

Manure Management Public Consultation Meeting

Agenda

Welcome and Introduction
Manure Management Measures
Manure Management Protocols
Open Discussion

Sept. 5, 2007 - Sacramento, CA



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 California Environmental Protection Agency
AIR RESOURCES BOARD

Welcome and Introduction

Linda Murchison
September 5, 2007



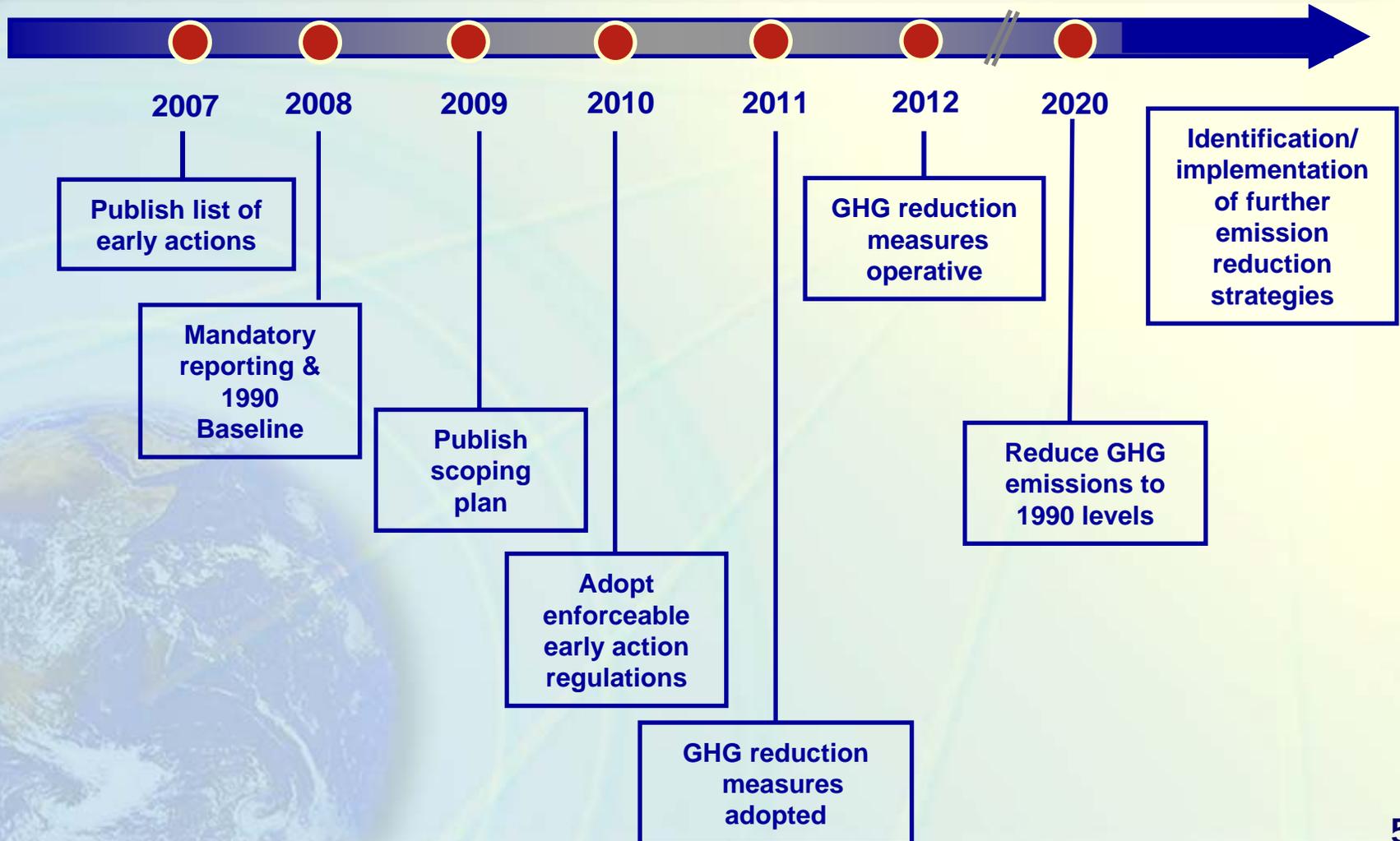
Purpose of Today's Meeting

- First in a series of workshops on manure management strategies
- Explore potential approaches and strategies
- CCAR manure digester protocol
- Invite suggestions from all stakeholders

Background

- Climate Action Team Report
- CCAR Protocol
- First Early Action Report
- Scoping Plan needs to quantify emission reductions to achieve 2020 target

AB 32 Timeline



Collaborative Process

- Public Agency Involvement
 - Air Resources Board
 - Climate Action Team and Subgroups
 - Energy Commission
 - Public Utilities Commission
 - Water Board, Regional Board
 - California Integrated Waste Management Board
 - Local Air Districts
 - California Climate Action Registry
- Engage all stakeholder groups in an extensive and transparent public process

Next Steps

- Today
 - Present our process and goals
 - Receive your ideas and concepts
- Moving Forward
 - Incorporate suggestions and maintain an ongoing dialogue with stakeholders
 - Series of focused workshops and workgroups over the next year

Today's Agenda

Manure Management Measures: Kitty Howard

Manure Management Protocols:

Voluntary GHG Reductions: Shelby Livingston

CCAR Overview and Protocol Development:
Derek Markolf

CCAR Protocol: Kevin Eslinger

Open Discussion

Adjourn

Greenhouse Gas Reduction: Manure Management Strategies

Kitty Howard
Sept. 5, 2007



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Overview

- Today's Goal
- Ground Rules for Strategies
- Background
- ARB's Process
- Activities to Date
- Call for Information
- Next Steps
- More Information
- Discussion

Today's Goal

- Start Public Process for Identification and Development of Manure Management Strategies
- Solicit Your Help in Information-Gathering Phase

Ground Rules for Strategies

- Rely upon best available economic and scientific information
- Assess existing and projected technological capabilities
- Achieve the maximum technologically-feasible and cost-effective GHG reductions
- Do not interfere with efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions
- Ensure that GHG reductions are real, permanent, quantifiable, verifiable, and enforceable

Manure Management Sources

- ARB Inventory Categories
 - Sheep, Goats, Horses, Swine, Poultry, Cattle (Dairy Cows and Other Cattle)
- Other Categories
 - Zoos, Fairs, Racetracks, Breeding Facilities, Research, Shelters

Manure Management Emissions

■ GHGs

- 1990 Levels
 - ◆ 5 MMT CO₂ E (1% of total GHG inventory)
- 2004 Levels
 - ◆ 7 MMT CO₂ E (1% of total GHG inventory)

■ ROGs

- 1990 Levels
 - ◆ 77 Tons Per Day (TPD) (2% of total ROG inventory)
- 2004 Levels
 - ◆ 89 TPD (4% of total ROG inventory)
- 2006 Levels
 - ◆ 89 TPD (4% of total ROG inventory)

■ PM₁₀

- 1990 Levels
 - ◆ 28 TPD (1% of total PM inventory)
- 2004 Levels
 - ◆ 33 TPD (2% of total PM inventory)
- 2006 Levels
 - ◆ 33 TPD (2% of total PM inventory)

ARB's Process

- Gather and evaluate information
- Solicit stakeholder input
- Conduct needs assessment
- Develop, propose, and prioritize options
 - Voluntary and/or regulatory measures
 - Recognize/Encourage early reductions
- Develop Schedule
- Hold public meetings, expand outreach, obtain first-hand knowledge
- Make recommendations to our Board

Activities to Date

- Established website and list serve
- Getting out into the field
- Introducing ourselves to the stakeholders
- Gathering Information
 - Understanding how the industries operate (financial, other regulations, large vs. small, culture)
 - Identification and initial evaluation of technologies and practices
 - Evaluation of current rules and regulations

Technologies and Practices

- Aeration
- Anaerobic Digestion
- Biochemical Treatment
- Composting
- Covered Lagoons
- Enclosed Barns
- Feed Management
- Gasification
- Incineration
- More Frequent Flushing, Scraping, and Vacuuming
- Pyrolysis

Current Rules and Regulations

- Several air districts have rules related to manure management
 - Amador APCD
 - Butte County APCD
 - Great Basin APCD
 - Imperial County APCD
 - Sacramento Metropolitan APCD
 - San Joaquin Valley APCD
 - South Coast AQMD
 - Yolo-Solano AQMD

Call for Information

- Help Us Identify Additional:
 - Stakeholders
 - Technologies
 - Research
 - Sources
 - Cost information
 - Incentive programs

- Get back to us by September 24, 2007

Next Steps

- Field visits
- Continued information gathering and evaluation
- Public outreach
- Future public meetings

Discussion

Voluntary Manure Digester Protocol Meeting Outline

- Voluntary GHG Reductions: Shelby Livingston
- CCAR Overview: Derek Markolf
- CCAR Livestock Protocol: Kevin Eslinger
- Next Steps
- Open discussion

Introduction

Voluntary Greenhouse Gas Reductions: Manure Digester Protocol

*Shelby Livingston
Sept. 5, 2007*



California Air Resources Board

California Environmental Protection Agency

Overview

- Background on Voluntary GHG Reductions
- ARB Process
- CCAR Protocol

Voluntary Reductions

- Not required by any law or regulation
- May be reported
- If reported, they must follow established calculation and verification guidelines or protocols
- Important aspect of achieving GHG emission reduction goals

Voluntary Reduction Protocols

- Protocols provide:
 - Basis for quality accounting
 - Methodology for calculating GHG emissions and emission reductions
 - Standard eligibility rules, monitoring instructions, and procedures for reporting project information

CCAR Livestock Protocol

- California Climate Action Registry (CCAR) developed a Livestock protocol for greenhouse gas accounting for manure digesters
- Extensive CCAR public process and expert review
- Approved by CCAR Board in June of 2007
- AB32 requires ARB to use California Climate Action Registry (CCAR) protocols

ARB's Process & Goals

- Hold public meetings on the CCAR protocol to inform the public and provide opportunity for questions & comments
- Consider taking the voluntary CCAR livestock protocol to our Board for endorsement for voluntary purposes
- Overall goal – to encourage early voluntary GHG emissions reductions

ARB Process for New Protocol Development

- Recognition of the wide variety and varying complexity of voluntary GHG emission reduction projects and activities
- One-size doesn't fit all, new approaches and applications will continue to be developed by ARB and CCAR in full public consultation
- ARB staff will be exploring avenues for addressing additional project types

Voluntary Manure Digester Protocol Meeting Outline

- Voluntary GHG Reductions: Shelby Livingston
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The Livestock Project Reporting Protocol

CARB Public Consultation Meeting
September 5, 2007

Derek Markolf
Senior Policy Manager



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Overview

- What is the California Climate Action Registry?
- What are project protocols?
- How was the Livestock project protocol developed?
- ARB staff will discuss the protocol in more detail.

Background on the Registry

- Established as a business initiative
- Public/private partnership created by state legislation in 2000
 - Create a GHG accounting standard
 - Encourage voluntary public reporting and early actions for reduction
 - Board represents business, government, NGOs
- Defines a “standard of excellence” in California

Role of Protocols

- Detailed accounting standard
 - Gives step-by-step guidance in measuring emissions and ensures that “a ton is a ton” across different organizations
- Two types: Entity and Project
- Entity protocols – footprint for an organization, snapshot

Project Protocols

- GHG Project: Specific project that reduces GHG emissions or increases GHG sequestration
- Projects are generally done for trading purposes
- Protocol is the tool that determines the GHG impact of the project activity

Project Protocol Components

- Define the GHG reduction project
- Determine eligibility (e.g., “additionality”)
- Establish the accounting boundary
- Calculate GHG reductions
 - Baseline emissions
 - Project emissions
- Verify project performance
- Register GHG reductions

Registry Core Values

- Engage industry experts and public stakeholders in protocol development process
- High quality standards
- Error on side of conservatism

Livestock Protocol Development Process

- Scoping meeting – April 2006
- Literature review and discussion paper production
 - Options and recommendations
 - A Protocol seed document
- Form workgroup – October 2006
- Develop draft protocols
- Public review – May 2007
- Board approval – June 2007

The Protocol Workgroup

- CA Air Resources Board
- CA Department of Food and Agriculture
- California Farm Bureau
- Western United Dairymen
- U.S. EPA
- The Center for Energy Efficiency and Renewable Technology
- Environmental Defense
- UC Davis
- Applied Geosolutions
- AgCert
- The Dolphin Group
- Inland Empire Utility Agency
- Manitoba Agriculture, Food and Rural Initiatives
- Sustainable Conservation

Protocol as Living Document

- Currently project activity is anaerobic digester only
 - Baseline methodology well suited for other project activities to be added in future
- N₂O impacts not currently included in project protocol due to level of uncertainty in available emission factors
 - As methods to calculate N₂O emissions at the farm level become available the Registry will incorporate them into this protocol.

Contact Information

Derek Markolf

Senior Policy Manager

derek@climateregistry.org

California Climate Action Registry

515 S. Flower St.

Suite 1640

Los Angeles, CA 90071

213-891-1444

California Climate Action Registry & Protocol

Kevin Eslinger
Sept. 5, 2007



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Manure Digesters

- Store manure & enhance digestion (anaerobic = in the absence of oxygen)
- Capture methane biogas produced by the naturally occurring anaerobic microbes (methanogenic bacteria)
- Make use of the biogas by...
 - ...burning/flaring it,
 - ...combusting it in an engine to generate electricity,
 - ...or purifying & injecting it into natural gas pipelines

CCAR's "Livestock Project Reporting Protocol" Overview

- Provides methodologies for calculating greenhouse gas (GHG) benefits of manure digesters
- Encompasses multiple digester technologies
- Allows for additions, revisions, & updates

Source of Protocol Methodologies

- Derived from international methodologies
 - Kyoto Protocol's Clean Development Mechanism (CDM)
 - ACM0010
 - EPA's Climate Leaders Program
 - Draft Manure Management Offset Protocol

CCAR Protocol Details

- Designed for bovine & swine manure digesters
- Variables include:
 - Animal size & population
 - Volatile solid excretion
 - Feed energy
 - Maximum methane producing capacity
 - Methane collection & destruction efficiencies
 - Ambient average temperature

CCAR Protocol Details, cont.

- What emissions are included?
 - CH₄
 - CO₂
- What emissions are excluded?
 - CO₂ resulting from burning biogas
 - Indirect emissions benefits of displacing grid electricity
 - N₂O (currently)

CCAR Protocol Details, cont.

■ Project boundaries

- Includes everything affected by installation of a digester

- Waste production
- Waste treatment & storage
- Waste disposal

E.g. changes in emissions resulting from transporting manure

CCAR Protocol Details, cont.

■ Eligibility

• Additionality

- Emissions reductions and/or activity (installing a digester) must exceed what is required by law
- Must meet all air & water quality regulations

• Location

- Must be based in the U.S.

CCAR Protocol Details, cont.

- **Monitoring**
 - Direct measurement
 - Continuous rate of biogas flow
 - Methane concentration of biogas to the combustion devices
- **Reporting**
 - All CH₄ & CO₂ emissions
 - No “de minimis” reporting provision
- **Certifying**
 - Annual certification by an approved entity

CCAR Protocol Development Process

- Initiated “Livestock Project Reporting Protocol” development in April 2006
 - Performed extensive public/stakeholder review which involved:
 - CA Farm Bureau, CA Dept. of Food & Ag, Center for Energy Efficiency & Renewable Technology, Environmental Defense, UC Davis, EPA, Western United Dairymen, SMUD, Bioenergy Solutions, Provost & Pritchard, CARB, and many others
- Adopted by CCAR Board in June 2007

How It Works in the Real World

- Information required for protocol calculations:
 - From tables in protocol
 - Methane Conversion Factors
 - by temperature (avg monthly) and by system (confined, grazing, etc.)
 - Volatile Solids by livestock category & system

How It Works in the Real World, cont.

■ Reporting Parameters

- Form 1 - General information (examples)
 - For dairy
 - Breed
 - # of lactating/dry/replacement cows & manure fraction
 - Types of manure collection & frequency
 - For swine
 - Type of swine operation
 - Animal types & #s

How It Works in the Real World, cont.

- Reporting Parameters
 - Form 2 - Biogas control system (examples)
 - Type of digester (mixed, plug-flow, covered lagoon, etc.)
 - # & type of animals
 - Average live weight or average milk production
 - Manure &/or wastewater volume
 - Manure treatment before & after digestion
 - Method of digester effluent storage

How It Works in the Real World, cont.

- Reporting Parameters
 - Form 3 – Biogas utilization information
 - How biogas is being utilized (boiler, electricity, flare, etc.)
 - Type of engine-generator set, flare, etc.
 - Pretreatment of biogas
 - Exhaust gas emissions control

Discussion Points

- Science
 - Cross-media impacts
- Policy
 - Interagency issues
 - Permits
 - Co-digestion
 - General order
- Marketability/Feasibility
 - Cost
 - Incentives

Next Steps

- Consider taking the protocol to our Board for endorsement
- Moving forward with a series of workshops over the next year
 - Address potential improvements to the existing protocol
 - Initiate the process for development and adoption of a voluntary verification & enforcement regulation

For More Information

- **Manure Management Websites:**
 - ARB Manure Management homepage
<http://www.arb.ca.gov/ag/manuremgmt/manuremgmt.htm>
 - Manure management strategies
<http://www.arb.ca.gov/ag/manuremgmt/asures/asures.htm>
 - Manure management protocols
<http://www.arb.ca.gov/ag/manuremgmt/protocols/protocols.htm>
- **Manure management list serve:**
 - <http://www.arb.ca.gov/listserv/manuremgmt.htm>

Contacts

■ Manure Management Measures

- Kitty Howard, Manager: 916.322.3984 khoward@arb.ca.gov
- Lea Yamashita: 916.323.1079 lyamashi@arb.ca.gov
- Dan Weller: 916.327.0481 sweller@arb.da.gov

■ Manure Protocol

- Richard Bode, Branch Chief: 916.323.8413 rbode@arb.ca.gov
- Dale Shimp, Manager: 916.324.7156 dshimp@arb.ca.gov
- Shelby Livingston: 916.327.0822 slivings@arb.ca.gov
- Kevin Eslinger: 916.445.2151 keslinge@arb.ca.gov

■ Scoping Plan

- Edie Chang: 916.324.2302 echang@arb.ca.gov