TAC Meeting – July 9, 2007
Announcements from the Chair

Tonight's meeting will be a discussion of the pros and cons of the various alternatives to Solids Disposal as presented in the County Project Team's Viable Project Alternatives Fine Screening Analysis.

Although the report only carried forth the hauling of Sub-Class B Biosolids, the TAC felt that there were pros for other alternatives and they should not be eliminated at this stage of the analysis.

We will again take public comments and questions after the three committees have presented their draft of the pros and cons and before the TAC begins its discussion.

At that time only comments and questions pertaining to the alternate methods of Solids Disposal will be allowed. If you have any other comment or question relating to the TAC and it role there will be a second public input period at the end of the meeting.

Questions to the Project Team will be answered as time permits at the end of the meeting. Please be sure and fill out Public Input slips and hand them in to a member of the project staff.

In the course of this meeting we hope that the public both here and at home who are watching and listening to our discussion of the pros and cons will gain a better understanding of solids disposal systems and of the part that they play in the overall wastewater project.

You may follow the progress of our pro/con analysis by visiting our website (http://www.slocounty.ca.gov/PW/LOWWP), select the TAC page and then the link to the working draft Pro/Con Analysis on Project Alternatives. This report has been updated to include information from last weeks meeting. We encourage you to send us any of your questions or comments on this report. Our e-mail address is LOWWP@co.slo.ca.us. I wish to acknowledge those of you who have submitted to our website. Your comments have been distributed to the committees for their consideration.

Before we get started I would like to announce that there will be a special meeting of the TAC to discuss the format and content of our report to the county Board of Supervisors. That meeting will be held at the County Government Center Room 161 on Monday, July 16, beginning at 12 noon. I have already received some feedback on this subject and I encourage anyone on the TAC to bring with them to the meeting their ideas - preferably with a written example.

Our next regular TAC meeting will also be held on Monday July 16, to discuss the important topic of effluent disposal. That meeting will start at 7PM.

Before we start the committee reports, Rob Miller will give us a brief overview of the various methods of treating and disposing of biosolids.

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SOLID DISPOSAL SYSTEMS

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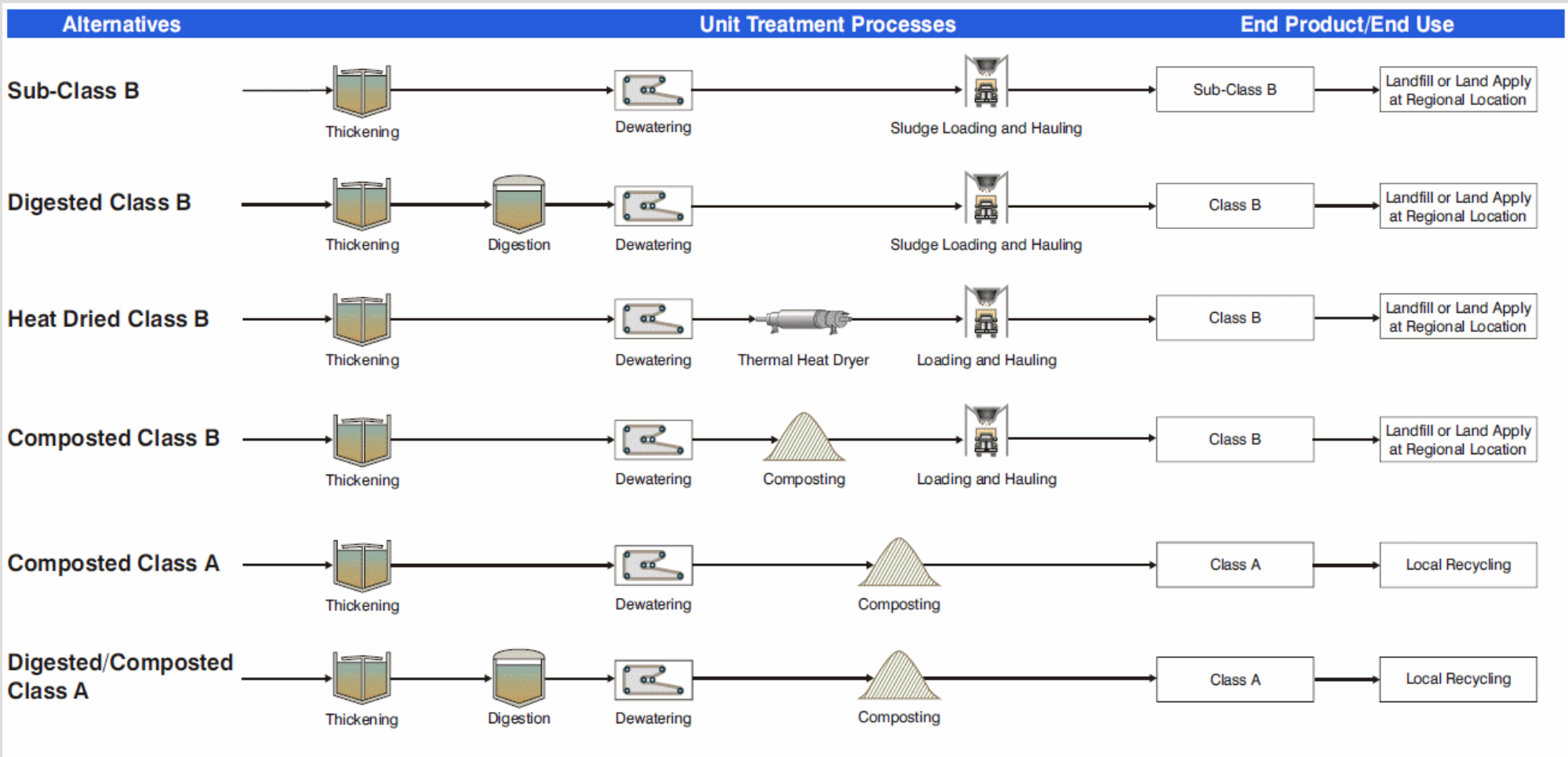

Technical Advisory Committee
Engineering and Water Resources Subcommittee
Project Pro/Con Analysis
Biosolids

Criteria	Method	Pro	Con
Maintain control and flexibility of disposal process.	Sub-Class B Disposal	Only thickening and dewatering treatment is required. Since thickening and dewatering are required for all of the other biosolids management alternatives, this option can be developed into a Class A or B operation in the future without decommissioning any of the initial project improvements.	Sub-Class B Biosolids must receive further treatment for land application or must be disposed of at a landfill. Fine Screen report assumes disposal at composting facility. The acceptance criteria of disposal facilities may become more stringent with time, which may require additional future treatment of biosolids. The percent solids achieved in this alternative is estimated to be less than 20%. Therefore, the local landfill could not accept this waste stream. This option produces the greatest mass of biosolids at 4,056 tons/year for a gravity system or 1,014 tons/year for STEP/STEG system. All biosolids would be shipped offsite for disposal.
	Digested Class B	Due to achieving Class B quality, the range of disposal options is much greater than for Sub-Class B biosolids.	This option produces a large mass of biosolids at 3,103 tons/year for a gravity system or 776 tons/year for STEP/STEG system (23.5% less than the Sub-Class B option).

Criteria	Method	Pro	Con
		Produces biosolids with a 20% solids content and therefore meets the percent solids acceptance criteria at the local landfill.	All biosolids would be shipped offsite for disposal.
	Heat Dried Class B	Due to achieving Class B quality, the range of disposal options is much greater than for Sub-Class B Biosolids. This option produces the least amount of biosolids at 1,043 tons/year for gravity or 261 tons/year for STEP/STEG system. Produces biosolids with a 90% solids content and therefore meets the percent solids acceptance criteria at the local landfill. This process can potentially produce Class A Biosolids	Operation of the system is relatively complex and would require a higher level of training for staff. Heat Drying is typically utilized for producing Class A Biosolids.
	Composted Class B	Due to achieving Class B quality, the range of disposal options is much greater than for Sub-Class B Biosolids. This option produces a low mass of biosolids, very similar to the Heat Dried Class B option, at 1,460 tons/year for gravity or 365 tons/year for STEP/STEG system.	Composting biosolids will require the addition of a bulking agent for a carbon source and to increase porosity. Therefore, the process will require a reliable source of bulking agent to be brought to the plant. All biosolids would be shipped offsite for disposal.

Criteria	Method	Pro	Con
		Produces biosolids with a 50% solids content and therefore meets the percent solids acceptance criteria at the local landfill. This process can potentially produce Class A Biosolids, but would require increased process time and footprint at plant site.	
	Composted Class A	Due to achieving Class A quality, the range of disposal options is much greater than for Sub-Class B and Class B Biosolids. This option produces a low mass of biosolids, very similar to the Heat Dried Class B option, at 1,327 tons/year for gravity or 332 tons/year for STEP/STEG system. Produces biosolids with a 55% solids content and therefore meets the percent solids acceptance criteria at the local landfill.	Although there is the potential for local use of Class A Biosolids, the County currently has an Ordinance in place that limits biosolids application to land to no greater than 1500 cubic yards per year. In addition, the Ordinance allows only Class A – Exceptional Quality to be applied to land in the County. Composting biosolids will require the addition of a bulking agent for a carbon source and to increase porosity. Therefore, the process will require a reliable source of bulking agent to be brought to the plant.
	Digested/Composted Class A	Due to achieving Class A quality, the range of disposal options is much greater than for Sub-Class B and Class B Biosolids. This option produces a low mass of biosolids, very similar to the Heat	Although there is the potential for local use of Class A Biosolids, the County currently has an Ordinance in place that limits biosolids application to land to no greater than 1500 cubic yards per year. In addition, the Ordinance allows only Class A – Exceptional Quality to be applied to land in the County.

Criteria	Method	Pro	Con
		Dried Class B option, at 1,128 tons/year for gravity or 282 tons/year for STEP/STEG system. Produces biosolids with a 55% solids content and therefore meets the percent solids acceptance criteria at the local landfill.	Composting biosolids will require the addition of a bulking agent for a carbon source and to increase porosity. Therefore, the process will require a reliable source of bulking agent to be brought to the plant. The long term use of compost materials at one location has the potential to accumulate
Nuisance assessment of bio-solids process and disposal	Sub-Class B Disposal	If thickening is achieved by a Belt Filter Press, there will be a minimal footprint requirement, estimated at 0.1 acre.	If solar drying is used, the operation will require 5.7 acres of land for biosolids produced from a gravity systems and 1.4 acres of land for biosolids produced from a STEP/STEG system. Solar drying has a high potential to be odiferous and also has the potential to attract vectors. This option is not designed to reduce the potential pathogen content in the produced biosolids. This alternative would require 4 to 5 truck trips per week leaving the plant.
	Digested Class B	This method is designed to reduce the potential pathogen content to very low levels so that any remaining pathogens in the biosolids will die-off in soil within short timeframe.	If solar drying is used, the operation will require 4.4 acres of land for biosolids produced from a gravity systems and 1.1 acres of land for biosolids produced from a STEP/STEG system. Solar drying has a high potential to be

Criteria	Method	Pro	Con
		If thickening is achieved by a Belt Filter Press, there will be a minimal footprint requirement, estimated at 0.1 acre	odiferous and also has the potential to attract vectors. This alternative would require 3 to 4 truck trips per week leaving the plant.
	Heat Dried Class B	This method is designed to reduce the potential pathogen content to very low levels so that any remaining pathogens in the biosolids will die-off in soil within short timeframe. There will be a minimal footprint requirement for this alternative, estimated at 0.1 acre.	This alternative would require 1 to 2 truck trips per week leaving the plant. Process may generate dust, which may potentially be explosive or present exposure/health concern. Exhaust gas may be odiferous, but can likely be mitigated through controls. Process is typically used to produce Class A Biosolids.
	Composted Class B	This method is designed to reduce the potential pathogen content to very low levels so that any remaining pathogens in the biosolids will die-off in soil within short timeframe.	Composting will require approximately 2.1 acre footprint for biosolids produced from a gravity system and 0.7 acres for biosolids produced from a STEP/STEG system. Storage of compost presents a potential fire hazard due to large volumes of carbonaceous materials. Sufficient moisture content, aeration and limited storage time reduces fire hazard. If not properly aerated, the compost operation can generate odors. Storm water infiltration into the compost

Criteria	Method	Pro	Con
			windrows has the potential to produce compost leachate, which may require control. This alternative would require 1 to 2 truck trips per week leaving the plant.
	Composted Class A	This option is designed to produce biosolids that are essentially pathogen free.	If not properly aerated, the compost operation can generate odors. Storm water infiltration into the compost windrows has the potential to produce compost leachate, which may require control. Storage of compost presents a potential fire hazard due to large volumes of carbonaceous materials. Sufficient moisture content, aeration and limited storage time reduces fire hazard. If Class A Biosolids are locally used, additional provisions may be needed for winter storage in order to prevent odor production and to mitigate fire hazard.
	Digested/Composted Class A	This option is designed to produce biosolids that are essentially pathogen free.	If not properly aerated, the compost operation can generate odors. Storm water infiltration into the compost windrows has the potential to produce compost leachate, which may require control. Storage of compost presents a potential fire hazard due to large volumes of carbonaceous materials. Sufficient moisture content, aeration

Criteria	Method	Pro	Con
			and limited storage time reduces fire hazard. If Class A Biosolids are locally used, additional provisions may be needed for winter storage in order to prevent odor production and to mitigate fire hazard.
Cost of process facilities, operations and maintenance, and ultimate disposal	Sub-Class B Disposal	Construction constitutes between **0.9** and 1.0% of total project construction costs for STEP/STEG Construction constitutes between 1.32 and 1.48% of total project construction costs for Gravity	O&M costs constitutes between 10.0 and 12.18% of total project O&M costs for STEP/STEG O&M costs constitutes between 16.03 and 28.86% of total project O&M costs for Gravity
	Digested Class B	Construction constitutes between 1.44 and 1.49% of total project construction costs for STEP/STEG Construction constitutes between 2.17 and 2.43% of total project construction costs for Gravity Potential for revenue.	O&M costs constitutes between 10.45 and 12.74% of total project O&M costs for STEP/STEG O&M costs constitutes between 15.82 and 28.38% of total project O&M costs for Gravity
	Heat Dried Class B	Construction constitutes between 1.74 and 1.94% of total project construction costs for STEP/STEG Construction constitutes between 2.81 and 3.03% of total project construction costs for Gravity	O&M costs constitutes between 11.55 and 17.96% of total project O&M costs for STEP/STEG O&M costs constitutes between 15.82 and 33.33% of total project O&M costs for Gravity

Criteria	Method	Pro	Con
		Potential for revenue.	Requires 1,400 to 1,700 BTU/ pound of water evaporated.
	Composted Class B	Construction constitutes between 1.24 and 1.64% of total project construction costs for STEP/STEG Construction constitutes between 2.0 and 2.37% of total project construction costs for Gravity Potential for revenue.	O&M costs constitutes between **9.77** and 19.88% of total project O&M costs for STEP/STEG O&M costs constitutes between 16.24 and 34.57% of total project O&M costs for Gravity
	Composted Class A	Construction constitutes between 1.24 and 1.64% of total project construction costs for STEP/STEG Construction constitutes between 2.0 and 2.37% of total project construction costs for Gravity Potential for revenue.	O&M costs constitutes between 10.22 and 20.81% of total project O&M costs for STEP/STEG O&M costs constitutes between 17.29 and 36.14% of total project O&M costs for Gravity
	Digested/Composted Class A	Construction constitutes between 1.79 and 2.24% of total project construction costs for STEP/STEG Construction constitutes between 3.14 and **3.29**% of total project construction costs for Gravity Potential for revenue.	O&M costs constitutes between 15.29 and 25.54% of total project O&M costs for STEP/STEG O&M costs constitutes between 25.00 and **41.76**% of total project O&M costs for Gravity

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SOLIDS HANDLING AND DISPOSAL ALTERNATIVES

ENVIRONMENT

Sub-Class B Biosolids	Least expensive construction cost Future flexibility Relatively low annual O&M Low acreage requirements	Worst Quality Largest volume Largest carbon footprint (High diesel consumption) Most expensive hauling costs Most restrictive disposal options (Dependant on outside parties for disposal*) Odor problems if solar drying used Wear and tear on road infrastructure from truck traffic) Odor
Class B Biosolids (All Treatment Alternatives)**	Future flexibility Low acreage requirements	Most restrictive disposal options (Dependant on outside parties for disposal) Wear and tear on road infrastructure from truck traffic) Higher energy consumption Moderate annual O&M Moderate hauling costs Moderate construction costs Odor

SOLIDS HANDLING AND DISPOSAL ALTERNATIVES

ENVIRONMENT

Composted Class A Biosolids (All Treatment Alternatives)	Future flexibility Least restrictive disposal options Sustainability Minimal hauling costs Least restrictive disposal options (Not dependant on outside parties for disposal) Best regional solution Minimal carbon footprint (Low diesel consumption)	High annual O&M High acreage requirements
Facultative Ponds	Future flexibility Least restrictive disposal options Sustainability Low hauling costs Minimal carbon footprint (Low diesel consumption) Lowest annual O&M Minimal odor	• Still requires Nitrate removal • Unknown future disposal options (Dependant on outside parties for disposal) • Least flexibility for water exchange

* Regional Biosolid treatment is the long-term solution but is outside the scope of this analysis.
** Flexibility for off-site recycling and disposal increases from Digested through Heat Dried to Composted Class B Biosolids.

SOLIDS TREATMENT AND DISPOSAL OPTIONS
TAC Financial Working Group

Draft 7/5/07

SOLIDS CLASS	PROS	CONS
Sub-Class B ▪ Capital Costs ▪ O&M ▪ Financial Risks	- Lowest construction costs: $1.9M - $2.4M for Gravity, $1.1M-$1.7M for STEP - O&M costs: $430,000-$470,000 for Gravity; $190,000-$270,000 for STEP - Flexibility to be upgraded	- Higher hauling costs - Most restrictive disposal option - Risk of third party cost escalations and future disposal restrictions
Composted A: **Assumes Gravity Belt Thickening, BFP, Windrow composting** ▪ Capital Costs ▪ O&M ▪ Financial Risks	- Construction costs: from $900,000 to $1,800,000 higher than Sub Class B - O&M costs: from $160,000 to $235,000 higher than Sub Class B - Greatest range of options for recycling/ disposal	- Requires willing compost users; risk of hauling - Composting requires larger amount of land
Ponds ▪ Capital Costs ▪ O&M ▪ Financial Risks	- Lowest O&M costs - Least amount of sludge handling, hauling, and least associated risks	- Land requirements are included in Treatment

* A complete table with all classes of solids is available. However, due to the relatively small cost differential between various levels of solids treatments, the Finance Working Group has chosen to compare Sub Class B and Composted A, thereby eliminating Digested Class B, Heat Dried Class B, and Composted B in the comparison above.

1. Who has been successful composting sludge?
2. Will we ~~not~~ see the cost of Bio Solids included in 218
3. How much can Cold Canyon accept? Is there a limit? How much energy.
4. How do you handle medications? Is this considered pathogens?
5. Will the O+M cost be included in 218
6. Which process has least O+M
7. How will air Quality Control deal with pollution from trucks.
8. Can we keep our green waste?

Step 1 Stay seems much more affordable and more importantly SUSTAINABLE for Los Osos.

Submitted by
Pat Renshaw
7/9/07

FLAND ON SCALE

$22 million TRI W $6 million

BIGROW shut down by Bio solids sludge TASK FORCE

CENTER FOR DISEASE CONTROL TIME

FOR CPU

FRIENDS with CANCER & Auto immune

MOST SUSTAINABLE

STEP ADD 8% SALES TAX

NONE FOR GRAVITY

ORMO SAY 50% ERROR IN

COST NUMBER

Submitted by
Al Barrow
7/9/07

19,713 $18,000 [illegible]

JBrady

Organics Home
Compost & Mulch
Biosolids
Sustainable Landscaping
Home Gardening
Food Scrap Management
Conversion Technologies
Events
Publications
Organics Site Index
External Links

Biosolids

Biosolids are the nutrient rich by-product of wastewater treatment, generated by channeling human waste through nearly 250 treatment plants and collection systems throughout California. Although the terms biosolids and sewage sludge are often used interchangeably, biosolids are the end product after treating sewage sludge with anaerobic digestion in combination with heat.

With the prohibition of ocean disposal of wastewater residuals in 1992, the use of biosolids as soil amendments (soil conditioners or fertilizers) or for land reclamation has increased to reduce the volume of biosolids that must be landfilled, incinerated, or disposed of at surface sites. In the last several years, numerous scientific, political and social factors have contributed to a growing public concern over the safety of biosolids which has resulted in strict local ordinances banning or severely restricting biosolids use in several California counties.

The management of biosolids in this state is layered and complex. This complexity is amplified by overlapping federal, State and local laws and ordinances, competing and fragmented jurisdictional oversight, shifting scientific evidence on human health and environmental safety, and sometimes short-term political solutions.

An item was presented to the CIWMB earlier this year on these issues.

Biosolids Usage

According to the California Association of Sanitation Agencies (CASA), California generates 750,000 dry tons of biosolids every year, most of which are Class B biosolids. Of this 750,000 dry tons:

- 54 percent are land applied.
- 16 percent are composted.
- 12 percent are used as alternative daily cover at landfills.
- 6 percent are disposed of in landfills.
- 4 percent are surface disposed.
- 8 percent are incinerated or stored.

Submitted by John Brady 7/9/07

Note that the 6 percent landfilled (approximately 45,000 tons) represents about 0.1 percent of all materials disposed in Class I (hazardous waste) landfills.

Classifications

Biosolids can be used as a soil amendment/fertilizer but are also disposed of when land application uses are not available or accessible, and too costly. When land applied, biosolids are generally used in four forms: as a rich, moist soil

amendment, dried pellet, liquid, or compost. There are essentially three categories of biosolids: Class B biosolids, Class A biosolids, and Exceptional Quality (EQ) biosolids.

- Class B biosolids may have low levels of pathogens which rapidly die-off when applied to soils, essentially becoming pathogen-free within a short period following application when the "Part 503" Rule requirements are followed. "Part 503" refers to the section in Title 40 of the Code of Federal Regulations, where various standards related to pathogens and metals in biosolids are codified. (Regulation Example: Riverside County)
- Class A biosolids are essentially free of pathogens prior to land application. The metal contents requirements under the Part 503 Rule are the same for Class A and Class B biosolids. (Regulation Example: Riverside County, Chapter 13.24)
- Exceptional Quality biosolids have lower metals concentration requirements than either Class A or Class B biosolids and have the same pathogen levels as Class A biosolids.

Land Application

Land application is the primary way biosolids are used in California and is currently the most controversial. Biosolids are used to enrich nutrient-depleted and/or barren soil with essential nutrients that, because they are organically bound, are released gradually to plants. Concerns about the land application of biosolids have been expressed by members of the general public regarding potential health effects related to such application. Some of the specific concerns include the presence of pathogens, heavy metals, and other chemical constituents in biosolids, and odors in areas where land application occurs. While no studies have directly linked the use of biosolids in this manner to harm in human or ecosystem health, a review by the National Research Council (NRC) of current federal regulations on biosolids (i.e., the Part 503 rule) cites problems in risk assessment methodologies and calls for additional research into biosolids safety. See the "Health Effects" section of the Board's April 2004 agenda item for more details on the NRC study.

Composting

Composting is the second largest use of biosolids with approximately 16 percent of the biosolids being composted for agricultural, horticultural, and land reclamation uses. Biosolids can be composted using a bulking agent such as wood chips or co-composted with green waste. Biosolids composting requires accessibility to an existing permitted facility with the capacity to accept additional material or a significant capital investment and operational outlay to fund the permitting, construction, and operation of a new facility.

There are currently several biosolids composting operations operating in California with the majority of operations located in Southern California. At this time, the overall size of the market for composted materials is uncertain and competition exists with the green waste composting market. Market considerations are an important aspect of composting since in the absence of an end market, composted materials would, by necessity, have to be landfilled. Composters who end up landfilling biosolids would incur financial losses due to tipping fees plus the costs incurred during the production of the biosolids into compost.

Alternative Daily Cover

Approximately 12 percent of the biosolids generated in California are used as alternative daily cover (ADC) at some landfills. ADC is material used to cover and contain landfilled materials at the end of each day and is a critical part of vector control at landfill facilities. Certain materials are permitted for use as ADC because of their physical characteristics and manageability. Of the 161 active landfills in California, three routinely accept biosolids for use as ADC. Regionally, there are areas in California where there are no landfills that accept biosolids for use as ADC and thus ADC is not a widespread biosolids management option.

Landfilling

Approximately 6 percent of the biosolids generated in California are disposed of at landfills. Biosolids can only be disposed of at permitted landfills. Some landfills permitted for the disposal of biosolids do not accept biosolids on a routine basis. Of the 161 landfills located in California, 60 are permitted to accept biosolids for disposal while only a portion of this 60 actually accept biosolids for disposal. As with ADC, there are regions in California where there are no landfills that accept biosolids for disposal. Due to limited landfill availability and the fact that the materials are disposed of rather than being beneficially used, landfill disposal is not a widespread management option.

Surface disposal methods account for 4 percent of the biosolids produced in California. Surface disposal methods require large amounts of vacant land which is lined with an impermeable material prior to the implementation of disposal operations. These operations are individually permitted and monitored by the California Regional Water Quality Control Board. Surface disposal is used on a limited basis by several wastewater treatment agencies and is not used on a widespread basis due to the dedicated land area requirements.

Incineration

Approximately 5 percent of the biosolids generated in California are incinerated. Incineration involves the high temperature burning of biosolids using a fuel supply such as natural gas or diesel fuel. The resultant ash is significantly lower in volume than the feedstock (biosolids) and, since the incineration process concentrates the trace metals that were present in the biosolids, there is a higher metal content. The ash is typically landfilled. Incinerators require significant capital investment and have high operating costs. There are three operating facilities statewide, each with a very limited capacity relative to the total amount of biosolids produced statewide. Due to existing and increasing air quality regulations, permitting of additional facilities is not considered likely and thus incineration is not considered a widespread management option.

Approximately 3 percent of the biosolids generated in California are stored temporarily in onsite facilities, such as lagoons. The biosolids are dried and further processed while in storage prior to the final deposition of the material using one or a combination of the management options described above.

Last updated: January 02, 2007

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