Draft Engineering Evaluation Report

Waste Management of Alameda County, Plant #2066
10840 Altamont Pass Rd, Livermore, CA
Application #26437

Background

Waste Management of Alameda County, ("Applicant") a Class II and III waste disposal facility that began operation in 1980, proposes the development of the following composting facility for waste diversion and resource recovery at the existing landfill, located at 10840 Altamont Pass Rd in Livermore (Plant #2066).

- Covered Aerated Static Pile (CASP) composting facilities
- Portable Grinder
- Portable Screen

The plant originally proposed to install a Materials Recovery Facility (MRF) complex with two buildings and a Reclaimable Anaerobic Composting (RAC) pre-processing facility, an Organic Materials Management Area (OMMA) with RAC and Garden Center Retail Compost Sales Yard. The plant has decided to only proceed with construction of the CASP compost facility. The other recycling and compost facilities will not be constructed at this time.

The facility proposed to increase the rate of waste diversion and recycling in the region and reduce the volume of waste that would otherwise be landfilled at the site and elsewhere. The facility will be constructed in an existing area of the landfill. The proposed facility will not expand the landfill footprint or require development of offsite facility.

Project Description

The purpose of the project is to provide organic material management that increase the capacity for waste diversion in Alameda County. By increasing the capacity for diversion, the project would help to fulfill the following state and local policies and goals

- The California Department of Resources Recycling and Recovery's (CalRecycle) Strategic Directive 6.1 to reduce the amount of organics in the waste stream by 50 percent by 2020.
- Support Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. Operation of the project would result in a net benefit in terms of GHG emissions due to the reduction of material entering the landfill and the reduced truck miles traveled to dispose materials.
- The Alameda County Waste Management Authority's mission statement to reach a 75 percent waste diversion goal.

Approximately 73 truck trips per day are estimated for CASP operations, consisting of 4 to 5 ton route trucks and commercial drop boxes and 18 to 20 ton transfer trucks. Approximately half the CASP truck trips will originate from the Davis Street Transfer Station. The other half of the CASP trips will come from routes and sources not currently using the ALRRF.

Covered Aerated Static Pile Composting System

The 500 tpd CASP system will process green wastes and green waste combined with food waste (up to 40 percent by weight). The organic materials will be received and placed into bunkers. The bunkers will be constructed on an improved surface pad capable of withstanding heavy equipment traffic and scraping, graded to drain for collection of storm water and leachate, and equipped with leachate collection and aeration piping. Once placed in the bunkers, the organic materials would be covered and subject to negative aeration. The collected air will be treated in a biofilter for air emissions and odor control purposes. The active composting period will be completed in 22 days. After the active composting phase in the bunkers is complete, the compost will be moved to the curing/storage area for finishing and then screened into commercial grade compost for other products such as mulch.

The facility proposes to implement a vacuum-based or pressure-based flow through the piles, or combination of the two, to maintain optimal aerobic conditions for decomposition; and to incorporate a biofiltering component to the process to control VOC emissions. Perforated PVC piping will be installed and processed greenwaste and foodwaste material will be placed over the piping, and wetted as needed. The pile will be covered with a layer of finished compost or other acceptable cover material and the system will be activated by connecting to the piping network to a blower to create negative or positive pressure within the pile. For negative-pressure operation, a biofilter will be constructed at the end of the piping and a condensate trap installed between the pile and the biofilter to collect the moisture.

The CASP method results in much lower particulate emissions than traditional windrow compost methods, because it eliminates the frequent turning of the compost pile during the active compost phase and the associated fugitive road dust emissions generated by the windrow turning equipment traveling on unpaved areas during these pile turning events. Using compost covers or biofilters on the aerated static pile reduces emissions of organic compounds and ammonia. Per article titled “Compost Emissions Estimate for a Conditional Use Permit Modification” dated June 29, 2011, it has been shown that aerated static pile composting with negative aeration and biofiltration can provide a VOC reduction by 85% (Tim O’Neill, 2010 Biocycle West Coast conference; Card & Schmidt, 2011 Biocycle West Coast Conference).

Curing Piles

After completing the active composting phase using the CASP method, the compost pile will be allowed to cure without turning for about 30 days to complete the composting process. The Applicant is not proposing to use any controls on the curing piles.

Stockpiles

The plant will operate feedstock stockpiles, ground feedstock stockpiles, and finished compost stockpiles. The green and food material feedstock will be processed by the portable grinder (source S-227) and portable trommel screen (source S-226) prior to being sent to the compost operation. The VOC and NH3 emissions produced by the feedstock stockpiles will be mitigated by requirements to incorporate the material within the CASP compost operation within 72 hours (green material) or 48 hours (food material).

Screening/Grinding Operations

The facility has proposed to install the following processing equipment as part of this application.

- a portable tub grinder powered by a diesel engine
- a portable screener powered by a diesel engine

The material from the stockpiles will be ground and screened prior to being introduced into the CASP composting operation. The overs from the screened stockpiled material will be used for biomass or mulch and transported offsite.

After the composting process, the finished compost will be screened and loaded into trucks and transported offsite. The overs will be sent back to the grinding operation to be introduced back into the composting operation.

The engine powering the tub grinder and screen also propel the mobile units. Regulation 2 Rule 1 Section 114.2.5 (Exemption, Combustion Equipment) states the following equipment is exempt from the requirements of Sections 2-1-301 and 302, only if the source does not emit pollutants other than combustion products, and those combustion products are not caused by the combustion of a pollutant generated from another source, and the source does not require permitting pursuant to Section 2-1-319.

114.2 Internal Combustion Engines and Gas Turbines:

2.5 Any engine mounted on, within, or incorporated into any vehicle, train, ship, boat, or barge used to provide propulsion for the vehicle, train, ship, boat, or barge and which is also used to supply mechanical or electrical power to ancillary equipment (e.g., crane, drill, winch, etc.) which is affixed to or is a part of the vehicle, train, ship, boat, or barge.

Since the engine powering the tub grinder and screen provide propulsion for the vehicle, the engines are exempt from Air District permitting requirements per 2-1-114.2.5.

Sources of Air Pollution

This project will generate particulate emissions from vehicle traffic traveling to and from the site (delivering feed stock and picking up product), composting operations, screening and grinding operations, and stockpiles. The composting operation and stockpiles will emit precursor and non-precursor organic compounds and toxic air contaminants (such as isopropanol, methanol and ammonia).

The sources of air pollution from this operation are as follows and will be assigned the following source numbers.

S-223 Commercial Green Waste and Food Waste Composting Operation, Covered Aerated Static Pile (CASP) Method, abated by Biofilter (A-223) with Composting Stockpiles
S-226 Portable Trommel Screen (156,000 tons/year throughput)
S-227 Portable Grinder Operations (156,000 tons/year throughput)

The composting stockpiles will be included with the composting operation source S-223. The paved and unpaved road vehicle particulate matter emissions will also be included with the composting operation source S-223.

Criteria Pollutant Emission Calculations

The proposed potential to emit for each operation are summarized in Tables 1-4. Calculation assumptions are explained below. Detailed spreadsheets showing all calculations are attached.

TABLE 1
Criteria Pollutant Daily Emissions (S-223)

Source	PM_{10}	$PM_{2.5}$	POC	HAP
Composting (lb/day)	3.5	0.5	501.2	
Stockpiles (lb/day)	8.7	1.3	300.0	-
Paved Roads (lb/day)	72.9	17.9	-	-
Unpaved Roads (lb/day)	40.9	4.1	-	-
Total (lb/day)	126.0	23.8	801.2	

TABLE 2
Criteria Pollutant Annual Emissions (S-223)

Source	PM_{10}	$PM_{2.5}$	POC	HAP
Composting (tons/year)	0.55	0.08	78.19	
Stockpiles (tons/year)	1.36	0.21	46.80	-
Paved Roads (tons/year)	11.38	2.80	-	-
Unpaved Roads (tons/year)	6.39	0.64	-	-
Total (tons/year)	19.68	3.73	124.99	

TABLE 3
Criteria Pollutant Emissions (S-226)

Source	PM_{10}	$PM_{2.5}$
Grinding (lb/day)	3.6	1.8
Grinding (TPY)	0.56	0.28

TABLE 4
Criteria Pollutant Emissions (S-227)

Source	PM_{10}	$PM_{2.5}$
Screening (lb/day)	3.6	1.8
Screening (TPY)	0.56	0.28

Emission Calculation and Basis
Particulate emissions are expected from vehicle traffic, composting operations, and screening, grinding, and stockpile operations. The composting operations and greenwaste stockpiles will also have organic and ammonia emissions. The District assumes that all VOC emissions discussed are precursor organic compounds (POC).

Composting Operation
The composting operation is expected to be a source of organic, ammonia, and particulate emissions. The applicant has proposed a maximum compost throughput of 500 tons/day and 156,000 tons/year.

POC
Composting operations include VOC emissions due to the physical aeration and biological composting processes. The BAAQMD currently bases uncontrolled windrow emission factors on results from the average of available active composting greenwaste emissions test data from an CARB report entitled “Compost VOC Emission Factors” dated September 15, 2010. A factor of 3.58 pounds of VOC per ton of wet compost is used for uncontrolled windrow composting. 90% of the VOC emissions happen in the active phase of composting and 10% of the VOC emissions happen in the curing phase.

Studies conducted in the South Coast and San Joaquin Valley Air Districts indicate that a CASP system and biofiltration, reduce VOC emissions by up to 90% as compared to uncontrolled windrow operations. For the sake of this application, it is assumed that VOC emissions from composting will be reduced by at least 80%; curing emissions are not affected. Therefore, the abated VOC emission factor for CASP composting and curing is estimated to be as follows.

EF (POC) = 3.58 lb/wet ton x 90% x (1 – 0.80) + 3.58 lb/wet ton x 10%
= 1.00 lb/wet ton

Daily Potential to Emit (POC) = 1.00 lb/wet ton x 500 tons/day
= 501.2 lb/day

Annual Potential to Emit (POC) = 1.00 lb/wet ton x 156,000 tons/year
= 156,374 lb/year
= 78.19 tons/year

Particulate Matter
The particulate matter emission factor for handling of the compost is from AP42 Section 13.2.4 Aggregate Handling and Storage Piles Table 13.2.4-1 November 2006.

The following equation may be used for estimation of particulate emissions during a batch drop of aggregate materials, such as adding material to stockpile or removing it from a stockpile and dropping it into a truck. Lacking any more appropriate data, this equation will be used to estimate particulate emissions due to the batch drop of fresh and shredded green waste, wood waste, and compost as the material is moves through each processing stage. The specific number of drop transfers are discussed below for the different types of materials being processed. The equation is appropriate for material silt contents ranging from 0.44%-19%. From Table 13.2.4-1, silt content for miscellaneous landfill fill materials are about 12%.

$E = k*(0.0032)*[(U/5)^{1.3}]/[(M/2)^{1.4}]$

Where
E = emission factor (lb/ton)
k = particle size multiplier = 0.35, for PM_{10}
k = particle size multiplier = 0.053, for $PM_{2.5}$
U = mean wind speed (mph) = 12 (per applicant site data)
M = material moisture content (%) = 2% (minimum expected throughout all processing steps, likely to be higher for fresh greenwaste)

E (PM_{10}) = 0.35*(0.0032)*[(12/5)1.3]/[(2/2)1.4] = 0.003495 lb/ton
E ($PM_{2.5}$) = 0.053*(0.0032)*[(12/5)1.3]/[(2/2)1.4] = 0.0005293 lb/ton

Truck Unloading to Stockpile Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

Greenwaste to Grinder Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

Greenwaste to Screener Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

Greenwaste to CASP Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

Compost to Curing Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

Cured Compost to Screen Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

Screened Compost to Truck Transfer Operation
Daily Potential to Emit (PM_{10}) = 0.003495 lb/ton x 500 tons/day = 1.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 500 tons/day = 0.3 lb/day
Annual Potential to Emit (PM_{10}) = 0.003495 lb/ton x 156,000 tons/year = 545 lb/year
Annual Potential to Emit ($PM_{2.5}$) = 0.0005293 lb/ton x 156,000 tons/year = 83 lb/year

The greenwaste to CASP transfer operation and compost to curing transfer operation will be considered part of the Composting operation and the other transfer operations will be considered part of the Stockpile operation.

Compost Transfer Operation
Daily Potential to Emit (PM_{10}) = 1.7 lb/day x 2 = 3.5 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.3 lb/day x 2 = 0.5 lb/day
Annual Potential to Emit (PM_{10}) = 545 lb/year x 2 = 1,091 lb/year = 0.545 tons/year
Annual Potential to Emit ($PM_{2.5}$) = 83 lb/year x 2 = 165 lb/year = 0.083 tons/year

Stockpile Transfer Operation
Daily Potential to Emit (PM_{10}) = 1.7 lb/day x 5 = 8.7 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.3 lb/day x 5 = 1.3 lb/day
Annual Potential to Emit (PM_{10}) = 545 lb/year x 5 = 2,726 lb/year = 1.363 tons/year
Annual Potential to Emit ($PM_{2.5}$) = 83 lb/year x 5 = 413 lb/year = 0.206 tons/year

Total Transfer Operation
Daily Potential to Emit (PM_{10}) = 1.7 lb/day x 7 = 12.2 lb/day
Daily Potential to Emit ($PM_{2.5}$) = 0.3 lb/day x 7 = 1.9 lb/day
Annual Potential to Emit (PM_{10}) = 545 lb/year x 7 = 3,817 lb/year = 1.908 tons/year
Annual Potential to Emit ($PM_{2.5}$) = 83 lb/year x 7 = 578 lb/year = 0.289 tons/year

Ammonia
Composting operations include ammonia emissions due to biological composting processes. The BAAQMD currently bases uncontrolled windrow emission factors on results from the average of available active composting greenwaste emissions test data from an CARB report entitled "Compost VOC Emission Factors" dated September 15, 2010. A factor of 0.78 pounds of NH3 per ton of wet compost is used for uncontrolled windrow composting. 70% of the NH3 emissions happen in the active phase of composting and 30% of the NH3 emissions happen in the curing phase. For the sake of this application, it is assumed that NH_3 emissions from composting will be reduced by at least 53%; curing emissions are not affected. Therefore, the abated VOC emission factor for CASP composting and curing is estimated to be as follows.

EF (NH_3) = 0.78 lb/wet ton x 70% x (1 – 0.53) + 0.78 lb/wet ton x 30%
= 0.491 lb/wet ton

Daily Potential to Emit (NH_3) = 0.491 lb/wet ton x 500 tons/day
= 245.3 lb/day

Annual Potential to Emit (NH_3) = 0.491 lb/wet ton x 156,000 tons/year
= 76,537 lb/year
= 38.3 tons/year

<u>Stockpiles</u>
The compost stockpile emissions will be included as part of the composting operation source. The applicant has proposed a stockpile throughput of 500 tons/day and 156,000 tons/year.

POC
Material VOC emissions are provided by the document entitled "ARB Emissions Inventory Methodology for Composting Facilities" for stockpiled greenwaste and foodwaste material for a composting operation. Stockpile storage time will be limited to three days in the permit conditions.

EF (POC) = 0.20 lb/wet ton-day

Daily Potential to Emit (POC) = 0.20 lb/wet ton-day x 500 tons/day x 3 days
= 300.0 lb/day

Annual Potential to Emit (POC) = 0.20 lb/wet ton-day x 156,000 tons/year x 3 days
= 93,600 lb/year
= 46.8 tons/year

NH3
Material ammonia emissions are calculated based on an average of four source tests performed at the following locations taking into account tests performed during different seasons.

Green Material Stockpile NH_3 EF		
Site	Season Samples Taken	EF (lb-NH_3/wet ton/day)
Northern Recycling Zamora	Spring	0.018
NorCal Jepson Prairie (Vacaville)	Summer	0.0095
SCAQMD Inland Empire #2 ("Winter")	Fall	0.0065
SCAQMD Inland Empire #1 ("Summer")	Fall	0.033
Average		0.02

EF (NH3) = 0.02 lb/wet ton-day

Daily Potential to Emit (NH3) = 0.02 lb/wet ton-day x 500 tons/day x 3 days
= 30.0 lb/day

Annual Potential to Emit (NH3) = 0.02 lb/wet ton-day x 156,000 tons/year x 3 days
= 9,360 lb/year
= 4.68 tons/year

Vehicle Traffic Emissions
The fugitive emission factors due to vehicle traffic are calculated separately for paved and unpaved roads.

Paved Roads
The emission factor for vehicle traffic on paved roads to and from the storage piles is calculated based on 82,576 miles/year of paved road estimated by the applicant and using the following equation found in AP-42 Chapter 13.2.1 January 2011.

$EF_{ext} = [k(sL)^{0.91}(W)^{1.02}](1 - P/4N)$

Where
EF_{ext} = Emission factor, pounds per vehicle miles traveled (lbs/VMT)
k = particle size multiplier (lbs/VMT) = 0.0022, for PM_{10} from Table 13.2.1-1
k = particle size multiplier (lbs/VMT) = 0.00054, for $PM_{2.5}$ from Table 13.2.1-1
sL = road surface silt loading (g/m^3)
= 7.4 mean value for municipal solid waste landfills from Table 13.2.1-4

W = average weight of vehicles (tons) = 19.88 estimate provided by applicant
P = number of days with at least 0.01 in. of precipitation in the averaging period
= 58 days, Precipitation for Livermore obtained from the Western Regional Climate Center website (www.wrcc.dri.edu)
N = number of days in the averaging period = 365 for annual

EF_{paved} (PM_{10}) = $[0.0022(7.4)^{0.91}(19.88)^{1.02}](1 – 58/4(365)) = 0.2756$ lbs/VMT

Annual Potential to Emit (PM_{10}) = EF_{paved} x VMT
= 0.2756 lbs/VMT x 82,576 miles/year
= 22,754 lb/year
= 11.4 tons/year

Assuming the operation runs 312 days per year, the daily emissions are calculated as follows.

Daily Potential to Emit (PM_{10}) = Annual Potential to Emit ÷ 312 days/year
= 22,754 lb/year ÷ 312 days/year
= 72.9 lb/day

EF_{paved} ($PM_{2.5}$) = $[0.00054(7.4)^{0.91}(19.88)^{1.02}](1 – 58/4(365)) = 0.0676$ lbs/VMT

Annual Potential to Emit ($PM_{2.5}$) = EF_{paved} x VMT
= 0.0676 lbs/VMT x 82,576 miles/year
= 5,585 lb/year
= 2.8 tons/year

Assuming the operation runs 312 days per year, the daily emissions are calculated as follows.

Daily Potential to Emit ($PM_{2.5}$) = Annual Potential to Emit ÷ 312 days/year
= 5,585 lb/year ÷ 312 days/year
= 17.9 lb/day

Unpaved Roads
The emission factor for vehicle traffic on unpaved roads to and from the storage piles is calculated based on 15,222 miles/year of paved road estimated by the applicant and using the following equation found in AP-42 Chapter 13.2.2 November 2006. Assume 50% abatement efficiency for use of dust suppressant.

$EF = k(s/12)^a(W/3)^b$ and $EF_{ext} = E[(365 – P)/365]$

$EF_{ext} = [k(s/12)^a(W/3)^b] [(365 – P)/365]$

Where
EF_{ext} = Annual Emission factor, pounds per vehicle miles traveled (lbs/VMT)
k = empirical constant (lbs/VMT) = 1.5, for PM_{10} from Table 13.2.2-2

k = empirical constant (lbs/VMT) = 0.15, for $PM_{2.5}$ from Table 13.2.2-2
a = empirical constant = 0.9, for PM_{10} industrial roads from Table 13.2.2-2
b = empirical constant = 0.45, for PM_{10} industrial roads from Table 13.2.2-2
s = surface material silt content (%)
= 6.4 mean value for municipal solid waste landfills from Table 13.2.2-1
W = mean vehicle weight (tons) = 19.88 estimate provided by applicant

P = number of days with at least 0.01 in. of precipitation in the averaging period
= 58 days, Precipitation for Livermore obtained from the Western Regional Climate Center website (www.wrcc.dri.edu)

$EF_{unpaved}$ (PM_{10}) = $[1.5(6.4/12)^{0.9}(19.88/3)^{0.45}]$ [(365 – 58)/365] = 1.678 lbs/VMT

Annual Potential to Emit (PM_{10}) = EF_{paved} x VMT x (1 – abatement eff)
= 1.678 lbs/VMT x 15,222 miles/year x (1 – 0.5)
= 12,772 lb/year
= 6.4 tons/year

Assuming the operation runs 312 days per year, the daily emissions are calculated as follows.

Daily Potential to Emit (PM_{10}) = Annual Potential to Emit ÷ 312 days/year
= 12,772 lb/year ÷ 312 days/year
= 40.9 lb/day

$EF_{unpaved}$ ($PM_{2.5}$) = $[0.15(6.4/12)^{0.9}(19.88/3)^{0.45}]$ [(365 – 58)/365] = 0.1678 lbs/VMT

Annual Potential to Emit ($PM_{2.5}$) = $EF_{unpaved}$ x VMT x (1 – abatement eff)
= 0.1678 lbs/VMT x 15,222 miles/year x (1 – 0.5)
= 1,277 lb/year
= 0.6 tons/year

Assuming the operation runs 312 days per year, the daily emissions are calculated as follows.

Daily Potential to Emit ($PM_{2.5}$) = Annual Potential to Emit ÷ 312 days/year
= 1,277 lb/year ÷ 312 days/year
= 4.1 lb/day

Tub Grinder Emissions

The greenwaste supplied to the compost operation will be ground and screened by the tub grinder and screener (S-226 and S-227). The particulate emission factor for the tub grinder is from AP-42 section 10.3 Plywood Veneer and Layout Operations Table 10.3-1 for log debarking, assuming 60% of emissions are PM_{10} with a 50% fraction of $PM_{2.5}$. The applicant has proposed a throughput of 100 tons/hr, 500 tons/day, and 156,000 tons/year. Water suppression will be assumed to provide 50% abatement of particulate emissions.

EF (PM_{10}) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP = 0.0144 lb/ton
EF (PM_{10}) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP x 0.5 lb-PM_{10}/lb-$PM_{2.5}$
= 0.0072 lb/ton

Daily Potential to Emit (PM_{10}) = EF x throughput x (1 – abatement eff)
= 0.0144 lb/ton x 500 tons/day x (1 – 0.5)
= 3.6 lb/day

Annual Potential to Emit (PM_{10}) = EF x throughput x (1 – abatement eff)
= 0.0144 lb/ton x 156,000 tons/year x (1 – 0.5)
= 1,123 lb/year
= 0.6 tons/year

Daily Potential to Emit ($PM_{2.5}$) = EF x throughput x (1 – abatement eff)
= 0.0072 lb/ton x 500 tons/day x (1 – 0.5)
= 1.8 lb/day

Annual Potential to Emit ($PM_{2.5}$) = EF x throughput x (1 – abatement eff)
= 0.0072 lb/ton x 156,000 tons/year x (1 – 0.5)
= 562 lb/year
= 0.3 tons/year

Screening Operation Emissions

The greenwaste supplied to the compost operation will be ground and screened by the tub grinder and screener (S-226 and S-227). The cured compost will also be screened by the screener prior to loading into trucks to be sent offsite. The particulate emission factor for the screener is from AP-42 section 10.3 Plywood Veneer and Layout Operations Table 10.3-1 for log debarking, assuming 60% of emissions are PM_{10} with a 50% fraction of $PM_{2.5}$. The applicant has proposed a throughput of 150 tons/hr, 500 tons/day, and 156,000 tons/year. Water suppression will be assumed to provide 50% abatement of particulate emissions.

EF (PM_{10}) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP = 0.0144 lb/ton
EF (PM_{10}) = 0.024 lb-TSP/ton x 0.60 lb-PM_{10}/lb-TSP x 0.5 lb-PM_{10}/lb-$PM_{2.5}$
= 0.0072 lb/ton

Daily Potential to Emit (PM_{10}) = EF x throughput x (1 – abatement eff)
= 0.0144 lb/ton x 500 tons/day x (1 – 0.5)
= 3.6 lb/day

Annual Potential to Emit (PM_{10}) = EF x throughput x (1 – abatement eff)
= 0.0144 lb/ton x 156,000 tons/year x (1 – 0.5)
= 1,123 lb/year
= 0.6 tons/year

Daily Potential to Emit ($PM_{2.5}$) = EF x throughput x (1 – abatement eff)
= 0.0072 lb/ton x 500 tons/day x (1 – 0.5)
= 1.8 lb/day

Annual Potential to Emit ($PM_{2.5}$) = EF x throughput x (1 – abatement eff)
= 0.0072 lb/ton x 156,000 tons/year x (1 – 0.5)
= 562 lb/year
= 0.3 tons/year

Cumulative Increase
The District tracks increases in emissions from each facility. These cumulative emissions were reset on April 5, 1991 for all facilities. This is an existing facility with pre-existing cumulative emissions.

TABLE 5
Cumulative Emission Increase Inventory (tons/year)

Pollutant	Existing Plant	Proposed Processing Equipment	Proposed Road Dust Emissions	Post-Project
PM_{10}	19.691	3.03	17.79	40.591
POC	62.773	124.99	0.000	187.763
NO_x	76.871	0.000	0.000	76.871
SO_2	74.623	0.000	0.000	74.623
CO	207.479	0.000	0.000	207.479

Statement of Compliance

Regulation 2, Rule 1: California Environmental Quality Act (CEQA) Requirements
District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with CEQA requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312.

The current solid waste permit allows disposal operations and a defined disposal expansion area as approved by a conditional use permit (CUP). While the proposed recycling facilities would be developed entirely within the active permitted area, they are not covered by the current solid waste permit. Therefore, the CUP needed to be revised to include the proposed uses.

The proposed project was approved by Alameda County, which prepared an Initial Study/Mitigated Negative Declaration in July 2011 for expansion of various activities at Altamont Landfill Resource and Recovery Facility including an Aerated Static Pile Composting System. Alameda County certified the Initial Study/Mitigated Negative Declaration on March 16, 2013 and issued Conditional Use Permit No. PLN-2010-00041. Therefore, the requirements of CEQA are satisfied.

Regulation 2, Rule 1: School Public Notice Requirements
The public notification requirements of Regulation 2-1-412 apply to modifications which result in an increase in toxic air contaminant or hazardous air contaminant emission at facilities within 1,000 feet of the boundary of a K-12 school. The Applicant has reported no K-12 school within that radius of this facility, and the District's database confirms that there is no K-12 school within one mile from the facility. Therefore, the public notice requirements do not apply to this operation.

Regulation 2, Rule 2: New Source Review
This application was deemed complete on October 16, 2014. The current version of Regulation 2, Rule 2 applies to applications deemed complete on or after August 31, 2016. Since this application was deemed complete prior to August 31, 2016, the previous version of Regulation 2, Rule 2 (amended June 15, 2005) is applicable to this application. All citations below refer to the June 15, 2005 version of Regulation 2, Rule 2.

Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements
Regulation 2, Rule 2, Section 301 states that BACT requirements are triggered if maximum potential emissions from a new or modified source will be 10 pounds/day or more of NO_x, CO, POC, NPOC, PM_{10}, or SO_2. As shown in Table 1, the emissions from S-223 could exceed 10 pounds/day for POC at the compost operation and for POC at the stockpile operation. Therefore, BACT is required for POC emissions. Also, fugitive emissions due to vehicle travel on paved and unpaved roads will exceed 10 pounds/day and triggers BACT.

<u>Compost POC BACT:</u>
Composting is a biological decomposition process that converts biodegradable solid waste (such as lawn and garden waste, food waste, and other organic matter) into a stable material that is typically used as a soil amendment or fertilizer. Traditional composting uses aerobic (oxygen based) decomposition processes to breakdown the biodegradable material. Oxygen level, temperature, moisture, carbon to nitrogen ratio, material porosity, and other factors affect the rate of decomposition, quality of the product, and the emissions to the atmosphere.

The most common type of composting operation uses the open windrow compost method. The compost feedstock is prepared by shredding, grinding, and mixing the available materials to achieve a desired mix ratio. This shredded and mixed feedstock is placed in long stockpiles, called windrows, to start the active composting phase. Decomposition accelerates as the temperature increases. The desired oxygen levels are maintained in the windrow by frequently turning over the windrow using mechanical means. Once the active composting phase is complete, the windows are allowed to rest and finish the composting process during a curing phase. This compost method requires a large work area, a large buffer zone between the facility and residents or industry, and a long time period to complete the compost process. This composting method typically has substantial fugitive particulate and organic emissions. Water sprays are commonly used to control particulate emissions, but organic emission controls are not typically employed.

Another type of composting process is the aerated static pile (ASP) process. Rather than placing the mixed feedstock in long windrows, the feedstock is placed in an area equipped with perforated pipes. Aeration is accomplished by blowing air into the pipes and through the feedstock (positive aeration), or the reverse, negative aeration, by pulling air through the feedstock and into the pipes. This aeration method typically requires less space and less total processing time than the traditional windrow method, but may still require large buffer zones and improves the oxygen control in the pile. It can also allow for greater flexibility in the type of feedstock processed. The ASP process eliminates the need for windrow turning, which is the largest source of particulate emissions for the windrow process. In addition, ASP process can easily be fitted with biofilters to control organic and ammonia emissions. Finished compost placed on top of the active compost curing piles acts as a biofilter for positive ASP. This type of ASP is often called a covered aerated static pile (CASP) process. Curing piles are typically handled similarly to the windrow process.

Another type of composting is the "in vessel" approach. This process may be used for sites that require a small footprint or that are in a more confined area. This type of system may be less adaptable with regards to types and amount of feedstock received. In-vessel composting equipment can be equipped with piping and biofilters to control organic and ammonia emissions. For in-vessel systems, the capture rates for organic and ammonia emissions are likely higher than the capture rates that can be achieved by the CASP process or a biofilter controlled negative ASP process. However, actual reported capture and control efficiencies for in-vessel systems vary widely and this range overlaps the ranges of capture and control efficiencies reported for CASP systems and biofilter controlled negative ASP systems. In addition, in-vessel system and control costs are considerably higher than for the CASP method.

Technology Rank by Control Effectiveness	
Rank	Option
1	Positively aerated static piles with cover (cover is engineered, 6 inches of finished compost, or equivalent). (Active and Curing Phases)
2a	In-vessel or container with aeration venting to biofilter or equivalent. (Active and Curing Phases)
2b	Negatively aerated static piles with cover (cover is engineered, 6 inches of finished compost, or equivalent) venting to biofilter. (Active and Curing Phases)

The District has two BACT levels: BACT1 and BACT2. A project must use BACT1 (the most stringent level of control) if it is found to be technologically feasible and cost effective. In accordance with the District's BACT/TBACT Workbook, the District's cost effectiveness thresholds are: $17,500/ton for POC, NPOC, and NOx; $18,300/ton for SO_2; and $5,300/ton for PM_{10}. The District's BACT/TBACT Workbook also identifies the procedures to be used for conducting a cost effectiveness analysis. If emission

controls do not meet the BACT1 criteria, the applicant must use BACT2, which is an achieved in practice level of control. BACT2 controls cannot be any less stringent than controls or emission limits that are required by any Air District, state, or federal rules or regulations.

For the proposed composting operation, the largest type of emission is precursor organic compounds with a proposed emission rate of 124.99 tons/year of POC for the CASP process at 156,000 tons/year of feedstock processed. As discussed above, in-vessel composting with biofilter abatement is a technologically feasible process that is expected to result in the highest potential control efficiency for organic emissions. However, for this type of composting process to be deemed BACT1 for this project, it must also be cost-effective.

A cost-effectiveness analysis for Option 1 which is a positive ASP is not required as the applicant is proposing such a system when operating as a pressure-based system.

The District conducted a cost-effectiveness analysis for a bio-filter controlled in-vessel composting system. Based on equipment cost data provided in application #25019 which will be considered worst case as the amount of compost material processed for that operation was less than the amount proposed in this application, the District calculated an annualized cost for the in-vessel equipment and controls that would be required to handle 156,000 tons/year of feedstock. For a worst case overall capture and control assumption of 80%, the cost-effectiveness would be more than $90,000/ton. Since the cost of a biofilter controlled in-vessel compost system will exceed the District's cost-effectiveness threshold for POCs ($17,500/ton), this type of system is not considered to be cost-effective.

Cost Effectiveness

In-vessel Composting System	
Cost Description	Cost ($)
Direct Costs (DC)	
In-vessel composting equipment (for 130,000 ton/year operation)	$2,300,000
Odor control equipment	$1,200,000
Mechanical pre-treatment and post-treatment	$1,700,000
Mobile equipment	$1,220,000
Site preparation/utilities connection	$1,000,000
Foundations	$5,000,000
Access roads, weigh station, paved yards, green areas	$1,500,000
Reinforced concrete works	$5,660,000
Buildings	$3,240,000
Total Direct Costs (TDC)	**$22,820,000**
Indirect Costs (IC)	
Design/Commissioning	$2,400,000
Permitting	$700,000

Total Indirect Cost (TIC)	**$3,100,000**
Subtotal Capital Investment (SCI = TDC + TIC)	**$25,920,000**
Project Contingency (15% of SCI)	$3,888,000
Total Capital Investment (TCI) (TDC + TIC + Contingency)	**$29,808,000**

Annualized Capital Costs

Annualized Capital Investment = Initial Capital Investment x Amortization Factor

Amortization Factor = $\left[\frac{0.05(1.05)^{10}}{(1.05)^{10}-1}\right]$ = 0.1295, amortizing over 10 years at 5%

Therefore,

Annualized Capital Investment = $29,808,000 x 0.1295 = $3,860,272

Annual Costs

Annual Costs			
Direct Annual Cost (DC)			
Operating Labor and Maintenance	5% of TCI		$1,490,400
Total DC			**$1,490,400**
Indirect Annual Cost (IC)			
Overhead	60% of Labor Cost		$894,240
Administrative Charge	2% TCI		$596,160
Property Taxes	1% TCI		$298,080
Insurance	1% TCI		$298,080
Total IC			**$2,086,560**
Annual Cost (DC + IC)			**$3,576,960**

Total Annual Cost = Annualized Capital Investment + Annual Cost
= $3,860,272 + $3,576,960
= $7,437,232

Emission Reductions

Assume a worst case capture and control efficiency of 80%.

Annual Emission Reduction = Compost Emissions x 0.80
= 78.19 tons-POC/year x 0.80
= 62.55 tons-POC/year

Cost Effectiveness

Cost Effectiveness = Total Annual Cost ÷ Annual Emission Reductions

Cost Effectiveness = $7,437,232/year ÷ 62.55 tons-POC/year
= $118,901/ton-POC

The analysis demonstrates that the annualized purchase cost of the in-vessel compost system and annual costs alone results in a cost effectiveness which exceeds the District's Guideline of $17,500/ton-POC. Therefore this option is not cost-effective and will not be considered for this project.

The BAAQMD has published a proposed BACT Guideline for composting green and food waste. The Guideline lists a proposed BACT2 Achieved in Practice control technology of Covered Aerated Static Pile (CASP) with biofilter, and either positive or negative aeration achieving a POC emission limit of 1.6 lb/wet ton of feedstock. The applicant has proposed a CASP with biofilter achieving a POC emission limit of 1.00 lb/wet ton of feedstock. Therefore, the application meets the proposed BACT2 requirements.

South Coast Air Quality Management District Rule 1133.2 requires that new co-composting operations (composting with biosolids) be equipped with aeration systems and VOC controls, with new systems required to meet 80% VOC control and existing systems required to meet 70% VOC control. San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4566 requires use of compost covers on windrows or other control measures achieving at least 60% control of VOC for certain types of non-agricultural commercial compost operations, if the compost operation has a throughput of > 200,000 tons/year of throughput but < 750,000 tons/year. For compost operations with throughput rates > 750,000 tons/year, SJVAPCD Rule 4566 requires 80% VOC Control. For composting operations, the SJVAPCD Rule 4566 control rates are the most stringent achieved in practice or BACT2 level of control that the District has identified to date.

The applicant has proposed to use aerated static piles for the active compost phase and has requested to have the flexibility to try both CASP and negative ASP vented to a biofilter processes for this project. Reported emission factors for ASP composting operations are highly variable. Biofilters have been demonstrated to achieve at least 85% control of POC emissions. Considering these factors, the District has determined that an 80% overall capture and control efficiency for the active composting phase is achievable for either a compost covered positive ASP or a negative ASP vented to a biofilter and that no controls for the curing phase is a reasonable criteria. The District is proposing to limit the total emission rate for this controlled compost project to 1.00 pounds of POC per ton of feedstock, which is less than the proposed BACT2 limit.

The proposed project will have a lower throughput rate and a higher overall capture and control efficiency than would be required by the SJVAPCD Rule 4566 (60% control at 200,000 tons/year of throughput) for a compost operation. Therefore, the proposed controls for this compost project are at least as stringent as BACT2 controls for compost operations. Since more stringent emission control measures such as biofilter controlled in-vessel composting is not cost effective and the proposed project will have more stringent controls than BACT2, the District finds that the S-223 compost project - with the POC emission limits and control measures specified in the proposed permit conditions – satisfies BACT for POC control.

Stockpile POC BACT:
The stockpiles of green waste feedstock also trigger BACT for POC emissions, because emissions from this step will exceed 10 pounds of POC per highest day. A literature review found that the only type of control employed for feedstock piles is a limit on the duration of time that material resides in the stockpile before being incorporated into the active compost step. Under the SJVAPCD Rule 4566, stockpile storage time is limited to 10 days for operations processing less than 100,000 tons/year of material and to 3 days for operations processing 100,000 tons/year or more. Since the proposed project will process more than 100,000 tons/year, it must meet a 3-day (72 hour) stockpile storage limit as a BACT2 control measure. The facility has agreed to incorporate greenwaste and foodwaste stockpiles into the composting operation within 48-72 hours. Therefore, the feedstock stockpiles will satisfy BACT for POC control.

S-223 PM10 BACT:
BACT is also required for control of PM_{10} emissions from S-223. The facility is substantially reducing PM_{10} emissions (compared to windrow compost methods) by using aerated static piles. For fugitive road dust emissions, BACT is typically achieved by paving all main haul roads. In addition, the facility is proposing to use dust suppressants and water sprays to control vehicle traffic particulate emissions from unpaved roads, good housekeeping measures to control particulate emissions from paved roads, and water sprays on all material handling operations to control particulate emissions from these operations. These types of control measures constitute BACT for control of fugitive PM_{10} emissions due to onsite vehicle travel on paved and unpaved roads.

Regulation 2, Rule 2: Offsets
The cumulative emission increases for this site and this application are summarized below.

TABLE 6
Offsets Calculation (tons per year)

Pollutant	Current Balance tons/year	Application Increases tons/year	New Balance tons/year	Offset Ratio	Offsets Required tons/year
PM_{10}	17.674	20.80	38.474	NA	0
POC	37.851*	124.99	124.990	1.15	143.74
NO_X	- 0.002	0	0.000	NA	0
SO_2	66.596	0	66.596	NA	0
CO	196.922	0	196.922	NA	0

* Balance being supplied under other Application #28197.

NOx and POC

The offset requirements for precursor organic compounds (POC) and nitrogen oxides (NOx) are found in Regulation 2, Rule 2, Section 302. Under Section 2-2-302, POC and NOx emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more on a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC or NOx per year, the emission offsets may be provided by the District's Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC or NOx, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

Since POC emissions from this site are greater than 35 tons/year, offsets are required for the proposed application.

The applicant has indicated the required ERCs as outlined in the offset section will be purchased prior to issuance of the Authority to Construct permit. The ERC certificates will be surrendered and credits withdrawn prior to issuance of the Authority to Construct. Any remaining ERC amounts will be re-issued back to the applicant.

There are no increases in NOx emissions in this application. Therefore, NOx offsets are not required.

PM_{10} and SO_2

Emission offset requirements for PM_{10} and SO_2 are defined in Regulation 2, Rule 2, Section 303. PM_{10} and SO_2 offsets are required for emission increases in excess of 1.0 ton per year since April 5, 1991 at a major facility. A major facility of regulated air pollutants is defined as a facility that has the potential to emit 100 tons per year or more of a regulated air pollutant. Emission offsets for PM_{10} or SO_2 are only required for major sources of PM_{10} or SO_2. Fugitive PM10 emissions are not included in determining major source status for this facility because landfills and composting operations are not one of the 28 PSD source categories for which fugitive emissions must be included. Excluding fugitive emissions, this plant is not a major source for PM_{10} or SO_2 as shown in Table 7. Therefore, emission offsets for PM_{10} or SO_2 are not triggered.

TABLE 7
Facility Potential to Emit (tons per year)

Pollutant	Site Total	Fugitive Total	Total Minus Fugitive
PM_{10}	447.117	405.458	41.659
POC	279.267	112.856	166.411
NO_X	181.335	0	181.335
SO_2	92.084	0	92.084
CO	225.000	0	225.000*

* Subject to a site-wide cap of 225.000 tons/year.

Regulation 2, Rule 2: Prevention of Significant Deterioration (PSD)
Regulations 2-2-304 through 308 apply to PSD facilities. Sites belonging to one of the 28 PSD source categories listed in section 169(l) of the federal Clean Air Act have a PSD threshold of 100 tons/year for each regulated air pollutant and must include fugitive emissions when making a PSD major facility determination. However, sites that fall within unlisted categories (such as composting and landfill facilities) have a PSD major facility threshold of 250 tons/year for each regulated air pollutant and may exclude fugitive emissions when making this major facility determination. The maximum permitted/potential site-wide emissions will be less than 250 tons/year for each regulated air pollutant (POC, NOx, CO, PM_{10}, and SO_2). Therefore, this site is not a PSD major facility and is not subject to the PSD requirements in Sections 304-308.

Regulation 2, Rule 2: Maximum Available Control Technology (MACT)
The facility is not subject to Regulation 2-2-317 (Maximum Achievable Control Technology). Although site-wide HAP emissions will exceed 10 tons/year of methanol (which is a HAP), EPA has not identified composting operations as a source category that is or will be subject to MACT requirements. Case-by-case MACT is only required if EPA has identified a source category under Section 112(i) of the Clean Air Act but has not adopted a NESHAP standard for that source category yet. EPA has not identified composting operations as a NESHAP source category. Therefore, case-by-case MACT is not required.

Regulation 2, Rule 2: Major Modification of a Major Facility
Section 2-2-221 defines Major Modification as any modification, as defined in Regulation 2-1-234, at an existing major facility that the APCO determines will cause an increase of the facility's emissions by the following amounts or more:

POC: 40 tons per year
NOx: 40 tons per year
SO2: 40 tons per year
PM10: 15 tons per year
CO: 100 tons per year

This facility is a major source for CO and NOx since the facility-wide potential to emit is greater than 100 tons/year. The increase in POC emissions in this application is greater than 40 tons per year and the increase in PM10 emissions in this application are greater than 15 tons per year. Therefore, this application is a Major Modification of a Major Facility.

Regulation 2, Rule 2: Publication of Notice and Opportunity for Public Comment
Section 2-2-405 states if the application is for a new major facility or a major modification of an existing major facility, the APCO shall provide notice of the preliminary decision made under Section 2-2-404 by inviting written public comment. The APCO shall publish the notice prominently on the District's internet website and shall also publish the notice prominently in at least one newspaper of general circulation within the District. The APCO shall transmit a copy of the notice to ARB; EPA Region IX; adjacent air districts; the California State Lands Commission; any Indian Governing Body whose lands may be affected by the new or modified source(s) that is the subject of the notice; any person who requests such specific notification in writing; and, if the application is for a PSD Project located within 100 km of any Class I Area(s), the Federal Land Manager(s) with responsibility for any such Class I Area(s).

This application is a major modification of an existing major facility. The project will undergo a 30-day public comment period and will be published in the newspaper. The notice will be sent to ARB, EPA, adjacent air districts, and the Federal Land Manager of the Point Reyes National Seashore.

Regulation 2, Rule 5: Permits – New Source Review of Toxic Air Contaminants - Health Risk Assessment Requirements
The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants (TAC). All TAC emissions from new and modified sources are subject to risk assessment, if the emissions of any individual TAC exceed either the acute or chronic emission thresholds defined in Table 2-5-1. If a health risk screening analysis is triggered, related projects permitted within the previous two years must also be considered in the analysis.

<u>POC</u>
The TAC emissions from the composting and stockpiling operation is based upon the POC fraction identified in the article published by the University of California Davis entitled "Volatile Organic Compound Emissions From Green Waste Composting: Characterization and ozone formation" to determine the individual TAC emissions based on the calculated total POC emissions from the composting and stockpiling operation.

TABLE 8
Compost and Stockpile TAC Emission Summary

Compounds	% VOC	lb/hr	lb/yr	Acute lb/hr	Chronic lb/yr
IPA*	42.31	1.41E+01	1.06E+05	7.1E+00	2.7E+05
Methanol*	12.79	4.27E+00	3.20E+04	6.2E+01	1.5E+05
Naphthalene*	0.50	1.70E-01	1.25E+03	NA	3.2E+00
Propene	0.22	7.00E-02	5.50E+02		
Acetaldehyde*	0.14	5.00E-02	3.50E+02	1.0E+00	3.8E+01
Acetone	0.47	NA	NA	NA	NA
Ammonia	NA	1.15E+01	8.59E+04	7.1E+00	7.7E+03

* Toxic Air Contaminants (TAC) per the California Air Resources Board

TABLE 9
Source Risk for Total Project

Receptor	Cancer Risk	Hazard Index	
		Chronic	Acute
Resident	2.06	0.015	0.63
Worker	0.13	0.0013	0.56

TBACT is required as cancer risk is greater than 1 in a million for S-223. The risk driver for S-223 is naphthalene which is a POC. T-BACT is met by using the same controls as those required to meet BACT for POC (see BACT section for T-BACT analysis). Project health risks are less than the Regulation 2-5-302 limits of 10 in a million cancer risk, 1.0 chronic HI, and 1.0 acute HI. Therefore, this project will satisfy all toxic NSR requirements.

PM_{10}
The PM_{10} emissions from the composting operation are not expected to generate any significant toxic emissions. PM_{10} emissions from these sources are mainly dust from entrained soil or small amounts of wood, materials that are generally non-toxic. Additionally, the compounds listed in Table 2-1 of Regulation 2 Rule 5 are not expected to be in any of the materials being composted.

Major Facility Review, Regulation 2, Rule 6
40 CFR Part 70, State Operating Permit Programs (Title V)
This facility is subject to MFR Permit requirements pursuant to Regulation 2-6-301, because it has the potential to emit more than 100 tons per year of any regulated air pollutant.

The facility has been issued a Title V permit. The Title V federal permitting requirements of 40 CFR Part 70 have been codified and are enforced through District Regulation 2, Rule 6. This regulation applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and other designated facilities. Therefore, this facility is subject to Regulation 2, Rule 6.

Regulation 2, Rule 6: Major Facility (Hazardous Air Pollutants)
The facility is subject to Regulation 2-6-212.2 (Major Facility – Hazardous Air Pollutants) because site-wide HAP emissions will exceed 10 tons/year for any single HAP and 25 tons/year for all HAPs combined. The HAP with the largest potential emission rate is methanol which is greater than 10 tons/year. The District calculation of cumulative emissions of all HAPs exceeds the 25 tons per year threshold. Since HAPs will exceed 10 tons/year of any single HAP and 25 tons/year of all HAPs, this plant is a major facility per Section 2-6-212.2. This application will trigger a significant modification and will be processed under application #26438.

Regulation 6, Rule 1: Particulate Matter – General Requirements
The facility will be in compliance with Regulation 6-1-311 General Operations. The process rate of the composting operation for source S-223 will not exceed 18,900 kg/hr.

This equates to an emission rate not to exceed 14.66 kg/hour or 32.32 lbs/hr per the formula E in kg/hr = 0.02 P^0.67 in kg/hr. Facility will comply with Table 1 of Regulation 6-1-311 for other sources which include S-226 Portable Trommel Screening and S-227 Portable Grinding Operations along with source S-223 Stockpiles.

Where P is the processing rate and E is the emissions.

P = 41,666.67 lbs/hr or 18,900 kg/hr

E = 32.38 lbm/hr or 14.66 kg/hr
E = 0.026*P^0.67 = lbm/hr
E = 0.02* P^0.67 = kg/hr

Regulation 7, Rule 1: Odorous Substances
This composting operation is not subject to this regulation per exemption 7-110.5 Agricultural operations as described in the California Health and Safety Code Section 41705. Section 41705(2) excludes composting operations per the Public Resources Code, as compost is defined per section 40116 of the Public Resources Code: If facility accepts any other waste that is not defined per 40116, then the facility shall be subject to Regulation 7, Rule 1. Compost definition includes “vegetable, yard and wood waste which are not hazardous waste”.

Regulation 8, Rule 2: Miscellaneous Operations
Regulation 8-2-301 limits total carbon emissions to either 15 pounds/day or to an exhaust stack concentration of 300 ppmv. The composting operation source S-223 will exceed the 15 pound/day total carbon limit. The alternative limit is 300 ppmv of total carbon, but this requires a stack test method to verify compliance. The facility will submit a permit shield for source S-223 Composting Operation (CASP) Covered Aerated Static Pile to allow the use of an alternative monitoring method to demonstrate compliance with the 300 ppmv for total carbon limit. Instead the facility will comply with the 300 ppm total carbon on fugitive testing of the static piles and curing piles to demonstrate that no off gassing is occurring. The permit shield will be incorporated in the facilities existing Title V application.

Regulation 9, Rule 2: Inorganic Gaseous Pollutants – Hydrogen Sulfide
The ground level concentration limit on hydrogen sulfide (H_2S) in Section 9-2-301 is 0.06 ppm averaged over 3 minutes or 0.03 ppm averaged over 60 minutes. Hydrogen sulfide is generally identified by its characteristic rotten egg small and can be detected by its odor at concentrations as low as 0.0005 ppmv. Therefore, H_2S emissions are usually detected by smell well before the concentrations approach the limits in Section 9-2-301. Hydrogen sulfide complaints have not been an issue for this facility in the past; therefore, area monitoring to demonstrate compliance with this rule has not been required for this facility. Hydrogen sulfide emissions are not expected from the compost operation.

Permit Conditions

Permit Condition # 26484
Conditions for S-223

S-223 Commercial Green Waste and Food Waste Composting Operation, Covered Aerated Static Pile (CASP) Method, including Stockpiles, Active Composting Piles (CASP abated by A-223 Biofilter), and Curing Piles

1. The total amount of feedstock material delivered to the composting facility shall not exceed 156,000 tons during any consecutive rolling 12-month period. Feedstock material may include green waste (such as yard trimmings, untreated wood wastes, natural fiber products, and construction and demolition wood waste) and may include food waste (such as food scraps, food waste, and compostable food packaging or serving materials). The food waste shall not include any pomace or liquid wastes from commercial food or beverage processing operations other than incidental amounts from residential or commercial streams. The feedstock shall not include any biosolids, animal wastes, or poultry litter other than incidental amounts from residential or commercial streams. For the purpose of conducting testing to demonstrate compliance with emission limits in part 3, the owner/operator may construct a single composting pile containing commercial food waste, liquid wastes from commercial food or beverage processing operations, or biosolids. For the purposes of the feedstock throughput limit in this part, feedstock does not include any finished compost that is added to either aerated static piles or curing piles and that is acting as a biofilter for odor or organic emissions control. (Basis: BACT, Offsets, and Cumulative Increase)

2. Active composting at this facility shall be performed only by the covered aerated static pile (CASP) method using perforated pipes and a blower system to provide positive or negative aeration of the active composting piles. For negative aeration operations (drawing air through the pile), active piles shall be covered with at least a 6-inch layer of finished compost and shall include a condensate trap upstream and an active biofilter (A-223) downstream of the blower. For positive aeration operations, active piles shall be covered with at least a 6-inch layer of finished compost to act as a biofilter (A-223). The CASP composting operation and biofilters shall be designed and operated to maintain a target 80% reduction of precursor organic compounds (POC) during positive or negative aeration as compared to the active phase of uncontrolled windrow style composting. The CASP composting operation and biofilters shall be designed and operated to maintain a target of 53% reduction of ammonia (NH3) as compared to the active phase of uncontrolled windrow style composting. The owner/operator shall demonstrate compliance with these control efficiency targets by meeting all of the Part 3 emission limits. (Basis: BACT, Offsets, and Cumulative Increase and Regulation 2-5-302)

3. The owner/operator shall demonstrate that all of the following limits are satisfied:
a. Total Precursor Organic Compound (POC) emissions from S-223 (for active composting (CASP) plus curing piles and stockpiles) shall not exceed any of the

following: 1.60 pounds per wet ton of feedstock and 124.99 tons in any consecutive twelve-month period.
b. Total ammonia (NH3) emissions from S-223 (for active composting (CASP) plus curing piles and stockpiles) shall not exceed 85,897 pounds per year averaged over the testing period.
c. Total isopropanol emissions from S-223 (for active composting (CASP) plus curing piles and stockpiles) shall not exceed 105,763 pounds per year averaged over the testing period.
d. Total methanol emissions from S-223 (for active composting (CASP) plus curing piles and stockpiles) shall not exceed 31,971 pounds per year averaged over the testing period.
e. The use of any feedstock materials shall not increase toxic emissions above the permitted levels for S-223 or result in new toxic air contaminant emissions above any District risk screening trigger level.
f. Exceedances of any of the limits in Part 3b and 3c would not be considered a violation if the owner/operator submits a permit application to increase the limits and demonstrate that the emissions pass a health risk assessment.
(Basis: BACT, Offsets, Cumulative Increase; Regulation 2-5-302, and Regulation 2-6-423)

4. To demonstrate compliance with Regulation 8, Rule 2, Section 301, the owner/operator shall ensure that the concentration of total carbon does not exceed the limits identified below for the following locations.
a. If the active compost pile is equipped with negative aeration, the emissions from the A-223 Biofilter shall not exceed 300 ppmv of total carbon on a dry basis.
b. If the active compost pile is equipped with positive aeration and the A-223 Biofilter is a compost cover on top of the active aeration pile, the average emissions from any covered aerated static pile shall not exceed 300 ppmv of total carbon.
c. The average emissions from any stockpile or curing pile shall not exceed 300 ppmv of total carbon.
(Basis: Regulation 8-2-301)

5. The vehicle fleet used for delivery, pick-up, processing, composting, on-site transport, or other handling of feed stock, biofilter material, compost, and related materials or any related operations shall comply with the following limitations:
a. The mean vehicle fleet weight shall not exceed 19.88 tons.
b. The distance traveled by the vehicle fleet on paved roads shall not exceed 82,576 miles during any consecutive 12-month period.
c. The distance traveled by the vehicle fleet on unpaved roads shall not exceed 15,222 miles during any consecutive 12-month period.
(Basis: Cumulative Increase)

6. The material handling operations associated with S-223, such as loading, unloading, stockpiling, mixing, turning, and screening - shall be abated by water sprays (A-11), as necessary to comply with Part 8. Dry, dusty material shall be wetted down before unloading from truck beds, as necessary to comply with Part 7. (Basis: Regulations 1-301 and 6-1-305, BACT)

7. All roadways associated with this operation shall be maintained in a clean or wetted condition, as necessary to comply with Part 8. (Basis: Regulations 1-301 and 6-1-305, BACT)

8. Visible dust emissions from any operation of this composting facility shall not exceed Ringelmann 1.0 or result in fallout on adjacent property in such quantities as to cause a public nuisance per Regulation 1-301. To ensure compliance with this part, the Permit Holder shall visually observe all material handling operations and roadways associated with these sources and shall immediately initiate corrective actions, if any visible dust emissions are detected that persist for longer than 3 minutes in an hour. (Basis: Regulations 1-301, 6-1-301 and 6-1-305)

9. The owner/operator shall use Best Management Practices (BMP) for aerated static pile composting operations to ensure that the CASP composting systems are operating as designed and to prevent negative impacts on air quality. Examples of BMP include, but are not limited to, Parts 10-15 and the following practices:
a. rapid incorporation of feedstocks into active compost piles; and/or
b. proper application and use of biofilters and cover materials; and/or
c. minimal disturbance of active composting piles; and/or
d. weekly monitoring of temperature, moisture content, and oxygen levels within the active and curing piles and weekly temperature monitoring of stockpiles; and/or
e. on-going monitoring and maintenance of piping, blowers, traps, biofilters, and cover materials; and/or
f. implementation of good housekeeping practices.
(Basis: BACT)

10. During normal operations, green waste shall be processed or removed within 72 hours of receipt and food waste shall be processed or removed within 48 hours of receipt (except during equipment breakdown or when food waste is delivered on-site on Friday or the day before a holiday; in which instances, the material will be processed on the next working day), so that these feedstocks do not decompose in the storage piles and generate odors on-site. Any stockpile that is deemed to be odorous by a District inspector shall be removed within 24 hours. (Basis: BACT, Regulation 1-301, Regulation 7-1)

11. Once an aerated static pile has been established, the active composting piles shall only be disturbed when necessary: (a) to ensure that the active compost process is achieving the desired temperature, moisture, and oxygen levels, (b) to prevent or control odorous, POC, or TAC emissions, or (c) to transfer material to a curing pile. (Basis: BACT)

12. The owner/operator shall ensure that the S-223 Composting Operations and Stockpiles are maintained within the temperature, moisture, and oxygen levels dictated by BMP for CASP method composting and curing operations and for green waste stockpiles. (Basis: BACT)

13. The owner/operator shall ensure that the A-223 Biofilter is maintained within the temperature, moisture, and oxygen levels dictated by BMP for compost operation biofilters. The owner/operator shall also ensure that A-223 is free of cracks, channeling, rodent burrows, and excessive weeds. (Basis: BACT)

14. The owner/operator shall handle and dispose of liquids that have come in contact with S-223 or A-223 in a manner that ensures that these liquids do not become a source of odors. (Basis: BACT)

15. The owner/operator shall sweep or clear debris and waste materials from the feedstock stockpile areas, active composting areas, biofilter areas, and curing pile areas as needed to ensure that these materials do not become a source of odors or excessive dust. (Basis: BACT)

16. If these sources receive two or more Violation Notices from the District for "Public Nuisance" in any consecutive 12-month period, the Permit Holder for these sources shall implement any control measures necessary to address the issue and prevent future recurrences of public nuisances. The Permit Holder shall consult with the District regarding appropriate control measures and shall receive District approval regarding necessary control measures and implementation time. Control measures may include one or more of the measures suggested below or other measures agreed upon by the Permit Holder and the District. If requested by the District, the Permit Holder shall submit to the District an application to modify the Permit to Operate and/or these permit conditions within 30 days of notification. (Basis: Regulations 1-301 and 2-1-403)
a. Reduce the total feedstock throughput rate allowed by Part 1.
b. Reduce the food waste.
c. Reduce the green waste and food waste stockpile times allowed by Part 10.
d. Apply odor inhibitor solutions to odorous operations.
e. Install an odor abatement system to prevent odors from traveling off-site.
f. Enclose odor nuisance operations in a building that is kept under negative pressure with emissions vented to a biofilter.
g. Use chemical suppressants to control fugitive dust emissions from roadways associated with the dust nuisance operation.
h. Pave roadways associated with the dust nuisance operation.
i. Enclose dust nuisance operations in a warehouse-like building.
j. Improve operating and monitoring procedures to conform with current best management practices for organic waste handling and compost operations.

17. In order to demonstrate compliance with Part 1, the owner/operator shall keep a dated record of the amount of feedstock received for composting at S-223. The owner/operator shall calculate and record the total amount of compost feedstock throughput on a monthly basis and the total amount of compost feedstock throughput for each consecutive rolling 12-month period. All records shall be kept in a District approved logbook, and records shall be made available for inspection by District staff upon request. (Basis: BACT, Offsets, and Cumulative Increase)

18. In order to demonstrate compliance with Parts 2-3, the owner/operator shall conduct an initial compliance demonstration test on the active composting operation, curing piles, and stockpiles for S-223. The initial compliance demonstration test shall be initiated within 180 days of start-up of the CASP process at S-223 and shall be conducted over the full composting cycle for a typical compost feedstock mix. Prior to initial operation of the CASP process at S-223, the owner/operator shall submit a source test protocol to the District's Engineering Division and to the Source Test Section that describes how, where, and when the testing will be conducted and that identifies all test methods that will be used for this test. The source test protocol shall include analyses for toxic air contaminants (TAC) of gases collected from the active compost piles after control by the biofilter and from the curing piles and stockpiles. The owner/operator shall use the data determined by this test to calculate the total POC, ammonia (NH3), and isopropanol emission rates from the compost operation, curing piles, and stockpiles in units of pounds per wet ton of feedstock. The owner/operator shall obtain District approval for the source test protocol and all analysis and reporting procedures prior to initiating any testing. (Basis: BACT, Offsets, and Cumulative Increase)

19. In order to demonstrate compliance with Part 4, the owner/operator shall conduct an initial compliance demonstration test on S-223. The initial compliance demonstration test shall be initiated within 180 days of start-up of the CASP process at S-223 and shall be conducted periodically over the full composting cycle for a typical compost feedstock mix. Prior to initial operation of the CASP process at S-223, the owner/operator shall submit a source test protocol to the District's Engineering Division and to the Source Test Section that describes how, where, and when the testing will be conducted and that identifies all test methods that will be used for this test. For negatively aerated static piles vented to a biofilter, testing shall be conducted in accordance with Section 8-2-601. For positively aerated static piles equipped with a biofilter cover and for curing piles and stockpiles, the source test protocol shall include use of a portable hydrocarbon analyzer with test locations and compost cycle dates identified in the source test protocol, or an alternative procedure proposed by the owner/operator and approved by the District. The owner/operator shall obtain District approval for the source test protocol and all analysis and reporting procedures prior to initiating any testing. Based on the results of this initial test, the District will establish an on-going monitoring schedule to verify compliance with the limit in Part 4. (Basis: Regulation 8-2-301)

20. In order to demonstrate compliance with Part 5, the owner/operator shall identify all vehicles that will make up the vehicle fleet associated with S-223 and shall calculate the mean vehicle fleet weight based on vehicle weight and load weight data. The owner/operator shall maintain maps of all vehicle fleet travel routes on paved and unpaved roads. The owner/operator shall maintain records of the type and number of vehicles delivering feed stock and picking up compost product and shall maintain records of on-site vehicle fleet trips. The owner/operator shall use this data and the map information to calculate and record the vehicle miles traveled (VMT) on both paved and unpaved roads by the vehicle fleet. The VMT data shall be summed for each consecutive rolling 12-month period. (Basis: Cumulative Increase)

21. In order to demonstrate compliance with Parts 6-8, the owner/operator shall maintain a dust mitigation plan that identifies all watering and dust suppressant application locations and schedules and any other dust mitigation measures that will be employed on a routine basis. The owner/operator shall implement this dust mitigation plan during all hours of operation and shall identify and record any instances when the plan was not followed or when additional measures were necessary to control dust. (BACT and Regulations 1-301 and 6-1-305)

22. In order to demonstrate compliance with Part 9-15, the owner/operator shall maintain the following records:
a. Maintain a list of all Best Management Practices that will be employed at this source and identify the desired ranges for temperature, moisture, and oxygen for the active aerated compost piles, curing piles, stockpiles, and biofilters.
b. Maintain records of feed stock receipt dates and compost pile initiation dates. Identify and record any instances when the stockpile storage times in Part 10 were exceeded.
c. Identify and record any instances when an aerated static pile is disturbed for reasons other than those allowed by Part 11.
d. Maintain weekly records of compost pile, curing pile, stockpile, and biofilter monitoring events and data (temperature, moisture, and oxygen levels). Identify and record any instances when the active compost piles, curing piles, stockpiles, or biofilters were outside of the desired BMP range. Identify and records the action taken to rectify this situation.
e. Maintain records of all maintenance activities conducted on S-223, A-223, or any of the associate piping or control systems.
All records shall be kept on site and shall be made available for inspection by District staff upon request. Records shall be retained for at least five years from the date of entry. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations. (Basis: BACT)

Permit Condition # 26485
Conditions for S-226 and S-227

S-226 Portable Trommel Screen Operations (156,000 tons/year throughput)
S-227 Portable Grinder Operations (156,000 tons/year throughput)

1. Total throughput of feed stock being processed at sources S-226 Trommel Screen or S-227 Portable Grinder shall not exceed 156,000 tons during any consecutive 12-month period per source. (Basis: Cumulative Increase, Regulation 6-1-301, 6-1-310, 6-1-311)

2. The material handling operations such as loading, unloading, stockpiling, mixing (grinding operation), turning, and screening - shall be abated by water sprays (A-11), as necessary to comply with Part 5. Dry, dusty material shall be wetted down before unloading from truck beds, as necessary to comply with Part 5. (Basis: Cumulative Increase, Regulations 1-301 and 6-1-305)

3. All roadways associated with this facility shall be maintained in a clean or wetted condition, as necessary to comply with Part 5. (Basis: Regulations 1-301 and 6-1-305)

4. Visible dust emissions from any operation of these sources shall not exceed Ringelmann 1.0 or result in fallout on adjacent property in such quantities as to cause a public nuisance per Regulation 1-301. To ensure compliance with this part, the Permit Holder shall visually observe all material handling operations and roadways associated with these sources and shall immediately initiate corrective actions, if any visible dust emissions are detected that persist for longer than 3 minutes in an hour. (Basis: Regulations 1-301, 6-1-301 and 6-1-305)

5. If these sources receive more than 2 violation notices for "public nuisance" from the District in any consecutive 12-month period, the owner/operator of the facility shall implement any control measures that the District, after discussion with the operator, deems necessary and appropriate within the time period specified by the District. If requested by the District, the Permit Holder shall submit to the District an application to modify the permit to operate and/or these permit conditions within 30 days, of notification. (Basis: Regulations 1-301)

6. The owner/operator shall maintain records, summarized on a monthly and annual basis, of waste throughput. These records shall be kept in a District-approved log, shall be retained on-site for a minimum of five years from the date of entry, and shall be made available to District representatives upon request. (Basis: Cumulative increase, Regulation 2 Rule 6)

Recommendations
The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source is a major modification to an existing major source (as defined in District Regulation 2-2-221 for being a major source and having an increase in PM10 and POC emissions greater than the major modification thresholds) which triggers the public notification requirements of District Regulation 2-2-405. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following sources:

S-223 Commercial Green Waste and Food Waste Composting Operation, Covered Aerated Static Pile (CASP) Method, abated by Biofilter (A-223) with Composting Stockpiles
S-226 Portable Trommel Screen (156,000 tons/year throughput)
S-227 Portable Grinder Operations (156,000 tons/year throughput)
A-223 Biofilter
A-11 Water Sprays

_____ _____
Stanley Tom, P.E. Date
Air Quality Engineer