

Organic Waste Composting Project Protocol Public Workshop

May 27, 2010
Los Angeles, CA



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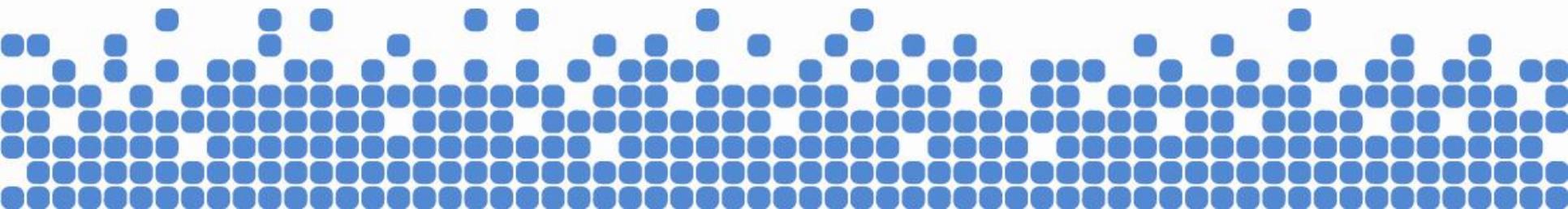
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Call-In Information

Call-in number: 1-712-432-3100

Code: 961845

- All call-in participants will be muted to prevent noise
- We will un-mute all participants during designated Q&A sessions throughout the workshop
- Please self-mute your phone during Q&A sessions if not talking by pressing 4* to mute and un-mute





Agenda

- Climate Action Reserve background
- Protocol development process
- Introduction to the Organic Waste Composting (OWC) Protocol
- Next steps
- Q&A

What is the Climate Action Reserve?



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- Non-profit GHG offsets registry
- Develop high-quality projects standards and register/track offset credits in public online system
- Ensure environmental integrity and quality of offset credits
- Intended to be the premier place to register carbon offset projects for North America
- Reserve stats:
 - 327 account holders
 - 46 projects registered with ~ 5 million CRTs issued
 - 305 additional projects seeking registration
 - Projects in 45 states and Mexico



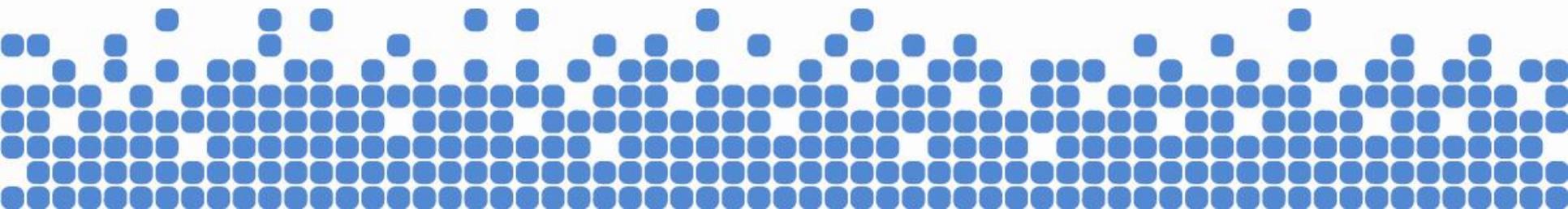
Protocol Development Goals

- Develop a standardized approach for quantifying, monitoring and verifying GHG reductions from organic waste composting
 - The protocol will only provide credit for the avoidance of methane
- Maintain consistency with or improve upon existing methodologies
 - Building off the Reserve's Organic Waste Digestion (OWD) protocol
- Ensure accuracy and practicality of projects



Reserve Program Principles

Real	Reductions have actually occurred, and are quantified using complete, accurate, transparent, and conservative methodologies
Additional	Reductions result from activities that would not happen in the absence of a GHG market
Permanent	Reductions verified ex-post, risk of reversals mitigated
Verified	Emission reports must be free of material misstatements, confirmed by an accredited verification body
Owned unambiguously	Ownership of GHG reductions must be clear
Not harmful	Negative externalities must be avoided
Practicality	Project implementation barriers should be minimized





The Standardized Approach

Benefits to a top-down approach:

- Low up-front costs to project developers
- Efficient review and approval of projects
- Transparency and consistency
- Same approach applies across projects
- Prescriptive guidance to eliminate judgment calls

*But...*high initial resource investment to program



Protocol Development Process

- Composting Issues Paper prepared by SAIC
- Internal protocol scoping
- Form multi-stakeholder workgroup
- Draft protocol
- Send draft through workgroup process
 - Workgroup provides technical expertise and practitioner experience
 - Periodic meetings and individual consultation when needed
- Draft protocol released for public review
- Public comments incorporated
- Protocol submitted to Reserve board for adoption

Protocol Timeline



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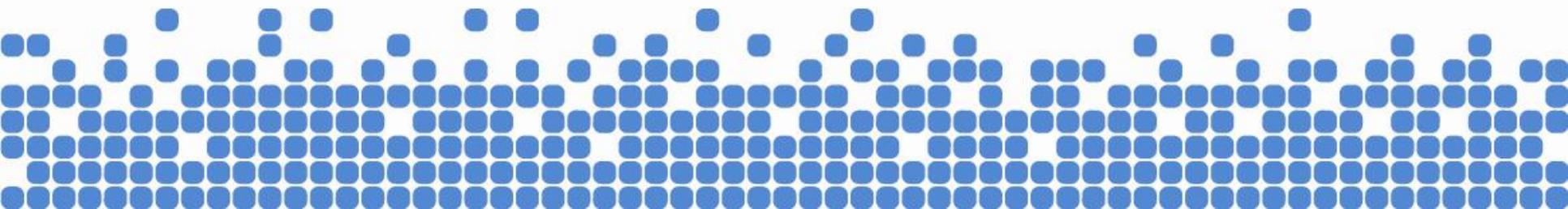
Public Kick-Off Meeting	December 09, 2009
WG Meeting 1	February 2
Draft protocol to workgroup	February 22
WG Meeting 2	March 4
WG comment period	February 22 - March 19
WG Meeting 3 (conference call)	April 8
Public comment period	May 10 - June 7
WG Meeting 4 (conference call)	May 20
Public workshop	May 27
Protocol adoption by Reserve Board	June 30

Workgroup Participants



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- Alameda County Waste Management Authority
- Association of Compost Producers
- California Composting Coalition
- California Department of Resource Recycling and Recovery
- California Organic Recycling Council
- California Resource Recovery Association
- Californians Against Waste
- Cedar Grove Composting
- Center for a Competitive Waste Industry
- Community Recycling
- Environmental Credit Corporation
- Integrated Waste Management Consulting
- Mundus Aer, LLC.
- New England Organics
- North Carolina State University
- Ohio Environmental Protection Agency
- Recology, Inc.
- SCS Engineers.
- Solid Waste Association of North America
- U.S. Environmental Protection Agency
- University of Washington
- Waste Management, Inc.





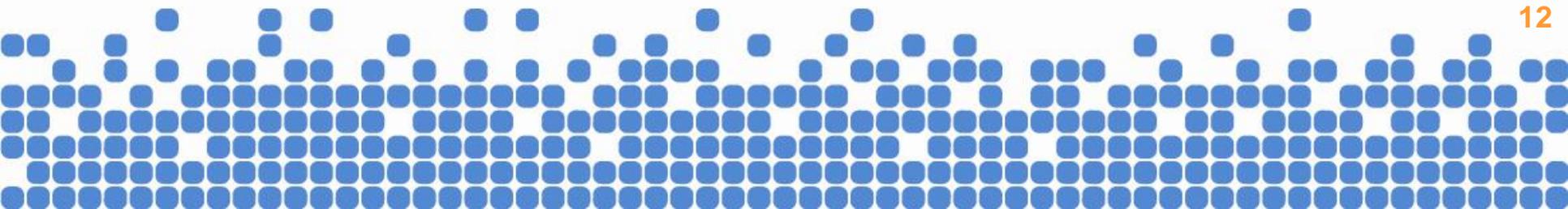
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Introduction to Protocol



Project Protocol Components

Define the GHG reduction project	Section 2
Determine eligibility	Section 3
Establish the GHG assessment boundary	Section 4
Calculate GHG reductions <ul style="list-style-type: none">• Baseline emissions• Project emissions	Section 5
Monitoring requirements	Section 6
Reporting requirements	Section 7
Verification guidance	Section 8





Composting Technologies

- In this protocol, two major categories:
 - Forced Aeration: Aerated Static Pile (ASP) and/or enclosed, in-vessel, or in-building composting systems that force air into piles using blower systems (positive or negative)
 - Turned Windrows: non-forced aeration by turning the active compost piles frequently



Project Definition

“The diversion of one or more eligible waste streams to an aerobic composting facility where the waste is composted in a system that complies with Best Management Practices (BMPs) that ensure the composting process is operated under optimal conditions.”

An *eligible* waste stream is one that:

- Consists of food waste and non-recyclable food soiled paper waste as defined in the Performance Standard
- Continually passes the Legal Requirement Test criteria

Project Definition – Required BMPs:



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Time, Temperature, and Turning Frequency:

- **Forced Aeration Systems:**
 - Temperature of the compost is maintained at 55°C or higher for 3 full days,
- **Turned Windrow Systems:**
 - Temperature of the compost is maintained at 55°C or higher for 15 full days or longer, during which time the windrow is turned a minimum of five times.
 - Less frequent turning allowed if project can demonstrate that turning frequency conforms to state agency issued regulations or BMPs.



Project Definition –Required BMPs:

Waste Handling:

- All in-coming waste streams containing food waste must be mixed and/or incorporated into composting system within 48 hours of delivery to facility
 - Note: WG noted that the language in the draft needs to be revised to account for instances when mixing isn't possible within 48 hours (holiday weekends, etc.)

Reserve Eligibility Criteria



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I:	Location	→	U.S. and its territories
II:	Project Start Date	→	Project must submit no more than 6 months after project becomes operational
III:	Additionality	→	Meet performance standard
		→	Exceed Legal Requirements
IV:	Regulatory Compliance	→	Compliance with all applicable laws



Project Crediting Period

- Crediting period is 10 years
- Maximum of two crediting periods per project
- Crediting will end for any waste streams that become legally mandated to be diverted from landfill, although project may continue receiving credit for other eligible waste streams composted at the facility



Start Date

- Reserve Start Date Policy:
 - Projects with start dates before June 30, 2008 are not eligible
 - Projects with start dates between June 30, 2008 and June 30, 2010 must be submitted to Reserve by June 30, 2011
 - After June 30, 2011 – all projects must submit to Reserve within 6 months of project start date
- Project start date:
 - Projects choose start date anytime after BMPs are implemented and eligible waste is composted at the project facility.
 - Note: Grocery store waste streams composted at facility prior to start date are ineligible



Performance Standard Test

- Projects pass the Performance Standard Test (PST) by meeting a performance threshold, i.e. a standard of performance applicable to all composting projects.
 - Based on assessment of the common practice waste management of potential compost feedstocks.
 - The PS for this protocol defines feedstocks that the Reserve has determined are likely to be deposited in landfills under common practice or “business-as-usual” management practices.
 - Only projects that divert and compost eligible feedstocks are deemed to exceed common practice and are therefore eligible for registration under this protocol.

Performance Standard – Eligible Waste



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- **MSW Food Waste:**
 - Non-industrial solid food waste commonly disposed of in a MSW system, consisting of uneaten food, food scraps, spoiled food and food preparation wastes from homes, restaurants, kitchens, grocery stores, campuses, cafeterias, or similar institutions
- **Food Soiled Paper Waste:**
 - Non-recyclable paper items that are co-mingled with food waste, consisting of paper napkins and tissues, paper plates, paper cups, fast food wrappers, used pizza boxes, and other similar paper items typically disposed of in an MSW system

PS Issue – Pre-Existing Food Waste Composting



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- Approx. 2.5% of the MSW food waste generated in the U.S. is composted annually as common practice
 - Composting this food waste is not additional (it was already composted without GHG credit incentives)
- Protocol needs a mechanism to prevent crediting of the waste streams that have historically been composted



Pre-Existing Food Waste Composting

- Options considered:
 - Project required to demonstrate for each eligible waste stream that it would have gone to a landfill
 - Apply a standard regional baseline to all composting projects
 - Credit only for amount of composting above and beyond historic level for a specific facility



Pre-Existing Food Waste Composting

Solution:

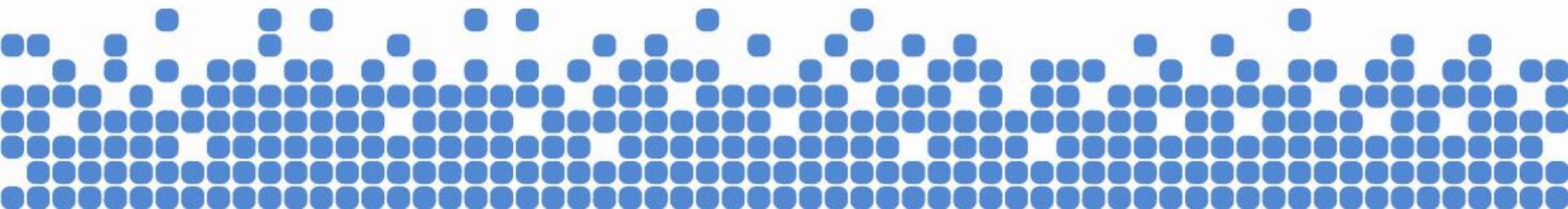
- Strong evidence that majority of composted food waste (i.e. much of the 2.5%) is a result of grocery store diversion programs
- Thus, grocery store waste streams:
 - composted prior to project start date are ineligible, and
 - all new grocery store waste streams must document that previous management was landfill for at least 36 months prior to date first delivered to facility



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Pre-Existing Food Waste Composting

- Note: Based on WG feedback, Reserve is considering revising language to allow grocery store waste streams that were previously composted and deemed eligible at an existing CAR registered composting project





Legal Requirement Test (LRT)

- LRT ensures that the GHG reductions achieved by a project would not otherwise have occurred due to federal, state, or local regulations, or other legally binding mandates.
- The LRT is applied to each eligible waste stream composted by the project.
 - If an eligible waste stream later becomes subject to a legal mandate, the waste stream will remain eligible up until the date that the legal mandate takes effect.
- Project developers required to submit signed Attestation for each reporting period during verification



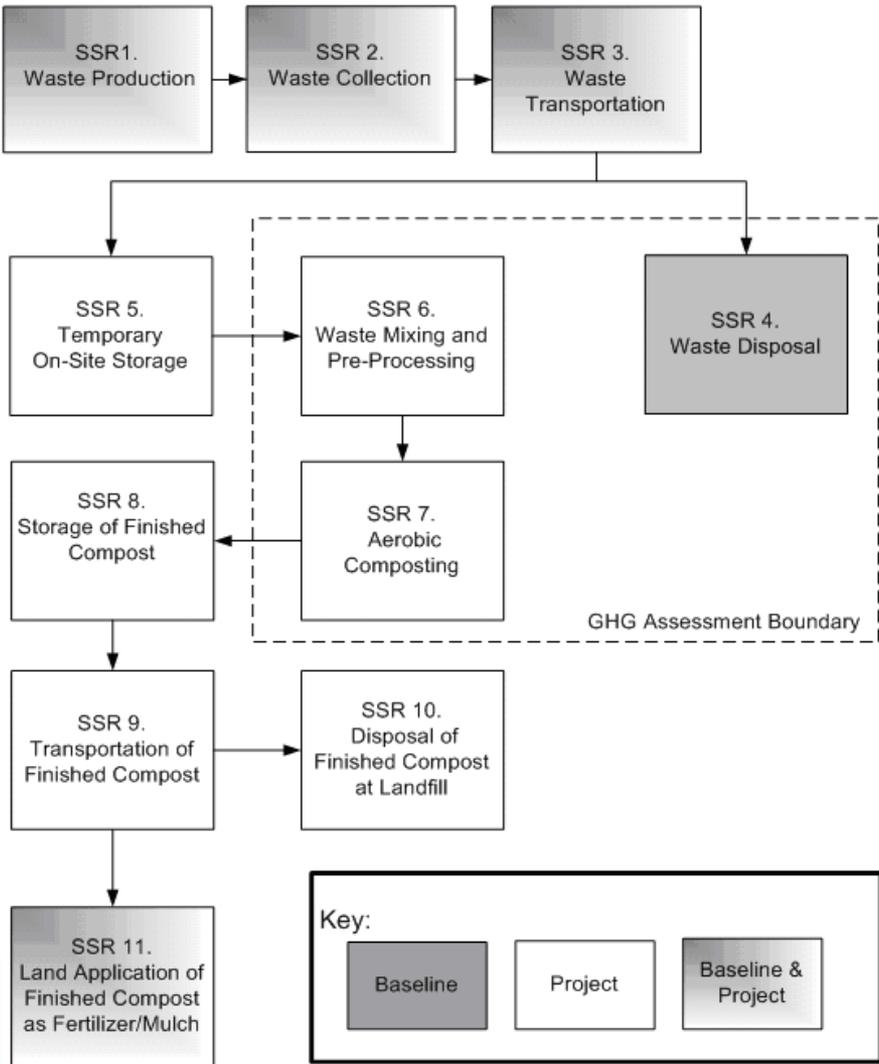
LRT Issue - Local Food Waste Diversion Mandates

- A legitimate exception to the LRT may arise if a food waste mandate is enacted *as a component of* an otherwise additional carbon offset project. (i.e. some projects may be financially viable only in the presence of a carbon offset market, but depend on a local mandate in order to obtain necessary feedstocks.)
- OWD Protocol includes such an exception
 - OWD: If project has a start date either no more than 6 months prior to or is implemented no more than 6 months following the passage of a local food waste mandate, then the food waste stream would be considered eligible at that project.
- OWC Draft Protocol does not include this Policy – Please provide feedback in comments on this issue

GHG Assessment Boundary



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Project Emission Reductions



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Equation 5.1: Emission Reductions

$$ER = BE - PE$$

- Emission reductions are the difference between baseline and project emissions
- Calculated at end of each reporting period during the project crediting period



Baseline Emissions

$$BE_{FW,S} = M \times W_{FW,S} \times DOC_{FW,S} \times DOCf_{FW,S} \times \sum_{x=1}^{10} \left[e^{-k_{FW,S} \cdot (x-1)} \times (1 - LCE_x) \times (1 - e^{-k_{FW,S}}) \right]$$

$$M = 0.9 \times (1 - WTE_S) \times (1 - OX) \times F_{CH_4} \times MCF \times (16/12) \times 21$$

- Methane that would have been released to the atmosphere from the landfilling of food and soiled paper waste, modeled and summed over a 10 year period
- Use FOD Model (eq's 5.3 and 5.4) with standardized assumptions about landfills – developed for OWD protocol
 - Key Parameters:
 - k value (decay rates) for food and soiled paper
 - Methane Potential for food and soiled paper
 - Baseline Waste Incineration Rate – by State
 - Landfill Gas Collection Assumptions

Assumptions Regarding LFG Collection Systems



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- Standardized approach requires assumptions to be made regarding LFG collection:
 1. *All Landfills have LFG Collection Systems*
 2. *All landfills are operated as if required to collect and control LFG according to federal NSPS guidelines with regards to installing LFG collection systems on active cells*
 - Assume a phased collection approach



Phased Landfill Gas Collection

- Draft contains a new *phased collection efficiency* proposal based off of scientific literature concerning typical landfill management:
- From date of placement of food waste in a landfill cell, gas collection system in cell will gradually improve efficiency
 - This approach refines first attempt in OWD protocol
 - EPA WARM Model updates expected soon – may update LCE assumptions

Current Draft:

Year 1,2: 0% collection

Year 3: 25%

Year 4: 50%

Year 5-10: 75%

WARM model revision:

Year 1,2: 0% collection

Year 3: 50%

Year 4 -7: 75%

Year 7-10: 95%



Baseline Emissions - Determining Weight of Eligible Waste

Waste Streams divided into categories:

- Non-Source Separated MSW
- Source Separated Organics (SSO)
 - Residential
 - Commercial:
 - Grocery store / supermarket
 - Restaurant / cafeteria / other food service
 - Food wholesale distributors
 - Special events / public venues
 - Other

Determining Weight of Eligible Waste – cont'd



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Source Separated Organics (SSO)

- Residential
 - Each residential waste stream must:
 - Have quarterly hand sampling to determine %food waste and %soiled paper, or
 - Use local municipal organics collection program data to determine percentages
- Commercial
 - Each commercial waste stream must:
 - Use generator supplied waste characterization data to determine percentages, or
 - Use supplied default values for food and soiled paper

Project Emissions



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$$PE = PE_{CO_2} + PE_{CH_4,C} + PE_{N_2O,C}$$

- Project emissions equal the sum of:
 - CO₂ emissions from mobile and stationary combustion of fossil fuels and/or the use of grid delivered electricity
 - CH₄ produced from composting process
 - N₂O produced from composting process

CH₄ and N₂O Emissions from Composting



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- Extent of emissions depends primarily on two controllable factors:
 - Degree to which compost system achieves and maintains adequate aeration, and
 - Ability of system to oxidize GHGs formed in the piles
- BMPs ensure compost process is largely aerobic



CH₄ and N₂O Emissions from Composting – Cont'd

$$PE_{CH_4,C} = \sum_T V_{C,T} \times EF_{CH_4,T}$$

- Use emission factor approach based on:
 - The type of composting system used (Turned Windrow or Forced Aeration), and
 - The use of Optional Process Controls (OPCs) that increase oxidation of CH₄
- All Emission Factors fall within the range given by IPCC and used in U.S. GHG Inventory
 - See Table 5.2



Monitoring Requirements

- Monitoring in-coming eligible waste streams:
 - Requires that a daily log be kept indicating weights and sources of all waste deliveries
 - Allow for use of off-site scale receipts from commercial scales
 - Calibration required only for on-site scales not used for commercial purposes



Monitoring Requirements

- Monitoring and documenting pre-project disposal of grocery store / supermarket waste streams:
 - Monitor initial date that new grocery store waste stream is delivered to project
 - Record origin (by facility)
 - Document pre-project waste disposal method, for each new grocery store waste stream
 - Provide documentation of pre-project landfill disposal of grocery store waste stream for verification
 - Landfill tip receipts
 - Waste hauler contracts
 - Grocery Store Internal documents, employee training memo's, public media campaigns



BMP Monitoring Requirements

Composting System	Temperature Monitoring	Turning Frequency Monitoring
Turned Windrow	One recording for every 150 feet of windrow. Must measure until temp drops below 50C upon completion of time requirement (15 days @ 55C)	Each 150 ft. of windrow must record all turning events until temp drops below 50C upon completion of time requirement
Forced Aeration	One recording every 200 cubic yards of compost. Must measure until temp drops below 50C upon completion of time requirement (3 days @ 55C)	N/A

- Must use measurements to demonstrate 90% of eligible waste is composted in system that meets BMPs



Optional Process Control Monitoring

- Application of finished compost to piles/windrows:
 - Must record dates and depth of application for first 3 weeks (turned) or 2 weeks (ASP)
- Biofilters must record:
 - Type of material used as 'media'
 - Area and depth of biofilter media
 - Ventilation rate of the designed system
 - Designed retention time



Reporting and Record Keeping

- Reporting period cannot exceed 12 months
 - except for the first verification
- Reporting periods are contiguous for the crediting period
- Detailed record keeping requirements in Section 7.2



Verification Guidance

- Three resources containing verification guidance:
 - OWC project-specific guidance in Section 8
 - General verification guidance in Verification Program Manual
 - Program Manual
- ISO- accredited verification bodies must be trained by the Reserve for this project type



Verification Activities

- Verify project eligibility criteria
- Identify emission sources, sinks and reservoirs
- Review application of the protocol methodology and management systems used to gather data
- Verify emission reductions estimates
 - Determine whether material misstatements occurred
- Tables in Section 8 provides summary of items to be verified and where professional judgment is applied



Next Steps

- Submit written comments via Composting webpage - deadline is:
5 PM PDT on June 07, 2010
 - Comments will be made public
 - Webpage: <http://www.climateactionreserve.org/how/protocols/in-progress/composting/>
- Summary of comments with responses and final protocol will be posted on Composting webpage week of June 21
- Protocol presented to Reserve Board on June 30, 2010
 - Opportunity for public comment in person or via conference call



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Thank you!

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