Substitute Environmental Document

Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL

Prepared under the California Environmental Quality Act (CEQA) Requirements of a Certified Regulatory Program

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EXECUTIVE SUMMARY

The California Regional Water Quality Control Board – Los Angeles Region is the Lead Agency for evaluating the environmental impacts of the proposed Total Maximum Daily Load (TMDL) for nutrients in Machado Lake. This Substitute Environmental Document (SED) analyzes environmental impacts that may occur from reasonably foreseeable methods of implementing a TMDL for nutrients in Machado Lake (Nutrient TMDL). This SED is based on a proposed nutrient TMDL that will be considered by the California Regional Water Quality Control Los Angeles Region (Los Angeles Water Board) and, if approved by the Los Angeles Water Board, implemented through an amendment to the Water Quality Control Plan Los Angeles Region (Basin Plan). The proposed nutrient TMDL is described in the Staff Report, Tentative Board Resolution and Tentative Basin Plan Amendment available on the Los Angeles Water Board website. This SED analyzes foreseeable methods of compliance with the nutrient TMDL and provides the public information regarding environmental impacts, mitigation, and alternatives in accordance with the California Environmental Quality Act (CEQA).

The SED will be considered by the Regional Board when the Regional Board considers adoption of the nutrient TMDL as a Basin Plan Amendment. Approval of the SED is separate from approval of a specific project alternative or a component of an alternative. Approval of the SED refers to the process of: (1) addressing comments, (2) confirming that the Regional Board considered the information in the SED, and (3) affirming that the SED reflects independent judgment and analysis by the Regional Board (Section 10590 15090 of CEQA Guidelines (Title 14 of CCR)).

Water quality in Machado Lake is limited by elevated nutrient levels and eutrophic conditions, as documented in current and proposed State of California 303(d) lists of impaired waterbodies. Nutrient loading to Machado Lake results in impairments of beneficial uses associated with recreation (REC 1 and REC 2), aquatic life (WARM, WILD, RARE, and WET) and water supply (MUN).

Nutrient enrichment and eutrophication problems rank as the most widespread water quality problems for lakes nationwide; more lake acres are affected by nutrients than any other pollutant or stressor (EPA 2000). Eutrophication is the increased growth of biota, phytoplankton, and other aquatic plants, as a result of increased nutrient loading to a waterbody. Phosphorus and nitrogen regulate aquatic plant growth and when excessive levels are present, they are responsible for the eutrophication of surface waters. As a result, nutrient standards and or TMDL listing for eutrophic conditions generally focus on these two constituents.

Excessive nutrient loading leads to excessive phytoplankton and macrophyte growth. This excessive plant biomass may cause increased turbidity, altered planktonic food chains, algal blooms, reduced dissolved oxygen concentrations, increased pH, and increased nutrient recycling. These changes can lead to a cascade of biological responses, culminating in impaired beneficial uses. The most distinct water quality problem affecting Machado Lake is eutrophication. Algal blooms are regularly observed in the lake during summer months. As a result of high phosphorus concentrations, algal blooms, and eutrophic conditions Machado Lake was placed on the Clean Water Act 303(d) list of impaired waterbodies in 1998, 2002, and 2006.

A nutrient TMDL is required under section 303 of the Clean Water Act and mandated by a Consent Decree between Heal the Bay et al. and the United States Environmental Protection Agency (US EPA). This consent decree requires that all TMDLs for the Los Angeles Region be adopted within 13 years, and prescribes schedules for certain TMDLs. The objective of the nutrient TMDL is to restore the beneficial uses of Machado Lake that are currently impaired by nutrients, in accordance with Clean Water Act section 303(d).

The Nutrient TMDL establishes waste load allocations (WLAs) to point sources (stormwater) and load allocations (LAs) to nonpoint sources and provides for a 8.5 year implementation schedule. Stormwater WLAs will be implemented through the Los Angeles County Municipal Separate Storm Sewer System (MS4) permits and the California Department of Transportation (Caltrans) Statewide Stormwater permit. LAs will be implemented through a Memorandum of Agreement in accordance with the Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options ("Policy"), Cleanup and Abatement Order or other appropriate regulatory order. The implementation plan includes lake management strategies/lake treatment options that will be implemented directly at the lake and watershed strategies for stormwater runoff throughout the watershed to treat and reduce nutrient loading to the lake. Potential adverse impacts to the environment stem principally from the installation, operation, and maintenance of lake management and stormwater treatment options such as hydraulic dredging, aeration, maintaining the lake level, floating islands hydroponic nesting island, fisheries management and alum treatment, sand/organic filters, biofilters, and alum injection system.

This SED analyzes four Program Alternatives and two types of Implementation Alternatives that encompass actions within the jurisdiction of the Los Angeles Water Board and implementing municipalities and agencies. A No Project Alternative is analyzed to allow decision makers to compare the impacts of approving a proposed alternative and its components compared with the impacts of not approving the proposed alternative. The SED analyzes the potential environmental impacts in accordance with significance criteria widely accepted by municipalities and government agencies in the Machado Lake watershed for CEQA review. The TMDL does not specify types of projects, specific locations, or mitigation measures for those projects. Projects are specified, designed, constructed, operated, and mitigated for by the TMDL Responsible Jurisdictions. Consequently, this environmental analysis is structured in accordance with guidelines for a Tier 1 Program SED rather than a Tier 2 Project SED.

Municipalities and agencies that will implement specific projects and BMPs may use this SED to help with the selection and approval of project alternatives. The implementing municipality or agency will be the lead agency and have responsibility for environmental review of the projects they determine necessary to implement this TMDL.

Approval of projects (i.e., project alternatives or components of project alternatives) refers to the decision of either the implementing municipalities or agencies to select and carry out an alternative or a component of an alternative. The components assessed at a project level have specific locations that will be determined by implementing municipalities and agencies. The project-level components will be subject to additional environmental review, including review by cities and municipalities implementing TMDL projects.

Many of the specific projects and BMPs analyzed in this SED will involve small construction projects and maintenance of equipment and stormdrain infrastructure. Infrastructure maintenance and urban construction projects generate varying degrees of environmental impacts. The potential impacts can include, for example, noise associated with construction, air emissions associated with vehicles to deliver materials during construction, traffic associated with increased vehicle trips and where construction or attendant activities occur near or in thoroughfares, and additional light and glare. These foreseeable impacts are analyzed in detail in this SED.

To address the environmental and nuisance impacts from these routine and essential activities, public works departments are required to employ a variety of techniques, "best management practices", and other mitigation measures to minimize the impacts on the environment. Generally accepted and recognized mitigation measures for construction projects on the scale of these maintenance projects include, for example, management of traffic by planning construction activities for certain times of the day, development of detailed traffic plans in coordination with police or fire protection authorities; mitigation of excessive noise by planning construction activities for certain times of the day, use of less noisy equipment, use of sound barriers; reduction of air emissions by use of lower emissions vehicles. Numerous agencies such as Caltrans, CASQA, and WERF publish handbooks containing guidance on the selection, siting, design, installation, monitoring, and evaluation of stormwater BMPs (Caltrans, 2002, 2003; CASQA, 2003a; CASQA, 2003b; WERF, 2005). These mitigation methods and BMPs are discussed in detail in this SED. They are intended to avoid or minimize site specific impacts, and in many cases they do so to less than significant levels, considering the context of the urbanized baseline conditions.

This SED finds foreseeable methods to comply with the nutrient TMDL by focusing on improvements to the stormdrain system and lake management activities. BMPs and lake management activities in the Machado Lake nutrient TMDL area generally do not cause significant impacts that cannot be mitigated through commonly used construction and maintenance practices. The SED finds that environmental impacts from the nutrient TMDL are those impacts related to installation and maintenance of lake management activities and structural BMPs. The SED identifies mitigation methods for impacts with potentially significant effects. The SED can be used by implementing municipalities and agencies to expedite any additional environmental analysis of specific projects required to comply with the nutrient TMDL. To the extent that there are unavoidable adverse environmental impacts, the benefits of this nutrient TMDL outweigh these impacts.

As discussed in this SED, California Water Code section 13360 prohibits the Regional Board from specifying the manner of compliance with the TMDL. Methods of compliance and selection of specific BMPs and associated mitigation measures are the responsibility of the responsible agencies for implementing the nutrient TMDL.

Many of the mitigation measures identified in the SED are common practices currently employed by agencies when planning and implementing stormwater BMPs. Agencies such as Caltrans, the California Stormwater Quality Association (CASQA), and the Water Environment Research Foundation (WERF) publish handbooks containing guidance on the selection, siting, design, installation, monitoring, and evaluation of stormwater BMPs (Caltrans, 2002, CASQA, 2003a, CASQA, 2003b, WERF, 2005). Manuals are also available, which describe engineering and administration policies and procedures for construction projects (e.g., Caltrans, 2003a). Since the decision to

perform these measures is strictly within the responsibility and jurisdiction of the individual implementing agencies, such measures can and should be adopted by these agencies. (Title 14, California Code of Regulations, Section 15091(a)(2).)

The alternatives analysis section of this SED discusses the program level alternatives for the nutrient TMDL and presents implementation alternatives to achieve compliance with the final waste load allocations (WLAs) and load allocations (LAs). Some implementation alternatives are discussed in the SED, as well. Site specific environmental impacts and the CEQA Checklist and Determination with in-depth analysis of each resource area, as well as other environmental considerations are also discussed.

PROJECT PURPOSE

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) proposes an amendment to the Water Quality Control Plan for the Los Angeles Region, also known as the Basin Plan, to incorporate a Total Maximum Daily Load (TMDL) to reduce nutrients in Machado Lake.

As further set forth herein, this project's purpose is twofold:

- To adopt a regulation that will guide Regional Board permitting, enforcement, and other actions to require responsible parties to take appropriate measures to restore and maintain applicable Water Quality Standards pertaining to eutrophic, algae, ammonia, and odors (nutrients) in Machado Lake; and

- To establish a TMDL for Machado Lake in compliance with the requirements of section 303(d) of the federal Clean Water Act (CWA) in a manner timely enough to avert federal intervention in state water quality planning, which would occur as a result of United States Environmental Protection Agency's obligations under section 303(d) and under a federal consent decree that would require USEPA to establish these TMDLs if the State does not do so.

Section 303(d) of the CWA requires the states to identify waters not meeting state water quality standards, and establish TMDLs for those waters, at levels necessary to resolve the impairments and maintain water quality standards. The purpose of this project is to both comply with the requirements of section 303(d) and to resolve the impairments and maintain compliance with water quality standards in the relevant water bodies.

LEGAL BACKGROUND

The TMDL for nutrients in Machado Lake is designed to attain the water quality standards for nutrient related impairments in this Lake. The TMDL is prepared pursuant to state and federal requirements to preserve and enhance water quality in Machado Lake. The adoption of a TMDL is not discretionary and is compelled both by section 303(d) of the federal Clean Water Act (33 USC 1313(d)) and by a federal consent decree, Heal the Bay Inc., et al. v. Browner, et al. C 98-4825 SBA (United States District Court, Northern District of California, 1999) approved on March 22, 1999.

The Basin Plan sets water quality standards for surface waters and ground waters in the region. These standards are comprised of designated beneficial uses (both existing and potential) for surface and ground water, and numeric and narrative objectives or criteria necessary to support beneficial uses, and the state's antidegradation policy. Water quality standards are mandated for all waterbodies within the state under the Porter-Cologne Water Quality Act, and for waters of the United States, by the federal Clean Water Act (CWA). In addition, the Basin Plan describes implementation programs to protect all waters in the region. The Basin Plan guides implementation of the Porter-Cologne Water Quality Control Act (commencing at Section 13000 of the "California Water Code") and serves as the State Water Quality Control Plan applicable to Machado Lake.

Section 305(b) of the CWA mandates biennial assessments of the nation's water resources. These water quality assessments are used, with any other available data and information, to identify and prioritize waters not attaining water quality standards. Waters identified as impaired are compiled and submitted biennially to USEPA as the state's "303(d) List" or the "Impaired Waters List". CWA section 303(d)(1)(C) and (d)(1)(D) require that the state establish TMDLs for each identified water, whether "listed" or not. Those TMDLs, the waters identified as impaired, and the 303(d) List, must be submitted to United States Environmental Protection Agency (USEPA) for approval under section 303(d)(2). Under the plain language of the CWA and as confirmed in *Cities of Arcadia v. SWRCB* (2006) 135 Cal.App.4th 1392, 1418, the CWA neither prohibits a Regional Board from identifying a water body as impaired and establishing a TMDL for it at essentially the same time, nor indicates that formal listing is a prerequisite to establishing a TMDL. In any event, the CWA requires TMDLs be established for all waters, impaired or not. While section 303(d)(1)(C) and (d)(1)(D) together require TMDLs for all waters identified as impaired, section 303(d)(3) requires TMDLs for all other waters, that is, those that have not been identified as impaired. Section 303(d)(3) TMDLs, however, are not subject to approval by USEPA. From California's perspective, no practical distinction exists between (d)(1) and (d)(3) TMDLs except the requirement for USEPA approval of the former under subdivision (d)(2). All TMDLs are ultimately memorialized in the basin plan, and are subject to implementation pursuant to California Water Code section 13242.

Section 303(d)(1)(C) requires TMDLs to be established at a level necessary to attain the applicable water quality standards, considering seasonal variations and a margin of safety. The TMDL must also include an allocation of parts of the total allowable load (or loading capacity) to all point sources and to nonpoint sources and natural background, in the form of waste load and load allocations, accordingly. Waste load and load allocations must be assigned for all sources of the impairing pollutant, irrespective of whether they are discharged to an impaired reach or to an unimpaired upstream tributary.

As referenced above, TMDLs are generally established in California through the basin planning process, i.e., an amendment to the basin plan to incorporate a new or revised program of implementation of the water quality standards, pursuant to Water Code section 13242. The process that the Regional Board uses for establishing TMDLs is the same whether under section 303(d)(1) or 303(d)(3). USEPA's authority over the 303(d) program includes the obligation to approve or disapprove the identification of impaired waters and TMDLs for such waters. If any identification or TMDL is disapproved, USEPA must establish its own TMDL or conduct his own identification.

The consent decree requires that all TMDLs for the Los Angeles Region, for 1998 303(d) listed waters, be adopted within 13 years. The consent decree also prescribed schedules for certain TMDLs. According to the consent decree, Machado Lake Nutrient TMDL must be approved or established by United States Environmental Protection Agency (USEPA) by March 2012.

The California Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" (Public Resources Code section 21080.5) that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq) requirements for preparing environmental documents. (14 Cal. Code Regs. § 15251(g); 23 Cal. Code Regs. § 3782.) As such, the Regional Water Board's basin planning documents together with an Environmental Checklist are the "substitute documents" that contain the required environmental documentation under CEQA. (23 Cal Code Regs. § 3777.)

These Substitute Environmental Documents and accompanying tentative resolution and basin plan amendment for adoption by the Regional Board are being released for public comment. These documents along with the CEQA checklist dated February 7, 2008**;** the Machado Lake Nutrient TMDL staff report dated February 7, 2008**;** response to comments dated **[Insert Date];** and any subsequent responses to comments, fulfill the requirements of Public Resources Code section 21080.5 and 23 Cal Code Regulations §3777.

WATER QUALITY STANDARDS APPLICABLE TO THE WATERS SUBJECT TO THE TMDLS

CWA section 303(d)(1)(C) requires TMDLs to be established at a level necessary to implement the "applicable water quality standards". In this case, the applicable water quality standards include numerous designated beneficial uses and water quality objectives identified the Basin Plan for the Los Angeles Regional Board (Basin Plan). . The Basin Plan for the Los Angeles Regional Board (LARWQCB, 1994) defines seven beneficial uses for Machado Lake (Table 1). These uses are recognized as existing (E), potential (P) or intermittent (I) uses. Nutrient loading to Machado Lake may result in impairments of beneficial uses associated with recreation (REC 1 and REC 2), aquatic life (WARM, WILD, RARE, and WET) and water supply (MUN).

Table 1 Designated Beneficial Uses of Machado Lake

Reach	MUN	REC 1	REC 2	WARM	WILD	RARE	WET
Machado Lake	P	E	E	E	E	E	E

CWC section 13241, the statute dictating the process to establish water quality objectives, includes among factors to consider in setting the level of any objective "the probable future beneficial uses of water". Over the objections of the Regional Board, the trial court, in the Los Angeles River and Ballona Creek Metals TMDLs (*Cities of*

Bellflower et al v. LARWQCB, Los Angeles Superior Court # BS101732), ruled that the term "probable future beneficial uses" is not concurrent with the term "potential uses", as the Regional Board had argued. Instead, the court ruled that probable future uses are a subset of all potential uses. Whether or not the Regional Board had legal authority (as per the court's ruling) to designate only the subset "probable future uses" instead of the universe of "potential uses", the Regional Board has not done so. The only uses in the basin plan that are deemed attainable though not presently existing are designated as potential uses. These potential uses, having been approved by USEPA under CWA section 303(c), are the applicable state water quality standards.

The following pollutant-waterbody combination was identified as impaired for failing to attain water quality objectives, and placed on the 303(d) List (Table 2).

Table 2 Pollutant waterbody combination.

Waterbody	Pollutant/Stressor	Date Impairment Identified
Machado Lake (Harbor Park Lake)	Algae, Ammonia, Odors, Eutrophic	1998, 2002, and 2006 303(d) List

WATER QUALITY OBJECTIVES

Narrative water quality objectives are specified by the 1994 Los Angeles Regional Board Basin Plan. The following narrative objectives are most pertinent to the Machado Lake nutrient TMDL.

Biostimulatory Substances: *Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.*

Taste and Odor: *Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance, or adversely affect beneficial uses.*

The Basin Plan also identifies several numeric water quality objects applicable to Machado Lake. The numeric objectives are listed below:

Dissolved Oxygen: *At a minimum the mean annual DO concentrations of all waters shall be greater than 7.0 mg/L, and no single determinations shall be less than 5.0 mg/L except when natural conditions cause lesser concentrations. The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges*

Ammonia: *In order to protect aquatic life, ammonia concentrations in inland surface waters characteristic of freshwater shall not exceed the values calculated for the appropriate instream conditions shown in Tables 3-1 – 3-3.*

Nitrogen: *Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2 – N), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N) or 1 mg/L as nitrite-nitrogen (NO_2-N).*

PROBLEM IDENTIFICATION

Eutrophication and nutrient enrichment problems rank as the most widespread water quality problems for lakes nationwide; more lake acres are affected by nutrients than any other pollutant or stressor (EPA 2000). Eutrophication is defined by increased nutrient loading to a waterbody and the resulting increased growth of biota, phytoplankton and other aquatic plants. Phosphorus and nitrogen are recognized as key nutrients for phytoplankton growth in lakes and are responsible for the eutrophication of surface waters. As a result, nutrient standards and or TMDL listing for eutrophic conditions generally focus on nitrogen and phosphorus.

In many lake systems, the discharge point of the external nutrient load may be a river as it flows into a lake. However, in a highly urban environment, such as Machado Lake, the sources of the external loading into the lake are the stormdrains. Machado Lake has three stormdrains that discharge directly into the lake. This stormdrain system collects runoff from the surrounding 20 square mile watershed and conveys it to the lake. In lakes it is also normal for pollutants, particularly nutrients, to be recycled within the lake. The key processes for internal nutrient recycling (internal loading) is the exchange of phosphorus across the sediment water interface.

There are many biological responses to nutrients (nitrogen and phosphorus) in lakes. Excessive nutrient loading leads to excessive phytoplankton and macrophyte growth, which is often considered the primary problems associated with increased nutrient concentrations in lakes. This excessive plant biomass may cause increased turbidity, altered planktonic food chains, algal blooms, reduced dissolved oxygen concentrations, and increased nutrient recycling. These changes can lead to a cascade of biological responses, culminating in impaired beneficial uses.

The plant growth may lead to increased pH in the lake due to rapid consumption of carbon dioxide. The elevated pH creates a harmful environment for organisms and can increase the concentration of ammonia, potentially leading to direct toxicity of fish and other organisms. As these large phytoplankton populations and macrophytes die or break apart, the decomposition process consumes oxygen and dramatically reduces dissolved oxygen levels in the lake. Low dissolved oxygen levels can be very stressful for fish and other organisms, and can lead to fish kills. Moreover, as the plant material is decomposed the nutrients are released and will recycle through the system. Shallow lakes tend to have increased biological productivity because it is likely that the photosynthetic zone and decomposition zone of the water column overlap, creating the situation in which as materials are decomposed and the nutrients released, they are also immediately available for photosynthesis and plant growth, which continues to drive ongoing impairments.

ALTERNATIVES ANALYSIS

According to CEQA Guidelines section 15126.6:

> "An EIR shall describe a range of reasonable alternatives to the proposed project, or to the location of the project, that could feasibly attain most of the

> basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation."

Under the regulation, the alternatives to be analyzed are limited to those that are feasible, would accomplish most of the basic objectives of the project, and would avoid or substantially lessen any of the significant effects of the project. "'Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." (14 Cal. Code Regs. §15364.)

Notably, the purpose of the alternatives analysis is to ascertain whether alternatives exist that offer substantial environmental advantages over the project proposal….; and (2) may be 'feasibly accomplished in a successful manner' considering the economic, environmental, social and technological factors involved. (Guide to CEQA, Remy, Thomas, Moose, & Manley, 10th Ed. (1999), p. 432, citing, *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566.)

DESCRIPTION OF ALTERNATIVES

In this alternatives analysis, the Regional Board has evaluated four potential program-level alternatives, set forth individually below. This analysis concludes that Alternatives 2 through 4 are not feasible, would not achieve the project's purposes, or would not result in less significant impacts than the project as proposed. The program alternatives include:

1) The TMDL as it is proposed for Regional Board adoption;
2) A TMDL established by the US EPA;
3) A TMDL without WLAs and LAs for nitrogen and phosphorus, only monitoring of nitrogen and phosphorus; and
4) A No Program Alternative in which a TMDL is not implemented.

While a no-program alternative is unlawful, because a TMDL is required by Section 303(d) of the Clean Water Act and a federal consent decree, this alternative is analyzed to allow decision makers to compare the impacts of approving a proposed alternative and its components with the impacts of not approving a proposed alternative.

The Regional Board also considered but declines to further analyze several alternatives brought up by stakeholders in other Regional Board adopted TMDLs (e.g., the Los Angeles River and Ballona Creek Metals TMDLs) where the Superior Court already denied challenges to the Water Boards' conclusion that they were either infeasible or would not achieve the project's purpose. These include (1) developing a "super TMDL" that would address all pollutants at the same time; (2) allowing third parties to develop the TMDL; (3) deferring to other federal or state programs in lieu of a TMDL.

The substitute documents do not analyze a "partial" TMDL; for example, a TMDL which would achieve only 70% or only an 80% of the required reduction in nutrients. This sort of alternative was considered and rejected because, to the extent that significant adverse environmental impacts would be created by compliance with this proposed TMDL, and to the extent that a "partial" TMDL may, in fact, have fewer of those environmental impacts associated with compliance (although, also, less environmental benefits of the TMDL), the specific legal requirements of section 303(d) of the Clean Water Act require a level necessary to achieve water quality standards. Thus, a "partial" TMDL is unlawful because a partial reduction in nutrients would not be established at a level necessary to implement the applicable water quality standards.

The components assessed at a program level generally are program elements that would be implemented as part of the Nutrient TMDL, but these elements do not have specific locations or design details identified. The components assessed at a project level have specific locations which will be determined by implementing municipalities and agencies. The specifics of the many projects which would make up a program alternative are discussed in the substitute environmental documents and include structural and Best Management Practices (BMPs) and lake management projects that are reasonably foreseeable to be implemented under the Nutrient TMDL program alternatives. The project-level components will be subject to additional future environmental review, including review by cities and municipalities implementing Nutrient TMDL projects.

PROGRAM ALTERNATIVES

ALTERNATIVE 1 - THE TMDL AS IT IS PROPOSED FOR REGIONAL BOARD ADOPTION

This program alternative is based on the TMDL that is presently proposed for Regional Board reconsideration. The proposed TMDL focuses on the reduction of nutrients in Machado Lake.

The TMDL WLAs and LAs are established through an amendment to Basin Plan. Waste load allocations are assigned to municipal stormwater discharges, general industrial and construction stormwater discharges. Load allocations are assigned to internal nutrients from the lake sediments. This alternative provides a program for addressing the adverse impacts of nutrients through a progressive reduction in nutrients discharges to Machado Lake through a 8.5 year schedule. This schedule is both reasonable and as short as practicable. The WLAs and the implementation schedule, once they are incorporated into the Basin Plan, will be considered by NPDES (Nation Pollutant Discharge Elimination System) permit writers when developing permit limits that are adopted in separate subsequent actions by the Regional Board.

POTENTIAL ENVIRONMENTAL IMPACTS

Potential environmental impacts associated with this alternative are related to the implementation of WLAs and LAs assigned to responsible jurisdictions. Stormwater WLAs will be implemented through the Los Angeles County Municipal Separate Storm Sewer System (MS4) permits and the California Department of Transportation (Caltrans) Statewide Stormwater permit. LAs for nonpoint sources will be implemented through a MOA in accordance with the Water Quality Control Policy for Addressing Impaired

Waters: Regulatory Structure and Options ("Policy"), a Cleanup and Abatement Order or other appropriate regulatory order.

During the development of the TMDL, the reasonably foreseeable means of compliance were examined. The implementation plan includes lake management strategies/lake treatment options that will be implemented directly at the lake and watershed strategies for stormwater runoff throughout the watershed to treat and reduce nutrient loading to the lake. Lake management strategies include hydraulic dredging, aeration, maintaining the lake level, floating islands hydroponic nesting island, fisheries management and alum treatment. Watershed strategies for stormwater runoff include installation of sand/organic filters, biofilters, alum injection system, and implementing stomwater BMPs. The nutrients removal efficiencies of these treatment options as reported by USEPA, the Federal Highway Administration (FHWA), and Caltrans, further support their use as reasonable means of compliance.

This TMDL program alternative anticipates compliance through a combination lake management and, non-structural and structural BMPs. Non-structural BMPs may include source control programs such as public education, planning management in developing areas, and illegal dumping controls. Structural BMPs may include the installation of stormwater treatment devices specifically designed to reduce nutrient loadings, such as infiltration trenches and sand or organic filters, at critical points in the stormwater conveyance system. Such devices may also incorporate surge control, such as underground storage vaults or detention basins.

Potential adverse impacts to the environment stem principally from the installation, operation, and maintenance of lake management and stormwater treatment options such as hydraulic dredging, aeration, maintaining the lake level, floating islands hydroponic nesting island, fisheries management and alum treatment, sand/organic filters, biofilters, and alum injection system. The installation of implementation projects are of relatively short duration and the reduction in nutrient loading to the lake as the result of the proposed implementation actions is a positive impact. Potential associated negative impacts can be avoided or mitigated by proper design, siting, and maintenance. In addition, the Regional Board determined that any significant impacts can be mitigated or that there are alternative means of compliance available.

ANALYSIS OF ALTERNATIVE 1

This alternative is reasonable and feasible. It accomplishes the project's purposes, as described in Section 1, Project Purpose. It complies with state and federal law and the consent decree by establishing a TMDL as required by section 303(d). It also achieves the Regional Board's goal of removing nutrient impairments from Machado Lake over a reasonable implementation schedule.

ALTERNATIVE 2 – USEPA TMDL

This program alternative is based on a TMDL that would be established by the United States Environmental Protection Agency, pursuant to the consent decree. This would occur if the Regional Board fails to adopt a Nutrient TMDL. Because the TMDL technical analysis would be similar to the Regional Board analysis, and because the same laws

and regulations apply, it is assumed that the technical portions and WLAs of this TMDL Program Alternative will be essentially the same as Program Alternative 1. In other words, any TMDL must implement the water quality objectives irrespective of which agency establishes it. However, because such a TMDL would not be implemented through a Basin Plan amendment, the WLAs will be implemented directly through NPDES permit limits as the permits are renewed without consideration of a compliance schedule. Because NPDES permits are renewed every five years, all responsible parties, municipalities and Caltrans, could be required to be in full compliance immediately following the TMDL adoption by USEPA, or within five years.

POTENTIAL ENVIRONMENTAL IMPACTS

Like Alternative 1, this TMDL program alternative also anticipates compliance through installation of lake management and stormwater treatment options such as hydraulic dredging, aeration, maintaining the lake level, floating islands hydroponic nesting island, fisheries management and alum treatment, sand/organic filters, biofilters, and alum injection system. Potential adverse impacts to the environment likewise stem principally from the installation, operation, and maintenance of the proposed implementation alternatives. The installation of implementation projects are of relatively short duration and typical of "baseline" construction and maintenance projects. The reduction in nutrient loading to the lake as the result of the proposed implementation actions is a positive impact and any associated negative impacts can be avoided or mitigated by proper design, siting, and maintenance. In addition, any significant impacts can be mitigated or there are alternative means of compliance available that would have less impacts.

ANALYSIS OF ALTERNATIVE 2

Alternative 2 assumes the Regional Board would abdicate its responsibility under section CWA section 303(d), as delegated to it by CWC section 13160. This alternative does not achieve the project's purpose that the Regional Board comply with 303(d) to prevent federal assumption of water quality planning in California.

Further, if USEPA established the TMDL, any adverse impacts would be more significant, not less. The same WLAs and LAs will need to be met and the same technological choices will be available under both this alternative, and Alternative 1. Alternative 1 will allow a measured implementation plan, resulting in full compliance in 8.5 years. Alternative 2, in contrast, will require compliance at the time of permit renewal, in all permit cases, in less than five years. The environmental impacts due to Alternative 2 may be of greater severity however, as the intensity of implementation actions will be greater to comply with the shorter time frame. The longer schedule of Alternative 1 allows for prioritization and planning, more thoroughly mitigated impacts, temporal distribution of compliance measures resulting in less concentration of impacts, more appropriately designed, sited and sized structural devices and, therefore, less environmental impact, in general. In addition, prioritization and planning will likely result in more efficient use of funds and lower overall costs.

ALTERNATIVE 3 - A TMDL WITHOUT WLAS AND LAS FOR NITROGEN AND PHOSPHORUS, BUT WITH MONITORING OF NITROGEN AND PHSOPHORUS.

This alternative involves a TMDL that does not have WLAs and LAs for nitrogen, but includes monitoring of nitrogen and phosphorus.

POTENTIAL ENVIRONMENTAL IMPACTS

A TMDL without WLAs and LAs for nitrogen and phosphorus, only monitoring of nitrogen and phosphorus may avoid those environmental impacts associated with compliance. However, the definition of eutrophication is the algal biomass response to nutrient loading. This alternative would still allow nutrient loading and therefore, continued impairments to the lake. Therefore, alternative 3 would have none of the environmental benefits of the TMDL as proposed, and would not achieve the goals of the CWA or the Porter-Cologne Act.

ANALYSIS OF ALTERNATIVE 3

This alternative is not recommended because while impact to the environment from construction or maintenance of lake management activities and structural BMPs would be avoided in this alternative, it would *not* restore beneficial uses to Machado Lake or attain water quality standards and represents a continued nutrient impairment of the environment. The ongoing impairment of this waterbody is far more significant that the nominal impacts that the cities discharging nutrients will be forced to endure from construction and implementation of compliance measures because Machado Lake provides habitat for numerous species of threatened and endangered birds and other wildlife and provides recreational opportunities for the community such as picnicking, birding, and walking. Furthermore, the lake allows nature to exist in the urban environment, where parks and open space are scarce. This alternative would allow continued impairment of beneficial uses and continued degradation of water quality to the detriment of public health, property values, flood control capacity, and green spaces.

Alternative 3 is not a feasible alternative because, while it avoids impacts due to discrete installation projects, it does not achieve any of the project purposes to restore and maintain water quality standards and avert federal intervention in state water quality planning.

ALTERNATIVE 4 – NO PROGRAM ALTERNATIVE

This program alternative assumes that neither the USEPA nor the Regional Board implements a Nutrient TMDL. While cities and municipalities could implement BMPs on a discretionary basis, this CEQA analysis is based on the assumption that no additional nutrient reduction BMPs would be implemented in addition to those that are presently in place. However, the No Project TMDL is contrary to federal and state law and a court ordered Consent Decree between citizen plaintiffs and the US Environmental Protection Agency. Therefore, the failure to implement a nutrient TMDL is unlawful. Further, the no-program alternative does not achieve any of the projects purposes, and is inconsistent with the Regional Board's mission.

POTENTIAL ENVIRONMENTAL IMPACTS

To the extent that significant adverse environmental impacts would be created by compliance with the TMDL as proposed, a no program alternative may avoid those environmental impacts associated with compliance. However, a no program alternative would have none of the environmental benefits of the TMDL as proposed, and would not achieve the goals of the CWA or the Porter-Cologne Act.

ANALYSIS OF ALTERNATIVE 4

This alternative is inconsistent with (a) CWA section 303(d), which requires the "state" to establish the TMDLs; (b) CWC section 13160, which delegates to the Water Board the responsibility to implement the Clean Water Act; (c) state policy for water quality control; (d) the mission of the Water Boards; and (e) the purposes of the CWA and Porter-Cologne Act which require restoration and attainment of water quality standards. Nothing in section 303(d) authorizes an alternative to a state established TMDL (except an EPA established TMDL), and nothing in CWC section 13160 authorizes the Regional Board to delegate the authority therein to stakeholders. Section 303(d) does not authorize a section 102 planning process as an alternative to a TMDL either. It says "each *state* shall establish…." Accordingly, an alternative that would involve no TMDL is not legal, and therefore not feasible.

In addition, while impact to the environment from construction or maintenance of structural BMPs would be avoided in this No Program alternative, No Program would *not* restore beneficial uses to Machado Lake or attain water quality standards and represents a continued nutrient impairment of the environment. The ongoing impairment of this waterbody is far more significant that the nominal impacts that the cities discharging nutrients will be forced to endure from construction and implementation of compliance measures because Machado Lake provides habitat for numerous species of threatened and endangered birds, and other wildlife and provides recreational opportunities for the community such as picnicking. Furthermore, the lake allows nature to exist in the urban environment, where parks and open space are scarce. The no-program alternative would allow continued impairment of these uses and continued degradation of water quality to the detriment of public health, property values, flood control capacity, cleaner streets, and green spaces.

Alternative 4 is not a feasible alternative because, while it avoids impacts due to discrete installation and management projects, it is illegal, and it does not achieve any of the project purposes to restore and maintain water quality standards and avert federal intervention in state water quality planning.

RECOMMENDED PROGRAM ALTERNATIVE

This environmental analysis finds that Program Alternative 1 is the most environmentally advantageous alternative, has the least associated significant adverse impacts, and is the only alternative that would achieve all the project purposes.

Either Alternative 1 or 2 will restore beneficial uses in Machado Lake and attain water quality standards by reducing nutrient loading to Machado Lake. As such, either Nutrient TMDL Alternative 1 or 2 represents a benefit to the environment. The key environmental difference between program Alternatives 1 and 2 is the establishment of an implementation schedule. Alternative 1 contains an implementation schedule that

allows compliance projects to be spread out over time to lessen potential environmental impacts. Alternative 2, therefore would foreseeably result in more significant impacts, not less. The key programmatic difference between Alternatives 1 and 2 is that Alternative 1 maintains state responsibility and control over water quality planning in California; Alternative 2 abdicates that responsibility to USEPA. Alternative 1, therefore meets all project purposes. Alternative 1 is therefore the recommended alternative.

PROJECT LEVEL ALTERNATIVES

The program alternatives above present many alternatives and options and do not require any specific projects to achieve compliance. Rather, a project level analysis must be performed by the local agencies that are required to implement the requirements of the TMDL (Pub. Res. Code § 21159.2.). Notably, the Regional Board is prohibited from specifying the manner of compliance with its regulations (Water Code § 13360), and accordingly, the actual environmental impacts will necessarily depend upon the compliance strategy selected by the local agencies and other permittees. Although the Regional Board cannot mandate the manner of compliance, foreseeable environmental impacts from methods of compliance are well known, as are feasible mitigation measures.

During the development of the TMDL, a CEQA scoping meeting was held (September 12, 2007) during which the manner of compliance was discussed. Potential compliance measures include structural stormwater BMPs such as diversion and treatment systems and lake management projects such as hydraulic dredging.

The components assessed at a project level have specific locations which will be determined by implementing municipalities and agencies. The project-level components will be subject to additional future environmental review, including review by cities and municipalities implementing nutrient TMDL projects. This SED includes an extensive discussion of the project alternatives.

DESCRIPTION OF IMPLEMENTATION ALTERNATIVES

This Section of the SED begins with a description of the stormwater system in the Nutrient TMDL area and a description of the type of sites where structural devices or controls might be placed in compliance with the Nutrient TMDL.

The project-level components will be subject to additional future environmental review. A project level environmental analysis must be performed by the local agencies that are required to implement the requirements of the TMDL (Pub. Res. Code § 21159.2.).

STORMDRAIN SYSTEMS

Underground stormdrains are typically designed to carry the runoff from up to a 10-year storm. Open channels are typically designed to carry the runoff from up to a 50-year storm, and in some cases, this design flow rate is increased to accommodate debris-laden flows. The rate of runoff a drain can safely convey, expressed in cubic feet per second, is called its peak capacity. While a drain's capacity will not diminish over the years, the amount of runoff generated by a given storm event can increase over the years. This potential increase could be due to a number of factors including: an increase

in the amount of development and impervious surfaces within the tributary area, and; the addition of smaller upstream tributary drains that deliver runoff more quickly to the collecting drain. The potential for such increases should always be considered in selecting the appropriate structural BMP for a particular site.

Storms are commonly referred to by their “frequency.” For example, a 1-year storm, having a long-term probability of happening at least once a year, is a very common occurrence. On the other hand, a 50-year storm event is a much rarer occurrence, with a long-term probability of occurring only once in 50 years. The actual rate of runoff from storms of a given size or frequency depends on a number of factors, including the intensity and duration of the rainfall, the size of the tributary area, the topography, the soil types within the tributary drainage area, and the overall connected imperviousness of the tributary area.

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management activities may include projects and devices that are designed to reduce and manage nutrient loading in the lake itself. This may include projects such as hydraulic dredging to remove nutrient rich sediments and an alum treatment to prevent nutrient flux from the sediments in the water column. Likewise, an aeration system may be used to maintain adequate dissolved oxygen concentrations and a fisheries management program can be used to balance the biological community. Described below are various lake management alternatives that may be implemented by responsible jurisdictions as part of TMDL compliance.

HYDRAULIC DREDGING

Dredging is the removal of accumulated sediments from the lake bottom. In general surface layers of loose nutrient rich organic material are removed. Dredging should be considered in situations where studies have demonstrated that the lake sediments are a considerable source of nutrient loading to the lake. A method of sediment removal from lakes is hydraulic dredging. A hydraulic dredge floats on the water and is approximately the size of a boat. It has a flexible pipe that siphons a mix of water and sediment from the bottom of the lake. The flexible pipe is attached to a stationary pipe that extends to an offsite location. The sediment that is removed from the lake bottom is pumped to a settling pond to dry. Hydraulic dredging does not require draining the lake or damage to the shoreline of the lake.

TRADITIONAL DREDGING

Traditional dredging is the process of removing or displacing gravel, mud, sand, and/or silt along with various materials (i.e. sediment, debris, etc.) from water bodies such as rivers, lakes, streams and their corresponding shorelines and wetlands. Traditional dredging, also known as "dry dredging", is a specific type of dredging that involves the drainage of the waterbody in order to proceed with excavation and/or repositioning of the sand and gravel. This method is generally done with the use of bulldozers and backhoes. Traditional dredging is typically used to maintain or repair (and possibly to construct) canals, navigation channels, harbors, to deepen or widen lakes. These activities of traditional dredging create disturbances in aquatic ecosystems that are largely negative and unavoidable.

There are numerous detrimental impacts to the natural environment within the waterbody subjected to traditional dredging and the surrounding area. The most immediate and severe impact of traditional dredging is the death of aquatic life inhabiting the waterbody and surrounding areas including fish, reptiles, birds, plants, algae, microscopic life, and invertebrates caused by draining the waterbody and the respective total loss of habitat for the aquatic organisms. Heavy machinery employed for excavation of the waterbody causes loss of habitat along the shoreline and areas surrounding the waterbody. This will severely impact terrestrial animals residing in areas near the waterbody. It may cause direct death of animals or the abandonment of den or nest sites that may contain young. Routine dredging practices along the shoreline can create permanent damage to the edge of the waterbody and may be a permanent loss of habitat areas.

Machado Lake is one of the last lake and wetland ecosystems in the Los Angels region and is used by many sensitive species for habitat, foraging and resting areas. Machado Lake is home to critical habitat areas such as willow riparian, coastal freshwater wetlands, and coastal sage scrub. In addition to providing critical habitat, the Machado Lake area is a key resting and foraging area for birds as part of the Pacific Flyway. The death of organisms, loss of critical habitat, and decreased biodiversity associated with traditional dredging projects would be devastating for this ecosystem.

Due to the severe and un-mitigable impacts of a traditional dredging operation Regional Board staff does not consider this is a reasonably foreseeable method of compliance for this TMDL. Therefore, the impacts of traditional dredging are not individually analyzed as part of this TMDL. Severe impacts from traditional dredging can be avoided by implementation of other lake management dredging options such as hydraulic dredging.

AERATION SYSTEM

The water quality in Machado Lake could be improved by installing aeration systems at various locations, which would help prevent an anoxic environment that can especially stressful for fish and even lead to fish kills. In general, aeration systems work by destratifying the lake through artificial circulation that mixes the water column and prevents the lake from becoming stratified (due to temperature), particularly during the summer months.

INCREASE AND/OR MAINTAIN LAKE LEVEL

Maintaining an optimal lake level is an important aspect in maintaining good lake water quality. In warm climates with short wet seasons a direct source of supplemental water with low nutrient concentrations could be used to help off set evaporative losses from the lake. Field data from Machado Lake has shown that the lake looses approximately 0.5 meters of water due to evaporation during the summer months. A supply of supplemental water would help to maintain the lake level and water quality through the summer months, which is considered the critical condition for the lake.

The source of water utilized to supplement the evaporative loss from Machado Lake could come from a variety of sources such as potable supply, stormwater (capture and reuse), or recycled water. Any water source used to supplement Machado Lake would be required to comply with the TMDL waste load and load allocations and all water quality objectives including the federal and statewide anti-degradation policy. The

Regional Board does not find it reasonably foreseeable that water not meeting water quality standards would be used as a source of supplemental water to the lake.

FLOATING ISLANDS / HYDROPONIC NESTING ISLANDS

Floating islands are constructed islands that provide terrestrial and aquatic habitat while at the same time reducing nutrient concentrations in the lake. The island provides nesting and resting habitat for bird species and the roots below the water provide fish habitat. Floating islands are beneficial in removing nutrients from the water column because the roots of these plants are exposed in the water column instead of rooted in the sediments of the lake. Plants on the floating island should be harvested occasionally in order to maintain actively growing vegetation and maximum nutrient uptake.

NUTRIENT INACTIVATION – ALUM TREATMENT

Aluminum sulfate (Alum) is generally used to inactivate nutrients in the sediments or precipitate phosphorus from the water column. Alum is applied to the lake and it will form a floc of aluminum hydroxide precipitate, which will settle and remove phosphorus from the water column through precipitation. Once the floc settles on the lake bottom, it forms a capped layer that will prevent the phosphorus flux from the sediment into the water column. Phosphorus, released from the sediments, combines with the alum and is not released into the water column where it would be biologically available for algal growth. This should lead to a decreased algal biomass in the lake due to the decreased availability of a key nutrient for algal growth. The amount of time the alum treatment is effective depends on the amount of alum applied and the depth of the lake. Alum treatment in shallow lakes for phosphorus inactivation is estimated to last approximately eight years, although it is possible for the treatment to last longer.

FISHERIES MANAGEMENT

Removal of Carp or other benthic fish would prevent the exacerbation of the nutrient problem. Additionally to balance the fish community the lake could be stocked with a piscivore such as large mouth bass or crappie. The goal of fisheries management is to create balance between the algal, zooplankton, and fish communities; this will help to create a system with low chlorophyll *a* concentrations. To accomplish this, there must be enough zooplankton grazing of the algal community to control algal growth and prevent blue green algae blooms. This is accomplished by controlling the population of zooplanktivorus fish (fish that eat zooplankton, such as – threadfin shad) with piscivore fish (fish that eat fish, such as– large mouth bass). This approach may have limited direct impact reduced nutrient loading; however the impact on improved water quality by have a more balanced food-web system can be substantial.

STORMWATER IMPLEMENTATION ALTERNATIVES

Structural stormwater BMPs may include the installation of stormwater treatment devices designed to reduce nutrient loadings, such as infiltration areas, sand or organic filters and alum injection systems, at critical points in the stormwater conveyance system. Sources of stormwater pollutants are diffuse and often require coordinated cooperation to reduce and control. Structural BMPs that may be implemented by responsible jurisdictions as part of TMDL compliance are listed below.

DIVERSION AND TREATMENT

Diversion and treatment programs would include the installation of facilities to divert stormwater or provide capture and storage of dry and or wet weather runoff with diversion of the stored runoff to location for treatment. Once the water was treated it would be routed back to the lake. Treatment options to reduce nutrients could include sand or media filters or alum injection systems. A typical sand/organic filter system contains two or more chambers. The first is the sedimentation chamber for removing floatables and heavy sediments. The second is the filtration chamber, which removes additional pollutants by filtering the runoff through a sand bed. The results of pollutant removal effectiveness vary, but typical total phosphorus removal effectiveness is approximately 60 – 80 percent (CASQA, 2003). Treatment effectiveness is somewhat less for total nitrogen and ranges from 30 – 50 percent removal (EPA, 2007).

Alum injection systems are another treatment option for dry weather or stormwater runoff. Alum injection is the process of adding aluminum sulfate salt (alum), to stormwater. Alum injection systems (AISs) have been used successfully in treating urban stormwater runoff that was significantly impairing several lakes in Florida. Alum fixes itself to common pollutants, such as phosphorus, and the floc settles from the water column. Studies of the effectiveness of nutrient removal report demonstrate 30 - 90 percent removal for nitrogen and phosphorus. Also traditional stormwater BMPs such as vegetated swales and filter strips can be used to effectively reduce nutrient loading. The range of removal efficiency is 20 – 80 percent (CASQA, 2003). The implementation schedule allows sufficient time for implementation of the BMPs.

INFILTRATION STORMWATER BMPS

VEGETATED SWALES

Vegetated swales are constructed drainageways used to convey stormwater runoff. Vegetation in swales allows for the filtering of pollutants, and infiltration of runoff into groundwater.. Broad swales on flat slopes with dense vegetation are the most effective at reducing the volume of runoff and pollutant removal. Swales planted with native vegetation offer higher resistance to flow and provide a better environment for filtering and trapping pollutants from stormwater. Vegetated swales generally have a trapezoidal or parabolic shape with relatively flat side slopes. Individual vegetated swales generally treat small drainage areas (five acres or less). A conservative estimate would say that a properly designed vegetated swale may achieve a 25 to 50 percent reduction in particulate pollutants, including sediment and sediment-attached phosphorus. Lower removal rates (less than 10 percent) can be expected for dissolved pollutants, such as soluble phosphorus, nitrate, and chloride.

FILTER STRIPS

Filter strips are densely vegetated, uniformly graded areas that treat sheet flow from adjacent impervious surfaces. They reduce runoff velocities, which traps sediment and other pollutants as they settle out. The reduced velocities also result in some infiltration. Filter strips are commonly planted with turf grass, but they may also employ native vegetation. Trees and shrubs may also be used to create visual screening and physical barriers. Filter strips are frequently used as a pretreatment system for stormwater that will be treated with other BMPs. Filter strips must be designed depending on the site.

Urban runoff studies suggest a minimum removal rate of 35 percent of solids and 40 percent of nutrients. (Metropolitan Council/Barr Engineering Co.) This assumes a filter strip that is properly designed, constructed, and maintained.

BIORETENTION

Bioretention uses a combination of soils and woody and herbaceous plants to remove pollutants from stormwater runoff. Runoff is conveyed to the treatment area, which consists of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The sand bed slows the runoff's velocity and distributes it evenly along the length of the ponding area. The ponding area has a surface organic layer and/or ground cover and the underlying planting soil. The ponding area is graded, and the center is depressed. Water is ponded to a depth of approximately 6 inches, and either infiltrates the ground, or is evapotranspired. Bioretention removes stormwater pollutants through both physical and biological processes. Common particulates removed from stormwater include particulate organic matter, phosphorus, and suspended solids.

INFILTRATION BASIN

An infiltration basin is an impoundment that captures stormwater and allows it to infiltrate into the ground over a period of days. The basin temporarily stores runoff for a specific design frequency storm. The bottom of the basin is vegetated, which is very important, as deep rooted plants increase the infiltration capacity of the basin. The roots create conduits for the water to infiltrate. The soil needs to be permeable enough to allow the water to infiltrate, but not so permeable that the water infiltrates too quickly and does not have ample time to be treated. The applicability of an infiltration basin depends on soil type, slope, depth to the water table, depth to the bedrock or impermeable layer, contributing watershed area, land use, and proximity to wells and surface waters. Infiltration basins generally require pretreatment of stormwater to remove large particulates and suspended solids before entering the basin.

NON-STRUCTURAL BMPS

Non-structural BMPs include prevention practice designed to improve water quality by reducing nutrient sources. Non-structural BMPs provide for the development of nutrient control programs that include, but are not limited to prevention, education, and regulation. Education and outreach to residents may minimize the potential for contamination of stormwater runoff; residents and businesses can be encouraged to pick up litter, minimize runoff from residential and commercial facilities, and control excessive irrigation. The public is often unaware of the fact that excess water discharged on streets and lawns ends up in receiving waters or the contamination caused by the polluted runoff.

Local agencies can provide educational materials to the public via television, radio, and print media, distribute brochures, flyers, and community newsletters, create information hotlines to outreach to educators and schools, develop community events, and support of volunteer monitoring and cleanup programs. Stormdrain inlet stenciling is another means of educating the public about the direct discharge of stormwater to receiving waters and the effects of polluted runoff on receiving water quality. Stenciling can be

conducted in partnership with other agencies and organizations to garner greater support for educational programs (USEPA, 2005).

Non-structural BMPs focus on education and outreach and do not involve a change to the physical environment, either directly or indirectly; thus, they would not result in any adverse environmental impacts to any of the impact categories on the Environmental Checklist.

SETTINGS, IMPACTS, AND MITIGATION

INTRODUCTION

This section presents the environmental setting, impacts, and mitigation, where applicable, for the proposed implementation alternatives evaluated in this draft Substitute Environmental Document (SED). The implementation alternatives for achieving compliance with the Machado Lake Nutrient TMDL are described in detail in this document and in the TMDL Staff Report. Each of these implementation alternatives have been independently evaluated in this draft SED. The environmental setting for the Machado Lake Nutrient TMDL is discussed, as well as the installation, operation, and maintenance activities associated with the nutrient TMDL implementation alternatives. There is also a discussion of the site-specific and device-specific environmental impacts from implementing the nutrient TMDL. The environmental checklist, which includes the potential negative environmental impacts of the Implementation Alternatives is also included in this section.

APPROACH TO ENVIRONMENTAL SETTING AND IMPACT ANALYSIS

Any potential environmental impacts associated with the Machado Lake Nutrient TMDL depend upon the specific compliance projects selected by the responsible jurisdictions, most of whom are public agencies subject to their own CEQA obligations. (See Pub. Res. Code § 21159.2.) This CEQA substitute document identifies broad mitigation approaches that could be considered at the program level. Consistent with PRC§21159, the substitute document does not engage in speculation or conjecture, but rather considers the reasonably foreseeable environmental impacts of the foreseeable methods of compliance, the reasonably foreseeable feasible mitigation measures, and the reasonably foreseeable alternative means of compliance, which would avoid or reduce the identified impacts.

Within each of the sections listed above, this draft SED evaluates the impacts of each implementation alternative relative to the subject resource area. The physical scope of the environmental setting and the analysis in this SED is Machado Lake and surrounding area as shown in Figure 3. This area is the geographic area for assessing impacts of the different implementation alternatives, because the discharge of nutrients generated in this area to the lake would be controlled and/or eliminated by any one of or a combination of the implementation alternatives. Also, any potential impacts of implementing the proposed alternatives would be focused in this area.

The implementation alternatives evaluated in this draft SED are evaluated at a program level for impacts for each resource area. An assumption is made that a more detailed project-level analysis will be conducted by all responsible agencies and jurisdictions

once their mode of achieving compliance with the nutrient TMDL has been determined. The analysis in this draft SED assumes that, project proponents will design, install, and maintain implementation measures following all applicable laws, regulations, ordinances, and formally adopted municipal and/or agency codes, standards, and practices. Several handbooks are available and currently used by municipal agencies that provide guidance for the selection and implementation of BMPs (Caltrans, 2002, CASQA, 2003a, CASQA, 2003b, WERF, 2005).

PROGRAM LEVEL VERSUS PROJECT-LEVEL ANALYSIS

As previously discussed, the Regional Board is the lead agency for the TMDL program, while the responsible agencies are the lead agencies for any and all projects implemented, within their jurisdiction, to comply with the program. The Regional Board does not specify the actual means of compliance by which responsible agencies choose to comply with the TMDL. Therefore, the implementation alternatives are mostly evaluated at a program level in this draft SED. The alternatives assessed at a program level generally are projects that would be implemented as part of TMDL compliance, PRC §21159 places the responsibility of project-level analysis on the agencies that will implement the water board's TMDL.

ENVIRONMENTAL SETTING

Machado Lake is located in the Ken Malloy Harbor Regional Park (KMHRP), which is a 231 acre Los Angeles City Park serving the Wilmington and Harbor City areas **(**Figure 1). The Park is located west of the Harbor freeway (110) and east of Vermont Street between the Tosco Refinery on the south and the Pacific Coast Highway on the North. Machado Lake is one of the last lake and wetland systems in Los Angeles; the area is approximately 103.5 acres in total size. The upper portion, which includes the open water area, is approximately 40 acres and the lower wetland portion is about 63.5 acres. This TMDL will address the 40 acre open water lake. The lake was originally developed as part of Harbor Regional Park in 1971 and intended for boating and fishing. Over the years water quality generally declined; boating was stopped and signs were posted warning of the risk of eating fish from the lake.

Machado Lake is located within the Machado Lake Sub-watershed which is approximately 20 square miles and positioned within the larger 110 square mile Dominguez Channel Watershed. The watershed is located in southern Los Angeles County and includes all or a portion of the following communities Harbor City, Los Angeles, Torrance, Carson, Lomita, Rolling Hills, Rolling Hills Estates, and Palos Verdes Estates. (Figure 2)

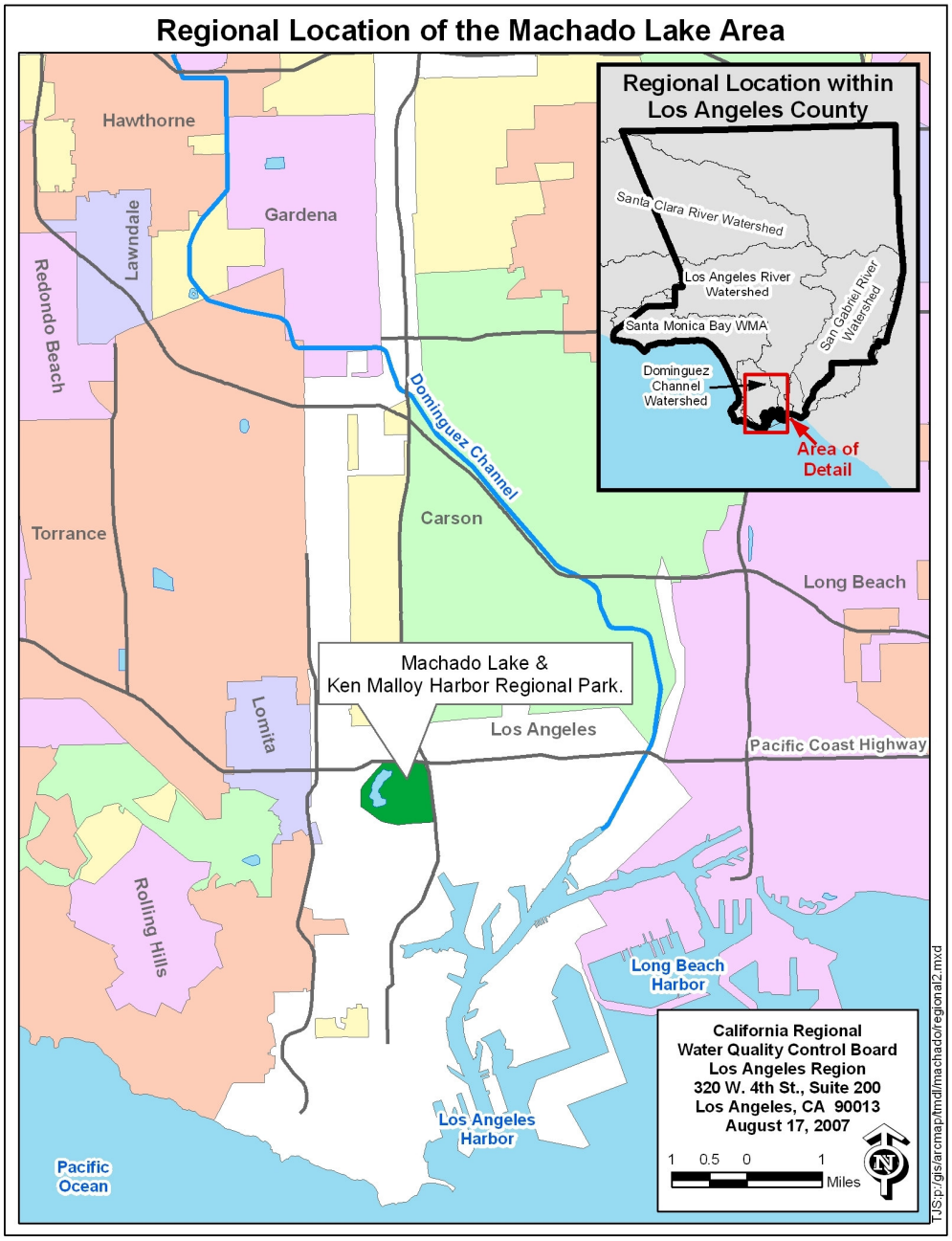

Figure 1. Regional Location Map of Machado Lake Area

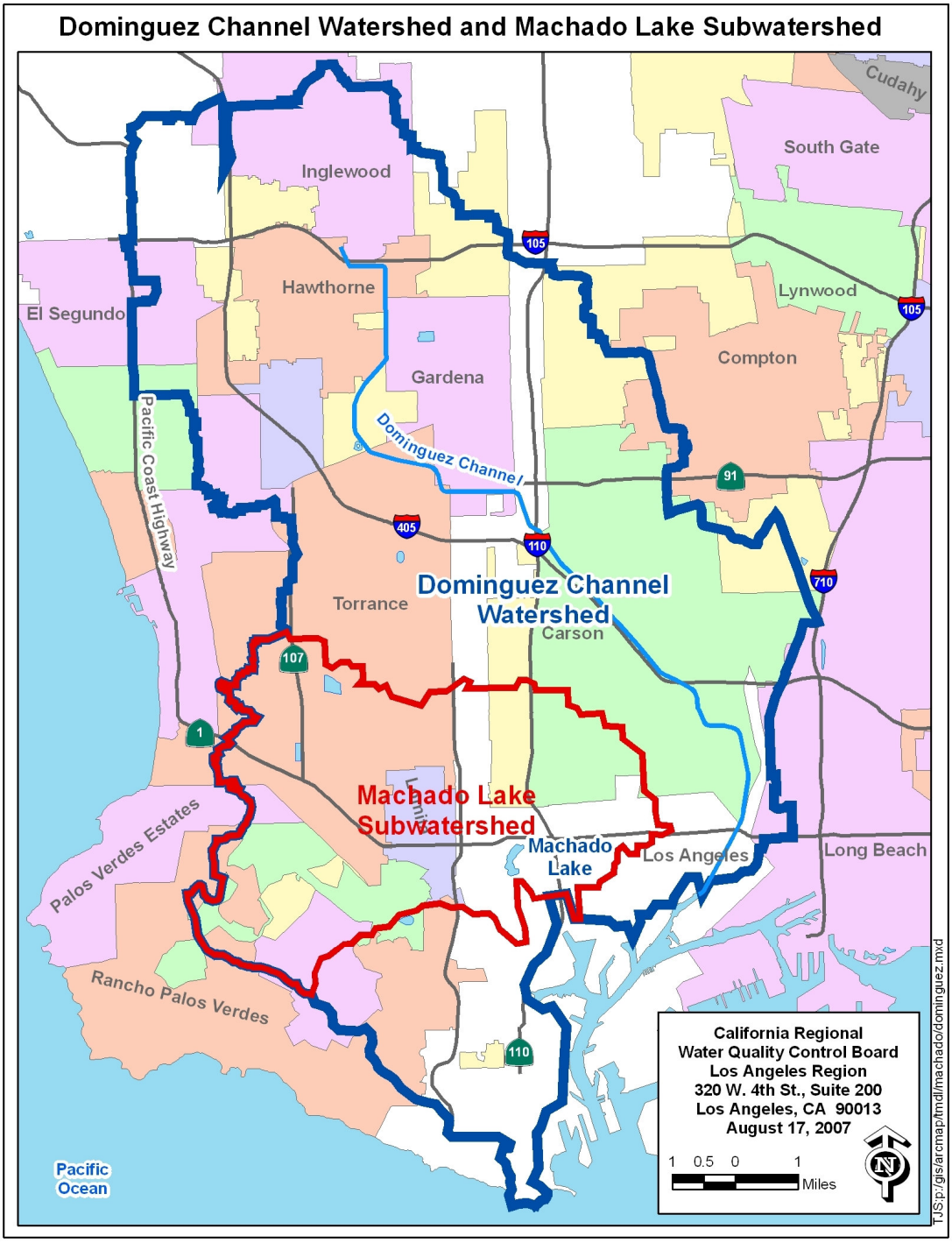

Figure 2 Dominguez Channel Watershed and Machado Lake Sub-watershed

The dominant land use in the Machado Lake Watershed is high density single family residential accounting for approximately 45 % of the land use. Industrial, vacant, retail/commercial, multi-family residential, transportation, and educational institutions each account for 5-7 % of the land use while "all other" accounts for the remaining 23 %. Machado Lake is a receiving body of urban and stormwater runoff from a network of stormdrains throughout the watershed. There are three discharge points into Machado Lake from the following stormdrain channels (Figure 3):

- Wilmington Drain
- Project No. 77
- Harbor City Relief Drain.

Machado Lake is part of one of the last freshwater wetland habitats in Los Angeles area. Although, the lake is generally located in a highly urbanized area it is surround by critical habitat and designated a significant ecological area by Los Angeles County (Basin Plan, p 1-17). Immediately bordering the lake are emergent wetland vegetation types such as bulrushes, cattails, and water primrose. On the north end of the lake, near the Wilmington Drain inlet, there is a well established willow riparian forest and an area where cottonwoods and sycamore have been planted. The willow riparian habitat continues along the east side of the lake creating a buffer between the lake and the Harbor Regional Golf Course. South of the lake, below the dam, resides the 63 acre seasonal wetland; this area contains several sensitive habitats and vegetation types. The west side of the lake is landscaped and considered the active recreation area for activities such as picnicking. There have been several recent sightings of threatened and endangered bird species residing and foraging in the area; Regional Board staff has observed least terns foraging at the lake.

Machado Lake is a shallow polymictic lake; the depth is generally 1.2 – 2.0 meters (4-6 feet) the average depth is approximately 1.0 meters. The northwest portion of the lake is slightly shallower (approximately 0.6- 0.9 meters deep). Machado Lake has been beset with water quality problems such as, algal blooms and low dissolved oxygen concentrations during summer months. There is a well established macrophyte community along the edge of the lake. The water normally has a brown – yellowish tint through out the year although, the lake can be quite green and subject to algal blooms in the summer months. The fish population includes goldfish, carp, and largemouth bass.

Figure 3 Aerial view Ken Malloy Harbor Regional Park and Machado Lake

BENEFICIAL USES OF MACHADO LAKE

The Basin Plan for the Los Angeles Regional Board (LARWQCB, 1994) defines seven beneficial uses for Machado Lake (Table 3). These uses are recognized as existing (E), potential (P) or intermittent (I) uses. Nutrient loading to Machado Lake may result in impairments of beneficial uses associated with recreation (REC 1 and REC 2), aquatic life (WARM, WILD, RARE, and WET) and water supply (MUN).

Table 3 Designated Beneficial Uses of Machado Lake

Reach	MUN	REC 1	REC 2	WARM	WILD	RARE	WET
Machado Lake	P	E	E	E	E	E	E

SITE SPECIFIC ENVIRONMENTAL ANALYSIS

Pursuant to Section 21159 of the Public Resources Code, an agency's environmental analysis must include an analysis of a reasonable range of specific sites. The following section includes a discussion of site-specific and device-specific environmental impacts for implementing the Nutrient TMDL. The municipality or public agency decisions in designing and siting structural devices and lake management projects may depend on the catchment land use. Site specific BMPs will likely be employed throughout the Nutrient TMDL area to reduce nutrient loading to Machado Lake, and specific BMPs will be best suited to particular land uses.

CEQA CHECKLIST AND DETERMINATION

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
1.	**Earth. Will the proposal result in:**				
	a. Unstable earth conditions or in changes in geologic substructures?			**X**	
	b. Disruptions, displacements, compaction or overcoming of the soil?	**X**			
	c. Change in topography or ground surface relief features?	**X**			
	d. The destruction, covering or modification of any unique geologic or physical features?	**X**			
	e. Any increase in wind or water erosion of soils, either on or off the site?	**X**			
	f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?	**X**			
	g. Exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?				**X**
2.	**Air. Will the proposal result in:**				
	a. Substantial air emissions or deterioration of ambient air quality?	**X**			
	b. The creation of objectionable odors?	**X**			
	c. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?				**X**
3.	**Water. Will the proposal result in:**				

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
	a. Changes in currents, or the course of direction or water movements, in either marine or fresh waters?	**X**			
	b. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?	**X**			
	c. Alterations to the course of flow of flood waters?	**X**			
	d. Change in the amount of surface water in any water body?	**X**			
	e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?	**X**			
	f. Alteration of the direction or rate of flow of ground waters?			**X**	
	g. Change in the quantity or quality of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	**X**			
	h. Substantial reduction in the amount of water otherwise available for public water supplies?	**X**			
	i. Exposure of people or property to water related hazards such as flooding or tidal waves?	**X**			
4.	**Plant Life. Will the proposal result in:**				
	a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?	**X**			
	b. Reduction of the numbers of any unique, rare or endangered species of plants?	**X**			
	c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	**X**			
	d. Reduction in acreage of any agricultural crop?				**X**

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
5.	**Animal Life. Will the proposal result in:**				
	a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?	**X**			
	b. Reduction of the numbers of any unique, rare or endangered species of animals?	**X**			
	c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	**X**			
	d. Deterioration to existing fish or wildlife habitat?	**X**			
6.	**Noise. Will the proposal result in:**				
	a. Increases in existing noise levels?	**X**			
	b. Exposure of people to severe noise levels?	**X**			
7.	**Light and Glare. Will the proposal:**				
	a. Produce new light or glare?	**X**			
8.	**Land Use. Will the proposal result in:**				
	a. Substantial alteration of the present or planned land use of an area?	**X**			
9.	**Natural Resources. Will the proposal result in:**				
	a. Increase in the rate of use of any natural resources?			**X**	
	b. Substantial depletion of any nonrenewable natural resource?			**X**	

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
10.	**Risk of Upset. Will the proposal involve:**				
	a. A risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	**X**			
11.	**Population. Will the proposal:**				
	a. Alter the location, distribution, density, or growth rate of the human population of an area?			**X**	
12.	**Housing. Will the proposal:**				
	a. Affect existing housing, or create a demand for additional housing?			**X**	
13.	**Transportation/Circulation. Will the proposal result in:**				
	a. Generation of substantial additional vehicular movement?	**X**			
	b. Effects on existing parking facilities, or demand for new parking?	**X**			
	c. Substantial impact upon existing transportation systems?	**X**			
	d. Alterations to present patterns of circulation or movement of people and/or goods?	**X**			
	e. Alterations to waterborne, rail or air traffic?			**X**	
	f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?	**X**			

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
14.	**Public Service. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:**				
	a. Fire protection?			**X**	
	b. Police protection?			**X**	
	c. Schools?			**X**	
	d. Parks or other recreational facilities?	**X**			
	e. Maintenance of public facilities, including roads?	**X**			
	f. Other governmental services?				**X**
15.	**Energy. Will the proposal result in:**				
	a. Use of substantial amounts of fuel or energy?	**X**			
	b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?			**X**	
16.	**Utilities and Service Systems. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:**				
	a. Power or natural gas?			**X**	
	b. Communications systems?			**X**	
	c. Water?			**X**	
	d. Sewer or septic tanks?	**X**			
	e. Stormwater drainage?	**X**			
	f. Solid waste and disposal?			**X**	
17.	**Human Health. Will the proposal result in:**				

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
	a. Creation of any health hazard or potential health hazard (excluding mental health)?	**X**			
	b. Exposure of people to potential health hazards?	**X**			
18.	**Aesthetics. Will the proposal result in:**				
	a. The obstruction of any scenic vista or view open to the public?	**X**			
	b. The creation of an aesthetically offensive site open to public view?	**X**			
19.	**Recreation. Will the proposal result in:**				
	a. Impact upon the quality or quantity of existing recreational opportunities?	**X**			
20.	**Archeological/Historical. Will the proposal:**				
	a. Result in the alteration of a significant archeological or historical site structure, object or building?	**X**			
21.	**Mandatory Findings of Significance**				
	a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	**X**			

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant	No Impact
	b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	**X**			
	c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	**X**			

ENVIRONMENTAL IMPACT ANALYSIS

1. **Earth. a.** Will the proposal result in unstable earth conditions or in changes in geologic substructures?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging involves the usage of a floatable dredge similar to the size of a boat for the removal of the top layers of sediment, primarily unconsolidated silt, and would not be of the depth or scale to result in unstable conditions or changes in the geological substructures to result in unstable earth conditions.

Aeration System

Aeration systems may include the use of floatable, suspendible, submersible devices tethered to the lake bottom and the installation or usage of an aeration system at Machado Lake would have minimal interaction and impact on underlying soils and structures and is not anticipated to result in unstable conditions or changes in the geologic substructures.

Maintain Lake Level

The additional of a supplemental water source to the lake in order to maintain lake level is not anticipated to result in conditions or changes in the geologic substructures. If this requires the additional pipe to route water to the lake it is not anticipated that this construction activity would not be to the size or scale to result in unstable earth conditions or in changes in geologic substructures. Geological surveys can be conducted prior to construction to aid in site selection.

Currently, supplemental water is added to the lake on an irregular basis; these water additions have not impacted geologic substructures

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands is not anticipated to be of the scale to result in unstable earth conditions or changes in geologic substructures.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and direct alum treatment at Machado Lake would have minimal interaction and impact on underlying soils and structures and is not expected to result in unstable earth conditions or in change to geologic substructures.

Fisheries Management

Conducting a fisheries management program at Machado Lake would have minimal interaction with underlying soils and sediment and is not anticipated to result in adverse impacts to geologic substructures or result in unstable earth conditions.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Infiltration devices like biofiltration, vegetated swales, filter strips, biorentention, and infiltration basins would not be of the size or scale to result in unstable earth conditions or in changes in geologic substructures. Proper sizing and siting is necessary to ensure that BMPs are installed away from areas with loose or compressible soils, areas with slopes that could destabilize from increased groundwater flow. Geological surveys can be conducted prior to installation to aid in siting the devices.

Diversion and Treatment

Construction of diversion and treatment facilities, like sand and media filters and alum injection systems would not be of the size or scale to result in unstable earth conditions or in changes in geologic substructures. Construction of diversion and treatment facilities requires relatively shallow earthwork. Sand filters require a minimum of 18 inches of sand overlaying 6 inches over 2 inches of gravel (CASQA, 2003).

Alum injection pumps are surface structures and construction of these stations and injections pipes would not be of the size or scale to cause unstable earth conditions or changes in geologic substructures.

1 **Earth. b.** Will the proposal result in disruptions, displacements, compaction or overcoming of the soil?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging involves the usage of a floatable dredge similar to the size of a boat for the removal of the top layers of sediment, primarily unconsolidated silt, and would not be of the depth or scale to result in disruptions, compaction or overcoming of the soil. Contaminated layers of sediment and soil in the lake bottom will be removed and displaced, however, this displacement is considered a positive impact.

Aeration System

Aeration systems may include the use of floatable, suspendible, submersible devices tethered to the lake bottom and the installation or usage of an aeration system at Machado Lake would have minimal interaction and impact on underlying soils and structures and is not anticipated to result in disruptions, displacements, compaction or overcoming of the soil.

Maintain Lake Level

The addition of the supplemental water to maintain the lake level at Machado Lake would not increase interaction with underlying soils and structures that exist in natural conditions and is not expected to result in disruptions, displacements, compaction or overcoming of the soil.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands is not anticipated to be of the scale or result in unstable earth conditions or changes in geologic substructures.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and direct alum treatment at Machado Lake would have minimal interaction and impact on underlying soils and structures and is not expected to result in disruptions, displacements, compaction, or overcoming of the soil.

Fisheries Management

Conducting a fisheries management program at Machado Lake would have minimal interaction with underlying soils and sediment and is not anticipated to result in disruptions, displacements, compaction or overcoming the soil.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration StormWater BMPs

The use of infiltration stormwater BMPs to treat a portion of stormwater could potentially result in disruptions of the soil, increased risk of liquefaction, or slope instability by increasing the rate at which water is discharged to the ground. This impact could be mitigated to less than significant levels if devices are properly designed and sited in areas where the risk of soil disruption is minimal. Suitable sites would be determined by geotechnical studies, conducted prior to construction of infiltration stormwater BMPs, to define site-specific surface and subsurface conditions, infiltration rates, and soil and groundwater characteristics.

Site specific studies should also evaluate on-site and off-site structural stability due to extended subgrade saturation and/or head loading of the permeable layer, including potential impacts to down gradient properties, especially on hills with known side-hill seeps. A minimum of 10 feet of groundwater separation is required (Caltrans, 2005). Investigations would be conducted to demonstrate the absence of potentially liquefiable soils or to prove that such soils are not and will not become saturated. If the project were determined to have the potential to cause an increased risk of liquefaction, monitoring and contingency measures should be required to reduce impacts to a less-than-significant level.

Such measures could include the installation of new monitoring wells to detect any substantial increase in groundwater levels and the re-routing of stormwater to other facilities as applicable if a substantial increase was detected. Infiltration devices should not be sited less than 10 feet down gradient or 100 feet up gradient from structural foundations when infiltrating to near surface groundwater (Caltrans, 2005). Potentially suitable methods for mitigation of lateral spread hazards to nearby structures may include edge containment structures, removal or treatment of liquefiable soils, ground improvements, reinforced foundations, or design of facilities to withstand predicted ground softening and/or displacements to an acceptable level of risk (CGS, 2002).

Finally, runoff from areas with inadequate depth to groundwater or unsuitable soils for infiltration should be treated with alternative structural treatment devices such as sand filters (CASQA, 2003) or nonstructural BMPs.

Diversion and Treatment

Disruption of the soil may occur during construction activities associated with installation of media filters or diversion and treatment facilities. Much of the upstream areas of the Machado Lake subwatershed is located in highly urbanized of single family residential housing and industrial, commercial, educational, and transportation land uses (see section 1.3 of the staff report). This high amount of urbanization has already led to soil compaction and hardscaping. However, to the extent that any soil is disturbed during construction, standard construction techniques, including but not limited to, shoring, piling and soil stabilization can mitigate these potential short-term impacts.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

1 **Earth. c.** Will the proposal result in change in topography or ground surface relief features?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging does require temporary storage of the dredge material for drying prior to disposal. The area where the dredge material is contained and stored for drying may be impacted by a temporary change in topography or surface relief. However, this impact would only be temporary and short-term as the dredge material will be properly disposed.

Aeration System

Aeration systems may include the use of floatable, suspendible, submersible devices tethered to the lake bottom and the installation or usage of an aeration system at Machado Lake would have minimal interaction and impact on underlying soils and structures and impacts would not be of the size or scale to result in change in topography or ground surface relief features.

Maintain Lake Level

The addition of the supplemental water to maintain the lake level at Machado Lake would not increase interaction with underlying soils and structures that exist in natural conditions and is not expected to result in changes in topography or ground surface relief features.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands is not anticipated to be of the scale or result in changes in topography or ground surface relief features.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and direct alum treatment at Machado Lake would have minimal interaction and impact on underlying soils and structures and is not anticipated to require earth moving that would cause changes in topography or ground surface relief features.

Fisheries Management

Conducting a fisheries management program at Machado Lake would have minimal interaction with underlying soils and sediment and is not anticipated to result in changes to topography or ground surface relief features.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

No impact is expected because infiltration stormwater BMPs and diversion and treatment facilities would not be of the size or scale to result in change in topography or ground surface relief features.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are

deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

1 Earth. d. Will the proposal result in the destruction, covering or modification of any unique geologic or physical feature?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging involves the usage of a floatable dredge similar to the size of a boat for the removal of the top layers of sediment, primarily unconsolidated silt and the operation may result in physical landscape changes that would cause the destruction, covering, or modification of any unique geologic or physical feature. This impact is temporary and existent only for the duration of the dredging operation. Temporary staging of the dredge material may help mitigate impacts potential impacts of dredging.

Aeration System

An aeration system would not be to the size or scale to result in destruction, covering or modification of any unique geologic or physical feature.

Maintain Lake Level

Maintaining the lake level may require physical landscape impacts that may cause the destruction, covering, or modification, of any unique geologic or physical feature. Diversionary pumps and structures and pipes may be employed to route supplemental water to the lake. This impact may be mitigated by located the pumps, structures, and pipes in the subsurface or designing the system to employing adequate hydraulic head and gravity for routing the flow.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands would not be to the size or scale to result in destruction, covering, or modification of any unique geologic or physical feature.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and direct alum treatment at Machado Lake would have minimal interaction and impact on underlying soils and structures and is not expected to result in landscape changes that would cause the destruction, covering, or modification of any unique geologic or physical feature. Alum floc retains the same coloration as underlying sediment and would not impact any unique geologic features.

Fisheries Management

A fisheries management program at Machado Lake would not cause the destruction, covering, or modification of any unique geologic or physical feature. The size and

population density of the fish is not of the scale to result in destruction, covering, or modification of any unique geological or physical features.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Implementation stormwater BMPs are not of the size or scale to alter unique geologic or physical features. Upstream portions of the Machado Lake subwatershed are highly urbanized with modification and hardscaping.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

1 Earth. e. Will the proposal result in any increase in wind or water erosion of soils, either on or off the site.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging is not expected to result in increased wind or water erosion of soil. The contained and stored of dredge materials may be subject to erosion processes during drying. This can be mitigated by covering dredge materials during windy or rainy condition. Once the dredged material is dry and disposed of potential erosion processes will cease. This erosion may occur as a short-term impact and can be mitigated by measures to minimize offsite sediment movement.

Aeration System

The implementation of an aeration system may increase water movement and wave velocities, potentially increasing water erosion of shoreline soil, inadequately protected with vegetation cover. Proper siting, design, and selection of lower power aerators may help mitigate a potential increase in erosion of shoreline soils.

Maintain Lake Level

Maintaining the lake level will not result in increased wind or water erosion of soil. Although, minor construction maybe needed for additional pipes etc., but this construction related soil excavation would cease with the cessation of construction any potential impacts would be short-term. Moreover, construction sites are required to retain sediment on site, both under general construction stormwater NPDES permits and through the construction program of the applicable MS4 permits; both of which are designed to minimize or eliminate soil erosion impacts to receiving water.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The operation and anchoring of the floating hydroponic nesting islands is not anticipated to result in increased wind or water erosion of soil. Proper siting and design of the floating hydroponic nesting islands island may mitigate potential increased wind or water movement velocity from the placement of the islands in the water.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and direct alum treatment at Machado Lake would have minimal interaction on wind and water movement velocities and is not expected to result in an increased wind or water erosion of soil.

Fisheries Management

Conducting a fisheries management program at Machado Lake would have minimal interaction with wind and water movement velocities and is not anticipated to result in an increase wind or water erosion of soil.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

The use of infiltration stormwater BMPs to treat runoff could result in erosion of the surface and underlying soil by increasing the rate at which water is discharged to the ground. This potential impact could be mitigated to less than significant levels if structural management practices are designed in compliance with existing regulations, standard specifications and building codes and sited in areas where risks to soil erosion are minimal. Proper siting, aided by geotechnical studies to define site-specific soil conditions, will help to determine identify site capable of supporting excess infiltration of stormwater as well site devices, such that they do result in an increase of wind erosion of soils. Soil types are restricted to HSG Class A, B, or C soils and soils with less than 30% clay and less than 40% combined silt and clay (Caltrans, 2005). Use of vegetated or other buffer strips can help reduce flow velocities to further mitigate water erosion of soils and improve infiltration and treatment efficiency.

Construction of infiltration stormwater BMPs could result in erosion of soils onsite. Cover plants and buffer strips may be planted prior to the completion of infiltration stormwater BMPs to reduce run-off and promote infiltration. Construction plans should also minimize clearing and grading activities and phase construction to limit soil exposure,

stabilize exposed soils immediately, protect steep slopes and cuts, and install sediment controls (USEPA, 2005). Furthermore, construction sites are required to retain sediments on site, either by a general construction stormwater permit or through the construction program of the applicable MS4 permit. Both permits are already designed to minimize or eliminate erosion impacts on receiving water.

Diversion and Treatment

Sand and media filters consist of coarser grade sediment and is less likely to be susceptible to erosion than finer grained material or uncovered soils. Use of vegetated or other buffer strips can help reduce flow velocities to further mitigate water erosion of soils and improve treatment efficiency as well as direct the flow across the filter uniformly.

Construction of sand and media filters and diversion and treatment facilities could result in erosion of soils onsite. Cover plants and buffer strips may be planted prior to the completion of infiltration stormwater BMPs to reduce run-off and promote infiltration. Construction plans should also minimize clearing and grading activities and phase construction to limit soil exposure, stabilize exposed soils immediately, protect steep slopes and cuts, and install sediment controls (USEPA, 2005). Furthermore, construction sites are required to retain sediments on site, either by a general construction stormwater permit or through the construction program of the applicable MS4 permit. Both permits are already designed to minimize or eliminate erosion impacts on receiving water.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

1 **Earth. f.** Will the proposal result in changes in or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging will modify the lake bed by removing materials that have been deposited in the lake from years of sedimentation processes. Hydraulic dredging will not increase lake sedimentation. There is a change in the lake bed under this implementation alternative, but it is a positive change and improves the lake. There may be increased sediment resuspension in the lake; however this impact is generally not

significant as lake ambient lake turbidity measurements 10 -20 feet from the dredge head are rarely above typical lake measurements.

Aeration System

The operation of an aeration system could potentially increase the movement and/or deposition of sediment by changing hydrological mixing and therefore, may result in changes in deposition of sediment materials in the lake bed. The potential effects from an aeration system can be adequately studied and modeled to mitigated potential impacts by appropriate design and placement of aerators. Aeration systems have been successfully implemented in other lakes without excessively changing sediment deposition or modifying the lake bed.

Maintain Lake Level

The addition of supplemental water to maintain the lake level may increase the quantity and velocity of water flowing in to the lake and potentially result in changes in siltation and deposition or erosion which may modify the lake bed. This potential impact maybe mitigated through control of the rate of addition of supplemental water, decreasing the flow deposition rate.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands is not anticipated to be of the scale or result in unstable earth conditions or changes in geologic substructures. The installation of floating hydroponic nesting islands are not expected to cause changes in siltation or deposition of sediment materials that would modify the lake bed.

Alum Treatment

An alum treatment at Machado Lake would not cause changes in siltation or deposition of sediment materials. However, an alum treatment would modify the lake bed by creating an alum “cap” over the top layer of sediment. However, the goal and purpose of an alum treatment is to modify the lake bed in this manner to preventing the release of nutrients from the sediments. This would be considered a positive change in the lake bed.

Fisheries Management

A fisheries management program may potentially reduce modification of the lake bed through the removal of benthic fish. This is a positive impact because lake bed disturbance is a component of sediment resuspension, which is highly contaminated with nutrients, in the water column.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Infiltration stormwater BMPs and diversion and treatment facilities may impact siltation or deposition of sand. Infiltration stormwater BMPs and diversion and treatment facilities are designed to treat, retain, filter, and or infiltration run-off. Minimal deposition currently occurs within the concrete lined drains. Reduction in siltation in the lake may be considered a positive impact as fine sediments may reduce the overall habitat of the lake and decrease water levels.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

1 **Earth. g.** Will the proposal result in exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure or similar hazards.

Answer: No Impact

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of lake management would be of the size or scale to result in an exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Proper siting conducted with geotechnical studies prepared at the project level would avoid the risk of damage from seismic-related hazards. It is not reasonably foreseeable that responsible agencies would choose to comply with this TMDL through structural means in areas where doing so would result in exposure of people or property to geologic hazards. For example, the Caltrans Stormwater Quality Handbook restricts usage of infiltration devices in seismic impact zones, unstable areas, or highly expansive/collapsible soils (Caltrans, 2007).

2 **Air. a.** Will the proposal result in substantial air emissions or deterioration of ambient air quality?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging will require the use of heavy equipment for example; the dredge itself and trucks to transport dredge material. The adverse impacts to ambient air quality may result from short-term operation of the dredge and increased in truck traffic for dredge material transportation. These impacts are temporary and can be mitigated. Mitigation measures for increased air emissions due to increased vehicle trips or for heavy equipment due to hydraulic dredging operations may include, but are not limited to, the following: 1) use of construction and maintenance vehicles with lower-emission engines, 2) use of soot reduction traps or diesel particulate filters, 3) use of emulsified diesel fuel, and 4) proper maintenance of vehicles and equipment so they operate cleanly and efficiently.

Aeration System

The installation of the aeration system will require workers and vehicles the transport the aerators to the lake. These impacts are temporary and can be mitigated by the use of low emission vehicles as well as other SCAQMD recommended mitigation measures.

Maintain Lake Level

Maintaining the lake level at Machado Lake is not expected to impact ambient air quality. However, if additional pipes are needed to transport a source of supplemental water to the lake there may be adverse impacts to ambient air quality from construction. The construction activities of pipe installation may cause short-term increases in traffic due to construction and may require the use of heavy equipment, which contribute to air emissions. Construction BMPs can be implemented to mitigated air impacts along with the use of low emission vehicles as well as other SCAQMD recommended mitigation measures.

Floating Islands/Hydroponic Nesting Islands

The installation of the floating hydroponic islands will require workers and vehicles to transport the islands to the lake. These impacts are temporary and can be mitigated by the use of low emission vehicles as well as other SCAQMD recommended mitigation measures

Alum Treatment

An alum treatment if conducted at Machado Lake would require the use of vehicles for transport and a boat to distribute the alum in the lake. The adverse impacts to ambient air quality may result from short-term operation of the boat and truck traffic. These impacts are temporary and can be mitigated. Mitigation measures for increased air emissions due to increased vehicle trips and boat operation may include, but are not limited to, the following: 1) use of vehicles with lower-emission engines, 2) proper maintenance of vehicles and equipment so they operate cleanly and efficiently as well as other SCAQMD recommended mitigation measures.

Fisheries Management

The fisheries management program at Machado Lake may include activities that may require increased trips to the lake by personnel and increased boat usage. The emissions from these activities would be on-going as the fisheries management program would be on-going. However, the emissions can be mitigated by the use of low emission vehicles and by incorporating fisheries management activities into the current lake management activities, thus minimizing the actual increase in boat usage and vehicle trips to the lake. Additionally, the implementation of SCAQMD mitigation measures can reduce air emissions.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Short term and increases in traffic during the construction and installation of infiltration stormwater devices and long-term intermittent increases in traffic caused by ongoing maintenance of these devices (e.g., delivery of materials and maintenance activities) are potential sources of increased air pollutant emissions. Construction activities could also potentially cause re-suspension of dry sediments. However, emission levels for potentially emitted pollutants are expected to be below the SCAQMD Air Quality Significance thresholds considering the scale of the nutrient TMDL program. Detailed analysis can only be done at project level. Any potential air emissions resulting from construction or maintenance activities would be subject to regulation by SCAQMD or the California Air Resources Board.

Mitigation measures for increased air emissions due to increased vehicle trips or increased use of construction equipment include: (1) use of construction and maintenance vehicles with lower-emission engines, (2) use of soot reduction traps or diesel particulate filters, (3) use of emulsified diesel fuel, (4) design of treatment devices to minimize the frequency of maintenance trips, and (5) proper maintenance of construction vehicles. Mitigation measures for re-suspension of sediments caused by construction activities include the use of vapor barriers and moisture controls to reduce transfer of small sediments to air. Exposed areas can be revegetated or covered to reduce fugitive dust.

Diversion and Treatment

Short term increases in traffic and emissions during the construction of diversion and treatment facilities and long term emissions caused by operation and maintenance of these facilities are potential sources of increased air pollutant emissions.

Routing water to and from treatment facilities and operation of alum injection systems could require pumping stations along pipelines, which could generate air emissions through operation and maintenance of pump stations and offsite electricity generation. Pump station operational intensity is dependant on flow. High flow storm events may exasperate the usage of pumps and adversely increase air pollution. Any potential air emissions would be subject to regulation by SCAQMD or the California Air Resources Board.

Mitigation measures for increased air emissions due to increased vehicle trips or increased use of construction equipment include: 1) use of construction vehicles with

lower-emission engines, 2) use of soot reduction traps or diesel particulate filters, 3) use of emulsified diesel fuel, and (4) proper maintenance of construction vehicles. Mitigation measures for re-suspension of sediments caused by construction activities include the use of vapor barriers and moisture controls to reduce transfer of small sediments to air. Exposed areas can be revegetated or covered to reduce fugitive dust.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

2 Air. b. Will the proposal result in creation of objectionable odors?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging may result in objectionable odors due to the anaerobic nature of sediments. However, this odor would be temporary and localized to personnel operating the dredge and would quickly dissipate and not be a significant impact. Objectionable odors may also be created due to exhaust from the operation of equipment and vehicles, but these impacts are temporary and localized to the operation of heavy equipment. BMPs such as those recommended by the SCAQMD can be implemented to mitigated air quality impacts

Aeration System

It is not expected that an aeration system will result in objectionable odors. Aeration systems would induce greater oxygenation of lake waters, increasing the dissolved oxygen. A more oxygenated system would reduce the amount of mercaptons and hydrogen sulfides, prevalent in anoxic conditions and responsible for the pungent odor commonly experience in systems like swamps and bogs, which would reduce the amount of objectionable odors that exist in the ambient environment resulting in an overall positive impact.

Maintain Lake Level

Maintaining the lake level at Machado Lake is not expected to result in objectionable odors. However, if additional pipes are constructed to transport a source of supplemental water to the lake there may be short-term adverse odors due to exhaust from construction equipment and vehicles. However, these impacts are temporary and localized to construction activities alone. Construction BMPs can be implemented to

mitigated air impacts along with the use of low emission vehicles as well as other SCAQMD recommended mitigation measures.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands may result in the creation of objection odors. These odors are associated with the use of motorized vehicles and boats. Any impact would be temporary and short term. The operation of floating hydroponic islands is not anticipated to result in the creation of objectionable odors, however proper design, selection of the less odorous plants, and regular inspection and maintenance may also help mitigate the creation objectionable odors.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and is odorless. Direct alum treatment at alum treatment is not expected to result in the creation of objectionable odors. The alum will be applied to the water column and create a "cap" over the lake bottom, which is anoxic in nature, further reducing the release of hydrosulfides and mercaptons and reducing the amount of objectionable odors in the ambient environment, which would result in a positive impact.

Fisheries Management

It is not expected that a fisheries management program at Machado Lake will result in the creation of objectionable odors. A balanced healthy fish population in the lake will help to reduce nutrient loading and improve nutrient cycling resulting in positive lake impacts.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Infiltration stormwater BMPs and diversion and treatment facilities may be a source of objectionable odors if design allows for water stagnation or collection of water with sulfur-containing compounds. Stormwater runoff is not likely to contain sulfur-containing compounds, but stagnant water could create objectionable odors. For example, improper design or maintenance of infiltration basins, sand and media filters, and biorentention devices may lead to clogging and stagnation of water creating objectionable odors. Vegetated systems require inspection and maintenance, replacing diseased and dead or dying plants to prevent build-up of detritus, and replacement of existing plants to increase efficiency and maximize nutrient uptake (WERF, 2005). Malfunctioning alum injection system pumps may lead to stagnation of settling ponds. Routine monitoring, inspection, and maintenance can help prevent equipment malfunctions.

Mitigation measures to eliminate odors caused by stagnation could include covers, aeration, filters, barriers, and/or odor suppressing chemical additives. Devices could be inspected to ensure that intake structures are not clogged or pooling water. During maintenance, odorous sources could be uncovered for as short of a time period as

possible. To the extent possible, structural BMPs could be designed to minimize stagnation of water (e.g., allow for complete drainage within 48 hours) and installed to increase the distance to sensitive receptors in the event of any stagnation.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

2 Air. c. Will the proposal result in alteration of air movement, moisture or temperature or any change in climate, either locally or regionally?

Answer: No impact

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of lake management projects or structural BMPs will result in an impact to air in the alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonably foreseeable that infiltration stormwater BMPs and diversion and treatment facilities would not result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

3 Water a. Will the proposal result in changes in currents, or the course of direction or water movements in either marine or freshwaters.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging involves the usage of a floatable dredge similar to the size of a boat for the removal of the top layers of sediment. During dredging water movement within the lake may be impacted, however this impact is temporary and only existent during the hours in which the dredge is operating. Hydraulic dredging at Machado Lake is not expected to permanently change currents or the direction of water movements in the lake, after the dredging has been completed.

Aeration System

An aeration system could potentially alter the direction of water movement. Aeration systems are designed to destratify the lake through artificial circulation that mixes the water column. Adequate modeling, siting, and planning can help to mitigate any possible negative impacts caused by water movement.

Maintain Lake Level

Maintaining the lake level by addition of supplemental water is may potentially alter the current or course direction of freshwaters in the lake. This impact may occur by the addition of water at times which the lake may experience very little to zero flow. This impact maybe mitigated by controlling the frequency, duration, and rate of additional flow entering the lake.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands may potentially change the current or course of water movement at the lake, however these impacts are temporary and exist only during placement and anchoring. The operation of floating islands/hydroponic nesting islands may also potentially impact currents and the direction of water movement in the lake. Proper siting and design may help mitigate potential impacts associated with the islands. If impacts are significant and unmitigable, responsible parties may choose to employ other strategies which would result in less impact.

Alum Treatment

Alum treatment to control nutrient release from the lake sediments may potentially change the current or course of water movement at the lake during direct application; however this impact is temporary and only existent during hours which vehicular application is present and is non-existent after application.

Fisheries Management

The implementation of a fisheries management program at Machado Lake is not expected to permanent change the current or course of water movement at the lake, because the fish are not of the size or population density to result in alteration of water movement. Use of pumps and aquatic vehicles may potentially impact water movement, however this impact is temporary and existent only during hours of pump and aquatic vehicle usage.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Sand and media filters and biofiltration may impede or slow overland flow to stormdrains if not properly designed and maintained. Devices should be designed to allow adequate drainage of water and maintained to remove clogged material to mitigate this impact. A change in freshwater movement may occur if compliance with the TMDL is achieved in part through infiltration or diversion of stormwater from open channels to wastewater or urban runoff treatment facilities. Alum injections systems inject alum into upstream

stormwater conveyances followed by the diversion and collection of floc in the settling ponds (Knox County, 2007). The treated water can be pumped back into the storm system minimizing impacts on water movement. Reductions in dry and wet-weather flow could have potential negative impacts on minimum flows required to support aquatic life. Potential impacts to dry and wet-weather flow should be considered at the project level. Mitigation measures to maintain minimal flow to support habitat related beneficial uses should be reviewed and approved by the California Department of Fish and Game (CDFG) and United States Fish and Wild Life Service (USFWS). Diverted run-off can be discharged back into the lake following treatment to maintain minimum flow.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water b. Will the proposal result in changes in adsorption rates, drainage patterns or the rate and amount of surface runoff.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The implementation of the following lake management alternatives are not expected to change the adsorption rate, drainage pattern, or rate and amount of surface runoff.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Alum treatment
- Fisheries Management

The listed lake management alternatives are applied directly at or on the lake and, other then hydraulic dredging, are not anticipated to required extensive excavation, removal of cover plants, result significant affect drainage patterns. Hydraulic dredging involves the removal of lake bed sediment and also has minimal affect on surface sediments. To the extent that temporary staging, use of construction equipment, and maintenance or other vehicles may cause significant compaction significantly impact absorption rates, construction BMPs and mitigation measures as available to mitigate the potential impact.

Also see 1. Earth a. and 1. Earth b.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Changes in drainage patterns and the rate and amount of surface water runoff will occur if a portion of stormwater is diverted, captured, treated, and infiltrated to achieve compliance with the TMDL. Infiltration stormwater BMPs will also have a positive impact on the rate of water absorption. Such devices address the effects of development and increased impervious surfaces in the watershed (USEPA, 2002). Potential negative impacts to dry and wet-weather flow should be considered at the project level. Mitigation measures to maintain minimal flow to support habitat related beneficial uses should be reviewed and approved by the CDFG and the USFWS.

Diversion and Treatment

Sand and media filters are flow-through devices that may cause a change in the rate of surface water runoff. These units may impede or slow overland flow to the stormdrain system. Any device installed on-line, especially an older, under-capacity stormdrain could have a negative effect on the drain's ability to convey surface waters, including flood waters. This negative impact can be mitigated through design of sand and media filters with flow splitters or overflow/bypass structures and by performing regular maintenance of these devices and if necessary enlargement of the stormdrain upstream of the device (CASQA, 2003). Alum injections systems inject alum into upstream stormwater conveyances followed by the diversion and collection of floc in the settling ponds (Knox County, 2007). Treatment ponds should be designed to handle appropriate storm flows to ensure the integrity of the backs. Stormwater conveyances can also be installed with bypasses to convey flow in excess of designed capacity back into the storm system. The treated water can be pumped back into the storm system minimizing impacts on water movement.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water c. Will the proposal result in alterations to the course of flow of flood waters.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The implementation of the following lake management alternatives are not expected to change the course of flow of flood waters. These projects will not prevent the lake from overtopping the dam and providing water to the lower wetlands, which is the current flood regime at Machado Lake

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Alum treatment
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

The use of infiltration stormwater BMPs could result in the diversion and infiltration of a portion of stormwater, altering its current course of flow into the lake. To mitigate any potential impacts, channels leading to infiltration devices should be designed to minimize erosion. Infiltration basins should be designed to treat only small storms, (i.e., only for water quality) and should be designed off-line. Potential impacts to the course of flow of flood waters may be considered a positive impact, as infiltration stormwater BMPs are likely to reduce the flow rate need for additional stormwater conveyance infrastructure.

Diversion and Treatment

Diversion and treatment facilities of a portion of stormwater would alter its current course of flow into the river. Any device into a stormdrain, especially an older, under-capacity drain could have a negative effect on the drain's ability to convey waters, including flood waters. This negative impact can be mitigated through proper design and maintenance of these devices. The size of the contributing drainage area should not exceed standard specifications (e.g., surface sand filters should treat no more than 25 acres and underground sand filters should treat no more than 2 acres) (CASQA, 2003). Alum settling ponds typically require a minimum of 50 acres for drainage (Knox County, 2007). Devices should be designed to allow bypass of flows that exceed the design capacity. Enlargement of the drain upstream of the device may be required. Bypass should be installed in stormwater conveyances for flows that exceed treatment capacities. The treated stormwater may also be diverted back into the stormwater system to mitigate the impact on the flow of food waters.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water d. Will the proposal result in change in the amount of surface water in any waterbody?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

The goal of hydraulic dredging is to remove years of accumulated sediment and restore the lake depth to a level that will improve water quality. The increase in lake depth would provide greater storage area for water in the lake. This would be considered to be a positive impact and would help to improve water quality.

Aeration System

Aeration systems may include the use of floatable, suspendible, submersible devices tethered to the lake bottom and the installation or usage of an aeration system is not anticipated to result in change to the amount of water in the lake.

Maintain Lake Level

Maintaining the lake level during the dry season by adding supplemental water to the lake would increase the amount of water in the lake during the summer months. This would be considered a positive impact. The evaporative loss of water from the lake in the summer can be considerable and lead to the concentration of constituents such as nutrients and salts that can impair water quality.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands are installed and reside on the lake surface. The placement and anchoring of the floating hydroponic nesting islands is not anticipated to induce evapotranspiration to the scale to result significant change to the amount of water in the lake.

Alum Treatment

Alum is powdery substance used to inactive nutrients in sediments or precipitate phosphorous in the water column, and direct alum treatment at Machado Lake and alum floc formation would have minimal interaction with evaporation rates or water flow and is not anticipated to result in change to the amount of water in the lake.

Fisheries Management

A fisheries management program at the lake is not anticipated to result in change to the amount of water in the lake because the program will not induce excess evaporation or reduce or promote added water concentrations at the lake.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

A change in the amount of surface water may occur if compliance with the TMDL is achieved in part through infiltration stormwater BMPs or diversion and treatment of stormwater which would otherwise enter stormdrain system discharging into the lake. Machado Lake supports sensitive freshwater wetland habitat (see section 1.3 in the staff report). Reductions in dry and wet-weather flow could have potential negative impacts on minimum flows required to support and protect the wetland habitat. Potential impacts

to dry-weather flow should be considered at the project level. Mitigation measures to maintain minimal flow to support habitat related beneficial uses should be reviewed and approved by the CDFG and the USFWS.

Diversion and Treatment

Sand and media filters may impede or slow overland flow to stormdrains if not properly designed and maintained and could change the amount of surface water. Devices should be designed to allow adequate drainage of water and maintained to remove clogged material to mitigate this impact. Alum settling ponds may potentially impact the quantity of surface water discharge into lake if not adequately design to treat the target flow. Flow bypasses should be installed to divert stormwater in excess of treatment capacity. The treated water can be pumped back into the storm system minimizing impacts on water movement. Reductions in dry and wet-weather flow could have potential negative impacts on minimum flows required to support aquatic life. Potential impacts to dry and wet-weather flow should be considered at the project level. Mitigation measures to maintain minimal flow to support habitat related beneficial uses should be reviewed and approved by the CDFG and USFWS.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water e. Will the proposal result in discharge into surface waters, or any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms.

Hydraulic Dredging

Hydraulic dredging will cause a potential positive impact to surface water quality by increasing the lake depth which will help to promote a healthy lake system. It is anticipated that temperature changes will continue to reflect seasonal changes and that dissolved oxygen in the lake will be reflective of lake mixing cycles. Hydraulic dredging does disturb the sediments and can cause increased turbidity during dredging activities. However, it is reported that this is generally a localized effect and turbidity is rarely above the ambient background for the lake outside of 10 – 20 feet from the dredge head. Dredging will not create permanent increased turbidity conditions.

Aeration System

The aeration system will cause a positive impact to surface water dissolved oxygen concentrations by ensuring that the lake well mixed and oxygenated. This will prevent stressful biological conditions or death for fish and other organisms. The aeration system is not expected to impact temperature or turbidity.

Maintain Lake Level

Maintaining the lake level by the addition of supplemental water will be a positive impact to surface water quality. Mitigating the considerable evaporative losses in the summer months will help to maintain good water quality and prevent potential problems associated with the concentration of constituents and very shallow lake systems.

Floating Islands/Hydroponic Nesting Islands

The installation of floating hydroponic islands will have a positive impact on water quality at the lake. It is expected that the islands will help to achieve the purpose of the TMDL by reducing nutrient concentrations in the lake and prevent eutrophic conditions.

Alum Treatment

Alum is aluminum sulfate and reactive aluminum (AL^{+3}) is strongly influenced by pH. If the pH is not controlled in a safe range of 6 -7.5 the reactive aluminum can be come toxic to fish. A critical mitigation measure for an alum treatment is appropriate buffering to maintain a safe pH range and safe water quality. Overall, an alum treatment is anticipated to have a positive impact on water quality at the lake. It is expected that the alum treatment will reduce the internal flux of phosphorus from the lake sediments. This will help to meet the TMDL load reduction and attain the water quality objectives.

Fisheries Management

A fisheries management program is anticipated to have a positive impact on water quality at the lake. Appropriate fisheries management will help promote a healthy balanced lake ecosystem helping lake to meet all of its beneficial uses. Fisheries management is not expected to adversely impact lake temperature, dissolved oxygen, or turbidity.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

The use of infiltration stormwater BMPs and diversion and treatment facilities to treat dry-weather and stormwater runoff will result in a change in the quality of surface water. This will positively impact water quality and associated aquatic life and water supply beneficial uses of surface waters. Several BMPs have multiple pollutant treatment potential. Sand and media filters have been effective at remove metals as well as bacteria and other pollutants (WERF, 2005). Alum injection systems are constructed to primarily target phosphorus removal. However, the system has also been shows to effectively remove ammonia, nitrate, total suspended solids, heavy metals, and pathogens (Carr, 1999; Knox County, 2007; Harper, 2007).

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water f. Will the proposal result in alteration of the direction or rate of flow of groundwater?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Machado Lake overlies the West Coast Groundwater Basin, the general flow of groundwater in this basin is south and west towards the Pacific Ocean. It is not anticipated that any of the following lake management implementation alternatives will result in an alteration of the direction or rate of groundwater flow.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Alum treatment
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

A change in the rate of flow of ground waters may occur if compliance with the TMDL is achieved through significant infiltration of stormwater. When properly managed, increased groundwater recharge would be considered a positive impact by the proposal, as it would contribute to replenishing local water supplies and reducing reliance on imported water.

Diversion and Treatment

Diversion and treatment facilities are above ground devices to treat stormwater and will have no impact on the direction or rate of flow of ground waters. They would be installed in areas that are already developed and installation activities would occur at depths that would not impact ground water. Diversion and treatment facilities are overflow devices that treat run-off through filtration and precipitation. Alum settling ponds can be lined to

prevent infiltration and the treated water can be pumped back into the stormdrain systems to mitigate impacts to the direction or rate of flow of ground water.

3 Water g. Will the proposal result in change in the quantity or quality of groundwater, either through direct additions or withdrawals or through interception of an aquifer by cuts or excavations.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The reasonably foreseeable implementation methods listed below act upon the surface water of Machado Lake and will not include direct additions or withdrawals of groundwater or interception of an aquifer by cuts or excavations.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Alum treatment
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

A change in the quantity of ground waters may occur if compliance with the TMDL is achieved through significant infiltration of stormwater. However, if infiltration stormwater BMPs are improperly designed, sited, and constructed, ground water quality could be adversely impacted. For instance, flow above designed capacity of biofiltration devices may lead to groundwater contamination from untreated stormwater. The potential for adverse impacts may be mitigated through proper design and siting of infiltration devices, pretreatment prior to infiltration, and groundwater monitoring.

Proper design and siting includes providing adequate groundwater separation with soils suitable for infiltration, and complying with any applicable groundwater permitting requirements. For example, in their BMP guidance manual, Caltrans recommends 10 feet separation to groundwater and a maximum infiltration rate of 2.5 inches per hour. They recommend against siting devices over contaminated groundwater plumes or in areas containing fractured bedrock within 3 feet of bottom (Caltrans, 2002). It is recommended that sand filters be used where soils or groundwater contamination are a concern (CASQA, 2003). However, where separation to groundwater is adequate, there is a low probability of groundwater contamination by infiltrated runoff because the soils attenuate pollutants and soil amendments can increase metals removal (CASQA, 2003).

Diversion and Treatment

Diversion and treatment facilities are above ground devices to treat stormwater and will have no impact on the quantity or quality of ground waters. They would be installed in areas that are already developed and at depths that would not impact ground water.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water h. Will the proposal result in substantial reduction in the amount of water otherwise available for public water supplies.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

This implementation measure will not have a foreseeable impact because it will not require the use of public water supplies.

Aeration System

This implementation measure will not have a foreseeable impact because it will not require the use of public water supplies.

Maintain Lake Level

This implementation measure could have a potential impact on public water supplies if public water supplies are used as the source of supplemental water to the lake. The City of Los Angels currently uses a potable source of water to supplement the lake on an irregular basis. If this source was used as a regular supply of water to the lake it may amount to a substantial use of public water supplies. Responsible parties should fully analyze this potential impact if they choose to continue the use of potable on a regular basis. However, other sources of water could be used to maintain the lake level, such as stormwater capture and reuse. This would mitigate the impact to public water sources.

Floating Islands/Hydroponic Nesting Islands

This implementation measure will not have a foreseeable impact because it will not require the use of public water supplies.

Alum Treatment

This implementation measure will not have a foreseeable impact because it will not require the use of public water supplies.

Fisheries Management

This implementation measure will not have a foreseeable impact because it will not require the use of public water supplies.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment
Implementation of the TMDL would result in an increase in the amount of water available for public water supplies if compliance with the TMDL is achieved through significant infiltration of stormwater or treatment and reuse of stormwater. Sand and media filters and alum injection systems are flow through devices to treat stormwater and treated stormwater can be pumped back into the stormwater system. No impact on the amount of water otherwise available for public water supplies is anticipated through diversion and treatment facilities.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

3 Water i. Will the proposal result in exposure of people or property to water related hazards such as flooding or tidal waves.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The lake management implementation alternatives listed below are implemented directly in Machado Lake and not anticipated to require significant alteration to the existing storm water conveyance systems nor are the alternatives anticipated to result in exposure of people or property to water related hazards such as flooding or tidal waves.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Alum treatment
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Implementation may result in flooding hazards if infiltration devices are not properly designed and constructed to allow for bypass of stormwater during storms that exceed design capacity. This potential impact can be mitigated through proper design. Potential risks of flooding due to clogging of devices with debris can be avoided by regular maintenance and inspection prior to storms. Pretreatment devices such as trash screens and biofiltration strips should be installed to minimize sediment load and clogging potential. Infiltration basins should be equipped with an observation well to monitor drain time and allow access if drainage is required (Caltrans, 2005). Infiltration devices may also reduce flooding hazards by reducing the peak storm flows in the Machado Lake subwatershed by diverting and retaining water on-site.

Diversion and Treatment

Diversion and treatment facilities divert stormwater from stormwater conveyances for treatment prior to discharge into wastewater treatment facilities or stormwater system is a positive effect, as it will reduce the potential for flooding during storm events. Implementation may result in flooding hazards if sand and media filters and alum injection systems are not properly designed, maintained, and constructed to allow for bypass of stormwater during storms that exceed design capacity. This potential impact can be mitigated through proper design. Potential risks of flooding due to clogging of devices with debris can be avoided by regular maintenance and inspection prior to storms.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

4 Plant Life a. Will the proposal result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging may have the potential to reduce aquatic plant species. Particularly, in shallow areas there may impacts to aquatic vegetation. Hydraulic dredging in areas with dense vegetation beds can cause clogging of the dredge pipeline. It is often suggested that temporary plant control such as harvesting take place prior to hydraulic

dredging activities. Recolonization of dredged areas is typically gradual, but provides the opportunity to improve the vegetative habitat to enhance the ecology of the lake. Hydraulic dredging does not disturb the shoreline and will not impact aquatic or terrestrial vegetation directly along the shore. Hydraulic dredging has overall fewer impacts to the lake when compared with traditional dredging methods.

Dredging my also impact the ability of rooted aquatic vegetation to colonize the main body of the lake. The amount of sediment removed (i.e. the new depth) and the associated light penetration will be critical to the ability of submerged plants to grow. Although some rooted plant re-growth is expected and is desirable for lake habitat and function. It is not expected that hydraulic dredging will be done to a depth that would prevent the re-establishment of desired and healthy aquatic plants.

Aeration System

It is not expected that the installation of an aeration system would result in a change in the diversity of species or number of plant species at the lake. The aerator would be installed via the boat launch area and would not impact shoreline aquatic or terrestrial vegetation. Also, the open water portion of the lake where aerators would be placed does not have extensive vegetation and would not require vegetation removal for aerator operation.

Maintain Lake Level

Machado Lake is primarily fed by wet weather stormwater runoff from the watershed area and during the dry season a minimal amount of runoff reaches the lake. Without an additional source of water to maintain the lake level during dry months the lake level is quickly reduced due to evaporative processes. If supplemental water was added to the lake to maintain the lake level the lake would be more likely to overflow into the lower wetlands on a more regular basis. In general this would be considered a positive impact to the wetland vegetation in the area below the dam that does receive reliable water supplies and is often very dry. Although as specific projects are developed and implemented the impact of more regular inundation of the lower wetland should be fully analyzed. It is not anticipated that the lake overflow would create flood like conditions that would potentially adversely impact terrestrial vegetation.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic islands will increase the diversity and number of aquatic plant species at Machado Lake. This is a positive impact as the islands can be designed to provide high quality habitat and use native aquatic plants.

Alum Treatment

An alum treatment will create a floc that precipitates from the water column, this flow may also carry other organisms such as algae species to the bottom of the lake. This would temporarily reduce the diversity of species and number of algae in the water column. In addition, changes in the algal community are expected due to the changes in nutrient availability. This would generally be considered a positive impact as a reduction in algal blooms and nuisance algal such as blue greens is expected. Adverse impacts to rooted aquatic vegetation are not expected.

Fisheries Management

A fisheries management program is not expected to have adverse impacts on the species diversity or number of plants at the lake. Fisheries management may serve to improve the diversity and number of appropriate plants at the lake if habitat creation and enhancement is included in the fisheries management program.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

If infiltration stormwater BMPs or diversion and treatment facilities are used, impact to plant life in terms of diversity of species, number of species, or reduce the number unique, rare or endangered species would most likely occur if facilities are located in critical habitat. Urban land uses tend to be landscaped and often with common, non-native species. The Machado Lake subwatershed is located in primarily urbanized landscape. However, a critical freshwater wetland habitat is also located in the subwatershed (see section 1.3 of the staff report). Infiltration stormwater BMPs or diversion and treatment facilities may be siting away from this critical habitat. It is not reasonable foreseeable for responsible jurisdictions to construct and site devices in such a manner as to adversely impact species diversity.

Proper timing may need to be exercised to avoid construction during critical periods of plant and animal development. Consultation with agencies including the CDFG and USFWS, having jurisdiction over identified resources would occur to identify specific mitigation measures such as restoration efforts designed to re-vegetate unique, rare or endangered species of plants. When the specific projects are developed and sites identified, a search of the California Natural Diversity Database could be employed to confirm that any potentially sensitive plant species in the site area are properly identified and protected as necessary. Focused protocol plant surveys for special-status-plant species could be conducted at each site location, if appropriate.

If sensitive plant and animal species occur on the project site mitigation shall be required in accordance with the Endangered Species Act. Mitigation measures shall be developed in consultation with the CDFG and the USFWS. Responsible agencies should endeavor to avoid compliance measures that could result in reduction of the numbers of any unique, rare or endangered species of plants and instead opt for such measures as enforcing litter ordinances in sensitive habitat areas. Plant number and species diversity could be maintained by either preserving them prior to, during, and after installation of facilities or by re-establishing and maintaining the plant communities post construction.

Infiltration stormwater BMPs and diversion and treatment facilities could result in reduced flows, particularly during dry weather, and may adversely impact downstream plant life. Potential impacts to dry-weather flow should be considered at the project level. Mitigation measures to maintain minimal flow to support downstream plant life-related beneficial uses should be reviewed and approved by the CDFG and USFWS.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to

reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

4 Plant Life b. Will the proposal result in reduction of the numbers of any unique rare or endangered species of plants?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Mitigation measures could be implemented to ensure that potential impacts to unique, rare or endangered plant species are eliminated. When the specific projects are developed and sites identified, a search of the California Natural Diversity Database could be employed to confirm that any potentially sensitive plant species or biological habitats in the site area are properly identified and protected as necessary. Focused protocol plant surveys for special-status-plant species could be conducted at each site location, if appropriate. If sensitive plant species occur on the project site mitigation should be required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS). Responsible agencies should endeavor to avoid compliance measures that could result in reduction of the numbers of any unique, rare or endangered species of plants.

Hydraulic Dredging

Hydraulic dredging may have the potential to reduce aquatic plant species in certain areas (see Plant Life a.). However, the plant species that maybe impacted are not listed as unique rare or endangered plant species. Critical plant habitats and sensitive plant species have been identified in the Machado Lake area, but they are not aquatic species and are located well away from dredging activities such as in the lower wetlands or riparian areas.

Aeration System

Sensitive plant species identified in the general Machado Lake area are not aquatic species. The lake aeration system will be installed in the lake itself and will not impact terrestrial plant species. The sensitive terrestrial plants in the area have been identified in the lower wetlands below the lake dam. The activities associated with the implementation of an aeration system will not take place in this area. .

Maintain Lake Level

Machado Lake is primarily fed by wet weather stormwater runoff from the watershed area and during the dry season a minimal amount of runoff reaches the lake. Without an additional source of water to maintain the lake level during dry months the lake level is quickly reduced due to evaporative processes. If supplemental water was added to the lake to maintain the lake level the lake would be more likely to overflow into the lower wetlands on a more regular basis. The sensitive plant species in the lower wetland areas such as coastal sage scrub are located in upland areas and would not be impacted by this more regular water supply to the wetland vegetation. It is not anticipated that the lake overflow would create flood like conditions that would potentially adversely impact terrestrial vegetation.

Floating Islands/Hydroponic Nesting Islands

The floating hydroponic islands would be placed in the open water portion of Machado Lake and would not be in areas where sensitive plant species have been identified. The installation of floating islands would likely take place via the boat ramp area and potentially using parking lot areas for staging and preparation. This is not expected to impact sensitive plant species.

Alum Treatment

Alum is generally applied to a lake in a solid or liquid form from boat. It is not expected that this activity would impact sensitive plant species generally located in riparian areas along the lake or in the lower wetland area. The boat launch area and potentially parking lots will be used to conduct an alum treatment. This would not adversely impact sensitive plant species.

Fisheries Management

Conducting a fisheries management program at Machado Lake would have minimal interaction with plant species and is not expected to adversely impact unique rare or endangered plant species.

STORMWATER IMPLEMENTATION ALTERNATIVES

See response to Response to 4. Plant life. a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

4 Plant Life c. Will the proposal result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging may have the potential to introduce new plant species into the lake if the dredging contractor has not properly decontaminated the dredge in between projects. However, this risk can be easily mitigated by ensuring that there are approved procedures for dredging cleaning after each project. It is expected that dredging will reduce the establishment of some aquatic vegetation; however it is not expected that it will prevent the replenishment of species to healthy habitat levels.

Aeration System

Aeration systems may include the use of floatable, suspendible, submersible devices tethered to the lake bottom and the installation or usage of an aeration system at Machado Lake would not be of the size or scale to be a barrier to the normal replenishment of existing species nor anticipated to have to the capability to introduce new plant species, as the device remains fixed during operation.

Maintain Lake Level

If supplemental water additions are employed to maintain the lake level during summer months it is likely that the lake would overflow into the lower wetlands on a more regular basis. If this overflow is not managed and properly controlled areas below the dam could be inundated for long periods of time. This could potentially impact the replenishment of existing species. However, this potential impact can be easily mitigated or avoided by controlling the water additions and preventing prolonged inundation conditions. It is not expected that maintenance of the lake level would introduce new plant species or prevent the replenishment of existing species in the lake itself.

Floating Islands/Hydroponic Nesting Islands

The floating hydroponic islands would be placed in the open water portion of Machado Lake. The islands would be vegetated and would introduce additional plant species to the lake area and potentially new species depending on the type of vegetation chosen. The plant species selected should be appropriate species to increase and improve the habitat available at Machado Lake. Project level environmental analysis should advise against the use of exotic, invasive, or nuisance plant species for island vegetation.

Alum Treatment

An alum treatment in Machado Lake is not expected to cause the introduction of new plant species to the lake or prevent the replenishment of existing species. Adverse impacts on the rooted aquatic plant community as result of alum treatment have not

been reported. In fact, as water clarity improves post treatment increased growth of root plants and the establishment of habitat has been observed.

Fisheries Management

A fisheries management program impacts existing fishes is not expected to prevent the replenishment of existing species in the lake. To the extent that the management program may introduce new plant species to the lake during transportation and stocking, mitigation measure can be employed, including screening, inspection, and filtering of the stock water to prevent the introduction of new plant species.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Vegetated infiltration stormwater BMPs may be used in conjunction with other structural treatment devices, which could result in the introduction of new species of plants into an area. Based on the waste load allocations for stormwater permittees, it is most likely that structural BMPs would be sited in urbanized areas. Urban land uses tend to be landscaped and often with common, non-native species. However, to the extent possible, Vegetated infiltration stormwater BMPs should be planted with native species. The use of exotic invasive species or other plants listed in the Exotic Pest Plant of Greatest Ecological Concern in California (CalEPPC, 1999) should be prohibited.

Diversion and Treatment

Diversion and treatment is not anticipated to result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species. However, to the extent that the construction, operation, or maintenance of the devices may potentially result in the introduction of new species of plants to the area, the devices can be and redesigned and sited in the subsurface to mitigate this potential impact.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

4 Plant Life d. Will the proposal result in reduction in acreage of any agricultural crop?

Answer: No Impact

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Neither Machado Lake nor the surrounding park area is used for agricultural crop production. Furthermore, Machado Lake is not used as a supply of agriculture irrigation water. It is not anticipated that the implementation of the following lake management implementation alternatives will result in a reduction in acreage of any agriculture crop.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Alum treatment
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Implementation of the proposed TMDL is not likely to result in the reduction in acreage of any agricultural crop, as agriculture is not a significant land use in the portions of the Machado Lake subwatershed subject to the TMDL. To the extent that implementation strategies are employed in agricultural areas, many of these strategies may actually improve agricultural resources by reducing the loss of topsoil or improving soil quality. The available management practices or other potential strategies are unlikely to lead to a conversion of agricultural land to other uses.

5 Animal Life a. Will the proposal result in change in diversity of specie, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or mirofauna)?

Answer: Potentially Significant Impact

Responsible parties should consult with the California Department of Fish and Game (CDFG) and the U. S. Fish and Wildlife Service (USFWS) prior to implementing projects that may impact animal life both protected and non-protected. Furthermore, the Machado Lake area is a critical habitat for many special status bird species and birds protected by the Migratory Bird Treaty Act. Appropriate measures such as bird, habitat, and nesting surveys for the protection of birds should be taken in conjunction with all construction, operation and maintenance activities at the lake.

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging does represent a significant project and in general impacts are expected however; with proper planning and care some impacts can be short lived and mitigated. The dredge is only capable of working in a small area of the lake at a time and the impacts are limited to the area of operation. Since the lake is maintained as an

aquatic habitat during dredging other parts of the lake can act as refuge areas for mobile species until activities are completed.

However, a reduction in benthic invertebrate species and a reduction in habitat available for benthic invertebrates are expected as the sediment and associated biota are removed from the lake. In areas of the lake were the sediments are totally anoxic these impacts are reduced, but in shallow areas with an active benthic community the impact is generally unavoidable. The goal of a dredging project is normally to change the nature of the lake substrate, as a result even after the dredging is complete the new substrate can be inhospitable to the previous benthic community and a reestablishment of the organisms is typically gradual.

Moreover other species (fish or birds) often rely upon the benthic community for food. A considerable reduction in the food source for this species may cause an adverse impact. Bird species may be required to travel to other areas in search of food; this may reduce the diversity of bird observed at the lake. Fish populations would be subject to in lake conditions, however their food source may temporarily supplemented in order to mitigate this impact.

Hydraulic dredging would be a large project taking place at the lake and will create noise and may require the removal of some shallow water vegetation that is often used as bird habitat. It is expected that this would impact bird species at the lake. This is a critical issue because threaten and endangered species have been observed at the lake along with many bird species that are protected by the Migratory Bird Treaty Act. Mitigation measures will be required to ensure the least disturbance possible. These measures could include a bird and habitat survey to identify sensitive species and suitable habitat areas. Nesting surveys could also be conducted to ensure that disturbing activities do not take place during the nesting season. Due to the potential impacts a hydraulic dredging operation should be fully analyzed on a lake wide basis at the project level. The long term benefits to animal life by implementation of the TMDL outweighs short term negative impacts.

Aeration System

Overall the installation of aerators is not expected to change the diversity or number of animal species at the lake. The aerators will provide well oxygenated conditions and it is expected that fish, aquatic insects, and zooplankton would benefit. The installation process may cause temporary and short term disturbance to bird species at the lake. However, these can be mitigated by conducting appropriate bird surveys and selecting appropriate times for the work to be conducted. Furthermore, most bird species populate the east side of the lake which is removed from the disturbance of day to park activities. The habitat areas on the east side of the lake could provide areas for birds to seek refuge during aerator installation. However, aerator installation should not be conducted during nesting season as even minor disturbance can cause a nest to be abandoned.

Maintain Lake Level

It is not expected that supplemental water additions to maintain the lake level will cause a reduction in the diversity or number of animal species. It is expected that additional

water to maintain the lake level during dry months and promote lake flushing will improve the overall water quality and provide better conditions for animal species.

Floating Islands/Hydroponic Nesting Islands

It is not expected that floating hydroponic islands would cause a change in the diversity or number of animal species at the lake. The islands will provide additional habitat for both terrestrial and aquatic species.

Alum Treatment

An alum treatment does have the potential to adversely impact fish number and diversity at the lake. Alum is aluminum sulfate. Reactive aluminum does have toxic properties but they are short lived in waters with a pH range from 6 – 8. At higher and lower and pH values the potential toxicity risk is markedly increased. However this risk can be controlled and mitigated by ensuring proper buffering during alum treatments.

Fisheries Management

A fisheries management program does have the potential to impact the number and diversity of fish species at the lake. Fisheries management may include the removal of nuisance species such as carp, that exacerbate water quality problems, and stocking with piscivore fish to balance the fish community. The goal of fisheries management is to appropriately balance the fish, zooplankton, and algal communities to create overall improved lake health. If carp removal is implemented as part of fisheries management the impacts to the carp would be unavoidable; however it is expected that it would result in benefits to the lake water quality. If responsible parties choose to implement a fisheries management plan as part of TMDL compliance the lake wide impacts should be evaluated on the project level.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Alum injections systems inject liquid aluminum sulfate prior to entering the settling pond. Impact to plant and animal life in terms of diversity of species, number of species, or reduce the number unique, rare or endangered species would most likely occur if facilities not are properly designed and maintained. Alum is acidic by nature. Excess alum, resulting in pH of lower than 6.0, may adversely impact plant and animals life. Excess dissolved aluminum may also adversely impact animal species (Carr, 1999; Knox County, 2007). Pathogens may also remain viable in the floc layer (Knox County, 2007). Proper design, inspection, and maintenance can be employed to mitigate potential impacts plant and animal life associated alum injection systems. Alum injection can be installed with flow weight sensors to regulate the amount of alum injection along proportioned with buffering agents to maintain the pH levels. Installation of a separate pump-out facility may reduce the likelihood and floc resuspension, transport, and to ensure the timely removal of the floc (Knox County, 2007).

Also see Response to 4. Plant life. a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

5 Animal Life b. Will the proposal result in a reduction of the numbers of any unique, rare, or endangered species of animals?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Depending on the lake management alternative implemented, direct or indirect impacts to special-status animal species may possibly occur during and after construction or implementation activities. Special-status species are present in the Machado Lake area and the watershed. If special-status species are present during activities such as dredging, aerator installation, and operation and maintenance activities associated with the potential projects, direct impacts to special-status species could result including the following:

- Direct loss of a special-status species
- Increased human disturbance in previously undisturbed habitats
- Mortality by construction or other human-related activity
- Impairing essential behavioral activities, such as breeding, feeding or shelter/refugia
- Destruction or abandonment of active nest(s)/den sites
- Direct loss of occupied habitat

In addition, potential indirect impacts may include but are not limited to, the following:

- Displacement of wildlife by construction activities
- Disturbance in essential behavioral activities due to an increase in ambient noise levels and/or artificial light from outdoor lighting around facilities

The following mitigation measures should be implemented to reduce or avoid potential project-level impacts to unique, rare or endangered species of animals:

Mitigation measures, however, could be implemented to ensure that special status animals are not negatively impacted, nor their habitats diminished. For example, when the specific projects are developed and sites identified, a focus protocol animal survey and/or a search of the California Natural Diversity Database (CNDDB) should be performed to confirm that any potentially special-status animal species in the site area are properly identified and protected as necessary.

If special-status animal species are potentially near the project site area, as required by the Endangered Species Act (ESA), two weeks prior construction/implementation activities and per applicable U.S. Fish and Wildlife Service (USFWS) and/or California Department of Fish and Game (CDFG) protocols, pre-construction surveys to determine the presence or absence of special-status species would be conducted. The surveys should extend an appropriate distance (buffer area) off site in accordance with USFWS and/or CDFG protocols to determine the presence or absence of any special-status species adjacent to the project site. If special-status species are present on the project site or within the buffer area, mitigation would be required under the ESA. To this extent, mitigation measures shall be developed with the USFWS and CDFG to reduce potential impacts.

Hydraulic Dredging

Species status bird species are regularly at the lake. Special status bird species include those that are listed and threatened or endangered and those protected by the Migratory Bird Treaty Act. The birds could be potentially impacted by a hydraulic dredging operation. This operation will create uncommon noise in the lake area and require the removal of some of the shallow water vegetation that is often used as bird habitat. Mitigation measures will be required to ensure the least disturbance possible. These measures could include a bird and habitat survey to identify sensitive species and suitable habitat areas. Nesting surveys could also be conducted to ensure that disturbing activities do not take place during the nesting season.

Special status fish or amphibian species have not been identified in the lake area. However is recommended that a CNDDB search be conducted and any necessary survey take place prior to the initiation of dredging activities.

Aeration System

The installation of aerators is not expected to cause a reduction in unique, rare or endangered animal species. The installation process may cause temporary and short term disturbance to bird species at the lake. However, these can be mitigated by conducting appropriate bird surveys and selecting appropriate times for the work to be conducted. Furthermore, most bird species populate the east side of the lake which is removed from the disturbance of day to park activities. The habitat areas on the east side of the lake could provide areas for birds to seek refuge during aerator installation. However, aerator installation should not be conducted during nesting season as even minor disturbance can cause a nest to be abandoned.

Maintain Lake Level

It is not expected that supplemental water additions to maintain the lake level will cause a reduction in rare or endangered animal species. Maintain lake level may promote the

propagation of the lake habitat and ensure the survival of rare or endangered animal species which would result in a positive impact.

Floating Islands/Hydroponic Nesting Islands

It is not expected that floating hydroponic islands would cause a reduction in the rare or endangered animals. If fact the nesting islands will be designed and vegetated to provide additional high quality habitat for special status bird species at the lake.

Alum Treatment

As previously noted (5 Animal life a.) there is a risk of aluminum toxicity to fish if the lake is not properly buffered as part of the alum treatment. If special status fish are present in the lake very careful mitigation measures and appropriating buffering of the lake during treatment would be required. A general CNDDB search conducted for this report did not identify special status fish species in Machado Lake. However, responsible parties should also conduct a database search and field surveys as required.

Fisheries Management

A fisheries management program is not expected to cause a reduction in unique, rare or endangered animals. However, before a fisheries management program is undertaken by responsible parties there should be a review of all special status species known in the area and a specific impact analysis conducted. It is possible for example, that a change in the lake fishery may impact birds residing or foraging in the lake area. This relationship should be fully and carefully analyzed by implementing parties.

STORMWATER IMPLEMENTATION ALTERNATIVES

Alum injections systems inject liquid aluminum sulfate prior to entering the settling pond. Impact to plant and animal life in terms of diversity of species, number of species, or reduce the number unique, rare or endangered species would most likely occur if facilities not are properly designed and maintained. Alum is acidic by nature. Excess alum, resulting in pH of lower than 6.0, may adversely impact plant and animals life. Excess dissolved aluminum may also adversely impact plant and animal species (Carr, 1999; Knox County, 2007). Pathogens may also remain viable in the floc layer (Knox County, 2007). Proper design, inspection, and maintenance can be employed to mitigate potential impacts plant and animal life associated alum injection systems. Alum injection can be installed with flow weight sensors to regulate the amount of alum injection along proportioned with buffering agents to maintain the pH levels. Installation of a separate pump-out facility may reduce the likelihood and floc resuspension, transport, and to ensure the timely removal of the floc (Knox County, 2007).

Also see Response to 4. Plant life. a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and

jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

5 Animal Life c. Will the proposal result in an introduction of a new species of animals into an area, or result in a barrier to migration or movement of animals.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging is not expected to result in the introduction of new animal species to the lake. Dredging however, may potentially impact the movement and/or migration of animals. Machado Lake is an important stopover for migrating waterfowl on the Pacific Flyway. If dredging activities take place during mitigation the noise and associated activities may adversely impact the migration patterns of some birds. It is anticipated that this could be mitigated by conducting dredging activities outside of the migration season.

Aeration System

The installation an aeration system is not anticipated to result in the introduction of new animal species to the lake or prevent the movement and migration of animals. The aeration system can be sited below the lake surface and redesigned to further mitigate the impact on migratory animals.

Maintain Lake Level

It is not expected that supplemental water additions to maintain the lake level will introduce new animal species or prevent the movement and migration of animals. Maintaining lake levels will promote added lake habitat for migratory animals resulting in a positive impact.

Floating Islands/Hydroponic Nesting Islands

It is not expected that floating hydroponic islands would result in the introduction of the new animal species to the lake or prevent movement and mitigation of animals. It is anticipated that the floating nesting islands would positively impact animal movement and migration by providing additional resting and foraging habitat for migrating waterfowl along the Pacific Flyway, which is a major migratory flyway for birds.

Alum Treatment

An alum treatment is not expected to result in the introduction of new animal species at the lake or prevent the movement and migration of animals. After precipitation, the alum

floc eventually settles to the lake bottom, and is not anticipated to prevent the movement of migratory animals.

Fisheries Management

Part of a fisheries management program may include stocking the lake additional fish. However it is anticipated that the lake would be stocked with fish that are already known to occur at the lake such as large mouth bass. This would not cause the introduction of a new species or prevent migration or movement of animals. It is not recommend or expected that new or exotic species be introduced to the lake.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonably foreseeable that implementation of infiltration stormwater BMPs will result in the introduction of a new animal species. In addition, because potential projects would be established in previously heavily developed areas it is not expected that potential project sites would act as a travel route or regional wildlife corridor.

Alum settling ponds may result in the introduction of new species of animals into an area. Stormwater is conveyed into settlings ponds prior to discharge back into the stormwater systems. Settling ponds can be enclosed or located below surface to mitigate the potential of introducing new species of animals into an area. Construction of these facilities would not considerably restrict wildlife movement.

A travel route is generally described as a landscape feature (such as a ridgeline, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g. water, food, den sites). Wildlife corridors are generally an area of habitat, usually linear in nature, which connect two or more habitat patches that would otherwise be fragmented or isolated from one another. It is unlikely that structural treatment devices would be constructed in areas such as these. Structural BMPs would be sited in urbanized areas.

However, infiltration stormwater BMPs and diversion and treatment facilities may potentially impact wildlife crossings. A wildlife crossing is a small narrow area relatively short and constricted, which allows wildlife to pass under or through obstacles that would otherwise hinder movement. Crossings are typically manmade and include culverts, underpasses, and drainage pipes to provide access across or under roads, highways, or other physical obstacles.

Construction activities associated with the implementation of infiltration stormwater BMPs and diversion and treatment facilities may impact migratory avian species. These avian species may use portions of potential project sites, including ornamental vegetation, during breeding season and may be protected under the Migratory Bird Treaty Act (MBTA) while nesting. The MBTA includes provisions for protection of migratory birds under the authority of the CDFG and USFWS. The MBTA protects over 800 species including, geese, ducks, shorebirds, raptors, songbirds, and many other relatively common species.

If structural treatment devices are implemented at locations where they would cause foreseeable adverse impacts on species migration or movement patters, mitigation measures could be implemented to ensure that impacts which may result in a barrier to the migration or movement of animal is less than significant. Any site-specific wildlife crossings should be evaluated in consultation with CDFG. If a wildlife crossing would be significantly impacted in an adverse manner, then the design of the project should include a new wildlife crossing in the same general location. If construction occurs during the avian breeding season for special status species and/or MBTA-covered species, generally February through August, then prior (within 2 weeks) to the onset of construction activities, surveys for nesting migratory avian species would be conducted on the project site following CDFG and/or USFWS guidelines. If no active avian nests are identified on or within 200 feet of construction areas, no further mitigation would be necessary.

Alternatively, to avoid impacts, the agencies implementing the TMDL may begin construction after the previous breeding season for covered avian species and before the next breeding season begins. If a protected avian species was to establish an active nest after construction was initiated and outside of the typical breeding season (February – August), the project sponsor, would be required to establish a buffer of 200 feet or as required by USFWS between the construction activities and the nest site.

If active nest for protected avian species are found within the construction footprint or within the 200-foot buffer zone, construction would be required to be delayed within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation are developed in consultation with CDFG or USFWS. These impacts are highly site specific, and assuming they are foreseeable, they would require a project-level analysis and mitigation plan.

Finally, to the extent feasible, responsible agencies should endeavor to avoid compliance measures that could result in significant barriers to the beneficial migration or movement of animals, and instead opt for such measures as non structural BMPs in sensitive areas.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

5 Animal Life d. Will the proposal result in deterioration to existing fish or wildlife habitat?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

As previously discussed (4 Plant life a and b, 5. Animal life a.) hydraulic dredging will require the removal of some aquatic vegetation and removal of benthic community habitat (fine organic sediments). The removal of aquatic vegetation would reduce wildlife habitat primarily for birds, however; it is expected that enough vegetation would remain in-place to prevent a significant impact. Moreover, the habitat areas reduced by dredging operations would gradually re-colonize.

In addition, the removal of dredged materials will reduce the fine organic sediments in large parts of the lake, which is generally where benthic aquatic invertebrates reside. This impact would be unavoidable and the removal of nutrient sediment material is the goal of a dredging operation. It is expected that the benthic community will gradually re-colonize as well.

In general the dredging operation is expected to deepen the lake and improve water clarity in the main body of the lake. This will improve the ability of rooted aquatic vegetation to colonize portions of the main body of the lake creating healthy habitat for fish. This would be a positive impact as a result of hydraulic dredging.

Aeration System

The installation an aeration system is not anticipated to result in the deterioration of existing fish and wildlife habitat. The aeration system will considerable improve the fish habitat of the lake ensuring adequate dissolved oxygen.

Maintain Lake Level

It is not expected that supplemental water additions to maintain the lake level will result in deterioration of existing fish and wildlife habitat. It is expected that preventing rapid evaporation of the lake during summer month and providing water to maintain the lake level and flush the lake will improve the fish habitat.

Floating Islands/Hydroponic Nesting Islands

It is not expected that floating hydroponic islands would result in the deterioration of existing fish and wildlife habitat. The floating islands are likely to improve habitat quality at the lake and provide additional habitat resources to both terrestrial and aquatic species. Birds may use the islands for additional resting, nesting, and foraging habitat and fish may use the hydroponic root mass below the water as resting and foraging habitat as well.

Alum Treatment

As previously noted (5 Animal life a.) there is a risk of aluminum toxicity to fish if the lake is not properly buffered as part of the alum treatment. If the lake was not properly buffered as part of the alum treatment this would represent a temporary deterioration of the fish habitat. However, this potential impact can be avoided by properly buffering the lake as part of the alum treatment.

Fisheries Management

A fisheries management program is not expected to deteriorate existing fish or wildlife habitat. The program will improve the existing fish habitat through alteration of existing fish populations to promote greater dissolved oxygen levels.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Implementation of the TMDL will considerably improve fish habitat by removing nutrients and other pollutants from the Machado Lake subwatershed. A change in the amount of surface water may occur if compliance with the TMDL is achieved in part through infiltration stormwater BMPs or diversion and treatment of stormwater which would otherwise enter stormdrain system discharging into the lake. Machado Lake supports sensitive freshwater wetland habitat (see section 1.3 in the staff report). Reductions in dry and wet-weather flow could have potential negative impacts on minimum flows required to support and protect the wetland habitat. Potential impacts to dry-weather flow should be considered at the project level. Mitigation measures to maintain minimal flow to support habitat related beneficial uses should be reviewed and approved by the CDFG and USFWS.

Diversion and Treatment

Sand and media filters and alum treatment systems are flow through devices. Sand and media filters may impede or slow overland flow to stormdrains if not properly designed and maintained and could change the amount of surface water. Alum injections systems inject alum and buffering agents into upstream stormwater conveyances followed by the diversion and collection of floc in the settling ponds (Knox County, 2007). Proper design, inspection, and maintenance may mitigate potentially adverse impacts to existing fish and wildlife habitats. Treated stormwater can be pumped back into the storm system minimizing impacts to fish and wildlife habitat.

Also see response to 5. Animal Life. a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

6 Noise a. Will the proposal result in increases in existing noise levels?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

There will be noise associated with a hydraulic dredging operation. It is expected that the noise levels will be greater than ambient noise; however the increased noise will be temporary and can be mitigated. Analysis for other hydraulic dredging operations found that community noise equivalent levels (CNEL) of 60dBA can be exceeded for locations within 2,000 feet of the dredge (Bolinas Lagoon Ecosystem Restoration Feasibility Study, 2002). Noise mitigation measures should be implemented and may include the selection of quieter running equipment, providing supplemental noise shielding around engines and pumps. Mitigation measures should be carefully considered and implemented if sensitive receptors such as educational or health care facilities are in the project area. Likewise, city or county noise ordinances should be reviewed to ensure compliance prior the initiation of the project.

Aeration System

An aeration system will possibly create a slight increase in ambient noise levels at the lake. The amount of noise generated however will be dependent on the type of aeration system implemented. However, this potential increase in noise can be mitigated by strategic placement of devices and devices can be installed with low noise generating motors and sound dampening panels. Optimal operation and timing my also reduce the duration of exposure to adverse noise levels.

Maintain Lake Level

It is not expected that supplemental water additions to maintain the lake level will result in an increase in the existing noise levels. Supplemental water additions are currently made to the lake on an irregular basis these additions do not cause in an increase in noise levels at the lake. It is not anticipated that even if the frequency of the water additions was increased that noise levels would increase. If construction activities take place for the installation of additional pipes etc., it is anticipated that activities would occur in limited, discrete, and discontinuous areas over a short duration. No major construction activities are anticipated. Noise from the small construction areas could be mitigated by selecting quiter running equipment and appropriately scheduling construction activities.

Floating Islands/Hydroponic Nesting Islands

It is not expected that floating hydroponic islands would result in an increases in existing noise levels. The installation of the floating island will require the use of a boat and trucks; however these types of vehicles are regularly used at the lake as part of ongoing activities. It is not anticipated that their use to install floating islands would cause an increase in existing noise levels.

Alum Treatment

An alum treatment will cause an increase in existing noise levels. The implementation of an alum treatment will likely require the use of a boat and various vehicles. A boat and maintenance vehicles are currently used at the lake on a regular basis. It is not expected that their usage to apply an alum treatment would increase existing noise levels at the lake.

Fisheries Management

A fisheries management program may cause an increase in existing noise levels. The program may require the usage of trucks, pumps, and boats. This impact is temporary and limited during times of stocking or population maintenance. Boats are currently used at the lake on a regular basis.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Construction of infiltration stormwater BMPs and diversion and treatment facilities would potentially involve removal of asphalt and concrete from streets and sidewalks, excavation and shoring, installation of reinforced concrete pipe, installation of the structural BMPs, and repaving of the streets and sidewalks. It is anticipated that construction activities would occur in limited, discrete, and discontinuous areas over a short duration. No major construction activities are anticipated. It is anticipated that excavation, for the purpose of installation, and repaving would result in the greatest increase in noise levels during the period of installation. Table 4 provides noise levels generated by different machinery that may be used in installing the structural treatment devices.

Table 4 Typical Installation Equipment Noise Emission Levels

Equipment	Maximum Noise Level, (dBA) 50 feet from source	Equipment Usage Factor	Total 8-hr Leq exposure (dBA) at various distances	
			50ft	100ft
Foundation Installation			83	77
Concrete Truck	82	0.25	76	70
Front Loader	80	0.3	75	69
Dump Truck	71	0.25	65	59
Generator to vibrate concrete	82	0.15	74	68
Vibratory Hammer	86	0.25	80	74
Equipment Installation			83	77
Flatbed truck	78	0.15	70	64
Forklift	80	0.27	74	69
Large Crane	85	0.5	82	76

Source; Caltrans, 2004

Contractors and equipment manufacturers have been addressing noise problems for many years, and through design improvements, technological advances, and a better understanding of how to minimize exposures to noise, noise effects can be minimized. An operations plan for the specific construction and/or maintenance activities could be developed to address the variety of available measures to limit the impacts from noise to adjacent homes and businesses. To minimize noise and vibration impacts at nearby sensitive sites, installation activities should be conducted during daytime hours to the extent feasible. There are a number of measures that can be taken to reduce intrusion

without placing unreasonable constraints on the installation process or substantially increasing costs. These include noise and vibration monitoring to ensure that contractors take all reasonable steps to minimize impacts when near sensitive areas; noise testing and inspections of equipment to ensure that all equipment on the site is in good condition and effectively muffled; and an active community liaison program. A community liaison program should keep residents informed about installation plans so they can plan around noise or vibration impacts; it should also provide a conduit for residents to express any concerns or complaints.

The following measures would minimize noise and vibration disturbances at sensitive areas during installation:

- Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All installation equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding).

- Perform all installation in a manner to minimize noise and vibration. Use installation methods or equipment that will provide the lowest level of noise and ground vibration impact near residences and consider alternative methods that are also suitable for the soil condition. The contractor should select installation processes and techniques that create the lowest noise levels.

- Perform noise and vibration monitoring to demonstrate compliance with the noise limits. Independent monitoring should be performed to check compliance in particularly sensitive areas. Require contractors to modify and/or reschedule their installation activities if monitoring determines that maximum limits are exceeded at residential land uses.

- Conduct truck loading, unloading and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid going through residential neighborhoods to the greatest possible extent. Ingress and egress to and from the staging area should be on collector streets or higher street designations (preferred).

- Turn off idling equipment.

- Temporary noise barriers shall be used and relocated, as practicable, to protect sensitive receptors against excessive noise from installation activities. Consider mitigation measures such as partial enclosures around continuously operating equipment or temporary barriers along installation boundaries.

- The installation contractor should be required by contract specification to comply with all local noise and vibration ordinances and obtain all necessary permits and variances.

Stormwater treatment BMPs should be design with sufficient hydraulic head to operate by gravity and eliminate the need for pumps. Diversion pumps may also result in an increase in existing noise levels. These pumps can be site below surface and the use of noise reducing barriers can be employed to mitigate the increase in noise levels.

Increases in ambient noise levels from construction activities are expected to be less than significant once mitigation measures have been properly applied.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

6 Noise b. Will the proposal result in exposure of people to severe noise levels.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

There will be noise associated with a hydraulic dredging operation (see 6 Noise a). Personnel conducting the dredging operation and/or working in the general area may be exposed to severe noise levels. This would require that all personnel be required to wear ear protection in order to mitigate this exposure. In addition to the noise mitigation measures previously described (6 Noise a.).

It is not expected that once mitigation measures are in place that park patrons will be exposed to severe noise levels. However the noise levels may be considered a nuisance and an irritation to park patrons. Patrons should be informed of potential noise impacts in the general park area via newspaper notices, postings at the park and website notices.

Aeration System

An aeration system will possibly create a slight increase in ambient noise levels at the lake; however this increase is not expected to be severe. The aeration system would not expose people to severe noise levels.

Maintain Lake Level

It is not expected that supplemental water additions to maintain the lake level will result in exposure of people to severe noise levels. Noise that may be generated due to construction related activities can be reduced by mitigation measures presented in 6. Noise a.

Floating Islands/Hydroponic Nesting Islands

The installation and maintenance of floating hydroponic islands is not anticipated to expose people to severe noise levels. The installation and maintenance of the island will likely require boat usage and the boat motor is a source of noise. While the noise associated with the motor is not considered severe this noise exposure can be mitigated by personnel wearing ear protection.

Alum Treatment

An alum treatment is not anticipated to expose people to severe noise levels. The application of an alum treatment requires boat usage and the boat motor is a source of noise. While the noise associated with the motor is not considered severe this noise exposure can be mitigated by personnel wearing ear protection.

Fisheries Management

A fisheries management program is not expected to expose people to severe noise levels. The implementation of ongoing fisheries management activities will likely require boat usage and the boat motor is a source of noise. While the noise associated with the motor is not considered severe this noise exposure can be mitigated by personnel wearing ear protection.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Implementation alternatives may entail short-term disturbances during construction, operation, and maintenance of infiltration stormwater BMPs and diversion and treatment facilities. The specific project impacts can be mitigated by standard noise abatement techniques including sound barriers and insulation to reduce noise from pumps, motors, fans, etc., passive design BMPs that do not require frequent maintenance, scheduling of maintenance during mid-day hours, and noise monitoring to ensure levels remain below acceptable levels. It is not foreseeable that implementation of the TMDL will result in exposure of people to severe noise levels once mitigation measures are implemented.

Potential noise impacts and associated mitigation mitigations for each implementation alternative are presented in Noise. 6.a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

7 Light and Glare a. Will the proposal produce new light or glare.

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Hydraulic Dredging

Hydraulic dredging is not anticipated to produce a new source of light or glare. Should night time dredging activities be proposed, or should lighting be used to increase safety around dredging facilities or equipment, potential impacts should be evaluated at the project level. A lighting plan could be prepared to include shielding on all light fixtures and address limiting light trespass and glare through the use of shielding and directional lighting methods, including but not limited to, fixture location and height. Potential mitigation efforts may also include screening and low-impact lighting. Additional lighting from operation is intermittent and short-term.

Aeration System

Depending on the type of aeration system installed it is likely that there will be portions of the structure visible above the surface of the lake. This visible portion may include solar panels or other reflective metal material that could cause glare. However this potential impact can be mitigated through the use of shielding and directional screening or other methods.

Maintain Lake Level

Maintain lake level with supplemental water additions is not anticipated to produce a new source of light or glare. Supplemental water additions can be timed during the day to prevent the need for night time light, mitigating the production of new sources of light or glare.

Floating Islands/Hydroponic Nesting Islands

Floating hydroponic nesting islands will not include the need for lighting or materials that could create glare. Should night time installation activities be proposed, a lighting plan could be prepared to include shielding on all light fixtures and address limiting light trespass and glare through the use of shielding and directional lighting methods, including but not limited to, fixture location and height. Potential mitigation efforts may also include screening and low-impact lighting. Additional lighting from installation is intermittent and short-term.

Alum Treatment

An alum treatment will not produce a new source of light or glare. Should night time operation activities be proposed, potential impacts should be evaluated at the project level. A lighting plan could be prepared to include shielding on all light fixtures and address limiting light trespass and glare through the use of shielding and directional lighting methods, including but not limited to, fixture location and height. Potential

mitigation efforts may also include screening and low-impact lighting. Additional lighting from operation is intermittent and short-term.

Fisheries Management

A fisheries management program will not create a new source of light and glare. Should night time operation activities be proposed, potential impacts should be evaluated at the project level. A lighting plan could be prepared to include shielding on all light fixtures and address limiting light trespass and glare through the use of shielding and directional lighting methods, including but not limited to, fixture location and height. Potential mitigation efforts may also include screening and low-impact lighting. Additional lighting from operation is intermittent and short-term.

STORMWATER IMPLEMENTATION ALTERNATIVES

Implementation of the proposed Basin Plan amendment is not likely to produce new light or glare because none of the reasonably foreseeable means of compliance involve additional lighting. Should night time construction activities be proposed, or should lighting be used to increase safety around infiltration stormwater BMPs or diversion and treatment facilities, potential impacts should be evaluated at the project level. A lighting plan could be prepared to include shielding on all light fixtures and address limiting light trespass and glare through the use of shielding and directional lighting methods, including but not limited to, fixture location and height. Potential mitigation efforts may also include screening and low-impact lighting. Additional lighting from construction is intermittent and short-term.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

8 Land Use a. Will the proposal result in substantial alteration of the present or planned land use of an area?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of compliance of lake management alternatives will result in substantial alteration of the present or planned land use of an area, they will not physically dvide an established community, or will they conflict with any land use plan.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

The installation of infiltration stormwater BMPs and diversion and treatment facilities is not expected to result in substantial alterations or adverse impacts to present or planned land use. To the extent that there could be land use impacts at a specific location, these potential land use conflicts are best addressed at the project level. Since, the Regional Board cannot specify the manner of compliance with the TMDL the Regional Board can not specify the exact location of structural treatment devices. The various cities that might install these devices will need to identify local land use plans as part of a project-level analysis to ensure that projects comply with permitted use regulations and are consistent with land use plans, general plans, specific plans, conditional uses, or subdivisions.

Notably, structural BMPs can be suitable for an ultra-urban setting and can be specifically designed to accommodate limited land area. For example, underground sand filters are well adapted for applications with limited land area and are most useful where multiple uses of land area are required. They can be placed adjacent to roadways without imposing a safety hazard and can function satisfactorily in the area below elevated roadways or ramps (FHWA, 2007). Alum settling ponds can also be enclosed and located below surface to mitigate the impact on land use.

Construction of structural treatment devices will not result in permanent features such as above-ground infrastructure that would disrupt, divide, or isolate existing communities or land uses. Projects can incorporate public education and aesthetically pleasing design with functional water quality treatment, such as the Santa Monica Urban Runoff Recycling Facility (Santa Monica, 2007). Projects may be designed to increase parks and wildlife habitat areas and to improve water quality. Construction activities could follow standard mitigation methods and BMPs to reduce any potential impact on surrounding land uses and access to all adjacent land uses could be provided during the construction period.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

9 Natural Resources a. Will the proposal result in increase in the rate of use of any natural resources?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives will not increase the rate of use of any natural resources. Implementation of lake management alternatives should not require quarrying, mining, or the extraction of locally important mineral resources. Operation and construction of the lake management alternatives and maintenance vehicles could increase the use of fossil fuels, and may require the use of electricity. Fuel and energy consumption are discussed in greater detail in item 15 Energy, listed below.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonable foreseeable that installation and maintenance of structural treatment devices would significantly increase the rate of use of any natural resources or cause substantial depletion of any nonrenewable natural resource. Installation and maintenance of structural treatment devices would not require quarrying, mining, dredging, or extraction of locally important mineral resources. Some types of structural BMPs and treatment facilities may consume electricity to operate pumps, etc., but not at levels which would cause impacts. Furthermore, facilities can be designed to operate hydraulically without the need for pumps.

9 Natural Resources b. Will the proposal result in substantial depletion of any non-renewable natural resource?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

See response to 9 Natural Resources a.

STORMWATER IMPLEMENTATION ALTERNATIVES

See response to 9. Natural Resources. a.

10 Risk of Upset. Will the proposal involve a risk of an explosion or the release of hazardous substances (including but not limited to: oil, pesticides, chemical or radiation) in the event of an accident or upset conditions?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

There is the possibility that hazardous materials (e.g. oil and gasoline) may be present during implementation and/or operation of the following lake management alternatives.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Fisheries Management

Potential risk of exposure and explosion can be mitigated with proper handling and storage procedures. Compliance with the requirement of California Occupational Health and Safety Administration (Cal OSHA) and local safety regulations during installation, operations, and maintenance of these alternatives would help to prevent any worksite accidents or accidents involving the release of hazardous materials into the environment. Mitigation may include properly storing hazardous materials in protected areas with fencing and signs to prevent health hazards.

Alum Treatment

An alum treatment is conducted by the addition of aluminum sulfate to the lake. This material is classified as hazardous under OSHA regulations. The risk of using alum can be mitigated by proper instruction, handling, administration, and storage of the material.

In general alum is an eye and skin irritant and all contact with eye, skin, and clothing should be avoided. Alum in the power form becomes acidic when it comes in contact with moisture. For example, if alum dust comes into contact with moisture in the eye it may result in moderate to severe eye irritation. Appropriate personal protection clothing is required. This includes splash goggles, coveralls, NIOHS/MSHA approved dust mask for dust concentrations of up to 10 mg/m^3 or more advanced respirator equipment for greater concentrations, gloves (neoprene, PVC, vinyl or rubber) and appropriate industrial foot ware (Alum MSDS, Marsulex).

Personnel conducting the alum treatment should be trained in hazardous material storage, handling, and clean-up. In addition an Accidental Release Clean-up Plan should be developed and kept on site prior to the initiation of an alum treatment.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

Implementation of infiltration devices is not likely to involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions. Nor should it result in any increased exposure to hazards or hazardous material. While some use of hazardous materials (e.g., paint, oil, gasoline) is likely during construction, potential risks of exposure can be mitigated with proper handling and storage procedures.

The health and safety plan prepared for any project should address potential effects from cross contamination and worker exposure to contaminated soils and water and should include a plan for temporary storage, transportation and disposal of contaminated soils and water. Compliance with the requirements of California Occupational Health and Safety Administration (CalOSHA) and local safety regulations during installation, operation, and maintenance of these systems would prevent any worksite accidents or accidents involving the release of hazardous materials into the environment.

Diversion and Treatment

Implementation of sand and media filters is not likely to involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions. Nor should it result in any increased exposure to hazards or hazardous material. While some use of

hazardous materials (e.g., paint, oil, gasoline) is likely during construction, potential risks of exposure can be mitigated with proper handling and storage procedures.

The health and safety plan prepared for any project should address potential effects from cross contamination and worker exposure to contaminated soils and water and should include a plan for temporary storage, transportation and disposal of contaminated soils and water. Compliance with the requirements of Cal-OSHA and local safety regulations during installation, operation, and maintenance of these systems would prevent any worksite accidents or accidents involving the release of hazardous materials into the environment.

Fluids and sediment must be removed from underground sand filters and could pose a risk of release of hazardous substances if not handled in a timely manner and disposed of appropriately. Contaminated sand removed from sand filters can be removed to landfill (WERF, 2005). Maintenance of underground sand and media filters may pose risks to maintenance workers. Mitigation measures to avoid these risks include requiring workers to obtain hazardous materials maintenance, record keeping, and disposal activities training, OSHA-required Health and Safety Training, and OSHA Confined Space Entry training.

Alum injection systems require the use of large amounts of alum. Handling and maintenance of alum injection systems may pose a risk to construction and maintenance workers. Mitigation measures to avoid these risks include requiring workers to obtain hazardous materials maintenance, record keeping, and disposal activities training, OSHA-required Health and Safety Training. Further mitigation measures can be taken by requiring only licensed hazardous wastes workers are allowed to handle the alum. Proper handling and disposal of the floc that settles in settling ponds is critical in mitigating potential risk in upset.

See also 17. Human Heath. a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

11 Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of compliance will result in an impact to population in altering the location, distribution, density, or growth rate of human population of an area. Potential implementation strategies including structural BMPs, would not directly or indirectly induce population growth in the area, or displace people.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not foreseeable that implementation of the TMDL would alter the location, distribution, density, or growth rate of the human population of an area. Potential implementation strategies including structural BMPs, would not directly or indirectly induce population growth in the area, or displace people.

12 Housing. Will the proposal affect existing housing or create a demand for additional housing?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of compliance will result in an impact to existing housing, or create a demand for additional housing. The lake management implementation alternatives will be take place in the lake itself and will impact nearby residential areas or create a need for additional housing.

STORMWATER IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of compliance will result in an impact to existing housing, or create a demand for additional housing. Small infrastructure project like structural BMPs are generally small and responsible parties would not need to impact existing housing in order to site these BMPs.

13 Transportation/Circulation a. Will the proposal result in generation of substantial additional vehicular movement?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

It is not anticipated that reasonably foreseeable methods of compliance will result in the generation of substantial vehicular movement. The lake management implementation alternatives will be take place in the lake itself and will not impact nearby roads resulting in substantial additional vehicular movement.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

The proposal may result in additional vehicular movement during installation of infiltration stormwater BMPs and diversion and treatment facilities. These impacts will be temporary and limited in duration to the period of installation. These impacts would be spread out spatially over the watershed and temporally over the implementation schedules. The proposed project would be in conformance with the existing Los Angeles County congestion management plan (CMP), and this impact would be less than significant.

In order to reduce the impact of construction traffic, implementation of a construction management plan for specified facilities could be developed to minimize traffic impacts upon the local circulation system. A construction traffic management plan could address traffic control for any street closure, detour, or other disruption to traffic circulation. The plan could identify the routes that construction vehicles will use to access the site, hours of construction traffic, and traffic controls and detours. The plan could also include plans for temporary traffic control, temporary signage and tripping, location points for ingestion and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off site. Potential impacts could also be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

Maintenance of structural treatment devices could cause additional traffic. The frequency and intensity of maintenance for these structural BMPs varies for high in infiltration basins to low in vegetated swales (USEPA, 2002). The proposed project should be in conformance with the Los Angeles County CMP and would result in a less than significant impact. To the extent that operation and maintenance caused traffic impacts, they could be mitigated by designing BMPs that require less frequent maintenance and scheduling of maintenance during non-peak traffic hours.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

13 Transportation/Circulation b. Will the proposal result in effects on existing parking facilities, or demand for new parking?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

Hydraulic Dredging

Hydraulic Dredging may result in temporary impacts to existing parking facilities. Open space may be required for the staging of dredging activities and for the temporary stockpiling of material removed from the lake bottom. All parking effects from the dredging itself should be limited and temporary only, equipment and materials are to be removed at the completion of dredging operations.

The TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. This may result in increased patron visitation of the park which could lead to an increased demand for parking.

Aeration System

The installation of the aeration system may result in temporary impacts to parking facilities. Parking areas may temporarily be required for the staging of the installation of the aeration system. All parking effects from the installation of the aeration system should be limited and temporary only.

The TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. This may result in increased patron attendance at the park which could lead to an increased demand for parking.

Maintain Lake Level

It is not expected that the process of maintaining the lake level will result in any foreseeable effects on existing parking or a demand for new parking. Lake levels are currently manipulated without impact to parking at the site. However, the TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. This may result in increased patron attendance at the park which could lead to an increased demand for parking.

Floating Islands/Hydroponic Nesting Islands

The installation of the floating islands/hydroponic nesting islands may result in temporary impacts to parking facilities. Parking areas may temporarily be required for the staging of the installation of the island system. All parking effects from the installation of the floating islands/hydroponic nesting islands should be limited and temporary only.

The TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. This may result in increased patron attendance at the park which could lead to an increased demand for parking.

Alum Treatment

It is not expected that the process of inactivating excessive lake nutrients through the application of alum will result in any foreseeable effects on existing parking or a demand for new parking. However, the TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. This may result in increased patron attendance at the park which could lead to an increased demand for parking.

Fisheries Management

Fisheries management may result in an increased demand for parking. While there is currently a health advisory against consumption of fish caught onsite, the TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. It is foreseeable the health advisory may be retracted in the future and there will be increased visitation by park patrons for the purpose of fishing. The fisheries management strategy would replace carp and other bottom-dwelling fish (which are generally less desirable for human consumption) with bass (and other types) that are generally considered a more desirable target by fishermen

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment
Compliance with the TMDL may result in alterations to existing parking facilities to incorporate infiltration stormwater BMPs or other structural BMPs to treat stormwater. Structural BMPs can be designed to accommodate space constraints or be placed under parking spaces and would not significantly decrease the amount of parking available in existing parking facilities. Available parking spaces can be reconfigured to provide equivalent number of spaces or provide functionally similar parcel for use as offsite parking to mitigate potential adverse parking impacts.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

13 Transportation/Circulation c: Will the proposal result in substantial impact upon existing transportation systems?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance will result in the substantial impact upon existing transportation systems. The lake management implementation alternatives will be take place in the lake itself and will not impact nearby roads therefore there is no expectation of any substantial impact upon existing transportation systems.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment
Depending on the implementation strategy chosen, the proposal may result in temporary alterations to existing transportation systems during construction of structural BMPs, stormwater diversions, or treatment facilities. The potential impacts are limited and

short-term. Potential impacts could be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement. The applicability of sand filters to roadway projects has been demonstrated (FHWA, 2007). Structural BMPs installed on streets could potentially impact public rights of way. Potential impacts should be considered and mitigated at the project level. Potential mitigation measures include proper design and siting of structural BMPs and installation of signage to direct and control traffic.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

13 Transportation/Circulation d: Will the proposal result in alterations to present patterns of circulation or movement of people and/or goods?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance will result in the alterations to present patterns of circulation or movement of people and/or goods. The lake management implementation alternatives will be take place in the lake itself and will not impact nearby roads resulting in changes to present patterns of circulation or movement of people and/or goods.

STORMWATER IMPLEMENTATION ALTERNATIVES

See response to “Transportation/Circulation.” 13.a. and 13.c.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

13 Transportation/Circulation e: Will the proposal result in alterations to waterborne, rail or air traffic?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

Hydraulic Dredging

Hydraulic dredging will not result in any foreseeable alterations to rail or air traffic but may result in temporary and limited alterations to waterborne traffic. Dredging activities may be directed from a barge located on the lake which could impede boat traffic. Currently boat traffic on the lake is limited to a city operation and maintenance boat so impacts are expected to be minimal.

Aeration System

The installation of an aeration system will not result in any foreseeable alterations to rail or air traffic but may result in temporary and limited alterations to waterborne traffic. Depending on the size and configuration of the aeration array, there may be temporary impedance of boat traffic during the installation. Currently boat traffic on the lake is limited to a city operation and maintenance boat so impacts are expected to be minimal and will be resolved once the installation of the aeration system is completed.

Maintain Lake Level

It is not expected that the process of maintaining the lake level will result in any foreseeable alterations to waterborne, rail or air traffic. Lake levels are currently manipulated without impact to waterborne, rail or air traffic.

Floating Islands/Hydroponic Nesting Islands

The installation of a floating islands/hydroponic nesting islands system will not result in any foreseeable alterations to rail or air traffic but may result in permanent alterations to waterborne traffic. Depending on the placement of islands, waterborne traffic may be impeded. Currently boat traffic on the lake is limited to a city operation and maintenance boat so impacts are expected to be minimal. As these effects are permanent it might be prudent to install navigation markers or warning flags to highlight new navigation paths on the lake.

Alum Treatment

Alum treatment at the lake has minimal interaction with waterborne, rail or air traffic and is not expected to result in any foreseeable alterations to waterborne, rail or air traffic.

Fisheries Management

It is not expected that the process of maintaining the lake level will result in any foreseeable alterations to rail or air traffic. A fisheries management strategy may result in a temporary and limited alteration to waterborne traffic depending on the methods utilized. It may be necessary to include the use of boats and/or net complexes to remove the nuisance fish. These tools would be used for a limited time and then removed. Currently boat traffic on the lake is limited to a city operation and maintenance boat so impacts are expected to be minimal.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

The proposal may potentially result in temporary alterations to rail transportation during construction of stormwater diversion or treatment facilities. The potential impacts would be limited and short-term. The potential impacts could be avoided or minimized through siting, designing, and scheduling of construction activities.

13 Transportation/Circulation f: Will the proposal result in an increase in traffic hazards to motor vehicles, bicyclists or pedestrians?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance will result in an increase in traffic hazards to motor vehicles, bicyclists or pedestrians. The lake management implementation alternatives will be take place in the lake itself and will not impact nearby roads resulting in an increase in traffic hazards to motor vehicles, bicyclists or pedestrians.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

The foreseeable methods of compliance may entail short-term disturbances during construction of structural BMPs, stormwater diversions, or treatment facilities. It is not foreseeable that this proposal will result in significant increases in traffic hazards to motor vehicles, bicyclists or pedestrians, especially when considered in light of those hazards currently endured in an ordinary urbanized environment. Notably, the applicability of infiltration devices and filters to roadway projects without imposing a safety hazard has been demonstrated (FHWA, 2007).

The specific project impacts can be mitigated by appropriate mitigation methods during construction. To the extent that site-specific projects entail excavation in roadways, such excavations should be marked, barricaded, and traffic flow controlled with signals or traffic control personnel in compliance with authorized local police or California Highway Patrol requirements. These methods would be selected and implemented by responsible local agencies considering project level concerns. Standard safety measures should be employed including fencing, other physical safety structures, signage, and other physical impediments designed to promote safety and minimize pedestrian/bicyclists accidents.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these

mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

14 Public Service a: Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: fire protection services?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance as all lake management activities occur directly on the lake and is not anticipated to directly or indirectly impact or result in a need for new or altered governmental services in the area of fire protection services.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonably foreseeable that this proposal will have an effect upon or result in a need for new or altered governmental facilities for fire protection services, the construction of which could cause significant environmental impacts. In addition, an Emergency Preparedness Plan could be developed for the construction of proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services is less than significant and would not result in a need for new or altered fire protection services. Any potential impact to fire protection due to diversion of resources is not an "environmental" impact that involves changes in the physical environment.

There is potential for temporary delays in response time of fire vehicles due to road closure/traffic congestion during construction activities. The responsible agencies could notify local emergency service providers of construction activities and road closures and could coordinate with local providers to establish alternative routes and appropriate signage. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure, and there is no evidence to suggest that installation of structural devices would create any more significant impediments than such other ordinary activities.

14 Public Service b: Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: police protection services?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance as all lake management activities occur directly on the lake and is not anticipated to directly or indirectly impact or result in a need for new or altered governmental services in the area of police protection services.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonably foreseeable that this proposal will have an effect upon or result in a need for new or altered governmental facilities for police protection services, the construction of which could cause significant environmental impacts. This is because compliance with the TMDL would not result in development of land uses for residential, commercial, and/or industrial uses nor would it result in increased growth. In addition, an Emergency Preparedness Plan could be developed for the construction of proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services is less than significant and would not result in a need for new or altered police protection services.

Any potential impact to police protection due to diversion of resources is not an "environmental" impact that involves changes in the physical environment. There is potential for temporary delays in response time of police vehicles due to road closure/traffic congestion during construction activities. The responsible agencies could notify local emergency service providers of construction activities and road closures and could coordinate with local providers to establish alternative routes and appropriate signage. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure, and there is no evidence to suggest that installation of structural devices would create any more significant impediments than such other ordinary activities.

14 Public Service c: Will the proposal have an effect upon, or result in a need for new or governmental services in any of the following areas: altered school services?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance as all lake management activities occur directly on the lake an is not anticipated to directly or indirectly impact or result in a need for new or altered governmental services in the area of altered school services.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Proposed implementation strategies for this TMDL include infiltration stormwater BMPs and diversions and treatment facilities. It is not foreseeable that this proposal will result

in a need for new or altered governmental facilities for schools, the construction of which could cause significant environmental impacts.

Any potential impact to schools due to diversion of resources is not an "environmental" impact that involves changes in the physical environment. Maintenance of school facilities is not expected to significantly increase school facilities maintenance demands. Projects may be designed to increase recreational areas and to improve water quality. Projects would not pose safety risks or hazards at a school because they are passive devices placed at or below grade. Infiltration devices can involve little more than amended soils and vegetation.

14 Public Service d: Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: parks or other recreational facilities?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance will result in a need for new or altered governmental services in the area of parks or other recreational facilities. See also 19 "Recreation" a.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Proposed implementation strategies for this TMDL include infiltration stormwater BMPs and diversion and treatment facilities. The proposal may result altered park recreational activities during construction periods or if open space areas of parks are used for stormwater infiltration. Projects may be designed to increase parks and wildlife habitat areas and to improve water quality. Several of the stormwater BMPs can be designed for multi-use purposes. Vegetated systems like swales and biofiltration systems can also be designed to integrate local vegetation. Placement of these systems within the park and usage as stormwater systems would not otherwise impact parks or other recreational facilities. Proper siting of other infiltration stormwater BMPs and diversion and treatment facilities may mitigate adverse impacts to parks and recreational facilities.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

14 Public Service e: Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: maintenance of public facilities, including roads?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

Hydraulic Dredging

Hydraulic dredging is a new maintenance activity on the lake facility itself but is not anticipated to result in a need for any new or altered maintenance of other public facilities, including roads. The hydraulic dredging will most likely be a punctuated activity and will not require new or altered maintenance of any other public facilities, including roads.

Aeration System

The installation and operation of an aeration system is a new maintenance activity on the lake facility. An aeration system will be an addition to the operational and maintenance infrastructure present at the lake and may require new periodic maintenance as the system matures. An aeration system is not expected to result in new or altered maintenance to other public facilities, including roads.

Maintain Lake Level

Maintaining lake levels is not anticipated to result in a need for any other new or altered maintenance of public facilities, including roads. Manipulation of lake levels is already a component of facility operations at Machado Lake.

Floating Islands/Hydroponic Nesting Islands

The creation and ensuing maintenance of a floating islands/ hydroponic nesting islands system is a new maintenance activity on the lake facility. The system will require new maintenance support as the system is established and subsequent maintenance to keep the system functioning in an optimal manner. It is not expected that the floating islands/hydroponic nesting islands will result in a new or altered maintenance to other public facilities, including roads.

Alum Treatment

Alum treatment is a new maintenance activity on the lake facility itself. The alum treatment will most likely be a punctuated activity and will not require new or altered maintenance of any other public facilities, including roads.

Fisheries Management

Fisheries management is a new maintenance activity on the lake facility itself but is not anticipated to result in a need for any new or altered maintenance of other public facilities, including roads. Most of the activity will be performed in a concentrated manner over a limited time frame at the beginning of implementation. Fisheries management may require periodic maintenance activities, most likely by contracted professionals.

These activities are not expected to require new or additional maintenance of any other public facilities, including roads.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

The proposal will result in the need for increased maintenance of public facilities and, specifically, infiltration stormwater BMPs and diversion and treatment facilities. All stormwater BMPs require some degree of maintenance, though the frequency and intensity of maintenance vary per BMPs. Alum injection systems require frequent monitoring to ensure successful and uninterrupted operation of the buffering system, the flow dependant injection mechanism, and to any floc removal systems. Weekly and monthly observation is recommended to ensure proper operation (Carr, 1999). Failure to monitor may lead to extensive maintenance and may result in potentially adverse impacts to plant life and animal life. This extensive maintenance may be mitigated by remotely accessing computerized sensors monitoring the system. This provides to capability to remotely determine if the system is function properly or if it requires maintenance. This will reduce the number of required trips to the BMP site.

Also see response to 4. Plant Life. a, b, and c and 5. Animal Life. a, b, and c.

While these requirements may result in increases in maintenance costs, any increase will be outweighed by the resulting overall improvement in water quality and protection of aquatic life and water supply beneficial uses.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

14 Public Service f: Will the proposal have an effect upon, or result in a need for any other new or altered governmental services governmental services in any of the following areas: Other governmental services?

Answer: No Impact

LAKE MANAGEMENT IMPLEMENTATION ACTIVITIES

It is not anticipated that reasonably foreseeable methods of compliance will result in a need for any other new or altered governmental services.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Implementation of the proposed TMDL is not likely to result in a need for new or altered other governmental services. Impacts to governmental services, including fire protection, police protection, schools, parks or other recreation facilities, and maintenance of public facilities included roads, have been addressed in 14. Public Services. a, b, c, d, and e.

15. Energy a. Will the proposal result in use of substantial amounts of fuel or energy?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The lake management implementation alternatives listed below should not result in the use of substantial additional amounts of fuel or energy, or a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

Installation and operation of the lake management alternatives will require energy and fuel for heavy equipment, machinery, and vehicles. Energy demand during construction and implementation are temporary. Responsible parties can mitigate fuel and energy consumption during construction through the use of more energy efficient vehicles and equipment. Required maintenance is unlikely to use substantial amounts of fuel or energy, substantially increase demand upon existing sources of energy, or require the development of new sources of energy.

Operation of an aeration system may require fossil fuels and electricity. However this energy consumption can be mitigated by installing aerators which use solar panels or only operating the aeration system as required not continuously.

Pumps may be required to transport supplemental water to the lake in order to maintain the lake level. Operation of pumps is not expected to place substantial increases on existing energy supply. Responsible agencies may reduce or avoid the use of pumps by siting and designing structures to allow for sufficient hydraulic head in order to take advantage of gravity flow.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Implementation of structural BMPs and diversion and treatment strategies should not result in the use of substantial amounts of fuel or energy, or a substantial increase in demand upon existing sources of energy, or require the development of new sources of

energy. Construction related heavy equipment, vehicles, and machinery require the use of fuel and electricity to operate. Maintenance vehicles and also require fuel and energy. Use of more fuel efficient equipment may help mitigate the extra fuel and energy consumption associated with temporary construction and maintenance activities.

Pumps that require electricity may be incorporated into structural BMPs and diversions; however, operation of pumps is not expected to place substantial increases on existing energy supply. Responsible agencies may avoid the use of pumps in structural BMPs by siting and designing BMPs to allow for sufficient hydraulic head in order to operate BMPs by gravity flow.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

15. Energy b. Will the proposal result in use of substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

See response to 15. Energy a. Implementation of lake management alternatives and compliance with the TMDL will not increase demand on existing energy sources or require the development of new sources.

STORMWATER IMPLEMENTATION ALTERNATIVES

b. See response to "15. Energy. a."

16. Utilities and Service Systems a. Will the proposal result in a need for new systems or substantial alterations to the following utilities: power or natural gas?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not of the size or scale to require new power or natural gas utilities.

- Hydraulic dredging

- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

That installation and operation of lake management alternatives will result in a substantial increased need for new systems, or substantial alterations to power or natural gas utilities is not reasonably foreseeable, because these alternatives are not large enough to substantially tax current power or natural gas sources.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonably foreseeable that implementation infiltration stormwater BMPs or diversion and treatment facilities would result in a substantial increase need for new systems, or substantial alterations to power or natural gas utilities. Some projects may require moderate amounts of electricity to operate pumps and treatment units; however, operation of pumps is not expected to place substantial increases on existing energy supply such that new or altered utilities would be required.

16. Utilities and Service Systems b. Will the proposal result in a need for new systems or substantial alterations to the following utilities: communication systems?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to require new or substantial alterations to the communication system.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

Lake management alternatives care conducted directly at or on the lake and to the extent that substantial alterations to the communication system need to be made, the alternative may designed and sited to mitigate this impact.

STORMWATER IMPLEMENTATION ALTERNATIVES

Implementation alternatives may entail short-term construction of structural BMPs, diversion and treatment facilities. It is anticipated that construction and maintenance crews will use various communication systems such as, telephones, cell phones, and radios. These types of communication devices and systems are used daily by the construction and maintenance personnel as part of regular business activities. It is not expected that the implementation of the TMDLs would create undue stress on the

established communication systems and will not require substantial alterations to the current communication system or a new communication system.

16. Utilities and Service Systems c. Will the proposal result in a need for new systems or substantial alterations to the following utilities: water?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to require new or substantial alterations to the water supply system.

- Hydraulic dredging
- Aeration system
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

Maintain Lake Level

Maintaining the lake level with supplemental water will require a water source, but the source does not necessarily need to be a public water utility. Currently potable water is added to the lake on an irregular basis and this has not required new or substantial alterations to the water supply system. If this water source was to be used regularly responsible parties should fully analyze the potential impact on the water supply system. However, other sources of water, that are not a potable source, could be used to maintain the lake level such as stormwater capture and reuse.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is not reasonably foreseeable that implementation of infiltration stormwater BMPs and diversion and treatment facilities will result in a substantial increase in the need for new systems, or substantial alterations to water utilities. Potential projects associated compliance of the TMDL will not result development of any large residential, retail, industrial or any other development projects that would significantly increase the demand on the current water supply facilities or require new water supply facilities.

The infiltration stormwater BMPs has the potential to recharge groundwater aquifers, and it is possible that additional wells or piping may be necessary to access this enhanced water supply. However, in this event, the increased water supply would outweigh the impacts of having to construct additional infrastructure. Environmental impacts due to construction of new water utilities would be speculative at this point, and would need to be assessed by the responsible agency in a project-level CEQA analysis.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels.

However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

16. Utilities and Service Systems d. Will the proposal result in a need for new systems or substantial alterations to the following utilities: sewer or septic tanks?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to require new or substantial alterations to the sewer or septic tanks, as the alternatives are not anticipated to generate extensive waste entering the sewer or septic systems or require excavation such that a substantial alteration to sewer or septic systems would be required

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs

It is not foreseeable that infiltration stormwater BMPs and diversion and treatment facilities will result in a substantial increase need for new systems, or substantial alterations to sewers or septic tanks.

Diversion and Treatment

Diversion and treatment facilities may result in the need for new systems, or substantially alter sewer systems if treated stormwater is diverted to a sanitary sewer. This diversion may adversely impact the treatment capacity of local Publicly Owned Treatment Works resulting in a new or substantially alter existing sewer and septic systems. However, this impact may be mitigated by installing high-flow bypasses, diverting all flow back into the sewer system, or conveying the flow into infiltration stormwater BMPs.

Alum injections systems inject alum into upstream stormwater conveyances followed by the diversion and collection of floc in the settling ponds (Knox County, 2007). The system may also adversely impact sewer and septic systems if the flow is diverted to the

sanitary sewer. The treated water can be pumped back into the storm system minimizing impacts existing sewer systems.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

16. Utilities and Service Systems e. Will the proposal result in a need for new systems or substantial alterations to the following utilities: stormwater drainage?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to require new or substantial alterations to the stormwater drainage system, as the lake management alternatives would have minimal or no interaction with the stormwater drainage system.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Implementation of diversion and treatment, such as sand and media filters, biofilters, vegetated swales, filter strips, bioretention and infiltration basin, and alum injection, or other structural BMPs could result in substantial alterations to stormwater drainage utilities. These types of devices may result in a potentially significant impact due to changes in drainage patterns or flooding hazards if devices became blocked by trash and debris. Any device installed in a stormdrain, especially an older, under-capacity drain could have a negative effect on the drain's ability to convey runoff. These negative impacts can be mitigated through design of devices with overflow/bypass structures, by performing regular maintenance of these devices and, if necessary, enlargement of the stormdrain upstream of devices.

Alum injection systems require installation of settling ponds, upstream injection mechanism, and diversion pumps. The water is diverted to settling ponds after injection to allow adequate time for floc precipitation. The treated waters from the settling ponds can be diverted back into the stormwater system to mitigate further impacts to stormwater drainage systems. Proper siting may allow for additional hydraulic head, minimizing the need for diversion pumps.

Overall, the significant amount of installation required by structural BMPs will substantially alter the stormwater drainage system. Implementation of the TMDL could potentially lead to the development of a stormwater utility. To the extent that these devices, if employed, may conceivably require the need for or require substantial alteration to existing stormdrain systems, responsible agencies would foreseeably opt for other structural or non-structural control measures that would otherwise result in less than significant impacts. These alterations will have a positive environmental impact with the resulting reduced pollutant loads from urban and stormwater runoff.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

16. Utilities and Service Systems f. Will the proposal result in a need for new systems or substantial alterations to the following utilities: solid waste disposal?

Answer: Less than significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to require new or substantial alterations to the solid waste disposal, as the listed lake management alternatives are not anticipated to generate significant amounts of solid wastes.

- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

Hydraulic Dredging

The purpose of hydraulic dredging is to remove sediments from the lake bottoms. This dredged material requires disposal. One option for disposal of dredged materials is a landfill site; this could potentially impact solid waste utilities. Machado Lake is listed on the 303(d) for some toxic organic substances which are presumed to be present in the

sediment. However, analytical data which characterizes the lake sediment demonstrates that the chemicals of concern are below total threshold limit concentration (TTLC) and soluble threshold limit concentration (STLC) guidelines for hazardous waste and sediment could potentially be accepted at a class 3 landfill (Machado Lake Watershed Management Plan 2002). It recommended though, that additional sediment analysis be conducted prior to a dredging operation.

There are several class 3 landfills in the Los Angeles area. . A survey of Class 3 landfills within Los Angeles County conducted by the Los Angeles Department of Public Works estimated remaining permitted landfill capacity at 102.42 million tons as of January 01, 2006 (County of Los Angeles, 2007. This potential impact is related to the amount of dredge material requiring disposal. The project specific planning of a dredging operation will decide the depth to which the lake will be dredged and the potential impact to solid waste disposal will be fully analyzed at that time. This potential project will generate solid waste requiring disposal, but it is not expected to be to the scale that would significantly impact landfill capacity.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Alum injection systems produce a precipitated, solid, floc that requires disposal in appropriate landfills. The floc is considered harmless and can be disposed of in a Class III landfill. A survey of Class III landfills within Los Angeles County conducted by the Los Angeles Department of Public Works estimated remaining permitted landfill capacity at 102.42 million tons as of January 01, 2006 (County of Los Angeles, 2007). Machado Lake receives an average of ~6853.2 acre-feet stormwater run-off annually. Given a dose rate of 10 mg/l and sludge production rate of 122 ft^3 per acre-ft of runoff, treating all stormwater run-off would produce 836,090.4 ft^3 of alum sludge (Carr, 1999). The alum sludge contains a significant portion of water and the volume can be reduced through drying. The dried alum may also be recovered and reused, further reducing the total amount of alum waste necessary for disposal and mitigating potential impacts on solid waste and disposal utilities (City of Durham, 1985). The volume of waste disposed may cause an impact to existing disposal systems. But based on the Department of Public Works figures, the amount of waste disposed compared to the existing capacity is insignificant.

Nominal amounts of construction debris may be generated by installation of structural BMPs. Construction debris can be recycled at aggregate recycling centers or disposed of at landfills. Improved sorting and recycling methods can reduce the total amount of disposable stormwater wastes. Existing landfills in the area have adequate capacity to accommodate this limited amount of construction debris. Impacts on the disposal of solid waste would be less than significant. It is not foreseeable that this proposal will result in a need for new systems, or substantial alterations to solid waste and disposal utilities.

17. Human Health a. Will the proposal result in creation of any health hazard or potential health hazard (excluding mental health)?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to create a health hazard or potential health hazard.

- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Fisheries Management

To the extent that the operation, installation, and maintenance of lake management alternatives listed may potentially result in the creation of potential health hazards, a health and safety plan should be prepared and implemented for any project to address potential health hazards. Compliance with the requirements of Cal OSHA and local safety regulations during installation, operation, and maintenance of these alternatives would prevent any worksite accidents or accidents involving the release of hazardous materials into the environment, which could harm the public, nearby residents and sensitive receptors such as schools.

Alum Treatment

An alum treatment does include the risk of a potential health hazard; however, this will be a short term potential hazard which can be mitigated. An alum treatment is conducted by the addition of aluminum sulfate to the lake. This material is classified as hazardous under OSHA regulations. The risk of using alum can be mitigated by proper instruction, handling, administration, and storage of the material.

In general alum is an eye and skin irritant and all contact with eye, skin, and clothing should be avoided. Alum in the power form becomes acidic when it comes in contact with moisture. For example, if alum dust comes into contact with moisture in the eye it may result in moderate to severe eye irritation. Appropriate personal protection clothing is required. This includes splash goggles, coveralls, NIOHS/MSHA approved dust mask for dust concentrations of up to 10 mg/m3 or more advanced respirator equipment for greater concentrations, gloves (neoprene, PVC, vinyl or rubber) and appropriate industrial foot ware (Alum MSDS, Marsulex).

Personnel conducting the alum treatment should be trained in hazardous material storage, handling, and clean-up. In addition an Accidental Release Clean-up Plan should be developed and kept on site prior to the initiation of an alum treatment.

Hydraulic Dredging

Machado Lake is listed on the 303(d) for various toxic organic substances, which are presumed to be present in the sediment. However, analytical data which characterizes the lake sediment demonstrates that the chemicals of concern are below total threshold limit concentration (TTLC) and soluble threshold limit concentration (STLC) guidelines for hazardous waste (Machado Lake Watershed Management Plan 2002). Personnel conducting the dredging activities may be exposed to this sediment and this may be a potential health hazard. This potential hazard can be mitigated by all personnel wearing appropriate protective clothing and have received health and safety/hazardous materials training. In addition, it is recommended that a sediment analysis for potentially

hazardous pollutants be conducted prior to a dredging operation. The health and safety plan prepared for a hydraulic dredging project should address potential impacts and detailed mitigation measures.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is reasonably foreseeable that hazards or hazardous materials could be encountered during the installation of diversion and treatment facilities and infiltration stormwater BMPs. Contamination could exist depending on the current and historical land uses of the area. Depending on their location, these facilities could be proposed in areas of existing oil fields and/or methane zones or in areas with contaminated soils or groundwater. The use of hazardous materials (e.g., paint, oil, gasoline) and potential for accidents is also likely during installation.

Alum is a hazardous, carcinogenic compound. When expose, alum may irritate the skin, eyes, gastrointestinal tract if ingested, and respiratory tract if inhaled (General Chemical, 2001). OSHA-required Health and Safety Training along and proper application safety equipment (e.g., gloves, inhalers, and protective eye wear) may mitigate potential impacts to human health during handling. Precipitated floc of aluminum hydroxide and aluminum phosphate is relative harmless. However, pathogens may still remain viable in the flow layer (Knox County, 2007. OSHA-required Health and Safety Training along and proper disposal safety equipment may mitigate potential impacts to human health.

To the extent that installation of infiltration stormwater BMPs and diversion and treatment facilities could involve work with or near hazards or hazardous materials, potential risks of exposure can be mitigated with proper handling and storage procedures. The health and safety plan prepared for any project should address potential effects from cross contamination and worker exposure to contaminated soils and water and should include a plan for temporary storage, transportation and disposal of contaminated soils and water. Compliance with the requirements of Cal OSHA and local safety regulations during installation, operation, and maintenance of these systems would prevent any worksite accidents or accidents involving the release of hazardous materials into the environment, which could harm the public, nearby residents and sensitive receptors such as schools.

Implementation of stormwater infiltration BMPs and diversion and treatment facilites could create a potential health hazard if facilities are not properly maintained to include vector (mosquito) control. This potential adverse impact can be mitigated by designing systems that minimize stagnant water conditions and/or by requiring oversight and treatment of those systems by vector control agencies. Stagnant water is minimized by allowing for rapid infiltration. Washington State Department of Ecology recommends that sand filters empty in 24 hours (WA DOE, 2005). Certain stormwater treatment BMPs, such as underground sand filters and alum settling ponds maintain a pool of water. These BMPs should be avoided where vectors are a concern, unless the local vector control agency approves their use (Caltrans, 2002). Alum setting ponds consolidates rapidly in a period of six to eights but does not reach maximum consolidation until 30 days (Harper, 2007). Alum settling ponds can also be sited below ground to help mitigate vector habitat. However, oversight and treatment by vector control agencies may also be an option. BMPs should be covered to seal vectors out,

but contain access doors to facilitate inspection and mosquito suppression by vector control agencies. Basic housekeeping practices such as removal of debris and upkeep of vegetative pretreatment devices to prevent clogging and stagnation will prevent vector breeding (CASQA, 2003).

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

17. Human Health b. Will the proposal result in exposure of people to potential health hazards?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to expose people to a potential health hazard.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Floating hydroponic nesting islands
- Fisheries Management

To the extent that the operation, installation, and maintenance of lake management alternatives listed may potentially result in the exposure of potential health hazards, a health and safety plan should be prepared and implemented for any project to address potential health hazards. Compliance with the requirements of Cal OSHA and local safety regulations during installation, operation, and maintenance of these alternatives would prevent any worksite accidents or accidents involving the release of hazardous materials into the environment, which could harm the public, nearby residents and sensitive receptors such as schools.

<u>Alum Treatment</u>

The implementation of an alum treatment does have the potential to expose people to a potential health hazard. The potential exposure would be limited to personnel working to implement the alum treatment and would be short in duration. The potential risk of exposure can be mitigated see 17. Human Health a.

STORMWATER IMPLEMENTATION ALTERNATIVES

See response to 17 Human Health a

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

18. Aesthetics a. Will the proposal result in the obstruction of any scenic vista or view open to the public?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

The lake management implementation alternatives listed below are not expected to be of the size or scale to result in the obstruction of any scenic vista or view open to the public.

- Alum Treatment
- Maintain lake level
- Floating hydroponic nesting islands
- Fisheries Management

These activities may require the use of a boat for a few hours/days for implementation or maintenance. This boat usage is not anticipated to cause an obstruction of a scenic view at the lake.

Hydraulic Dredging

Hydraulic dredging will require that a dredge be floating on the lake in order to remove sediment materials. In addition, there may be visual impacts associated with open space areas that are used for the staging of dredging activities and for the temporary stockpiling of material removed from the lake bottom. This will temporarily impact the scenic view of the lake and surrounding area. The obstruction of the scenic view of Machado Lake will only be impacted during actual dredging activities this is not a permanent view obstruction therefore this impact is not considered potentially significant.

Aeration System

Depending on the type of aeration system selected there may be metal structures and/or solar panels exposed above the surface of the lake. This would be an adverse impact to the scenic view of Machado Lake. This impact can be mitigated by creative design and paint to help the structures blend into the background and reduce the contrast with the surrounding environment.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Infiltration stormwater BMPs and diversion and treatment facilities could be aesthetically offensive if not properly designed, sited, and maintained. Underground structures do not present aesthetics issues (WERF, 2005). Alum settling ponds and diversion pump can be designed and sited underground to mitigate impacts on aesthetics. However, above ground structures, such as sand filters, can present aesthetic problems if constructed with vertical concrete walls (CASQA, 2003) or if designed as rectangular concrete structures (WERF, 2005).

Many structural BMPs can be designed to provide habitat, recreational areas, and green spaces in addition to improving stormwater quality. Standard architectural and landscape architectural practices can be implemented to reduce impacts. For example, the SMURRF was constructed as an aesthetically pleasing facility that is integrated with the surrounding land uses (Santa Monica, 2007). Screening and landscaping may also be used to mitigate aesthetic effects.

Vandalized structures may become an aesthetically offensive site. Vandalism, however, already exists to some degree in most if urbanized areas and adding new structures is not of itself likely to have any impact upon current vandalism trends. Improved lighting and enforcement of current vandalism regulations may decrease vandalized structures. Below grade structures, such as subsurface sand filters and infiltration basins, are safe for application in public areas and are relatively vandal-proof (FHWA, 2007).

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

18. Aesthetics b. Will the proposal result in the creation of an aesthetically offensive site open to public view?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to create an aesthetically offensive site open to public view.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment

- Floating hydroponic nesting islands
- Fisheries Management

Some of these implementation alternatives may temporarily or partially obstruct the scenic view of Machado Lake (see 18 Aesthetics a.) however they will not create permanent offensive sites open to public view.

STORMWATER IMPLEMENTATION ALTERNATIVES

See response to 18 Aesthetics a.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

19. Recreation a. Will the proposal result in impact upon the quality or quantity of existing recreation opportunities?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below have the potential to impact the quality of existing recreation opportunities. They are not anticipated to impact the quantity of recreation opportunities.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment
- Floating hydroponic nesting islands
- Fisheries Management

Particularly, hydraulic dredging, aeration system, alum treatment, and floating hydroponic nesting islands will likely require preparation and staging areas to be used during operation and/or installation. This may temporarily reduce the parking available to park patrons. However all potential impacts on parking availability will be limited and temporary equipment and materials are to be removed at the completion of implementation activities.

The TMDL will improve surface water quality with respect to nutrient concentrations, eutrophic conditions, and algal blooms. The improved water quality and improve ecosystem health the quality of recreational opportunities at Machado Lake will be positively impacted.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

It is reasonably foreseeable that installation of infiltration stormwater BMPs and diversion and treatment facilities, such as alum injection systems, may temporarily impact the usage of existing recreational sites. Structural BMPs and subsurface devices and will only pose temporary impairment to recreational opportunities. For instance, bike lanes may be temporarily unavailable during installation of structural BMPs or parking locations for recreation facilities may be impacted. Mitigation measures include the incremental installation of the BMPs located in parks, bike lanes, and other recreational sites to avoid impairment of the entire site. The responsible agency may also redesign the BMPs to be less obtrusive or choose a less disruptive implementation strategy such as a non-structural alternative.

Implementation of the TMDL will have a positive impact on the quality and quantity of recreational opportunities by protecting aquatic life-related beneficial uses. Many parks are integrating stormwater BMPs as part of the aesthetic and architectural features of the sites. The environmental impacts can be mitigated through construction BMPs and siting, planning and design practices that minimize environmental impacts. Applicable and appropriate mitigation measures will be evaluated when specific projects are determined. Adding water features to parks has the potential to increase recreational opportunities by providing fishing, birding, and aesthetic enjoyment.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

20. Archeological/Historical a. Will the proposal result in the alteration of a significant archeological or historical site structure, object or building?

Answer: Potentially Significant

LAKE MANAGEMENT IMPLEMENTATION ALTERNATIVES

Lake management implementation alternatives listed below are not expected to impact a historical structure or building. These implementation alternatives will take place in the lake itself and will not impact historical structures. Moreover there are not historical structures within the Ken Malloy Harbor Regional Park area.

- Hydraulic dredging
- Aeration system
- Maintain lake level
- Alum Treatment

- Floating hydroponic nesting islands
- Fisheries Management

The Ken Malloy Harbor Regional Park area is known to lie within the region of the Gabrieleno Native America people. The Gabrieleno people occupied a large territory including the entire Los Angeles Basin (Jones and Stokes, 2006). At this time Machado Lake was a permanent freshwater source and an appealing area for habitation. The lake implementation activities, particularly hydraulic dredging may have the potential to uncover an archeological site and artifacts. It is recommended that the implementation of these lake management alternatives be monitored by a qualified archaeologist. Likewise, in the event that cultural resources are discovered all work should be halted until a qualified archaeologist can visit the site and assess the significance. Site treatment may be required including recordation, evaluation, and data recovery.

STORMWATER IMPLEMENTATION ALTERNATIVES

Infiltration Stormwater BMPs and Diversion and Treatment

Infiltration stormwater BMPs and diversion and treatment facilities would be installed in currently urbanized areas where ground disturbance has previously occurred. Because these areas are already fully urbanized it is unlikely that implementation of structural treatment devices would cause a substantial adverse change to historical or archeological resources, destroy paleontological resources, or disturb human remains. However, depending on the final location of facilities, potential impacts to cultural resources could occur. The site-specific presence or absence of these resources is unknown because the specific locations for facilities will be determined by responsible agencies at the project level. Installation of these systems could result in minor ground disturbances, which could impact cultural resources if they are sited in locations containing these resources and where disturbances have not previously occurred.

Upon determination of specific locations for structural treatment devices, responsible agencies should complete an archaeological survey including consultation with the Native American Heritage Commission, to make an accurate assessment of potential to affect historic, archaeological, or architectural resources or to impact any human remains. If potential impacts are identified, mitigation measures could include project redesign, such as the relocation of facilities outside the boundaries of archeological or historical sites. In the event that prehistoric or historic cultural resources are discovered in project area during construction, all work shall be halted in the vicinity of the archaeological discovery until a qualified archaeologist can visit the site of discovery and assess the significance of the archaeological discovery.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

21. Mandatory Findings of Significance.

21.a Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Answer: Potentially Significant
The potential impacts of the project will not cause a significant degradation to the environment with appropriate implementation of available mitigation measures. The implementation of this TMDL will result in improved water quality in the waters of the Region and will have significant beneficial impacts to the environment over the long term.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

21.c. Does the project have impacts which are individually limited, but cumulatively considerable?

Answer: Potentially Significant

Each compliance measure is expected to have nominal environmental impacts if performed properly. Mitigation measures are available for most of these impacts. It is not expected that implementation of the TMDL will cause cumulatively considerable impacts if available mitigation measures are properly implemented.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

21. d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Answer: Potentially Significant
Without implementation of recommended mitigation measures, potentially significant environmental impacts, such as impacts to air, noise, and transportation, can result from implementation projects. In some cases, mitigation measures even if performed may not reduce the impacts to less than significant levels. The significance of these impacts is discussed in detail above, as well as elsewhere in this document. The project will not cause substantial adverse effects on human beings.

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

OTHER ENVIRONMENTAL CONSIDERATIONS

This section evaluates several other environmental considerations of reasonably foreseeable methods of complying with the nutrient TMDL, specifically:

7.1. Cumulative Impacts of the Program Alternatives (as required by CEQA Guidelines Section 15130);

7.2. Potential Growth-Inducing Effects of the Program Alternatives (as required by CEQA Guidelines Section 15126); and

7.3. Unavoidable Significant Impacts (as required by CEQA Guidelines Section 15126.2).

CUMULATIVE IMPACTS

Cumulative impacts, defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed TMDL, but also the impacts from other municipal and private projects, which would occur in the watershed during the period of implementation.

The areas of cumulative impacts analyzed in this section include: 1) the program-level cumulative impacts and 2) the project-level cumulative impacts. On the program-level, the impacts from multiple TMDLs, if they exist, are analyzed. On the project-level, while the full environmental analysis of individual projects are the purview of the implementing municipalities of agencies, the cumulative impact analysis included

here entails consideration of construction activities occurring in the vicinity of one another as a result of other projects being built in the same general time frame and location. The nutrient TMDL projects, if occurring with other construction projects, could contribute to temporary cumulative noise and vibration effects that would not occur with only one project.

PROGRAM CUMULATIVE IMPACTS

Compliance with the Machado Lake Nutrient TMDL, will include stormwater BMPs such as sand/organic filters and filter strips, which also reduce pollutant loading of other pollutants not just nitrogen and phosphorus. Also, lake management alternative such as hydraulic dredging may remove other pollutants residing in the sediment. Thus these implementation alternatives will potentially contribute to the implementation of other TMDLs in the future and reduce overall pollutant loading to the lake.

Currently there is one other TMDL adopted for the Machado Lake, the Machado Lake Trash TMDL. Some trash removal systems for compliance with this TMDL have a secondary benefit; the catch basin improvements and gross solids removal systems developed by Caltrans and discussed in section 5 of the Trash TMDL SED also remove sediments. Reducing the sediment load to Machado Lake will also reduce the nutrient loading to the lake. Therefore, the potential implementation strategies discussed in the Trash TMDL SED will also contribute to the implementation of the nutrient TMDL. Since many of the BMPs are dual purpose for the reduction of trash loading and nutrient loading the impacts from BMP implementation to comply with both the Machado Lake Trash and Nutrient TMDLs are expected to be limited and not cumulative in effect.

PROJECT CUMULATIVE IMPACTS

Specific TMDL projects must be environmentally evaluated and cumulative impacts considered as the implementing municipality or agency designs and sites the project. However, as examples, TMDL projects and other construction activities may result in cumulative effects of the following nature:

Noise and Vibration - Local residents in the near vicinity of installation and maintenance activities may be exposed to noise and possible vibration. The cumulative effects, both in terms of added noise and vibration at multiple nutrient TMDL installation sites, and in the context of other related projects, are not considered cumulatively significant due to the temporary nature of noise increases. Noise mitigation methods including scheduling of construction or implementation device installation are available as discussed in the checklist. In addition, the fact that implementation BMP installation activities are being conducted in the same vicinity as other projects will not make mitigation methods less implementable.

Air Quality - Implementation of the nutrient TMDL Program may cause additional emissions of criteria pollutants and slightly elevated levels of carbon monoxide during construction or BMP and lake management device installation activities. The TMDL, in conjunction with all other construction activity, may contribute to the region's non-attainment status during the installation period. Because these installations, related emissions are temporary, compliance with the TMDL would not result in long-term significant cumulative air quality impacts. In the short term, cumulative impacts could be significant if the combined emissions from the individual TMDL projects exceed the

threshold criteria for the individual pollutants.

Transportation and Circulation - Compliance with the nutrient TMDL involves installation activities occurring simultaneously at a number of surface sites in the nutrient TMDL area. Installation of BMP devices may be occurring in the same general time and space as other related or unrelated projects. In these instances, surface construction activities from all projects could produce cumulative traffic effects which may be significant, depending upon a range of factors including the specific location involved and the precise nature of the conditions created by the dual construction activity. Special coordination efforts may be necessary to reduce the combined effects to an acceptable level. Overall, significant cumulative impacts are not anticipated because coordination can occur and because transportation mitigation methods including are available as discussed in the checklist. In addition, the fact that structural BMPs and lake management alternative installation activities are being conducted in the same vicinity as other projects will not make mitigation methods less implementable.

Public Services - The cumulative effects on public services in the nutrient TMDL study area would be limited to traffic inconveniences discussed above. These effects are not considered cumulatively significant as discussed above.

Aesthetics - Construction activities associated with other related projects may be ongoing in the vicinity of one or more nutrient TMDL construction sites. To the extent that combined construction activities do occur, there would be temporary adverse visual effects of less than cumulatively significant proportions as discussed in the checklist.

GROWTH-INDUCING IMPACTS

This section presents the following:

7.2.1) an overview of the CEQA Guidelines relevant to evaluating growth inducement,

7.2.2) a discussion of the types of growth that can occur in the Machado Lake Watershed,

7.2.3) a discussion of obstacles to growth in the watershed, and

7.2.4) an evaluation of the potential for the TMDL Program Alternatives to induce growth.

CEQA GROWTH-INDUCING GUIDELINES

Growth-inducing impacts are defined by the State CEQA Guidelines as:

> The ways in which a 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 impacts which would remove obstacles to population growth. Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects... [In addition,] the characteristics of some projects.. .may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It is not

assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

(CEQA Guidelines, Section 15126.2(d)).

Growth inducement indirectly could result in adverse environmental effects if the induced growth is not consistent with or accommodated by the land use plans and growth management plans and policies. Local land use plans provide for land use development patterns and growth policies that encourage orderly urban development supported by adequate public services, such as water supply, roadway infrastructure, sewer services, and solid waste disposal services.

Public works projects that are developed to address future unplanned needs (i.e., that would not accommodate planned growth) could result in removing obstacles to population growth. Direct growth inducement would result if, for example, a project involved the construction of new wastewater treatment facilities to accommodate populations in excess of those projected by local or regional planning agencies. Indirect growth inducement would result if a project accommodated unplanned growth and indirectly established substantial new permanent employment opportunities (for example, new commercial, industrial, or governmental enterprises) or if a project involved a construction effort with substantial short-term employment opportunities that indirectly would stimulate the need for additional housing and services. Growth inducement also could occur if the project would affect the timing or location of either population or land use growth, or create a surplus in infrastructure capacity.

TYPES OF GROWTH

The primary types of growth that occur within the Nutrient TMDL area are:

1) Development of land and

2) Population growth (Economic growth, such as the creation of additional job opportunities, also could occur; however, such growth generally would lead to population growth and, therefore, is included indirectly in population growth.)

Growth in land development

Growth in land development is the physical development of residential, commercial, and industrial structures in the Nutrient TMDL area. Land use growth is subject to general plans, community plans, parcel zoning, and applicable entitlements and is dependent on adequate infrastructure to support development.

Population Growth

Population growth is growth in the number of persons that live and work in the Nutrient TMDL area and other jurisdictions within the boundaries of the area. Population growth occurs from natural causes (births minus deaths) and net emigration to or immigration from other geographical areas. Emigration or immigration can occur in response to economic opportunities, life style choices, or for personal reasons.

Although land use growth and population growth are interrelated, land use and population growth could occur independently from each other. This has occurred in the past where the housing growth is minimal, but population within the area continues to increase. Such a situation results in increasing population densities with a corresponding demand for services, despite minimal land use growth.

Overall development in the County of Los Angeles is governed by the County of Los Angeles General Plan, which is intended to direct land use development in an orderly manner. The General Plan is the framework under which development occurs, and, within this framework, other land use entitlements (such as variances and conditional use permits) can be obtained. Because the General Plan guides land use development and allows for entitlements, it does not represent an obstacle to land use growth. The cities with in the Nutrient TMDL area also have plans which direct land use development.

EXISTING OBSTACLES TO GROWTH

Obstacles to growth could include such things as inadequate infrastructure, such as an inadequate water supply that results in rationing, or inadequate wastewater treatment capacity that results in restrictions in land use development. Policies that discourage either natural population growth or immigration also are considered to be obstacles to growth.

POTENTIAL FOR COMPLIANCE WITH THE PROPOSED TMDL TO INDUCE GROWTH.

Direct Growth Inducement

Because the reasonably foreseeable methods of compliance with the proposed nutrient TMDL focus on lake management activities, non-structural BMPs and improvements to the stormdrain system which is located throughout the urbanized portion of the Nutirent TMDL area, the nutrient TMDL would not result in the construction of new housing and, therefore, would not directly induce growth.

Indirect Growth Inducement

Two areas of potential indirect growth inducement are relevant to a discussion of the proposed TMDL: (1) the potential for compliance with the TMDL to generate economic opportunities that could lead to additional immigration, and (2) the potential for the proposed TMDL to remove an obstacle to land use or population growth.

Installation of devices to comply with the proposed TMDL would occur over a 8.5 year time period. Installation and maintenance spending for compliance would generate jobs throughout the region and elsewhere where goods and services are purchased or used to install structural treatment devices and implement lake management activities. Based on the above annual construction cost estimates, the alternatives would result in direct jobs and indirect jobs. The creation of jobs in the region is considered a benefit.

Although the construction/implementation activities associated with the nutrient TMDL would increase the economic opportunities in the area and region, this construction is not expected to result in or induce substantial or significant population or land use development growth because the majority of the new jobs that would be created by this construction are expected to be filled by persons already residing in the area or region,

based on the existing surplus of unemployed persons in the area and region. SCAG estimates that the SCAG region had over 405,000 unemployed persons.

The second area of potential indirect growth inducement is through the removal of obstacles to growth. As discussed above, no obstacles exist to land use or to population growth in the watershed.

UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS

Section 15126.2(c) of the CEQA Guidelines requires a discussion of potential significant, irreversible environmental changes that could result from a proposed project. Examples of such changes include commitment of future generations to similar uses, irreversible damage that may result from accidents associated with a project, or irretrievable commitments of resources. Although the proposed TMDL would require resources (materials, labor, and energy) they do not represent a substantial irreversible commitment of resources.

In addition, implementation of the TMDL will have substantial benefits to water quality and will enhance beneficial uses. Enhancement of the recreational beneficial uses (both water contact recreation and non-contact water recreation) will have positive social and economic effects by decreasing potential hazards and increasing the aesthetic experience at the lake. In addition, habitat carries a significant non-market economic value. Enhancement of habitat beneficial uses will also have positive indirect economic and social benefits. Section 6 of this SED identifies the anticipated environmental effects for each resource area, identifies mitigation measures for potentially significant impacts, and determines that impacts after implementation of mitigation are insignificant.

STATEMENT OF OVERRIDING CONSIDERATIONS AND DETERMINATION

The Regional Board staff has balanced the economic, legal, social, technological, and other benefits of this proposed nutrient TMDL against the unavoidable environmental risks in determining whether to recommend that the Regional Board approve this project. Upon review of the environmental information generated for this project and in view of the entire record supporting the TMDL, staff has determined that the specific economic, legal, social, technological, and other benefits of this proposed nutrient TMDL outweigh the unavoidable adverse environmental effects, and that such adverse environmental effects are acceptable under the circumstances.

The implementation of this Basin Plan amendment will result in improved water quality in the waters of the Region and will have significant positive impacts to the environment (including restoration and enhancement of beneficial uses) and the economy over the long term. Enhancement of the recreational beneficial uses (both water contact recreation and non-contact water recreation) will have positive social and economic effects by decreasing potential hazards and increasing the aesthetic experience at Machado Lake. Specific projects employed to implement the Basin Plan amendment may have adverse significant impacts to the environment, but these impacts are generally expected to be limited, short-term or may be mitigated through design and scheduling.

The Staff Report, Basin Plan amendment, and this SED provide the necessary information pursuant to Public Resources Code section 21159 to conclude that properly

designed and implemented BMPs generally should not foreseeably have a significant adverse effect on the environment. Any potential impacts can be mitigated at the subsequent project level when specific sites and methods have been identified, and responsible agencies can and should implement the recommended mitigation measures.

For this TMDL, mitigation measures are available to reduce environmental impacts to less than significant levels and in most cases are routine measures that are typically used in construction projects, infrastructure maintenance and lake management. Routine construction and maintenance of power lines and storm sewer systems are regular and expected activities carried out by municipalities and county agencies throughout Los Angeles County. Sewer and power line maintenance, traffic alterations, and environmental impacts from them already occur and are expected. This project will foreseeably require these types of projects and their individual impacts are not expected to be extraordinary in the magnitude or severity of impacts. In addition to storm drain upgrade projects, the TMDL may require projects typical of lake management activities, such as dredging, aeration, and chemical treatment to improve water quality. For these activities, there are mitigation measures available to reduce environmental impacts, and these measures are routine and already carried within Los Angeles County. Mitigation measures including but not limited to deployment of optimally-sized aerators, covering dredge piles, adhering to Material Safety Data Sheets instructions when handling chemicals may reduce environmental impacts to less than significant levels.

Specific projects to comply with this TMDL that may have a significant impact will be implemented by local agencies and jurisdictions and would therefore be subject to a separate environmental review. The lead agency for the TMDL Implementation projects have the ability to mitigate project impacts, can and should mitigate project impacts, and are required under CEQA to mitigate any environmental impacts they identify, unless they have reason not to do so. Notably, in almost all circumstances, where unavoidable or unmitigable impacts would present unacceptable hardship upon nearby receptors or venues, the local agencies have a variety of alternative implementation measures available instead. Cumulatively, the many, small individual projects may have a significant effect upon life and the environment throughout the region.

This TMDL is required by law under section 303(d) of the federal Clean Water Act, and if this Regional Board does not establish this TMDL, the USEPA will be required to develop a TMDL. The CWA requires states to establish a priority ranking for waters on the 303(d) list of impaired waters and to develop and implement TMDLs for these waters (40 CFR §130.7). The impacts associated with USEPA's establishment of the TMDL would be significantly more severe, as discussed herein, because USEPA will not provide a compliance schedule, and the final waste load allocations, pursuant to federal regulations, would need to be complied with upon incorporation into the relevant stormwater permits. (40 CFR 122.44(d)(1)(vii)(B).) Since compliance would not be authorized over a period of years, all of the impacts associated with complying would be truncated into a short time frame, thus exacerbating the magnitude of the cumulative effect of performing all projects relatively simultaneously throughout the region.

The implementation of this TMDL will result in improved water quality at Machado Lake, but it may result in short-term localized significant adverse impacts to the environment as a variety of small construction projects may be undertaken in the vicinity of Machado Lake of approximately 8.5 years. Individually, these impacts are generally expected to be limited, short-term or may be mitigated through careful design and scheduling. The Staff Report for the Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient)

TMDL and this checklist provide the necessary information pursuant to Public Resources Code section 21159 to conclude that properly designed and implemented lake management activities and structural or non-structural BMPs of compliance should mitigate and generally avoid significant adverse effects on the environment, and all agencies responsible for implementing the TMDL should ensure that their projects are properly designed and implemented.

All of the potential impacts must, however, be mitigated at the subsequent, project level because they involve specific sites and designs not specified or specifically required by the Basin Plan Amendment to implement the TMDL. At this stage, any more particularized conclusions would be speculative. The Regional Board does not have legal authority to specify the manner of compliance with its orders or regulations (Wat. C. § 13360), and thus cannot dictate that an appropriate location be selected for any particular project, that it be designed consistent with standard industry practices, or that routine and ordinary mitigation measures be employed. These measures are all within the jurisdiction and authority of the agencies that will be responsible for implementing this TMDL, and those agencies can and should employ those alternatives and mitigation measures to reduce any impacts as much as feasible. (14 Cal. Code Regs., § 15091(a)(2).)

Implementation of the TMDL is both necessary and beneficial. To the extent that the alternatives, mitigation measures, or both, that are examined in this analysis are not deemed feasible by those local agencies, the necessity of implementing the federally required TMDL and removing the eutrophic, algae, ammonia, and odors impairment from Machado Lake (an action required to achieve the express, national policy of the Clean Water Act) remains.

DISCUSSION OF ENVIRONMENTAL EVALUATION (Based on information in the Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL Staff Report and Substitute Environmental Documents for the Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrient) TMDL)

This SED impact analysis concludes that there are potentially significant impacts from implementation of the TMDL, but notes that there are mitigation measures available to reduce potentially significant environmental impacts to less than significant levels. However, implementation of these mitigation measures are within the responsible and jurisdiction of the responsible agencies listed in this TMDL (Title 14, California Code of Regulations, Section 15091(a)(2)). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations (Title 14, California Code of Regulations, Section 15091(a)(3)).

PRELIMINARY STAFF DETERMINATION

☐ The proposed project COULD NOT have a significant effect on the environment, and, therefore, no alternatives or mitigation measures are proposed.

☑ The proposed project MAY have a significant or potentially significant effect on the environment, and therefore alternatives and mitigation measures have been evaluated.

Signature	Date
Printed Name	For

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21080(c), 21080.1, 21080.3, 21082.1, 21083, 21083.3, 21093, 21094, 21151, Public Resources Code; Sundstrom v. County of Mendocino, 202 Cal.App.3d 296 (1988); Leonoff v. Monterey Board of Supervisors, 222 Cal.App.3d 1337 (1990).

REFERENCES

California Department of Conservation, California Geological Survey. 2002. Guidelines for Evaluating the Hazard of Surface Fault Rupture – Note 49.

California Exotic Pest Plant Council (CalEPPC). 1999. Exotic Pests Plants of Greatest Ecological Concern, October, 1999. http://www.cal-ipc.org/ip/inventory/pdf/Inventory1999.pdf

California Stormwater Quality Association (CASQA). 2003a. California Stormwater BMP Handbook: Municipal. January 2003. http://www.cabmphandbooks.com

California Stormwater Quality Association (CASQA). 2003b. California Stormwater BMP Handbook: New Development and Redevelopment. January 2003. www.cabmphandbooks.com

Carr, David. An Assessment of an Inline Alum Injection Facility Used to Treat Stormwater Runoff in Pinellas County Florida. 1999. Sixth Biennial Stormwater Research and Watershed Management Conference.

City of Durham, NC. 1985. Alum Recovery at a Drinking Water Treatment Plant.

Federal Highway Administration (FHWA). 2007. Storm Water Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring. http://www.fhwa.dot.gov/environment/ultraurb/

General Chemical. Material Safety Data Sheet, Alum. June 2001.

Harper, Harvey. Current Research and Trends in Alum Treatment of Stormwater Runoff. Environmental Research and Design, Inc.

Jones & Stokes. 2006. Archaeological Survey Report: Storm Drain and Street Improvement Project, Vermont South of PCH, Los Angeles, California. April. Los Angeles, CA. Prepared for City of Los Angeles, Department of Public Works, Bureau of Engineering.

Knox County Tennessee Stromwater Management Manual Volume 2 (Technical Guidance). Page 4-241-248.

Los Angeles County. Countywide Integrated Waste Management Plan. 2005. Annual Report. Countywide Summary Plan and Countywide Siting Element. May 2007.

Los Angeles Regional Water Quality Control Board (LARWQCB). 1994. Water Quality Control Plan for the Los Angeles Region (Basin Plan).

Marsulex. Material Safety Data Sheet, Dry Alum. November 15, 2007

Minnesota Urban Small Sites BMP Manual. Prepared by Barr Engineering Company 2001. http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm Accessed December 2007

Parsons. May 2002. Machado Lake Watershed Management Plan Volume II. Prepared for City of Los Angeles, Department of Recreation and Parks.

South Coast Air Quality Management District (SCAQMD) webpage. http://www.aqmd.gov/Default.htm. Accessed November 2007.

State of California Department of Transportation (Caltrans). 2002. Storm Water Quality Handbooks: Project Planning and Deign Guide. September 2002, revised July 2005. http://www.dot.ca.gov/hq/oppd/stormwtr/.

State of California Department of Transportation (Caltrans). 2003a. Construction Manual. December 2003.

State of California Department of Transportation (Caltrans). 2005. Division of Environmental Analysis. http://www.dot.ca.gov/hq/env/stormwater/ongoing/gsrd_pilot_study/index.htm –Website updated: December 22, 2005

Stormwater Management Manual for Western Washington. 2005 http://www.ecy.wa.gov/PROGRAMS/WQ/stormwater/manual.html. Accessed December 2007.

U.S. EPA. 2000. Nutrient Criteria Technical Guidance Manual Lakes and Reservoirs. EPA 822-B00-001.

U.S. EPA. 2005. Stormwater Phase II Final Rule - Public Education and Outreach Minimum Control Measure Fact Sheet. EPA 833-F00-005

United States Environmental Protection Agency (US-EPA9). 2007. National Menu of Stormwater Best Management Practices, Catch Basin Inserts. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm. Accessed December 2007.

Water Environment Research Foundation (WERF). 2005. Critical Assessment of Stormwater Treatment and Control Selection Issues. Project No. 02-SW-1 http://www.werf.org/AM/Template.cfm?Section=Research&Template=/CustomSource/Research/ResearchProfile.cfm&ReportId=02-SW-1&CFID=707181&CFTOKEN=54086235.