Overview of New Composting Rules
A Joint Presentation
CA State Water Resources Control Board and CalRecycle

April 14, 2016

PRESENTED BY:
LESLIE GRAVES – STATE WATER BOARD
ROBERT HOLMES – CALRECYCLE
OVERVIEW

- CA State Water Board General Waste Discharge Requirements for Composting Operations
  - Requirements
  - Implementation
- CalRecycle’s New Regulations on Composting and Anaerobic Digestion
  - Requirements
  - Implementation
    - Comparison of regulatory requirements
- Land Application of Compostable Materials
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

LESLIE GRAVES, P.G, C.HG
LAND DISPOSAL PROGRAM MANAGER
Why Do Composting Operations Require Regulations for Water Quality?

• Leachate from composting operations has the potential to impact water quality:
  o nitrates
  o salts
  o pathogens
  o metals

Inspection photo
A person is required to submit a Report of Waste Discharge to the appropriate Regional Water Board (§13260), if discharging waste or proposing to discharge waste that could affect waters of the state.
Why a General Order?

- Protect water quality
  - Individual Waste Discharge Requirements (WDRs)
    - Lengthy, complex process
    - Staff resources
  - General Order
    - Consistent with Water Code
      - Similar wastes
      - Similar operations
      - Streamline permitting process
      - Statewide consistency
    - Support State’s diversion goal
Who would the General Order apply to?

- Existing operations covered by an individual WDR or waiver
  - Remain in effect until renewed
- Existing composting operations
- New composting operations
## State Water Board Regulatory Tiers – Compost Materials

<table>
<thead>
<tr>
<th>Exempt</th>
<th>General Order Tier I</th>
<th>General Order Tier II</th>
<th>Individual WDRs or Waivers</th>
</tr>
</thead>
</table>
| • < 500 yd³ allowable mat.  
• < 5,000 yd³ (conditional) | • < 25,000 cubic yards | • ≥ 25,000 cubic yards | • No volume restriction |
| • Agricultural Composting  
• On site  
• Chipping and Grinding  
• Lot clearing by local governmental agencies  
• Fully enclosed vessel | • Agricultural materials  
• (does not include manure)  
• Green materials  
• Paper materials  
• Vegetative food materials  
• Anaerobic digestate  
• derived from Tier I feedstocks  
• Residentially co-collected or self-hauled food and green materials | • Non-vegetative food materials  
• Biosolids  
• (Class A, B, and/or EQ)  
• Manure  
• Anaerobic digestate  
• derived from Tier II feedstocks  
• A combination of allowable Tier I and Tier II feedstocks | • Non-hazardous materials  
• MSW  
• Other materials  
• *May include materials not allowed under G.O.* |
| | • 10% additives | • 30% additives | • Additive/Amendment blends/materials not allowed under G.O. |
# State Water Board Regulatory Tiers – Design Specifications

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>Tier I</th>
<th>Tier II (Tier I requirements, plus:)</th>
</tr>
</thead>
</table>
| **WORKING SURFACES** | • Design for 25-year, 24-hour storm event  
• Withstand equipment activities  
• Facilitate drainage | • Hydraulic conductivity $1 \times 10^{-5}$ cm/sec  
• Monitoring program in lieu of hydraulic conductivity |
| **DRAINAGE CONVEYANCE SYSTEMS AND BERMS** | • Design for 25-year, 24-hour storm  
• Protect from erosion  
• Maintain free of debris | • Hydraulic conductivity $1 \times 10^{-5}$ cm/sec  
• Monitoring program in lieu of hydraulic conductivity |
| **DETENTION PONDS** | • Not required  
• Must comply with the 25-year 24-hour storm event | • Hydraulic conductivity $1 \times 10^{-6}$ cm/sec  
• Design for 24-year, 24-hour storm  
• Pan lysimeter  
• Tanks in lieu of pond |
| **MONITORING** | • Facility Inspections  
• Wastewater management system  
• Annual survey of structures  
• Major storm events | • Detention Pond  
• Biosolids  
• Groundwater Protection Monitoring  
• If used in lieu of a Tier II working surface |
Exemptions

- Agricultural Composting
- Chipping and grinding facilities, including operations at composting facilities
- Lot clearing by local governmental agencies
- Fully enclosed vessel
- Small operations
  - Less than 500 cubic yards at any given time of allowable materials
  - Less than 5,000 cubic yards per year of allowable Tier I or Tier II feedstocks, additives, and amendments
    - Must completely cover during rainy weather
    - Manage application water to reduce wastewater
Tiers and Siting Criteria

- Tier I - smaller facilities
  - < 25,000 cubic yards
    - Limited feedstock choices
- Tier II - larger facilities
  - ≥ 25,000 cubic yards
    - Additional feedstock choices
    - Additional design requirements
- 100’ from water supply wells/surface water
- Depth to groundwater requirements
# Feedstocks

## Tier I
- Agricultural materials
- Green materials
- Paper Materials
- Vegetative food materials
- Residential co-collected food and green materials (<10%)
- Anaerobic digestate
  - derived from allowable Tier I feedstocks

## Tier II
- Food materials (non-vegetative)
- Biosolids (Class A, B, and/or EQ)
- Manure
- Anaerobic digestate
  - derived from allowable Tier II feedstocks
- A combination of allowable Tier I and Tier II feedstocks
Working Surfaces (Pad)

- **Hydraulic conductivity**
  - $1 \times 10^{-5}$ cm/s or less,
- **Consist of one of the following:**
  - Minimum one foot compacted soil
  - Asphaltic concrete or Portland cement concrete;
  - An equivalent engineered alternative approved by the Regional Water Board.
- **Option:** *Groundwater Protection Monitoring Program*
Detention Ponds or Tanks (Tier II Only)

- **Ponds**
  - **Liner system:**
    - Hydraulic conductivity
      - $1 \times 10^{-6}$ cm/s
    - Geomembrane/Compacted Clay
    - Geosynthetic clay/prepared base
    - Portland cement concrete/Geomembrane
    - Equivalent engineered alternative

- **Tanks**
Other State Requirements for Compost Facilities

- Pond Design 25-year, 24-hr storm
- Pond Hydraulic Conductivity ≤ 1 x 10^{-6}
- Lined Ponds or Tanks
- Pad - Asphalt or Concrete required
- Pad/Drainage Hydraulic Conductivity ≤ 1 x 10^{-5}
- Depth to Water (5 feet or greater)
- Outside 100-year Floodplain
- Setback from Wells (100 to 2500 feet)
- Surface Water Setback (50 to 1000 feet)
Implementation Plan

- General Order Adopted: **August 4, 2015**
- Existing Operations
  - **Submit by Notice Of Intent Deadline:** **August 4, 2016**
    - Notice Of Intent
    - Technical Report
    - Filing Fee - [http://www.waterboards.ca.gov/resources/fees/](http://www.waterboards.ca.gov/resources/fees/)
  - **Within 6 Years of date of Notice Of Intent**
    - Operations required to implement specifications of the General Order.
- New Operations
  - **90 days prior to composting operations**
    - Work with your Regional Water Board
State Water Board’s Compost Webpage

- [http://www.waterboards.ca.gov/water_issues/programs/compost/#currentdocs](http://www.waterboards.ca.gov/water_issues/programs/compost/#currentdocs)
  - General Order (with Requirements)
  - Matrix (Requirements Summary)
  - Resolution
  - Environmental Impact Report
  - Response to Comments
Resolution 2015-0054

- If composting operations do not pose a threat to water quality.
  - as determined by the Regional Board;
    - Not required to obtain coverage
- Convene interagency work groups with CalRecycle.
  - to review the state of regulatory oversight of land application of uncomposted green waste in California;
- Continue to engage in California Healthy Soils Initiative.
  - with CDFA, CalRecycle and other associated agencies;
- Develop performance measures with compost industry and regulatory agencies.
- Report on the status of enrollment and compliance with the General Order.
CALRECYCLE

ROBERT HOLMES

MANAGER, TRAINING & ASSISTANCE SECTION
Topics

- Physical Contamination
- Odors
- Compost Tier Chart
- In-Vessel Digestion
- Permit Toolbox Resources
Physical Contamination
Physical Contamination
Physical Contamination
Physical Contamination

• Compost Operations & Facilities
  - 0.5% by weight
  - Film plastic - no more than 20% of 0.5% (0.1%)
  - Regulation becomes effective on January 1, 2018
Physical Contamination

• **Chipping and Grinding Operations & Facilities**
  
  o Must sample material to determine % of physical contaminants
  
  o Must keep records of physical contaminants results
  
  o Regulation becomes effective on **January 1, 2018**
Physical Contamination

- Measuring Physical Contaminants

  - CalRecycle will develop field methodology to determine % of physical contaminants in compost & chipped and ground material

  - Operators will use field methodology to determine % of physical contaminants (compost & chipped and ground material)

  - Enforcement Agency can require operator to send sample to laboratory to determine % of physical contaminants (compost only)
Odors
BEFORE

OIMP

OPERATING STANDARD
Minimizing odors?
AFTER

OIMP/OMP

OPERATING STANDARD
Minimizing odors?
AFTER

OIMP/OMP

NUISANCE?

OPERATING STANDARD Minimizing odors?
AFTER

OIMP/OMP

Investigation

NUISANCE?

OPERATING STANDARD
Minimizing odors?
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OIMP/OMP

Operating Standard
Minimizing odors?

Investigation

ODOR BMP Feasibility Report

Nuisance?
AFTER

OIMP/OMP

ODOR BMP FEASIBILITY REPORT

Investigation

Data

NUISANCE?

OPERATING STANDARD Minimizing odors?
## Compostable Materials Tier Chart

<table>
<thead>
<tr>
<th>Excluded Tier</th>
<th>Enforcement Agency Notification Tier</th>
<th>Registration Permit Tier</th>
<th>Full Solid Waste Facility Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small-scale Composting</strong> (≤ 100 yd³ and 750 ft²)</td>
<td><strong>Agricultural Material Composting Operations</strong> <em>(all)</em> §17856</td>
<td><strong>Green Material Composting Operations</strong> <em>(≤ 12,500 yd³)</em> §17857.1(a)</td>
<td><strong>Composting Facilities</strong> <em>(all)</em> <em>(e.g. biosolids, digestate, food material, mixed materials)</em> §17854</td>
</tr>
<tr>
<td><strong>(Refer to §17855 for complete list of exclusions)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biosolids Composting Operations at POTWs</strong> <em>(all)</em> §17859.1</td>
<td></td>
<td><strong>Vegetative Food Material Composting Facilities</strong> <em>(≤ 12,500 yd³)</em> §17857.2</td>
<td><strong>Vegetative Food Material Composting Facilities</strong> <em>(&gt; 12,500 yd³)</em> §17857.2</td>
</tr>
<tr>
<td><strong>Research Composting Operations</strong> §17862</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Chipping and Grinding Operations</strong> <em>(≤ 200 tpd)</em> §17862.1(a)</td>
<td><strong>Chipping and Grinding Facilities</strong> <em>(&gt; 200 tpd and ≤ 500 tpd)</em> §17862.1(b)</td>
<td><strong>Chipping and Grinding Facilities</strong> <em>(&gt; 500 tpd)</em> §17862.1</td>
<td></td>
</tr>
</tbody>
</table>
Small-scale Exclusion - Before

- Three different exclusions:
  - Green material (500 cubic yards or less)
  - Non-commercial (less than 1 cubic yard of food material)
  - Within-vessel (less than 50 cubic yards of capacity)

- Restriction on source of generation

- Restriction on amount sold or given away annually

- Restriction on amount of food material
• Small-scale Exclusion - After
  o Composting green material, agricultural material, food material, and vegetative food material, alone or in combination

  o Less than 100 cubic yards and less than 750 square feet on-site at any one time
Vegetative Food Material

- Plant-based food material with no added salts, preservatives, fats, oils, or adulterants and contains ≤ 1% physical contaminants
Vegetative Food Material Composting
- Registration Tier – up to 12,500 cubic yards of material on-site
- Full Tier – more than 12,500 cubic yards of material on-site

Material counted includes feedstock, chipped and ground material, amendments, additives, active compost, and stabilized compost
In-Vessel Digestion
In-Vessel Digestion

- Previously regulated under the Compostable Materials Handling or Transfer/Processing regulations, depending on nature of feedstock & how it is handled
In-Vessel Digestion

- Standards adapted from both Transfer/Processing & Compostable Material Handling
- Handling of feedstock and residual waste materials subject to transfer/processing-like requirements
- End products (digestate, compost) subject to compostable material handling-like requirements
### In-Vessel Digestion Tier Chart

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<tr>
<td>Anaerobically digestible materials at POTWs</td>
<td>Research In-Vessel Digestion Operations</td>
<td>Medium Volume In-Vessel Digestion Facilities [average between 15 tpd, not to exceed 700 tpw]</td>
<td>Large Volume In-Vessel Digestion Facilities [average &gt; 100 tpd, average &gt; 700 tpw]</td>
</tr>
<tr>
<td>Ag material derived from ag site &amp; returned to same site</td>
<td>Dairy In-Vessel Digestion Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-vessel digestion at a dairy</td>
<td>Distribution Center In-Vessel Digestion Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-vessel digestion activities with less than 100 cubic yard on-site capacity</td>
<td>Limited Volume In-Vessel Digestion Operations [average &lt; 15 tpd, not to exceed 105 tpw]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling activities already subject to more stringent handling requirements under Federal or State law</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In-Vessel Digestion

- Anaerobically digestible materials at POTWs
  - Co-digestion of waste water and vehicle-transported anaerobically digestible material
  - Anaerobically digestible material includes inedible kitchen grease, food and vegetative food material
  - Material must be **pumped or off-loaded** directly into a covered, leak-proof container and then pumped, or diluted or slurried and then pumped
  - The POTW must implement Standard Operating Procedures
In-Vessel Digestion

• In-Vessel digestion at a dairy
  o Co-digestion of agricultural material or vegetative food material with manure at a dairy
  o Material must be **pumped or off-loaded** directly into a covered, leak-proof container and then pumped, or diluted or slurried and then pumped
In-Vessel Digestion

- Small-scale Digestion
  - The in-vessel digestion of less than 100 yd$^3$ of solid waste feedstock and digestate on site
In-Vessel Digestion

- Research In-Vessel Digestion Operations
  - Initial 2 year research period
  - Additional 2 year extension if further research is needed
**In-Vessel Digestion**

- **Dairy In-Vessel Digestion**
  - Dairy importing solid waste feedstock
  - Material must be **pumped or off-loaded** directly into a covered, leak-proof container and then pumped, or diluted or slurried and then pumped
In-Vessel Digestion

- Distribution Center In-Vessel Digestion
  - Unsold products from retail (grocery) stores to which the products were originally sent
  - Products must be collected and processed in covered, leak-proof containers, and remain in the custody of the owner at all times
  - Putrescible products must be refrigerated at the retail store and maintain a core temperature of 55 degrees Fahrenheit during transport to the operation
In-Vessel Digestion

- Limited Volume In-Vessel Digestion Operations
  - Less than 15 tons/day
  - Or, 105 tons/week
Medium Volume In-Vessel Digestion Operations

- Between 15 tons/day and 100 tons/day
- Or, 700 tons/week
In-Vessel Digestion

- Large Volume In-Vessel Digestion Operations
  - Greater than 100 tons/day
  - Or, greater than 700 tons/week
In-Vessel Digestion

- **Digestate Handling**
  - Digestate removed from a digester must within 24 hours be:
    1. Stored or processed in a sealed container or sealed structure,
    2. Incorporated in an on-site aerobic compost process, or
    3. Removed from the site and:
       - transported to another solid waste facility or operation
       - used in a manner approved by local, state, and federal agencies, or
       - properly disposed
Please visit the Regulations Implementation Guidance webpage.
http://www.calrecycle.ca.gov/LEA/Regs/Implement/default.htm

For questions related to site-specific issues, contact CalRecycle Permitting and Assistance Branch point of contact.
http://www.calrecycle.ca.gov/LEA/CountyAssign.asp

For general questions relating to the regulations contact:
Martin Perez
Martin.Perez@calrecycle.ca.gov
Implementation Plan

- Regulations Operative: **January 1, 2016**
  (physical contaminants = January 1, 2018)
- Training
  - **Round 1:** completed
  - **Round 2:** summer 2016 as determined
- Guidance
  - **Permit Toolbox:** Type “**Permit Toolbox**” and click on the “**Permit Toolbox homepage.**” Click on the “**What’s New**” link.
<table>
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<th>Feedstock</th>
<th>General Order</th>
<th>CalRecycle Regulations</th>
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<tr>
<td>Ag materials</td>
<td>Tier I (&lt;25,000 yd³)</td>
<td>EA Notification</td>
</tr>
<tr>
<td>Ag materials with manure</td>
<td>Tier II</td>
<td>EA Notification</td>
</tr>
</tbody>
</table>
| Green Materials               | Tier I (<25,000 yd³)  | EA Notification (≤12,500 yd³)  
                                  |                       | Full SWFP (>12,500 yd³) |
| Vegetative food materials     | Tier I (<25,000 yd³)  | Registration (≤12,500 yd³) 
                                  |                       | Full SWFP (>12,500 yd³) |
| Food materials                | Tier II               | Full SWFP              |
| Biosolids                     | Tier II               | Full SWFP              |
| Mixed materials               | Individual WDR        | Full SWFP              |
LAND APPLICATION
The Water Code requires anyone who discharges waste or proposes to discharge waste that could affect the waters of the state to file a “report of waste discharge.”

- Waste Discharge Requirements, (WDRS), conditional waivers, or other orders (e.g., General Orders)
- Enforcement
  - Discharge subject to administrative liabilities
- Discharge & Cleanup Abatement Orders (CAO)
  - violations subject to: $10,000 a day & $10 per “gallon” of waste.
Mixed compostable materials remain (years) after material settles
Potential Impacts to Surface Water & Groundwater
Interagency Work Group and Goals

- Review regulatory oversight of land application
- Launch education and outreach program
  - Informational presentations
  - Publications, brochures
  - Website
- Take enforcement action
  - As needed to address potential threats
- Report to State Water Board
  - Status updates
  - Progress Reports
Land Application

Disposal of compostable materials does not include Land Application
Land Application

- Land application means the final deposition of compostable material and/or digestate spread on land. The material must meet limits on:
  - **Effective January 1, 2016:**
    - Maximum metal concentrations and pathogen density
    - Application frequency and depth
  - **Effective January 1, 2018:**
    - Physical contaminants
Maximum metal concentrations
- Same as existing compost requirements: Arsenic, Cadmium, Chromium*, Lead, Mercury, Nickel, Selenium*, and Zinc

Pathogen Density Limits
- Same as existing compost testing requirements: fecal coliform and Salmonella sp.
- Does not require time/temperature requirements (e.g., 131°F for 15 days)
## Frequency and Depth limits

<table>
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<tr>
<th>ZONING</th>
<th>FREQUENCY</th>
<th>DEPTH</th>
<th>ALTERNATIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land <strong>NOT</strong> zoned only for agricultural uses</td>
<td>( \leq 1 ) per 12-month period</td>
<td>( \leq 12 ) inches accumulated on surface</td>
<td>X</td>
</tr>
<tr>
<td>Land zoned only for agricultural uses</td>
<td>( \leq 3 ) per 12-month period</td>
<td>( \leq 12 ) inches accumulated on surface</td>
<td>X, X</td>
</tr>
</tbody>
</table>

* CalRecycle coordinates EA requests for consultation

* RWQCB: Regional Water Quality Control Board
  * CDFA*: California Department of Food and Agriculture

**With EA Approval in Consultation With**
Land Application

Verification of compliance with the requirements must be provided to the EA upon request.
Contacts

- **LEA/CalRecycle**
  - Local Enforcement Agencies:
  - CalRecycle - Permitting and LEA Support, Single Point of Contact:
    [http://www.calrecycle.ca.gov/LEA/CountyAssign.asp](http://www.calrecycle.ca.gov/LEA/CountyAssign.asp)

- **Water Boards**
  - Locate your Regional Water Board Contacts:
  - Regional Water Board Office Locations:
    [www.waterboards.ca.gov/about_us/contact_us/rwqcbs_directory.shtml](http://www.waterboards.ca.gov/about_us/contact_us/rwqcbs_directory.shtml)
  - Regional Water Board Enforcement Coordinators:
Questions?