

This document contains excerpts of the subject report.
The full report is available upon request.

Odor Impact Minimization Plan

Western Placer Waste Management Authority Compost Facility

June 2008

Prepared for:

WESTERN PLACER WASTE MANAGEMENT AUTHORITY

Prepared by:

INTEGRATED WASTE MANAGEMENT CONSULTING, LLC
19375 Lake City Road, Nevada City, CA 95959

This document contains excerpts of the subject report.
The full report is available upon request.

Contents

Section	Page
I INTRODUCTION.....	I
Background.....	I
2 ODOR IMPACT MINIMIZATION PLAN.....	2
Odor Monitoring Protocol	2
Meteorological Conditions	4
Complaint Response Protocol	6
Design Considerations for Minimizing Odors	7
Operating Procedures for Minimizing Odors.....	9
Contingency Plans.....	11
Plan Revision	12

Table

I Sources of Odor and Possible Management Techniques	T-1
--	-----

Figure

I Relationship of Receptors and Competing Odor Sources.....	follows Table I
---	-----------------

Appendices

A CIWMB Regulations regarding OIMP	A-1
B Compost Odor Wheel	B-1
C Odor Complaint Log	C-1
D Historic Wind Information	D-1
E Commercially Available Odor Neutralizers.....	E-1

This document contains excerpts of the subject report.
The full report is available upon request.

ODOR IMPACT MINIMIZATION PLAN
Compost Facility

I.0 INTRODUCTION

California Integrated Waste Management Board (CIWMB) regulations, Title 14, CCR Section 17863.4 require that all compostable material handling operations and facilities prepare and maintain a site-specific Odor Impact Minimization Plan (OIMP). The following OIMP has been developed to meet regulatory requirements and to serve as a documentation of site-specific operating procedures designed to minimize the potential for nuisance-level off-site odors.

I.1 BACKGROUND INFORMATION

Project Name: Western Placer Waste Management Authority
Green Material Compost Facility

Project Location: 3033 Fiddymment Road
Roseville, CA 95747

Mailing Address: 3033 Fiddymment Road
Roseville, CA 95747

Landowner: Western Placer Waste Management Authority
3033 Fiddymment Road
Roseville, CA 95747

**Project
Contacts:** Eric Oddo, Senior Civil Engineer
Western Placer Waste Management Authority
11476 C Avenue
Auburn, CA 95603
916-543-3984

**Regulatory
Contacts:** Deborah Kirschman, R.E.H.S
Placer County
Department of Health & Human Services
Environmental Health Division
3091 County Center Drive, Suite 180
Auburn, CA 95603
530-745-2300

This document contains excerpts of the subject report.
The full report is available upon request.

2.0 ODOR IMPACT MINIMIZATION PLAN

The following provides specific information on compliance with §17863.4 (b) – (d). The text from Title 14 is presented in *italics* followed by the Facility's proposed method of compliance.

(b) Odor impact minimization plans shall provide guidance to on-site personnel by describing, at a minimum, the following items. If the operator will not be implementing any of these procedures, the plan shall explain why it is not necessary.

2.1 ODOR MONITORING PROTOCOL

(1) an odor monitoring protocol which describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors; and

The closest receptors are WPWMA staff and the operators that work at the compost facility, the buy back facility, MRF, scalehouse, and the landfill. On-site staff is the best source of real-time information regarding odors.

Directly one mile south and southeast of the WRSL property boundary is a residential development referred to as the Crocker Ranch (the composting facility is approximately 3/4 mi. further north). This development includes residential housing and schools. These are the primary off-site receptors.

Other potential receptor locations that are not in the primary path of air movement but are also of concern since the wind direction sometimes moves towards these locations in relation to WPWMA are established residential neighborhoods approximately 2 miles north of WPWMA and a casino approximately 1.5 miles to the northeast of WPWMA. All of the land to the west within a close proximity of WPWMA is designated as agriculture/pasture and no residential, commercial, or industrial developments exist, though some are being contemplated for the future.

It is important to note that there are a number of potentially competing odor sources within a reasonable vicinity of the composting facility as well. Approximately 2.5 miles to the southeast of the composting site is a composting and soil blending facility (Mallard Creek). The Rio Bravo wood-burning power plant is located approximately 2 miles to the east. Both of these sources stockpile significant amounts of organic materials. These receptor locations are directly in the primary path of the air movement in relation to compost facility. To the North of the composting facility are a chicken farm and a dairy which are other competing odor sources. The

This document contains excerpts of the subject report.

The full report is available upon request.

aforementioned casino, in addition to being a potential receptor is also a potential odor source as the facility operates its own on-site wastewater treatment plant.

Approximately 1.5 miles to the east and southeast of WPWMA are various industrial plants, including a propane dealer. Although these locations are not in the primary path of the air movement in relation to WPWMA, they are of interest since wind blows this direction a small percentage of the time.

Please see Figure I to see the relationship of the facility to nearby receptors and competing odor sources.

As discussed above, there are a number of potentially competing odor sources on the WPWMA site and in the vicinity. These include:

On-Site

Western Regional Sanitary Landfill

C&D sort line

Material Recovery Facility

LFG to Energy plant (Energy 2001)

Composting Facility

Off-Site

Rio Bravo wood waste to energy power plant facility

- 1.5 miles southeast of the WPWMA
- 0.35 miles northeast of Crocker Ranch;

Mallard Creek composting facility

- 1.75 miles southeast of the WPWMA
- 0.70 miles east of Crocker Ranch;

Placer Propane – propane dealer

- 1.75 miles southeast of the WPWMA
- 1.0 mile east of Crocker Ranch;

Invirotec –accepts and processes septage

- 1.5 miles northeast of the WPWMA
- 2.0 miles north-northeast of Crocker Ranch;

Thunder Valley Casino WWTP

- 1.5 miles to the northeast of the WPWMA
- 2.0 miles to the north, northeast of Crocker Ranch

Chicken farm

- 0.75 miles northwest of the northwestern corner of the WPWMA
- 2.4 miles north-northwest of Crocker Ranch;

This document contains excerpts of the subject report.
The full report is available upon request.

Dairy farm

- 2.75 miles west-northwest of the northwestern corner of the WPWMA
- 3.6 miles northwest of Crocker Ranch.

Each day the operator will evaluate on-site odors and evaluate planned operations to minimize the potential release of objectionable odors. These include good composting practice as described in the Report of Composting Site Information (RCSI) (appropriate C:N ratio, sufficient moisture content, adequate porosity, etc.) to minimize production and persistence of odors; and good housekeeping measures (like clearing spilled materials between piles, eliminating areas where water could pond, and maintaining reasonably sized stockpiles of feedstock and finished compost). Additional site-specific odor-minimization practices are detailed in Table I.

If the operator detects an objectionable on-site odor, they will follow the following protocol:

1. Investigate and determine the likely source of the odor.
2. Determine if on-site management practices could remedy the problem and immediately take steps to remedy the situation. Potential odor sources and likely management actions are shown in Table I.
3. Determine whether or not the odor is traveling beyond the site by patrolling the site perimeter and noting existing wind conditions.
4. Enter observations in the Odor Log.

In addition, to the observations made by the compost facility operator, WPWMA staff monitors odors from the compost facility. The frequency of WPWMA observations varies, but include monitoring of the facility and off-site potential odor sources and the nearest receptors, based on wind and weather conditions. Any observations are included in the Odor Tracking log.

2.2 DESCRIPTION OF METEOROLOGICAL CONDITIONS

(2) a description of meteorological conditions effecting migration of odors and/or transport of odor causing material off-site. Seasonal variations affect wind velocity and direction shall also be described; and

The geographic proximity of the compost facility is classified as an Intermediate/Semi-Mediterranean climate. It is Mediterranean in the sense that there is a dry season and a wet

This document contains excerpts of the subject report.

The full report is available upon request.

season. The length of the “wet” and “dry” seasons can be highly variable. Typically rain can fall from October to May, and is far less likely in June through September. Average yearly rainfall for the nearby town of Lincoln is 24.62 inches.

Summers are much like coastal Southern California, only slightly warmer, when "Delta" maritime breezes are present - ocean breezes flow from the southwest to the northeast, traveling up the Sacramento River delta. Because of the river delta and the absence of coastal mountains blocking ocean maritime breezes, cooling takes place during the normally hot summer months in the Sacramento Valley and Sierra Nevada Foothills. When Delta breezes aren't blowing, and the winds come overland from the north, generally hot conditions prevail.

Winters are more characteristic of Oregon and Washington, with rain and fog. The difference is slightly warmer temperatures, due to more southerly latitude. Winter storms can come from three different sources. The first and the most common of storms, is the North Pacific Storm. This type of storm brings rain and fog to the coast, and then they track right through the Sacramento River Delta and on up into the foothills. The second type of winter storm comes from the Gulf of Alaska. These are much colder storms than the first type. The third type of winter storm comes from Canada and is rare. These are very cold. When storms manage to make it across Idaho, Montana and Nevada and the barrier mountains to the east, snow can fall as low as the Sacramento Valley floor.

Historical wind directional data has been compiled for the surrounding area near the WPWMA. Wind roses for the project area showing the wind speed and direction for each month with direction estimated as emanating from a particular direction are contained in Appendix D. The general direction of the wind during the winter months is to the south-southeast (from the north-northwest) and to the south-southwest (from the north-northeast) in the summer months.

With ambient air as the pathway, three different mechanisms may be causing odor complaints within the surrounding residential areas: inversion, diffusion, and advection.

Inversions are stable atmospheric conditions resulting in limited vertical air movement. Certain atmospheric conditions can cause a temperature inversion to occur, trapping odors near the ground. A temperature inversion is a situation where a warmer body of air is located above a colder air mass, inhibiting the vertical movement of gases. One situation in which a low level, or surface inversion, might take place is on a clear night, when the earth's surface radiates heat away rapidly. If the air is clear, the ground and the air directly above it can be cooler than the air at higher altitudes. In many cases, temperature inversions are most

This document contains excerpts of the subject report.

The full report is available upon request.

prevalent from the evening to the early morning. This is a likely explanation as to why odor complaints are typically more prevalent at these times.

Diffusion is the process whereby compounds move from a region of higher concentration to one of a lower concentration. Diffusion would cause odors to be detected even upwind of the Compost Facility. When odor complaint data shows odor complaints while the wind is coming from varying directions, this could be an indication of diffusion causing dispersion of odors.

The third pathway is advection. Odors can be carried large distances by the wind. Based upon the review of meteorological data in the vicinity of Compost Facility, the wind generally blows from the facility toward the residences, indicating that advection may be causing the dispersion of odors and impacts to residents.

The facility has an on-site weather monitoring station to monitor wind speed and direction, temperature, and other meteorological functions. The on-site weather system is consulted prior to scheduling major material handling activities. Daily records are logged to generate site-specific historical weather pattern information.

2.3 COMPLAINT RESPONSE PROTOCOL

(3) a complaint response protocol; and

Facility management will use the following protocol in responding to citizen complaints.

Response to Citizen Complaints

It is expected that the majority of complaints will be received, not by the operator (Nortech) or the LEA, but by the owner (WPWMA). Historically most of the odor complaints are received by WPWMA staff.

Upon receipt of a complaint regarding odors, WPWMA staff will:

1. Record the complainant's description of the odor and contact information in the Odor Complaint Log, which is available to the LEA, upon request.
2. Check and record weather conditions (especially wind direction) at the time of the complaint.
3. Visit the location of the complaint (when possible) and attempt to characterize the odor.

This document contains excerpts of the subject report.

The full report is available upon request.

4. If the complainant location is downwind of the WPWMA facility, staff will contact the compost facility operator to verify the operating conditions and activities at the time of the complaint.
5. Staff will document all of the information gathered and potential source (s) of the odor in the Odor Complaint log.
6. Respond to the complainant within 24 hours of receiving the complaint, or within 48 hours should the complaint be received after operating hours or during weekends or holidays.

Upon receipt of a complaint or notification of a complaint by the WPWMA staff, the compost facility operator will:

1. Promptly provide information needed to assess the nature and source of the odor.
2. Consider implementing one or more of the management practices (if deemed feasible, given the time of year, particular source of the odor, etc.) listed in Table I.
3. Monitor and adjust management practices and report results to WPWMA staff.
4. The Operator will document all odor-related actions and results in the Odor Complaint Log (See Appendix C).

2.4 DESIGN CONSIDERATIONS FOR MINIMIZING ODORS

(4) a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including method and degree of aeration, moisture content of materials, feedstock characteristics, airborne emission production, process water distribution, pad and site drainage and permeability, equipment reliability, personnel training, weather event impacts, utility service interruptions, and site specific concerns; and

Method and Degree of Aeration

The facility uses a turned windrow method of composting using a specialized windrow turner. Aeration is largely a function of the particle size of the feedstock, the moisture content and the height of the pile; collectively this is often referred to as “porosity”.

Moisture Content of Materials

Most of the material received consists of mainly woody material (shrubs, trees, bushes, etc.) with a small percentage of materials that have high moisture content, like grass clippings. It has

This document contains excerpts of the subject report.

The full report is available upon request.

historically been necessary to add significant amounts of water to maintain the minimum amount of moisture for effective composting.

Feedstock Characteristics

The feedstock consists of green material, yard trimmings, and wood waste, as they are defined in 14 CCR §17852. Typical green material is relatively brushy with seasonal amounts of leaves and grass. Water will be added to achieve the desired moisture content.

Airborne Emission Production

The main sources of dust and potentially odor-carrying particles at the facility are from material handling, grinding, windrow turning, screening, and traffic. All access roads to the site are paved and are properly maintained to minimize dust. Proper moisture management during the compost process and in the compost products while onsite also will help to prevent dust generation. Because of these measures, the storage and transfer of feedstock does not increase ambient levels of dust around the site. To the extent possible dust generating-activities will be scheduled based on current wind conditions.

Process Water Distribution

Process water is moved around the site using water trucks. In addition the windrow turner is equipped with a mechanism to add water directly to the windrows as the piles are turned.

Pad and Site Drainage and Permeability

The MRF drainage system (including the compost site) consists of ditches, berms, culverts, a stormwater detention basin and a compost retention basin. With the exception of the compost retention basin, the drainage system is designed to accommodate 10-year, 12-hour storm per the requirements of the Placer County Stormwater Management Manual. The compost retention basin design is based on a 100-year, 24-hour storm event, with no discharge. All non-contact water from the MRF is directed to the stormwater detention basin for eventual discharge off-site. All contact water/leachate from the green and wood waste receiving, processing and storage area is directed to the compost retention basin.

The entire compost site is paved and is bisected by a drainage channel which drains the grinding pad and the compost pad into the leachate pond.

Equipment Reliability

All equipment shall be maintained per manufacturer recommendations. The compost facility has an on-site back up windrow turner. The facility has additional front-end loaders and manpower that could be directed to the composting operation in the event of a failure.

This document contains excerpts of the subject report.
The full report is available upon request.

Personnel Training

Personnel assigned to the compost facility have been trained in subjects applicable to the compost site operation and maintenance, load checking procedures, and heavy equipment operations. Monthly safety meetings occur on various topics to ensure proper and safe procedures are followed. All heavy equipment operators must go through a training period before they are able to run each different piece of machinery (loaders, roll-off, water truck, etc.). The training records and safety meeting attendance are kept on file.

Weather Event Impacts

Inversions are probably the most likely weather event to impact the facility (see discussion under meteorological conditions). Occasional severe rains would limit production at the compost site, but rarely last long enough to severely interrupt operations. The facility can be impacted by peak loads that can arrive after wet periods in the winter. As described in Table I, the facility has developed contingency measures for these conditions.

The facility is equipped with a recording weather station and also has a prominently displayed windsock to direct on-site operations.

Utility Service Interruptions

Most mobile equipment is powered by diesel engines, with the exception of the horizontal grinder, which is electric. During an extensive outage a contract grinder could be brought in, though this would be an unlikely occurrence. Incoming green material could also be run across the adjacent C&D processing line, which also has an electric grinder.

Water Source

Potable water is available via on-site wells.

2.5 OPERATING PROCEDURES TO MINIMIZE ODOR

(5) a description of operating procedures for minimizing odor, including aeration, moisture management, feedstock quality, drainage controls, pad maintenance, wastewater pond controls, storage practices (e.g., storage time and pile geometry), contingency plans (i.e., equipment, water, power, and personnel) weather impacts, biofiltration, and tarping.

The Facility manages all odor-producing areas of the facility so as to minimize the development of conditions that could lead to odor problems. A key management tool in this effort will be the use of a recording weather station and the windsock. Other possible management tools are summarized in Table I.

Areas with the potential for odor generation include:

This document contains excerpts of the subject report.
The full report is available upon request.

Feedstock Receiving Area. Incoming feedstocks can generate odors if they are stored for excessive periods of time. Feedstocks left unprocessed or un-mixed at the site can also generate significant odors, particularly during the rainy season. In order to minimize these potential odors, the Facility will process material regularly and within regulatory limits. Odors from incoming materials can also be generated upstream of the facility, depending on collection practices.

Aisles between Processing Areas. Aisles between processing areas and windrows can be sources of odor if raw, uncomposted, or improperly mixed material is left for excessive amounts of time without being exposed to the high temperatures of composting. The facility practices good housekeeping methods which include regular patrolling of all aisles to clean any spilled materials. Additionally, all surfaces from the receiving area through the composting pads have been designed and graded so that contact water moves efficiently into the leachate pond, which will minimize any potential ponding in raw feedstock areas.

Composting Piles. Odors emanating from windrows typically indicate problems in the initial mixing, turning frequency, pile porosity, and/or moisture content of the pile. The operator strives to manage its windrows with appropriate carbon to nitrogen ratio, assure adequate initial mixing, and maintaining adequate moisture within the piles. Piles are turned every 2 to 3 days. Any odors detected from the windrows will be corrected using the techniques described in Table I.

Curing Piles. Curing piles have the potential to create odors if material that is not stable is moved to curing too soon. In order to minimize curing odors, the operator will ensure that material is adequately composted prior to moving it into the curing pile.

Storm Water Retention Basin/Compost Leachate Pond. The compost leachate pond could cause odors if it were overloaded with sediment or nutrients. The pond is aerated allowing some volatile particles to be released in a controlled manner.

Aeration

The facility does not use forced aeration but relies on the particle size of the feedstock to allow for natural aeration. The spaces between the particles is referred to as porosity. A rough measure of porosity can be obtained by measuring bulk density. Piles are turned regularly which may help to reestablish porosity. The literature reports ideal bulk density of between 700 and 1100 pounds per cubic yard.

This document contains excerpts of the subject report.
The full report is available upon request.

Moisture Management

The majority of the feedstocks processed at the facility are relatively low moisture content feedstocks. The site is adequately graded and paved to minimize ponding of water that could lead to odors.

Feedstock Quality

The WPWMA Compost Facility only accepts clean, source separated green material. As these collection programs are relatively mature, contamination is relatively low. However, in some cases the frequency of collection can have an impact on odor generation. The operator will work with the green material haulers to identify loads which may have been left sitting for substantial time periods prior to collection and delivery to the facility. When possible these loads should be expedited to assure that they are processed in a timely manner and that the processed material is rapidly incorporated into a windrow.

Drainage Controls

As discussed above, the facility separates stormwater from “contact” water. Any water that contacts incoming wood or green waste or compost is directed to the central channel drain which bisects the entire compost pad and ultimately leads to the compost leachate pond. The drain could become a source of odors from entrapped sediment if it were not cleaned out regularly.

Pad Maintenance

The pad is maintained regularly on an as needed basis.

Wastewater Pond Controls

Regular maintenance of the stormwater pond and the leachate pond should minimize potential odors from these features. The leachate pond is more likely to be a source of odors. The leachate pond is aerated regularly to provide oxygen to the pond.

Storage Practices

The facility has limited storage space and has developed contingency plans for those periods where existing storage is inadequate. These primarily include the identification of off-site locations that could receive processed, but not composted green material (see below).

2.6 CONTINGENCY PLANS

The following provides information on contingency planning for facility equipment, water, power, personnel, weather impacts, and storage.

This document contains excerpts of the subject report.
The full report is available upon request.

Equipment. All equipment is maintained per the manufacturer recommendations. The facility has a fulltime mechanic who does scheduled maintenance and repairs on the composting equipment. In the event of equipment breakdown, composting services can be contracted out or equipment could be rented to continue operations. The compost facility does have an on-site back up turner and additional front-end loaders are also on-site as part of other operations.

Water. If needed, water could be brought in by tanker truck, but this is an unlikely situation. In the short term the facility could re-use water stockpiled in either of the retention basins during periods when the regular water supply was interrupted.

Power. Most mobile equipment, except for the horizontal grinder is powered by diesel engines. During the unlikely event of a prolonged power outage a contract grinder could be contracted to provide grinding services.

Personnel. Additional trained personnel could be made available from other Nortech operations.

Weather impacts. The only severe weather event impacts are heavy rainfall or high wind conditions that could temporarily impede processing activities.

Biofiltration. The facility has no provisions for biofilters. However the facility is experimenting with the use of a “pseudo-biofilter” or “compost blanket” to reduce odors in the initial windrows. This may include adding compost “overs” into the initial compost mix to increase porosity or may include using finished compost as a windrow blanket during the first few weeks.

Tarping. WPWMA does not anticipate the use of tarps as part of its regular operations.

Storage. Given the current throughput, the facility is limited by the amount of available pad space. Under peak loading conditions, it may be desirable to re-direct processed green material to an off-site location rather than try to force a large throughput through the system. The operator has identified the potential for off-site receiving locations, such as direct land application of green material.

2.7 PLAN REVISION

(c) The odor impact minimization plan shall be revised to reflect any changes, and a copy shall be provided to the enforcement agency, within 30 days of those changes.