family units (17 percent of all new multi-family units), and about 3,200 other commercial jobs. Sand City currently has zero hotel rooms, 23 multi-family units, and 1,550 jobs.

In the unincorporated areas, the Highway 68 area has significant growth potential as it is the corridor connecting the Monterey Peninsula with the county seat of Salinas. The Carmel Valley is an another area with high growth potential.

The 74 percent growth in employment could add 34,331 new jobs in the District. The preponderant commercial sector, with nearly 87 percent of the existing employees in the District, could increase to 89 percent at buildout. Tourist oriented facilities are included in the commercial sector, but a substantial portion is office and general retail. Major employment expansions anticipated at the airport (office and industrial) and at the Monterey Research Park (office, warehouse, and light industrial) would account for nearly 28 percent of all new commercial employment and about 12 percent of all types of employment at buildout.

Tourism and its related industries play an important part in the District's economy and would continue through buildout as the number of hotel rooms is increased by nearly 40 percent over 1988 levels. This positive economic impact would carry over to other visitor oriented businesses such as retail shops, restaurants, and tours. However, data do not show that hotels alone dominate the local economy and would not do so at buildout. Hotel employees comprised 12 percent of the total employees within the District in 1988, and this number could drop to 8 percent at buildout. The number of hotel employees in 1988 could increase by 47 percent through buildout compared to a 74 percent increase in total commercial employment in the District. It should be noted that many hotels have already been constructed in the period 1988 to 1991, or are presently under construction.

The disparity in the growth rates for the residential and commercial sectors would have far reaching implications within the District. The area is currently a single function residential and economic community. The preponderance of single-family units reinforces the bedroom and retirement community image, while tourism constitutes the largest economic activity in the District.

The proportionately higher growth rates of the commercial sector and the number of multi-family units would diversify the area. The increase in jobs would draw new residents to the District and current land use patterns would require multi-family units to meet the housing demand. The multi-family units would increase the density of the residential population and draw a broader range of socioeconomic groups. The increase in jobs would also increase the number of employees commuting from outside the District, exacerbating the already poor traffic conditions. A more detailed assessment of the traffic situation is set forth in Sections 19.4 and 19.9.3. The increased urbanization would be accompanied by an associated increase in congestion and demand for public services that would require attention by planners and policy makers.

19.11 OTHER INDIRECT IMPACTS

In addition to the direct impacts of growth discussed above, the future growth associated with a water supply project would have indirect impacts on water quality, vegetation and wildlife, noise, and fire and police services within the District.

Current water sources within the District are the existing San Clemente Dam and groundwater. A new water supply project would increase the supply of surface water and lessen the dependence on groundwater sources, which would improve water quality. The growth estimated for the District would increase pressure on the wastewater treatment facilities, but expansions to these plants would be able to accommodate the increased flow. Leakage from septic tanks in the Carmel Valley could threaten water quality in aquifers, but future development of the Carmel Valley is highly regulated and would limit dwelling units to a safe number. To date, groundwater quality in Carmel Valley has met all standards set by health authorities.

Future growth would impact vegetation and wildlife within the District. The biggest impact would occur in the currently undeveloped areas of the District. Changes in land use to accommodate future growth would remove open space areas and wildlife habitat. Local jurisdictions should regulate and monitor future development to limit the impact on habitat areas and to ensure that rare and endangered species would not be affected.

The future growth estimated for the District would bring an accompanying increase in noise levels. Noise during construction of new roadways, commercial units, and residential units would affect surrounding areas. Local jurisdictions should take measures to ensure that noise reduction devices are used on all heavy equipment during construction projects.

The growth would also require increased levels of fire and police protection. Some jurisdictions would be required to invest in new capital equipment and personnel to maintain existing service standards. Local jurisdictions must ensure that tax revenues and user fees from future projects would be sufficient to cover the costs of expanded service. Local jurisdictions must also regulate future development projects to ensure that adequate access routes would be implemented.

19.12 SUMMARY OF GROWTH IMPACTS AND MITIGATION MEASURES

This section summarizes the effects of planned growth that would be allowed by long-term water supply projects, and reviews mitigation measures within and outside the scope of the MPWMD to address adverse impacts.

Each long-term water supply alternative would be considered "growth inducing" under CEQA as each would allow planned growth to occur; growth is currently constrained by lack of water. Planned growth at buildout would result in increased traffic congestion on the Monterey Peninsula; it is uncertain whether adequate funding for highway improvements will be available to alleviate this situation.

Growth would result in increased vehicle emissions, but successful implementation of Air Quality Management Plans would reduce this effect to a less than significant level. Solid waste and wastewater facilities will have adequate capacity to support growth at buildout. There would be episodic overcrowding at some schools at buildout, but temporary classrooms and efficient use of school facilities would alleviate this problem.

The fiscal health of most Peninsula cities would improve due to the higher rate of commercial growth compared to residential growtn. However, cities that supply commuting employees (Marina or Salinas) may not benefit.

The residential character of the Peninsula would change and be more diversified due to higher commercial growth rates and increased multi-family dwellings. The increased urbanization would be associated with more traffic congestion and noise; additional police, fire protection and other services would be needed. Development would remove open space and reduce wildlife habitat.

The adverse environmental effects of growth in the Monterey Peninsula could be lessened by the implementation of various mitigation measures. Measures within the scope of the MPWMD's authority include:

- The MPWMD would coordinate with AMBAG and the MBUAPCD to allocate water connections in each service area in a manner that is consistent with the growth projections of the AQMP and subsequent California Clean Air Act and Federal Clean Air Act Plans.

- consider coordinating the phasing of allocated water with development of traffic infrastructure to help meet goals of the Traffic Congestion Management Plan.

Measures outside the scope of MPWMD's authority include:

- support by MPWMD of efforts to coordinate infrastructure and land use planning on County and regional levels;

- imposition of more stringent vehicular and stationary source air pollutant controls;

- transportation system management (TSM) measures including encouragement of car- and vanpooling, provision of parking lots at transit stops, provision of exclusive carpool and bus lanes, etc.;

- restriction on the use of packaging materials, increased use of returnable beverage containers, prohibition of disposable diapers, and other measures to reduce the volume of the urban solid waste streams.

Appendix 19-B provides additional information on mitigation measures outside the scope of MPWMD's authority.

---

1. EIP Associates, Estimates of Housing and Employment at Buildout Within The Monterey Peninsula Water Management District, Final Report, July, 1988.

2. California Department of Transportation, Traffic Volumes on California State Highways, Sacramento, 1984.

3. County of Monterey, Department of Public Works, 1986 Annual Average Daily Traffic, Salinas, 1985.

4. County of Monterey, Department of Public Works, 1986 Regional Transportation Plan, Salinas, 1986.

5. Highway Research Board, Highway Capacity Manual (Special Report 87), Washington D.C., 1965.

6. Monterey County Transportation Study, Monterey Peninsula Corridor Study , Salinas, January, 1979.

7. Planning Analysis and Development, Inc., Subsequent Carmel Valley Master Plan Draft EIR, May, 1986.

8. Association of Monterey Bay Area Governments, School Enrollment Projections: 1980-2020: Methodology and Assumptions, January, 1986.

9. Vance Baldwin, Assistant Superintendent, Carmel Unified School District, telephone communication, September 21, 1988.

10. Department of Finance, Population Projections for California Counties 1980-2020, December, 1986.

11. Marian McEwing, Administrative Secretary, Pacific Grove Unified School District, telephone communication, September 21, 1988.

12. Larry Lekander, Superintendent of Schools, Salinas Union High School District, telephone communication, September 21, 1988.

13. Jerry Tollefson, Superintendent of Schools, Washington Union School District, telephone communication, September 21, 1988.

14. William Merry, District Engineer, Monterey Regional Waste Management District, telephone communication, September 20, 1988.

15. Ibid.

16. Richard Watson, Interim Agency Manager, Monterey Regional Water Pollution Control Agency, telephone communications, September 21, 1988.

17. Mike Zambory, General Manager, Carmel Sanitation District, telephone communication, September 20, 1988.

18. Margo Nottenkamper, Associate Project Planner, MPWMD. Personal communication, January 15, 1993.

19. Richard Andrews, General Manager, Pebble Beach Community Services District, telephone communication, September 20, 1988.

20. James M. Montgomery Consulting Engineers, Inc., Carmel Valley Wastewater Study, February, 1982.

21. County of Monterey Planning Department, Carmel Valley Area Plan, unpublished as of this writing.

22. Greg D'Ambrosio, Finance District, City of Carmel-By-The-Sea, personal communication, September 23, 1988.

23. Gary Bales, City Manager, City of Pacific Grove, personal communication, September 23, 1988.

24. Robert Franco, Mayor, City of Del Rey Oaks, personal communication, September 23, 1988.

25. Marie Mlacnik, City of Monterey Finance Office, personal communication, December 30, 1988.

26. Association of Monterey Bay Area Governments.

20. IDENTIFICATION OF ENVIRONMENTALLY SUPERIOR, ENVIRONMENTALLY PREFERABLE FEASIBLE, AND OVERALL PREFERRED ALTERNATIVES

20. IDENTIFICATION OF ENVIRONMENTALLY SUPERIOR, ENVIRONMENTALLY PREFERABLE FEASIBLE, AND OVERALL PREFERRED ALTERNATIVES

The 1991 Supplemental Draft EIR/EIS evaluated 10 water supply alternatives. Based on the analyses in that document, requests by permitting agencies, and new information developed in 1992, this Supplemental Draft EIR/EIS-II addresses five water supply alternatives, including the No Project scenario (see Chapter 3). The following sections refer only to the five alternatives analyzed in this document.

20.1 ENVIRONMENTALLY SUPERIOR ALTERNATIVE (CEQA)

The California Environmental Quality Act (CEQA) requires that an EIR describe and compare the impacts of a range of reasonable alternatives to the proposed project which could feasibly attain the basic objectives of the project (CEQA Guidelines, Section 15126-D). "Feasible" is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors (CEQA Guidelines, Section 15364). An EIR must identify the "environmentally superior" alternative, and discuss alternatives that could eliminate any significant adverse effects of the proposed project, even if that alternative would be more costly or impede the attainment of project objectives. However, additional adverse effects caused by the alternatives must also be discussed.

In August 1992, the State Water Resources Control Board (SWRCB) began five days of hearings on complaints against the California-American Water Company (Cal-Am). Complainants alleged that Cal-Am is illegally diverting underflow of the Carmel River, and that existing water supply practices are adversely affecting the public trust resources of the Carmel River. Extensive written and oral testimony from public agencies and complainants presented at the hearings, as well as subsequent communications with SWRCB staff, form an important basis for the determinations in this chapter.

Two dominant themes emerged from the SWRCB hearings -- (1) the existing (No Project) situation on the Carmel River is unacceptable, significant and adverse in the view of responsible agencies such as the California Department of Fish and Game, environmental groups, and members of the public; and (2) streamflow from a project such as the proposed New Los Padres Reservoir is the only feasible long-term solution to correct the existing damage to fishery and riparian habitat, and provide adequate instream flows to protect the public trust resources of the Carmel River.

Determination

Based on the testimony and evidence presented at the SWRCB hearings,[1] data provided in the MPWMD Water Allocation Program EIR,[2] and information contained in this document, it is evident that the No Project alternative is not the environmentally superior alternative. All factors considered, the **24,000 AF New Los Padres Reservoir** with or without desalination is identified as the environmentally superior alternative under CEQA. Reasons for this selection include: (1) only the two 24 NLP reservoir alternatives would correct existing damage in the lower Carmel River and provide adequate instream flows for public trust resources in nearly all years; (2) the two 24 NLP alternatives would provide the greatest benefit to the steelhead resource (in some cases, exceeding "natural" conditions), stream-associated riparian wildlife, lagoon habitat and wildlife, water-dependent recreation and aesthetics; and (3) inundation impacts could be mitigated to a less than significant (and in some cases, beneficial) level.

In terms of environmental superiority, the choice between the two 24 NLP alternatives is difficult due to their similarity. The 24 NLP alternative (without desalination) entails the least energy use of all long-term alternatives and would not entail mitigation measures for the few significant adverse effects identified in the Near-Term Desalination Project Final EIR. However, the production from the 3 MGD desalination plant would result in improved instream flows and aquifer storage in certain drought years, which would benefit aquatic life during those crucial periods.

The 15 CAN/D alternative would entail extensive upland inundation impacts, construction impacts (particularly traffic) and energy use, and would not provide instream flows needed to sustain the public trust resources. The 7 DSL alternative would result in continued, unacceptable dewatering of the Carmel River, similar to the No Project situation, in order to meet municipal demand. The 7 DSL alternative would not entail inundation impacts, but habitat for listed species could be affected by pipeline construction, and the energy use would be substantial (equivalent to the annual use of

5,900 residential customers). As noted above, the No Project alternative results in chronic, unacceptable adverse effects to the public trust resources of the Carmel River.

20.2 ENVIRONMENTALLY PREFERABLE FEASIBLE ALTERNATIVE (NEPA)

The environmentally preferable feasible alternative is a federal definition that refers to the practicable alternative that would have the least environmental consequences prior to mitigation. The Clean Water Act, Section 404(b)(1) Guidelines defines "practicable" as "available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes."

In the 404 Permit application, the basic project purpose is defined as "(a) provide water supply for increased drought protection for existing and future users, and (b) meet projected municipal demand associated with planned growth within [the MPWMD]." The District Board has set a goal to have no more than a 10 percent shortage in any year, which corresponds to "voluntary" rationing. The overall project purpose is to provide adequate instream flow to protect the public trust resources of the Carmel River.

Based on an analysis conducted in January 1993 in accordance with the Clean Water Act, Section 404(b)(1) Compliance Evaluation (on file in the U.S. Army Corps of Engineers' San Francisco District office), only two of the five alternatives analyzed in this SD EIR/EIS-II are considered to be practicable -- the 24 NLP and 24 NLP/D alternatives. The remaining alternatives are not considered to be practicable because they either fail to meet the water supply purpose, are too costly, entail serious technical concerns, are constrained by logistical factors, and/or do not meet the 404(b)(1) Guidelines with respect to "other significant adverse environmental consequences." A brief summary of the conclusions of the 404(b)(1) evaluation follows.

Alternatives Considered to be Practicable

24,000 AF New Los Padres Reservoir. The 24 NLP alternative is considered to be practicable as it would provide water supply and drought protection for existing users and planned growth, though not to the same level of performance as the 24 NLP/D alternative. As shown in Summary Tables S-1 and S-2, as well as Section 20.1 above, the 24 NLP alternative (along with the 24 NLP/D project) would result in the greatest pre-mitigation benefits to hydrology (year-round streamflow in most years and higher ground water levels); adequate instream flows to support a healthy steelhead resource in most years; optimum conditions for riparian vegetation and greater species diversity of stream-associated riparian wildlife in most years; enhanced lagoon/wetland habitat; as well as enhanced river-based aesthetic and recreational opportunities. The 24 NLP reservoir would inundate steelhead spawning and rearing habitat, riparian and valley oak woodland habitat, and would have the greatest impact to cultural resources.

24,000 AF New Los Padres Reservoir/3 MGD Desalination. The 24 NLP/D alternative is considered to be practicable as it would provide excellent water supply performance due to the production capacity of the desalination plant in critical periods. This alternative would entail all of the pre-mitigation benefits and impacts enumerated above for the 24 NLP alternative (See Summary Tables S-1 and S-3), but some to a greater degree. For example, the production from the 3 MGD desalination plant would result in a longer duration of adequate instream flows (and greater aquifer storage) in certain drought years, which would benefit aquatic life during those crucial periods. The presence of the desalination plant is associated with possible site-specific impacts, most of which were determined to be less than significant prior to mitigation. It should be noted that a reservoir smaller than 24,000 AF combined with desalination would not provide the instream flows determined to be necessary by the Interagency Fishery Working Group.

Alternatives Considered Not to be Practicable

15,000 AF Cañada Reservoir/3 MGD Desalination. The 15 CAN/D alternative is considered to be infeasible due to the combined effect of excessive cost (based on 1992 estimates) compared to other alternatives with similar or better water supply performance, and significant uncertainties about true project costs. Uncertainties include the "highly unusual characteristics" of the native rock used to construct the dam[3] and the need to construct a test fill, the feasibility and impacts of the river diversion works, the cost impacts of the extensive dependence on electricity for pumped storage and desalination should power rates increase, and the need to site and build an electrical substation.

The 15 CAN/D alternative would be similar (but would entail some improvement) to the No Project scenario in terms of inadequate instream flows to protect public trust resources, and would entail inundation of native upland habitat. A logistical constraint includes the low probability of voter approval given that the 15 CAN/D alternative would provide 10 percent more simulated firm yield than the 24 NLP project at over three times the cost to the average Cal-Am residential customer. There would also be three years of significant, unavoidable, adverse traffic impacts on Highway 68 (a major link between Salinas and Monterey) for six days per week, 10 hours per day in order to import materials with which to build the dam. This construction impact would be substantially more onerous than with any other alternative.

7 MGD Desalination Plant. The 7 DSL alternative is considered to be infeasible due to the combined effect of excessive cost (based on 1992 estimates) for the benefits received, uncertainties of true water supply performance given SWRCB action that could be taken on the Carmel River, uncertainties about true project costs in the future (should power rates increase) due to a heavy dependence on electricity, and vulnerability to disrupted electric power service (i.e., after a seismic event). The 7 DSL alternative would entail construction of two desalination plants, one of which would be outside the District boundaries.

The 7 DSL alternative would be very similar to the No Project scenario in terms of degradation of public trust resources due to groundwater pumping and inadequate instream flows. A logistical constraint includes the low probability of voter approval given that the 7 DSL alternative would provide 24 percent more simulated firm yield than the 24 NLP project at over 2.6 times the cost to the average Cal-Am residential customer, and still do very little to correct environmental damage to the Carmel River.

It should be noted that the excellent simulated water supply performance of the 7 DSL alternative depends on and assumes very similar levels of diversion and pumping from the Carmel River that exist for the No Project alternative (with similar impacts). It also entails use of the entire 7 MGD production capacity for meeting the demand of future growth; this is a significant departure from the Near-Term Desalination Project, which sets aside 50 percent of desalination production capacity for drought reserve and the environment.

Based on testimony provided at the SWRCB hearings concerning complaints against Cal-Am, it is evident that Cal-Am is diverting underflow from the Carmel River and does not have a permit to do so. (Cal-Am is presently applying for permits to divert underflow through existing wells in Carmel Valley.) SWRCB staff have indicated that if the District does not address the Carmel River problem, then the State would consider more stringent conditions and enforcement actions.[4] Devotion of 50 percent of the Near-Term Desalination Project production to drought reserve/environment was cited as an example of addressing the problem. Thus it is possible that a significant portion of the production from the 7 DSL alternative could not be used to meet the needs of planned growth (or conversely, pumping from Carmel Valley would be limited by SWRCB action). In either case, water supply performance would fall short of that of a practicable alternative.

No Project Alternative. The No Project alternative is not considered to be feasible as it does not meet the basic project purpose of providing adequate drought protection and supply for planned growth. It would result in continued degradation of the Carmel River environment as well.

Determination

Because the 404(b)1 Guidelines focus on impacts prior to mitigation, the **24,000 AF New Los Padres Reservoir** is identified as the environmentally preferable feasible alternative under NEPA. There would be significant pre-mitigation benefits to the lower Carmel River and public trust resources in nearly all years (including the steelhead resource, stream-associated riparian wildlife, lagoon habitat and wildlife, water-dependent recreation and aesthetics). The 24 NLP alternative would not entail potential effects to sensitive species, energy use and hydrologic concerns associated with the 3 MGD desalination component of the 24 NLP/D alternative.

An authorizing election is targeted for June 1993 for construction of a 3 MGD Near-Term Desalination Project. If the vote is positive, the District would continue to pursue permits for the 24,000 AF New Los Padres Reservoir as the environmentally preferable feasible alternative. If the desalination project vote is negative, the District would pursue construction of the new dam as a stand-alone alternative. The community could consider a desalination plant in a future year (approximately year 2015) when it may be needed to meet municipal demand estimated at that time.

20.3 OVERALL PREFERRED ALTERNATIVE

The overall preferred alternative is the project selected by MPWMD, based on environmental impacts and benefits as well as water supply performance, cost, reliability, and other factors. The overall preferred alternative need not be identified in a Draft or Supplemental Draft EIR/EIS, but must be identified in a Final EIR/EIS.

The overall preferred alternative is identified as the **24,000 AF New Los Padres Reservoir combined with a 3 MGD desalination plant.** Though its cost would be higher than the 24 NLP alternative alone (present worth cost in 1992 dollars of $17.79 versus $8.55 per Cal-Am bill, respectively, for the average residential water user, a difference of $9.24 every two months), this combination would result in the best instream flow conditions that are feasible on the Carmel River and would provide excellent water supply performance in meeting demand estimated to occur with planned growth (buildout). It would be less expensive than infeasible alternatives (15 CAN/D, 7 DSL) that do not perform as well in terms of water supply and/or do not alleviate existing degradation of the lower Carmel River environment. A reservoir smaller than 24,000 AF would not provide sufficient instream flows determined to be necessary by the interagency Fishery Working Group.

It should be noted that the construction of the dam first, followed by desalination in approximately the year 2015 would reduce present worth costs to Cal-Am residential customers compared to the reverse sequence (present worth cost in 1992 dollars of $10.98 versus $17.79 per Cal-Am bill, respectively, for the average residential water user, a difference of $6.59 every two months). However, from a water supply perspective, the immediate need for more secure drought protection and relief from the District-mandated moratorium are reasons to pursue the near-term desalination component as soon as possible, followed by the new dam. An election to authorize proceeding with a near-term desalination project is scheduled for June 8, 1993.

---

1. Transcripts of SWRCB Hearings, August 24-26, 31 and September 1, 1992; Volumes I-V. Written testimony and exhibits submitted to SWRCB for the above hearings.

2. MPWMD, Final EIR, Water Allocation Program (SCH 87030309), April 1990.

3. Brown and Caldwell Consultants, Cañada Reservoir Project Phase 3 -- Analysis of 15,000 AF Reservoir (draft report); prepared for Cal-Am Water Company, November 1992.

4. MPWMD memorandum by Jim Cofer dated December 17, 1992 describing December 11, 1992 telephone conversation with Steven Herrera of SWRCB.

21. STATUTORY SECTIONS

21. STATUTORY SECTIONS

21.1 INTRODUCTION

The California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) both require that various summary statements addressing specific topics be discussed within all Environmental Impact Reports and Environmental Impact Statements (EIR/EISs). The CEQA- and NEPA-mandated impact overview requirements discussed in this chapter include unavoidable significant adverse effects, cumulative impacts, relationship between short-term uses of the environment and long-term productivity, and irreversible or irretrievable commitment of resources. The effects on the Monterey Peninsula area from growth are discussed in Chapter 19, while Chapter 20 identifies the least damaging and overall preferred alternatives.

21.2 UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS

The CEQA guidelines require that significant environmental effects that cannot be avoided must be identified in an EIR. Section 15382 of the CEQA guidelines state that a "significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. The guidelines also indicate that "an ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting." Because few definitive criteria exist as to what would be considered a "significant" impact, the best professional judgment is used in this Supplemental Draft EIR/EIS-II (SD EIR/EIS-II).

In making the judgment of significance, it was assumed that to be judged "significant and unavoidable," an adverse impact would have to involve a permanent or substantial temporary degradation in the quality of the environment, or the destruction of important natural and cultural resources that cannot be prevented by the incorporation of mitigation measures. Standards of significance are presented throughout the SD EIR/EIS-II, and judgments of significance are presented both before and after mitigation. In some cases, mitigation measures are presented, but impacts would still remain significant and unavoidable. The term "potentially unavoidable" refers to the situation where the suggested mitigation measures can possibly reduce impacts to a less than significant level, but success must be confirmed by additional studies. Table 21-1 summarizes the potentially significant and unavoidable (PSU) and significant and unavoidable (SU) impacts for each alternative that would occur with demand at buildout levels (22,750 AF annual Cal-Am production).

Construction

Each of the reservoir alternatives would involve unavoidable significant impacts with respect to traffic, noise and air quality that would result from dam construction activities. The roadways in the vicinity of (or enroute to) the construction sites are already congested, and the additional construction traffic would exacerbate the existing situation for about two to three years, depending on the alternative. The proposed dam sites are rural in nature with low ambient noise levels; dam construction would elevate noise levels for the duration of construction. Dam construction would also generate dust, vehicular exhaust emissions, and combustion emissions from the burning of vegetation, all of which would be considered unavoidable and significant impacts. However, these construction impacts, while significant, would not be permanent. Construction of the Cañada Reservoir would consume about nine times more energy than any other alternative due to the large amount of earthen material that would be imported by truck and the duration of construction, an impact which is considered unavoidable and significant. The adverse noise impacts associated with desalination plant construction would be significant and unavoidable, though temporary.

Hydrology

The 15 CAN/D, 7 DSL and No Project alternatives would have an unavoidable significant effect on Carmel River streamflow, with inadequate flow or a dry river for at least two months, even in normal rainfall years. Lack of river flow in the lower Carmel Valley would also adversely affect the Carmel River Lagoon, visual resources and recreational opportunities. Adequate streamflow could not be provided with these alternatives due to limited storage capacity or lack of a connection to the Carmel River. Discontinuous flow would also occur for the 24 NLP and 24 NLP/D alternatives in critically dry years (about 13 percent of the time); this impact would be unavoidable due to reduced reservoir storage in multi-year droughts.

TABLE 21-1

SUMMARY OF POTENTIALLY SIGNIFICANT UNAVOIDABLE AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Alternative	Environmental Impact of Alternative	Significance
24 NLP	Discontinuous flow in Carmel River during drougnts (13 percent of time)	SU
	Reduced opportunity for steelhead upstream migration compared to natural conditions (severe droughts only)	SU
	Adverse effects to lower Carmel River riparian habitat due to drawdown in droughts (13 percent of time)	PSU
	Traffic, air quality and noise during project construction	SU
24 NLP/D	Discontinuous flow in Carmel River during droughts (13 percent of time)	SU
	Reduced opportunity for steelhead upstream migration compared to natural conditions (severe droughts only)	SU
	Adverse effects to lower Carmel River riparian habitat due to drawdown in droughts (13 percent of time)	PSU
	Traffic, air quality and noise during project construction	SU
15 CAN/D	System operations impair ability of steelhead to pass over existing dams due to lack of flow and inadequate facilities	PSU
	Reduced opportunity for steelhead upstream migration compared to natural conditions (droughts only)	SU
	Chronic discontinuous Carmel River streamflow affects hydrology, Carmel River Lagoon, stream-associated wildlife and river-based recreation	SU
	Adverse effects to lower Carmel River riparian habitat due to drawdown in droughts (13 percent of time)	PSU
	Traffic, air quality, noise and energy use during project construction	SU

TABLE 21-1 (Continued)

Alternative	Impact	Significance
7 DSL	Reduced opportunity for steelhead upstream migration compared to natural conditions (droughts only)	SU
	System operations impair ability of steelhead to pass over existing dams due to lack of flow and inadequate facilities	PSU
	Chronic discontinuous Carmel River streamflow affects hydrology, Carmel River Lagoon, stream-associated wildlife and river-based recreation	SU
	Chronic degradation of riparian habitat in lower Carmel Valley due to groundwater drawdown; affects wildlife and visual resources	PSU
	Noise generated during project construction	SU
NO PRJ	Reduced opportunity for steelhead upstream migration compared to natural conditions (droughts only)	SU
	System operations impair ability of steelhead to pass over existing dams due to lack of flow and inadequate facilities	PSU
	Chronic discontinuous Carmel River streamflow affects hydrology, Carmel River Lagoon, stream-associated wildlife and river-based recreation	SU
	Chronic degradation of riparian habitat in lower Carmel Valley due to groundwater drawdown; affects wildlife and visual resources	PSU

PSU = Potentially significant and unavoidable; mitigation measures could possibly reduce impacts to a less than significant level, but success must be confirmed by additional studies.
SU = Significant and unavoidable; mitigation measures are not possible, or would reduce impacts somewhat, but not to a less than significant level.

Carmel River Steelhead Population

The Carmel River flow regime resulting from all of the alternatives would reduce opportunities for adult steelhead upstream migration in winter, during droughts, compared to natural conditions. This impact would be unavoidable for all alternatives, including the No Project scenario.

Cal-Am system operations that are a part of the 15 CAN/D, 7 DSL and No Project alternatives would result in a potentially significant adverse effect to fish passage; adequate flow would not be available for fish to safely pass over the existing dams on the Carmel River, which entail inadequate facilities. Additional studies would need to be performed to confirm whether operation and facility changes would reduce these impacts to less than significant levels.

Vegetation and Wildlife

The 7 DSL and No Project alternatives would result in potentially unavoidable adverse effects to about 110-120 acres of riparian vegetation and wildlife habitat in the lower Carmel Valley due to chronic groundwater drawdown. Mitigation measures such as irrigation and revegetation, as documented in the Water Allocation Program Final EIR, may or may not reduce impacts to a less than significant level. Monitoring over a number of years will be necessary to confirm mitigation success. Similar adverse effects due to groundwater drawdown in droughts (about 13 percent of the time) would also occur for the 24 NLP, 24 NLP/D and 15 CAN/D alternatives.

Energy

Construction of Cañada Dam would result in a significant impact on energy consumption because of the large amount of earthen materials that would need to be imported to the site as well as the duration of construction; construction of Cañada Dam would consume about nine times as much energy as the other alternatives, based on projected vehicle trips. Though the operation of the 7 MGD desalination plant would consume about 38,000 Mwh of electricity per year (the energy equivalent of about 5,900 residential customers annually); this would not be considered as a significant impact because adequate capacity exists to meet this electrical demand.

Cultural Resources

The 24 NLP and 24 NLP/D alternatives would entail inundation of archaeological sites and traditional cultural properties, but the losses could be mitigated to a less than significant level.

Land Use, Planning and Recreation

All projects would be generally consistent with land use plans. The alternatives associated with inadequate Carmel River streamflow (15 CAN/D, 7 DSL and NO PRJ) would all have unavoidable significant impacts with respect to river-based recreational opportunities in the lower Carmel Valley. Activities such as rafting, swimming, and fishing would be adversely affected due to the lack of streamflow.

21.3 CUMULATIVE IMPACTS

The CEQA guidelines require a discussion of cumulative impacts that "shall reflect the severity of the impacts and their likelihood of occurrence." The cumulative impact is defined as the change in the environment that results from adding the effect of a project to closely related past, present and reasonably foreseeable future projects. For the purposes of this SD EIR/EIS-II, the discussion of cumulative impacts will be discussed in terms of the Carmel River basin and the MPWMD boundaries.

The cumulative impacts of growth within the MPWMD boundaries on traffic, air quality, schools, solid waste, wastewater, and other areas are discussed in Chapter 19.

Past and present water development practices within the Carmel River watershed have resulted in significant impacts to the fisheries and riparian habitats of the lower Carmel Valley, as documented in the MPWMD's Water Allocation Program Final EIR.[1] The cumulative effects on the Carmel River basin from past and present water gathering practices, including the construction and operation of the two existing dams (San Clemente and Los Padres), and of groundwater pumping within the lower Carmel Valley, have been an alteration of the volume and timing of the streamflow, a dewatering of the lower river during dry periods, a continuing loss of riparian vegetation, adverse effects on anadromous fisheries from the altered flow regime and lack of streamflow, and destabilization of the river banks as a result of the loss of vegetation.

The cumulative effects on the Carmel River basin that would occur from the implementation of any one of the alternatives analyzed in this document would be the continued human manipulation of the water resources of the river. Presently, careful management of the water resources system is needed to stretch limited supplies to meet municipal needs, while attempting to minimize environmental damage. This is accomplished through the District's quarterly review of Cal-Am's water supply strategy and budget. The New Los Padres Reservoir alternatives would improve this situation as they would be operated to provide adequate flows for the steelhead resource throughout its lifecycle in most years. The 15 CAN/D, 7 DSL and No Project alternatives would result in a situation similar to the existing scenario.

Mainstem dam construction would convert existing river habitat into lake habitat. However, the existing adverse impacts resulting from dewatering of the lower Carmel River would be improved significantly by the New Los Padres alternatives. Cañada Reservoir would entail extensive diversions from the Carmel River, and convert undeveloped upland habitat into a lake environment; there would be minor improvements to Carmel River streamflow.

The New Los Padres Reservoir alternatives would greatly improve the conditions for the steelhead resource, especially in lower Carmel Valley. The new reservoir would be expected to improve passage at the existing Los Padres Dam, and provide flows that would improve passage over the existing San Clemente Dam. Inundation by the new reservoir would contribute to the cumulative loss of steelhead spawning and rearing habitat, but improvements in habitat due to flow released from the new dam would more than compensate for these losses.

The New Los Padres Reservoir would entail greater handling of fish at upstream and downstream passage facilities in the upper Carmel River than presently occurs. However, the need for trapping, "rescuing" and transporting fish from degraded habitat in the lower Carmel River would be greatly reduced due to the year-round flow in most years. With the 15 CAN/D, 7 DSL and No Project alternatives, there would be extensive handling due to rescue activities in the lower Carmel River as well as some handling at the existing fish trap for upstream migrants at Los Padres Dam.

The New Los Padres Reservoir alternatives would greatly improve the conditions for riparian habitat, especially in lower Carmel Valley. The new reservoir would provide flows that would improve the degraded riparian corridor that exists today, and increase species diversity due to the presence of a flowing river. Inundation by the new reservoir would contribute to the cumulative loss of riparian habitat, but this would be mitigated so there would be no net loss of in-kind habitat value. Riparian inundation with the 15 CAN/D would be minimal, and high groundwater levels in normal years would benefit the riparian corridor. The 7 DSL and No Project alternatives would entail a continuation of the existing degraded situation, and the need for extensive irrigation, revegetation and other riparian mitigation programs.

The New Los Padres Reservoir alternatives would contribute to the cumulative loss of Esselen Tribe archaeological sites and traditional cultural properties. However, improvements to the Carmel River flow regime and riparian corridor would be considered as beneficial to Esselen folkways.

21.4 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The 24 NLP and 24 NLP/D alternatives would not be expected to produce short-term gains at the expense of long-term productivity because (1) inundation impacts (namely the loss of riparian vegetation or valley oak woodland) would be mitigated to a less than significant level by physically enhancing degraded habitat off-site, and (2) the generally year-round stream flows that would result from the operation of these alternatives would improve the existing degraded conditions for fish and riparian habitat in the lower Carmel Valley. Overall, the biological productivity and diversity within the Carmel River basin would be expected to increase with the implementation of one of these alternatives.

The 15 CAN/D alternative would also entail extensive inundation of upland habitat, but only a small amount of riparian habitat. It would also entail benefits to the riparian corridor in the lower Carmel Valley due to higher water tables and some improvement to streamflow, though not to the same degree as the New Los Padres alternatives.

Implementation of either of the remaining alternatives (7 DSL or NO PRJ) would have fewer direct effects (i.e. less habitat loss from inundation) but would result in the continued degradation of the aquatic and riparian habitats in the lower Carmel Valley. While not necessarily constituting a short-term use of the environment, implementation of one of these alternatives would result in an overall reduction in the long-term biological productivity and diversity within the Carmel River basin.

21.5 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of any of the alternatives analyzed in this document would result in an irretrievable commitment of the human labor necessary for the design and construction of the project, and the irreversible loss of all of the energy (from 105 to 1,330 billion BTUs) and most of the materials involved in project construction. Operation of a desalination plant or pumped storage facilities represents an irretrievable commitment of the energy used (an average of 4,000 to 38,000 Mwh per year) for the production of potable water.

New Los Padres Reservoir construction essentially commits up to 2.2 miles of stream channel to a lake or water storage environment, although it would be possible (albeit very expensive) to remove a dam and restore the existing river environment. Reservoir inundation would result in a loss of steelhead spawning and rearing habitat as well as 39 acres of riparian vegetation, 7 acres of valley oak woodland, and about 166 acres of all other types of vegetation. Esselen archaeological sites and traditional cultural properties would also be lost. Mitigation measures would reduce these losses to a less than significant (and in some cases, beneficial) level. The Cañada Reservoir alternative would also entail irretrievable loss of about 200 acres of inundated upland habitat, four acres of riparian habitat and possible loss of two Costonoan archaeological sites.

---

1. Monterey Peninsula Water Management District, Final Environmental Impact Report, Water Allocation Program, SCH # 87030309, April 1990.

22. PUBLIC INVOLVEMENT

22. PUBLIC INVOLVEMENT

22.1 PUBLIC INVOLVEMENT

The District has integrated extensive public involvement into the planning process for its long-term Water Supply Project EIR/EIS. Public involvement has taken several different forms including public hearings, workshops and District Board meetings at which the public were offered an opportunity to comment. A complete listing of public meetings and an indication of the topics covered is contained in Table 22-1. The table begins with June 1987; a list of prior public meetings may be found in Chapter 20 of the 1987 Draft EIR/EIS on the New San Clemente Project.

22.2 INTERAGENCY GROUP AND TECHNICAL SUBCOMMITTEE

The District had extensive interaction with representatives of state and federal regulatory and resource agencies who are interested in the project. This interaction took the form of five interagency group meetings in 1988 through early 1992, which were chaired by Rep. Leon Panetta. In addition, six interagency technical subcommittee (ITC) meetings (including one field trip) were held in 1988 and 1989 to review the alternatives evaluations, develop criteria for the "least damaging" alternative, and provide early drafts of reports to review. Other ITC activities included participation on Habitat Assessment and Instream Flow teams, and regular communication by phone or memoranda. Federal interagency group members included the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service and the Environmental Protection Agency. State interagency group members included the California State Water Resources Control Board, California Department of Fish and Game, and California Department of Water Resources.

In January 1992, an Interagency Fishery Working Group and a Vegetation/Wildlife Working Group were formed. The Fishery Group held several meetings to refine and improve reservoir operations as they relate to the Carmel River steelhead resource; agreements about the best fish passage facility designs were also developed. The Vegetation/Wildlife Group conducted field inspections and worked with District staff and consultants to develop acceptable mitigation plans for the loss of riparian and valley oak woodland habitat, as well as a restoration plan for vegetation in the Construction Impact Zone.

22.3 REGULATORY REVIEW

Many government agencies are expected to review this EIR/EIS. Copies of the EIR/EIS will be sent to the following agencies for their consideration.

FEDERAL AGENCIES

- Advisory Council on Historic Preservation
  Washington, D.C.
- Agriculture Stabilization and Conservation Service
  Davis, CA
- Forest Service
  San Francisco, CA
- Soil Conservation Service
  Davis, CA
- National Oceanic and Atmospheric Administration
  Washington, D.C.
- Department of Energy
  Washington, D.C.
- Environmental Protection Agency,
  Washington, D.C.
- Environmental Protection Agency
  San Francisco, CA
- Federal Emergency Management Agency
  Washington, D.C.
- Federal Emergency Management Agency
  San Francisco, CA
- Department of Health and Human Services
  Washington, D.C.

- Department of Housing and Urban Development
  San Francisco, CA

- Department of the Interior
  Washington, D.C.

- U.S. Coast Guard
  Alameda, CA

- Federal Highway Administration
  San Francisco, CA

- U.S. Fish and Wildlife Service
  Sacramento, CA

- National Marine Fisheries Service
  Santa Rosa, CA

- U.S. Army
  Fort Ord, CA

STATE AGENCIES

- California State Water Resources Control Board
- California Department of Fish and Game
- California Department of Water Resources, Division of Safety of Dams
- California Regional Water Quality Control Board – Central Coast Region
- California Department of Transportation
- California Department of Boating and Waterways
- California Department of Forestry
- California State Office of Historic Preservation
- California Department of Parks and Recreation
- California Air Resources Board
- California Department of Health Services
- California Coastal Commission
- California Department of Conservation

- Native American Heritage Commission
- State Lands Commission

REGIONAL AND LOCAL AGENCIES

- County of Monterey
- Monterey Bay Unified Air Pollution Control District
- Association of Monterey Bay Area Governments
- Cities of Carmel-by-the Sea, Monterey, Seaside, Pacific Grove, Del Rey Oaks and Sand City
- Monterey Regional Water Pollution Control Agency

TABLE 22-1

MPWMD WATER SUPPLY PROJECT
PUBLIC INVOLVEMENT

Date	Type[1]	Topic
June 8, 1987	BM	1. Adopt resolution calling for advisory vote on New San Clemente Project
July 13, 1987	BM	1. Revise advisory ballot resolution
August 8, 1987	BM	1. Authorize preparation of EIR Supplement in newspapers
September 14, 1987	BM	1. Receive New San Clemente Project Draft EIR/EIS and approve Noti'e of Completion; begin 54-day comment period 2. Pass resolution endorsing approval of advisory ballot measure for the New San Clemente Project
October 19, 1988	BM/W	1. Receive oral comments on Draft EIR/EIS
October 20, 1988	BM/W	1. Receive oral comments on Draft EIR/EIS
November 9, 1988	BM/PH	1. Receive oral comments on Draft EIR/EIS
December 14, 1988	BM	1. Review oral and written comments on Draft EIR/EIS 2. Review workplan to respond to comments
January 11, 1988	BM	1. Review federal and state permit processes 2. Review EIR/EIS process and schedule 3. Board determines that a Supplemental Draft EIR/EIS will be prepared and the alternatives evaluation will be repeated.
January 21, 26, 1988	BM/W	1. Policy issues for revised EIR/EIS; develop revised alternatives selection process and criteria
February 8, 1988	BM	1. Retain consultants to revise demand projections 2. Describe role of new wells in upper Carmel Valley for No Project
March 14, 1988	BM	1. Approve Phase I work program for revised EIR/EIS
April 1, 1988	BM/PH	1. Ordinance authorizing expenditure of capital projects fund for EIR/EIS studies

Table 22-1 (Continued)

Date	Type[1]	Topic
May 9, 1988	BM	1. Acceptance of estimates of housing and employment of buildout
May 25, 1988	BM/W	1. Part I evaluation of alternatives
June 13, 1988	BM	1. Review of city and county comments on buildout projections 2. Amend Part I evaluation report 3. Develop estimates of water demand at buildout
July 11, 1988	BM	1. Revise project purpose for 404 permit application 2. Revise criteria for Part II alternatives evaluation
October 10, 1988	BM	1. Acceptance of Habitat Assessment Report
October 20, 1988	BM/W	1. Part II evaluation of alternatives
December 12, 1988	BM	1. Authorize geotechnical and engineering studies for Los Padres and San Clemente Creek sites
February 13, 1989	BM	1. Retain consultants to assess impacts of New San Clemente, San Clemente Creek, New Los Padres, Chupines Creek and Cachagua Creek sites 2. Approve riparian mitigation concept with Regional Park District 3. Presentation on Canada Reservoir concept by Cal-Am
February 15, 1989	BM/W	1. Symposium on Water Supply Project
March 2, 1989	BM	1. Review of February 15 Interagency Group meeting 2. Select 24,000 AF New Los Padres Dam as proposed project 3. Select Canada Reservoir as an alternative in the EIR/EIS
March 13, 1989	BM/PH	1. Amend MPWMD law to shorten approval process for water supply projects 2. Authorize survey of Ventana Wilderness boundary
April 10, 1989	BM/PH	1. Consider agreements between District and pumpers to dismiss water rights protests 2. Approve IFIM fishery study between existing dams
May 5, 1989	BM/W	1. Symposium on "State of the District"

Table 22-1 (Continued)

Date	Type[1]	Topic
May 8, 1989	BM	1. Reception of lower Carmel Valley groundwater analysis 2. Amend alternatives to be analyzed in revised EIR/EIS 3. Receive cost estimates for New Los Padres and San Clemente Creek sites.
June 12, 1989	BM	1. Review status, timeline for Canada Reservoir and coordination with Cal-Am regarding studies
August 14, 1989	BM	1. Receive final report on preliminary designs and cost estimates for New Los Padres and San Clemente Creek sites 2. Approve endangered species survey for Smith's Blue butterfly
September 11, 1989	BM	1. Receive lagoon mitigation recommendations 2. Amend non-dam alternative to include desalination
February 26, 1990	BM	1. Receive Canada Reservoir ownership options report
March 12, 1990	BM	1. EIR/EIS status and timeline
July 23, 1990	BM	1. Status of legislation to amend Ventana Wilderness boundary
August 8, 1990	BM/W	1. Status of Canada project 2. Final assumptions for Supplemental Draft EIR/EIS
August 27, 1990	BM	1. Receive IFIM fishery study
October 22, 1990	BM	1. Report on Ventana Wilderness land exchange
November 5, 1990	BM	1. Certification of Water Allocation Program EIR; adoption of long-term mitigation program
December 13, 1990	BM	1. Authorize IFIM study downstream of San Clemente Dam
January 28, 1991	BM	1. Authorize desalination feasibility study contracts
March 25, 1991	BM	1. Authorize addition of 16,000 AF New Los Padres Reservoir plus 3 MGD desalination for analysis in EIR/EIS
May 20, 1991	BM	1. Selection of preferred desalination project sites.
June 27, 1991	W	1. Receive public scoping comments on Desalination EIR.
July 22, 1991	BM	1. Receive Final Desalination Feasibility Study.

Table 22-1 (Continued)

Date	Type[1]	Topic
August 26, 1991	BM	1. Authorize contract for preparation of Desalination Project EIR
		2. Authorize contract for Preliminary Design for Desalination Project
		3. Authorize contract for hydrogeologic investigation of seawater intake system; approve Notice of Exemption
		4. Receive Supplemental Draft EIR/EIS (SDEIR/EIS) for long-term Water Supply Project; set comment period
October 7-10, 1991	W	1. Three workshops on SDEIR/EIS
October 21, 1991	PH	1. Receive oral comments on SDEIR/EIS for long-term Water Supply Project
December 16, 1991	BM	1. Include a Desalination Project in the Sand City area as a third alternative for consideration
January 13, 1992	BM/W	1. Approve work plan to respond to comments on SDEIR/EIS
		2. Authorize contracts to prepare revised SDEIR/EIS-II
March 16, 1992	BM	1. Receive Desalination Project Preliminary Design Report
April 20, 1992	BM	1. Receive Draft Desalination Project EIR; set comment period.
		2. Authorize analysis of seawater intake and brine injection concept for Sand City Desalination Project site
		3. Authorize contract amendments for additional work on New Los Padres Project geotechnical investigations, construction scenario, riparian mitigation efforts, and archaeology (Phase I)
May 18, 1992	BM	1. Authorize contract to refine project design and cost estimates for 15,000 AF Cañada Reservoir combined with desalination
May 28, 1992	W	1. Workshops on Desalination Project EIR

Table 22-1 (Continued)

Date	Type[1]	Topic
June 8, 1992	PH	1. Receive oral comments on Desalination Project EIR
June 15, 1992	BM	1. Authorize contract to refine design and cost estimate for 7 MGD desalination plant alternative for SDEIR/EIS-II
July 20, 1992	BM	1. Select Sand City site as preferred site for a 3 MGD Desalination Facility
August 17, 1992	BM/W	1. Reception of Final Report on Sand City Hydrogeologic Study
		2. Study session on Water Rights application for 24,000 AF New Los Padres Project; authorize stipulation agreements with water rights protestants
August 24-26, 31 September 1, 1992	---	1. SWRCB Hearing on complaints filed against Cal-Am regarding Carmel River diversions and pumping
October 19, 21, 1992	---	1. SWRCB Water Rights Hearing on MPWMD application for 24,000 AF New Los Padres Project
October 29, 1992	BM	1. Consider allocation of water from Desalination Project
December 14, 1992	BM	1. Receive Final EIR for Desalination Project
		2. Set target date for Desalination Project authorizing election
January 28, 1993	BM	1. Certify FEIR for Near-Term Desalination Project
		2. Receive Draft Engineer's Report for Desalination Project
		3. Adopt Resolution of Intent to Undertake Near-Term Desalination Project

[1]BM = Full Board Meeting
W = Public Workshop
PH = Public Hearing

23. LIST OF PREPARERS

23. LIST OF PREPARERS

This document was prepared by the Monterey Peninsula Water Management District under the direction of Mr. James Cofer, General Manager, and Mr. Bruce Buel, former General Manager. Technical assistance was provided by EIP Associates, under the direction of John A. Davis, Mr. Roger Golden of the U. S. Army Corps of Engineers provided further technical assistance.

The staff of MPWMD's Planning and Engineering Division and Water Resources Division contributed extensively to this EIR/EIS. The following individuals were primarily responsible for the following subjects:

Project Management	Henrietta Stern
Need for Project	Henrietta Stern
Alternatives Selection	Henrietta Stern
Project Description and Costs	Andrew Bell James Cofer Darby Fuerst Margo Nottenkamper
Water Supply	Darby Fuerst Henrietta Stern
Geology	Joseph Oliver
Hydrology	Andrew Bell Darby Fuerst Larry Hampson Joseph Oliver Henrietta Stern
Fish and Aquatic Life	David Dettman
Vegetation	Ambessaw Assegued

Public Health and Safety	Andrew Bell Joseph Oliver

EIP staff contributors include:

Project Management	David Friedland Melanie Singer
Project Description	David Friedland
Water Quality	David Friedland
Vegetation and Wildlife	Ricardo Villasenor David Mullen, Ph.D. Barry Anderson
Traffic	David Friedland
Air Quality	Joseph Steinberger
Noise	Joseph Steinberger
Visual Quality	Jennifer Toth
History and Archaeology	John Davis
Public Health and Safety	David Friedland
Energy	Joseph Steinberger David Friedland
Land Use, Planning and Recreation	Terry Whisler Ingrid Lantz
Socioeconomics	Michael Kent
Growth	Michael Kent Terry Whisler
Graphics	Janet Fong Bobbi-Jo Azzouzi
Editor	Michael Dunham

Desktop Publishing	James Reinhardt
Word Processors	Robert Babcock Richard J. Panero Pat Koutoulakis Mark Mischan Marsha Savin

A number of specialist consultants also provided a valuable contribution to the preparation of this document. These include:

D. W. Alley and Associates	Fisheries Biology
Archaeological Consulting, Inc.	Archaeology
Bechtel Civil, Inc.	Project Description
Brown and Caldwell Consultants	Project Description (Cañada Reservoir)
California-American Water Company (AWWSC)	Project Description
Denise Duffy and Associates	Biology (Cañada Reservoir)
D.W. Kelley and Associates	Fisheries Biology
Mathias Kondolf and Associates	Hydrology
Graham Matthews and Associates	Hydrology Vegetation Air Quality
Charles McNiesh	Vegetation
Ed Mercurio Environmental Consulting	Vegetation
RAMLIT Associates	Computer Modeling

Specialist consultants who contributed to preparation of desalination information include:

ABA Consultants	Marine Resources - Desalination
Boyle Engineering Corporation	Project Description - Desalination
James M. Montgomery Consulting Engineers	Project Description - Desalination

Nolte Engineers	Project Description - Desalination
Ranney Method Western Corporation	Project Description - Desalination
Separation Processes, Inc.	Project Description - Desalination
Staal, Gardner & Dunne Inc.	Project Description - Desalination Hydrology - Desalination Marine Resources - Desalination

24. GLOSSARY OF TERMS

24. GLOSSARY OF TERMS

7 DSL: 7 MGD Desalination alternative.

15 CAN/D: 15,000 AF Cañada Reservoir with 3 MGD Desalination plant alternative.

24 NLP: 24,000 AF New Los Padres Reservoir alternative.

24 NLP/D: 24,000 AF New Los Padres Reservoir with 3 MGD Desalination plant alternative.

Acclimation: The process of adjusting fish a new set of environment conditions.

Acre-foot (AF): The volume of water (325,851 gallons) that would cover one acre to a depth of one foot.

ADT: Average daily traffic volume.

Air Quality Management Program/Plan: A federally-mandated plan identifying strategies for controlling air pollution.

Alevins: The developmental stage of salmonid fishes in which the yolk sac has not been fully absorbed and in which the fish lives in the nest prior to emerging as fry.

Allocation Program: The allotment of water resources by the District that contains the following three components: (1) A limit on how much total water may be produced annually from the Monterey Peninsula Water Resource System, given the need to protect instream fish and wildlife resources, protect riparian resources, provide for drought protection, and prevent seawater intrusion; (2) A scheme for allocating Cal-Am water to each of the jurisdictions within the Cal-Am service area; (3) A set of mechanisms for monitoring jurisdictional water use, ensuring jurisdictional compliance with the allocation scheme, and making adjustments to the allocation scheme over time.

Alluvial: Relating to, composed of, or found in clay, silt, sand, gravel, or similar material deposited by running water.

Alluvium: Sedimentary formation composed of clay, sand, gravel and other materials moved by streams and deposited by them.

AMBAG: Association of Monterey Bay Area Governments.

Anadromous fish: Any species that lives as an adult in the ocean and returns to freshwater to spawn (e.g., steelhead, salmon, striped bass, American shad).

AQ1: Subbasin of the Carmel Valley Aquifer extending westward from San Clemente Dam to Robles del Rio gaging station.

AQ2: Subbasin of the Carmel Valley Aquifer extending from Robles del Rio gaging station to the Narrows.

AQ3: Subbasin of the Carmel Valley Aquifer extending from the Narrows to Near Carmel gaging station.

AQ4: Subbasin of the Carmel Valley Aquifer from Near Carmel gaging station to the river mouth.

Aquifer: Stratum or zone below the surface of the earth capable of producing water from a well.

Aquifer drawdown model: A computer code used to simulate the changes in depth to groundwater.

Armoring: In a river bed, a phenomenon resulting from fine sediments being washed out, leaving a surface layer of gravel, cobbles and boulders which prevent erosion of the river bed except during the largest floods.

Attenuate: In hydrology, to spread a given flood event over a longer period of time. This results in a reduction of the peak streamflow rate.

Attraction flows: Pulses of high flow from the rivermouth which are sufficient to break open the sandbar and attract steelhead from the ocean into freshwater.

Bed load: Soil, gravel, rock or other material rolled along the bottom of a stream by moving water, as contrasted with sediment carried in suspension above the stream bed (see suspended load).

Board: The Monterey Peninsula Water Management District's seven-member Board of Directors. Five are elected at large; two are appointed public officials, typically a mayor or County supervisor, who serve within the District.

Brackish water: A mixture of sea water and fresh water.

Brood: Fish born in the same year.

Buildout: The maximum unconstrained development of all allowable growth, as defined by General Plans, zoning and other policies of cities and County areas within the District boundaries.

Cal-Am: California-American Water Company, a privately owned and operated water company, which is the largest of the water distribution systems located within the MPWMD boundaries.

Caltrans: California State Department of Transportation.

Carmel River Management Program/Plan (CRMP): A 10-year plan adopted by the District in 1983 to manage erosion along the banks of the Carmel River between Carmel Bay and Klondike Canyon.

CDF: California Department of Forestry and Fire Protection.

CDFG: California Department of Fish and Game.

Cenozoic: Geologic era from approximately 65 million years ago to the present. The Cenozoic era is divided into two periods: The Tertiary and Quaternary.

CEQA: California Environmental Quality Act.

cfs: Cubic feet per second.

Clearing: The removal of trees and brush from an area such as a construction site or reservoir inundation area. For construction projects, clearing typically refers to a removal of all standing brush or trees two inches or greater in diameter at a point six inches above the ground, or any vegetation greater than six feet in height (see grubbing).

Climax community: A more or less stable biotic community.

CNDDB: California Natural Diversity Data Base.

CO: Carbon monoxide; a gaseous compound containing one atom of carbon and one of oxygen.

Coastal dune: Vegetation community found grown on the sandy dunes just inland from the coast.

Colluvium: A general term applied to loose and incoherent deposits, usually at the foot of a slope or cliff and brought there chiefly by gravity.

Conjunctive use: The coordinated use of various water sources, such as surface water, groundwater and desalinated seawater, managed so that the benefit from the overall water resource system is maximized. Conjunctive operation provides a greater sustained yield from a system than would otherwise be possible, usually at a lower cost.

Conservation: Mechanical or behavioral reductions in potable water conservation resulting from a structured program.

CPUC: California Public Utilities Commission.

Critical riffle: A riffle which acts as a barrier to the migration of steelhead under low flow conditions.

CRSA: Carmel River Steelhead Association.

CVSIM: Carmel Valley Simulation Model.

Denil ladder: A short, relatively steep fish ladder with baffles place at an angle less than 90 degrees in relation to the slope of flow down the ladder. The baffle dissipates energy and provides a solid column of water in which the fish can migrate upstream.

Desalination: The separation of water from dissolved impurities whereby nearly pure water is recovered from source water such as seawater, brackish water or wastewater.

Desiccation: The act of drying-up.

Discontinuous stream: A stream which has a segment or segments in which the water flows beneath the stream bed and does not occur as surface flow.

District: Monterey Peninsula Water Management District.

Drawdown: A decrease in the elevation of the water table of an aquifer in response to pumping.

Drought: For the Monterey Peninsula Water Resources System, a drought is defined as two or more consecutive dry or critically dry years. The determination is based on unimpaired inflow at the San Clemente Dam site and selected flow frequency values.

Drought reserve: Water that is not available for allocation or use reserved to minimize water supply shortfalls during times of drought. The drought reserve is not a discrete supply of water, but is a method of calculating water which would be available for use during a drought.

Drought-tolerant species: Plants that are tolerant of low soil moisture conditions for extended periods of time.

Drought year yield: As used in this document, the average of the simulated production in the California-American Water Company system for a given project alternative in water years 1977 and 1990.

Dry season: The period of the year with the lowest rainfall; generally from May to October.

DWR: California Department of Water Resources.

EIR/EIS: Environmental Impact Report/Environmental Impact Statement

Emergence: The process whereby fry actively swim from the confines of their gravel nest into the water column above the substrate.

Epilimnetic: Referring to the warmer, upper portion of a lake or reservoir above the metalimnion.

Evapotranspiration: The loss of water from the soil by both evaporation and by transpiration from the plants growing thereon.

Exceedance frequency: The number of times that a particular value will be equalled or exceeded during a specific series of events.

Extractable storage: Aquifer storage that can be physically removed.

Fingerling steelhead: Juvenile steelhead which are about 75 mm in length and usually less than 1 year old.

Fiscal year: The period from July 1st of one calendar year to June 30th of the following calendar year.

Fish screen: A device used to separate fish from a large flow of water or to keep fish from moving into a specific area.

Fish separator: A device for separating a mixtures of different sized fish into discrete groups based on size.

Forb: Broad-leafed, annual or herbaceous perennial plant species

FRB: Future Reference Baseline. In this document, the No Project alternative facilities with water demand of 23,080 AF annual Cal-Am production.

Fry: Very small, recently-hatched steelhead. The term is commonly applied to fish up to about a month old and 1-1/2 inches long.

Gabion structure: A series of wire baskets filled with rock or concrete, lashed together, and anchored in or adjacent to the stream channel.

Geohydrologic: Pertaining to the character, source, and mode of occurrence of underground water.

Geomorphic: Of, or pertaining to, the form of the earth, the general configuration of its surface, and the changes that take place in the evolution of landforms.

Glide: Portion of stream which is the transition between pools and riffles. It is characterized by laminar, converging water flow and a gradient of accelerating water velocity from the upstream to downstream ends.

Granitic rocks: Light-colored granular igneous rocks with visible grains that are approximately the same size.

Groundwater: Non-saline and saline water beneath the natural surface of the ground, whether or not flowing through known and definite channels.

Groundwater basin: An interrelated set of water-bearing strata of permeable rock, sand, or gravel.

Groundwater hydrology: The study of the occurrence, distribution, character, and movement of water below the surface of the earth (synonymous with the term "Hydrogeology").

Grubbing: The removal of stumps, roots and brush from an area that has been cleared, as for a construction site or reservoir inundation area (see clearing).

Habitat area: The square footage of a specific type of habitat in a section, reach, or other unit of stream length.

Holocene: The latest epoch of the Quaternary Period; from approximately 11,000 years ago to the present.

Hydraulic conductivity: A measure of the ease with which groundwater moves through an aquifer.

Hydrogeologic: Of, or pertaining to, the occurrence, distribution, character, and movement of subsurface water.

Hydrologic: Of, or pertaining to, the study of the waters of the earth.

Hydrologic record: A recorded period of hydrologic events, such as streamflow.

Hypolimnetic volume: The volume of cool hypolimnetic water in a lake or reservoir.

Hypolimnetic: Referring to the cool, deeper portions of a stratified lake or reservoir which are below the metalimnion.

Igneous Rocks: Crystalline or glassy rocks that have solidified from a molten magma; the magma may pour out onto the surface of the earth (such as lava) or may cool at depths below the surface (such as granite).

Incubation: The process referring to the development of fish eggs before they hatch into alevins.

Interim Relief Plan (IRP): A set of programs adopted by the MPWMD Board in September 1988 in recognition of the need to ameliorate environmental impacts for the period of time prior to augmentation of the water supply for the Carmel River and the Monterey Peninsula. The IRP includes programs to rescue and rear fish stranded in the Carmel River, to irrigate riparian vegetation along the Carmel River, and to release water from the San Clemente Dam.

Jurisdictions: The eight local agencies designated to receive a separate allocation in the District's Water Allocation Program. These agencies are the City of Carmel-by-the-Sea, the City of Del Rey Oaks, the City of Monterey, the City of Pacific Grove, the City of Sand City, the City of Seaside, the County of Monterey, and the Monterey Peninsula Airport District.

Juvenile steelhead: Small steelhead, less than one year old. Also called young-of-the year.

Kelts: Adult steelhead which have spawned and are migrating back to the ocean.

Lagoon: A body of shallow water, particular as is the case of the Carmel River Lagoon, one possessing a restricted connection with the sea.

Landlocked: Referring to a steelhead population or individual who cannot emigrate to the ocean due to an impassable barrier.

Landslide: The perceptible downward sliding or falling of a relatively dry mass of earth, rock, or mixture of the two.

Lithologic: Of, or pertaining to, the physical character of a rock, generally as determined without the aid of a microscope.

Long-term yield: The amount of water that can be withdrawn from an aquifer without causing long-term decline in the water table or piezometric surface. Long-term yield is roughly equal to the net recharge rate of the aquifer.

LOS: Level of service; a qualitative measure of traffic-operating characteristics defined as the ratio of volume to capacity (V/C). Roadway segments are assigned letter designations from A through F, representing progressively worsening traffic conditions.

Lower Carmel Valley: That section of the Carmel Valley downstream of the Narrows to Carmel Bay which contains Carmel Valley Aquifer Subbasins AQ3 and AQ4.

Marsh: Soft, wet areas which can include wetlands and in some instances willow scrub riparian vegetation.

Maximum Credible Earthquake (MCE): The most severe earthquake that is believed possible at a given location, based on the existing geological and seismological evidence.

MBUAPCD: Monterey Bay Unified Air Pollution Control District.

Mean daily flow: The average streamflow during a particular day, midnight to midnight, at a given location (usually expressed as cubic feet per second (cfs) or acre-feet per day). For the streamflow analysis in this document, mean daily flow is computed by dividing the monthly volume by the number of days in the month and converting to cfs.

Mean monthly flows: Average flow volumes for a given month for the simulated period (1902-1990)

Mesic: Moist.

Mesozoic: Geologic era from approximately 225 to 65 million years before present. The Mesozoic era is divided into three periods.

Metalimnetic: Referring to the zone of stratified lake or reservoir where density and usually temperature of water changes rapidly with increasing depth, also known as the thermocline.

Metamorphic Rocks: Rocks which are changed by the action of heat and/or pressure below the earth's surface. Changes brought about by metamorphism can be in the rock's mineral composition, texture and structure.

MGD or mgd: Million gallons per day.

Monterey County Water Conservation Plan: A plan adopted by Monterey County and the major water providers in the county that establishes water conservation goals for each area of the county.

Morphology of stream: Referring to the shape and texture of a stream channel.

MPRPD: Monterey Peninsula Regional Park District.

MPUSD: Monterey Peninsula Unified School District.

MPWMD: Monterey Peninsula Water Management District.

MPWMD Law: The District's enabling legislation (Statutes of 1977, Chapter 527, found in *West's California Water Code Appendix* § 108-1 to 122-100).

MPWMD Rules and Regulations: The collection of ordinances under which the District operates.

MPWRS: Monterey Peninsula Water Resources System. The MPWRS consists of the Carmel River, the Carmel Valley Aquifer, and the Seaside Coastal Groundwater Basin.

MRWPCA: Monterey Regional Water Pollution Control Agency.

Narrows: The location in Carmel Valley in the vicinity of Scarlett Road that separates the Upper Carmel Valley from the Lower Carmel Valley.

NEPA: National Environmental Protection Act.

NO PRJ: No Project Alternative.

No-flow periods: Periods when streamflow is non-existent.

Non-Cal-Am Groundwater Users: Individual private wells or small distribution systems drawing from the Monterey Peninsula Water Resources System.

Nonusable storage: Aquifer or groundwater retained in an aquifer to repel seawater intrusion; this water is not available for withdrawal.

Normal Year Demand: Water use that would occur under normal conditions if the water supply were adequate to meet all needs. As used in this document, normal conditions are based on streamflow and range from "above normal" to "below normal" values. This range is defined by the 25th percentile and 75th percentile exceedance frequencies.

North Coast Central Air Basin: The air basin containing the Monterey Peninsula, as defined by the California Air Resources Board.

NOx: Nitrogen oxide.

Overstory: The tall, woody trees which provide the upper canopy of foliage in a forest and generally shade lower levels.

Ozone: A gaseous molecule containing three atoms of oxygen; a major component of photochemical smog.

PBCSD: Pebble Beach Community Services District.

Phreatophytic: A deep-rooted plant that obtains its water from the water table or the layer of soil just above it.

Plant water stress: Loss of plant vigor or fitness caused by a low soil moisture and the resultant loss of turgor pressure and eventual wilting.

PM_{10}: Particulate matter less than 10 microns in diameter which can be inhaled and are therefore considered hazardous to human health.

Potable: Suitable for drinking.

Production: The amount of water extracted by the water distribution system from all sources of water supply.

Probable Maximum Flood (PMF): The maximum streamflow that may be expected at a given location from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

Pumping capacity: The capability of a well to produce water.

Pumping regime: The pattern of groundwater pumping.

Quaternary: Period of geologic time from approximately 2 million years ago to the present. It is the latest period within the Cenozoic era. The Quaternary Period is divided into two epochs: The Holocene and Pleistocene.

Rationing goal: The percentage reduction in water consumption that is or would be included in a water rationing ordinance.

RCC: Roller-compacted concrete.

Rearing habitat: Portions of stream which is used by juvenile steelhead while they reside in freshwater. Good quality habitat is characterized as having highly oxygenated water, summer water temperatures in the range of 55 to 65 deg. F, a streambed covered with cobbles and boulders, turbulent flow conditions, water velocities of at least 0.5 feet per second, water depths greater than 0.5 feet, and vegetation or woody debris which hangs over or enters the water.

Recharge: The process by which an aquifer receives additional water from outside sources.

Reclamation: The recovery of subpotable or wastewater sources so as to substitute this supply for irrigation applications currently using potable supply.

Remnant run: A population of adult steelhead which has been severely reduced in size compared to historical or natural conditions, which is threatened, and may become endangered, if conditions which reduced the run are not corrected.

Riparian: Of, or pertaining to, the banks of a stream, lake, reservoir, or other body of fresh water.

Riparian forest: The terrestrial environs adjacent to freshwater bodies such as rivers and streams. Riparian vegetation found in these forests relies on these water bodies to provide soil moisture in excess of that otherwise available through local precipitation.

Riparian scrub: Low-growing (one- to three-meter) vegetation growing in riparian areas.

Riparian vegetation: Plants found growing at the edges of freshwater bodies. Riparian vegetation requires moist year-round soil conditions such as those found near a river.

Riparian woodland thicket: Low- to middle-canopy vegetation growing in riparian areas.

Risk/uncertainty: The concept that the occurrence of an event is not certain. Risk/uncertainty is usually expressed as probability.

Rotary drum fish screen: A cylindrical shaped fish screen which turns on a horizontal or vertical axis, thereby passing water through it, debris over or around it, and blocking the passage of fish through it.

Runoff: The movement of excess precipitation across the ground.

Salinity level: The level of salts in a body of water.

Seawater intrusion: The phenomenon occurring when sea water invades a body of fresh water.

Sedimentary budget: The input to, deposition in, and outflow of sediment in a stream system.

Sedimentary Rocks: Material that has been deposited by water, ice, wind, or chemically precipitated in water. Sedimentary rocks are usually stratified into layers or beds.

Sedimentary transport: The process by which soil, rock and debris are moved by flowing water.

Seismicity: The likelihood of an area being subject to earthquakes.

Septic system: A small sewage disposal system generally serving a single user.

Shortfall: The amount by which the monthly or annual supply, or production, is less than the corresponding demand, as calculated by the CVSIM model. When expressed as a percentage, the shortfall is a percentage of the demand.

Significant Environmental Impact: According to § 15382 of the *CEQA Guidelines*, a "significant effect on the environment means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant."

Siliceous: Of or pertaining to silica.

Smolts: Juvenile steelhead which have physiologically adapted to live in seawater and are actively emigrating from freshwater to the ocean.

Soil column: The vertical alignment of soil.

Spawning habitat: Portions of stream which is used by female steelhead for constructing her nest. Typically, these areas are located at the downstream end of pools just upstream of where turbulent water flows through riffles. Good quality spawning habitat is characterized by appropriate sized gravel, water velocities of at least 2 feet per second, and water depths of at least 1 foot.

Special-status plant species: Special-status plant species are defined to include species that are federally listed, proposed, or candidates for threatened and endangered status (50 CFR 37958-37967); listed by the State of California as threatened and endangered species or are candidates for listing; California Native Plant Society (CNPS) rare and endangered species.

Special-status wildlife species: Special-status wildlife species are defined to include species that are federally-listed threatened and endangered species (50 CFR 37958-37967); listed by the State of California as threatened and endangered species (California Administrative Code, Title 14, Section 670.5); identified by the Department of Fish and Game as species of special concern; or identified by the Department of Fish and Game as fully protected species in California.

SR 1: State Route 1.

SR 68: State Route 68.

SR 218: State Route 218.

Storage capacity: The total water-bearing capacity of an aquifer or surface reservoir.

Stress: The physiological response to environmental changes which is characterized by increased blood pressure, release of specific hormones, and a heightened state of activity or awareness and a reaction to flee from the change.

Sub-potable water: Water which is not fit for human consumption without treatment, including reclaimed water.

Succession: Change through time in the plant species composition of an area.

Surface flows: Water flow across the ground surface, generally in stream channels.

Suspended load: Sediment, usually clay particles, silt and fine sand, which is carried in suspension above the bottom of a stream by moving water, as contrasted with the bed load rolled along the bottom.

Swimup fry: Referring to the development stage of steelhead just after they emerge from the gravel nest and at the time they normally begin to feed on external food.

SWRCB: State Water Resources Control Board.

System capacity: The amount of water in acre-feet that a water distribution system is permitted by the District to produce annually. Capacity is based on the cumulative sustained yield of wells adjusted for periodic lowering of the water table and the projected yield of other sources of supply.

Tectonic: Of, pertaining to, or designating the rock structure and external forms resulting from the deformation of the earth's crust.

Tertiary: Period of geologic time ranging from approximately 65 to 2 million years before present. It is the earliest period within the Cenozoic era.

Thermocline: See metalimnetic.

THM: Trihalomethane.

Transportation flows: Streamflow which is sufficient to allow adult passage over critical riffles and throughout the lower river downstream of spawning habitat.

Tributary flows: Streamflows from small streams tributary to a main stream or river.

Typical dry season: An average condition relating to the portion of the year with minimum rainfall.

Understory: The short, shade-tolerant, woody and herbaceous vegetation growing in the lower canopy of the forest.

Unimpaired (flow) (1) Streamflow that is unaffected by artificial diversions, imports, storage or other works of man in the stream channel. (2) Recorded streamflow, with corrections applied to remove the effects of artificial diversions, imports or storage.

Upland vegetation: Vegetation growing in areas outside wetland and riparian zones which relies solely on precipitation as its source of water.

Upper Carmel Valley: The section of the Carmel Valley above the Narrows and below San Clemente Dam which includes Carmel Valley Aquifer Subbasins AQ1 and AQ2.

Usable storage: Aquifer storage that is available for withdrawal.

USFS: United States Forest Service.

USFWS: United States Fish and Wildlife Service.

USGS: Unites State Geological Survey.

V/C: Volume to capacity ratio; a measure used to define traffic Level of Service (LOS) on a street or highway.

Vegetation die-offs: The loss of vegetation through mortality.

Water table: The surface of the groundwater in an unconfined aquifer.

Water year: The period from October 1st of one calendar year through September 30th of the following calendar year.

Water-dependent recreation: Recreation activity that requires direct contact with water.

Water-enhanced recreation: Recreation activities that do not require direct contact with water, but that area enhanced by its presence.

Watershed: The area contained within a drainage divide above a specified point on a stream.

Well: Any device or method, mechanical or otherwise, for the production of water from groundwater supplies, excluding seepage pits and natural springs.

Well perforations: The slots or openings in the casing wall of a well that allow water to enter the well.

Wetland: An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Certain federal agencies, including the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the U.S. Soil Conservation Service, have formulated varying definitions of the terms "wetland" or "wetlands" for use with various laws, regulations, and programs.

Wetland vegetation: Hydrophytic plants which can survive and grow in water-saturated or inundated conditions.

Yearling-sized steelhead: Steelhead that have spent one complete summer in the stream. At the beginning of their second summer, they usually range from four to eight inches in length

Young-of-the-year: Referring to juvenile steelhead which are less than one year old.

Zero habitat: Jargon referring to the lack of river habitat suitable to the rearing of juvenile steelhead.

Zonation: The arrangement of area within a region into strips or blocks distinguishable from each other by differences in vegetation, soils, flooding frequency, etc.