

Preliminary Cost Information Gathered by ARB Staff Regarding Waste Digesters

Who Was Contacted:

- Dairy Methane Digester System Program Evaluation Report (California Energy Commission Public Interest Energy Research Program (CEC PIER Program))
- AgSTAR Industry Directory
- Construction/Earthmovers
- Equipment Manufacturers/Distributors
- Project Developers
- Utility Companies

What We Talked About:

- Construction
- Digester and Gas Production Enhancements
- Energy Conversion
- Gas Handling
- Manure Collection and Pretreatment
- Utility Interconnection

Summary of Limited Waste Digester Cost Information		
	Low	High
Construction	\$34,840	\$1,039,230
Digester and Gas Production Enhancements		
Digester	\$84,850	\$1,449,940
Digester heating system	\$7,610	\$63,720
Lagoon cover	\$32,240	\$366,290
Energy Conversion		
Engine/ Generator	\$178,610	\$4,140
Flare	\$250	\$30,000
Gas Handling		
Gas transport	\$2,110	\$211,540
Gas treatment	\$10,000	\$11,890
Manure Collection and Pretreatment		
Collection mix tank	\$8,000	\$259,940
Manure collection	\$5,620	\$47,690
Lagoon (construction)	\$55,730	\$349,660
Separator	\$29,050	\$731,840
Vacuum trailer	\$38,890	\$438,100
Utility Interconnection	\$2,500	\$71,440

Preliminary Groups Identified by ARB Staff Sponsoring and/or Conducting Research Related to Manure Management

Who We Talked To:

- ARB Research Division
- American Society of Agricultural and Biological Engineers
- San Joaquin Valley Air Pollution Control District
- United States Department of Agriculture
- United States Environmental Protection Agency
- Universities
 - UC Davis, UC Berkeley, CSU Fresno, Colorado State University, Cornell University, University of Georgia, Iowa State University, University of Idaho, Kansas State University, University of Kentucky, University of Minnesota, Penn State University, Purdue University, Texas A&M University, Utah State University
- Industry Associations

Categories We Identified:

- Air Modeling
 - Process-Based Modeling
 - Modeling Development
 - Modeling Verification
 - Mass-Balance/ Life-Cycle
- Air Monitoring
 - Open-Path Fourier Transform Infrared (FTIR)
 - Ultraviolet Differential Optical Absorption Spectroscopy (UV Sentry)
 - Flux-Chamber
 - Open-Path Tunable Laser Diode
- Practices Evaluation
 - Feed Management
 - Land Application
 - Manure Collection/Removal Frequency
- Technology Evaluation
 - Aeration
 - Anaerobic Digestion
 - Biofilters
 - Gasification/Pyrolysis
 - Lagoon Covers/Liners
 - Biological Nutrient Removal
 - Solid-Liquid Separation
 - Transportation

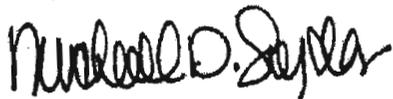
Rocky Mountain National Park

Nitrogen Deposition Reduction Plan

Memorandum of Understanding Agencies



Vaughn Baker, Superintendent, Rocky Mountain National Park



Michael Snyder, Acting Director, National Park Service, Intermountain Region



Robert E. Roberts, Regional Administrator, Environmental Protection Agency, Region 8



James B. Martin, Executive Director, Colorado Department of Public Health & Environment

August 16, 2007