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SUBREGIONAL PLANNING:

WASTEWATER TREATMENT ALLOCATION AND DEVELOPMENT

Review Draft 2/76

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UNIVERSITY OF CALIFORNIA SEA GRANT COLLEGE PROGRAM

COASTAL ZONE MANAGEMENT RESEARCH



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SUBREGIONAL PLANNING:  
WASTEWATER TREATMENT ALLOCATION AND DEVELOPMENT

Review of the California Coastal Zone Conservation Commission (CCZCC) policies in the Coastal Plan<sup>1</sup> indicates three analytic processes for relating coastal development to wastewater systems. A sequential process emerges from three different types of considerations and associated CCZCC policies regarding wastewater systems:

1. Expansion of sewer service in areas with sub-standard treatment and disposal facilities shall not be permitted until adequate facilities are in operation. (7e). Upgrade existing municipal and industrial discharges. (7a). Phase out discharges to enclosed bays and estuaries. (7b).
2. Public service and transportation facilities... especially sewer and water systems and roads, shall be provided or expanded only to the extent that the location and amount of development and population that systems will potentially serve is consistent with other Coastal Plan policies. Where the physical effects of the expansion of the public service system itself are in conflict with Coastal Plan policies, service system expansion shall not be permitted and development shall be regulated to assure that capacity of the existing service is not excluded. (61).

Population and development policies particularly relevant to the provision and expansion of sewer systems include:

...projected levels of urban development in the subregion will not significantly increase

public service costs or assessment of agricultural lands (e.g., for sewer or water services). (32b).

Consider recreation potential before allowing other uses of oceanfront land.\* (132).

Give priority to commercial recreation over private development. (133).

Give priority to coastal dependent development.\*\* (1)

3. Phase out discharges to enclosed bays and estuaries (7b)...and...require adequate treatment for new or enlarged discharges to other coastal waters. New or enlarged sewage systems and treatment plants discharging to other coastal waters shall meet present Federal requirements, and all wastes shall be treated sufficiently to maintain the natural quality of ocean waters and thereby to sustain optimum healthy populations of marine organisms (e.g., fisheries, kelp beds), and maintain human health and suitability, where appropriate for water contact sports. (76).

A process for relating wastewater systems to coastal development is illustrated by Figure 1. The various steps of the diagram are discussed in context with the Half Moon Bay case study.

#### ANALYSIS OF WASTEWATER SYSTEMS

There are three wastewater utilities within the Half Moon Bay subregion: the city of Half Moon Bay, El Granada Sanitary District,

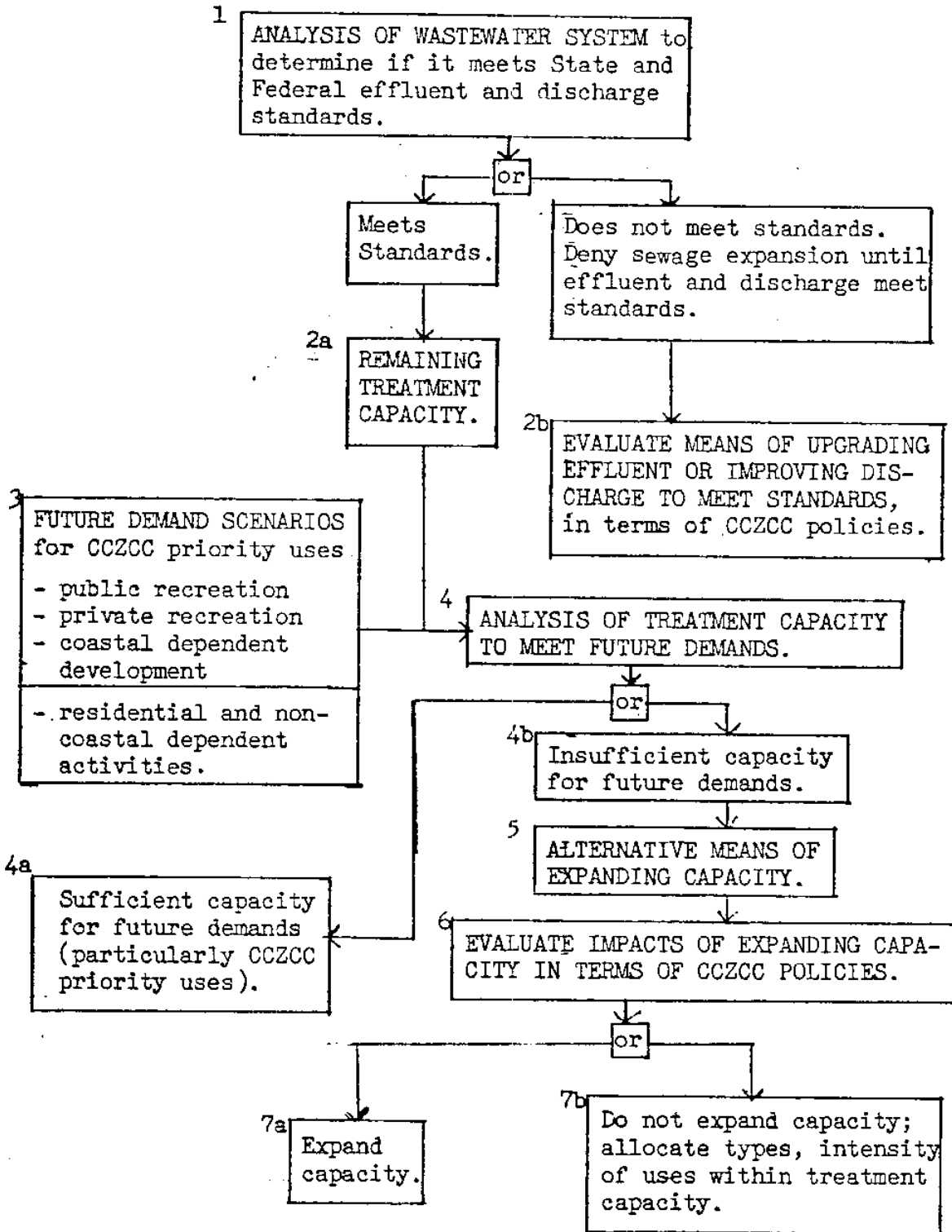
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\* Oceanfront lands do not usually extend more than 1,000 feet landward. (Glossary of the Coastal Plan.)

\*\* Policy 62 cites ports, yacht basins, and certain mineral extraction activities as coastal dependent industries. The glossary of the Coastal Plan specifies that coastal-dependent development is to "include fishing, aquaculture, port facilities, extraction of coastal minerals (e.g., sand and offshore petroleum), tanker terminals, boatworks, shipyards, and marinas."

FIGURE 1

A GENERALIZED PROCESS FOR APPLYING THE COASTAL COMMISSION POLICIES TO WASTEWATER TREATMENT ALLOCATION AND DEVELOPMENT



and the Montara Sanitary District. Figure 2 indicates the respective service limits of the three utilities. An extensive and prolonged study was conducted by a consortium of engineering consultants on consolidating, expanding, and upgrading the three utilities.

#### City of Half Moon Bay

The Half Moon Bay treatment plan was originally constructed in 1957 and was upgraded in 1973 with an extended aeration activated sludge process.<sup>2</sup> Design capacity is 1.0 MGD for average dry weather flow and 3.5 MGD for peak wet weather flow.\* Secondary treatment is given before ocean discharge. Construction has been funded by EPA for extending the present ocean outfall 1,000 feet offshore with a 200 foot diffuser at the terminus.\*\*

The design capacity of the modified outfall is 1 MGD. The outfall is located near the mouth of Pilarcitos Creek, in the center of Half Moon Bay (Figure 3). The Department of Fish and Game has previously objected to shoreline pollution of discharges from the existing outfall. According to EPA the Half Moon Bay plant's effluent offshore discharge meets Federal and State ocean discharge standards.<sup>3</sup>

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\* Average dry weather flow - the average daily flow as recorded on days when the daily rainfall did not exceed 1/10 inch.

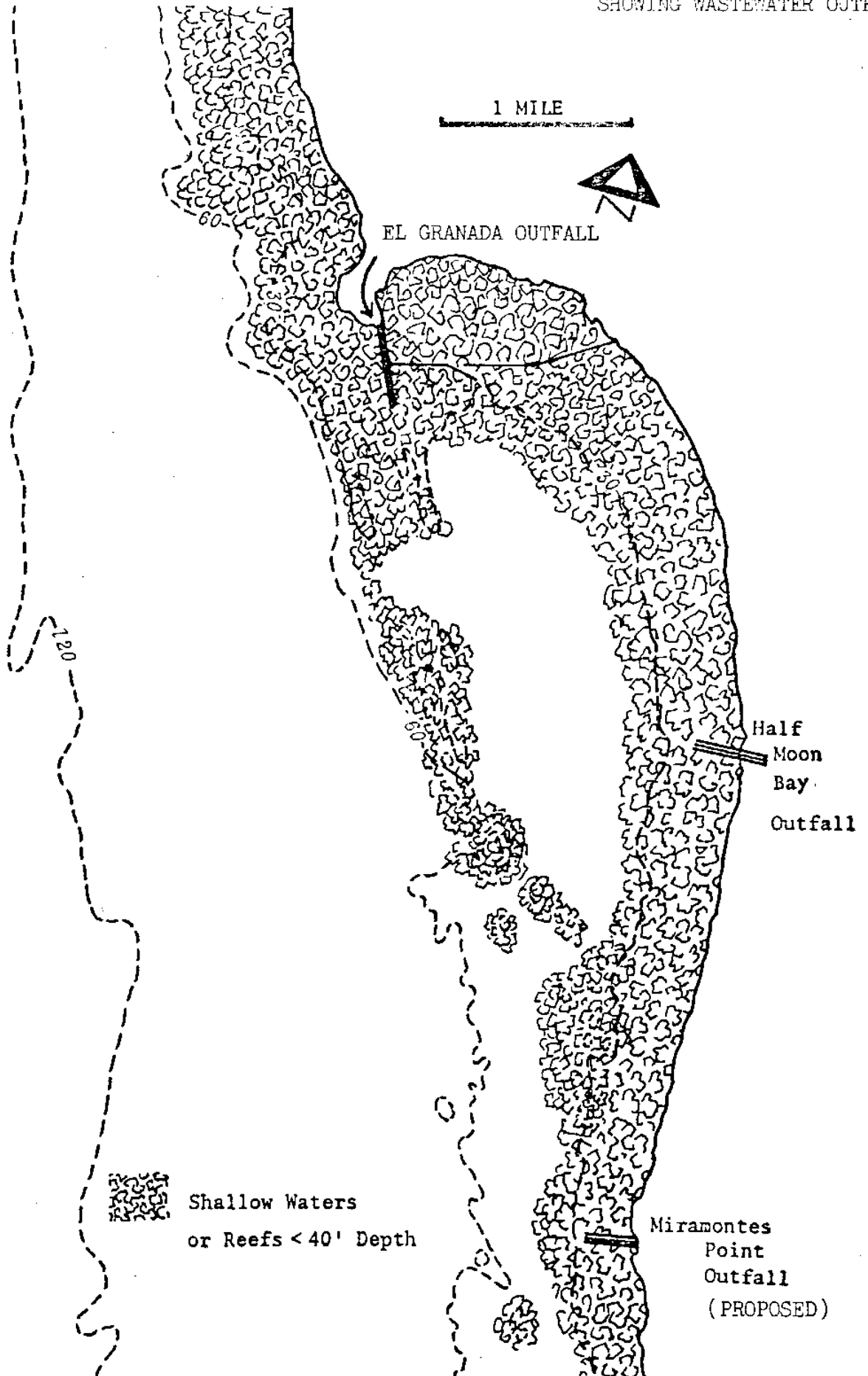
Peak dry weather flow - peak dry weather flow during a 24 hour period on a yearly average.

Peak wet weather flow - peak dry weather flow plus the peak infiltration recorded during a rainfall event on a yearly basis.

\*\* State Water Resources Control Board standards prohibit discharge of treated wastes in areas of biologic sensitivity, within rocky bottom areas or within 1,000 feet of the shore.<sup>4</sup>

FIGURE 3

HALF MOON BAY ENCLOSURE  
SHOWING WASTEWATER OUTFALLS



El Granada Sanitary District

The El Granada treatment plant was built in 1960. Design capacities of the plant are 1.0 MGD for average dry weather flow, and 3.5 MGD for wet weather flow. The design consists of primary treatment and a discharge outside the west breakwater of Pillar Point Harbor. Chemicals are being added after primary treatment as a temporary measure to improve the quality of the ocean discharge. The addition of chemicals is an expensive and short-term operation until treatment can be upgraded by the construction of new facilities. Since neither present treatment of effluents nor the ocean discharge meet Federal or State standards, CCZCC policy 7e would not permit expansion of sewer service within the El Granada Sanitary District.\*

Montara Sanitary District

The Montara treatment plant was built in 1962. Wastewater is given secondary treatment using the contact stabilization process. The design capacity of the plant is .5 MGD for average dry weather flow, and 1 MGD for peak wet weather flow. The outfall extends 460 feet offshore from Point Montara. Proposals have been

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\* It also should be noted that both the El Granada and Montara outfalls discharge in the vicinity of Fitzgerald Marine Preserve. The Preserve has been designated by the State Water Resources Control Board to be an "Area of Special Biological Significance." Discharge from these outfalls would appear to be in conflict with CCZCC policy 2, "...special protection shall be given to areas and species of special biologic and economic importance including those identified by the State Water Resources Control Board as Areas of Special Biological Significance, by State Department of Fish and Game, and in the Coastal Plan."

made to move the outfall to Montara Beach using 1,000 feet design to meet State standards. However, since the discharge is only 460 feet offshore, and does not meet State standards, application of CCZCC policy 7e would not permit expansion of sewer service within the Montara Sanitary District.

#### REMAINING TREATMENT CAPACITY

In 1973 the loading of the Half Moon plant was approximately .3 MGD during average daily dry weather flow and 3.5 MGD during peak wet weather flow. The population within the service area in 1974 was estimated at 5,600.<sup>5</sup> The Half Moon Bay plant has the design capacity to treat another .7 MGD of wastewater during average daily dry weather flow.

It is estimated that the El Granada plant serves a population of 3,250.<sup>6</sup> Since the average dry weather flow is .2 MGD the plant has the capacity to accommodate another .1 MGD of wastewater.

The present loading of Montara's plant is approximately .2 MGD during peak daily dry weather flow and 1.3 MGD during peak wet weather flow. The Montara District serves a population of 2,850.<sup>7</sup> The facility has the capacity to treat another .3 MGD during peak dry weather flow. However, the peak wet weather flow exceeds the design capacity by .3 MGD, and therefore, policy 7e could be applied to limit residential development to lots already serviced by sewers.



EVALUATE MEANS OF UPGRADING EFFLUENT OR IMPROVING DISCHARGE TO MEET STANDARDS.

The three wastewater utilities in the subregion in a joint exercise of powers have selected Plan A,<sup>8</sup> one of the seven alternative means of upgrading treatment and improving discharge proposed by the engineering consultants (the Barrett report).<sup>9</sup> Alternative A would enlarge the existing primary treatment plant at El Granada to .5 MGD capacity secondary treatment facility. The facilities at Half Moon Bay and Montara would also be upgraded (but not enlarged). Three effluent pumping stations would carry treated wastewater to a common chlorination system which would discharge to an irrigation system for a local golf course or, during the rainy season, discharge at the existing outfall in Half Moon Bay or a new outfall near Miramontes Point.

Alternative A selected by the three local utilities, differs from the alternative (Plan F in the Barrett report)<sup>10</sup> recommended by the Water Quality Control Plan, San Francisco Basin.<sup>11</sup> In Alternative F the treatment facilities at Montara and El Granada would be abandoned and a new 2.0 MGD secondary treatment facility would be constructed at Half Moon Bay. Treatment would be essentially the same as Alternative A.

Wastewater reclamation potential, upgrading treatment, ocean front location, and growth location emerge as the four major CCZCC policy areas distinguishing Alternatives A and F. Coastal Plan Policy 8 states that:

Reclamation and reuse of adequately treated wastewater... shall be fully considered as a preferred alternative

to discharges into coastal waters as a desirable component of all water and wastewater management programs.

According to the draft environmental impact report, Plan A, which includes a treated wastewater interceptor running the entire distance between Montara and Half Moon Bay, offers several advantages over Plan F for reclamation and land disposal.<sup>12</sup>

However, Plan F offers a higher degree of treatment reliability than Plan A, since a failure of one small plant out of three is more likely than the failure of a single consolidated facility. The treatment reliability is important, not only in meeting effluent standards for ocean disposal, but also of importance in a reclamation program where malfunction may result in economic damage to effluent users.

A regional plant proposed by Alternative F would be easier to upgrade if advanced treatment became necessary, either to meet additional disposal requirements (proposed by CCZCC or other agencies) or to implement an intensive wastewater reuse program.

Abandoning the ocean front plants at Montara and El Granada as proposed by Plan F would be encouraged by CCZCC policy 56:

...major public service facilities (such as...sewerage treatment facilities...pumping stations)...that do not require water or ocean front locations shall not be located in the ocean front area unless there is no less environmentally damaging alternative.

The draft EIR points out that growth patterns would be more flexible with Plan F.<sup>13</sup> The design capacities of the three plants

would allocate a 1:1:2 population ratio to El Granada, Montara-Moss Beach, and Half Moon Bay. This pattern of development may or may not be compatible with land use alternatives formulated by applying the CCZCC policies. Policies on agriculture preservation and infilling the existing community may involve considerable density shifts in residential zoning within the subregion. The service district boundaries and associated capacities set by three separate facilities may not be compatible with the shifts in the density of residential development suggested by the CCZCC policies.

#### Ocean Outfall

A location of the outfall has yet to be recommended pending the outcomes of ongoing oceanographic surveys of Half Moon Bay (to be completed by April 1976). Both Alternatives A and F involve construction of a parallel pipe and diffuser next to the existing Half Moon Bay outfall (Figure 3). Miramontes Point to the south is being considered as an alternative site for an outfall. According to the environmental impact report:<sup>14</sup>

Potential impacts due to ocean disposal of the Half Moon Bay site include aesthetic problems at the beaches, potential health impacts due to recreational use of the Coastal area, disruption of shellfish in the northern Half Moon Bay area, contamination of benthic deposits and benthic organisms, and an inducement of algal or dinoflagellate blooms in the confined regions of the Bay. All these factors are likely to be more important north of the proposed outfall because there is greater potential for concentration of sewage effluent. There is generally low sensitivity throughout most of the remainder of the Half Moon Bay habitats. The primary impact of concern is that of aesthetic and health problems at the beach zones.

To the south of the Half Moon Bay outfall lie several beaches and isolated reefs and rocky sections. At Miramontes Point, where the reefs become extensive, and the coastline emerges from the protection of the Pillar Point reefs, the bottom characteristics change. The fine sands grade into coarse sands with loose large shell fragments. This substrate provides less opportunity for biological growth and benthic activity. There are also fewer beaches of recreational significance to the immediate south. (Page 34.)

Evaluating the impact of ocean outfall in context with CCZCC policies will have to await the findings of the oceanographic survey and the subsequent proposal for an ocean discharge facility. CCZCC policies (6 and 7 in particular) would be used to evaluate the impacts of an ocean outfall proposal.

Given the potential adverse impacts of ocean disposal, wastewater reclamation and/or land disposal would be encouraged by CCZCC policies. The demand for reclaimed wastewater is critically assessed by the environmental impact report.<sup>15</sup>

This project proposes reclamation of a portion of the treated wastewater for irrigation as a disposal alternative. One obvious benefit of reclamation is that it reduces ocean discharge, but under present conditions, the effectiveness of this alternative is limited and major reduction in ocean discharge will not be achieved in the near future.

There are three types of potential use for the Mid-Coastside: lawn or landscape irrigation (inedible crops), floriculture irrigation, and intensive agricultural irrigation (truck crops). Lawn or landscape irrigation is the most feasible in terms of cost and poses the fewest problems from a public health standpoint...The demand for this water and hence its usefulness as a disposal technique is restricted to the summer dry season.

Floriculture irrigation is unlikely at present because potential buyers are unsure of the effects of standard two percent effluent on their products. Without a demonstration project, the reluctance to incur the capital cost of a distribution system and fear of fluctuations in water quality or quantity may not offset the economic incentive of cheaper irrigation water (\$.23/1,000 gallons versus \$.81/1,000 gallons for CCWD water now purchased).

Intensive agricultural use of treated wastewater is highly unlikely in the foreseeable future. All truck crop farming on the Mid-Coastside is now economically marginal and its continuance is in part dependent on the availability of ample private water supply at minimal cost. Even at \$.23/1,000 gallons, the growers could not afford to purchase the wastewater. Crop irrigation is also seasonal and would require winter ocean disposal. There is also the problem of the effect of the wastewater on the crops themselves. Insufficient chlorination can lead to the problem of bacterial contamination of an edible crop. Occasionally inadequate dechlorination (due to plant malfunction) can cause foliar burning. There are also the problems of build up of dissolved solids in the soils, possible hardening of clay soils due to sodium ions, boron toxicity to certain sensitive crops, and algal formation in water distribution systems, permitted by nitrate and phosphate if the effluent is stored under light conditions. The nitrate and phosphate in the waste stream do have positive value in that they partially replace existing needs for fertilizer. (Page 10.)

The priority placed on wastewater reclamation by CCZCC policy 56 suggests that the Commission would stipulate that a demonstration project be conducted on the feasibility of wastewater use by floriculture prior to the upgrading or consolidation of existing plants (as proposed by either Plan A or F) and the construction of a second ocean outfall.

## FUTURE DEMAND SCENARIOS

Improvements of Routes 1 and/or 92 will accelerate the transformation of the subregion to a regional recreation destination. A component analysis of the case study, "Recreation Scenarios for the Half Moon Bay Subregion," estimated peak beach day use to be 40,800 when all recreation facilities are fully developed. The impact statement for Pillar Point Harbor estimated peak day use of 5,700 visitors.\*<sup>16</sup> There are also plans to develop a 593 unit overnight camper area.<sup>18</sup>

Using Department of Park and Recreation criteria of 5-10 gpcd for day visitors and 25-50 gpcd for campers,<sup>19</sup> at least .3 MGD of wastewater treatment capacity should be reserved for recreation use.

There are no specific projections for private recreational development in the subregion.\*\* Presently, there are a number of bars and restaurants that cater to tourists. Plans for a fifty-two unit motel have recently been approved. Recent plans for Pillar Point Harbor development propose leasing sites for restaurants, hotels, and tourist retail shops.

The development of Pillar Point Harbor may also attract coastal dependent industries such as fish-processing operations, and

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\* However, Pillar Point Harbor is within the El Granada Sanitary District, and therefore, would not develop until the inadequate treatment and discharge situation is corrected.<sup>17</sup>

\*\* In a companion study on Water Supply in the Half Moon Bay Subregion it was estimated that 7,000g was the average peak daily, and 1,330g was the average daily water use for the 60 commercial connections. It is assumed that in many cases, such as restaurants and lodging (without extensive lawns and pools), that domestic water consumption will be converted into an equivalent volume of wastewater.

" E R R A T A S H E E T "

FOR: CUIMR-T-76-007

"Subregional Planning: Wastewater Treatment Allocation and Development"

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FIGURE 4: Population Accommodate by Wastewater Facilities

	Existing Design Capacity	Present Use (1973)	Remaining Treatment Capacity	Total Population Accommodated	
City of Half Moon Bay	1 MGD <sup>1</sup> 3.5 MGD <sup>2</sup>		.7 MGD <sup>1</sup>		
			7,000 <sup>4</sup>	7,000	
			10,000 <sup>5</sup>	10,000	
			.3 MGD <sup>1</sup>		
			1.8 MGD <sup>2</sup>		
		5,600 <sup>3</sup>		5,600	
Montara Sanitary District	.5 MGD <sup>1</sup> 1.0 MGD <sup>2</sup>		.3 MGD <sup>1</sup>		
			3,000 <sup>4</sup>	3,000	
			4,235 <sup>5</sup>	4,285	
			.2 MGD <sup>1</sup>		
			1.3 MGD <sup>2</sup>		
		2,850 <sup>3</sup>		2,850	
Granada Sanitary District	.3 MGD <sup>1</sup> 1.0 MGD <sup>2</sup>		.1 MGD <sup>1</sup>		
			1,000 <sup>4</sup>	1,000	
			1,428 <sup>5</sup>	1,428	
			.2 MGD <sup>1</sup>		
			.8 MGD <sup>2</sup>		
		3,250 <sup>3</sup>		3,250	
				22,700	
less provision for .3 MGD for coastal dependent activities (recreation in particular)				-3,000 <sup>6</sup>	-4,285 <sup>7</sup>
				<u>19,700</u>	<u>23,128</u>

<sup>1</sup> Average dry weather flow

<sup>2</sup> Peak wet weather flow

<sup>3</sup> 1974 population served within utility district<sup>21</sup>

<sup>4</sup> Assuming a rate of 100gpcd

<sup>5</sup> Assuming a rate of 70gpcd

<sup>6</sup> .3 MGD ÷ 100gpcd

<sup>7</sup> .3 MGD ÷ 70gpcd



report<sup>23</sup> propose a .2 MGD increase in the subregion's wastewater treatment capacity from 1.8 MGD to 2.0 MGD. The .2 MGD added capacity converts into a 2,000 residential population increase using a 100 gpcd rate or a 2,857 residential population increase using a 70 gpcd.

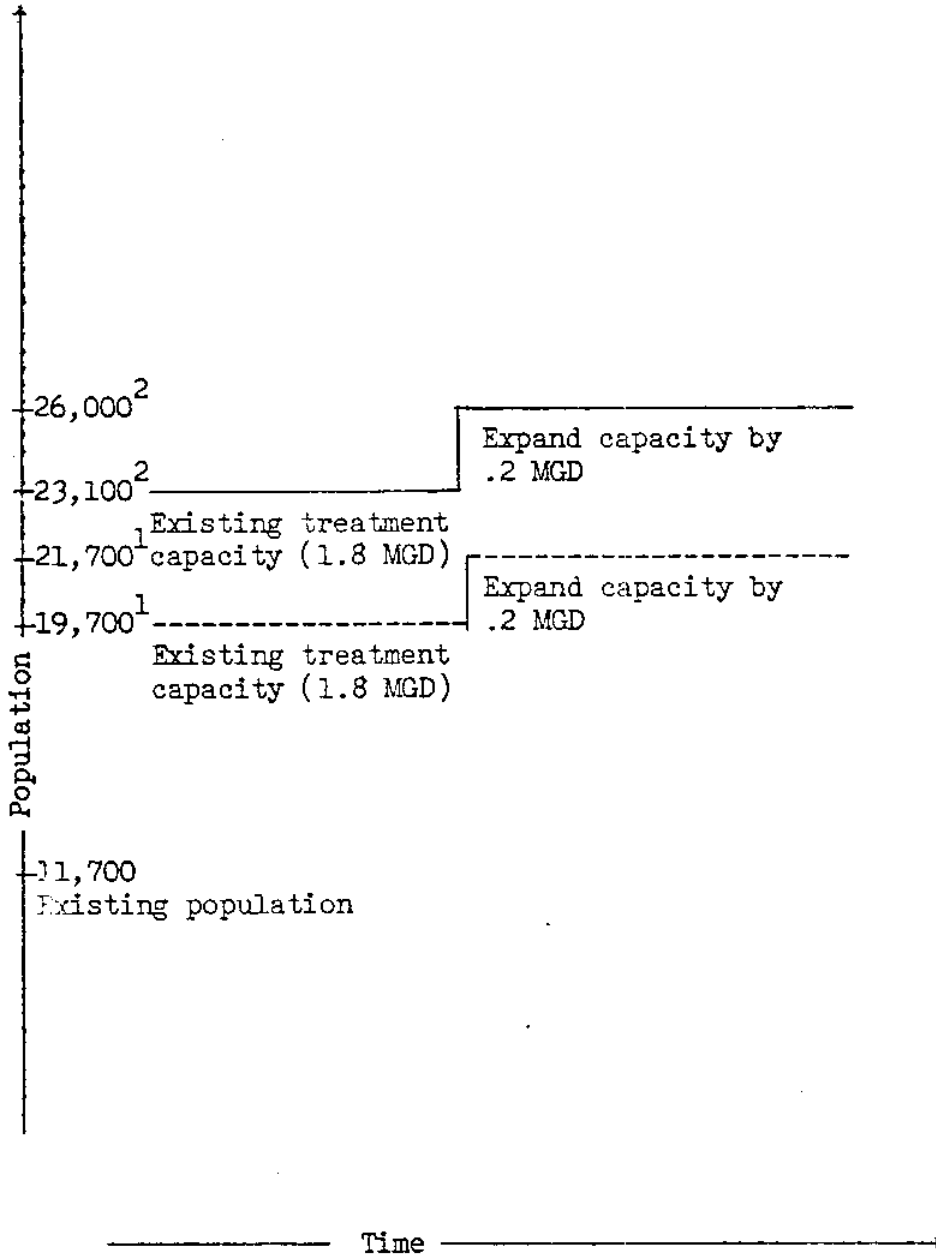
Expansion of the treatment capacity will depend in part on the population projections (termed E-Zero) made by the California Department of Finance (DOF). If a wastewater agency plans for facilities in excess of those required to meet the E-Zero population projections for the area, that excess capacity is not deemed eligible for 87½ State-Federal grant funding. E-Zero projections are 11,500 for 1976, 13,500 for 1986, and 14,600 for 1996. The residential growth accommodated by a 2 MGD treatment capacity, (assuming application of CCZCC priority of use policies) ranges between 21,700\* and 25,985\*\* (see Figure 5). The 1996 E-Zero projection is 14,600 or 7,100 below the population service capacity of the Plan A alternative.

Expansion of treatment capacity in excess of DOF population projections must be funded totally by the local utility. If expansion of the wastewater system is considerably greater than the size eligible for funding by the Clean Water Grant Program, increased assessment of property within the districts to pay for the excess capacity may force conversion of marginally economic agricultural

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\*100 gpcd  
\*\*70 gpcd

FIGURE 5: Future Population in the Half Moon Bay Subregion as a Function of Wastewater Treatment and Capacity



<sup>1</sup>100 gpcd

<sup>2</sup>70 gpcd

lands. Furthermore, development accommodated by the additional treatment capacity may physically encroach on agricultural lands by restricting farming operations. Either effect may be in conflict with CCZCC policies 30, 33, 34, and 35 as well as policy 37:

New development, land division, or the formation of urban assessment districts shall be allowed adjacent to agricultural lands only if the type of use proposed will not interfere or conflict with continued agricultural use and the development is designed to avoid conflict with farming practices...and it will not have an adverse economic effect on the long-term preservation of agricultural lands. (37)

A convincing argument might be made to increase the sewage capacity of the El Granada Sanitary District (assuming secondary treatment) by .2 MGD (as proposed by Plan A) in order to accommodate the development of Pillar Point Harbor, associated recreational facilities, and coastal dependent industry.

#### EVALUATE IMPACTS OF EXPANDING CAPACITY IN TERMS OF CCZCC POLICIES

Potential changes in the type, mix, intensity and distribution of land use induced by the additional .2 MGD wastewater treatment capacity must be estimated before a specific evaluation can be made of the impacts. Neither the consulting engineer's report nor the draft environmental impact report describes potential changes in terms of types, densities, and geographic distribution. This is due in great part to the failure of both the County and the City of Half Moon Bay to adopt a specific land use plan for their respective jurisdictions. The impact statement describes the land use changes in brief general terms. For example, the EIR states that:

...although development will not take prime agricultural land exclusively, there is nonetheless a significant threat to mid-coastside posed by the degree of residential growth anticipated by this project.<sup>24</sup>

The State Water Resources Control Board's comments on the draft EIR recommended that the final EIR:

...contain a map or maps showing as accurately as possible where the growth to be accommodated by the recommended project will occur.<sup>25</sup>

Table 1 is a framework of major impacts in context with CCZCC policies associated with expanding capacity.

TABLE 1  
PUBLIC SERVICES MANAGEMENT: WASTEWATER DISPOSAL

MANAGEMENT ALTERNATIVE	MAJOR IMPACTS	COASTAL PLAN DOCUMENTATION	POLICY GUIDANCE FOR MITIGATION
Allow demand to exceed capacity or use of sub-standard facilities	Degrades habitat areas. Degradation of watershed and coastal waters.	7a discharges that adversely affect biologically sensitive sites F- waste discharges impair essential water quality. 7a discharges that adversely affect wetlands, estuaries	7e "restrict expansion of substandard sewage systems" 7a "upgrade existing municipal and industrial discharges" 7b "phase out discharge to enclosed bays and estuaries"
Access	Loss of recreation access	7a discharges that adversely affect areas important for water contact sports.	
<u>Economic</u>	Loss of business.	7a discharges that adversely affect areas that produce shellfish for human consumption.	
Allow unsewered discharges.	<u>Environmental</u> degradation of watershed and coastal waters	F- failing septic tanks (can cause) degradation of water quality or unnatural changes in the rate of water-flow into coastal waters.	7d "new or expanded coastal developments that are not connected to sewers and sewage treatment systems shall meet strict waste discharge requirements to prevent adverse impacts".
Construct new facilities or expand existing ones. (open space, -treatment plants	Loss of environmentally sensitive lands	-new facilities require land. F-extending urban services into coastal recreational, agricultural, and wildlife areas would make possible development that might not otherwise occur.	7c "new or enlarged sewage systems and treatment plants discharging to other coastal waters shall meet present Federal requirements."
-pipelines	Degradation of viewshed	F- 'sewage treatment facilities that can be major visual intrusions	
Access	Loss of public access to coastal recreation areas	F- excessive expansion of services in already - developed areas can result in additional development to the extent of impeding public access to coastline.	

PUBLIC SERVICES MANAGEMENT: WASTEWATER DISPOSAL

POLICY GUIDANCE  
FOR MITIGATION

61 "sewer...systems shall be provided or expanded only to the extent that the location and amount of development and population that the systems will potentially serve is consistent with other coastal plan policies"

COASTAL PLAN  
DOCUMENTATION

- Cost of new facilities

MAJOR  
IMPACTS

Social/Economic  
Change in local jurisdictions  
fiscal posture and change in tax and fee burden on citizens

MANAGEMENT  
ALTERNATIVE

construct new facilities .. etc.  
(continued)  
Increase in state and federal funding for projects in the coastal zone.  
-State and federal share of cost or new facilities.

NOTES

<sup>1</sup>California Coastal Zone Conservation Commission. Coastal Plan. Sacramento: State of California. December 1975.

<sup>2</sup>Barrett and Associates; San Mateo County Mid-Coastside Supplemental Project Report, Phase I. October 1974. All figures on the alternative designs are from this report unless otherwise noted.

<sup>3</sup>Personal communication with Bill Helphingstine, Environmental Protection Agency, Region IX. October 17, 1975.

<sup>4</sup>Thomas Reid Associates: Environmental Impact Report Draft: San Mateo County Mid-Coastside Wastewater Management Plan. June 1975.

<sup>5</sup>Ibid.

<sup>6</sup>Ibid.

<sup>7</sup>Ibid.

<sup>8</sup>Ibid.

<sup>9</sup>Barrett and Associates; San Mateo County Mid-Coastside Supplemental Project Report, Phase I. October 1974. All figures on the alternative designs are from this report unless otherwise noted.

<sup>10</sup>Ibid.

<sup>11</sup>State Water Resources Control Board, Regional Water Quality Control Board, San Francisco Bay Region. Water Quality Control Plan San Francisco Bay Basin. April 1975.

<sup>12</sup>Thomas Reid Associates: Environmental Impact Report Draft: San Mateo County Mid-Coastside Wastewater Management Plan. June 1975.

<sup>13</sup>Thomas Reid Associates: Environmental Impact Report Draft: San Mateo County Mid-Coastside Wastewater Management Plan. June 1975.

<sup>14</sup>Ibid.

<sup>15</sup>Ibid.

<sup>16</sup>San Mateo County Harbor District, Environmental Impact Statement, Pillar Point Harbor East Basin District, El Granada, California (Supplement), November 1972.

<sup>17</sup>Thomas Reid Associates: Environmental Impact Report Draft: San Mateo County Mid-Coastside Wastewater Management Plan. June 1975.

<sup>18</sup>California Department of Parks and Recreation, "Half Moon Bay State Beach 1975-1976 -- Conversion of Day Use Area to Recreation Vehicle Campground."

<sup>19</sup>Personal communication with Clark Muldavin, Engineering Section, Department of Parks and Recreation, Sacramento, California. January 20, 1976.

<sup>20</sup>Barrett and Associates; San Mateo County Mid-Coastside Supplemental Project Report, Phase I. October 1974. All figures on the alternative designs are from this report unless otherwise noted.

<sup>21</sup>San Mateo Harbor District: Environmental Impact Statement -- Pillar Point Harbor East Basin Project El Granada, California. November 1972.

<sup>22</sup>Thomas Reid Associates: Environmental Impact Report Draft: San Mateo County Mid-Coastside Wastewater Management Plan. June 1975.

<sup>23</sup>Barrett and Associates; San Mateo County Mid-Coastside Supplemental Project Report, Phase I. October 1974.

<sup>24</sup>Thomas Reid Associates: Environmental Impact Report Draft: San Mateo County Mid-Coastside Wastewater Management Plan. June 1975.

<sup>25</sup>California State Water Resources Control Board, "Review of Draft Environmental Impact Report (EIR), State Clearinghouse No. 75090824 for San Mateo County Mid-Coastside Wastewater Management Plan, Project No. C-06-1022." September 30, 1975.