Executive Summary

Executive Summary

Introduction

The California State Water Resources Control Board (SWRCB) is proposing to adopt a General Order (GO) for General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities in California. (The entire text of the proposed GO is included in Appendix A.) Biosolids are defined as sewage sludge that has been treated, tested, and shown to be capable of being used beneficially as a soil amendment for agriculture, silviculture, horticulture, and land reclamation. The GO would establish a notification and permit review process applicable to all persons and public entities intending to apply biosolids to land for the purposes stated above. The GO defines discharge prohibitions, discharge and application specifications, transportation and storage requirements, and general procedures and provisions to which all land appliers would be required to adhere.

This EIR was originally certified in 1999. Litigation brought against the SWRCB after approval of the GO has resulted in this revision of the original program environmental impact report (PEIR). The court generally found the 1999 PEIR to be adequate, but concluded that two of the project alternatives were dismissed from detailed analysis without sufficient grounds. It decertified the EIR and set aside the approval of the GO pending revision and recertification of the EIR, with new analyses of the two alternatives. The court case is discussed in more detail under Post-Certification Litigation below.

Consistent with the order of the court, the following PEIR has been revised to include a detailed examination of two additional alternatives to the proposed GO: "Class A Only Alternative" and "Food Crop Limitation." These examinations are found in Chapter 14. In addition, where pertinent new information has become available since certification of the original PEIR, new discussions have been added. Other discussions have been updated to reflect changes in the regulatory environment that have occurred since certification of the original PEIR. These changes to the text of the 1999 Draft EIR are indicated by underlining new material and striking out outdated material. Text changes are also indicated by a dashed vertical line in the right-hand margin of the modified page.

Purpose of the Statewide Program EIR

The purpose of this statewide program environmental impact report (EIR) is to comply with a Superior Court order by evaluating the environmental impacts of the SWRCB's adoption and implementation of a GO that would allow the issuance of general WDRs for land application of biosolids. The California Environmental Quality Act (CEQA) requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before taking action on those projects (Pub. Res. Code 21000 et seq.). The project analyzed in this document is the SWRCB's discretionary action on the GO; the underlying activity associated with this action is the land application of biosolids. CEQA also requires that each public agency mitigate or avoid, wherever feasible, the significant environmental effects of projects it approves or implements. Biosolids is defined as sewage sludge that has been treated and tested and shown to be capable of being beneficially and legally used as a soil amendment for agriculture, silviculture, horticulture, and land reclamation activities as specified under 40 CFR part 503.

An EIR is an informational document used in state, regional, and local planning and decision-making processes to meet the requirements of CEQA. A program EIR is an EIR that is prepared for a series of actions that can be characterized as one large program, in this case the issuance of statewide regulations governing conduct of a continuing program (14 CCR 15168).

Background on Biosolids Generation, Disposal, and Reuse

Treatment of municipal wastewater typically generates two waste streams: a liquid component and a solid or semisolid component. The liquid component, commonly referred to as effluent, usually is discharged to surface waters or percolation ponds or is used as irrigation water on some types of land. The solid or semisolid component, commonly referred to as sewage sludge, is treated to varying degrees and is typically incinerated, stored in drying beds or ponds, disposed of in landfills, or reused as a soil amendment on some types of land. The GO being considered by the SWRCB would apply to sewage sludges treated and tested to meet the definition of biosolids presented above. More than 50% of the biosolids generated in the United States are reused through some form of land application (Goldstein 1998).

This document will use the terms "beneficial use," "reuse," and "application" interchangeably to describe the application of biosolids to land. The term "disposal" is not

used to describe this activity in order to avoid confusion with the Part 503 regulations use of that term. Under Part 503, disposal involves the placement of biosolids on land at greater than the agronomic rate (i.e., the rate at which crops take up nitrogen). This includes placement in a landfill or a biosolids disposal facility. Disposal would also apply to the incineration of biosolids. Disposal is not intended to describe the use of biosolids as soil amendments or fertilizers.

Land application of biosolids is currently regulated by the U.S. Environmental Protection Agency (EPA) under Standards for the Use or Disposal of Sewage Sludge (Title 40 Code of Federal Regulations [CFR] Part 503, known as the Part 503 regulations), which were adopted in 1993. Part 503 regulates the final use of biosolids by controlling the permissible levels of various constituents of concern, including the level of pathogen reduction, the degree of vector attraction reduction, and the concentration of pollutants in the biosolids. The Part 503 regulations apply to the generator of the biosolids, however, not the applier. The GO would apply to dischargers of biosolids rather than biosolids generators. The Part 503 regulations establish two pathogen reduction standards for land-applied biosolids: Class A biosolids are treated sufficiently for all pathogens to be essentially eliminated, and Class B biosolids have been treated sufficiently for the level of pathogens to be substantially reduced but not completely removed.

No single state agency regulates land application of biosolids in California; biosolids recycling projects may involve oversight by the SWRCB, the nine regional water quality control boards (RWQCBs), the California Integrated Waste Management Board (IWMB), the California Air Resources Board, and the California Department of Food and Agriculture (DFA). The California Department of Health Services (DHS) acknowledges biosolids recycling efforts in its Manual of Good Practice for Landspreading Sewage Sludge (California Department of Health Services 1983). The IWMB has classified biosolids as a solid waste and thus exercises jurisdiction over biosolids use and disposal. The IWMB is responsible for regulating biosolids composting practices (14 California Code of Regulations [CCR], Division 7, Chapter 5), which requires recycling agencies to submit a permit application through the IWMB tiered permitting program. The IWMB designates a reasonable agency as the local enforcement agency (LEA), which sets standards and enforces solid waste regulations. Some counties have made land application of biosolids exempt from solid waste regulations, and others specify where and how disposal of biosolids can be conducted. Some counties have banned the land application of biosolids entirely.

In an effort to streamline the RWQCB application and permitting process for the use of biosolids, the Central Valley and Lahontan RWQCBs developed separate general waste discharge requirements (WDRs) (also called GOs) for biosolids land application in 1995 and adopted their programs after approving negative declarations under CEQA. Public agencies subsequently petitioned the SWRCB to set aside the RWQCB actions. During

the interim before the SWRCB decision, biosolids application projects were permitted for approximately 50,000 acres under the Central Valley GO. The SWRCB remanded the Central Valley RWQCB GO in April 1996 as a result of legal challenges to the negative declaration but allowed for the continued land application of biosolids on sites for which permit coverage had been filed before April 1, 1996. In May 1996, a CEQA-based lawsuit was filed by the Central Delta and South Delta Water Agencies in the Superior Court of California, County of Sacramento, seeking that the SWRCB's interim permission for biosolids land application be rescinded under the GO unless an EIR is prepared. On June 12, 1997, the Superior Court decided that the SWRCB exceeded its authority in allowing the limited number of land application projects to proceed. On September 12, 1997, the Superior Court judge allowed for the continued application of biosolids on the subject sites and ordered the SWRCB to develop this statewide EIR for land application of biosolids within approximately a 3-year timeframe (by October 2000). The Lahontan GO was also subsequently remanded by the SWRCB, but no sites were permitted under this GO at that time.

In September of 2000 a lawsuit was filed by Kern County and other litigants against the ~~State Water Resources Control Board (~~SWRCB~~)~~ regarding the June 1999 version of this PEIR. This suit challenged various aspects of the adequacy of the PEIR. A hearing was held in July 2001 and a ruling was issued on August 2003. This ruling stated that the SWRCB generally complied with CEQA in developing and certifying the ~~EIREIREIR~~PEIR, however it ordered the PEIR de-certified pending recirculation of a revised PEIR that addressed two new alternatives. (Kern v. SWRCB 2002).

Existing and Projected Biosolids Land Application in California

The methods available for biosolids management, and particularly land application of biosolids, are determined primarily by the quality of the generated product. Sewage sludges removed in municipal wastewater treatment plants can be treated to produce biosolids of sufficient quality for use as soil amendments or can be disposed of using the alternatives mentioned below. The three primary methods for reuse and disposal of biosolids are land application, surface disposal in a landfill, and incineration.

Quantity of Biosolids Generated in California

The California Association of ~~SanitarySanitarySanitarySanitary~~Sanitation Agencies (CASA), a nonprofit organization of municipal utilities, conducted statewide surveys in 1988, 1991, and 1998 to estimate the quantity of biosolids generated and the uses of those biosolids (California Association of ~~SanitarySanitarySanitarySanitary~~Sanitation Agencies

1991, 1999). The 1988 and 1991 CASA survey results are derived from a database of 120 publicly owned treatment works (POTWs) in California.

CASA concluded that daily sludge disposal was 1,025 dry tons per day (TPD) in 1988; 1,610 dry TPD in 1991; and 1,842 dry TPD in 1998 (not all of the 120 POTWs submitted survey results). More than 70% of this material is generated at 10 POTWs that have wastewater flows in excess of 50 million gallons per day (mgd). The Los Angeles RWQCB region generates the greatest percentage (nearly 50%) of sludge among the nine RWQCB areas, followed in order by the Central Valley, San Francisco Bay, and Santa Ana regions.

Disposal and Reuse Methods

Most of the biosolids being reused in California are generated in the Los Angeles and Orange County areas, as well as in the other large urban centers of the state (San Diego, the San Francisco Bay Area, Sacramento). Much of this material is transported a considerable distance by truck for land application. The counties supporting the largest amounts of biosolids reuse are ~~Kern, Kings,~~ Merced, San Diego, Riverside, and Solano.

Biosolids disposal and reuse methods in California include landfills, land application, composting, onsite storage and incineration. The 1988 CASA survey results estimates that approximately 60% of the biosolids generated in California were disposed of in landfills; the percentage decreased to approximately 45% by 1991. Land application and composting accounted for 18.7% and 21.7%, respectively, of biosolids reuse in 1991, and both uses had increased considerably from what was reported in 1988. The combined onsite storage and incineration of biosolids remained stable from 1988 to 1991 at approximately 14% of the total generated quantities. The 1998 information indicates a huge increase in land application, with nearly 68% of the material reported through the survey going to this reuse option. As a result, the percentage being disposed of in landfills was reduced to 9.1%. Incineration was the selected method of disposal for 5.6%, and 6.9% remained in onsite storage.

The GO regulates the use of biosolids for agriculture, horticulture, silviculture, and land reclamation. In general, the most common land application practice for biosolids is spreading and incorporation into agricultural lands. In California, horticultural use typically involves Class A Exceptional Quality biosolids that have been composted with various types of green waste. The use of biosolids for horticultural activities could include large-scale landscape plantings such as road medians, parks, and golf courses and as a planting or potting medium in large nursery operations.

Currently, no large-scale silvicultural uses (commercial tree farming operations) of biosolids are under way in California. Silvicultural uses are common in other parts of the country, however, including the Pacific Northwest. Additionally, land reclamation is not currently a major biosolids reuse option in California. The major use that would fall into this category is incorporation into final cover material at landfills. This use is not considered a disposal method because it is intended to increase the productivity of the cover soils. Other land reclamation uses could include incorporation into surface materials at mining reclamation sites or soil borrow areas where subsoil material with low growing potential is exposed at the surface.

Future Biosolids Activity in California

Future biosolids production can be estimated based on population projections and per capita generation rates. Statistics were compiled from the California Department of Finance and CASA for use in this EIR. Based on census information, the population in urban areas in 1990(the date for which census data and CASA survey data most closely coincide) was 29.8 million (California Department of Finance 1998a), and this figure is expected to increase by approximately 42.3% to 42.4 million by 2015 (California Department of Finance 1998b). Based on the 1991 CASA estimate of biosolids generation (1,610 dry TPD) and assuming that the rate of per capita biosolids generation remains similar until 2015, the total estimated production of biosolids is expected to increase to 2,329 dry TPD. If the percentage of biosolids that are land applied remains constant in the next 15 years, the amount of material being land applied would be 1,579 dry TPD in 2015, with an annual total of 576,690 dry tons.

General Order Program Objectives

The goal of the GO is to provide a clear and consistent regulatory process that is adequately protective of environmental resources, streamlines the permitting process for land application of biosolids, and includes policies and procedures that ensure continued refinement of biosolids disposal practices and protection of the environment. Therefore, the GO is intended to:

- comply with Section 13274 of the California Water Code and the judicial order by the Superior Court of California for the County of Sacramento by adopting statewide general WDRs for the discharge of dewatered, treated, or chemically fixed sewage sludge (biosolids) for beneficial use as a fertilizer and/or soil amendment;

- provide a regulatory framework for biosolids application to land that can be used by individual RWQCBs to act on Notices of Intent (NOIs) filed by potential dischargers in a manner that avoids or mitigates potentially adverse environmental effects; and

- provide a flexible regulatory framework that allows implementation of a biosolids ~~disposal program for~~ land application ~~operations~~operationsoperationsoperations program at the regional level and contains requirements that are based on sound science and best professional judgment.

Description of General Order

Overview

The proposed GO was developed to provide a single regulatory framework for the land application of biosolids in California and to streamline the permitting process that each RWQCB uses for biosolids application projects. Provisions of the GO are based largely on the federal Part 503 regulations to ensure that the state regulation incorporates the extensive health risk assessments and scientific review that went along with developing the federal regulation. Baseline criteria that were established under the Part 503 regulations must be met under the GO and associated general WDRs. Projects that fail to meet the criteria established by the GO may still apply for an individual permit from the RWQCB. This section generally describes the principal permit conditions and procedures of the GO.

Applicability

For the purposes of the GO, biosolids are defined as only those sewage sludges produced at municipal wastewater treatment plants that meet the requirements of the Part 503 regulations. Unstabilized sewage sludge, septage, and wastes that do not meet the Part 503 regulations or are determined to be hazardous under Title 22, Division 4.5, Chapter 11, Article 3 of the CCR would not be regulated under the GO.

Under the GO, the discharger is primarily defined as the landowner and generator, but may also include an individual, business, or organization involved in the generation,

transportation, use and application of biosolids. The discharger would be legally responsible for implementing and complying with the provisions of the general WDRs issued by the RWQCB in accordance with the GO.

A biosolids application project that is permitted under a single NOI must involve less than 2,000 acres of land that receive biosolids, and all application sites must be within 20 miles of each other. In addition, each landowner involved with a biosolids application project must file a separate NOI, pay a separate filing fee, and list each generator associated with the proposed operation as co-dischargers. A permitted project for which the GO is applicable may involve a single application of biosolids or repeated applications. The identification of permitted activities under the GO does not preempt or supersede the authority of local agencies to prohibit, restrict, or control biosolids reuse. The discharger is responsible for making inquiries about permitted uses and obtaining applicable local permits and authorizations.

An important component of the GO is the requirement that each biosolids application project operator, before applying any biosolids, must prepare and submit an NOI for the area in which the biosolids are to be applied. The appropriate RWQCB would then review information contained in the NOI and, if it finds the information to be adequate, issues a Notice of Applicability under the general WDRs of the GO along with discharge monitoring requirements. A complete NOI includes a preapplication report that provides the RWQCB with specific information relating to each field or distinct application area.

An annual filing fee is required for each year that the project is operating and is based on the threat to water quality and complexity of the project as identified in 23 CCR 2200. Biosolids projects encompassing an area of 40-2,000 acres would be designated a Category II threat to water quality and given a Category “b” complexity rating. Biosolids projects of less than 40 acres would be classified a Category III threat to water quality and given a Category “b” complexity rating.

Relationship of the GO to Part 503 Regulations

Some of the minimum standards established under the Part 503 regulations are applicable to the proposed GO program:

- Biosolids must be treated to reduce potential disease-causing pathogens.
- Class A biosolids have been treated sufficiently that pathogens are essentially eliminated; Class A biosolids must be monitored for bacteria growth at the time of use.

- Class B biosolids have been treated sufficiently that pathogens are substantially reduced, but not completely eliminated. Land application of biosolids that meets Class B criteria is restricted by the following conditions:
  - food crops with harvested parts that touch the soil cannot be harvested for 14 months after biosolids application;
  - food crops with harvested parts below the soil cannot be harvested for 20 months after application if biosolids remain on the land surface for 4 months or longer before being incorporated into the soil;
  - food crops with harvested parts below the soil cannot be harvested for 38 months after application if biosolids remain on the land surface for less than 4 months before being incorporated into the soil;
  - food and fiber crops cannot be harvested for 30 days after biosolids application;
  - animals cannot be grazed on the site within 30 days of biosolids application;
  - turf cannot be harvested for 12 months after biosolids application if the site is likely to have extensive public exposure (e.g., golf courses, parks);
  - public access to land that is likely to have extensive public exposure is not allowed for 12 months after biosolids application;
  - grazing of milking animals used for producing unpasteurized milk for human consumption is prevented for at least 12 months if the field is used as pasture; and
  - public access to land that is unlikely to have extensive public exposure is not allowed for 30 days after biosolids application.

The Part 503 regulations also outline several alternative chemical and physical treatment processes and management practices that the biosolids must undergo to reduce vector attraction. Biosolids must be treated to meet at least Class B criteria for pathogen reduction and vector reduction levels before they can be applied to land.

The material quality of biosolids that are to be applied to land under the GO must comply with minimum standards for concentrations of 10 metals, nine of which are regulated under the Part 503 regulations (see the discussion below in “Discharge Prohibitions of the

GO" and "Discharge Specifications of the GO"). Restrictions on pollutant addition levels are described in "Discharge Specifications in the GO".

Discharge Prohibitions of the GO

The GO contains prohibitions that apply to all land application projects that request authorization. In general, biosolids must not be applied under the following conditions:

- the biosolids to be discharged cannot contain any chemical at a concentration in excess of the federal or state regulatory limits for classification as a hazardous waste;
- the biosolids cannot be discharged except as allowed at authorized storage, processing, and land application sites;
- no application is permitted until the RWQCB has issued a Notice of Applicability, a set of individual WDRs, or a waiver of WDRs;
- no application is permitted if the discharge would cause or threaten to cause pollution or create a nuisance as defined by Section 13050 of the California Water Code;
- no application is permitted that would cause a violation of the Safe Drinking Water and Toxic Enforcement Act (Health and Safety Code Section 25249.5);
- no application is permitted to areas not specified in the applicant's NOI;
- no application is permitted to surface waters or drainage courses;
- no application is permitted when the application rate would exceed the nitrogen requirements of the vegetation or the rates that would degrade groundwater unless specifically authorized (application in excess of nitrogen requirements may be allowed for land reclamation sites if a certified agronomist, registered agricultural engineer, or registered civil engineer demonstrates that application would not degrade the quality of underlying groundwater);
- no surface water runoff resulting from irrigation of the site is permitted within 30 days of application unless a sufficient buffer of grass (more than 33 feet) is present to prevent biosolids from being carried in runoff from the application site;

- no application is permitted to frozen or water-saturated ground or during periods of rain heavy enough to cause runoff from the site;
- the application of biosolids containing a moisture content of less than 50 percent is prohibited;
- no application is permitted in areas subject to erosion or washout offsite; and
- discharge of biosolids with pollutant concentrations greater than specified levels is prohibited.

Discharge Specifications of the GO

The GO contains specifications for the quantity and quality of biosolids that are allowed to be land applied. Most of these specifications are similar to the requirements of the Part 503 regulations and include the following:

- Biosolids must be treated to meet Part 503 standards for vector reduction and be treated to either the Class A or Class B level of pathogen reduction standards.
- Cumulative lifetime metals loading limits for a given application site shall not exceed specified levels (including background soil levels and levels in applied biosolids).
- Biosolids application rates shall not exceed the agronomic rate for nitrogen for the crop being planted except as allowed for reclamation sites or biosolids research projects.
- Following incorporation of biosolids into the soil, tilling practices must minimize erosion of the site resulting from wind, stormwater, and irrigation water.
- If the slope of the application site is greater than 10%, an erosion control plan must be prepared by a qualified erosion control specialist.
- For Class B biosolids, the harvesting period for crops is restricted as described in the Part 503 regulations. In addition, the location of application is specified with respect to property lines, municipal and agricultural supply wells, public roads, surface waters, agricultural buildings, and residential buildings.

Storage and Transportation

The GO specifies conditions for the storage and transportation of biosolids. Major conditions of the GO include the requirement for biosolids to be transported in covered, leakproof vehicles; drivers must carry a copy of an approved spill response plan and be trained with regard to the proper response to accidents or spill events. The GO defines short-term storage as placement of biosolids on the ground or in nonmobile containers for longer than 48 hours, but less than 7 consecutive days at an intermediate site other than the place of generation and/or processing. If biosolids are to be stored at the application site, the operator must prepare and implement an RWQCB-approved storage program. Biosolids must not be stored for longer than 7 consecutive days; storage areas must be covered between October 1 and April 30 during periods of runoff-producing precipitation; public access to storage areas must be restricted; and control measures should be implemented to prevent leachate into the soil, surface runoff, and washout from floods.

Provisions

The GO contains 20 general conditions and procedures that must be followed by the discharger. The general provisions are summarized under the following categories of responsibilities:

- **Obtaining, maintaining, and terminating coverage under the GO:** An NOI must be submitted for each biosolids source and discharge site. Specific agencies, adjacent residents, and adjacent landowners identified in the GO and any local agency with jurisdiction over the application site must be notified. The RWQCB must be notified in advance of any transfer of the project to another party. The RWQCB must be notified of project completion through submittal of a Notice of Termination and a Final Discharge and Monitoring Program report. Provisions of the general WDRs issued by the RWQCB are severable.

- **Chain of responsibility:** Individual property owners and companies responsible for biosolids discharges and site operations are primarily accountable for compliance and enforcement actions under the GO. The discharger is responsible for informing all biosolids haulers using the land application site of the conditions contained in the GO. Individual property owners are responsiblefor applicable crop selection, property access, and harvesting restrictions under the GO.

- **Monitoring, reporting, and record keeping:** The preapplication form that is attached to the GO describes the general reporting requirements and specific groundwater monitoring requirements (if deemed necessary). Groundwater monitoring would generally be required if the depth to groundwater at the disposal site is less than 25 feet and biosolids would be applied to the site more than twice in a 5-year period. If required, one upgradient and two downgradient wells must be monitored annually at each application site to evaluate water level, pH, total dissolved solids, sodium, chloride, nitrate, and total nitrogen levels. The discharger is responsible for implementing the requirements of the GO and for site operations and conducting the required monitoring programs. Sampling must be conducted using approved methods, accurate and properly calibrated equipment, and certified laboratories. Information that must be recorded includes the quantity of biosolids applied at each site along with its nitrogen content, crops grown, and total pollutant loading. The discharger must notify the RWQCB of any noncompliance with the GO within 24 hours. The discharger must keep monitoring records for at least 3 years. Annual monitoring reports submitted to the RWQCB must be signed and certified by the discharger or a duly authorized representative.

General Order Exclusion Areas

The proposed GO specifies several areas of the state within which biosolids application projects under the GO cannot be permitted. Generally, the exclusion areas are unique or valuable public resources, jurisdictional waters or preserves, or state-designated management areas. The general areas excluded from this GO are the following:

- the Lake Tahoe Basin;
- the Santa Monica Mountains Zone;
- the California Coastal Zone;
- the area within 0.25 mile of a wild and scenic river;
- the jurisdictional Sacramento-San Joaquin River Delta;
- Suisun Marsh;
- the area under the jurisdiction of the San Francisco Bay Conservation and Development Commission; and

- several specific areas within the jurisdiction of the Lahontan RWQCB, including the Antelope Hydrologic Unit above 3,500 feet, areas in the Mojave River Planning Area, the Hilton Creek/Crowley Lake areas, and areas of the Mono-Owens Planning Area.

These areas are not included in the analysis of this EIR.

Alternatives to the Proposed Project

In accordance with State CEQA Guidelines Section 15126.6, an EIR must describe a range of reasonable alternatives to the project, or to the location of the project, that would feasibly attain most of the basic project objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the project, and must evaluate the comparative merits of these alternatives. An EIR does not need to 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. State CEQA Guidelines Section 15126.6(d) allows for alternatives to be analyzed in lesser detail than the proposed project. In response to litigation over the prior version of this EIR, the Class A Only and Food Crop Limitation alternatives are also discussed.

The alternatives to the proposed project were developed to comply with CEQA and are based on input received during the public scoping period. The No-Project Alternative was developed to comply with CEQA. The Modified General Order Alternative is included because it would achieve the project's objectives and would result in reduced impacts compared with the proposed project. Although the Land Application Ban Alternative would not meet the project's basic objectives, it was included in the alternatives analysis to respond to issues identified during the public scoping period.

Impacts of the Proposed General Order

Table ES-1 (at the end of this chapter) presents a summary of project impacts and mitigation measures under the proposed project. Details of the mitigation measures can be found in each relevant technical chapter. Additionally, a mitigation monitoring program is included in Chapter 15, "Mitigation Monitoring Program".

Table ES-1.
Summary of Impacts and Mitigation Measures for the California State Water Resources Control Board General Waste Discharge Requirement for Biosolids Land Application

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Soils, Hydrology, and Water Quality			
Changes to existing drainage patterns or increase in surface runoff	Less than significant	None required	Less than significant
Changes in groundwater supply and hydrology	Less than significant	None required	Less than significant
Potential degradation of surface water from nutrients in biosolids	Less than significant	None required	Less than significant
Potential degradation of groundwater from nutrients	Less than significant	None required	Less than significant
Potential degradation of surface water and groundwater from trace elements in biosolids	Less than significant	None required	Less than significant
Potential degradation of surface water and groundwater from synthetic organic compounds in biosolids	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
		Land Productivity	
Changes in physical soil properties and resulting effects on productivity	Less than significant	None required	Less than significant
Changes in soil fertility and salinity and resulting effects on productivity	Potentially significant	4-1: Provide soil- and site-screening information with the pre-application report	Less than significant
Changes in trace elements and heavy metal plant toxicity in soils and resulting effects on productivity	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report	Less than significant
Changes in amount of synthetic organic compounds in soils and resulting effects on agricultural productivity	Less than significant	None required	Less than significant
Changes in grazing-land productivity	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report 4-2: Extend grazing restriction period to allow for SOC biodegradation	Less than significant
Increases in soil erosion rates and resulting effects on production	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report	Less than significant
Changes in farmland classification	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Effect on agricultural lands caused by public concerns about crop contamination from biosolids applications	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report 4-2: Extend grazing restriction period to allow for SOC biodegradation 4-3: Track and identify biosolids application sites	Less than significant
Changes in soil nutrient properties and resulting effects on productivity for silvicultural activities	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report	Less than significant
Potential soil degradation at recreation-area ~~apploication~~applo~~o~~ication sites	Less than significant	None required	Less than significant
Potential soil degradation	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report 4-2: Extend grazing restriction period to allow for SOC biodegradation	Less than significant
Public Health			
Potential for increased incidence of disease resulting from direct contact with pathogenic organisms at biosolids land application sites	Less than significant	5-1: Review manual of good practices (recommended)	Less than significant
Potential for increased incidence of disease resulting from direct human contact with pathogenic organisms in irrigation runoff from biosolids land application sites	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Potential for increased incidence of disease resulting from ingestion of pathogenic organisms in crops grown on land application sites or animals fed with crops grown on land application sites	Potentially significant	5-2: Extended grazing deferment period to allow for pathogen reduction	Less than significant
Potential for increased incidence of chronic human disease resulting from ingestion of biosolids-derived metals in crops grown on land application sites or animals fed with crops grown on land application sites	Less than significant	None required	Less than significant
Potential for increased risk of chronic disease resulting from ingestion of biosolids-derived organic compounds in food, soils, animals, dairy products, or wildlife	Less than significant	None required	Less than significant
Potential for increased incidence of disease resulting from ingestion of groundwater contaminated by biosolids-derived pollutants or pathogens	Less than significant	None required	Less than significant
Potential for increased incidence of acute or chronic disease resulting from human exposure to aerosols and wind-blown particulates from biosolids stockpiling, composting, or land application	Less than significant	5-3: Good management practices should include the wearing of respirators or masks by workers.	Less than significant
Potential for increased risk of disease resulting from contact with biosolids spilled during transport from point of generation to application site	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Potential for exposure of residents and agrigultural workers to unsafe levels of radionuclides after long-term application of biosolids.	Significant	5-4: Follow ISCORS management recommendations	Less than significant
Land Use and Aesthetics			
Application of biosolids in a manner and/or in locations in conflict with local land use plans and ordinances, including future planned land uses	Less than significant	None required	Less than significant
Application of Class B biosolids at locations that may conflict with existing land uses in urban areas; recreation areas; or other sensitive areas, including schools, hospitals, and recreation/public assembly areas	Potentially significant	6-1: Require injection of biosolids in areas defined as having a high potential for public exposure for Class B biosolids	Less than significant
Reduced visual quality resulting from truck transport of biosolids through residential and/or recreational areas	Significant	10-2: Control fugitive dust from unpaved roads 11-1: Avoid the use of haul route near residential lands	Less than significant
Reduced visual quality resulting from land application activities adjacent to schools, hospitals, or recreation/public assembly areas	Potentially significant	10-2: Control fugitive dust from unpaved roads	Less than significant
Reduced visual quality resulting from spillage of biosolids on public roads	Significant	6-2: Require the maintenance of biosolids transport trucks after biosolids are loaded in the trucks	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Biological Resources			
Reduction in the number of a special-status plant or wildlife species	Significant	7-1: ~~Conduct a site assessment on natural terrestrial habitat and fallow lands for special-status plant and wildlife species~~Modify pre-application report and provide biological information	Less than significant
Substantial disturbance of biologically unique or sensitive natural communities	Significant	7-2: ~~Conduct~~Modify pre-application report ~~site assessment~~ and provide information on ~~natural terrestrial habitats for~~ biologically unique or sensitive natural communities	Less than significant
Potential for physiological effects of biosolids application on wildlife	Less than significant	None required	Less than significant
Fish			
Potential for acute toxicity to fish from leaching of biosolids constituents from application sites to surface waters	Potentially significant	8-1: Increase setback from enclosed water bodies if pupfish are present	Less than significant
Potential for reduced fisheries productivity resulting from runoff and erosion	Potentially significant	4-1: ~~Develop a~~Provide soil- and site-screening information with the pre-application report	Less than significant
Traffic			
Potential increase in traffic resulting from the transport of biosolids	Less than significant	None required	Less than significant
Deterioration of roadway surfaces	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Potential for roadway safety hazards resulting from accidental spills	Less than significant	None required	Less than significant
Air Quality			
Significant increase in ROG, NOx ,and PM10 from biosolid transport vehicles and biosolids spreaders	Less than significant	None required	Less than significant
Exposure of sensitive receptors to odors	Less than significant	None required	Less than significant
Biosolids drift associated with wind-blown biosolids	Less than significant	None required	Less than significant
Noise			
Exposure of noise-sensitive land uses to noise resulting from the transport of biosolids	Significant	11-1: Avoid the use of haul routes near residential land uses	Less than significant
Exposure of noise-sensitive land uses to noise from the land application of biosolids	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
		Cultural Resources	
Damage to or destruction of cultural resources on lands not previously disturbed by agricultural activities	Significant	12-1: Conduct a cultural resources investigation	Less than significant
Damage to or destruction of unknown cultural resources on lands currently in agricultural production	Significant	12-2: Comply with state laws regarding disposition of Native American burials, if such remains are found	Less than significant
		Cumulative Impacts	
Cumulative nitrate contamination of groundwater	Potentially significant	13-1: Minimize contribution to groundwater nitrate contamination from land application of biosolids conducted under the GO 13-2: Reduce Sources of Nitrate Contamination	Less than significant
~~Cumulative Reduction in Fisheries Productivity 13-1: Minimize Contribution to Groundwater Nitrate Contamination from Land Application of Biosolids Conducted under the GOLess than significant13-2: Reduce Sources of Nitrate Contamination~~Cumulative loss of ~~Special-Status~~ special-status plant and wildlife species or the loss or disturbance of biologically unique or sensitive natural communities	Less than significant	None required	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Cumulative increase in NO_x and PM10 emissions	Less than significant	None required	Less than significant
Cumulative deterioration of roadways	Less than significant	None required	Less than significant

Environmentally Superior Alternative

CEQA requires that~~ the lead agency~~, where the no-project alternative is the environmentally superior alternative, that the EIR identify the environmentally superior alternative from among ~~those~~ th~~os~~e ~~evaluated in the EIR that are within the reasonable range of~~ ~~of~~other alternatives.~~.~~ The Modified General Order Alternative is the environmentally superior alternative because it reduces the potential for significant environmental effects when compared to the proposed GO and it is within the reasonable range of alternatives. The Modified GO would include various additional discharge requirements that take into account some of the unusual conditions that exist in regions of California that ~~are likely to~~might receive land-applied biosolids. It also contains the requirements for some additional data and technical analysis to be available to the RWQCB staff when evaluating individual land application permits.

Under the Modified General Order Alternative, potential impacts related to water quality, land productivity (including trace elements and heavy metals in soils), soil erosion, crop contamination, public health risk, land use compatibility, reduced visual quality, potential loss of special-status plant and wildlife species or biologically unique or sensitive natural communities, air quality emissions exceeding significance thresholds for air districts, exposure of sensitive receptors to noise, and disturbance of significant cultural resources would not occur because measures have been incorporated into the design of this alternative to avoid these impacts.

The Class A Only and Food Crop Limitation alternatives would avoid the impacts identified for the proposed GO (before mitigation) and have a similar level of impacts to the Modified GO alternative. However, neither of them is an environmentally superior alternative when compared to the Modified GO. Both the Class A Only and Food Crop Limitation alternatives would have greater levels of impacts with regard to truck traffic, air quality, and energy use. The additional effects would occur as treatment plant operators that are currently land-applying Class B biosolids convert to more energy-intensive Class A treatment or decide to haul biosolids to distant land application or disposal sites.

Other CEQA-Required Impact Conclusions

Cumulative Impacts

State CEQA Guidelines Section 15130 requires that an EIR discuss cumulative impacts of a proposed project when the incremental effects of an individual project would be considerable viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects. Additionally, the State CEQA Guidelines state that when a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant but shall briefly describe its basis for reaching that conclusion. Land application of biosolids could contribute to less-than-significant cumulative impacts for ~~the following resources: groundwater, fish,~~ biological resources, air quality, and transportation and a significant cumulative impact for groundwater. Cumulative impacts on these resources are discussed in Chapter 13.

Growth-Inducing Impacts

State CEQA Guidelines Section 15126.6(d) requires an EIR to include a discussion of the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.

The land application of biosolids would not be growth inducing because it would not foster economic or population growth or remove any obstacles to growth in California. Land application of biosolids is an existing activity in California and would not induce growth as a result of adopting the proposed GO.

Significant and Unavoidable Impacts

CEQA requires that an EIR identify any significant and unavoidable impacts of the proposed project. Implementation of the GO would not result in any significant and unavoidable impacts.

Irreversible Commitment of Resources and Significant Irreversible Environmental Changes

State CEQA Guidelines Section 15126~~.6(c)~~ requires that an EIR include a discussion of any irreversible commitment of resources that would occur as a result of project implementation. Irreversible commitment of resources would occur as a result of implementing the proposed project. These resources include fossil fuels, labor, and energy required for transporting and spreading biosolids.

CEQA also requires that an EIR identify any significant irreversible environmental changes that could result from the project. Although there is the potential for accidental spills of biosolids to occur during transportation of the biosolids to the application site, the GO requires that biosolids be transported in covered, leakproof vehicles; therefore, accidental spills of biosolids resulting from transporting biosolids to a site are unlikely because of the measures incorporated into the GO. If spills did occur, it would be unlikely that an irreversible environmental change would occur. Additionally, land application of biosolids would generally occur on lands that are currently in agricultural production. It is unlikely that significant amounts of land would be converted from nonagricultural to agricultural land use (or to silvicultural, horticultural, or land reclamation use) as a result of this project.

Known Areas of Controversy

State CEQA Guidelines Section 15123(b) requires that an EIR identify areas of controversy known to the lead agency, including issues raised by other agencies and the public. The following are known areas of controversy for regulating the land application of biosolids expressed during the scoping and preparation of this EIR.

Validity of Scientific Data Used during the Formulation of Part 503 Regulations. Numerous comments were received during the scoping process for the draft EIR regarding the validity of the scientific data used by EPA when formulating the Part 503 regulations. These concerns, including those expressed in the Cornell Waste Management Institute's 1999 working paper (Cornell Waste Management Institute 1999) have been reviewed and taken into consideration in preparing the impact analyses in this EIR. The proposed GO includes land application controls that are more stringent than those included in the Part 503 regulations to account for unusual conditions that may exist in California and differences of opinion that may exist about the adequacy of the Part 503 regulations.

Reduced Property Values where Land Application Occurs. Issues were raised during the scoping process for the draft EIR regarding the potential for reduced property values on and adjacent to sites where land application occurs. Potential property value effects have not been addressed in this EIR, as they would be an economic rather than an environmental effect. Property value effects are considered speculative at this time.

Loss of Crop Value as a Result of Public Perception. Another known area of controversy raised during the scoping process for the draft EIR was the potential for a decrease in crop value resulting from the public perception of biosolids being applied to the soil where these crops were grown. Additionally, concern was raised that crop value would be reduced for land adjacent to parcels where biosolids land application has occurred because the public or food processors could believe that the crops were grown on soil containing biosolids or were contaminated by the adjacent site where biosolids have been used. This issue has been addressed in Chapter 4, "Land Productivity" with regard to the productive value of the land. The potential economic effects are not discussed because they are considered speculative and would not result in a physical change in the environment.

Increase in Operation Costs. Concerns were raised about the GO's effect on operating costs at POTWs. If POTW costs are increased to meet additional treatment and reuse restrictions, the cost to the general public for wastewater treatment might also increase. Although the cost of biosolids treatment and management might increase to meet all of the terms of the GO, the economic effects have not been predicted in this EIR because they are not considered environmental impacts.

Availability of RWQCB Resources to Adequately Monitor and Enforce the GO. Several comments received during the scoping process for the draft EIR related to the ~~availabilityavailabilityavailability~~ability of the RWQCBs to adequately monitor and enforce the GO. The RWQCBs are the state enforcement agency charged with regulating the land application of biosolids. Members of the public and agency staff indicated that both funds and staffing resources would be needed for the RWQCBs to adequately administer this additional regulatory program. Much of the public concern regarding the viability of the GO has related to its reliance on strong monitoring and enforcement actions.

Significance of Certain High-Profile, Widely Publicized Human Diseases. Several comments also were received regarding certain high-profile, widely publicized human diseases, such as AIDS, hepatitis, "mad cow" disease, hormone inhibitors, and Legionnaire's disease. Chapter 5, "Public Health", discusses the potential for these diseases to occur as a result of implementing the proposed GO. Because there is not a large body of research regarding the ability of these diseases ~~and their ability~~ to be transmitted specifically in biosolids, the ~~potential for a~~ public health ~~risk~~risks are considered speculative

and the potential for these risks will continue to be studied~~ and will remain subject to varying opinions~~.

General Public Acceptance of Reusing Human Waste. Another known area of controversy is the public acceptability of reusing human waste. Although human waste has been used as a resource by various cultures worldwide for thousands of years, the potential public health risk and the tendency to remove this material from today's modern society will continue to make land application a controversial action. The agencies and associations interested in maintaining the resource value of biosolids are attempting to change public perception through education and additional research~~ on public~~.

Health Risks Posed by Dioxins. Human health risks posed by exposure to dioxins in biosolids is also an area of controversy. To address this area of uncertainty, the EPA has recently concluded a five year study that looked at the health risks of dioxins in biosolids. ~~Their~~Its study, which was undertaken as part of the consideration of additional Part 503 regulations, determined that dioxins from this source do not pose a significant risk to human health or the environment. The EPA's analysis showed that, even for a theoretical farm family that applies biosolids as a fertilizer to crops and animal feed and then consumes those crops and animals, 0.003 new cases of cancer could be expected each year or 0.22 new cases over a span of 70 years. The EPA found that the risk to the general population is even smaller due to the lower exposures from this source. In addition, the 2001 Dioxins Update to the National Sewage Sludge Survey found that the presence of dioxins in biosolids ~~is so insubstantial that they do not pose a significant risk to human health. As a result of this study, the EPA has decided not to amend Part 503 to regulate dioxins in biosolids. (EPA 2003).~~
has decreased since the EPA's last survey in 1988. The EPA expects this downward trend to continue, as a result of stricter regulatory controls on additional sources of dioxins in the environment.

Petition to EPA for Moratorium on Land Application. On October 7, 2003, the Center for Food Safety (Center), on behalf of some 72 other organizations, petitioned the EPA seeking an emergency moratorium on the land application of sewage sludge (i.e., biosolids). The petition requested that EPA halt the issuance of new NPDES permits and rewrite current NPDES permits that would allow the land application of biosolids. In addition, the petition requested that the EPA immediately initiate a rulemaking to eliminate land application as an acceptable use of biosolids. (Center for Food Safety 2003). The Center based its petition on the following claims: that biosolids contain heavy metals and other hazardous materials that have been applied to farmland; that there is "considerable anecdotal evidence" that the land application of biosolids has resulted in harm to people, livestock, and the environment; and that because of "the inherently unpredictable and inherently hazardous nature of sewage sludge" the EPA is "unable to implement any program or regulatory scheme to protect public health or the environment" from land

application of biosolids. The Center referenced three specific instances of human deaths and a case of dairy cow deaths where claims were made that exposure to biosolids was a causative factor.

The EPA responded by letter on December 22, 2003, denying the Center's petition. The EPA's response addressed each of the allegations made by the Center.

Regarding claims of adverse health effects, the EPA found that "none of these claimed adverse health effects have been proven or substantiated as having been caused by exposure to land-applied sewage sludge." After examining the information provided in the petition and other sources, the EPA concluded that there is "no evidence that exposure to land-applied sewage sludge was the cause of any of the allegations of adverse health effects or the specific human and animal deaths cited by the petitioners." (U.S. Environmental Protection Agency. 2003x) The EPA will be cooperating with the Federal Centers for Disease Control and Prevention (CDC) to undertake a comprehensive review of reported human health effects as part of its final action plan in response to the NRC "Biosolids Applied to Land" report. (68 Federal Register 75531)

Regarding toxic levels of chemicals in biosolids, the EPA cited studies in which testing of biosolids samples from around the country have demonstrated that sewage sludge does not qualify as a hazardous waste under RCRA, that sewage sludge meets federal regulations for metals content, and that pretreatment programs for industry have led to a decrease in the concentrations of potentially hazardous or toxic elements in sewage sludge over the past 20 years. The EPA also noted that the Agency is pursuing an active research program for certain contaminants.

Regarding program oversight, the EPA listed its current and future efforts in enforcement and compliance. It also described the roles of state and local health agencies and the CDC in responding to reports of adverse health effects.

Required Permits and Approvals

State CEQA Guidelines Section 15124 states that an EIR must include a list of the agencies that expect to use the EIR in their decision making and a list of the approvals required to implement the project. In order for the proposed GO to be implemented, the SWRCB would adopt the GO and certify the EIR. With the exception of the RWQCBs, no other agencies would use the EIR for decision making purposes. No other permits or approvals would be required.