CHAPTER 4

ALTERNATIVES TO THE PROPOSED PROJECT

4.1 INTRODUCTION

The *CEQA Guidelines* provide guidance for the discussion of alternatives in Section 15126. Section 15126.6(b) of the *CEQA Guidelines* states that:

> *Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment, the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.*

The range of alternatives to be analyzed in an EIR is guided by Section 15126.6(f), which states:

> *The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision-making.*

Two types of alternatives that may be reviewed in an EIR are: (1) alternatives *of* the project which include modified project components, such as alternative project sites or processes and/or modified facilities, layout, size and scale of the proposed project; and (2) alternatives *to* the project which are other projects entirely or other approaches to achieving the project objectives rather than the project or modified project. In addition, consideration of the No Project Alternative is specifically required by Section 15126.6(e)(1) of the *CEQA Guidelines*. As applied to this Subsequent EIR, the No-Project Alternative is defined in more detail below.

4.2 ALTERNATIVES CONSIDERED IN PREVIOUSLY CERTIFIED 1999 PROGRAM EIR

This Subsequent EIR evaluates the impacts related to selected changes to the 1999 Strategic Plan PEIR. Prior to its certification, the Strategic Plan PEIR evaluated the following six treatment scenarios at an equal level of detail:

- **Scenario 1: NPDES Permit Compliance without GWR System Project.** This scenario provides a level of treatment necessary to meet the 1999 NPDES permit conditions and the

California Ocean Plan. All wastewater would receive advanced primary treatment and the amount of secondary treatment would be governed by the NPDES limits.

- **Scenario 2: NPDES Permit Compliance with GWR System Project.** This scenario is the same as Scenario 1 except that 50-80 mgd average daily flow and up to 100 mgd peak wet weather flow of secondary effluent would be diverted from OCSD to the GWR system.

- **Scenario 3: Full Secondary Treatment without GWR System.** This scenario would provide full secondary treatment of all wastewater prior to ocean disposal. Under this alternative the GWR System project would not be implemented. The capacity within both Plants 1 and 2 would be increased to accommodate peak projected flows. The existing facilities would be optimized through flow diversions to minimize the construction of new facilities.

- **Scenario 4: Full Secondary Treatment with GWR System.** This scenario would provide full secondary treatment and in coordination with OCWD, divert flows from OCSD to GWR.

- **Scenario 5: 50:50 Blend without GWR System Project.** This alternative scenario would maintain the level of treatment provided in 1998. All wastewater would receive advanced primary treatment and about 50 percent would also receive secondary treatment prior to ocean discharge.

- **Scenario 6: 50:50 Blend with GWR Project.** This scenario would also maintain the level of treatment provided in 1998 with implementation of the GWR project.

Among these six alternatives, Scenarios 1 and 2 represented the least amount of additional facilities and thus less construction activity compared to scenarios 3, 4, 5, and 6. Scenarios 3 and 4, which provided for meeting secondary treatment standards for all flows to the ocean, represented the greatest amount of new, additional facilities and construction and also the highest level of effluent quality. The PEIR Summary Chapter, Chapter 9.0 – Alternatives, and Chapter 10.0 Cross-Media Trade-offs summarize and highlight key differences among the six treatment alternatives. As summarized in the PEIR Summary Chapter, each of the six treatment alternatives evaluated would have, at that time, met the District's NPDES permit requirements. Each of the six alternatives also would result in the same three significant and unavoidable impacts: significant noise, vibration and air quality during construction, significant air quality during operation from increased mobile sources, and significant secondary effects of planned growth such as traffic congestion, air quality and loss of open space. All other impacts associated with each of the six treatment alternative could be mitigated to less than significant levels. PEIR Table S-1 summarizes the key characteristics and impacts of each alternative. The reader is referred to the PEIR for further analysis of the six treatment alternatives as well as additional background on other alternatives considered in the planning process, described in PEIR Chapter 9.0.

The preferred alternative in the previously certified PEIR was to upsize the existing trunk sewers, implement Scenario 2 treatment for 1999 NPDES permit compliance, support GWR System Phase 1 Implementation, use the 78-inch outfall for infrequent peak wet-weather discharges and continue to beneficially reuse biosolids. The preferred alternative included a blend of primary and secondary treated effluent to meet ocean discharge permit limits.

The District submitted an application for a modified NPDES permit from the RWQCB in December 2002 and has received its permit. The new ocean discharge permit commits the District to meeting secondary

treatment standards. This is similar to the treatment Scenarios 3 and 4 evaluated in the PEIR. In November 2004, the State Water Resources Control Board and the EPA signed a Consent Decree for OCSD that sets interim effluents limits, deadlines for completion of the new secondary treatment facilities, and reporting requirements for the District. The interim standards will be applied during the period necessary to construct the secondary treatment facilities by 2012.

4.3 ALTERNATIVES EVALUATED IN THIS SUBSEQUENT EIR

As described in the section above, the PEIR analyzed six treatment alternatives in equal level of detail and thus accomplished a comprehensive environmental review of level of treatment alternatives; the PEIR analysis of treatment alternatives is incorporated by reference and is not re-visited in this SEIR For this Subsequent EIR on the proposed Project, the alternatives discussion focuses on a) treatment system alternatives for providing secondary treatment at Plant No. 2, and b) comparison of this proposed Project with a No Project Alternative. Section 4.4 below addressed secondary treatment system alternatives at Plant No. 2 and Section 4.5 presents the No Project Alternative analysis.

For this revised project SEIR analysis, the preferred alternative approved in conjunction with the certification of the 1999 Strategic Plan PEIR (Scenario 2) becomes the "No-Project" Alternative. If OCSD does not implement the proposed treatment revisions to the 1999 Strategic Plan considered herein, then for CEQA purposes "No-Project" means that the District would continue to implement the 1999 Strategic Plan as previously approved. The purpose of evaluating the No-Project Alternative is to allow decision-makers to compare the impacts of the proposed Project with the impacts that would occur without implementation of the proposed Project.

4.4 PLANT NO. 2 SECONDARY TREATMENT SYSTEM ALTERNATIVES

The PEIR identified the need for secondary treatment facilities at Plant No. 2 under Scenario 4, but did not specify the specific type of treatment system to be installed. The existing secondary treatment facilities at Plant No. 2 utilize activated sludge technology with both air (conventional) and pure oxygen. Since 1999, the District authorized a study of secondary treatment alternatives for Plant No. 2 which indicated that the preferred means of treatment was a modern trickling filter design that provided for future modification to enhance the removal of certain "emerging contaminants of concern." The District evaluated three treatment systems for providing secondary treatment at Plant No. 2: 1) conventional activated sludge (CAS), 2) trickling filters (TFs), and 3) membrane bioreactors. The three systems are described below.

Conventional Activated Sludge: The CAS process uses microorganisms to feed on organic contaminants in wastewater, producing a high-quality effluent and high quantities of "activated sludge." As microorganisms grow, they form particles that clump together forming floc that is allowed to settle to the bottom of the tank. This "activated sludge" which settles is removed and portions of it are returned to the mixing tanks as "mixed liquor" which provides a seed for the newly introduced wastewater. The mixture is stirred and injected with large quantities of air or pure oxygen to keep the solids in suspension and support oxidation of the organic contaminants.

Trickling Filters: The trickling filter process involves the distribution of wastewater on a continuous basis over a media of plastic honeycomb blocks stacked inside a concrete tank that optimizes the

oxidation of wastewater by the microorganisms that grow on the large surface area provided. Up to five trickling filters, each 145 in diameter and 53 feet tall, containing plastic media stacked to a height of 20 feet within the structure have been proposed. These five trickling filters proposed would provide media surface for oxidizing the wastewater to reduce biochemical oxygen demanding substances. The organisms use the nutrients in the wastewater for growth and produce a biomass that sloughs off and is captured as a solid. The solids are concentrated in a solids contactor tank and the secondary effluent from the TFs flows to the clarifiers. The clarified effluent would be disinfected and discharged to the ocean after reaching a targeted concentration of below 30 mg/l for both TSS and BOD.

Membrane Bioreactors: Membrane bioreactors utilize similar oxidation of wastewater by microorganisms that grow within a series of treatment tanks. However, MBR systems also clarify the effluent through pressurized systems where wastewater is forced through submersed membranes. The technology provides superior effluent quality, but is more expensive to construct and operate.

SUMMARY COMPARISON

A summary report comparing the three alternative technologies was prepared by Integrated Program Management Consultants (IPMC) in 2004. The three different technologies were evaluated based on six main criteria and 23 sub-criteria. The six main criteria included the capacity to remove toxicity, environmental considerations, operational considerations, constructability, financial and institutional constraints. The comparison of construction requirements for each treatment system is summarized in **Table 4-1** and a comparison of cost and operational considerations is summarized in **Table 4-2**. This information represents a planning-level analysis of the treatment technologies.

Table 4-1
Comparison of Secondary Treatment System Construction Requirements

	Volumes concrete (cubic yards)	*Number of piles*	*Volume of excavated material (cubic yards)*	*Land Use (acres)*
Trickling Filters	21,030	1,948	69,204	9.2
Conventional Activated Sludge	43,568	1,100	177,573	7.3
Membrane Bioreactors	19,685	1,777	71,781	4.4

Source: Orange County Sanitation District, 2004.

The results of the weighted scoring process revealed that TFs had the highest rank followed by conventional activated sludge with membrane bioreactors being the lowest ranking primarily based on costs and the need for pilot testing and time to implement after determining their potential applicability at OCSD. Trickling filters were rated highest based primarily on their favorable costs for construction and (O&M), solids generation, proven technology, their lack of waste streams for additional processing, and their proven effectiveness and public acceptance.

The TFs did have lower scores compared to the other two technologies based on land requirements and trace organics removal. The issue of trace organics removal and emerging contaminants not presently being regulated were an issue of concern that was addressed in great detail in the alternatives evaluation. The study was thorough in its evaluation of the potential concern over removal of the over 130 priority pollutants. Modification of the trickling filters was considered to address this concern. The study

Table 4-2
Comparison of Costs and Operational Considerations (60 mgd)

	CAS[1]	TF[2]	TF Modification	MBR[3]
Cost millions 2003 dollars				
Capital[4]	178.6	112.6	140.1	416.1
Annual O & M[5]	2.11	.059	0.71	5.61
Life Cycle[6]	208.2	620.9	150.1	494.5
Annual	10.41	6.04	7.50	24.72
Cost MG treated	$475	$276	$342	$1128
Comparative Features				
Removal of trace organics	--	--	--	--
Optimal energy use (millions of kwh/yr)	26.9	4.4		30
Operational Labor – full time employees	4	3		6
Concrete Use (cubic yards)	43,568	21,030		19,685
Land Use (acres)	7.3	9.2	--	4.4
Tallest Structural Element (feet)	20	53	--	-

1. Conventional activated sludge
2. Trickling filter
3. Membrane bioreactor
4. Construction costs, contractors, associated engineering, construction management, legal and administrative costs
5. Operation and maintenance costs includes annual cost of labor, energy, chemicals and other materials
6. Based on a 20-year period assuming a discount rate of 6 percent

concluded that there was basically little distinction on trace contaminant removals between the three processes studied based on the very low levels of trace contaminants now found in the influent wastewater to Plant No. 2.

Environmental Effects

Overall, each of the three treatment process alternatives would have similar construction and operation environmental impacts, requiring the same types of mitigation. The extent of impacts would vary some between the three secondary treatment alternatives but in most cases the environmental impacts would not be distinct. Impacts determined to be significant and requiring mitigation for the preferred trickling filter process alternative would also result from implementation of either of the other two secondary treatment alternatives considered. Thus, these secondary treatment alternatives would not avoid or minimize the impacts of the preferred, proposed Project.

As shown in Table 4-1, trickling filters would require the most land area and greatest number of piles, but would result in the least amount of soil excavation and less than half the concrete required to construct the CAS process facilities. Thus, the preferred trickling filter process would involve less materials hauling and thus generate less construction traffic and potentially less dust and construction emissions but would generate more noise and vibration for installation of the required piles. As discussed above, each of three treatment process alternatives would provide effluent that fully meets the NPDES permit quality requirements for secondary treatment and there would be little distinction in the ability to remove trace contaminants. As shown in Table 4-2, the trickling filter process would require the tallest structures (53

feet) but the visual impact analysis presented in Section 3.1- Aesthetics shows that with mitigation these facilities would not have a significant visual impact.

4.5 NO-PROJECT ALTERNATIVE

This alternative involves implementation of Scenario 2 as described in the 1999 Strategic Plan. As indicated in that document, this alternative would result in the following unavoidable impacts:

- Effluent discharge to the 78-inch outfall during infrequent peak wet weather events would result in a significant cumulative pollutant loads (particularly pathogens) in the nearshore waters used for water-contact activities or where shellfish are harvested.

- Construction activities related to improvements to the plants would intermittently and temporarily generate noise levels above ambient levels in the project vicinity.

- Construction activities would generate short-term emissions of air pollutants including dust and criteria pollutants from demolition, construction and restoration activities.

- Cumulative impacts to air quality and noise could occur as a result of treatment facility construction activities.

- The OCSD Strategic Plan would accommodate planned growth in the service area. Some of the secondary effects of growth have been identified as significant and unavoidable including air quality and traffic congestion.

The No Project Alternative would differ slightly from the Scenario 2 assessed in the PEIR in that existing secondary treatment capacity would be maximized and the effluent would be disinfected. The No-Project Alternative would not avoid any of the significant unavoidable impacts associated with Scenario 2. However, the significant impacts associated with construction (noise and air emissions) would be greater under the proposed Project than under Scenario 2 since more construction would occur. In addition, the proposed Project would include an additional significant impact to peak hour traffic during peak soil haul activities. However, the No Project Alternative would not meet the project objectives and would not provide secondary treatment facilities needed to meet effluent quality standards in the District's revised ocean discharge permit. This would be a significant impact of the No Project Alternative and is the principal reasons for implementing the proposed Project.

4.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The proposed Project would develop secondary treatment that would result in the highest effluent quality compared to the treatment option (Scenario 2) originally approved as part of the 1999 Strategic Plan (which represents the No Project alternative in the document). However, the proposed Project would increase temporary impacts to traffic, air quality and noise associated with construction activities compared with the No Project Alternative. The proposed Project would result in one new significant unavoidable impact to peak hour traffic during certain soil haul periods. However, due to the temporary nature of these construction-related impacts versus the long-term benefits of greater effluent quality, the proposed Project is the environmentally superior alternative compared to the treatment option (Scenario 2) originally approved as part of the 1999 Strategic Plan.