Chapter 14. Alternatives Analysis

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This chapter has been revised since the Biosolids PEIR was first circulated for public review and comment. In response to litigation over the PEIR, this chapter now analyzes two additional alternatives to the proposed Biosolids General Order that were not previously discussed:

- Class A Only; and
- Restriction on Application to Food Crops.

These are in addition to the following three alternatives analyzed in the prior Biosolids PEIR:

- No-Project;
- Modified General Order Provisions and Specifications; and
- Land Application Ban.

No substantive change is being made to the discussions of the three original alternatives.

The prior Biosolids PEIR identified a number of other alternatives that had been considered during the scoping process, but rejected from further analysis. The "Class A Only" and "Food Crop Limitation" alternatives are now being analyzed at the same level of detail as the No-Project, Modified GO, and Land Application Ban alternatives. The additional alternatives are similar to the "in vessel composting" and "crop limitation" alternatives that were previously on the list of Alternatives Considered but Rejected. Those two alternatives have been removed from the rejected list. Otherwise the discussion of rejected alternatives is unchanged.

Consistent with the rest of the EIR, this chapter uses "biosolids" to refer to treated sewage sludge that complies with the requirements of 40CFR 503. Biosolids can either be disposed of through alternatives such as incineration, landfills, or dedicated land disposal sites; or the biosolids can be beneficially used for agricultural land application or horticultural mixes for the nutrients and organic content it has. Thus, the terms disposal and beneficial use are used in this chapter for distinct purposes.

Alternatives to the Issuance of the General Order

In accordance with Section 15126.6 of the State CEQA Guidelines, a draft ~~program~~ EIR must describe a reasonable range of alternatives to the proposed project that could feasibly enable the project's basic objectives to be met while reducing or eliminating any of the significant adverse impacts of the proposed project. As detailed in Chapter 2, "Program Description", the objectives of this project are 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 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 at the regional level and contains requirements that are based on sound science and best professional judgment.

In this chapter, alternatives to the proposed project are described and the anticipated environmental impacts of the alternatives are compared with those analyzed for the proposed GO in Chapters 3-12 of this report. The alternatives analyzed in this chapter are described below.

No-Project Alternative

Under the No-Project Alternative, it is assumed that land application of biosolids would continue in its current form and be regulated by the RWQCBs through individual WDRs or exemptions and by county governments through local ordinances and regulations. Existing land application operations would continue and would be controlled by the conditions contained in their individual permits. Biosolids generation would continue to increase as described in Chapter 2, and the amount of material going to land application sites would increase proportionately. The types of conditions and prohibitions placed on existing and new land application operations would be similar to those imposed in existing permits from the RWQCBs. Because it is not possible to predict how county and city

governments might alter their regulation of land application of biosolids in the future if a statewide GO were not in place, it is assumed that local regulation would remain in its current form.

The objectives of the proposed project would not be met under this alternative. There would be no statewide, unified approach to regulation of land application with a streamlined permit review and CEQA documentation process. Decisions on use of the federal Part 503 regulations and levels of environmental protection would be made on an individual-project basis by the RWQCBs.

Modified GO Provisions and Specifications Alternative

Land application of biosolids, as allowed under the proposed GO, has the potential to result in several significant impacts. To provide for addressing these impacts while still meeting the objectives of the proposed project, an alternative was developed that incorporates the mitigation measures identified in Table ES-1 that are necessary to address potentially significant effects as modified provisions and specifications. These added provisions and specifications would be as follows:

- Dischargers shall provide sufficient information in their Pre-Application Reports to determine the potential for soil degradation or reduced land productivity and shall ascertain, or use the services of a qualified soil scientist or qualified agronomist to ascertain, that no such soil degradation or reduced land productivity will occur as a result of biosolids application.

- After an application of Class B biosolids, the discharger shall ensure that animals are not grazed on that land for at least 90 days.

- Prior to application of biosolids to agricultural land, the discharger shall enter site assessor parcel numbers into a statewide tracking system, accessible to the public, that can identify whether a parcel of land has received an application of biosolids.

- Land application of Class B biosolids shall be prohibited, under the GO, within ½ mile of areas defined as having a "high potential for public exposure".

- Dischargers shall ensure that biosolids transporters develop truck routing plans that avoid traffic in primarily residential neighborhoods.

- All biosolids shall be transported in trucks that have been adequately cleaned to remove biosolids from the exterior of the vehicles prior to leaving the site of generation and the site of land application.

- There shall be no discharge of biosolids to uncultivated land or land otherwise undisturbed, or lands left fallow for more than 1 year without a site assessment being conducted for special-status plant and wildlife species or biologically unique or sensitive natural areas.

- There shall be no discharge of biosolids within 500 feet of enclosed water bodies potentially occupied by desert pupfish.

- The transport of biosolids shall not generate daily emissions of nitrogen oxides or particulate matter in excess of daily thresholds included in the policies of California air districts responsible for achieving attainment status under the federal and state Clean Air Acts.

- Dischargers shall control fugitive dust on unpaved access roads to land application sites.

- There shall be no discharge of biosolids to uncultivated land or land otherwise undisturbed without a cultural resources investigation being conducted, and if significant resources are found, development of a mitigation plan.

All other elements of the proposed GO are assumed to remain as described in Chapter 2 of this EIR.

Land Application Ban Alternative

Under this alternative, land application of biosolids would not be facilitated by regulation. Regulation of land application for agricultural, horticultural, silvicultural, or land reclamation purposes would be sufficiently restrictive to make the activity economically uncompetitive. Biosolids generators would be encouraged to pursue other options, such as use of landfills, incineration, and development of dedicated disposal sites (monofills). Each of these disposal options was mentioned in the scoping process. It is assumed that this policy approach would result in an effective ban on land application for beneficial reuse. Although this alternative does not meet the objectives of the proposed GO, it does reflect numerous comments received from the public during the scoping process requesting that the SWRCB consider biosolids disposal options rather than land application for beneficial reuse. This alternative is not considered the environmentally

superior alternative to the GO because it is not within the reasonable range of alternatives and it does not meet the project objectives.

This alternative would differ from the No-Project Alternative in that the current process of issuing individual WDRs through the RWQCBs (which is assumed under the No-Project Alternative) would be discouraged in favor of pursuit of ~~disposal~~other options. As stated above, individual WDRs would be discouraged through restrictive policies and permitting requirements.

Assuming that biosolids generation continues to increase as described in Chapter 2, the need for landfill space, new dedicated landfills (monofills), and incineration facilities are expected to increase. Biosolids treatment levels would be modified to meet the requirements for these disposal methods. The material would be transported by truck to the disposal facilities and it would be managed and disposed of according to current practice in the state.

Class A Only Alternative

This alternative would allow the application of only Class A biosolids to land. The proposed General Order would cover the beneficial use of Class A, Exceptional Quality, and Class B biosolids. Under the Class A Only Alternative, the GO would exclude the land application of Class B biosolids.

In addition to restricting land application to Class A biosolids, the alternative would incorporate a number of non-pathogen-related measures that are also included in the Modified GO Alternative:

- Dischargers shall provide sufficient information in their Pre-Application Reports to determine the potential for soil degradation or reduced land productivity and shall ascertain, or use the services of a qualified soil scientist or qualified agronomist to ascertain, that no such soil degradation or reduced land productivity will occur as a result of biosolids application.

- After an application of Class A biosolids, the discharger shall ensure that animals are not grazed on that land for at least 90 days to allow for SOC degradation.

- Land application of Class A biosolids shall be prohibited within ½ mile of areas defined as having "a high potential for public exposure."

- Dischargers shall be required to ensure that any biosolids adhering to the outside of the biosolids transport trucks and tires be removed before the trucks leaving the dischargers' sites or application areas.

- The Pre-Application Report shall be revised to include a location for the discharger to indicate whether the land application site contains natural terrestrial habitat areas or whether it has been fallow for more than 1 year. The discharger shall be required to submit a report that states whether special-status species occur on the site. If special-status species occur on the site, the report must identify the measures that will be taken to mitigate or avoid impacts on these species. The report must be prepared by a qualified biologist.

- The Pre-Application Report shall be revised to include a location for the discharger to indicate whether the land application site contains biologically unique or sensitive natural communities. If the application site contains these habitats, the discharger must submit a biological report with the Pre-Application Report that indicates measures to mitigate or avoid impacts on these habitats. The report must be prepared by a qualified biologist.

- Proposed land applications in the habitat range of the pupfish shall be reviewed for proximity to enclosed water bodies that could be occupied by pupfish. If such water bodies are near the land application areas, setbacks of 500 feet shall be required.

- The transport of biosolids will not be allowed to generate daily emissions of nitrogen oxides or particulate matter in excess of daily thresholds included in the policies of the California air districts responsible for achieving attainment status under the federal and state Clean Air Acts.

- Dischargers shall control fugitive dust on unpaved access roads to land application sites.

- Dischargers shall ensure that biosolids transporters develop truck routing plans that avoid traffic primarily residential neighborhoods. If the use of haul routes near residential land uses cannot be avoided, the project applicant or transporter will limit project-related truck traffic to daylight hours (8 a.m. to 6 p.m.).

- There shall be no discharge of biosolids to uncultivated land or land otherwise undisturbed without a cultural resources investigation being conducted, including but not limited to a records search at the appropriate Information Center, and, if significant resources are found, development and implementation of a mitigation plan.

- If human remains are discovered, the discharger shall comply with state laws relating to notification of the County Coroner and the disposition of Native American burials, if any are found.

- As a condition of the review of each individual NOI submitted for a proposed biosolids application, the RWQCB engineer responsible for issuing the NOA would evaluate whether the discharge would occur in an area designated as having existing nitrate contamination problems and evaluate whether the proposed discharges would pose an imminent threat of contributing to or causing exceedences of water quality standards for nitrates. If the engineer finds either condition, the RWQCB shall minimize the potential water quality impacts by requiring the applicant to modify the proposed discharge activities or provide additional information to verify that the discharge would not cause or contribute to violations of water quality standards.

- The SWRCB will continue to identify causes of cumulative nitrate loading in nitrate sensitive areas and develop an effective strategy for reducing those sources.

Under the regulations established by the federal Environmental Protection Agency (EPA), biosolids must be demonstrated to meet three separate criteria to be land applied. These include:

- **Pathogens** - where the biosolids can meet one of two pathogen reduction requirements, Class A biosolids are treated sufficiently for the level of pathogens to be substantially reduced but not completely removed, or Class B biosolids, where detectable levels of pathogens remain, but EPA has determined that restrictions on their use and the sites where they are applied provide equal protection,

- **Vector Attraction Reduction** - where the biosolids must meet at least one of ten specific procedures or tests to reduce or prevent vectors such as flies and rodents from being attracted to the biosolids, and

- **Pollutant Concentration Limits** - where the biosolids must be tested and the application sites must either be monitored or, if the metals concentrations within the biosolids are low enough, the EPA has determined no monitoring is necessary.

Exceptional Quality (EQ) biosolids are biosolids that meet Class A requirements, strict vector attraction requirements, and meet the lowest metals content requirements. of any biosolid (40 CFR 503.13 and 40 CFR 503.32) . When a biosolid meets EQ standards, there are no EPA restrictions to use and the application site is not required to be

monitored for toxic metals concentration. EQ biosolids are commonly sold by the bag and marketed for home, rather than commercial agricultural, use. In contrast, while Class A biosolids have no site restrictions, they are subject to monitoring to avoid the concentration of toxic metals over time.

"Class A" can be described as a family of treated biosolids, rather than a single type. Appendix H provides more information on the technologies that produce Class A biosolids. Briefly, Class A biosolids may be treated through a variety of methods to comply with Class A pathogen reduction requirements. Class A biosolids may range from dry to liquid in form.

In comparison to Class B biosolids, Class A has reduced nitrogen content. This in turn reduces its effectiveness as a soil amendment.

This alternative meets the GO program objectives of providing for the beneficial use of biosolids, and providing a regulatory framework for biosolids application to land. It would be subject to the limitations on application set out in federal regulations, including avoidance of cumulative concentrations of metals. Class A biosolids meet the same standards for metal content as Class B biosolids. The overall volume of biosolids that might be expected to be beneficially applied would be less than that expected under the proposed GO because there is less capacity to treat biosolids to meet Class A standards than there is to meet both Class A and Class B standards.

Restricting the land application of biosolids to Class A will limit the most common current approach to beneficial use. As discussed in Chapter 2, approximately 48% of the total dry tons of biosolids produced in 2001 were land applied. Most of this volume consisted of Class B biosolids.

Under the Class A Only Alternative, sanitation agencies would have to increase the amount of biosolids being treated to meet Class A standards, haul Class B biosolids to other states for land application, or dispose of the biosolids in landfills or through incineration. The particular approach chosen by agencies will be driven by a number of physical and economic factors. These include the availability of space in landfills, the potential for increased use of biosolids as landfill alternative daily cover, the feasibility of Class A treatment at existing facilities, costs of alternative treatment, transportation costs, and landfill fees, and availability of out-of-state application sites.

In response to phased bans on Class B biosolids application in Fresno, Kern, Kings, Riverside, and Tulare counties, a number of sanitation agencies have been studying alternative management practices which would treat biosolids to meet the Class A or Exceptional Quality standard. The following types of treatment technologies are a representative sample of the approaches being considered by several agencies:

- Thermophilic anaerobic digestion
- Heat drying
- Chemical addition
- In-vessel composting

Another response to the county bans has been to find alternative locations for the land application of biosolids. As application sites have become less available in California, some sanitation agencies have increased their shipments of Class B biosolids to Arizona and Nevada for beneficial reuse on agricultural lands in those states. Treating biosolids to Class A standards does not necessarily make them acceptable in all counties that restrict Class B biosolids. As examples, Riverside County would not allow the application of odiferous Class A biosolids (Class A treatment does not necessarily remove odors), and Kings County will allow only Exceptional Quality compost 2006.

Possible Treatment Technologies

These represent a range of treatment approaches and markets that could be selected by sanitation agencies under the Class A Only Alternative. This is not intended to be a comprehensive listing of all possible types of treatments, but rather a reasonable sample that describes the actions which may result from the Class A Only Alternative.

The improvements needed for a sanitation agency to undertake one or more of these treatment approaches depends upon the types of treatment and treatment infrastructure that the particular agency is currently employing. Because there is insufficient information about the future use of each of these methods to determine their level of use, a detailed analysis of their effects would be speculative. As a result, the following discusses the general characteristics and impacts of each of the treatment and markets.

Thermophilic anaerobic digestion. This process consists of an enclosed tank where the sewage sludge is treated at thermophilic temperatures (i.e., 50 to 62 degrees C) under anaerobic digestion conditions. There are multiple configurations for this process, but they all contain a total of approximately fifteen days of detention time in the presence of anaerobic acid and methane-forming bacteria which treat the solids.

The resultant biosolid meets Class A requirements. The process is more effective than conventional mesophilic (i.e., 35 to 40 degrees C) anaerobic digestion, which does not result in Class A biosolids, though it still produces gas with methane, CO2 and H2S, which can produce odiferous sludge, as would a conventional mesophilic anaerobic digestion process.

Impacts. Conversion of existing digester facilities to make them capable of thermophilic anaerobic digestion would result in construction-related impacts.

Necessary construction may include installation of new equipment at existing digesters and construction of new digesters at existing treatment plants. Construction of the necessary facilities would result in increased levels of noise and traffic during the construction period.

One operational impact will be an increased demand for energy to fuel the additional heating required by this process. The amount of energy needed beyond current demand will depend in part on the ability to reuse methane gas generated during the digestion process. Typically, the high-quality methane produced by the thermophilic digesters could be used to meet a portion of the fuel needs of the process. Any burning of waste gases would be subject to permitting by the pertinent air quality management or air pollution control district.

The significance of potential impacts would be examined in the environmental analyses prepared for future conversions to the modified processes. Because the installations would likely occur at existing facilities and would be subject to permitting from city and county governments, as well as the pertinent air district, the impacts are generally expected to be less-than-significant.

Heat drying. This is a generic term for any of several methods for heating biosolids to kill viable pathogens and to reduce their moisture content to 10% or lower. This requirement is reached by agitating biosolids while exposing them to heat using hot gases such as hot air or steam, or heated surfaces to increase the evaporation rate and temperature. Common approaches include rotary drum dryers and disk/paddle dryers. Rotary drum dryers resemble cylindrical kilns that mix the biosolids. The drying gas is largely reheated and recycled as part of the process (typically, about 10 percent of the gas is treated and either released into the atmosphere or used as combustion air). Disk/paddle dryers use heated disks or paddles to mix the biosolids. The disks or paddles are heated by a heat transfer medium such as steam, water, or oil. (Delta Diablo Sanitation District 2002).

The resultant product meets Class A requirements. Typically, a heat drying process would require new equipment, and a building to enclose the equipment, to be installed at the wastewater treatment facility. This may include equipment necessary to produce dry pellets as the final product.

Impacts. Installing heat drying equipment at existing treatment facilities would result in construction-related impacts. Construction of the necessary facilities would result in increased levels of noise and traffic during the construction period.

One operational impact will be an increased demand for energy to fuel the additional heating required by this process. Air drying techniques, which require direct heating and exchanging air through the drier, are generally more energy intensive than disk/paddle dryers which use indirect heat. The amount of additional energy needed beyond current demand will depend in part on the ability to reuse methane gas generated during the digestion process. Any burning of waste gases and the exhaust gases from the heating and drying process would be subject to permitting by the pertinent air quality management or air pollution control district. These potential impacts have precluded several agencies from implementing heat dryers at their facilities.

One positive impact is that the weight and volume of the biosolids hauled from the treatment plant would be reduced to a quarter of the "dewatered" biosolids amount. This significantly reduces the number of truck loads hauled from the site and subsequent vehicle emissions and traffic disruption.

The significance of potential impacts would be examined in the environmental analyses prepared for future installations of heat dryer systems. Because the installations would likely occur at existing facilities and would be subject to permitting from city and county governments, as well as the pertinent air district, the impacts are generally expected to be less-than-significant.

Chemical addition. Chemical addition is a term for any of several commercial processes by which a chemical, usually lime (CaO), is added to biosolids to kill viable pathogens by increasing the pH (making it more alkaline). Typically, following anaerobic digestion, the biosolids would be dewatered, then conveyed to a vessel where it would be thoroughly mixed with chemicals. The biosolids/chemical mixture would then be allowed to cure, during which an exothermic reaction within the mixture, and in some processes additional heat, would pasteurize the mixture. The heat would further reduce the water content of the biosolids. The biosolids would then be further dried either by windrow drying, or by some contained heating process such as a rotary heat dryer. (Delta Diablo Sanitation District 2002). Drying may occur on- or off-site.

Chemical addition results in a Class A biosolids that is dry and granular. It is often alkaline, so in the eastern U.S. it is used to adjust the pH of acidic soils. However, such soils are rare in California, so the practical use of this biosolids product may be limited.

Impacts. Installing chemical addition equipment at existing treatment facilities would result in construction-related impacts. Construction of the necessary facilities would result in increased levels of noise and traffic during the construction period.

Operational impacts could include an increased demand for energy if the selected process requires additional heating. The amount of additional energy needed beyond current

demand will depend in part on the particular process. Some commercial processes rely on the heat created by the exothermic reaction of the biosolids and chemicals. Others require additional heat or pressure to be added to the reactor vessel because the reaction does not reach the necessary temperatures by itself. There is insufficient information available at the level of detail contained in the GO to make a definitive determination of the significance of operational energy impacts.

Lime is usually produced from the heating of limestone, or may be the form of power plant ash (when metal levels are acceptable) or concrete dust. Increased hauling of lime into and out of the site where it is chemically stabilized would increase traffic and related air quality emissions over current levels.

The significance of potential impacts would be examined in the environmental analyses prepared for future installations of chemical addition systems. Because the installations would likely occur at existing facilities and would be subject to permitting from city and county governments, as well as the pertinent air quality or air pollution district if there are air emissions, the impacts are generally expected to be less-than-significant.

In-Vessel Composting. In this process, dewatered biosolids are typically mixed with a bulking agent such as sawdust, woodchips, or chipped green waste and placed in a reactor vessel within which aerobic conditions are maintained (some processes use biosolids as the bulking agent). This encourages microbial decomposition of the biosolids over a period of 14 to 21 days. The high temperatures that result from the microbial decomposition process reduce pathogens to Class A standards. After removal from the reactor vessel, the biosolids are typically given an additional curing period of approximately 30 days, although some commercial processes are efficient enough to result in a finished product at the end of the in-vessel stage. Curing occurs in a warehouse equipped with air scrubbers to treat gas and control odors. The size of in-vessel composting facilities can vary substantially.

The product that results from this process meets Class A requirements, is rich in organic matter, has a near neutral pH, and has a moisture content of 50% or less. (City of Santa Barbara, 2001). This process takes substantially less space than the traditional windrow or aerated static pile composting, making it a potential option for installation at existing treatment facilities where room allows. (Delta Diablo Sanitation District 2002).

Impacts. Installing in-vessel composting equipment at existing treatment facilities would result in construction-related impacts. This would also be true should size constraints necessitate off-site construction. Construction of the necessary facilities would result in increased levels of noise and traffic during the construction period.

Composting facilities would involve a change in truck traffic over current operations. Trucks would be used to deliver bulking agents, as well as for transportation of the processed compost. This would increase the level of truck traffic at individual POTWs.

Operational impacts could include odors; however, this is unlikely if the facility is operated correctly. In-vessel composting does not require substantial heating, but the air movement necessary to maintain optimum microbial action consumes additional energy in comparison to Class B techniques. In addition, continuous air exchange is necessary (air is filtered during exchange) to maintain a safe work environment.

The significance of potential impacts would be examined in the environmental analyses prepared for future installations of in-vessel composting systems. Because the installations would likely occur at existing facilities and would be subject to permitting from city and county governments, as well as the pertinent air quality or air pollution district if there are air emissions, the impacts are generally expected to be less-than-significant.

Energy Consumption

As part of a legal deposition in 1999, Robert Gillette, P.E., D.E.E of Carollo Engineers prepared an estimate of the energy needs of converting Class B biosolids to Class A standard using three of the alternative technologies described above: heat drying, chemical treatment, and in-vessel composting. While actual energy use will vary dependent upon the specific methods employed, this estimate nonetheless offers a general indication of the level of energy consumption that would be involved. The following table is based on the overall energy consumption for conversion of 600,000 wet tons (low) and 1,000,000 wet tons (high) of Class B biosolids to Class A biosolids. This is more biosolids than produced by any single facility or agency, and would represent the combined yearly energy use of several sanitation agencies.

Table 14-1. Conversion of Class B Biosolids to Class A

Technology	Electrical Power MWHs	Fuel Gallons	Natural Gas BTUs (millions)
Heat Drying	53,000 (high) 32,000 (low)	N/A	3.24 (high) 1.94 (low)
Chemical Treatment	60,000 (high) 36,000 (low)	N/A	2.80 (high) 1.68 (low)
In-Vessel Composting	100,000 (high) 42,000 (low)	533,000 (high) 160,000 (low)	N/A

(Gillette 1999)

At 1999 rates of consumption, this approximates the annual electricity demand of 5,000 and 15,000 typical Southern California homes, and the annual natural gas demand of between 10,000 and 18,000 typical homes.

Food Crop Limitation Alternative

Under this alternative, the GO would prohibit the application of all biosolids on lands where food crops are to be grown. The Food Crop Limitation Alternative would invoke a state standard that is stricter than federal regulations by prohibiting the application of Class A, Class B, and Exceptional Quality biosolids to lands where food crops are grown. The term "food crops" should be the same as used in federal regulations. The Part 503 regulations define food crops as follows:

"Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco." (40 CFR 503.9(l))

There are many possible ways to implement a ban on biosolids application to lands where food crops are grown.

First, the definition of food crops is subjective. In addition to the Part 503 definition of food crops. EPA has provided guidance in several documents (EPA/831-B-93-002b) - Land Application of Sewage Sludge, and EPA/625/R-92/013 - Environmental Regulations and Technology, Control of Pathogens and Vector Attraction in Sewage Sludge) that feed crops such as grains, grasses, and silage fed to cattle are not “food crops.” In fact, some fiber crops which are not considered to be food crops, like cotton, have elements which may be processed for food (i.e., cottonseed oil).

Second, the ban on land application of biosolids to lands where food crops are grown could be implemented in perpetuity or for a specific time period, just as the current Part 503 regulations prohibited harvesting of food crops that are grown beneath the ground surface until 38 months after Class B biosolids are land applied. One complication to this is that some tree crops, such as citrus and olives, are long lived and could continue to produce for forty of fifty years after implementation of a General Order. At least some of the citrus orchards have had biosolids applied to them in the past. A permanent ban on crops where biosolids has been applied would place a severe financial burden on these farmers.

Third, it should be understood that EQ biosolids in the form of compost and heat dried pellets are currently marketed through home improvement stores and nurseries and used in home garden throughout California. The regulation of small bagged quantities of EQ biosolids has not been included in the General Order.
In order to compare this alternative to the original General Order, the specifics of implementation must be selected. The selected alternative and the rational for that selection follow.

Under this alternative, the application of biosolids to land would be prohibited where the land is being or will be cultivated for fruits and vegetables. Two sub-alternatives are considered for land that is cultivated for food crops: (a) a full ban on biosolids in perpetuity; and (b) a ban for a period of at least 38 months prior to harvest.

In addition to restricting land application on food crops, the alternative would incorporate a number of non-pathogen-related measures that are also included in the Modified GO Alternative:

- Dischargers shall provide sufficient information in their WDR Pre-Application Reports to determine the potential for soil degradation or reduced land productivity and shall ascertain, or use the services of a qualified soil scientist or qualified agronomist to ascertain, that no such soil degradation or reduced land productivity will occur as a result of biosolids application.

- Land application of biosolids shall be prohibited within ½ mile of areas defined as having "a high potential for public exposure."

- Dischargers shall be required to ensure that any biosolids adhering to the outside of the biosolids transport trucks and tires be removed before the trucks leaving the dischargers' sites or application areas.

- The WDR Pre-Application Report shall be revised to include a location for the discharger to indicate whether the land application site contains natural terrestrial habitat areas or whether it has been fallow for more than 1 year. The discharger shall be required to submit a report that states whether special-status species occur on the site. If special-status species occur on the site, the report must identify the measures that will be taken to mitigate or avoid impacts on these species. The report must be prepared by a qualified biologist.

- The WDR Pre-Application Report shall be revised to include a location for the discharger to indicate whether the land application site contains biologically unique or sensitive natural communities. If the application site contains these habitats, the discharger must submit a biological report with the Pre-Application

Report that indicates measures to mitigate or avoid impacts on these habitats. The report must be prepared by a qualified biologist.

- Proposed land applications in the habitat range of the pupfish shall be reviewed for proximity to enclosed water bodies that could be occupied by pupfish. If such water bodies are near the land application areas, setbacks of 500 feet shall be required.

- The transport of biosolids will not be allowed to generate daily emissions of nitrogen oxides or particulate matter in excess of daily thresholds included in the policies of the California air districts responsible for achieving attainment status under the federal and state Clean Air Acts.

- Dischargers shall control fugitive dust on unpaved access roads to land application sites.

- Dischargers shall ensure that biosolids transporters develop truck routing plans that avoid traffic primarily residential neighborhoods. If the use of haul routes near residential land uses cannot be avoided, the project applicant or transporter will limit project-related truck traffic to daylight hours (8 a.m. to 6 p.m.).

- There shall be no discharge of biosolids to uncultivated land or land otherwise undisturbed without a cultural resources investigation being conducted, including but not limited to a records search at the appropriate Information Center, and, if significant resources are found, development and implementation of a mitigation plan.

- If human remains are discovered, the discharger shall comply with state laws relating to notification of the County Coroner and the disposition of Native American burials, if any are found.

- As a condition of the review of each individual NOI submitted for a proposed biosolids application, the RWQCB engineer responsible for issuing the NOA would evaluate whether the discharge would occur in an area designated as having existing nitrate contamination problems and evaluate whether the proposed discharges would pose an imminent threat of contributing to or causing exceedences of water quality standards for nitrates. If the engineer finds either condition, the RWQCB shall minimize the potential water quality impacts by requiring the applicant to modify the proposed discharge activities or provide additional information to verify that the discharge would not cause or contribute to violations of water quality standards.

- **g** The SWRCB will continue to identify causes of cumulative nitrate loading in nitrate sensitive areas and develop an effective strategy for reducing those sources.

The Food Crop Limitation Alternative meets the GO program objectives of providing for the beneficial use of biosolids, and providing a regulatory framework for biosolids application to land. Applications to land would otherwise be in accordance with federal requirements, including restrictions on the cumulative build-up of metals.

Sub-alternative (b), the 38-month transition period, is based on the more conservative of the following two periods established by federal law. The National Organic Program (7 CFR 205) regulates the labeling, marketing, and production of foods that are to be identified as "100 percent organic," "organic," or "made with organic." Section 205.105 prohibits the use of "sewage sludge" (the term adopted by this regulation for biosolids) in the production of organic foods. Any field or farm parcel from which harvested crops are intended to be sold, labeled, or represented as organic must have had no biosolids applied to it for a period of 3 years (e.g., 36 months) immediately preceding harvest of the crop (7 CFR 205.202).

The EPA Part 503 Biosolids Rule (40 CFR 503) provides a variety of restrictions on the harvesting of crops where Class B biosolids are applied. The most restrictive of these is for food crops with harvested parts below the land surface where biosolids remain on the land surface for less than 4 months prior to incorporation into the soil. In that case, food crops may not be harvested for 38 months after the application of biosolids (40 CFR 503.32[b][5]).

Note that sub-alternative (b) would be more restrictive than federal limitations on food crop application because it would apply a time restriction to Class A and Exceptional Quality biosolids that federal regulations do not. In addition, it would apply to all food crops, not just those grown below the ground surface. The GO established under the Food Crop Limitation Alternative would also be more restrictive than the Kern and Kings County ordinances, which allow the application of Exceptional Quality and composted biosolids, respectively, to food crops with RWQCB permits.

Food Crop Limitation Alternative would continue to allow biosolids to be applied to non-food crops such as cotton, alfalfa, and pasture land, and cover crops such as small grains not grown for harvest.

According to information gathered by the U.S. EPA in 2001, food crops make up a major portion of the agricultural land to which biosolids are being applied in California (U.S. EPA 2003). Based on U.S. EPA reporting data, biosolids were applied to a total of approximately 133,000 acres of agricultural land in 2001. This included approximately 13 acres of pumpkins, 38 acres of walnuts, 560 acres of safflower, and 57,590 acres of

wheat and corn (this does not include corn used for silage). Therefore, during that period, food crops made up approximately 44% of the agricultural land to which biosolids were applied.

This total of food crop acreage is probably overstated. Wheat acreage makes up the majority of this land. However, not all wheat grown in California is used for human consumption. Wheat can also be used as a feed grain. The Part 503 regulations are not clear whether wheat is always considered a "food crop," and there is no way to disaggregate the acres of wheat used for human food from those used for animal feed from the data available. So, for purposes of a conservative estimate, this analysis assumes that all of the wheat is being used for human consumption.

Under this alternative, the volume of Class B biosolids that could be applied to agricultural land would be substantially reduced. As a result, a major method of using biosolids would be eliminated and alternative means of dealing with nearly half of the production of biosolids would need to be found.

Under either sub-alternative (a) or (b), farmers who currently accept biosolids for use on non-food crops may be disinclined to continue to do so because the alternative would restrict their future use of the land for food crops. Where biosolids are currently applied to food crops, farmers would have to go back to chemical fertilizers and soil amendments under sub-alternative (a) and would likely to go back to such prior practices under sub-alternative (b). Because biosolids are often supplied farmers for free, and chemical fertilizers and amendments are not, this alternative would result in an undetermined economic impact on farmers. Further, biosolids provide all or a portion of the fertilizer needs of the fields to which they are applied. Therefore, reduction in their use would result in an increase in the use of chemical fertilizer products, with a resultant potential increase in release of nitrogen to the environment due to chemical fertilizers' greater nitrogen concentration..

This analysis of the Food Crop Limitation Alternative (b) assumes that the limitation, including the time delay between application of biosolids and the use of the land for food crops, would be a strong disincentive for the use of biosolids on food crops. While it would not technically constitute a total ban, it would probably dissuade many farmers from applying biosolids to food crops. The 38-month restriction would limit farmers' ability to meet shorter-term market demands by increasing food crop acreage. The restriction would require that the land either lay fallow or be planted in a non-food crop during the 38-month transition period, and effectively limit the production of food crops on treated fields to 3 years of every 10.

Although there are a number of possible outcomes resulting from eliminating a current beneficial use of biosolids, the following are considered to be a reasonable set of scenarios for biosolids producers in making up the difference:

- Expansion of the home market for biosolids
- Dedication of land for surface disposal of biosolids
- Disposal of biosolids in landfills/use as alternative daily cover
- Transport of biosolids to other states for land application

The following discusses these representative approaches in more detail.

Expansion of the Home Market. Pursuant to Federal Part 503 regulations, Exceptional Quality biosolids can be and are being sold as soil amendments to home gardeners. Typically, they are bagged and sold through gardening or home improvement stores. This currently accounts for a very small amount of the biosolids being produced in California. Because of the cost of converting existing treatment facilities to produce Exceptional Quality biosolids, costs related to marketing, and the limits on prices that can be competitively charged for packaged biosolids, this is not expected to expand substantially. Because the Food Crop Limitation Alternative would also preclude the beneficial use of Class A and Exceptional Quality biosolids, there would be little or no incentive to treat biosolids to Class A or Exceptional Quality standards other than for the home market.

Impacts. The impacts discussed under Class A Only Alternative would result if Exceptional Quality biosolids treatment were increased over current levels in order to serve an expanded home market. In addition, all of the EQ biosolids have to be bagged and transported to markets for sale. No other impacts are considered significant. The U.S. EPA allows the use of Exceptional Quality biosolids for home gardens without restriction. Therefore, an increase in home use would have a less-than-significant impact.

Dedication of land for surface disposal. Another possibility is that agricultural lands would be converted to surface disposal facilities for biosolids. Such facilities are intended for the final disposal, rather than the beneficial use or recycling of biosolids and, as a result, biosolids are applied at much higher rates than they would be when applied to agricultural lands. Surface disposal facilities are subject to permitting under the U.S. EPA (Subpart C, Part 503 rule), as well as state (CIWMB and RWQCB) and local permitting (conditional use permit). The permitting process can be expected to be multi-layered and intensive. While this would tend to discourage a farmer from converting a portion of their farm to a surface disposal site, this may nonetheless offer a business opportunity for companies that would specialize in operating such facilities. Although it is a possibility, this approach is unlikely to become a substantial method of disposal because of the cost to sanitation agencies of transportation from treatment

facilities and disposal fees. With the exception of a facility operated by the Sacramento Regional County Sanitation District, the Dublin San Ramon Sewer District, the Las Gallinas Valley Sanitation District and the Novato Sanitation District next to their treatment facilities for its own use, there are no such facilities in California.

East Bay Municipal Utilities District (EBMUD) commissioned a technical study of alternative disposal methods in 2003, which offers an example of typical costs. The study estimated that a 100-acre surface disposal facility to serve its needs would cost EBMUD approximately $36.65 million to plan, permit, and construct and approximately $1.33 million annually to operate and maintain. (East Bay Municipal Utilities District 2003) .

Impacts. The impacts related to the development of surface disposal facilities would be based on the characteristics of the site proposed for such facilities. Because neither the number, nor location of such future facilities can be known (or even whether they would all be within California), an attempt to describe the level of significance of specific impacts would be purely speculative. However, general impacts would be expected to include increased truck traffic and related air quality emissions, noise, and odors. Any of those may be significant. Due to the multi-jurisdictional permitting process that would be expected to apply to such facilities, water quality or health impacts would be expected to be major regulatory focuses, however, they would be expected to be less-than-significant, as regulated.

Landfilling/Alternative Daily Cover Use. In 2000, approximately 10% of the biosolids produced in California was buried in landfills and approximately 20% was used for landfill cover. The California Integrated Waste Management Board (CIWMB) regulates landfill operations in California. Standard landfill operations require active landfill cells to be covered by a minimum of 6 inches of compacted earthen material on at least a daily basis (27 CCR 20680). This is called "daily cover." Biosolids buried in landfills are simply treated as solid waste; biosolids used for landfill cover are used in landfill operations which is considered beneficial use. CIWMB regulations allow the use of biosolids as a compacted, alternative daily cover material provided that (1) the biosolids meet the performance standards for cover material, (2) they do not exceed 25 percent of the total landfill cover material, and (3) public contact with the biosolids is prohibited (27 CCR 20690). Class A and Class B biosolids may be used alone or blended with soil, processed green material, or stabilization agents (i.e., lime, lime kiln dust, or cement kiln dust) as alternative daily cover material (27 CCR 20690).

There are approximately 161 landfills in operation within California (CIWMB 2003a). Of these, approximately 60 are permitted to accept biosolids (CIWMB 2003a). However, anecdotal evidence indicates that the number of landfills accepting biosolids is less than the number permitted to accept biosolids. For example, only 1 of the 6 landfills in Orange County permitted for biosolids disposal actually accepts biosolids and 4 of the

16 southern California landfills permitted to accept biosolids have available capacity (Baroldi Pers. Comm; Tetra Tech 2003). Landfill capacity is available in southwestern Arizona, but would require a longer truck trip (Tetra Tech. 2003).

The landfilling of biosolids is costly for biosolids producers in that it requires the transportation of biosolids to landfills and the payment of tipping fees. The number of landfills accepting biosolids in proximity to urban areas is very limited, so transportation costs would be substantial. Landfilling of biosolids would be unlikely to increase substantially as a result of the Food Crop Limitation Alternative because of these limiting costs.

Biosolids are being applied as alternative daily cover in only 15 of the state's landfills (CIWMB 2003b). Because biosolids are limited to 25 percent of the daily cover, and only a small number of landfills will accept biosolids for this use, this means of beneficial use is unlikely to increase substantially.

Impacts. Traffic and related vehicle emissions would increase along routes to existing landfills. Landfills are subject to permitting by the CIWMB, RWQCB, and local enforcement agencies. Use of biosolids as alternative daily cover material is not expected to substantially change existing operations or impacts at landfills. The impact would be less-than-significant.

Transport to Other States for Land Application. In response to recent restrictions on biosolids use in the San Joaquin Valley, southern California sanitation agencies have increased their shipments of Class B biosolids to Arizona and Nevada agricultural lands, including Tribal lands of the Fort Mohave Tribe. Given the volume of Class B biosolids that would be affected by this alternative, transport to other states would be likely to become much more common. However, the long-term availability of out-of-state agricultural lands for use by California agencies is not secure. While Arizona and Nevada cannot ban the interstate transfer of biosolids, local agencies in those states can place restrictions on the use of biosolids from all sources, just as some California counties have done. For example, during the summer of 2003, both La Paz and Mohave Counties in western Arizona adopted ordinances restricting the application of biosolids (La Paz County 2003; Mohave County 2003). As shipments increase, the possibility of such restrictions will also increase.

Impacts. Traffic and related vehicle emissions would increase along routes to out-of-state application lands. Long-distance traffic would increase on major highways to Nevada and Arizona. This relocates this traffic and approximately doubles the miles traveled per haul. Overall, including traffic in Nevada and Arizona, the traffic impact would be more severe than the proposed GO. The impact would be less-than-significant. Increased truck traffic through the South Coast and Mojave air

basins would result in increased emissions. The cumulative impact of this approach on air quality would be considerable.

Alternatives Considered but Rejected

A number of other potential project alternatives were considered through the EIR scoping process but were not selected for detailed evaluation in this EIR. CEQA guidelines Section 15126(d)(2) requires that these alternatives be briefly described and the reasons underlying their rejection be identified. The following alternatives were identified either by the SWRCB or individuals participating in the scoping process but have been rejected as infeasible.

- **Regulation through RWQCB General Orders.** This alternative would accomplish most of the proposed project objectives through issuance of GOs by each of the nine RWQCBs. These GOs might vary slightly from one region to the next, but would streamline the permitting process within each region. The alternative was rejected because it did not reduce any of the potential significant environmental effects of the proposed SWRCB GO.

- **Total Prohibition.** ~~-~~This alternative would place a total ban on the land application of biosolids in California. It was ~~incorporated into the Land Application Ban Alternative, which is analyzed below~~rejected because it would not meet the project objectives (described in Chapter 2) which commit the SWRCB to adopting rules for the land application of biosolids.

- **Partial Prohibition (No Land Application over Enclosed Groundwater Basins).** This partial prohibition alternative would place lands overlying enclosed groundwater basins in the "exclusion area" category of the GO. The alternative was rejected because it did not reduce any of the potential significant effects of the proposed SWRCB GO. No evidence was found that indicated that enclosed groundwater basins in the state were any more likely to have significant adverse water quality effects than other groundwater basins.

- **Engineered Monofills.** This alternative would direct biosolids to monofills engineered exclusively to receive this material. The impacts of diverting biosolids to disposal sites (including monofills) rather than to land application sites ~~is~~are considered in the Land Application Ban Alternative analyzed below.

- ~~**In-Vessel Composting.** In-vessel composting is a biosolids treatment process that reduces the number of pathogens that remain in the material after other~~

~~more typical treatment processes. This treatment could be used to reduce the potential for health-related impacts resulting from the biosolids transport and spreading operations. The alternative was rejected because it did not reduce any of the potential significant effects of the proposed SWRCB GO.~~

- **Worm Casings.** This alternative would direct biosolids to worm farms to provide a food source for worms. The alternative was rejected as infeasible because there is no evidence that there are adequate worm farming operations in the state to accommodate the volume of biosolids going to land application. Also, it is not clear whether this alternative would reduce or eliminate any of the significant adverse effects of the proposed project.

- **Incineration.** Incineration is a biosolids disposal method used by some POTWs in California. The impacts of using this disposal method are described in the analysis of the Land Application Ban Alternative.

- **Disposal at Atomic Testing Sites.** This alternative assumes that biosolids would be disposed of on lands previously used to test atomic weapons. No specific location for this activity was identified in the scoping comments; most of these sites in the western United States are located in Nevada. Neither the SWRCB nor any of the RWQCBs have jurisdiction to approve or regulate the disposal of biosolids in Nevada; therefore, the alternative was rejected as infeasible.

- **Landfilling.** Landfilling of biosolids is a common practice in some regions of California; the effects of this disposal option are considered in the Land Application Ban Alternative.

- **Limit RWQCB Authority to Issue Waste Discharge Requirements for Land Application.** This alternative was identified during the informal discussion phase of the scoping process. The individual suggesting the alternative did not provide additional detail about the intent of limiting RWQCB authority over land application of biosolids. It is assumed that a narrower range of authority was being suggested, resulting in fewer approvals of land application operations. Because this alternative has not been described in sufficient detail for a meaningful analysis to be conducted and changing the permitting authority for the land application of biosolids would not reduce environmental impacts, it has not been considered in detail in the EIR.

- **Modified GO , Providing More Local Control in Determining Exclusion Areas.** This Modified GO alternative would allow for local citizens to have a greater voice in the location of land application activities by determining what are appropriate exclusion areas on a case-by-case basis. The objective of the

proposed GO is to provide a statewide program under state regulatory control; the exclusion areas have been identified based on existing state laws and plans that identify significant resources that should be protected from certain land use activities. The GO would no longer provide its programmatic function if local decisions on exclusions were made on a case-by-case basis. Local governments have the authority to exclude certain land use practices, including land application of biosolids, through their general planning or ordinance processes. These vehicles would be more effective at serving local interests for exclusions. For these reasons, this alternative was rejected as infeasible.

- **Modified Prohibitions Alternative.** An alternative was proposed during the scoping process that added more prohibitions to the GO. These additional measures included prohibition of storage, staging, and bulk application on lands having the following: less than 60 feet of depth to groundwater; land where the elevation is not at least 3 feet above the 100-year floodplain elevation; areas protected from flooding by levees; areas within the inundation zone of any dam or dam failure; areas within 850 feet of any water well; and any area within 850 feet from surface waters, including creeks, ponds and marshes, water supply ditches, and canals that discharge into surface waters. Although this alternative would have the potential for reducing some of the potential adverse effects of the proposed GO, the alternative was not carried into the EIR for more detailed analysis. A similar modified GO alternative has been developed that addresses each of the potentially significant adverse effects of the proposed GO; it is discussed below. A second modified GO alternative ~~was not deemed necessary~~would be repetitive and redundant.

- ~~**Crop Limitation Alternative.** Several suggestions were made during the scoping process that would limit the types of crops that could be grown on land that has received a biosolids application. It was suggested that fresh fruits and vegetables should not be grown on land application sites; also, it was suggested that only fiber and cover crops be allowed on land application sites. These suggestions were not carried forward into the EIR as an alternative because they~~this alternative ~~would not avoid~~reduce ~~any significant adverse effect~~impacts ~~of the proposed GO that could not be otherwise mitigated. The only impact that these suggestions would address is the potential for a reduction in land productivity resulting from public perceptions of biosolids effects. This potential effect can be mitigated by development of a statewide tracking system of land application sites. With the restrictions contained in the proposed GO, there are no significant adverse public health threats anticipated from biosolids application on lands where any type of agricultural product is being grown. The proposed GO would not result in any public health impacts related to the consumption of fresh fruits and vegetables.~~

- **Food Processing Waste Alternative.** An alternative was suggested through the scoping process that would separate food processing waste from other wastes. It is assumed that the individual suggesting this action sought to limit land application to food processing waste only. This food processing waste could be applied to the land without the potential adverse effects of applying human-derived waste products. The alternative was rejected because it does not meet any of the objectives of the proposed project; it does not address the land application of all sewage sludge and other biological solids as required by the state Water Code (Section 13274). The suggestion that human-derived biological solids not be applied to the land has been addressed in this EIR in the Land Application Ban Alternative (discussed on following pages).

Impact Comparison

No-Project Alternative

As described above, under this alternative land application of biosolids would probably continue to be regulated by the RWQCBs through individual WDRs or exemptions and by county governments through local ordinances and regulations.

Soils, Hydrology, and Water Quality

The water quality effects of biosolids land application under current regulation would be greater than those anticipated with implementation of the proposed GO. Current regulatory practice does not place restriction on the use of EQ biosolids, and it does not include the runoff control and setback requirements of the proposed GO. The potential for surface water or groundwater contamination from temporary storage of biosolids is greater under current conditions. In addition, the heavy metals cumulative loading restrictions currently being used (the Part 503 limits) do not account for the heavy metals content of soils before land application. Therefore, the potential for accumulating heavy metals in soil that could eventually affect surface water or groundwater would be greater.

Land Productivity

This alternative would have a greater potential for impacts on land productivity because the ceiling thresholds of various heavy metals concentrations would be higher for applied

biosolids under the No-Project Alternative. Current use of the Part 503 cumulative heavy-metals limitations does not require the inclusion of background soil levels. Additionally, this alternative does not provide a means to address the cumulative loading of molybdenum, which could result in greater impacts on grazing land productivity. The land application of EQ biosolids would remain unregulated, so long-term disposal operations could eventually affect land productivity through the creation of nutrient imbalances or heavy metals buildup to potentially phytotoxic levels.

Public Health

The No-Project Alternative has the potential to result in slightly greater impacts on public health because existing provisions designed to prevent groundwater contamination by biosolids (e.g., setbacks, minimum distance to wells, runoff controls, minimum depth to groundwater) are not as stringent as those included in the proposed GO. The RWQCBs could adopt stricter controls to protect public health in the future, but current practice does not include all of the controls mentioned above. In addition, current practice relies on the use of less reliable pathogen indicators (coliform bacteria) than are proposed in the GO (*Salmonella*). Therefore, higher levels of pathogens may be applied to the land under the No-Project Alternative than under the proposed GO.

Animal manures may pose a threat to human health. Farm animals such as cattle, pigs, and chickens become infested and excrete a number of human pathogens in their feces. These include *Salmonella*, *Campylobacter*, *Yersinia*, *E. coli 0157:H7*, *Listeria* spp., and the protozoan parasite *Cryptosporidium.* Cattle manure is believed to be the major source of both water- and food-borne outbreaks of *E. coli* in the United States associated with lettuce and apples.

Although animals have not been known to be a source of human enteric viruses, recent studies shown that hepatitis E infects pigs and can be found in their feces. Two recent cases of hepatitis E in the United States are believed to have been associated with water- and food-borne outbreaks in the developing world (Meng et al. 1998).

Land Use and Aesthetics

The No-Project Alternative would result in land use impacts similar to those of the proposed GO because setbacks for all types of sensitive receptors (e.g., recreational areas, educational areas) are not defined. Aesthetic impacts (e.g., reduction in visual quality) associated with biosolid haulers using roadways through residential and recreational areas would also be similar under this alternative. Therefore, land use and aesthetic impacts would be considered significant because additional setbacks and

defined truck access routes would not be required to help reduce visual and land use (e.g., traffic and noise) impacts on all types of sensitive receptors.

Biological Resources

This alternative would result in similar impacts on biological resources because the preparation of a specific site assessment for special-status plant and wildlife species and/or biologically unique or sensitive natural communities is not a requirement under the No-Project Alternative for areas that have not been disturbed within the last year. Therefore, biological resource impacts would be considered potentially significant because the appropriate site assessment (e.g., for special-status species, sensitive natural communities) would not be required to help identify and compensate for any potential impacts on biological resources in the application area before they are affected by land application.

Fish

Under this alternative, impacts on fisheries (e.g., acute toxicity) would be similar to those identified for the GO. Current practice provides for setbacks similar to those in the GO between land applications and water bodies with protected fish species. Because the land application of EQ biosolids is not regulated under current practice, there is some potential for adverse effects on fish where EQ material is applied or disposed of adjacent to streams.

Traffic

Under the No-Project Alternative, the potential for traffic safety hazards resulting from the accidental spill of biosolids on local and regional roadways would be slightly greater than those identified for the proposed GO. The No-Project Alternative does not require implementation of a Spill Prevention Plan. However, it should be noted that several counties currently require that transporters implement various emergency procedures, including those associated with an accidental spill of biosolids.

Air Quality

The No-Project Alternative would result in air quality impacts similar to those under the proposed GO because restrictions on the size and travel distance for specific biosolid application projects is not a requirement under either option. Air quality impacts could be significant because it is expected that application projects requiring more than 4,800 VMT

daily would generate daily transportation and application-related NO_x emissions that would exceed significance thresholds for air districts where biosolids are applied in the greatest volumes.

In addition, current practice under the No-Project Alternative does not specifically restrict the movement of visible particulates from an application site. Therefore, it is possible that more nuisance particulates will escape land application sites under existing conditions than would occur under the proposed GO.

Noise

As described above under "Land Use and Aesthetics", the No-Project Alternative would result in noise impacts similar to those of the proposed GO because defined truck access routes would not be required to help reduce transportation-related noise impacts on residential land uses. Consequently, noise impacts would be considered significant because there would be no control on the use of delivery routes adjacent to residential land uses. Also, setback requirements between land application operations and individual residences would be expected to be the same under both alternatives.

Cultural Resources

This alternative would result in impacts on cultural resources similar to those of the proposed GO because cultural resource surveys would not be required for land applications in areas that had not been previously disturbed. Cultural resource impacts would be considered potentially significant because no cultural resource survey would be conducted to identify significant resources before ground disturbance begins.

Modified GO Provisions and Specifications Alternative

As described above, this alternative addresses all the significant or potentially significant impacts resulting from implementation of the proposed GO and incorporates the mitigation measures identified in Table ES-1 as additional provisions or prohibitions..

Soils, Hydrology, and Water Quality

The Modified GO Alternative includes measures that should improve groundwater and surface water protection compared with the level of protection provided by the proposed

GO. Although implementation of the proposed GO is not expected to result in significant water quality or hydrology effects, the GO modifications would include a data collection and evaluation step as part of the application process; this step would be designed to avoid application of biosolids in those unique settings where soil structure and chemistry could lead to leaching of nutrients or heavy metals into the groundwater. The additional data and evaluation would be especially valuable where biosolids land application was being planned over impaired or degraded groundwater basins. Professional help, as deemed necessary, would be required to estimate nitrogen application rates and appropriate irrigation management in areas where nitrate contamination of groundwater was judged to be a significant issue.

Land Productivity

The Modified GO Alternative would result in fewer land productivity impacts than the proposed GO because the development and analysis of soils data would be required to avoid land application in those parts of California where existing soil conditions could contribute to declines in land productivity. Therefore, the ability of the land to support agricultural, horticultural, silvicultural, or land reclamation activities would be less likely to deteriorate over time because the implementation of these data collection and evaluation efforts would reduce the incidence of poor land management practices and minimize soil erosion. Additionally, under this alternative, biosolids application sites would be identified and monitored to address any potential public concerns regarding crop contamination.

Public Health

~~Even though l~~Land application under the proposed GO ~~is not expected to~~would potentially result in a significant health ~~risks, application under t~~risk from human ingestion of pathogens on crops. The modified GO would reduce the risk ~~of public health impacts compared with the risk under the proposed GO because the application of biosolids would be better controlled in regions of California where soil conditions could allow leaching of nitrates and metals into the groundwater. Collection and evaluation of soils data would be required as a condition of applying for WDRs under the modified GO.~~ to a less than significant level by imposing grazing restrictions. These restrictions would avoid exposing the public to viable pathogens. Consequently, public health impacts would be considered less than significant.

Land Use and Aesthetics

The Modified GO Alternative would result in fewer land use and aesthetic impacts than the proposed GO because the modified GO would include additional setbacks (up to 0.5

mile) for all sensitive land use areas and because the definition of an area having a "high potential for public exposure" would be expanded to include other sensitive land uses, such as hospitals and educational facilities. Consequently, land use and aesthetic impacts (i.e., disturbance through increased traffic and noise, odors, and visual impairment) would be considered less than significant because the setbacks would provide additional buffers to minimize these impacts.

Biological Resources

This alternative would be expected to result in fewer impacts on biological resources compared with the proposed GO because the preparation of a specific site assessment for special-status plant and wildlife species and/or biologically unique or sensitive natural communities would be a requirement under the Modified GO for areas that have not been disturbed within the last year. Therefore, biological resource impacts would be considered less than significant because the appropriate site assessment would help to identify and compensate for any potential biological resources in the project area before they were adversely affected.

Fish

Under this alternative, fisheries-related impacts would be less than those identified for the GO because additional setbacks would be required for land applications in the vicinity of internally drained water bodies with protected fish species.

Traffic

This alternative would result in traffic impacts similar to those of the proposed GO. No significant effects would be expected.

Air Quality

Under the proposed GO, the application of biosolids on sites that would require delivery truck traffic to exceed 4,800 vehicle miles per day would result in the generation of air emissions (e.g., combustion emissions, fugitive dust) that could exceed local air district thresholds for NO_x and PM10. The Modified GO Alternative would result in fewer air quality impacts because it includes provisions that restrict the amount of vehicle traffic that can be generated by an individual project. This restriction would ultimately reduce

the potential for a specific project to exceed daily significance thresholds for emissions of NO_x, and PM10. Therefore, air quality impacts would be considered less than significant.

Noise

The application of biosolids has the potential to result in transportation-related noise impacts on sensitive receptors located along delivery routes. This alternative would result in fewer transportation-related noise impacts than the proposed GO because the modified GO would restrict the use of delivery trucks near residential land uses to the extent possible. Consequently, noise impacts would be considered less than significant.

Cultural Resources

This alternative would reduce the chance of damaging cultural resources because cultural resource surveys would be a prerequisite to applying biosolids in areas that had not previously been disturbed. Cultural resource impacts would be considered less than significant because the cultural resource investigation would help to identify any potential resources in the project area before they were adversely affected.

Land Application Ban Alternative

As more fully described earlier, the land application of biosolids would not be facilitated by regulation under this alternative. Biosolids generators would be encouraged to pursue other management options such as use of landfills, incineration, and development of dedicated disposal sites.

Soils, Hydrology, and Water Quality

Under the Land Application Ban Alternative, biosolids reuse would not have an effect on surface water or groundwater quality. Biosolids currently being applied to the land would eventually be diverted to disposal operations. Additional land application sites would not be developed. With these materials going to landfills, monofills, or incinerators, the potential for water quality effects would be reduced. Landfills and monofills are strictly regulated for contamination of surface water and groundwater. Most of these facilities have natural or manufactured liners that catch leachate, or they have extensive leachate collection systems that minimize percolation of contaminants to groundwater. Newly developed landfills or monofills would be expected to include state-of-the-art leachate control systems. Incinerators are enclosed facilities that do not generate a significant

liquid waste stream. It is assumed that incinerator ash would be disposed of in an appropriate landfill.

Land Productivity

Under the Land Application Ban Alternative, adverse crop and soil productivity impacts associated with changes in soil nutrient levels and changes in heavy metal plant toxicity resulting from the application of biosolids would not occur. Additionally, public concerns over crop contamination from biosolids applications would not occur under this alternative. Other fertilization and soil amendment practices would continue to occur. These practices could include use of other organic fertilizers, such as manure. Use of chemical and manure-based fertilizers is not currently considered to have an effect on long-term land productivity. Studies are being undertaken, however, to determine the long-term effect of chemical fertilizer use on land productivity. Also, manure typically has a higher total dissolved solids content than biosolids, so changes in soil salinity could be more of an issue with manure use. Also, the loss of biosolids as a soil conditioner would have an adverse effect on land productivity in those situations in which there would be no option of using biosolids as an amendment on soils with low amounts of organic material.

Public Health

If biosolids reuse is abandoned in favor of disposal alternatives in the future, there would be additional demand for landfill or monofill space, or perhaps for added incinerators. If new facilities are placed in rural settings, as is normal, potentially productive land could be eliminated by construction of facilities. These losses would be more long term than is likely at land application sites. This indirect effect of facilities siting efforts could be avoided if low-productivity lands were sought for new facilities.

Under this alternative, there would be no risk of human or animal disease from the land application of biosolids in agricultural, horticultural, silvicultural, or land reclamation settings. Land application would be discouraged and the pathogens and other contaminants in biosolids would not be placed in settings with a significant risk of public exposure. Most biosolids generated in the state would be transported to and disposed of in landfills, monofills, or incinerators. These types of facilities generally have stricter control on public access, so the potential for direct human contact would be substantially reduced.

One potential for an adverse effect under this alternative would be related to air emissions from biosolids incinerators. The increased incidence of biosolids incineration

would create increases in emission of particulates and other potential air contaminants, affecting residents in the vicinity of the incinerator (see "Air Quality" below). Emission control facilities on incinerators could be used to reduce the significance of this effect.

Agricultural sites currently using biosolids for soil conditioning and as a source of nutrients could, in the future, receive animal manures as an alternative. The public health implications of this change have not been investigated extensively, but the use of animal manures is not currently actively regulated. Some additional public health effects could result from this change in fertilizer source.

Land Use and Aesthetics

The Land Application Ban Alternative would result in land use (e.g., traffic, noise) and aesthetic impacts (e.g., reduction in visual quality) similar to or greater than those of the proposed GO because of the need for increased Class II and Class III landfill space and more incinerators for biosolids disposal. This increased need for facilities has the potential to create greater land use and aesthetic impacts than the proposed GO because landfills and incinerators are much more visible elements of the landscape and have a much greater life expectancy than periodic land application.

Biological Resources

This alternative would be expected to result in similar but much less extensive impacts on biological resources than the proposed GO because the potential need to expand existing landfill and incineration areas might also affect special-status plant or wildlife species or biologically unique or sensitive natural communities located within the expansion areas. These areas would be much smaller than land application sites in general, but may be similar in size to previously undisturbed areas that might be affected under the proposed GO. Biological resource impacts would be potentially significant under this alternative, and the appropriate site assessments (e.g., for special-status species, sensitive natural communities) would be required to help identify and compensate for any potential biological resources in the expansion areas before they are adversely affected.

Fish

This alternative has the potential to result in fisheries impacts similar to those of the proposed GO because the potential need to expand existing landfill areas might also affect special-status fish species or biologically unique or sensitive natural communities located within the expansion areas. Fisheries impacts would be considered potentially significant under this alternative, and the appropriate site assessments (e.g., for special-

status species, sensitive natural communities) would be required to help identify and compensate for any potential fisheries resources in the expansion area before they are adversely affected.

Traffic

Under the Land Application Ban Alternative, most biosolids would no longer be transported to agricultural, horticultural, silvicultural, or land reclamation areas as a source of nutrients and soil conditioning. Instead, this material would be transported to landfills, monofills, or incinerators for disposal. The truck traffic associated with moving this material to disposal sites rather than reuse sites may be greater or lesser than under the proposed GO, depending on the relative distances between these sites and the degree of dewatering that would take place before transport. However, with the effective ban on land application, those lands currently receiving biosolids would require other sources of nutrients and soil conditioners. Some level of truck traffic would be associated with supply of this replacement material. Consequently, it is likely that traffic related to switching from land application to disposal of biosolids would be greater than under the proposed GO. Also, a land application ban would not stop generators from using highways to transport biosolids out of the state.

Air Quality

This alternative would result in greater air quality impacts than the proposed GO. With an effective ban on land application, incineration of biosolid materials would be expected to increase, resulting in NO_x and PM10 emissions that could exceed local air district significance thresholds. Additionally, the incineration of biosolid materials may result in the release of minimal amounts of hazardous materials emissions, which may create a public health hazard. The transportation of fertilizers to existing agricultural operations and the delivery of biosolids materials to landfill areas would also result in elevated levels of transportation-related NO_x and PM10 emissions. Consequently, because of the increase in both incineration and transportation-related emissions and the potential to exceed local air district significance thresholds under the Land Application Ban Alternative, air quality impacts are expected to be greater under this alternative. Also, a land application ban would not stop generators from using highways to transport biosolids out of the state.

Noise

As described above in the traffic analysis, agricultural operations would continue to receive a source of nutrients and soil conditioning, resulting in a similar number of truck trips and resultant noise impacts. Additionally, under this alternative a number of truck trips associated with the transport of biosolids materials to out-of-state landfills and incineration sites would be generated, resulting in additional transportation-related noise impacts on sensitive receptors located along landfill access routes. Consequently, because of the increased noise levels caused by the additional number of trucks generated by the Land Application Ban Alternative, noise impacts are expected to be greater than for the proposed GO.

Cultural Resources

This alternative could result in cultural resource impacts similar to those described for the proposed GO. Previously undisturbed land could be used for construction of additional landfill, monofill, or incineration facilities as biosolids are diverted from land application. The size of lands needed for new facilities would be smaller than the total acreage used for land application, but the size may be similar to the amount of undisturbed land that would be used under the proposed GO. Significant cultural resource impacts could occur as new disposal facilities are constructed, making it necessary to conduct appropriate site surveys to avoid or develop compensation for cultural resources lost or damaged in the process.

Class A Only Alternative

The Class A Only Alternative is compared to the proposed GO, before mitigation. Because it incorporates a number of mitigating features, this alternative would result in less severe impacts than the proposed GO in several areas. This alternative would result in more severe impacts than the proposed GO in the areas of traffic, air quality, and energy consumption.

Increased energy consumption when compared to the proposed GO is related to two factors: increased energy needs of Class A biosolid treatment, and increased fuel needs related to longer truck trips. The technology for treating biosolids to Class A standard generally requires a substantially greater energy input (for heating, turning, aeration/air transfer, etc.) than is necessary to reach Class B standards. As discussed below under traffic, the Class A Only Alternative would result in longer truck trips because Class B land application sites would be available only in other states.

Soils, Hydrology, and Water Quality

Class A biosolids are similar in composition to Class B biosolids; differing primarily in the absence of pathogens. Therefore, the Class A Only Alternative would result in similar impacts to soils as the proposed GO. With regard to hydrology and water quality, Class A biosolids contain nutrients, trace elements, and synthetic organic compounds which could affect surface and groundwater quality. However, the application of Class A biosolids would be subject to regulation to ensure that they are not applied in such a way that would exceed specified requirements. The impacts would be no greater than those identified for the proposed GO.

Land Productivity

The Class A Only Alternative would result in impacts similar to the proposed GO.

Public Health

The Class A Only Alternative would have a less than significant impact in all areas under public health. Limiting land application to Class A biosolids only could avoid impacts related to public exposure to pathogens that would result if public access regulations for Class B biosolids were not followed. Overall, this impact of this alternative would be less severe than the proposed GO.

Land Use and Aesthetics

The Class A Only Alternative would not have any impacts that are more severe than the proposed GO in this area. Further, with the mitigating features made a part of the Class A Only Alternative, it would have a less-than-significant impact on visual quality. Overall, the impact of this alternative would be less severe than the proposed GO.

Biological Resources

The Class A Only Alternative would incorporate mitigating features that would result in a less than significant impact on biological resources. As a result, the impact of this alternative would be less severe than the proposed GO.

Fish

The Class A Only Alternative would incorporate mitigating features that would result in a less than significant impact on fish. As a result, the impact of this alternative would be less severe than the proposed GO.

Traffic

The additional cost of Class A treatment, in comparison to Class B treatment, could lead to an increase in the amount of Class B biosolids being trucked out-of-state for beneficial use. This is already occurring as a result of local restrictions on the use of Class B biosolids now being imposed in Kern and Kings Counties. The amount of biosolids being transported out of state by truck is increasing. The Arizona Department of Environmental Quality estimates that in the year 2001 approximately 1,014 dry tons of biosolids were transported from California producers (primarily from Southern California) to sites in Arizona. In 2002, approximately 59,906 dry tons were brought in from California. Of this, approximately 34,917 dry tons were applied to land, 8,649 dry tons were composted, and 16,340 tons were disposed of in landfills. The Department's biosolids coordinator expects that, when compiled, the 2003 tonnage will be greater still. (Reed pers. comm.) A non-published CASA survey estimates that over 105,000 dry tons of biosolids produced by Southern California sanitation agencies were transported to and managed in Arizona and Nevada in 2003. In some cases, over 1/3 of the particular agency's 2003 output was transported out of state. (Hudnall pers. comm.)

To relate the dry volume being transported to the number of truck trips, a truck will haul approximately 24 tons of biosolids per trip, on average. (Gillette pers. comm.) Although the actual number of truck trips is unknown, a reasonable estimate is 4,375 one-way trips (i.e., 8,750 trips in both directions) to Arizona and Nevada receiving sites per year. These trips would be distributed among the Southern California biosolids producers and have a variety of origin and end places.

While the number of out-of-state truck trips is increasing, so is the length of trip. As an example of the distance that biosolids are being transported, one Southern California biosolids producer is currently hauling Class B biosolids from 290 to 370 miles one-way to land application sites in Arizona and Nevada. In contrast, when agricultural sites were available in Kern and Kings Counties, the one-way trip was approximately 200 miles or less (Baroldi 2003).

This outcome would be expected when the cost of Class A treatment exceeds the cost of Class B treatment plus the cost of transport out of California. Assuming generally that the Class A Only Alternative would result in a reduction of the volume of biosolids being applied in California, then this alternative would have a less severe impact on local traffic

in California than would the proposed GO. With the loss of biosolids as a soil amendment, those lands currently receiving Class B biosolids would require other sources of nutrients and soil conditioners. Some level of traffic would be associated with supplying this replacement material, but it would likely be less than that associated with biosolids application, particularly if chemical fertilizers are used. At the same time, long-distance traffic would increase on major highways to Nevada and Arizona.

If the application of Class B biosolids is essentially prohibited in California, sanitation agencies can be expected to continue to increase the dry tonnage of biosolids that are being transported out-of-state. Although the impact cannot be quantified by number of trips per east-west highway because the origins and ends of the trips are various, overall the substantially longer truck hauls from producer to application site and the increasing number of these truck trips can reasonably be assumed to result in a more severe impact than under the proposed GO. However, the impact would still be less than significant.

Air Quality

The additional cost of Class A treatment, in comparison to Class B treatment, may lead to an increase in the amount of Class B biosolids being trucked out-of-state for beneficial use. Overall, additional truck traffic on southern routes to Nevada and Arizona would incrementally increase air emissions. The Class A Only Alternative would have a more severe impact than the proposed GO. Overall, the impact would be less than significant with the mitigating features incorporated into this alternative.

Noise

Primary noise impacts would arise from transportation. The Class A Only Alternative would incorporate mitigating features that would result in a less than significant noise impact on sensitive receptors. As a result, the impact of this alternative would be less severe than the proposed GO.

Cultural Resources

The Class A Only Alternative would incorporate mitigating features that would result in a less than significant impact on cultural resources. As a result, the impact of this alternative would be less severe than the proposed GO.

Cumulative Impacts

The Class A Only Alternative would result in greater contributions than the proposed GO to cumulative effects on traffic, air quality, and energy consumption. Increased truck traffic on major roads between southern California and land application sites in Nevada and Arizona will make a cumulatively considerable contribution to traffic impacts. This alternative would make a cumulatively considerable contribution to air quality impacts (ozone precursors and particulate matter) related to truck emissions in the South Coast and Mojave air basins. This alternative would also contribute to energy consumption as a result of the more energy-intensive technology necessary to treat biosolids to Class A standard, in comparison to the energy level necessary for Class B treatment.

Food Crop Limitation Alternative

The Food Crop Limitation Alternative differs substantially from the proposed GO. The proposed GO would, consistent with EPA Part 503 regulations, allow the application of Class A and Exceptional Quality biosolids to food crops without limitation. The proposed GO also allows the application of Class B biosolids subject to certain limitations. In contrast, the Food Crop Limitation Alternative would either (a) ban biosolids from any land that is to produce food crops or (b) prohibit the use of any biosolids on food crops for the 38 months prior to harvest.

The Food Crop Limitation Alternative differs from the Land Application Ban Alternative in that the latter would not allow the application of any biosolids. The Food Crop Limitation Alternative would either ban biosolids from lands producing food crops or allow application to lands producing food crops 38 months prior to harvest.

In the following discussions, the Food Crop Limitation Alternative is compared to the proposed GO, before mitigation. Because it incorporates a number of mitigating features, the Food Crop Limitation Alternative would result in less severe impacts than the proposed GO in several areas. This alternative would result in more severe impacts than the proposed GO in the areas of traffic and air quality.

Soils, Hydrology, and Water Quality

The Food Crop Limitation Alternative would allow the application of the same types of biosolids that may be applied under the proposed GO, but over a more limited area. The impact of the alternative would be less than significant. Overall, this alternative would have a less severe impact than the proposed GO.

Land Productivity

Under the Food Crop Limitation Alternative, the application of biosolids to food crops would be significantly reduced. Under either of the sub-alternatives, once biosolids are applied, the use of that land for food crops will be severely restricted. Assuming that most farmers would not choose to switch exclusively to non-food crops in order to continue to apply biosolids, this alternative would result in a de facto ban on the use of biosolids on food crops. As a result, more chemical and manure-based fertilizers would be used.

When biosolid application is ceased, food crops (particularly those on marginal lands) would no longer benefit from the improved nitrogen levels and water retention capacity that can result from application. To compensate, use of chemical and manure-based fertilizers will increase.

This alternative would apply stricter reporting requirements to WDR applicants than the proposed GO. In addition, the Food Crop Limitation Alternative would result in a less than significant impact relative to public concerns about crop contamination since it would limit the future use of land to which biosolids had been applied. Overall, the impact of this alternative would be less severe than the proposed GO.

Public Health

Although there is no evidence that the application of Class A, Class B (with restrictions), or Exceptional Quality biosolids results in creation of a public health risk, the Food Crop Limitation Alternative would have even stronger assurances against the possible transfer of pathogens and other substances to food crops than would the proposed GO. Limiting land application to non-food crops would reduce impacts related to public exposure to pathogens. In addition, this alternative would apply stricter public health related requirements than the proposed GO. Overall, the impact of this alternative would be less severe than the proposed GO.

Land Use and Aesthetics

The Food Crop Limitation Alternative would result in a reduction in the amount of land to which biosolids would be applied. As a result, the impacts identified under the proposed GO would be less severe under this alternative. The Food Crop Limitation Alternative would not have any impacts that are more severe than the proposed GO in this area. Further, with the mitigating features made a part of the Food Crop Limitation Alternative,

it would have a less-than-significant impact on visual quality. Overall, the impact of this alternative would be less severe than the proposed GO.

Biological Resources

The Food Crop Limitation Alternative would result in a reduction in the amount of land to which biosolids would be applied. In addition, it would incorporate mitigating features that would result in a less than significant impact on biological resources. As a result, the impacts identified under the proposed GO would be less severe under this alternative.

Fish

The Food Crop Limitation Alternative would probably result in a reduction in the amount of land to which biosolids would be applied. In addition, it would incorporate mitigating features that would reduce any impacts on fish to a less than significant level. As a result, the impacts identified under the proposed GO would be less severe under this alternative.

Traffic

Under the Food Crop Limitation Alternative, a portion of the biosolids being applied to land would no longer be transported to agricultural areas in California to be used as a source of nutrients and soil conditioning. Instead, this material would be transported to landfills, incinerators, or lands outside of California for disposal and beneficial use. As discussed in the traffic impact section under the Class A Only Alternative, the truck traffic associated with transporting a larger proportion of the biosolids to out-of-state sites would be greater than under the proposed GO. However, with the loss of biosolids as a soil amendment, those food crops currently receiving biosolids would require chemical or manure-based sources of nutrients and soil conditioners. Some level of traffic would be associated with supplying this replacement material, but it would likely be less than that associated with biosolids application, particularly if chemical fertilizers are used. At the same time, long-range truck traffic would be expected to increase to carry biosolids to out-of-state beneficial use sites. Consequently, it is likely that the traffic associated with both biosolids beneficial use and disposal and delivery of chemical/manure-based soil amendments would be greater than under the proposed GO. In addition, the substantially longer truck hauls from producer to application site would result in a more severe impact than under the proposed GO. However, the impact would still be less than significant.

Air Quality

As discussed above, the level of traffic associated with the Food Crop Limitation Alternative would be expected to be greater than the proposed GO. To some extent, this alternative may lead to increases in incineration of biosolids if the cost is competitive with the cost of transport of biosolids to out of state beneficial use areas. Increased truck traffic through the South Coast and Mojave air basins would result in increased emissions. The Food Crop Limitation Alternative would have a more severe impact than the proposed GO. However, overall, the impact would be less than significant.

Noise

Primary noise impacts would arise from transportation. The Food Crop Limitation Alternative would incorporate mitigating features that would result in a less than significant noise impact on sensitive receptors. As a result, the impact of this alternative would be less severe than the proposed GO.

Cultural Resources

The Food Crop Limitation Alternative would incorporate mitigating features that would result in a less than significant impact on cultural resources. As a result, the impact of this alternative would be less severe than the proposed GO.

Cumulative Impacts

Food Crop Limitation Alternative would result in greater contributions than the proposed GO to cumulative effects on traffic, air quality, and energy consumption. Increased truck traffic on major roads between southern California and land application sites in Nevada and Arizona would make a cumulatively considerable contribution to traffic impacts. In addition, this alternative would make a cumulatively considerable contribution to quality impacts (ozone precursors and particulate matter) related to truck emissions in the South Coast and Mojave air basins. The increased distances over which biosolids would be transported, compared to current practice, would increase the amount of fuel consumed by transport trucks.