



# Chino Basin Organics Management Workshop Report

*PRESENTED BY*  
National Water Research Institute

*IN COOPERATION WITH*  
Inland Empire Utilities Agency and  
Southern California Alliance of Public Owned Treatment Plants

Kellogg West Conference Center & Lodge  
California State Polytechnic University  
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## FOREWORD

Three years ago, the five member agencies of the Santa Ana Watershed Project Authority—Orange County Water District, Western Municipal Water District, Eastern Municipal Water District, San Bernardino Valley Municipal Water District, and the Inland Empire Utilities Agency (IEUA)—launched a program, in cooperation with other local, state, and federal organizations, to begin the process of developing a water resources plan. The purpose of the water resources plan was to implement water recycling, water quality management, and a watershed plan that included dairy cleanup and organic materials conservation, habitat enhancement for endangered species, salinity management, and recreation development of the Santa Ana River system.

One of the key elements of this plan is the management of organic materials generated from the many animal and agricultural practices within the Chino Groundwater Basin. The challenges presented by this critical aspect of the plan have been the focus of attention by the IEUA for several years. The IEUA commissioned a draft business plan and technical feasibility study that would describe and offer recommendations regarding an organics management strategy, products, markets, fail-safe options for organics, and a recommended action plan.

Because of the wider geographic implications of organics management and the desire to ensure that this plan would address all the concerns and issues related to organics management, the Southern California Alliance of Publicly Owned Treatment Works, in collaboration with the IEUA, approached the National Water Research Institute (NWRI) for assistance. NWRI offered to conduct a two-phase program that would allow the concerned parties to reach consensus in a positive environment.

The first phase is a nominal group technique (NGT) workshop, which is based on the work of Andre Delbecq of the University of Wisconsin in the 1960's. The NGT method is an intensive experience that provides a rich and robust opportunity for the participants to explore issues and reach consensus. The focus of this workshop was to address the question: *What are the most significant barriers that may inhibit the Chino Basin Organics Management concept from being implemented?*

Prior to the NGT workshop, the participants toured the Chino Basin to gain a first-hand perspective regarding the dimensions of the organics management issues. The tour included visits of the IEUA's co-composting facility, which was built in 1995 and endorsed by the Regional Water Quality Control Board, Santa Ana Region, and the Milk Producers' Council. Also visited during the tour were Regional Plant 5, which has been under construction since September 2000, and three additional sites currently under consideration.

Phase two of the NWRI program will be the convening of the Chino Basin Organics Management Conference on June 15, 2001. This all-day event is designed to present the top priority barriers and strategies to overcome the barriers identified during the workshop and reported in this document. In the two months prior to the conference, many of the NGT workshop participants will join with other experts on 10 task groups that will create an expanded

version of the 10 priority barrier write-ups found in this document. These will detail and enhance the original workshop reports and coalesce it into an action plan/strategy to overcome the barriers identified during the workshop.

No workshop could be successful without the support provided by the professional staff. Special thanks are extended to Patricia Linsky and Gina Melin, Editors; Tammy Dapkewicz, Meeting Coordinator; Joseph Pezely, Graphics Illustator; Fernando Barrera, Graphics Assistant; Paul Ohshima, Evlee Pinkney, Barry Shietze, Word Processors; and Teresa Taylor, Photographer. Sincere appreciation is extended to William S. Gaither, Ph.D. who, through his masterful facilitating skills, brought the NGT to a successful conclusion.

RONALD B. LINSKY

*Executive Director*

*National Water Research Institute*

*Workshop Secretary*

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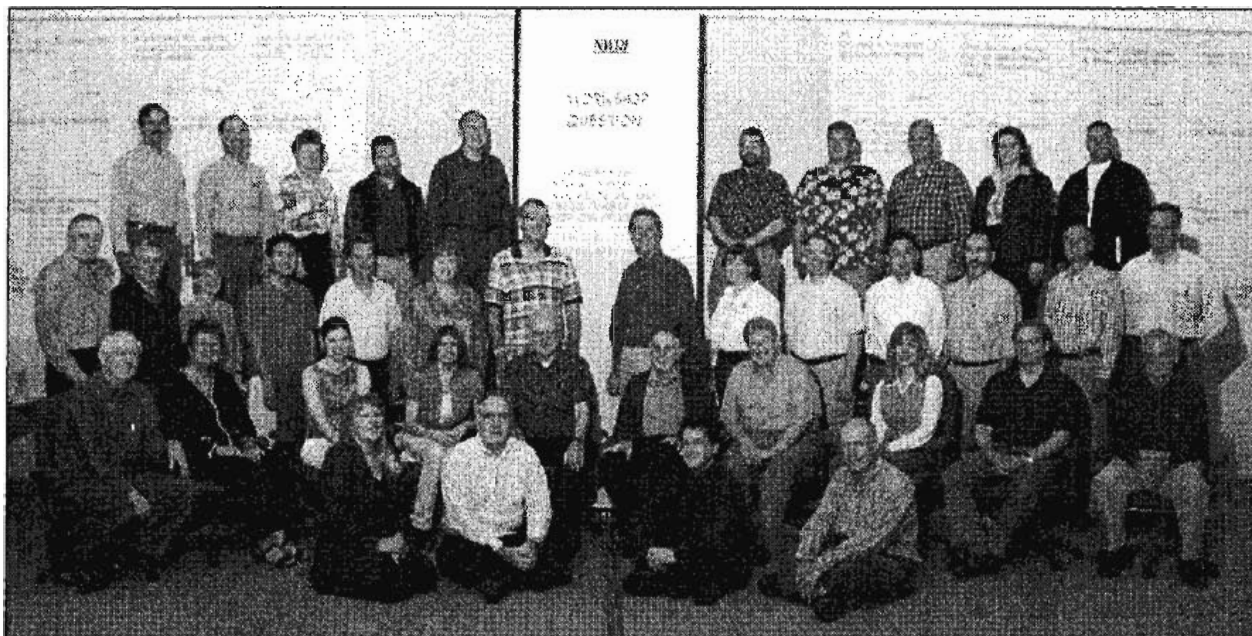
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## PARTICIPANTS



Top Row: Blake Sanden, Robert Gillette, Julia Lester, Robert Wilkinson, Bill Gaither (Facilitator), Tracy Cork, Jeff Watson, Steve McCalley, Jayne Joy, Fernando Barrera (Graphic Asst.)

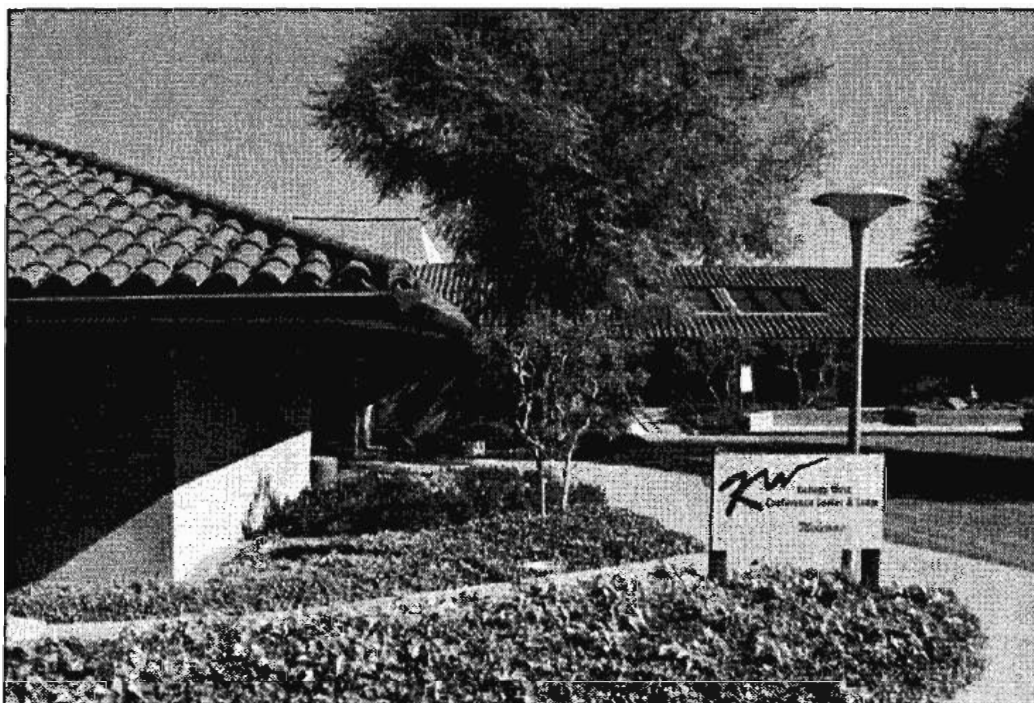
Standing: Joe Pezely (Graphics), Al Page, Anne Briggs, Paul Ohshima (Word Processor), Barry Shietze (Word Processor), Evlee Pinkney (Word Processor), Jim Hill, Blake Anderson, Marsha Eubanks, Frank Munsey, Andrew Chang, Bob Bastian, Stephen Storelli, Chip Leslie

Seated: Ron Linsky (Secretary), Patricia Linsky (Editor), Gina Melin (Asst. Editor), Tammy Dapkewicz (Meeting Coordinator), John Walker, Eliot Epstein, Marvin Mears, Geralyn Skapik, Allen Dusault, Richard Atwater

Kneeling: Lorrie Loder, Mike Hoover, John Graham, and Jim Earsom



## **WORKING GROUPS' REPORTS**

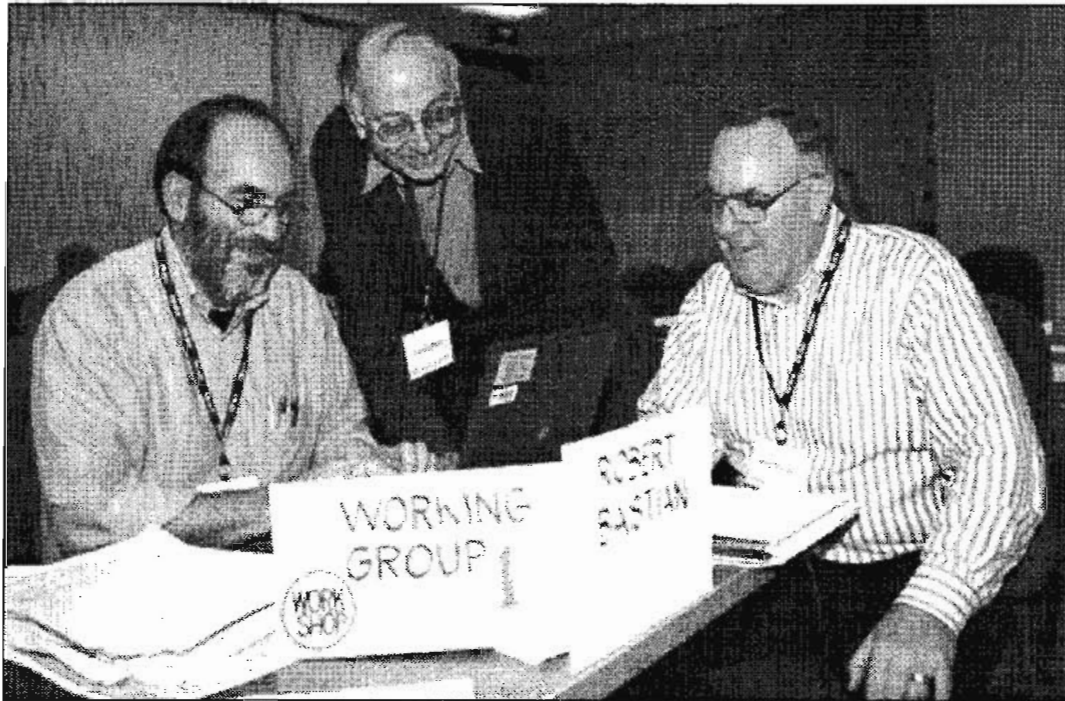


## INTRODUCTION

### **Summary Descriptions of the Highest Priority Barriers That May Inhibit the Chino Basin Organics Management Concept From Being Implemented**

After completing the Nominal Group Technique (NGT) Workshop, which is presented in Part 2 of this report, the ten highest priority barriers were posted on the workroom wall. Working groups of two or three participants were assigned to review, digest, and synthesize the information contained in all of the NGT Workshop barriers that had been subsumed under their priority barrier. Following this process of mental digestion, the working group was expected to write a succinct summary description that incorporated the most salient features of the NGT write-ups. Working groups began their assigned tasks at 7:30 p.m. and worked late into the evening.

The following morning, beginning at 9:00 a.m., the working groups presented their reports. Each working group was allowed 15 minutes to present their report and to respond to questions or suggestions. At the conclusion of each working group presentation written comments were solicited from the participants. The written comments are presented immediately following the working group's report. In all cases except one, the working group reports were not modified to accommodate the written comments. In one case, noted in the following section, the working group leader asked to review the written comments and modified the group's report to accommodate most suggestions.



## **PRIORITY 1**

# **Inability to Site New Organics Processing Facilities**

### **WORKING GROUP MEMBERS:**

Bastian, Epstein, and Hoover

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#### ***Barrier Description:***

- Unless new processing facilities can be established and kept in operation, the Chino Basin Organics Management concept will not be implementable.
- Potential available sites for new processing facilities are limited based on current land-use plans, current site-use practices, and limitations.
- Failure to identify sites without significant adverse land-use impacts will likely lead to strong public opposition and possible litigation.
- Perceived inequitable location of sites for new processing facilities among the local jurisdictions may lead to strong opposition by some local communities.

#### ***Importance:***

- Siting decisions may arouse major project opponents.
- Sites in proximity to the wastewater treatment plants and dairies could significantly reduce trucking requirements by allowing pumping of digested sludge and/or manure by pipelines to the facility; reduce power transmission costs; and lead to an economy of operations.
- New local operating facilities for processing digested sludge and manure under local control will allow more self reliance rather than dependence on other entities, such as private operations in other political jurisdictions.

### ***Approach:***

- Consider additional sites that may be available within the local area.
- Involve local community stakeholders and leaders in the site-selection process, development of management alternatives, system designs, as well as with participation in oversight of program implementation.
- Meet with local citizens and stakeholder groups; provide fact sheets, charts, detailed drawings and a scale exhibit or model to keep them informed of plans and actions.
- Build and operate local pilot and demonstration facilities.
- Visit similar sites and facilities; document compatibility and performance; and interview neighboring residents and businesses.
- Provide incentives/benefits to the local community.
- Establish a task force or working group of local political leaders to help work out compatible options.
- Initiate mediation to help clarify issues and try to seek a resolution to site-selection issues.

### ***Recommended Task Group Members:***

- IEUA's Regional Policy Committee
- Chino Watermaster
- San Bernardino County
- Regional Water Quality Control Board
- South Coast Air Quality Management District (SCAQMD)

### ***Comments:***

"Good overview. I believe the focus of keeping it local is necessary. Proximity is a guiding principle that all public agencies ought to achieve."—***Blake Anderson***

"I think Groups #1 and #5 could merge because Group #5 dealt with the NIMBY syndrome for locating new facilities."—***Anne Briggs***

"Would like to see some development or definition of what realistic and unbiased siting criteria might be. Need to apply these criteria consistently if multiple projects/sites are involved."—**Tracy Cork**

"Good report. Expect the unexpected. Siting is harder and more expensive than it seems. It also takes longer."—**Allen Dusault**

"More detail regarding each option, pros and cons, for those of us who are not experts in this field."—**Marsha Eubanks**

"Specifically address use of the existing site."—**Robert Gillette**

"Construction of a biosolids composting facility next to a sewer treatment plant resolves many local concerns (e.g., trucking, dependency on other sites and agencies)."—**James Hill**

"The project tied to a specific site or sites will need to be certified through the environmental impact report (EIR) process pursuant to the California Environmental Quality Act (CEQA). Siting analysis should include sites where the EIR process may be subject to the least potential for legal challenge.

"The Inland Empire Utilities Agency (IEUA) has indicated that they prefer their organics management strategy to be applied to multiple 'centers' rather than a single 'center.' The single center concept should be part of a siting barrier.

"IEUA has indicated that the organics management strategy will need to be phased. For successful implementation and maintaining good public relations, full disclosure of the ultimate use of a site or sites needs to be made to the local community."—**Chip Leslie**

"Specifically address potential for use of existing facility."—**Lorrie Loder**

"Generally a good report. Details and specifics should be expanded as will be done before June 15, 2001."—**Steve McCalley**

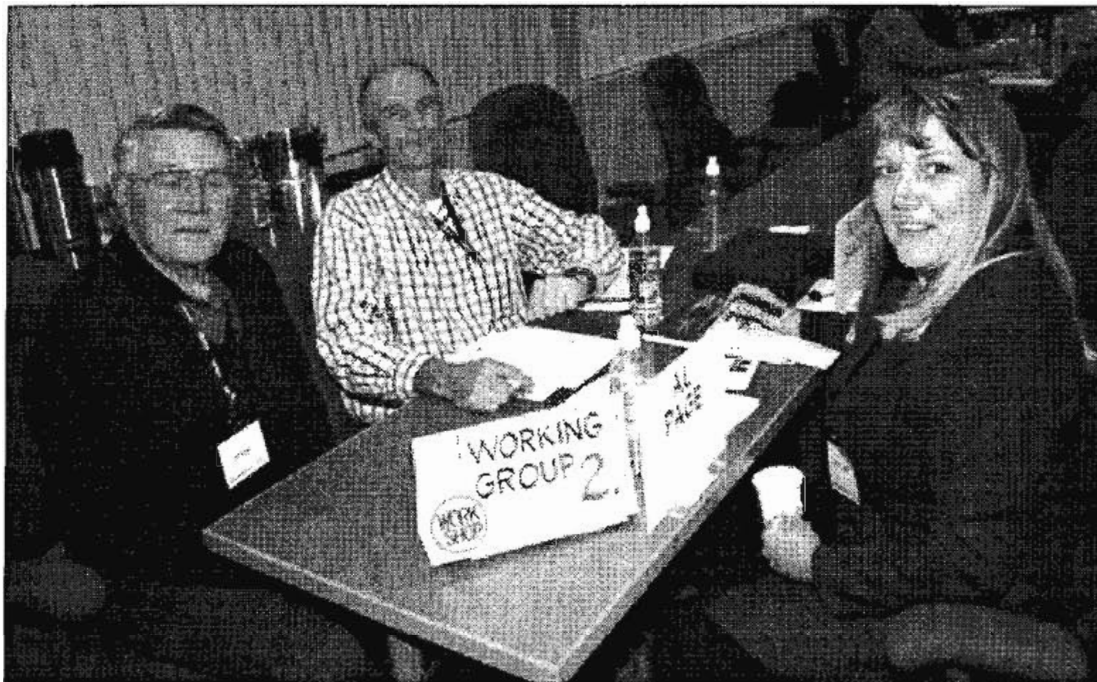
"Will need to provide for the delivery and handling of materials to be used for amendment purposes."—**Marvin Mears**

"Were sites outside of the Basin considered?"—**Albert Page**

"A local community action group or individual needs to be included in the list of people to overcome this barrier."—**Blake Sanden**

"Nice report, include SCE and California Energy Commission for siting questions."—**Stephen Storelli**

"Should include a discussion of the planned phasing and pilot testing in the siting report. Could also include a discussion of why the single site was not chosen. Something on the evaluation of shipping out of state as Class B."—**John Walker**





## **PRIORITY 2**

# **Public Nuisances**

### **WORKING GROUP MEMBERS:**

Loder, Page, and Storelli

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#### ***Barrier Description:***

Nuisances are naturally associated with organics management. Odor is the most frequent complaint encountered in the management of manure and wastewater treatment residuals in neighboring communities. It is possible to minimize nuisance impacts with present-day technology.

In addition, this barrier interacts with the publics' real or perceived perception of health effects relating to organics reuse operations. Historically, the organics material management industry has lacked an appreciation of public perception as a valid hindrance to a successful operation.

#### ***Importance:***

Any organics reuse project that does not recognize the importance of the publics' perception of nuisances will have difficulty in siting a new facility and/or will not remain a long-term sustainable operation.

#### ***Approach:***

- Locate near sources. In a number of respects, the Chino Basin Organics Management strategy has planned for the control of odor and dust nuisances by confining operations to locations near sites where organics are generated, through in-vessel digestion of organics, through the use of pipelines for transport of organics, and through indoor composting of organics with biofiltration.
- Monitor odor. Odor monitoring should include quantifiable scientific technology and standards for odor intensity ratings. These standards should be implemented as a baseline for compliance with minimums established. The standards should be acceptable to all affected parties. If standards are not set, legislation should be put in place to lessen the impact of nuisance complaints on compost facilities.

- Create a communication program to convey any and all operational changes to the citizens, regulators, and elected officials. Information is power.
- Assure the community that the facility will contain the best available technology and will have the ability to deal with problems. Establish a system that the citizens will have confidence in.
- Complete an Environmental Impact Review that address the traffic and noise issues.
- Form a cohesive alliance between agencies, appliers/processors, and reuse markets (i.e., farmers, landscapers) to lessen impacts at all stages of the process stream and help to provide public acceptance for organics reuse.

***Recommended Task Group Members:***

Establish a task group to identify individuals involved in all aspects of nuisance management. Possibly, include:

- Integrated Waste Management Board
- South Coast Air Quality Management District
- Environmental Protection Agency
- Public Utilities
- Appliers/Processors
- University of California, Riverside
- Consultants

***Comments:***

“Commitment to zero odor complaints is the principle that the IEUA should go for. Compliance with regulatory minimums is not enough. Citizen input is a must.”—***Blake Anderson***

“Why not focus the ‘legislation’ or ‘standards’ to be benchmarks established jointly with stakeholders for the local project to serve as a baseline for the project to operate at, and then seek means to address nuisance problems that may occur even when these are met.”—***Robert Bastian***

“If standards are not in place...leads to legislation? Coalition group. Both of these statements need to convey a working relationship with the citizens experiencing the nuisance problem, with the intent to lessen or resolve their nuisance, not ‘protect the facility’ from the citizens.”—**Anne Briggs**

“Consider ‘best management practice’ concept as opposed to numerical standards. Legislation protects individuals versus industries (theoretically). It must be crafted carefully and allow flexibility and not limit the ability of communities to interpret and find what works best for their particular situation. Public participation in setting local odor ‘best management practices’ and, if appropriate, numerical standards and complaint response plans may be a good way to implement rules and gain local support.”—**Tracy Cork**

“Encourage the state or county to establish numerical odor levels that will not impact receptors (e.g., 5 or 7 DT at dilution to threshold nearest receptor). Have a standardized method of measuring odor that is not dependent on individual perception or sensitivity.”—**Eliot Epstein**

“It is a good idea to develop legislation that a processing facility must comply with. However, no matter what a limit is, the processing facility will always be liable to the public. The odor will always be connected with the public agency in the area.”—**Marsha Eubanks**

“It is still possible to transport biosolids and manure to remote sites. This option will one day be taken away. Therefore, it is necessary to find local solutions to the situation.”—**James Hill**

“Not possible to guarantee a fail-safe operation of any facility. Best management practices, regulatory standards—yes. Facilities need to have redundancy and contingency plans. The public should not be told or expect that there will never be a circumstance in which a failure occurs. Suggest confidence in operation through operational and pilot experience, operator training, peer review, and operational audits.”—**Mike Hoover**

“Would be helpful if the industry had standards to establish baseline levels for nuisance (mainly odor) control.”—**Albert Page**

“Advice from experts in fly control technology for animal facilities should be considered when addressing public nuisance concerns.”—**Blake Sanden**

“Odor irritation and inflammation may also be needed for a baseline determination of the potential for odor as a health effect, in addition to a nuisance. Particulates, endotoxins, allergens, and pathogens can perhaps be compounded with odor causing irritation, inflammation, or infection. Realize that odor control is ethically correct and adopt an agency standard of very low levels. Likewise, also adopt internal standards for visual appearance (cleanliness) blending within a community. Also standards for dust and noise. Work with stakeholders in the community to set the agency standard and a monitoring panel or program.”—**John Walker**



## **PRIORITY 3**

# **Lack of an Integrated Strategy for Organics Management**

### **WORKING GROUP MEMBERS:**

Atwater, Chang, and Wilkinson

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#### ***Barrier Description:***

- There is a lack of cohesive public policies that credit integrated organic solids management plans benefiting multiple environmental media.
- Developing a regional organic solids management plan for Chino Basin is a multifaceted process. It requires the considerations of a wide range of physical, socio-econo-political, and regulatory factors.
- There are waste streams of various quantities and characteristics. There are also seasonal and spatial variations in quantities and characteristics. The permutations for handling, processing, and recycling organic solids are thus numerous. The ripple effects on downstream processes are even more diverse. The economics of scale becomes ambiguous, and the best facility configuration needs to be fleshed out.
- There are also multiple-layer and sometimes redundant (or conflicting) jurisdictions involving local, regional, state, and federal entities. Implementation of the management plan must satisfy these potential constraints. It may be difficult to sort out the multiple-policy objectives.
- Policy makers in all concerned entities need to adopt systematic approaches that objectively evaluate policy options and adopt policies that enhance (or maximize) multiple and cross-media societal good of an integrated organics management plan in the Santa Ana River Watershed.

### ***Importance:***

- Current policies governing pollution control and waste management are often designed to satisfy narrowly focused mandates. They tend to disfavor the adoption of management options that provide greater overall societal goods across the environmental media but fail in compliance with technicalities of selected regulations.
- There are numerous options to collect, transport, and process organic solids to site processing and treatment facilities and to produce and market the final product. It is difficult to make objective selections on management options without a systematic evaluation.
- There should be a mechanism and process merging the outcomes of facility planning into appropriate regulatory framework and incentives for the lead agency to adopt cost-effective options that provide maximum societal goods, not simply for achieving regulatory compliance.

For example, exporting salts through export of products may prevent the degradation of groundwater quality in Chino Basin but cause the salt loading in the other equally critical basins to rise. The resolution of organic solids disposal problems could have far-reaching and long-term benefits that are not always properly quantified (improving air quality, reducing non-point source water pollution caused by storm runoffs, etc.).

### ***Approach:***

- Identify physical, legal, and institutional issues and constraints governing the organic solids management in Chino Basin.
- Employ a systems approach for a basinwide comprehensive evaluation of all organic solids management alternatives to compare the merits of on-premise and off-premise treatment and to select sites, processes, and capacities for facilities.
- Incorporate the full range of benefits, including cross-media secondary environmental effects (beneficial and adverse), into the cost and benefit considerations and regulatory compliance.
- Form interagency coordinated reviews in permitting, financing, and regulating integrated organics management concepts.
- Enlarge participation. The Chino Basin Organics Management strategy so far has involved the Santa Ana Watershed Group to facilitate the dialogue with local, state, and federal agencies.
  - Local: Orange, Riverside, and San Bernardino Counties, numerous cities, water and wastewater utilities, the SCAQMD, Metropolitan Water District of Southern California, Chino Basin Watermaster, Santa Ana River Watermaster, Milk Producers Council, landfill agencies, etc.

- State Agencies: California Energy Commission, Public Utilities Commission (PUC), California Food and Agriculture Agency, California EPA, Air Resources Board, Resources Agency, State Water Resources Control Board (SWRCB), Integrated Waste Management Board, Santa Ana Regional Water Quality Board, Fish and Game, CALFED Bay-Delta Program, and the Department of Health Services.
- Federal Agencies: USEPA, Dept. of Energy, U.S. Department of Agriculture (USDA), Dept. of the Interior, U.S. Geological Survey (USGS), U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, Army Corps of Engineers.

***Recommended Task Group Membership:***

- Lindell Marsh (Facilitator, Santa Ana Water Watershed Group)
- Andrew Chang (University of California, Riverside)
- Richard Atwater (IEUA)
- Robert Wilkinson (Rocky Mountain Institute)
- Mary Nichols, Secretary of Resources Agency
- Winston Hickox, Secretary of California EPA
- Bill Lyon, Secretary of Food and Agriculture
- Art Baggett, Chair of SWRCB
- Alan Lloyd, Chair of ARB
- William Keese, Chair of the Energy Commission

***Comments:***

“Governance/decision making must occur through cooperative and open discussion. This concept will work effective through relationships that are developed over time. I didn’t hear enough about the people side of the equation. Relationships are primary, and everything else is derivative.”—***Blake Anderson***

“Good general concept for approaching the overall effort, but can examples of specific areas be addressed (such as if residual salts can or should be handled)?”—***Robert Bastian***

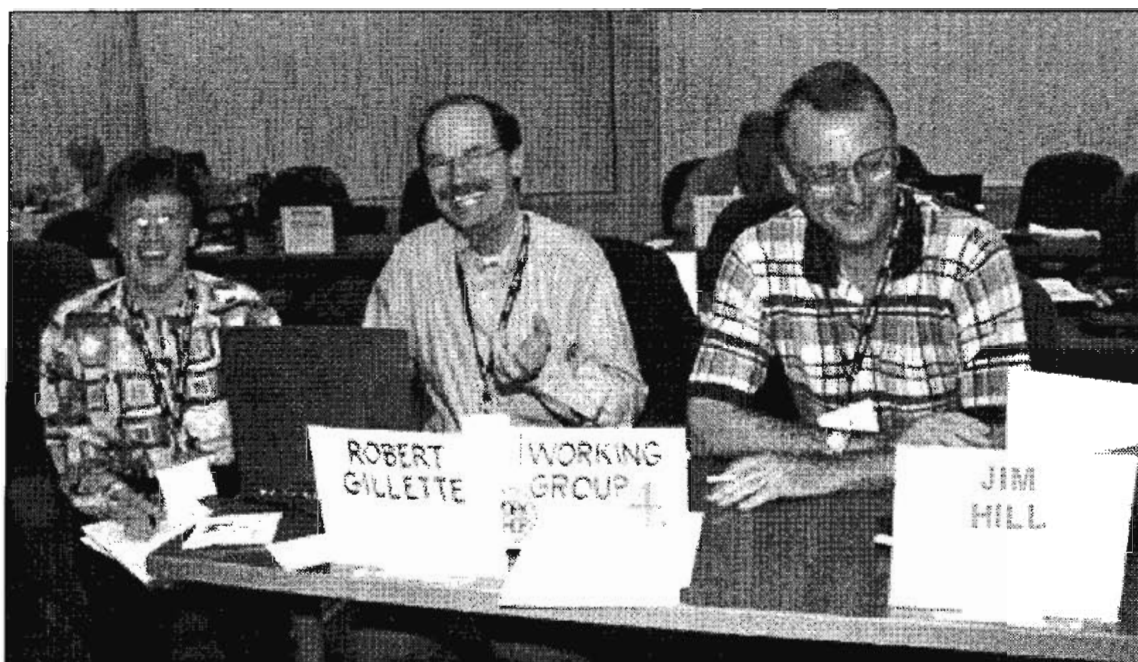
“Agree it was at a very high level. Really need to stress local and state benefits resulting from these alliances.”—***Marsha Eubanks***

“Engineering, construction, and operation and maintenance must be done in close cooperation of state and regional environmental policies.”—*James Hill*

“A very ambitious approach. All efforts should be made to follow through.”—*Albert Page*

“Rational approach to interagency communication that fits the way current policy making occurs. But this mechanism is usually slow, and the question is if this process can get ahead of the demands of the organics residuals issues. I’m not sure they can – they’re behind now. What about an “organics czar” at the federal level?”—*Blake Sanden*

“Hard to understand what is being proposed. Perhaps a systems approach is very clear to persons who do the same. The presentation was at a complex level. A lot of specifics were lost that were placed into this topic area yesterday. Can more specifics and clarity of thinking be incorporated into this report?”—*John Walker*





## PRIORITY 4

# Public Health Concerns

### WORKING GROUP MEMBERS:

Gillette, Hill, and Lester

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#### *Barrier Description:*

Health issues are foremost in the public's mind and the root of their fears. Cancer, emerging pathogens, allergies, HIV, and other diseases are part of our daily lives. The public health concerns with regards to composting and biosolids facilities include:

- Odorous compounds, including ammonia. (Odors have been the single most important issue in siting and closing down facilities. Odors can imply public health problems.)
- Airborne dust (particulate) from process operations and truck trackout.
- Other air emissions – diesel exhaust, volatile organics, bioaerosols.
- Pathogens, especially viruses and bacteria, and toxins (lead and mercury).
- Vectors – flies and rodents.

The public perception of adverse health effects associated with these concerns about compost/biosolids facilities can be a strong public platform against siting a facility.

Arguments about the effectiveness of controls (enclosures, biofilters, etc.) can inhibit decision making by public officials. Previous negative experiences increase this barrier.

The public focuses on potential negative health impacts of the proposed facility, not the larger regional health and public policy problems that the facility was designed to address.

Regulatory agencies also may delay siting if larger health issues (regional air and water quality) are not addressed.

Understood or foreseen health concerns are already a significant barrier, but they are something we can assess and propose controls. When the known concerns are coupled with the potential for unforeseen or unknown diseases and pollutants (as we often see in the news), this barrier is harder to overcome. When the effectiveness of controls for the known concerns are questioned, the unknown simply exacerbates public concerns.

***Importance:***

This barrier generates public opposition to any type of siting.

***Approach:***

**Answer the Public**

- Use the Environmental Impact Report (EIR) to analyze project-specific impacts and mitigation.
- Form a citizens advisory committee (CAC) as early as possible; solicit health professionals (see listed individuals below) to advise the CAC; provide the CAC with documented evidence as to what has been found and is known.
- Demonstrate that biofilters can work – show good odor control facilities; identify good composting operations using odor control similar to the proposed facilities in Edmonton, Canada; Davenport, Iowa; Longmont, Colorado.
- Take public officials and citizens to see the facilities or potential sites; talk to people living in those areas; and obtain feedback from those groups.
- Establish a well-planned system for responding to public comments and questions; publish a telephone number and e-mail address for immediate contact.
- Change processes to reduce exposure to odor, particulates, pathogens, and endotoxins; create a plan to ensure the ongoing maintenance of controls (enclosures and biofilters); and inform the public.
- Provide education opportunities for local physicians regarding the effects of biosolids and other composting operations on public health.
- Provide this information on a web page.

**Inform the Decision Makers and Officials**

- Identify design elements that reduce public health concerns.
- Identify a known location to dispose of manure and biosolids during an emergency.

- Take public officials, citizens, and elected officials to see the facilities or potential sites.
- Work with local officials and the public to identify concerns and information needs.

#### Respond to the Regulatory Agencies

- Have agencies (SCAQMD, CIWMB, RWQCBs) and academia independently review and assess emissions testing. Involve them early (i.e., test designs).
- Propose mitigation for truck-out (see SCAQMD Rule 403), emissions (e.g., idling, support of alternative fuels or particulate traps), and traffic (e.g., flow design).
- Respond to agency comments on EIRs.

#### Design Considerations to Reduce Health Concerns

- Set up systems (to evaluate and address potential problems):
  - monitoring program
  - contingency plan, if the monitoring shows an increase in the parameters measured, including the ability to shut down the facility until the problem is corrected. Emergency power generation.
- Build a redundant system.
- Monitor and mitigate truck traffic impacts.
- Develop Emergency Action Plans.
- Develop an Environmental Management System (EMS).

#### Identify Other Information Needs

- Analyze the incremental impacts of organics management projects; document the extent of the problem.
- Analyze the impacts from trucking the materials to other further locales.
- Study emerging pathogens issues of concern in animal manures, biosolids, and other organic materials. A better perspective on this issue should arise from the NWRI/IEUA organics workshop in June 2001.
- Encourage a working relationship between industry and agencies to organize and provide medical/scientific evidence of safe operation of compost/biosolids facilities. Educating undecided residents will be the key to ensuring that perception does not overrule reality.

- Determine the extent of irritation and inflammation from odor and particulates, endotoxins, and pathogens via a team from the United States Drug Administration (USDA), involving also John Walker (EPA), Duke University, a contractor, and perhaps others.
- Determine:
  - chemical characteristics of air emissions
  - biological characteristics of air parcels from source
  - human responses to ambient air exposures
  - meteorological measurements
  - psychological profiling
- Identify critical control areas that can be monitored and which can lead to process modification.
- View manure as a feedstock to be used for more than a soil amendment (e.g., wall board manufacturing, use in adhesives manufacturing, or heat drying).
- Evaluate biosecurity issues related to dairies and organic management facilities.

***Recommended Task Group Members:***

Health Experts

- Dr. Jean Ospital (SCAQMD Health Effects Officer)
- Dr. Mary McDaniels, (310) 392-6462, [mfmcdaniels@mclam.com](mailto:mfmcdaniels@mclam.com)
- Local Family Practitioners

Technical Support

- Air Regulator:
  - South Coast Air Quality Management District staff, Julia Lester.
- Water Regulators:
  - California Regional Water Quality Control Board (CRWQCB) – Santa Ana River Basin
  - USEPA
- Solid Waste Regulator:
  - California Integrated Waste Management Board (CIWMB), Jeff Watson
- Health Regulator
  - San Bernardino County Health Department
- IEUA Regional Policy & Technical Committees

- Industry
  - National Biosolids Partnership (NBP)
  - Water Environment Federation (WEF)
- Health Related Research:
  - Dr. Charles Gerba, Pathogens in the groundwater – University of Arizona
  - Dr. Marilyn Yates, Pathogens in groundwater –University of California, Riverside
  - Dr. Alice Pell - Cornell
  - Dr. Bill Yanko, Pathogen survival/regrowth – LA County Sanitation District
  - Dr. Robert Cooper
  - Dr. Mark Sobsey, Microbiologist – University of North Carolina

***Comments considered by the Working Group and incorporated into this report:***

“Dr. Mary McDaniel should be added to this group.”–***Blake Anderson***

“Other individuals who may be able to provide insight into the potential associated with pathogen health issues associated with biosolids and manure product exposures would include Dr. Mark Sobsey from the University of North Carolina and Dr. Charles Gerba from the University of Arizona.”–***Robert Bastian***

“Add Dr. Gerba (Arizona). Compile and provide to the public a comprehensive document on public health issues (both pro and con) pertaining to biosolids and manure composting facilities. This should include, as much as possible, gray literature (e.g., the State of Illinois evaluation of potential health impact).”–***Eliot Epstein***

“Public health concerns. Health effects concerns do not warrant scientific/logical answers. In addition, agency needs to work with cities-government agencies the public understands. No one reads his or her water/sewer bills. Web page – linked to cities.”–***Marsha Eubanks***

“Do not underestimate the general public’s understanding of the regionwide benefits of an integrated organics management strategy, but attempt to understand a local community’s resistance when they alone may be the receptors of the negative impacts (whether potential, real, or perceived) of an associated regional facility placed next to them. The perception of unfairly having to shoulder the impacts will be heightened when a particular industry (dairies) stands to benefit.”–***Chip Leslie***

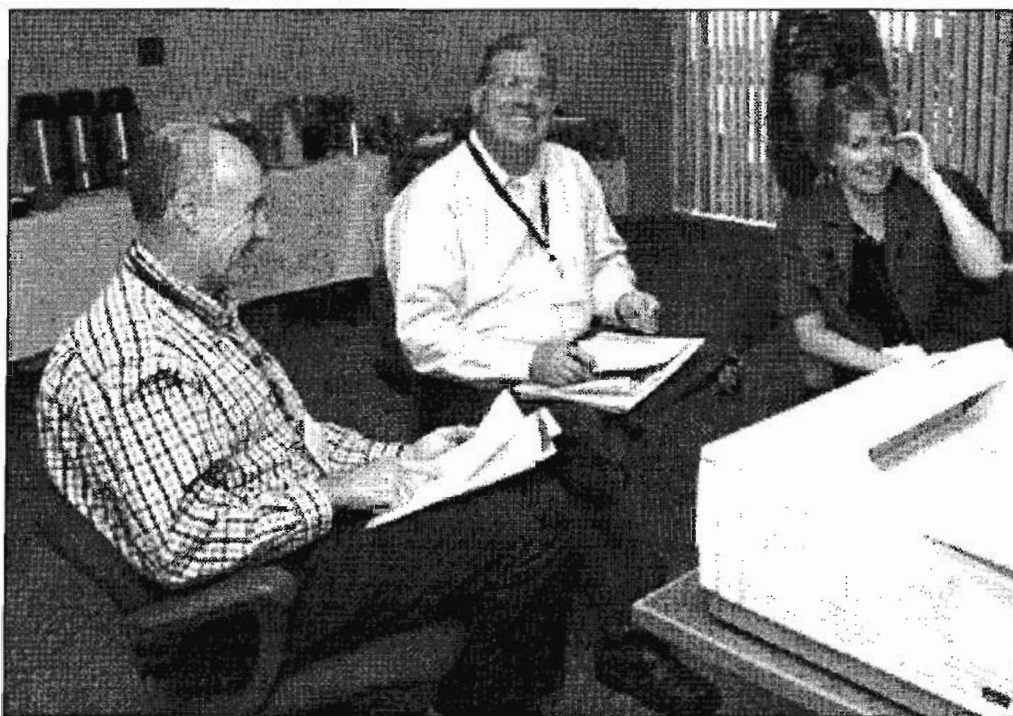
“Education of local physicians regarding effects of biosolids on human health. More professional studies regarding public health and biosolids reuse.”–***Lorrie Loder***

“No other barrier addresses the biosecurity for the dairies. Possible transfer of disease and/or virus from one site to another. Specifically the trucks hauling from the dairies to the Chino Basin Organics Center or from the center back to the dairy.”–***Marvin Mears***

“Establish an immediate contact for complaints. Telephone number with a knowledgeable person available to respond to complaints on a timely basis. E-mail address with timely response; establish a web page.”—*Albert Page*

“Other area individuals for health concerns: Dr. Marilyn Yates, University of California Riverside, pathogens in groundwater. Dr. Bill Yanko, Los Angeles County Sanitation, research in pathogen survival/regrowth on compost.”—*Blake Sanden*

“Excellent write-up and presentation. One addition I believe that you should study is in regards to existing operations with respect to composting, land application, and annual dairy operations.”—*John Walker*



## PRIORITY 5

# Public Opposition: NIMBY (Not-In-My-Backyard)

### WORKING GROUP MEMBERS:

Briggs, Earsom, and McCalley,

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#### *Barrier Description:*

Overcoming the Not In My Backyard (NIMBY) syndrome.

#### *Importance:*

Siting a multiple-faceted compost-processing facility in a transitional urban/rural setting is critical to the IEUA in developing a self-sufficient facility for biosolids/manure/green waste transformation. Siting is the most difficult task. Although the citizens may be in favor of recycling, they do not want such a facility near their homes. They will cite issues of odor, public health, aesthetics, traffic, noise, dust, etc. In addition, with public opposition comes political opposition that can lead to ordinance restrictions and permit denial.

However, composting facilities must be located somewhere. The expectation that other counties and states will take our wastes and solve our problems is not conducive to establishing a long-term sustainable recycling program.

Siting a composting facility near an existing wastewater treatment facility or heavy industrial area is recommended. In particular, a potential site in Chino is within the Regional Plant 5 (RP-5) recycling facility. However, the City of Chino Hills does not accept this site. RP-5 is located ideally for the sewerage of dairy washwater and manure and is a major digested solids center. RP-5 also has the skilled labor necessary for composting operations. Onsite composting would allow the moving of digested solids without trucking, reducing air quality and traffic impacts.

#### *Approach:*

Solicit community input through comprehensive meetings to ensure that citizens' comments, expectations, and needs are fully understood. We need to emphasize the overall environmental and economic benefits of the facility to the community. We need to stress that the IEUA is looking after the "greater good" of their ratepayers.

- Collaborate with the community to define and establish criteria to demonstrate a mutual long-term commitment to the success of the project. This can be accomplished through collaborative planning and siting of a facility to meet unfulfilled needs, such as recreation, arts, and open-space expectations of a forward-looking community. This could result in the development of sports complexes, parks, and recreational facilities or similar amenities defined by the citizens through scoping meetings with concerned citizens. In addition, financial incentives could be developed to encourage those in the sphere of influence to accept the project. We also recommend a give-away program for compost to all IEUA ratepayers. Citizens involved in the early stages of a project are frequently proud of the outcome when they have a stake in the success. With community input, the IEUA and the citizens can determine what is needed.
- Demonstrate that the processing facility's design criteria will be critical to ensuring a good fit with community's architectural expectations. Elements to be included may be berms, recessed or enclosed buildings, multiuse facilities, architectural treatments to share the spirit of the community, upscale fences or walls, vegetation, buffer zones, etc.
- Construct a model of the proposed facility to ensure that the "new" designers clearly understand the importance of the project and can visualize how the facility will be an asset to the community. The model will demonstrate the interface of key meteorological, climatologic (air movements), and geographic elements, recognizing how each will be either mitigated or enhanced.
- Establish an ongoing Citizens Advisory Committee. This group should be composed of community leaders. Individuals selected from service clubs, such as Rotary, Lions, Kiwanas, Garden Clubs, or other notable leaders, can function as advisors to build community trust and ensure that the local view of the community is respected.
- Define the environmental and financial benefits to the community. This facility will represent an opportunity to showcase the environmental foresight of the IEUA. Citizens must understand how their lives will be enhanced by this project and how they can individually benefit by the successful completion of this program.

***Recommended Task Group Members:***

Local community leaders and interest groups should be solicited to overcome the NIMBY syndrome. Formal mediators may be useful in solving some the citizen issues with IEUA officials. We recommend Michele Tuchman, Dr. Mary McDaniels (310) 392-6462 or Debra Stein.



***Comments:***

“Emphasize transparency, timeliness, and complete exchange of information between the IEUA and interested parties. The program should be proactive and always active.”—***Blake Anderson***

“As a follow up to ‘build it in my backyard,’ you may want to consider giving more visibility to groups and individuals to realize benefits from the project, or related projects, in other locations, including use of the products produced, suppliers of equipment, supplies relative to their increase in business, parks/recreation groups (assuming related amenities are made a part of the project), etc.”—***Robert Bastian***

“This barrier, along with many of the others, is driving home a point. All of these barriers are interlinked and synergistic. By themselves, addressing only one barrier without consideration of other barriers will doom the project(s) to failure.”—***Tracy Cork***

“There is a need for ‘conflict resolution’ to assist in gaining public trust.”—***Jim Earsom***

“Solicit and bring out the silent majority to public meetings. Let them understand environmental-tax implications by not having the facility.”—***Eliot Epstein***

“Do not forget compost give-away! Get to schools so they do not ban biosolids on their property if possible (Los Angeles Unified does). Give compost to Cal Poly Pomona so academics supports.”—***Marsha Eubanks***

“Try to establish win-win situations to overcome opposition.”—***James Hill***

“Do not underestimate the general public’s understanding of the regionwide benefits of an integrated organics management strategy, but attempt to understand a local community’s resistance when they alone may be the receptors of the negative impacts (whether potential, real, or perceived) of an associated regional facility placed next to them. The perception of unfairly having to shoulder the impacts will be heightened when a particular industry (dairies) stands to benefit.”—***Chip Leslie***

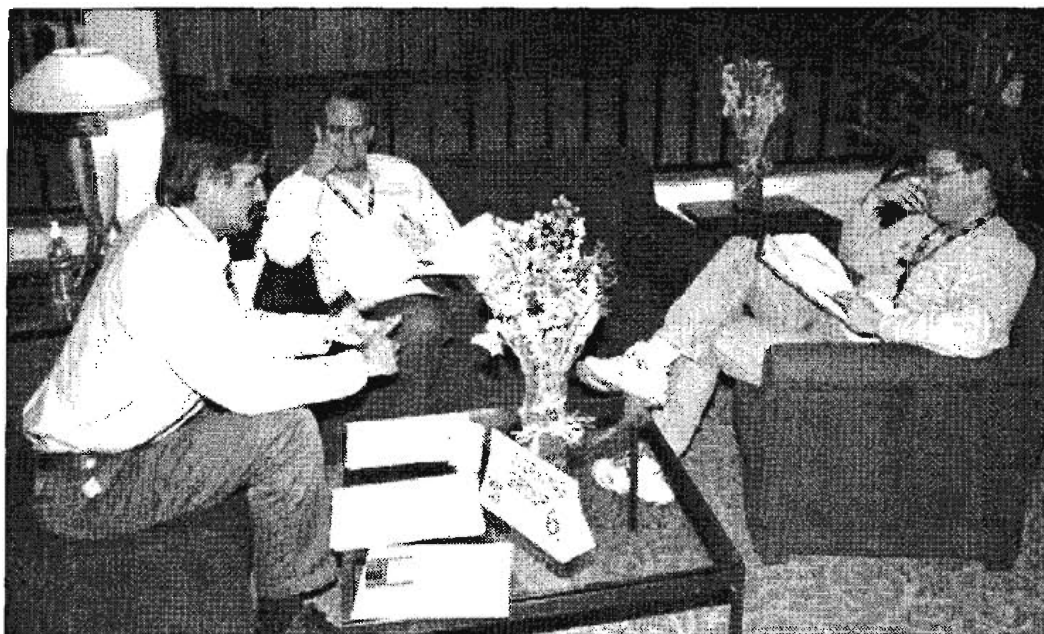
“Provide for public tours through the facility — education — awareness.”—***Marvin Mears***

“Applies to all work groups. Individuals best able to address, overcome and/or dissolve a barrier should come from the local community.”—***Albert Page***

“Should include straightforward information that is not ‘sugar-coated,’ i.e., statements such as, ‘This facility will not have odors associated with its operation.’ This statement, if presented to the community, can cause credibility issues and decrease public confidence in the operators, as this facility will omit odors and, if the biofilter fails, significant odors will overcome the community. The community should be educated and told that at times, odors will be generated from its operations, but the operators will attempt to manage and control odors, and, if the biofilter fails, the community will be immediately notified. Further, though the idea of parks dedicated to the community is a noble one, if a homeowner cannot enjoy a barbecue in their own backyard, they probably will not be able to enjoy picnicking in a park.”—*Geralyn Skapik*

“Might explore opportunities for win-win component-power. Manure management, greenhouse gas reduction. Provide recycled water. Compost to parks. Like the Freeway Trust in Washington state, which has a different purpose, but they work together. A trust of municipal, industry, and environmental groups even received funding from the state, EPA, and USDA. The GWT is highly effective for gaining public acceptance in the Seattle area. A never-ending process; a long-term commitment.”—*John Walker*

“The success of the facility means a better standard of living for the zones immediate to the facility. The greatest advantages are available to the closest neighbors; electric rate rebates, open space access, and recreational opportunities. Ongoing ‘participatory decision making’ must be employed with periodic outreach that reflects the changes in the various zones surrounding the facility.”—*Jeff Watson*



## **PRIORITY 6**

# **Lack of Meaningful and Effective Communications with the Public**

### **WORKING GROUP MEMBERS:**

Dusault, Leslie, and Sanden

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#### ***Barrier Description:***

- Imperfect information.
- Emotional and financial concerns of the public.
- Poorly conveyed information – comes across as incomplete, conflicting, or inaccurate.
- Too technical; information does not connect.
- Creating community confidence – what to do with the conflicting opinions of the “experts.”
- Lack of public awareness of organic matter recycling benefits to sustainable soil quality.
- Not understanding larger public benefits: improved groundwater and air quality benefits in the Chino Basin.

#### ***Importance:***

- A confused and ill-informed public is detrimental to facility siting, implementation and sustainability of operations of the Chino Basin Organics Management facilities.
- Emotion will fill in the spaces not occupied by appropriate information.
- To engender long-term community support.
- Political decision making follows public opinion.

***Approach:***

- Encourage events, site visits, education center, news articles, pamphlets, hotline, open house.
- Spend time in the neighborhoods; barbeques provide community benefits: compost, trees, electricity
- Do not overpromise.
- Develop relationship with press.
- Survey and respond to public concerns including health, environmental and financial.
- Emphasize the positive: improved water quality, air quality, land sustainability, and reduction in global warming.
- Provide useful, complete, accurate and understandable information.
- Disseminate latest research information in a user-friendly fashion – Internet, etc.

***Recommended Task Group Members:***

- Environmental representatives
- Independent consultants
- University researchers
- Public advisory committee including local officials
- Influential community organizations
- Educators/school principles
- Homeowners

***Comments:***

“Develop a better piece on the press. Talk about open, instantaneous, and complete information that the agency proactively provides the press. Give them the bad news. Read Peter Sandman on dealing with public outrage. Getting him here is too expensive (he does not work for free) but he’s very good. (609) 683-4073”—***Blake Anderson***

“What about efforts to actively involve the press from the get go and building a relationship with them over time as a source of information in order to respond to questions and issues, give visibility to similar operating facilities to be emulated. and respond to complains and problems.”—***Robert Bastian***

“Excellent point! Do not overpromise. Often, we have heard the words from the IEUA, ‘Don’t worry, the compost facility will be totally enclosed.’ This leaves the impression that it will never have an odor or dust event. This is not true! It will help minimize occurrences, but only if designed and operated properly.”—***Tracy Cork***

“Water Environment Research Foundation literature review of chemical, physical and biological properties of manures, biosolids, and chemical fertilizers. Project Manager Lynn Moss, CDM, Austin, Texas.”—***Eliot Epstein***

“Arlene Post, PIO, Las Virgenes MWD has worked extensively in getting information out regarding our odor issues at the compost plant.”—***Marsha Eubanks***

“To get favorable media coverage, arrange meetings with newspaper editorial boards. These connections usually pay long-term dividends. The team that meets with the editorial boards should be totally honest, understand details of the project(s) proposed, and have a believable reputation and demeanor.”—***Bill Gaither***

“Emphasize the need to be honest and up front with people. If you do not know, tell them you do not know, but that you will investigate the issue and get back to the individual.”—***James Hill***

“The agency should have a staff person whose sole responsibility is public information.”—***Albert Page***

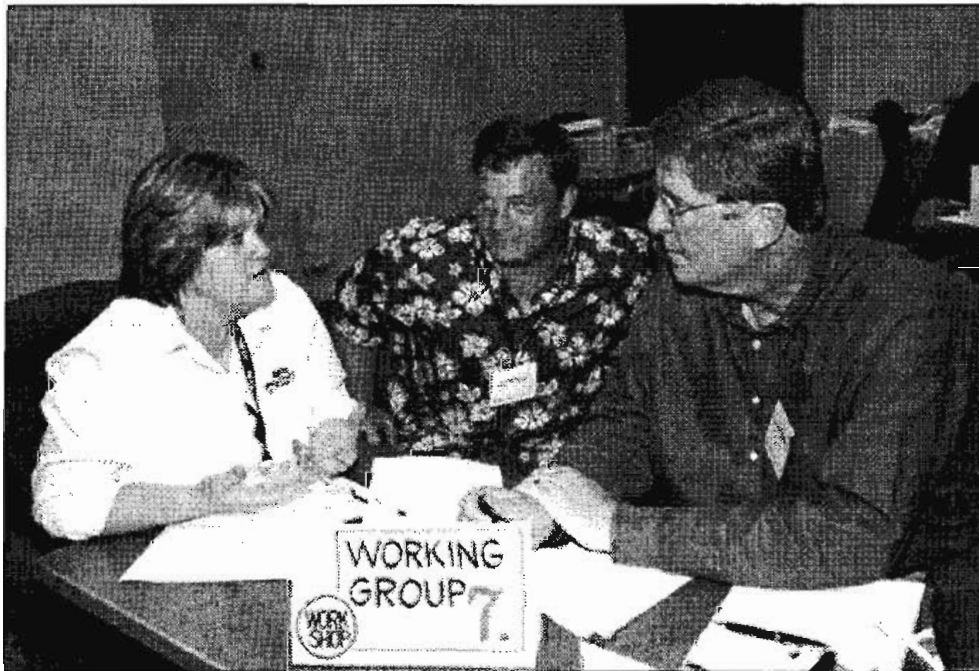
“Appropriate individuals:

Consultants: Ralph Jergens, New Era Compost, Fresno; Bob Dixon, Agronomic/Waste Management (also connected with Central Valley Agriculture, now working with Los Angeles County Sanitation).

University Researchers: Stu Pettygrove, compost quality/manure, University of California, Davis; Andrew Cheng, metals impacts; Jesus Valencia, compost in vegetable crops, University of California Cooperative Extension, Stanislaus; Blake Sanden, biosolids and compost in field crops; Thomas Harten, Hydrology of NO<sub>3</sub> and salt contamination, University of California, Davis, (530) 752-2709.”—***Blake Sanden***

“Should include straightforward information that is not ‘sugar coated,’ i.e., statements such as ‘This facility will not have odors associated with its operation.’ This statement, if presented to the community, can cause credibility issues and decrease public confidence in the operators as this facility will omit odors and, if the biofilter fails, significant odors will overcome the community. The community should be educated and told that, at times, odors will be generated from its operations, but the operators will attempt to manage and control odors and if the biofilter fails, the community will be immediately notified. Further, though the idea of parks dedicated to the community is a noble one, if a homeowner cannot enjoy a barbeque in their own backyard, they probably will not be able to enjoy picnicking in the park.”—*Geralyn Skapik*

“Need to more carefully define who you mean by the public. A communications plan for the Water Environment Federation (WEF) defines more public, each of which you need to communicate with, e.g., press, citizens, environmental groups, university people, local officials, etc. The techniques of communicating with different groups vary, and the reasons, benefits, and risks associated with each community vary. Ultimately, such a plan for communication should include this recognition and plan accordingly. I can supply you with a copy of this WEF communication plan or send it to you. Relationship building is essential.” – *John Walker*



## **Lack of Operational Competency**

### **WORKING GROUP MEMBERS:**

Anderson, Eubanks, and Watson

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#### ***Barrier Description:***

Maintaining credibility with elected officials, developing public support, meeting customer requirements, and maintaining regulatory compliance cannot be achieved without consistent operational competency.

Lack of credibility with elected officials limits access to needed resources (fees, grants, financing, technical support, regulatory flexibility).

Lack of public support will prevent continued operations at a given location. A poor track record of timely operational responsiveness and communication with the public increases public outrage and motivates the public to wage war against the agency. For instance, if the operations smell bad, pollute water, carry salts, pollutants or pathogens to humans via air, water, and/or food, the operations will not survive.

Without customer satisfaction, markets shrink, revenues decrease, inventory stockpiles, and we lose a place to put the materials.

Lack of regulatory compliance will result in fines, reduced operational flexibility and capacity, and the potential for litigation and outright shutdown of the facilities.

#### ***Importance:***

Customer service, neighborhood impacts, regulatory compliance, and the economic viability of these facilities depend upon consistently competent operation.

Long-term success requires that the technical processes employed are properly operated, maintained, and periodically refurbished. Competency must be provided by the entities responsible for the management of organic materials. Staff must be competent. Revenues must be adequate. Reserves must be in place.

To meet the expectations of the public, day-to-day communication is essential, including identification of key staff personnel responsible for managing complaints.

Odor control is essential to the success of such a project. A single odor event can generate substantial public dissatisfaction, and subsequent events will galvanize public opposition. Health concerns ride on odor perceptions. These perceptions doom any facility that is slow to repair its odor control system, such as biofilters.

Although federal, state, and local agencies have ordinances to regulate organic residual management, achievement and enforcement of these regulations are the responsibility of the industry.

Residents, business owners, and elected officials do not want to sense that “someone else” is responsible and are unable to determine who is working on the problem. The operator cannot pass the buck. Responsibility must be owned.

In the future, the ability to site or expand processing facilities depends on the successful operation of any regional facility, which has been previously constructed.

#### ***Approach:***

- Commitment by the community, the governing board, and management to a systematic approach in the long term for sustainable operations. This includes designing, operating and, in particular, funding the system to minimize dust, odor, air and water pollution and to maximize the production of a consistent, high-quality product.
- Develop and participate in an Environmental Management System (EMS) to address the residuals handling in a community-friendly manner for the entire operation, including:
  - National Biosolids Partnership – EMS operation/environmental and community impact independent third party oversight
  - ISO 9000 – product quality
  - ISO 14001 – operation/environmental and community impact

This includes involving local stakeholders early in the development of the EMS and in plans for identifying problems and implementing solutions.

- Have agencies such as SCAQMD, CIWMB, RWQCB and academia to independently and periodically review and assess operational processes. Involve them early (i.e., test designs).
- Develop a regional advisory committee composed of experts in the fields of public relations, design/operation of ongoing facilities, regulatory affairs, marketing, and product quality.



- Work with local officials and the public to identify concerns and information needs. Actively involve local community stakeholders and leaders in the development of management alternatives, system designs, and facility siting, as well as with participation in oversight of program implementation.
- Establish a data-management system encompassing all operational aspects to track the source of all loads and the place where products go. The information must be understandable and accessible so all interested parties can judge for themselves whether competency is being maintained. Use a web site for easy access.
- Contingency planning is a must. Build and operate redundant systems that comply with Best Management Practices. The operations and maintenance staff must quickly react to problems that will inevitably occur. This will greatly impact the sustainability of all regional management concepts – not just this one. Develop backup and problem response plans that are flexible enough to deal with the wide range of problems that will inevitably occur during the operation of the processing facilities, moving the final products in the market place, etc.

When problems occur, the public and regulatory agencies must know whom to call. There must be a well-publicized telephone number where an assigned staff member can be reached to respond and take immediate action.

- Recognize and fund the need for maintenance. A long-term, preventive-maintenance program using predictive methods and adequately funded must be committed to by the entities operating the facilities.

Ongoing training of operations staff and management is necessary to ensure products meet current marketing requirements, plant processes are optimized, and regulatory standards are consistently achieved. Professional certification programs available through the state of California and statewide professional associations should be used to the maximum extent possible.

***Recommended Task Group Membership:***

- John Hay/Lewis Naylor of Black and Veatch – Biofilter construction/maintenance
- Jeff Gage
- Montgomery Watson, Nutrients
- CH2MHill, Solids
- Robert Gummerman, Aliso Water Management Agency (943)770-6296
- Mary Matava

***Comments:***

“Well prepared report; detailed and comprehensive.”—*Albert Page*



## **PRIORITY 8**

# **Will the Design of the Chino Basin Organics Management Program Be Adequate to Ensure an “Acceptable” Risk-Free Level of Operation?**

### **WORKING GROUP MEMBERS:**

Mears and Walker

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### ***Barrier Description:***

The concern is that the design of the Chino Basin Organics Management program may not be of sufficient quality to ensure an “acceptable” risk-free level of operation. The quality of design includes flexibility, reliability, low health and nuisance risk, and sufficient redundancy so that risks are at low “reasonable” levels and costs are not too high. To ensure that the risk is acceptably low, the components of the design must be reliable and have a sufficient history of successful operation or appropriately pilot-tested as a basis for use in the program. Components of the design that must be quality controlled are the:

- Liquid-manure-wastewater treatment, including sidestream.
- Manure digestion.
- Composting system, including its biofilter, for controlling odor. Do the blends of bulking agent and manure or biosolids have sufficient porosity and energy for composting?
- Health and nuisance impacts.
- Marketable compost product.

### ***Importance:***

If the envisioned design of the Chino Basin Organics Management program does not work well, there will be increased public opposition, billions of dollars will have been wasted, and this major failure could have a devastating effect on the ability to manage the organic residues in the Chino Basin.

### ***Approach and Recommended Task Group Members:***

- The major assumption is that the static aerated pile-composting configuration under cover and with a biofilter will work well in the Chino Basin. The facilities would be larger and of somewhat different design than previously operated successfully at other locations. Put together a team of the most experienced operators of, and consultants for, static aerated pile composting, as well as other in-vessel systems, to critique/value engineer the proposed design. Areas not currently addressed in the draft business plan include the anticipated need for what type and amount of bulking material, how the bulking material will be prepared, the nature of mixing, and the need for screening. Another component that is not discussed is the potential need for storage of the compost product after curing. Some minimal storage would be needed onsite as well as a series of alternative places where the product could be taken after processing. Uses for off-spec products, such as daily landfill cover, would also be needed.

Over the years, there have been major failures of most of the components of composting systems. Several experts, who know where these failures have occurred, the improvements that have been made, and where weaknesses are still likely to be, are Joel Thompson and Charles Murray from the Washington Suburban Sanitary Commission, Clyde Wilbur of Greeley & Hansen, Larry Hentz of PBS&J, and Tim Haug of Los Angeles.

Simplicity of design has enabled some facilities to use feedstocks of widely differing properties and bulking materials that vary greatly without having to change the materials handling trains.

Knowing the right energy balance, moisture content and porosity of the feedstock, and bulking agent is vital (e.g., use of Tim Haug's Composting Handbook). Backup power is needed for compost aeration. Otherwise, without power, the composting can go anaerobic and odorous in minutes.

- The anaerobic digestion is planned to be pilot tested at full scale in an existing biosolids digester. Cattle manure of different ages will be tested. Conceptual designs should be scrutinized by outside consultants and subject to value engineering. One possible consultant is George Tchobanoglous, University of California, Davis.

The current energy crises with high costs for energy make the potential value of anaerobic digestion very high as a renewable source of energy. Additional benefits are the anticipated reduction in volumes of materials to be handled along with the reduction in greenhouse gases.

- Studies are needed to determine the potential exposure to odorants, pathogens, particulates, endotoxins in the air in and around the existing and proposed design of composting operations, in and around the dairy operation itself, and in and around land application sites for animal manures and biosolids. Such information is vital to determining the potential benefit of varying more costly designs in reducing potential exposure to nuisance and health

effects. Similar studies are to be undertaken by a team headed by Drs. John Walker, EPA, and Pat Millner, USDA.

- Consult with the National Biosolids Partnership (NBP) to develop and participate in an Environmental Management System (EMS) to help ensure that the design will provide for identification of critical control points so that residuals handling will be compliant and can be accomplished at reasonable cost in a community-friendly manner. Consult with Dr. Pete Machno of the NBP. This is a very important part of oversight as it provides for continual improvement and independent third-party oversight.

Another important part of oversight, and the ability to correct potential problems, is the establishment of a data management system to track the source of all incoming loads and the place where the products go.

- Involve local stakeholders early in the design and planned testing. This should ensure appropriate high-quality and operational design that will yield the desired environmental goals as well as have their buy-in oversight and solutions to design and operational problems that will inevitably occur and must be managed. An excellent consultant is Rob Greenwood of Ross and Associates.
- Provide for training to ensure that the design is operated properly, including the critical linkages via critical control points (part of the EMS concept) that ensure compliance and avoidance of nuisance and health problems.
- Have appropriate experts ensure that the compost products will be useful both from a safety and public acceptability point of view. For example, carrot growers want an animal manure compost of uniform high quality that does not contain biosolids, i.e., was not co-composted with biosolids.
- In short, design and operate to minimize dust, odor, and pollution of water and maximize the production of a consistent high-quality product.

***Comments:***

“Third-party involvement is an excellent idea. The IEUA should embrace this concept as completely as possible. Use value engineering. Use sufficient pilot work to be confident that what is selected will work.”—***Blake Anderson***

“Suggest that they check the historic work done by Bill Jewell, Cornell University, on anaerobic digestion/methane production and recovery from manures. He has done extensive testing of various anaerobic digester designs with different manure sources (as well as work on sewage sludge).

“You should consider involving Dr. Larry Beran with the Texas Institute for Applied Environmental Research that has been addressing airy manure management for a county in Texas that has even more dairy cows than Chino, and he has been working on a comprehensive program with congressional add-on funds for a number of years now. Their experience and information should be useful in helping you to avoid making the same mistakes they have already made!

“Also, Dr. Frank Humenik at North Carolina State University is coordinating a national effort to develop a series of white papers on a wide range of animal manure management issues and management practices involving agricultural engineers, extension types, etc., from approximately 16 Land Grant Universities across the country.”—**Robert Bastian**

“Need to consider digester processes — much more likely point of failure — much less experience — European technology new here — issues when incorporating green waste, human waste, and manure in some digesters.”—**Allen Dusault**

“A microscopic review of plans – looking as an operator also, not as an engineer – is critical. Look for bottlenecks and areas where amendment/compost can clog equipment. This becomes an operator’s nightmare. Time and energy is required to clean-out these bottlenecks.”—**Marsha Eubanks**

“Where can the IEUA find experienced and capable operators? Where were the biosolid composting failures, and what were the causes? List some possible pitfalls.”—**James Hill**



## **PRIORITY 9**

# **Unforeseen Circumstances and Costs for the IEUA Organics Management Strategy in Southern California**

### **WORKING GROUP MEMBERS:**

Cork, Joy, and Skapik

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### ***Barrier Description:***

This barrier includes anything that could adversely impact, delay, derail, muddle, or sidetrack the implementation of the Chino Basin Organics Management concept. All public projects and programs have a degree of uncertainty associated with them. This barrier encompasses elements from virtually all of the other identified barriers.

For example, the fundamental question in Priority 8 is: “Will it work?” Clearly defining the project goals and constraints, operational and maintenance requirements, and associated costs is a method used to “acid test” the basic design concept. If, during this process, issues or problems are identified, several mechanisms can be used to address them. Pilot studies can be designed and run to refine design criteria and add certainty to the expected results. The design approach can be altered to mitigate or eliminate the problem. If all else fails, the project goals can be modified so that a realistic design approach will result in a successful project.

By definition, “unforeseen” defies quantification. If a problem or issue is not “unforeseen,” it can be dealt with through the careful planning and execution of the process. As nebulous as this sounds, it underscores the primary premise of this barrier. By thoughtful and careful application of planning, engineering, construction, and project implementation practices, the goal is to reduce the number of “unforeseen” issues to a manageable level.

A few examples of the areas in which unforeseen issues can arise include:

- Increases in capital and operation and maintenance costs due to insufficient or inadequate design procedures.
- Litigation costs resulting from inadequate siting investigations or the lack of public involvement.
- Impacts from changes in regulatory requirements.

The potential for unforeseen circumstances and costs is relatively high, as many of the technologies being proposed have not been implemented with widespread success.

***Importance:***

Unforeseen circumstances can result in astronomical costs or insurmountable barriers that can render a project infeasible.

***Approach:***

Recommended analyses:

Only through the careful application of strategic project planning, innovative project implementation techniques, realistic financial planning, and interactive public participation can “unforeseen circumstances and costs” be reduced to a manageable level.

The following are some of the techniques for reducing risk:

- Conduct Value Engineering Workshops for each of the identified technology approaches by recognized experts.
- Develop a list of pilot projects that clearly defines the scope and information needs for each project based on the results of the Value Engineering Workshops.
- Conduct a new, unbiased siting analysis using the applicable barriers identified in this workshop session.
- Peer review the Conceptual Design Report, including assumptions used in design criteria, cost estimates, and conclusions.
- Conduct constructability reviews and develop a realistic phased implementation plan.
- Subject projects to operational reviews from those with directly applicable experience in operating similar facilities or programs.
- Develop a sound financial plan, including a realistic assessment of capital and life cycle costs and offsetting revenue streams.
- Subject projects to regulatory and permitting reviews by federal, state, and local regulators early in the planning process and throughout the design and implementation phase.
- Conduct workshops to identify current and potential regulatory requirements.



- Based on the results of the previous items, conduct a Proper Environmental Analysis – preparation of an EIR/EIS following all CEQA/NEPA requirements.
- Educate the general public as to how the proposed project will impact them.
- Clearly establish monitoring requirements for regulatory compliance and day-to-day process control.

The following are some examples of the potential high-cost items this project may encounter:

- In review of the ventilation system requirements for the enclosed facility, the biofilter required for the facility is 520,000 cfm; this rate of exchange will result in 12 air exchanges each day, which exceeds fire code requirements and creates a comfortable work environment. The costs for this biofilter (as estimated by this workshop) total \$41M: \$31M for construction of the biofilter; \$6M for maintenance of the biofilter; and \$4M for ammonia and the humidification of the biofilter. Previous estimates fall short of this. This difference is significant; applying value engineering, conceptual design review, and constructability review to this project should refine costs estimates and process equipment requirements.
- Since the facility is located in an ozone nonattainment region, the air permitting for the composting facility and the energy generation facility will most likely require emission offsets and best available control technology (BACT) for the new stationary source equipment being installed, such as biofilter, internal combustion engines, and microturbines. If the IEUA cannot create emission offsets within their current facility, then these offsets can be requested from the emission reduction credit (ERC) reserve that has been set aside for these types of essential public services. If the reserve does not have the required amount of ERCs, then the ERCs can be purchased or leased. ERCs are not readily available in this region and can be high in cost. Potential unforeseen costs associated with purchasing ERCs and installing BACT on the equipment should be included in the cost analysis.
- Currently, the Santa Ana Regional Water Quality Control Board is redefining their basin plan by changing subbasin boundaries and their objectives for nitrogen and total dissolved solids (TDS). These changes are scheduled to go before the Executive Board for approval in early 2002. The proposed basin plan objectives for nitrogen and TDS have been reduced in the Chino basins. These objectives will be used to regulate the discharges of wastewater, storm water, and land application of the biosolids from this facility. Analysis of the waste streams from this facility needs to be analyzed in light of these new basin-plan objectives.

Litigation associated with siting of this facility should be anticipated. Therefore, there must be critical thinking as to where such a facility is to be located. If the site is near a residential urban community, litigation will likely be initiated. Proper environmental analysis is required that complies with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Such analysis will avoid possible CEQA/NEPA challenges, which can significantly delay the construction of the project in question. If sited near an urban/residential setting, even with proper environmental review, the potential is high for nuisance lawsuits. The cost associated with resolving such lawsuits is hard to quantify.

- In the event that something goes wrong, the growers, adjacent owners, and the general public need to be assured that a responsible agency will bear the cost. The liability needs to rest with the generator, namely, the wastewater treatment plant. Stakeholders must be assured that they will be compensated for any loss incurred where systems fail. Informing the general public and stakeholders that the liability of the system rests with the owner/operator of the facility should reduce any public relations issues.
- Animal health and disease issues and their potential to derail the transportation of manure need to be analyzed. Protocols for entry and exit of composting facilities may need to be established as well as decontamination protocols.

***Recommended Task Group Members:***

- Engineers, planners and scientists – experts in various elements of each project
- Legal experts experienced in facility siting, land use, the public process, and the CEQA/NEPA process
- Regulatory compliance managers
- Community relations officers
- Financial planners with experience in public projects

***Comments:***

“Consider a revenue stream, tax or fee, that would be available for unforeseen circumstances and costs.”—***Eliot Epstein***

“Staffing estimates may be too low and become a recurring cost. Maintenance costs are underestimated. Corrosion environment harsh.”—***Marsha Eubanks***

“This topic should address emerging pathogens and pharmaceuticals. It also needs to specifically address new regulations. Of specific concern should be dioxin regulations, county ordinances, and dust during application (i.e., 50 percent solids limitations in the statewide biosolids General Order).”—***Robert Gillette***

“Budget for ongoing relations projects and conflict resolution.”—***Lorrie Loder***

“Regulatory reporting and constraints over salt loading/interbasin transfers may create significant costs in the future.”—***Blake Sanden***

“Provide adequate funding for start-up, pilot-testing, and modification that will be needed. Also realize that these problems will occur, and there will be a need for modification. The presentation does an excellent job of suggesting how to keep these problems to a manageable level – also as mentioned in Working Group 8.”—***John Walker***



## **Lack of Product Marketing and Manufacturing Using Organic Resources**

### **WORKING GROUP MEMBERS:**

Graham and Munsey

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### ***Barrier Description:***

Not having the marketing and manufacturing systems to succeed in a competitive market.

### ***Importance:***

The agency has up to 1,000,000 tons per year of organic solids to convert into products. The agency's products must win the competition for customer's chosen dollar or it will be left with a huge disposal cost.

### ***Approach:***

Focus on customer needs and markets and then develop products to fit those needs.

- Develop a long-term contractual partnership with a soil improvement marketing organization. Jointly develop a long-term marketing and manufacturing program.
- Determine market size and differentiate the market into different service and quality levels.
- Provide guarantees of full satisfaction, including full compliance with all environmental requirements and responsibilities.
- Learn the various quality certification standards and other quality standards that are valued by customers, the publics, and regulators.
- Seek way to use the power of brand recognition either by developing a new brand or using existing brands.
- Decide whether to co-compost or to segregate dairy and biosolids.

- Use the Internet to assist in research and delivery of services.
- Form joint agreements with other public agencies to create supportive competition.
- Develop ongoing supportive relationships with horticultural experts in the areas that are credible with potential users.
- Support a research foundation that conducts appropriate demonstration trials of composted products and makes presentations to local groups. Help these experts connect with national biosolids experts and become a resource for more complicated situations needing expert assistance.
- Develop clear product standards that meet selected customer needs.
- Consider providing services along with the compost (like soil testing), if such a service adds adequate value to the product. This is particularly applicable to large institutional accounts.
- Look for opportunities to broaden the marketing of products to include items such as compost by-products, fertilizers, bedding materials, electrical, energy, hot water, and organics processing.

***Recommended Task Force Membership:***

- Local marketing research firms
- Compost companies currently supplying customers in the area
- Academic researchers

***Comments:***

“Use a broad spectrum of product names/product quality/product uses. “Compost” or “soil conditioner” is too narrow. Look to multiple markets. Look to independent markets. Work toward national standards and product identification. Add the folks from the Texas Institute of Applied Environment Research. They have done a lot on market issue. Larry Beran is the contact at (254) 968-9567.”—***Blake Anderson***

“Explore the potential for meeting already established markets for consistent quality composted products, such as the Kellogg’s brand name products. Emphasize consistent product quality. Consider other products that will or could be produced by the processing facilities, including energy and waste heat, bedding fertilizers, etc.”—***Robert Bastian***

“More than one product: mulch, fertilizer, bedding, manufactured products (e.g., building materials, landfill cover, impermeable cap); digesters (heat, CO<sub>2</sub>, methane, and electricity)”—**Allen Dusault**

“Under Approach, include: Each city or community contributing waste to the facility should be willing to commit to take a certain percentage or quantity of material for their own use. Encourage or legislate that state agencies should utilize compost, e.g., DOT, parks, etc.”—**Eliot Epstein**

“Good description of barrier. I like your points. They are clear and concise. Imperative to have local urban research included. Do you need to include cost benefit analysis of outside marketing (e.g., Scott’s, Kellogg’s) versus trying to do it in-house? Major cost increase to budget.”—**Marsha Eubanks**

“We need to stress that we are reusing a product, not disposing of sewage sludge.”—**Robert Gillette**

“Do not use ‘Chino’ in the material brand name”—**James Hill**

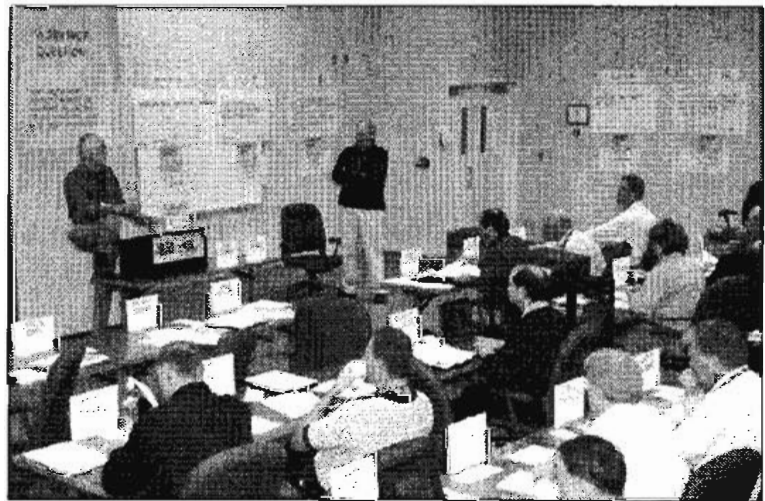
“Expand/implement various channels of marketing efforts to include product branding, base for other brands, mine reclamation, and landfill daily cover.”—**Lorrie Loder**

“Good report. Refine specific market opportunities and expand broader effort to relate to positive vision of Chino.”—**Steve McCalley**

“The scope of the market needs to be expanded. There are many other potential uses of compost. These should be identified and included in any market analysis. Name recognition for the product should assist in marketing. Bandini and Kellogg come to mind.”—**Albert Page**

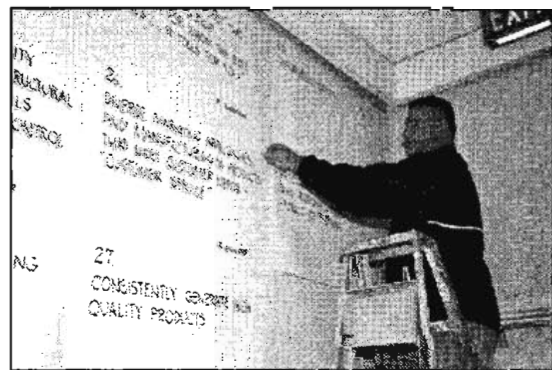
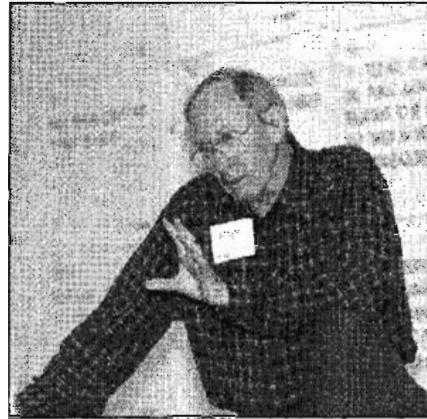
“Good approach. Create market name and services that come as a package. Linking with local experts and getting their endorsements is the key.”—**Blake Sanden**

“Include in discussions a spectrum of products that could result. For example, bedding, fertilizer from sidestreams, wallboard, landfill daily cover, energy recovery, etc. Consider talking about stability measurements for process control to meet an ISO 9000 standard for various uses. Mention Compost Council Certification Program. Consider speaking of pros and cons for composting. Cons: Certain users will not accept biosolids compost. May have additional limiting regulations for a biosolids/animal manure blend. Pros: A more holistic approach. Could use the benefits of each product, i.e., creating a designer product.”—**John Walker**





## NGT WORKSHOP



## INTRODUCTION

**Participants Presented Their Highest Priority Barrier Descriptions That May Inhibit the Chino Basin Organics Management Concept From Being Implemented. One-hundred-and-one Individual Responses Were Presented in Written Form and Delivered Orally During the NGT Workshop.**

Several University of Wisconsin professors, led by Dr. Andre Delbecq, decided in the mid-1960s that business and professional meetings were often inefficient and did not produce the results that the individuals assembled were capable of producing. The result of their work was, among other accomplishments, the conceptualization of the Nominal Group Technique (NGT). The name derived from the notion that any meeting comprises a “nominal group” of participants convened for a particular purpose. The essence of the process required that the participants meet and immediately write their most perceptive and penetrating responses to a prepared question. No discussion was allowed. This avoided the domination of the meeting by one or more vocal individuals and gave each participant the opportunity to have an equal voice in response to the question.

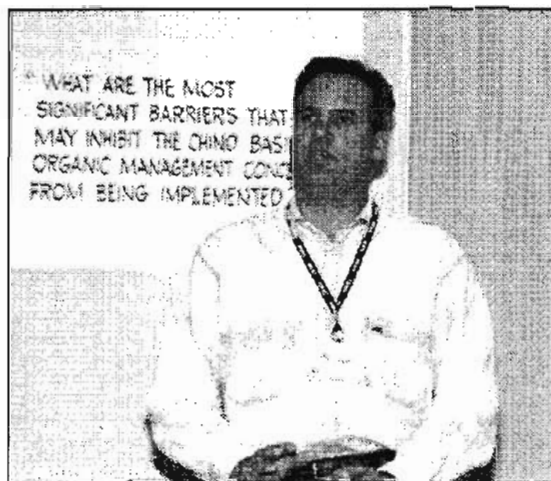
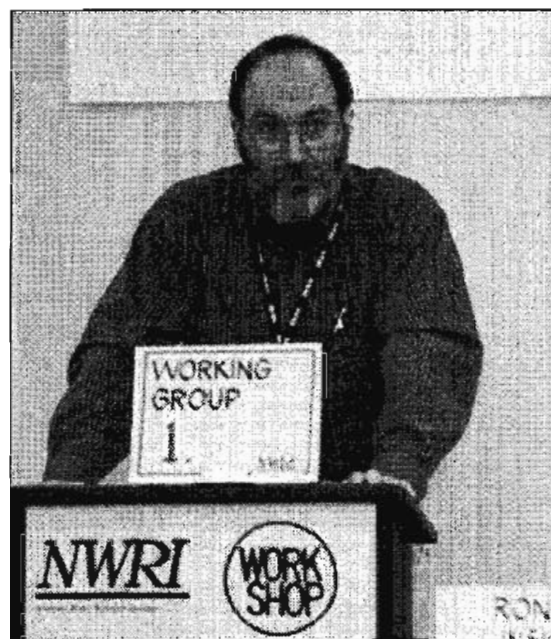
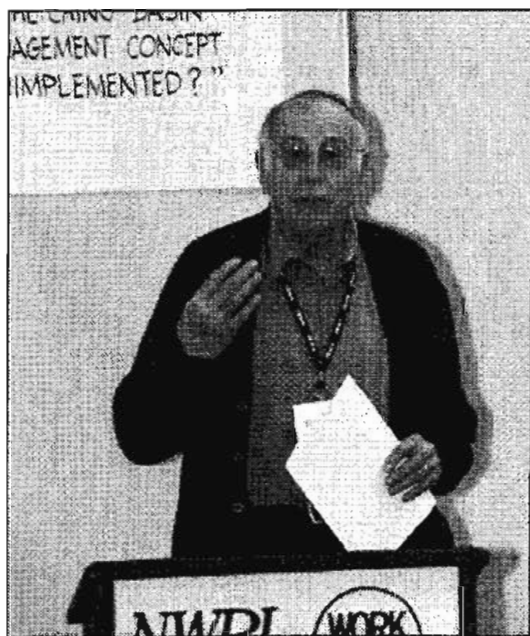
Over three decades have passed since the NGT process was devised. During that time it has been modified and enhanced by Dr. William S. Gaither, working during the last ten years with the National Water Research Institute. This report presents the results of the NGT workshop held on April 18-20, 2001. The question that was put before the 28 participants was ***What are the most significant barriers that may inhibit the Chino Basin Organics Management concept from being implemented?***

In the afternoon on the 18th, participants were taken on a bus tour of representative Chino Basin Organics processing facilities. Following the tour, the consultant leaders presented the results of their work to date.

On the following morning, April 19th, the NGT workshop convened at 8:00 a.m. It comprised three parts:

- Identification of barriers (101 were identified).
- Consolidation of barriers into major barrier areas (21 major barrier areas resulted).
- Ranking by each participant of their ten highest priority major barrier areas.

Following the ranking process, participants went to dinner and the workshop staff tallied the ranking results. Upon returning from dinner, participants were assigned to working groups, and their reports are presented in Part 1 of this document.



## PRIORITY 1

### Siting

**Originators:**

Epstein on behalf of himself, Bastian, Leslie, and Hoover

*The following barriers were consolidated under the above title:*

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**Title:**            **Siting**

**Originator:**    Epstein

***Barrier Description:***

Locating an organic materials handling facility is the most difficult task. Although people are generally in favor of recycling, they do not want a facility located near them. They will cite issues such as odors, public health, aesthetics, traffic noise, dust, etc.

***Importance:***

This is the single most important issue in the establishment of a facility.

***How Do You Propose Overcoming This Barrier?***

- Select a location near an existing wastewater treatment plant or an already established facility in a remote or heavily industrial area.
- Involve the citizens of the community in the entire process by establishing a Citizens Advisory Committee; meeting with citizen groups (e.g., Lions Club); keeping citizens informed of actions; and providing a mechanism for correcting problems, including shutting the facility down.
- Stress and document the environmental benefits.

- Conduct an odor model and show the public where a similar analysis was correct.
- Provide incentives to the local community.

---

**Title:**            **Siting New Processing Facilities and Keeping Them in Operation**

**Originator:**    Bastian

***Barrier Description:***

The ability to site new processing facilities and to keep them in operation is imperative to implementing the Chino Basin Organics Management concept.

***Importance:***

Unless new processing facilities can be established and kept in operation, the Chino Basin Organics Management concept will not be able to be implemented.

***How Do You Propose Overcoming This Barrier?***

Actively involve local community stakeholders and leaders in the development of management alternatives, system designs, and facility siting, as well as with participation in oversight of program implementation.

---

**Title:**            **Land Use Incompatibility**

**Originator:**    Leslie

***Barrier Description:***

The project has the potential to have, and to be perceived to have, adverse impacts (air quality, including pollution, odor, and dust; health concerns; noise and traffic) that make it incompatible with residential, commercial, or recreational uses. The project should not be placed in proximity to existing or planned urban use areas. If an adequate site or sites without significant adverse land-use impacts cannot be identified, this would be a significant barrier. A potential problem is a perceived inequitable sharing of burden, not just nimbyism.

***Importance:***

Sites that are in the proximity of existing or planned urban use areas may be infeasible to develop with the proposed project due to insufficient proven technology and economic infeasibility to mitigate adverse impacts to a level of insignificance.

Inadequate analysis of environmental impacts, inadequate mitigation measures, and inadequate alternative siting analysis could result in legal challenges that may delay or render the project infeasible.

Real and/or perceived adverse impacts will generate political opposition due to the outcry by constituents.

***How Do You Propose Overcoming This Barrier?***

Locate the project site(s) a significant distance away from existing or proposed urban development areas.

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***Title:*** U.S. Census: "Too Many People." – Deal With It

***Originator:*** Hoover

***Barrier Description:***

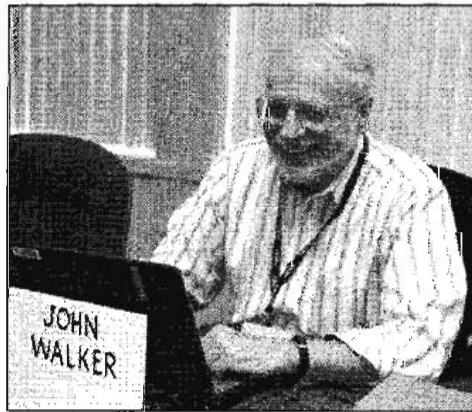
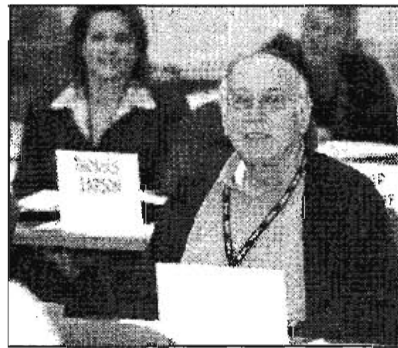
Not in my backyard (NIMBY) is a siting barrier that is not compatible with urban development. Sites in Chino that are located around the RP-5 water recycling plant are being challenged by the City of Chino Hills as unacceptable. The perception is that other counties and states will take our waste and solve our problem.

***Importance:***

RP-5 is located ideally for sewerage dairies and is a major digested solids center. Digested solids need to be processed. RP-5 also has the skilled labor necessary for composting operations. Local solids processing (onsite, or near the R-P5 site) would allow the pumping of digested solids without trucking.

### *How Do You Propose Overcoming This Barrier?*

- Demonstrate that totally enclosed building(s) are effective for process and nuisance control.
- Build a model display.
- Visit related sites and facilities and document compatibility.
- Demonstrate the environmental benefits.





## **Public Nuisance Associated With Odors, Dust, Vectors, Traffic, Noise, Etc.**

**Originators:**

Page on behalf of himself, Epstein, Loder, and Walker

*The following barriers were consolidated under the above title:*

---

**Title:**            **Public Nuisance Associated With Odors, Dust, Vectors, Traffic, Noise, Etc.**

**Originator:**    Page

***Barrier Description:***

The most frequent complaint encountered in the management of manure and wastewater treatment residuals is its nuisance impact on neighboring communities. In a number of respects, the Chino Basin Organics Management strategy has planned for the control of nuisance by confining operations near sites where organics are generated, through the vessel digestion of organics, through the use of pipelines for transport of organics, and through indoor composting of organics. However, although it is possible to minimize nuisance with present day technology, it is not possible to eliminate it.

***Importance:***

As the region becomes more and more residential, the numbers of people exposed to organics management operations will increase. It is important to overplan for nuisance control in all design operations.

***How Do You Propose Overcoming This Barrier?***

All systems must operate to their design capacity. Provisions need to be in place to overcome a breakdown at all stages in the design operation.

---

**Title:**           **Odor Resulting from Composting Operations**

**Originator:**   Epstein

***Barrier Description:***

Odors have been the single most important issue in siting and closing down facilities. Odors can imply public health problems.

The USEPA is evaluating odor as a health factor (e.g., asthma, stress, etc.).

***Importance:***

The public is aware and concerned that the facility would create odors. They are concerned as to the reduction of property values and the inability to sell property. They are concerns about lifestyles and enjoying their property.

***How Do You Propose Overcoming This Barrier?***

- Identify good composting operations using odor control similar to the proposed facilities in Edmonton, Canada; Davenport, Iowa; Longmont, Colorado.
- Take public officials, citizens, and elected officials to see those facilities and talk to the citizens in the area near the facility.
- Obtain feedback from these groups.
- Assure the community that the facility will contain the best technology and will have the ability to deal with problems.
- Establish a system that the citizens will have confidence in.
- Design a good facility that incorporates effective technology.
- Biofilters do work—show good odor control facilities.

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**Title:**           **The Human Nose Is Subjective**

**Originator:**   Loder

***Barrier Description:***

Monitoring programs must include quantifiable scientific technologies to detect odors.

***Importance:***

The ability to quantify and scale any offsite odors is imperative to a successful program. The agency should implement a program for odor measurement.

***How Do You Propose Overcoming This Barrier?***

- Use scientific odor panels and technology to measure odor levels.
  - Work on legislation to implement odor measurement standards.
- 

**Title:**           **Public Fear of Health Effects from Odor, Pathogens, and Particulates in the Air**

**Originator:**   Walker

***Barrier Description:***

Determine the potential exposure to odorants, pathogens, particulates, and endotoxin in the air, in and around a composting operation, the dairy operation itself, and the land application sites.

***Importance:***

If the operation smells bad, it will not survive for a long time period. Likewise, if the operations are causing health problems, they will survive for an even shorter period of time.

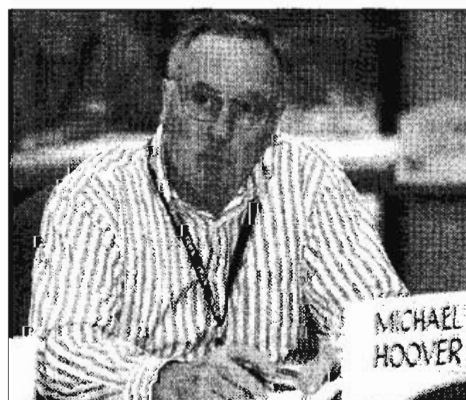
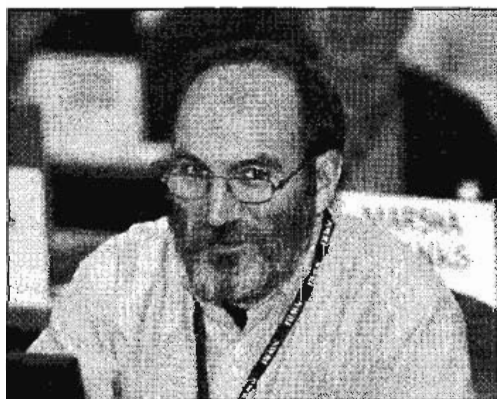
### *How Do You Propose Overcoming This Barrier?*

Determine the extent of irritation and inflammation from odor and particulates, endotoxin, and pathogens via a team from the United States Department of Agriculture, involving also John Walker (USEPA), Duke University, a contractor, and perhaps others.

Determine:

- Chemical Characteristics.
- Biological characteristics of air parcels from source.
- Human responses to ambient air exposures.
- Meteorological measurements.
- Psychological profiling.

Change processes to reduce exposure to odor, particulates, pathogens, and endotoxin.



## **PRIORITY 3**

# **Coordinated Regional Multi-Media Environmental Policies That Encourage the Recycling of Organic Material in a Long-Term Sustainable Manner**

### **Originators:**

Atwater on behalf of himself, Bastian, Chang, Hoover, Sanden, and Wilkinson

*The following barriers were consolidated under the above title:*

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**Title:**           **Coordinated Regional Multi-Media Environmental Policies That Encourage the Recycling of Organic Material in a Long-Term Sustainable Manner**

**Originator:**   Atwater

### ***Barrier Description:***

Proper recognition of the multiple environmental benefits of proper reuse and recycling of organic material (e.g., biosolids, manure, food waste, and green material) to reduce air, water, and land environmental problems is critical to provide incentives to proper resource management.

In California, the Chino Basin Organics Management strategy effort has involved the Santa Ana Watershed Group to facilitate the dialogue with local, state, and federal agencies.

- **Local:** Orange, Riverside, and San Bernardino Counties, numerous cities, water and wastewater utilities, the South Coast Air Quality Management District (SCAQMD), Metropolitan Water District of Southern California, Chino Basin Watermaster, Santa Ana River Watermaster, Milk Producers Council, landfill agencies, etc.
- **State Agencies:** California Energy Commission, Public Utilities Commission (PUC), California Food and Agriculture Agency, California EPA, Air Resources Board, Resources Agency, State Water Resources Control Board (SWRCB), Integrated Waste Management

Board, Santa Ana Regional Water Quality Board, Fish and Game, CALFED Bay-Delta Program, and the Department of Health Services.

- Federal Agencies: USEPA, U.S. Department of Energy, USDA, Department of the Interior, U.S. Geological Survey (USGS), U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers.

### ***Importance***

Recognizing the benefits of multi-media solutions on a watershed basis justifies leveraging public investments in a coordinated manner to encourage long-term solutions to organics management.

### ***How Do You Propose Overcoming This Barrier?***

Implement watershed-based “inclusive” dialogues to coordinate local, regional, state, and federal agency policies to ensure that coordinated regulatory approaches and public investment policies are integrated.

---

***Title:***           **Water Recycling Really Works**

***Originator:***   Atwater

### ***Barrier Description:***

Desalting contaminated groundwater is very expensive (Chino 1 Desalter) – approximately \$800/acre foot (50 percent higher than the cost of imported water from the Metropolitan Water District of Southern California) or \$700 per ton to remove salts. Preventing groundwater contamination is much more cost effective (less than \$100 per ton).

### ***Importance:***

Shortage of clean water requires recycling and treating poor-quality water.

### ***How Do You Propose Overcoming This Barrier?***

Value recycling and conservation of organic material.

---

**Title:**           **Where Will All the Salt, Etc., Go?**

**Originator:**   Bastian

***Barrier Description:***

Ultimate disposal of the salt and other sidestream materials generated by the groundwater recovery operations and biosolids/manure processing facility operations.

***Importance:***

Management of the salt and other sidestream materials generated by the overall program may well dictate whether it is economically feasible. Current plans are to discharge many of these residuals to the Santa Ana River Interceptor (SARI) sewer line and rely upon Orange County Sanitation District to handle the processing of these residuals – but at what cost, what constraints, and with what long-term commitments? The potential limitations associated with the final products to be marketed by the program have yet to be clarified and may well exacerbate this issue as well.

***How Do You Propose Overcoming This Barrier?***

- Incorporate more detailed plans for addressing the management of salt and other sidestreams as a part of the program plans.
- Obtain clear commitments from the Orange County Sanitation District as to its willingness and ability to handle the processing of residuals planned to be discharged to the SARI line.
- Gain a better understanding of the acceptable salt levels in the final products to be generated and marketed by the program.

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**Title:**           **Systems Analysis of Waste Processing and End-Product Marketing Options to Minimize Disposal Costs**

**Originator:**   Chang

***Barrier Description:***

In the Chino Basin, there are waste streams of various quantities and characteristics. There are also seasonal and spatial variations in quantities and characteristics. Each waste stream (or a blend of several) is suitable for certain treatment processes or for producing specific end products. The systems analysis approach should be employed to determine how much of which wastes are going into which treatment processes (to produce certain end products) and, therefore, end up in which market so that the total cost of waste disposal is minimized.

***Importance:***

Properly set-up systems analysis enables the basinwide comprehensive analysis of all options and for the entire waste stream. In multiple site facilities, it will also optimize the capacity of each site. In this manner, the least costly and most sustainable alternatives for the management of wastes can be identified.

***How Do You Propose Overcoming This Barrier?***

Develop a systems analysis model to analyze the organic wastes management options.

---

**Title:**           **Financially, Too Expensive...As Compared to What?**

**Originator:**   Hoover

***Barrier Description:***

Existing practice(s) are cost effective, and the perception is that they could be continued indefinitely.



***Importance:***

A totally enclosed facility is more costly than current operations. This is significant to member agencies and the public.

***How Do You Propose Overcoming This Barrier?***

First, confirm and convince agencies and the public that existing practices will not be allowed in the future. Second, provide local self-reliant solutions compatible in cost to alternative solutions (locally and regionally), and then confirm costs after the preliminary design. Use contractor and operator's estimates to compare with the engineer's estimates.

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***Title:***            **Pass the Salt – Organic Amendments to Agriculture May Be Incorporated in Future Salt Balance Accounting**

***Originator:***    Sanden

***Barrier Description:***

Salt concentrations in industrial/municipal and agriculture processing effluents are regulated in many hydrologic basins in California. This will eventually be extended to formal standards for the total mass of salts allowed on an annual basis. The Tulare Lake Basin Plan was conceived more than a decade ago and will be upgraded in the near future on a formal basis. Manure loadings and the potential salts they carry may come under standards. If this happens, then it will be a short time before all organic materials on all farm acreage will be brought under reporting requirements.

***Importance:***

The implementation of salt-loading standards may restrict interbasin transfers of salts and, hence, limit the options of compost markets. The Santa Ana River Basin is already overloaded with salts. Most of the southern San Joaquin Valley is the same, although not as concentrated in most of the municipal area aquifers. Regulators at the Central Valley Regional Water Control Board want to see NO additional salts imported at this time.

The additional digestion of manure for energy production will further concentrate salts and decrease the value of the easily available nitrogen content. This can potentially decrease the market appeal of the product.

### ***How Do You Propose Overcoming This Barrier?***

This may be solved by tracking “salt credits” of imported forage to offset salts contained in organic amendments exported out of the basin. The quality of water used to make composts, however, has a significant impact on the final salt load in the material, which may be more than the “credits” the basin has allocated for export.

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***Title:***           **Fully Quantify the Multiple Benefits of an Integrated Strategy for Organics Management**

***Originator:***   Wilkinson

#### ***Barrier Description:***

Cost/benefit analyses are often done on single factors rather than on integrated packages.

#### ***Importance:***

Benefits are not fully understood or quantified (e.g., storm water runoff, greenhouse gas emissions, and truck traffic reduction).

### ***How Do You Propose Overcoming This Barrier?***

Analyze the full, integrated package of techniques and technologies as a whole, and quantify the full benefits as well as costs.

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***Title:***           **Economies and Diseconomies of Scale**

***Originator:***   Wilkinson

#### ***Barrier Description:***

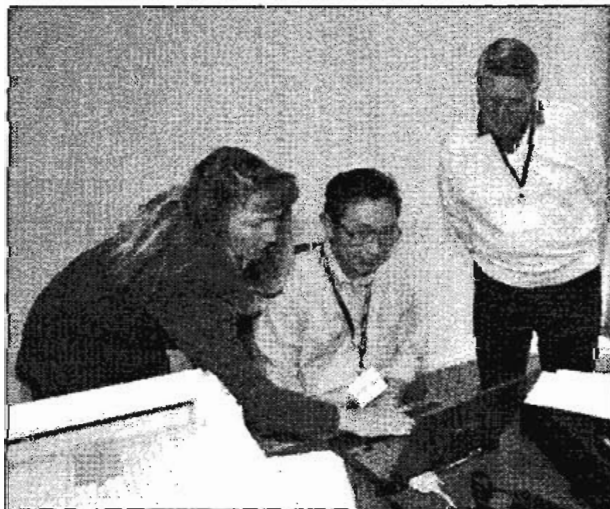
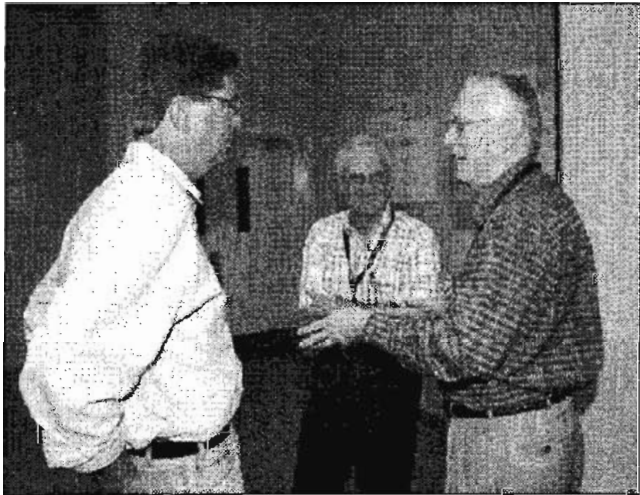
Issue: Advantages and disadvantages of centralization and decentralization.

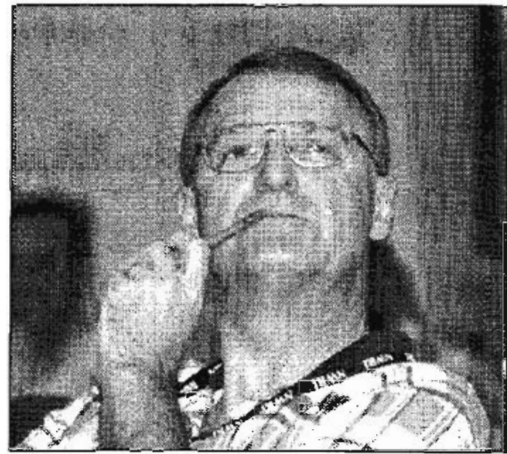
***Importance:***

- Resilience and redundancy.
- Concentrating problems.

***How Do You Propose Overcoming This Barrier?***

Examine the advantages and disadvantages.





## **Fear of Public Health Dangers**

**Originators:**

Epstein on his behalf, Hill, Lester, Loder, and Walker

*The following barriers were consolidated under the above title:*

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**Title:**           **Fear of Public Health Dangers**

**Originator:**   Epstein

***Barrier Description:***

Public health issues are foremost in the public's mind and fear. Cancer, emerging pathogens, allergies, HIV, and other diseases are part of our daily lives. The public health concerns with regards to composting and biosolids facilities include:

- Bioaerosols.
- Pathogens, especially viruses and bacteria.
- Chemical emissions – volatile organics, lead, and mercury.
- Organic dust.
- Vectors – flies and rodents.

***Importance:***

Health fears can be persuasive in convincing officials, groups, and individuals that the facility will represent a significant health problem.

### ***How Do You Propose Overcoming This Barrier?***

- As early as possible, form a Citizens Advisory committee (CAC).
  - Provide the CAC with documented evidence as to what has been found and is known.
  - Set up systems to evaluate and address the potential problem:
    - monitoring program
    - contingency plan, if the monitoring shows an increase in the parameters measured, including the ability to shut down the facility until the problem is corrected.
  - Solicit health professionals to serve on the CAC.
- 

***Title:***            **Odor Resulting from Composting Operations**

***Originator:***    Epstein

### ***Barrier Description:***

Odors have been the single most important issue in siting and closing down facilities. Odors can imply public health problems.

The EPA is evaluating odor as a health factor (e.g., asthma, stress, etc.).

### ***Importance:***

The public is aware and concerned that the facility would create odors. They are concerned as to the reduction of property values and the inability to sell property. They are concerned about lifestyles and enjoying their property.

### ***How Do You Propose Overcoming This Barrier?***

- Identify good composting operations using odor control similar to the proposed facilities in Edmonton, Canada; Davenport, Iowa; Longmont, Colorado.
- Take public officials, citizens, and elected officials to see those facilities and talk to the citizens in the area near the facility.
- Obtain feedback from these groups.

- Assure the community that the facility will contain the best technology and will have the ability to deal with problems.
  - Establish a system that the citizens will have confidence in.
  - Design a good facility that incorporates effective technology.
  - Biofilters do work—show good odor control facilities.
- 

**Title:** Overcoming Three Mile Island Syndrome

**Originator:** Hill

***Barrier Description:***

Technologically, it is possible to engineer and construct several beautiful and efficient state-of-the-art facilities, as proposed. It is a given that we can compost manure and biosolids to be marketed for retail sale and to generate bio-gas for use in the process. When the system is shiny new and operating at peak capacity, it will be the envy of the world. But what happens during maintenance shut downs or power outages? Or worse yet, when the digestors or aerated static system fails? What happens if the system is severely damaged by an earthquake?

***Importance:***

An inoperable system will generate noxious odors, flies, and other vectors. The fallback position will probably require trucking the stockpile away, which will result in a huge increase in truck traffic on local streets, rapid deterioration of the street pavement, and the accumulation of manure and biosolids within the cities.

***How Do You Propose Overcoming This Barrier?***

Prior to it ever being needed, the implementation of:

- System redundancy.
- Emergency power generation.
- Emergency Action Plan, approved by Chino and Chino Hills.
- A known location to truck manure and biosolids during an emergency situation.

---

**Title:**           **Truck Emissions and Traffic**

**Originator:**   Lester

***Barrier Description:***

Diesel trucks would most likely be used to bring in compost feed stock (e.g., manure, green waste, biosolids) and bring out the finished compost. Diesel trucks are the major source (71 percent) of cancer-causing air emissions in the Basin. Truck traffic can cause the track-out of material onto public roadways, which ultimately can be entrained into the local air. Traffic impacts from truck traffic may be (or may be perceived to be) significant.

***Importance:***

- The Mira Loma Study has highlighted the impact of trucks in the industrial areas of the Inland Empire.
- The public is sensitive to truck traffic on local roads.

***How Do You Propose Overcoming This Barrier?***

- Analyze the incremental impacts of organic management projects.
- Analyze the impacts if materials are trucked to further locales.
- Propose mitigations for track-out (see SCAQMD rule 403), emissions (e.g., idling, support of alternative fuels or particulate traps), and traffic (e.g., flow design).
- Use the Environmental Impact Report (EIR) to analyze project-specific impacts and mitigations.
- Contact the SCAQMD California Environmental Quality Act (CEQA) section for air-quality assessments.
- Work with cities on traffic impacts and mitigations.



---

**Title:** Emissions Control Effectiveness: “He Said, She Said”

**Originator:** Lester

***Barrier Description:***

Arguments about the effectiveness of controls (enclosures, biofilters, etc.) can prevent officials and the public from making decisions.

***Importance:***

Arguments over “facts” can reduce public trust, which is essential to their approval.

***How Do You Propose Overcoming This Barrier?***

- Work with local officials and the public to identify concerns and information needs.
  - Have agencies (SCAQMD, CIWMB, RWQCBs) and academia independently review and assess emissions testing. Involve them early (i.e., test designs).
  - Create a plan to ensure the ongoing maintenance of controls (enclosures and biofilters).
- 

**Title:** Public Perception of Health Effects Related to Siting Compost Facilities

**Originator:** Loder

***Barrier Description:***

Public perception of adverse health effects associated with compost/biosolids facilities can be a strong public platform against siting a facility.

***Importance:***

The Chino Basin Organics Management concept might be inhibited if the project does not address the health concerns of the public. The emotional outcry of residents at public meetings will snowball if the project does not take a proactive approach to public perception regarding health

***How Do You Propose Overcoming This Barrier?***

Industry should work together to organize and provide medical/scientific evidence to support no known health impacts to surrounding communities of compost/biosolids facilities. Educating undecided residents will be the key to ensuring that perception does not overrule reality. An Environmental Management System will help to provide continuing education once sited.

- National Biosolids Partnership
  - Water Environment Federation
  - USEPA
- 

***Title:***            **Public Fear of Health Effects from Odor, Pathogens, and Particulates in the Air**

***Originator:***    Walker

***Barrier Description:***

Determine the potential exposure to odorants, pathogens, particulates, and endotoxin in the air, in and around a composting operation, the dairy operation itself, and the land application sites.

***Importance:***

If the operation smells bad, it will not survive for a long time period. Likewise, if the operations are causing health problems, they will survive for an even shorter period of time.

### ***How Do You Propose Overcoming This Barrier?***

Determine the extent of irritation and inflammation from odor and particulates, endotoxin, and pathogens via a team from the United States Drug Administration, involving also John Walker (USEPA), Duke University, a contractor, and perhaps others.

Determine:

- Chemical Characteristics.
- Biological characteristics of air parcels from source.
- Human responses to ambient air exposures.
- Meteorological measurements.
- Psychological profiling.

Change processes to reduce exposure to odor, particulates, pathogens, and endotoxin.

---

***Title:***            **Public Fear of Health Effects from Pathogens, Nutrients, Salts, Other Toxins and Biological Oxygen Demand (BOD) in Water**

***Originator:***    Walker

#### ***Barrier Description:***

Determine the potential exposure to pathogens, nutrients, salts, toxins, and BOD in the water in and around a composting operation, the dairy operation itself, and land application sites.

#### ***Importance:***

If the operation continues to pollute the water, it must change or be closed. Likewise, if the operations are causing documented health problems, they will survive for an even shorter period of time.

### ***How Do You Propose Overcoming This Barrier?***

- Document the extent of the problem.
  - Identify critical control areas that can be monitored and that can lead to process modification.
  - View manure as a feedstock to be used for more than a soil amendment (e.g., wall board manufacturing, use in adhesives manufacturing, or heat drying, or buying out dairies).
- 

***Title:*** Will Composting Control All the Pathogenic Agents of Concern?

***Originator:*** Walker

### ***Barrier Description:***

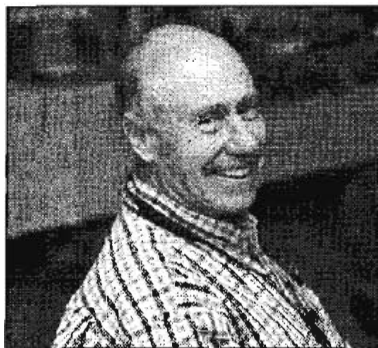
We need to know the limits of composting to control all pathogenic agents of concern (e.g., prions).

### ***Importance:***

- Do not oversell what you are doing.
- Know your limitations.

### ***How Do You Propose Overcoming This Barrier?***

There are emerging pathogenic issues of concern in animal manures, biosolids, and other organic materials. A better perspective on this issue should arise from the NWRI/IEUA organics workshop in June 2001.



## **Public Opposition**

**Originators:**

Earson on behalf of himself, Briggs, Epstein, and Hoover

*The following barriers were consolidated under the above title:*

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**Title:**           **Public Opposition**

**Originator:**   Earson

***Barrier Description:***

Most people agree with the concept of an environmentally sound and sustainable way of organic waste management. What the majority of people are opposed to is the organic waste management processing sites being located close to their homes.

***Importance:***

With public opposition comes political opposition, which can lead to ordinance restrictions.

***How Do You Propose Overcoming This Barrier?***

Make the organic waste management center a desired neighbor, like a park or open space. The center can be an attribute to the neighborhood. Use of the site could be restricted to the neighborhood only, creating a feeling of ownership.

---

**Title:**            **Not-In-My-Backyard (NIMBY) Syndrome**

**Originator:**    Briggs

***Barrier Description:***

Even if citizens buy a home or business next to an existing manufacturing facility, landfill, sewage treatment plant, highway, or sports park, etc., they may later complain to government authorities or homeowner associations about problems such as noise, after-dark lighting, odors, dust, trespassers, truck or automobile traffic, etc. When locating a new facility, there is even more public outcry against many of the same issues. These types of facilities either need to be remotely located or otherwise need to be as “neighbor-friendly” as economically and technologically feasible. However, these types of facilities must be located SOMEWHERE and not exclusively in low-income communities (environmental justice issue).

***Importance:***

Some people will never be satisfied with the final decision, but the silent majority can accept a project if they were included in the PROCESS. The Chino Basin Organics Management center will have to encounter the same NIMBY syndrome in locating new management facilities. The citizens will not be swayed by the lofty goals of the project (i.e., recycling, cleaning up groundwater, creating a marketable product from a waste product, etc.) but, rather, the project’s impact (or minimization of the impact) on their personal lifestyle.

***How Do You Propose Overcoming This Barrier?***

- Look for remotely located sites, if possible and economically feasible.
- Build the facility with a design that is pleasing to the eye and, at least, as “upscale” as the surrounding community.
- Use trees, flowers, and other landscaping to hide the facility and buffer the negative impacts.
- Use upscale fencing to surround the facility (use wrought iron, wood, or stucco instead of chain-link with barbwire, if possible).
- Enclose the facility and use odor control.
- Minimize truck traffic through the surrounding community.

---

**Title:**        **Siting**

**Originator:**   Epstein

***Barrier Description:***

Locating an organic materials handling facility is the most difficult task. Although people are generally in favor of recycling, they do not want a facility located near them. They will cite issues such as odors, public health, aesthetics, traffic noise, dust, etc.

***Importance:***

This is the single most important issue in the establishment of a facility.

***How Do You Propose Overcoming This Barrier?***

- Select a location near an existing wastewater treatment plant or an already established facility in a remote or heavily industrial area.
- Involve the citizens of the community in the entire process by establishing a Citizens Action Committee; meeting with citizen groups (e.g., Lions Club); keeping citizens informed of actions; and providing a mechanism for correcting problems, including shutting the facility down.
- Stress and document the environmental benefits.
- Conduct an odor model and show the public where a similar analysis was correct.
- Provide incentives to the local community.

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**Title:** U.S. Census: "Too Many People." – Deal With It

**Originator:** Hoover

***Barrier Description:***

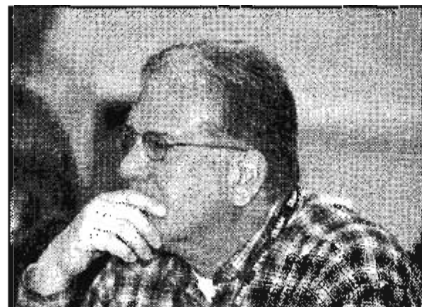
Not-in-my-backyard (NIMBY) is a siting barrier that is not compatible with urban development. Sites in Chino that are located around the RP-5 water recycling plant are being challenged by the City of Chino Hills as unacceptable. The perception is that other counties and states will take our waste and solve our problem.

***Importance:***

RP-5 is located ideally for sewerage dairies and is a major digested solids center. Digested solids need to be processed. RP-5 also has the skilled labor necessary for composting operations. Local solids processing (onsite, or near the R-P5 site) would allow the pumping of digested solids without trucking.

***How Do You Propose Overcoming This Barrier?***

- Demonstrate that totally enclosed building(s) are effective for process and nuisance control.
- Build a model display.
- Visit related sites and facilities and document compatibility.
- Demonstrate the environmental benefits.





## **Inadequate Public Information**

**Originators:**

Leslie on behalf of himself, Anderson, Atwater, Graham, Hill, Loder, McCalley, Sanden, and Wilkinson

*The following barriers were consolidated under the above title:*

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**Title:**           **Inadequate Public Information**

**Originator:**   Leslie

***Barrier Description:***

Insufficient, incomplete, or inaccurate information is provided to the public. Aspects of the project that are not made generally known or understood will come as a surprise to the public. Conflicting information will confuse. Not fully explained information will cause misconceptions.

***Importance:***

Fosters mistrust by the public and results in public and political opposition.

***How Do You Propose Overcoming This Barrier?***

Identify all aspects of importance on the project and inform the public in terms they can understand and be comfortable with.

---

**Title:** "Where is Ted Danson When You Need Him?" We Need a Spokesperson for This Problem

**Originator:** Anderson

***Barrier Description:***

Without an understanding of the immense implications of this problem by legislators, city councils, and the public, we will have a limited ability to fund and implement large-scale environmental and water resources improvements.

***Importance:***

We cannot move without a shared vision.

***How Do You Propose Overcoming This Barrier?***

Find a champion who is credible, well known, and knowledgeable. Does Martha Stewart want to help? Recycling: it's a good thing.

---

**Title:** Coordinate Federal Research and Development on Organics Residuals Management

**Originator:** Atwater

***Barrier Description:***

The USDA, USDOE, and USEPA need to do a better job of coordinating the federal funding of research and the development of biosolids, animal manure, food waste, and green material utilization. A National Academy of Sciences Committee on research priorities, venture capital product development, and cutting edge new technologies (that can be tested and demonstrated) is needed.

Include research for new regulatory standards, product development, and nuisance standards (odor, dust, and other air emissions.)

***Importance:***

A federal leadership role can help in developing long-term sustainable technologies for organics management that addresses the multi-media issues (e.g., air, water, and land pollution).

***How Do You Propose Overcoming This Barrier?***

An Executive Order to create a federal research council to coordinate multiple-agency funding of research and development. Use the National Academy of Science committees to recommend research priorities.

---

***Title:***            **Underestimating the Value of the Web Relating to the End-Product Marketplace**

***Originator:***    Graham

***Barrier Description:***

We need to augment local end-product marketing strategies with internet-based strategies.

***Importance:***

Our competitors will use it.

***How Do You Propose Overcoming This Barrier?***

- Identify our “portal” partners.
- Design the web portal site.
- Identify “co-portal” existing outlets.
- Monitor and track what is being done elsewhere.
- Probe regional “quantity/bulk buy” marketplace.

---

**Title:**           **Data Acquisition – Do We Have It?**

**Originator:**   Graham

***Barrier Description:***

Have we looked at communicating with other agencies or groups regarding request for proposals for data acquisition?

***Importance:***

Lost opportunity to add information that supports project development.

***How Do You Propose Overcoming This Barrier?***

- Define the initial data we can supply.
  - Profile the areas where this data will be sourced.
  - Find out the “price” placed on this data.
  - Target local, state, regional, and national agencies.
- 

**Title:**           **How Do We Get Accurate Information Out?**

**Originator:**   Hill

***Barrier Description:***

When engineers and scientists speak to the public, they are often more concerned about being technically accurate than communicating useful and helpful information. The barrier is the use of technical jargon and speaking down to the public, and then asking them to “trust” us.

***Importance:***

The public will stop trying to understand and become emotionally and intellectually defensive.

***How Do You Propose Overcoming This Barrier?***

- I do not know!
  - Perhaps use residents who live near similar facilities to discuss their early anxiety and what became reality.
- 

***Title:***           **In the Closet Too Long**

***Originator:***   Loder

***Barrier Description:***

Biosolids reuse has been hidden in the water closet too long. When any news article is written, the public always read negative reports about biosolids reuse.

***Importance:***

Historically, public perception is negative towards biosolids reuse due to bad press.

***How Do You Propose Overcoming This Barrier?***

Conduct a statewide public education campaign.

---

**Title:**           **Create Community Confidence and Acceptance**

**Originator:**   McCalley

***Barrier Description:***

The multi-faceted project proposed must have the full confidence and acceptance of the surrounding community. The nature of solutions is technically complex and may not be fully understood by many.

***Importance:***

Citizens must have a full understanding of what is being planned, why the solutions and locations have been selected, and how they will benefit. As the residential pressures develop, citizens will typically oppose a project in their neighborhood.

***How Do You Propose Overcoming This Barrier?***

Essentially, everyone must become mini-experts in the Chino Basin Organics Management effort. Inclusion in siting, financial benefits, and aesthetic elements is essential to success.

---

**Title:**           **Confusing Information Dissemination and Advocacy by Various University Extension Programs Across the United States**

**Originator:**   Sanden

***Barrier Description:***

The Cornell University Waste Management Institute has been vocal in advocating extreme caution, bordering on a complete ban, of land application of Class B biosolids. The University of Washington has verified the economic benefit of Class B application to wheat and hops farms in Washington State, but they do not make a big noise on the national scene.

The University of California has done excellent work over the past 30 years in looking at metals residuals/plant toxicities and nitrogen mineralization work. Long-term pathogen residual work in a field setting has not been done to my knowledge.

Charles Gerba of the University of Arizona has done the most in-field documentation of pathogen residual/transmission after Class B application, and he feels that the 503 regulations are sufficient with respect to human pathogens, but the University of Arizona does not publish extension bulletins on this subject so as not to offend vegetable crop growers in Arizona.

***Importance:***

Most University of California extension personnel are affiliated with specific commodities. Of course, vine and tree crops are California's claim to fame with vegetable crops following immediately after. These high-value crops are volatile in price on the wholesale market and are subject to the whims of public perception. Most of my county-based California agricultural extension compatriots think that I am nuts for working with biosolids and say, "Who needs an extra headache?" Thus, the "unofficial" stance of the University of California extension service in the field comes across as "too many unknowns, do not risk it."

***How Do You Propose Overcoming This Barrier?***

Change current European standards; brainwash all scientists and extension agents; and tell God to make the natural environment less variable! In other words, people are always going to disagree, and the details of applications and results change from one field setting to the next.

---

***Title:***           **The Value of Soil**

***Originator:***   Wilkinson

***Barrier Description:***

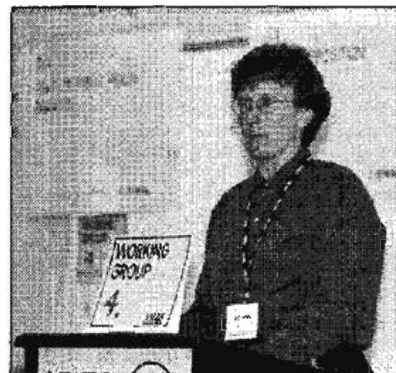
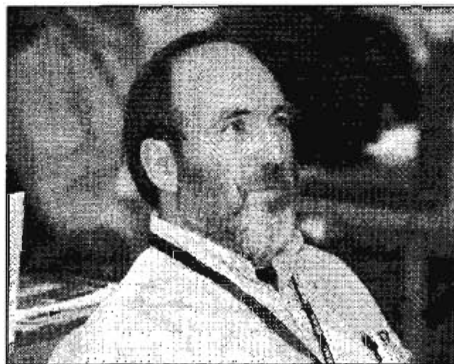
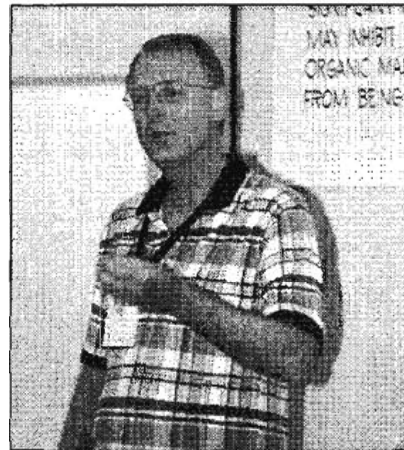
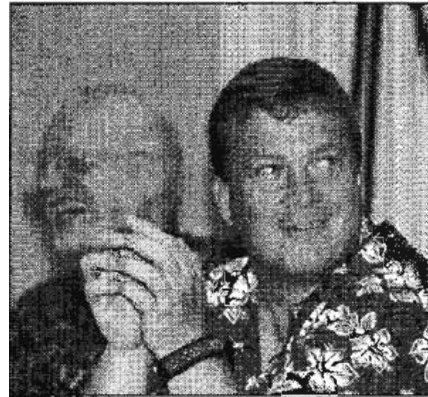
There is a lack of public understanding about the value of soil. Poor soils require more synthetic fertilizers, retain less water, and often plants grown on them require more pesticides.

***Importance:***

- Healthy, quality soils provide the basis for healthy plant growth.
- "Waste" to be disposed versus "resource" to be used.

### *How Do You Propose Overcoming This Barrier?*

Education programs on the value and importance of healthy soils, and the role of organic matter in building soils (example, New Zealand).





## **Lack of Operational Oversight, Follow-through, and Accountability**

### **Originators**

Anderson on behalf of himself, Bastian, Eubanks, Hill, Lester, Page, Walker, and Watson

*The following barriers were consolidated under the above title:*

---

**Title:**           **Lack of Operational Oversight, Follow-through, and Accountability**

**Originator:**   Anderson

### ***Barrier Description:***

Operational competency must be consistently provided by the entity having responsibility for any facility supporting the management of organic materials. Long-term success requires that the technical processes employed are properly operated, maintained, and rehabilitated. Staff must be competent. Revenues must be adequate. Reserves must be in place. Day-to-day communication with the public, including knowing who is responsible, must be straightforward and timely.

### ***Importance:***

Customer service, neighborhood impacts, regulatory compliance, and the economic viability of these facilities depend upon consistently competent operation.

### ***How Do You Propose Overcoming This Barrier?***

Gain commitment by the community, the governing board, and management to a systematic approach to long operation.

---

**Title:**            **Siting New Processing Facilities and Keeping Them in Operation**

**Originator:**    Bastian

***Barrier Description:***

The ability to site new processing facilities and to keep them in operation is imperative to implementing the Chino Basin Organics Management concept.

***Importance:***

Unless new processing facilities can be established and kept in operation, the Chino Basin Organics Management concept will not be able to be implemented.

***How Do You Propose Overcoming This Barrier?***

Actively involve local community stakeholders and leaders in the development of management alternatives, system designs, and facility siting, as well as with participation in oversight of program implementation.

---

**Title:**            **Backup Plans – What Happens When It Does Not Work As Planned?**

**Originator:**    Bastian

***Barrier Description:***

What will the Inland Empire do when the program has problems with implementing the Chino Basin Organics Management concept as advertised?

***Importance:***

How the Inland Empire reacts to problems that inevitably occur will greatly impact the sustainability of the Chino Basin Organics Management concept. How will off-spec products be handled? How will odor complaints be dealt with? What will happen when the energy recovery

rates fall far below projected levels? If the product does not sell as fast as it is produced, how will the product backlog be managed?

***How Do You Propose Overcoming This Barrier?***

Develop backup- and problem-response plans that are flexible enough to deal with the wide range of problems that will inevitably occur during the operation of the processing facilities, moving the final products in the market place, etc.

---

***Title:***           **Never Underestimate Your Child's Ability to Rebel**

***Originator:***   Eubanks

***Barrier Description:***

The biofilter (odor control) is essential to the success of such a project. The biofilter is labor intensive and must be carefully managed to be successful. It is innocuous – it just sits there. Who manages it? Your composting staff. They quickly become the most desensitized to odors.

***Importance:***

A biofilter gone bad is a public relations nightmare. Costs quickly increase.

***How Do You Propose Overcoming This Barrier?***

- Recognize and fund maintenance.
- Build redundancy – do not short change.
- Need a biofilter maintenance technician/engineer.
- Recognize this need upfront.

---

**Title:**           **Who Is In Charge?**

**Originator:**   Hill

***Barrier Description:***

When the biosolids hit the fan (that is, when the Santa Ana winds blow from east to west and carry odors into areas where they should not be), who will the public call? The first call will go to the City of Chino and the second to the Air Quality Management District. Chino will call the IEUA, and the IEUA will call the plant operators, etc. In a short period of time, elected officials will be involved as will the local press. There needs to be a central telephone number where someone can respond to the problem and take immediate action.

***Importance:***

Residents, business owners, and elected officials do not want to hear that someone else is responsible and is working on the problem.

***How Do You Propose Overcoming This Barrier?***

Establish one phone number, highly published and circulated, that reaches someone who will be responsible for resolving any problem that surfaces.

---

**Title:**           **Emissions Control Effectiveness: “He Said, She Said”**

**Originator:**   Lester

***Barrier Description:***

Arguments about the effectiveness of controls (enclosures, biofilters, etc.) can prevent officials and the public from making decisions.

***Importance:***

Arguments over “facts” can reduce public trust, which is essential to their approval.

***How Do You Propose Overcoming This Barrier?***

- Work with local officials and the public to identify concerns and information needs.
  - Have agencies (SCAQMD, CIWMB, RWQCBs) and academia independently review and assess emissions testing. Involve them early (i.e., test designs).
  - Create a plan to ensure the ongoing maintenance of controls (enclosures and biofilters).
- 

***Title:***            **Effectiveness of the Industry's "Self-Policing Practices"**

***Originator:***    Page

***Barrier Description:***

In the past, the industry has not consistently adhered to best management practices. Controls on land application have not been effective.

***Importance:***

Although federal, state, and local agencies have ordinances to regulate organic residual management, the enforcement of these regulations is the responsibility of the industry.

***How Do You Propose Overcoming This Barrier?***

Impose penalties where violations occur.

---

***Title:***            **Manage of Manure and Biosolids**

***Originator:***    Walker

***Barrier Description:***

Poor operations are not publicly acceptable.

***Importance:***

- If the operations smell bad, pollute water, and carry salts, pollutants, and pathogens to humans via air, water, and/or food, the operations will not survive for a long time period.
- Likewise, if the operations are causing health problems, they will survive for an even shorter period of time.

***How Do You Propose Overcoming This Barrier?***

- Design and operate to minimize dust, odor, and the pollution of water, and maximize the production of a consistent, high-quality product.
- Develop and participate in an Environmental Management System (EMS) to address the residuals handling in a community-friendly manner for the entire operation, including:
  - National Biosolids Partnership – EMS operation/environmental and community impact independent third party oversight.
  - ISO 9000 – product quality
  - ISO 14001 – operation/environmental and community impact.
- Involve local stakeholders early in the development of the EMS and/or plans for identifying the problem and implementing potential solutions.
- Establish a data management system to track the source of all loads and the place where products go.

***General Conclusion:***

Solutions can be implemented with very positive results in 2 years or less where there is a firm resolve and backing of management and the selection of a capable solution-oriented person who is good with people. Examples:

- Blue Plains Wastewater Treatment Plant – odor control.
- Greenway Trust – 50 environmental groups cooperating with industry, municipal government to use bestialities as part of keeping a greenway along Interstate 95.
- Springfield, Massachusetts – odor control.

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**Title:**           **Odor Kills Facilities; Biofilters Are Alive**

**Originator:**    Watson

***Barrier Description:***

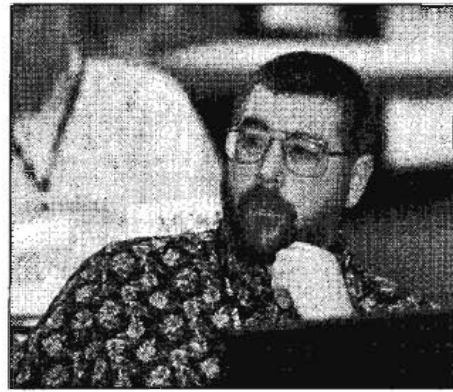
The failures of biofilters in recent history have left an ugly wake of public distrust. This has helped create credibility problems regarding technical assertions.

***Importance:***

A single odor event can generate substantial public dissatisfaction, and subsequent events will galvanize public opposition. Health concerns ride on odor perceptions. These all doom any facility that is struggling to repair its biofilter, an expensive endeavor in many ways.

***How Do You Propose Overcoming This Barrier?***

View the biofilter as alive, like a child or at least a pet. Designs must include “regular care and feeding.” Biofilter construction must be done in a “nurturing manner.” In short, biofilters must be loved, from start to finish.





## **PRIORITY 8**

# **Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring, Really Work?**

### **Originators:**

Walker on his behalf, Chang, Cork, Graham, Hoover, Mears, Munsey, and Watson

*The following barriers were consolidated under the above title:*

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**Title:** Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring, Really Work?

**Originator:** Walker

### **Barrier Description:**

The major assumption is that the static aerated pile composting configuration under cover and with a biofilter will work well in the Chino Basin. The facilities would be larger and of somewhat different design than previously operated successfully at other locations.

### **Importance:**

If the envisioned composting configuration does not work well, millions of dollars will have been wasted, and this major failure could have a devastating effect on the ability to manage the organic residues in the Chino Basin.

### ***How Do You Propose Overcoming This Barrier?***

- Pull together a team of the most experienced operators and consultants for static aerated pile composting, as well as other in-vessel systems, to critique/value engineer the proposed design. Several experts are Joel Thompson and Charles Murray from the Washington Suburban Sanitary Commission, Clyde Wilbur of Greeley & Hansen, Larry Hentz, Tim Haug of Los Angeles, and Eliot Epstein of E&A Environmental Consultants.

Over the years, there have been major failures of most of the components listed in the title. These experts know where these failures have occurred, the improvements that have been made, and where weaknesses are still likely to be.

- Simplicity of design has enabled some facilities to use feedstocks of widely differing properties and bulking materials that vary greatly without having to change the materials handling trains.

Knowing the right energy balance, moisture content and porosity of the feedstock, and bulking agent are vital (e.g., use of Tim Haug's Composting Handbook).

- In a parallel mode, plan to pilot test the anaerobic digestion of cattle manure of different ages.

---

***Title:***            **Critical Review of Past Experiences**

***Originator:***    Chang

#### ***Barrier Description:***

The organic waste management in Chino Basin has been investigated by various public entities in the past 30 years. With the knowledge gained from past experience on the nature of the problems, physical and economical constraints, implementation issues, and outcomes of past operations, the project planning may be expedited.

#### ***Importance:***

Much of the ideas in the current business plan for the Chino Basin Organics Management Center concepts have been proposed, investigated, or tried in Chino Basin or elsewhere. Critical review of the outcomes of the past investigations and analyses of their successes and failures will provide vital information on how to proceed and what to pursue. It is essential that the planners of the current facility are well aware of the past experiences and do not "reinvent the wheel." It

is especially important to ask the questions: "What has changed since the issues were visited? Is there a need to revisit them?"

### ***How Do You Propose Overcoming This Barrier?***

Include the critical review results of the past investigations on waste management initiatives with special attention to follow-up on the successes and failures.

---

***Title:***            **Adverse Impacts on Regional Treatment Plants**

***Originator:***    Cork

### ***Barrier Description:***

Portions of the projects have been identified that have a direct impact on the existing domestic wastewater treatment plants. Some of these items include:

- Dairy washwater is approximately five times stronger and significantly different in character than domestic wastewater and can have unforeseen impacts on the treatment processes.
- Additional solids loading to sludge stabilization and dewatering processes have plant-wide impacts due to increased and variable recycle streams.
- Manure contains unacceptable solids that must be removed prior to further processing to avoid mechanical and process upsets to the plants.

Impacts from these and other as yet undefined issues could compromise the primary function of the regional plants to provide treatment for domestic wastewater. Significant additional costs could result, and permit compliance for the regional plants could be an issue.

### ***Importance:***

If the functionality of the regional plants is compromised due to the operation of the organics management strategy, significant public pressure could be experienced, resulting in project implementation problems and potentially undermining the entire strategy.

### ***How Do You Propose Overcoming This Barrier?***

Pilot testing and solid design development will be required to establish both design criteria and operational and maintenance issues. Conceptual designs should be scrutinized by outside consultants and be subject to value engineering, constructability reviews, and reviews by operations staff from operating facilities.

---

***Title:***           **Dairies – Have We Really Looked at the Benefits/Value of Onsite Reclaimed/Reuse Water Systems?**

***Originator:***   Graham

### ***Barrier Description:***

The barrier here is “missed opportunities” for exemptions, incentives, or tax credits related to reclaiming dairy wastewater.

### ***Importance:***

Diminishes overall projects’ potential efficiency capabilities and funding/tax credit support opportunities.

### ***How Do You Propose Overcoming This Barrier?***

- Value proposals that include the reclaiming of farm wastewater for reuse on farms.
- Identify state/federal incentives for this area.
- Determine if both the public and legislators have considered this. If not, propose it.

---

**Title:**           **It Is All About Risk**

**Originator:**   Hoover

***Barrier Description:***

The perception is that projects should be risk free from potential health risk, nuisance risk, performance and reliability risk, and the risk of economic overrun(s).

***Importance:***

While risk is widely know and generally accepted as a part of life, project opponents may exaggerate and exploit public opinion to create a significant barrier.

***How Do You Propose Overcoming This Barrier?***

- Be open and honest about risk factors. They exist!
- Evaluate and define specific risk factors (as possible) with peer review and sensitivity analysis.
- Do not try to define "acceptable" risk!

---

**Title:**           **Aerated Static Pile Compost Technology Produces Blended Organics Compost**

**Originator:**   Mears

***Barrier Description:***

Biosolids do not contain adequate carbon to produce enough heat to kill pathogens. The Chino Basin Organics Management center(s) will need to add organics in rather large quantities, possibly as much as 200 percent of the amount of biosolids or manure.

The State and University of California, Davis, are expected to release guidelines on the salt content in manure to be land applied in the next 90 days. These guidelines could further impact the need for additional dilution and product blending.

***Importance:***

Manure has some advantages and has a much higher acceptance rate by the gardeners and organic farmers than biosolids. The salt guidelines may impact the ease to market and may require additional labeling.

***How Do You Propose Overcoming This Barrier?***

There is very limited information on plant uptake and processes or ways to minimize the salts in manure. Research needs to be done to find a simple solution to the problem. Some effort is now underway, but the solution/technology will be applied during the treatment process.

The University of California, Davis, has said there are no affordable polymers to solve this problem. Would need to research the effect of polymers in the soil and water.

---

***Title:***           **Impacts of Recycle Streams From Biosolids Processing**

***Originator:***   Munsey

***Barrier Description:***

The large amount of solids processing will generate a large recycle stream with significant environmental and cost issues. The project does not clearly address this impact.

***Importance:***

Can undo some of the expected benefits if not fairly assessed early in the design.

***How Do You Propose Overcoming This Barrier?***

Improve the assessments of recycle streams by process experts. Need to look particularly at ammonia, BOD, and salts.

---

**Title:**           **Odor Kills Facilities; Biofilters Are Alive**

**Originator:**   Watson

***Barrier Description:***

The failures of biofilters in recent history have left an ugly wake of public distrust. This has helped create credibility problems regarding technical assertions.

***Importance:***

A single odor event can generate substantial public dissatisfaction, and subsequent events will galvanize public opposition. Health concerns ride on odor perceptions. These all doom any facility that is struggling to repair its biofilter, an expensive endeavor in many ways.

***How Do You Propose Overcoming This Barrier?***

View the biofilter as alive, like a child or at least a pet. Designs must include "regular care and feeding." Biofilter construction must be done in a "nurturing manner." In short, biofilters must be loved, from start to finish.





## **PRIORITY 9**

# **Unforeseen Circumstances and Costs**

### **Originators:**

Cork on behalf of himself, Joy, Page, and Skapik

*The following barriers were consolidated under the above title:*

---

**Title:** Unforeseen Costs

**Originator:** Cork

### ***Barrier Description:***

This barrier hinges on the concept of a totally enclosed facility. From the draft information provided, it does not appear that sufficient conceptual design and cost information have been presented to adequately understand the full cost implications involved in implementing a successful project from beginning to end.

### ***Importance:***

Historically, poor planning and insufficient preliminary information have led some facilities to be implemented in a haphazard fashion. Initial operating difficulties have led to public opposition from the inception of the project and significant "after-startup" costs. These costs, being repair or mitigation oriented, are typically much more expensive than they would have been if included in the original project.

### ***How Do You Propose Overcoming This Barrier?***

Additional conceptual design and preliminary cost development are necessary. Specifically, facility-sizing criteria needs to be clearly defined, and odorous air volumes must be quantified. Expertise in material handling design and compost and odor control experts at this workshop should be capable of refining the design criteria and order of magnitude cost information.

---

**Title:** “Where Have the Cows Gone?” (Verify the Continued Availability of Feedstocks and Markets)

**Originator:** Cork

***Barrier Description:***

Many of the projects identified have included projections and are dependent on the continuing existence of the dairy industry. As urban pressure increases and land values continue to increase, there will be a tendency for dairies to take their fortune elsewhere. Assumptions regarding this important issue are identified in the Business Plan and in the technical memorandums. These assumptions are admittedly somewhat arbitrary, but important.

***Importance:***

As with any business, market conditions change both in supply and demand. Sometimes, these changes are gradual; sometimes they are dramatic and sudden. Examples throughout history are numerous (e.g., Microsoft versus IBM). Changes resulting from decreasing dairies must be considered, and contingency plans must be developed to maintain a stable production operation for all finished products, including power.

***How Do You Propose Overcoming This Barrier?***

- Continue monitoring dairy production and partnering with the local dairies to more closely track the changes in animal counts and the land under dairy production.
- Develop contingency plans for dramatic changes in feedstock supply.
- Implement aggressive and thorough management as a business enterprise.

---

**Title:** Potential New and More Stringent Regulatory Requirements

**Originator:** Joy

***Barrier Description:***

We are in a time of ever-changing regulatory requirements. As we move into new concepts of biosolids management, we should anticipate new regulations that may stifle the organic management strategies — before they get started. Regulatory requirements are set to control the generators and protect public health and concern

***Importance:***

Regulations could be created that may inhibit proposed practices — as we have seen with the land application process, etc.

***How Do You Propose Overcoming This Barrier?***

- Need to take a proactive approach with the policy makers and regulatory agencies.
  - Sell the process.
- 

**Title:** In the Event Something Goes Wrong, Where Does the Liability Rest?

**Originator:** Page

***Barrier Description:***

Growers, adjacent owners, and the general public need to be assured that a responsible agency will bear the cost if something goes wrong.

***Importance:***

Unless liability concerns are addressed, projects are doomed. Stakeholders must be assured that they will be compensated for any loss incurred where systems fail.

***How Do You Propose Overcoming This Barrier?***

Liability should rest with the generator (the treatment plant).

---

***Title:***            **Litigation, Litigation, Litigation**

***Originator:***    Skapik

***Barrier Description:***

There will most probably be litigation initiated with the siting of this project. Therefore, there must be critical thinking as to where such a facility is to be located. If the site is near a residential urban community, litigation will be initiated.

***Importance:***

There will be multiple challenges regarding the site of the project. Therefore, there must be a critical siting analysis and a clear and adequate project description.

***How Do You Propose Overcoming This Barrier?***

- Make certain that ample consideration is given as to where this project will be located.
- Will need proper environmental analysis, and should prepare a comprehensive CEQA/NEPA document.

## **Diverse Marketing Approaches and Manufacturing of Products That Meet Customer Needs – “Customer Service”**

**Originators:**

Atwater on behalf of himself, Anderson, Briggs, Eubanks, Graham, Mears, Munsey, and Walker

*The following barriers were consolidated under the above title:*

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**Title:**            **Diverse Marketing Approaches and Manufacturing of Products That Meet Customer Needs – “Customer Service”**

**Originator:**    Atwater

***Barrier Description:***

Just like water recycling, the water/wastewater industries need to recognize that they must manufacture products that meet the needs of customers (e.g., bottled water, recycled water for cooling towers, dual piping for irrigation use). Fertilizer products must meet specific customer requirements.

Horticulture and farming have different fertilizer needs; therefore, manufacture products that meet customer needs.

***Importance:***

Multiple products ensure economic feasibility, long-term marketing, and changing markets.

### ***How Do You Propose Overcoming This Barrier?***

- Public-private partnerships.
  - Academic research on fertilizer products.
  - Customer marketing research
- 

***Title:***            **Access to a Market That Is Ready, Willing, and Able to Use the Materials**

***Originator:***    Anderson

### ***Barrier Description:***

The end products that are created in the center must have a market. The market must be reliable, and the market must provide income that partially offsets the capital and operating costs of the center. Unfortunately, the agricultural bulk-use market of biosolids-related materials is highly uncertain. Local opposition to the use of biosolids is pervasive throughout California. In particular, Riverside and Kern Counties are a problem.

### ***Importance:***

In the absence of a reliable market, there is no long-term solution other than landfilling or continuing to run the risk of uncertainty.

### ***How Do You Propose Overcoming This Barrier?***

Engage agricultural interests in Kern County on their terms and provide meaningful answers to all of their concerns. In particular, identify those agricultural properties and fully compensate them in the event that future phyto-toxicity or other productivity issues unexpectedly emerge from the use of these products.

---

***Title:***            **Promote Biosolids Compost and Pellets to Certified Organic Farmers and Vegetable Growers, Packers, and Processors**

***Originator:***    Briggs

***Barrier Description:***

We should not accept the attitude of biosolids as an “inferior” product to manure and green waste compost. Just as tertiary 2.2 reclaimed water can be used for food crops, in recreational impoundments, and laundromats, let us ask for the same for our highest-quality biosolids compost.

***Importance:***

We need to start breaking down psychological barriers. Let us start at the top of the food chain and work down from there (i.e., to the certified organic farmers and vegetable growers, packers, and distributors).

***How Do You Propose Overcoming This Barrier?***

- Create the cleanest, highest-quality compost.
- Meet with veggie people and organic farmers.
- Form an “organics coalition.”
- Conduct field trials that compare food quality with all types of compost.

---

**Title:** Will a Southern California Marketing Consortium Assist in Product Disposal?

**Originator:** Eubanks

***Barrier Description:***

- Regulations will create competition and problems.
- Poor planning will cause public opposition to all facilities.
- Commercial companies will blend.
- Public/private competition.

***Importance:***

- Large amounts of product to be produced continuously.
- Finished product continues to grow.

***How Do You Propose Overcoming This Barrier?***

- Partnering with private groups.
- Regional state commitment by publicly owned treatment works (POTW) for education and lobbying.
- Can use be legislated/mandated?
- Joint Agreement for marketing by public agencies so that revenues are equalized and public agencies are not competing.
- Self-regulating umbrella agency, such as the Metropolitan Water District of Southern California or the PUC.
- State/national issue.



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**Title:** Underestimating the Value of the Web Relating to the End-product Marketplace

**Originator:** Graham

***Barrier Description:***

We need to augment local end-product marketing strategies with internet-based strategies.

***Importance:***

Our competitors will use it.

***How Do You Propose Overcoming This Barrier?***

- Identify our “portal” partners.
  - Design the web portal site.
  - Identify “co-portal” existing outlets.
  - Monitor and track what is being done elsewhere.
  - Probe regional “quantity/bulk buy” marketplace.
- 

**Title:** Data Acquisition – Do We Have It?

**Originator:** Graham

***Barrier Description:***

Have we looked at communicating with other agencies or groups regarding request for proposals for data acquisition?

***Importance:***

Lost opportunity to add information that supports project development.

***How Do You Propose Overcoming This Barrier?***

- Define the initial data we can supply.
  - Profile the areas where this data will be sourced.
  - Find out the “price” placed on this data.
  - Target local, state, regional, and national agencies.
- 

***Title:***            **Competition from Larger Cities Employing the IEUA Model Willing to Subsidize to Obtain Market Share**

***Originator:***    Mears

***Barrier Description:***

The City and County of Los Angeles could employ the IEUA model and, based on the volume of material and the resource muscle, uncut the prices offered for the Chino Basin Organics Management program. Southern California is one of a few large and growing markets for garden and horticulture products. It is also a market with a much longer season than most parts of the country.

How will/can the products offered by the Chino Basin Organics Management program differentiate from similar products (e.g., Synagro, Scott's, Kellogg's) being offered?

***Importance:***

It is possible that Chino Basin organics cannot move the finished product in a bagged form into the marketplace at any price because it does not have a recognized name or agreements with the large retailers, such as Scott's or Kellogg's.

### ***How Do You Propose Overcoming This Barrier?***

The Chino Basin Organics Management center has a unique opportunity like no other competitor in the marketplace. The Chino product could be diluted with a low percentage of biosolids and a high percentage of manure. A formula and label could be developed that could clearly separate Chino Basin Organics from all other products on the market.

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**Title:** Inland Empire Utilities Agency Responsible for Use

**Originator:** Munsey

#### ***Barrier Description:***

Responsible final use cannot be delegated by the IEUA to their marketing partners. The IEUA must take responsibility for providing proper use information and ensuring that the information is widely and appropriately distributed.

#### ***Importance:***

Essential to long-term success.

### ***How Do You Propose Overcoming This Barrier?***

- Develop ongoing supportive relationships with “experts” in the area that are credible with the potential users or neighbors of users.
- Create a research foundation that conducts appropriate demonstration trials of composted products in various applications.
- Use local people who will speak on the outcomes and who can be called to answer the many challenges that will occur.
- Help local experts connect with national experts so that they develop a broader-based support group.
- Create long-term (10-20 years) demonstration plots for typical uses of products.
- Provide measurements of key parameters of success and compare these parameters to competitors.
- Identify user needs.

- Identify how these products will fulfill the needs.
  - Develop local demonstration test plots.
  - Have test results communicated locally. The IEUA needs to take responsibility for the proper use of compost.
- 

***Title:***            **Changed Relationship with Marketing Partners**

***Originator:***    Munsey

***Barrier Description:***

Developing successful long-term partnership relationships that are healthy to all partners is difficult. Without having clear quality expectations and appropriate financial incentives, the private partner cannot sustain the quality program required for ongoing success and flexibility. There are many examples of failed partnerships, and there are many changes planned in the process and expectations. These need to be put into contractual relationship.

***Importance:***

Essential.

***How Do You Propose Overcoming This Barrier?***

Ensure a means to have two or more private companies provide parallel services. Make sure that contractual relationships have clear quality expectations and can be adjusted, as needed, for all parties. Have a clearly defined contractual process for modifying the contract and evolving to meet new needs. Find good long-term contractual models (public/private).

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**Title:** Is it Advisable to Co-Compost?

**Originator:** Walker

***Barrier Description:***

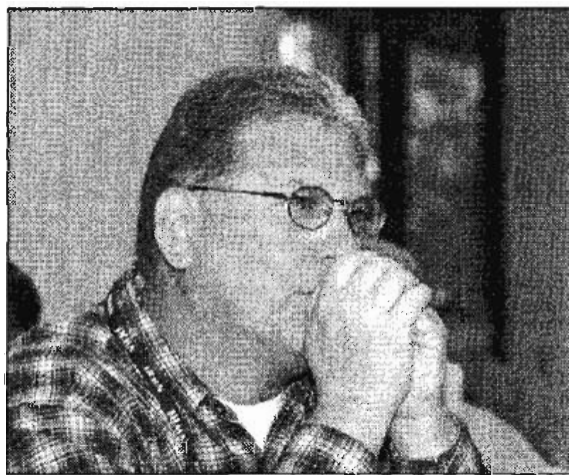
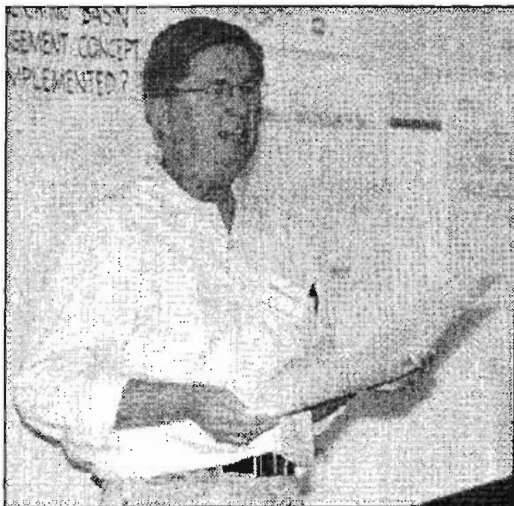
Is it advisable to co-compost when the regulatory requirements for composting and use of animal manures and biosolids are very different? Also, when public acceptance of the end products may be very different?

***Importance:***

Some products of co-composting may not be acceptable for certain uses or may have more regulation than it otherwise might have.

***How Do You Propose Overcoming This Barrier?***

Carefully consider the pros and cons of co-composting.



## **PRIORITY 11**

# **Lack of Political Leadership**

### **Originators:**

Earsom on behalf of himself, Anderson, Loder, and McCalley

*The following barriers were consolidated under the above title:*

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**Title:**           **Lack of Political Leadership**

**Originator:**   Earsom

### ***Barrier Description:***

Local, state, and federal, representatives who do not take leadership make it more difficult to win public acceptance.

### ***Importance:***

The lack of political leadership could lead to political opposition that could distract the public's focus on dealing with long-term organic waste management.

### ***How Do You Propose Overcoming This Barrier?***

Invite political leaders to all phases of implementation of organics management centers (i.e., a united political collaboration would be helpful).

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**Title:**           **We Haven't Figured Out That Hemingway Was Right: "Ask Not for Whom the Bell Tolls...It Tolls for You"**

**Originator:**   Anderson

***Barrier Description:***

For too long, we have divided ourselves into "them" and "us." – agriculture versus urban – southern California versus Central Valley – business versus the environmentalists. This tendency to divide into opposing camps causes a lack of trust. We fail to understand that we must look for statewide alliances to solve California's daunting problems. We are all in this together and cannot solve these problems unless we are together.

***Importance:***

We must get broad buy-in and participation throughout California to solve the Chino Basin Organics Management and other problems as big as this one (sustainable water supply/salt build-up in Central Valley agricultural lands/sustainable agriculture/sustainable dairy).

***How Do You Propose Overcoming This Barrier?***

Four broad fronts:

- Open up communication and work with communities.
- Get our science straight.
- Get our technologies and related costs better understood.
- Tie regulations and permitting issues together.



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**Title:** "Where is Ted Danson When You Need Him?" We Need a Spokesperson for This Problem

**Originator:** Anderson

***Barrier Description:***

Without an understanding of the immense implications of this problem by legislators, city councils, and the public, we will have a limited ability to fund and implement large-scale environmental and water resources improvements.

***Importance:***

We cannot move without a shared vision.

***How Do You Propose Overcoming This Barrier?***

Find a champion who is credible, well known, and knowledgeable. Does Martha Stewart want to help? Recycling: it's a good thing.

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**Title:** In the Closet Too Long

**Originator:** Loder

***Barrier Description:***

Biosolids reuse has been hidden in the water closet too long. When any news article is written, the public always read negative reports about biosolids reuse.

***Importance:***

Historically, public perception is negative towards biosolids reuse due to bad press.

### ***How Do You Propose Overcoming This Barrier?***

Conduct a statewide public education campaign.

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***Title:***           **Your Move...Crown Me...We Win**

***Originator:***   McCalley

### ***Barrier Description:***

Inconsistent regulations, expectations, and needs have created a checkerboard of opportunities/threats in California communities. Therefore, the organics residual issue has not found consensus or a well-defined economic and fully acceptable solution. Regional solutions have been developed without fully exploring nonregional impacts.

### ***Importance:***

All communities have “the problem.” All communities do not have a clear recognition of waste diversion and how products integrate to their economy, health, and safety mutual benefit.

### ***How Do You Propose Overcoming This Barrier?***

- Education.
- Regulatory and legislative consistency and persistence.
- Forethought given to legislation and implementation to ensure community acceptance.
- Take a statewide approach, and we can all wear the crown of success.

## **Lack of an Acceptable Financial Plan**

**Originators:**

Munsey on behalf of himself, Anderson, Cork, Gillette, and Hill

*The following barriers were consolidated under the above title:*

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**Title:**           **What Will This Cost Me?**

**Originator:**   Munsey

***Barrier Description:***

A financial plan is essential to answer basic financial questions, obtain support for the financial plan, and provide the financial resources to succeed.

***Importance:***

It is essential to complete the plan.

***How Do You Propose Overcoming This Barrier?***

- Clearly identify the financial needs in total and year-by-year.
- Assess financing alternatives and have a decision-making process that will gain public acceptance.
- Involve representatives of major financial contributors:
  - industry
  - farmers
  - residential ratepayers
  - financial institutions

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**Title:**           **How Do We Get Dairies and Public Agencies (Local, State, and Federal) to Agree to a Fair Share Funding Strategy?**

**Originator:**   Anderson

***Barrier Description:***

Manure management costs are grossly underfunded. The dairies argue that they are land rich and cash poor. They say that the regulated milk market limits their margins and, therefore, their ability to contribute to paying for all of this. Public agencies have not provided infrastructure funding for the construction and operation and maintenance of manure, stormwater, and sewerage facilities that are necessary to support a sustainable dairy industry in California.

***Importance:***

Groundwater pollution, surface water pollution, agriculture land salt buildup, air pollution, and nuisance problems remain unaddressed. To a large extent, we have not yet seen the worst impacts of the California dairy. This is true for both the Chino Valley and the Central Valley.

***How Do You Propose Overcoming This Barrier?***

Broad funding initiatives must include the following:

- “Green Milk” – Every gallon of milk produced in California must have an environmental mitigation fee attached to it. (A cent or two per gallon would generate a large revenue stream.)
- Local funding and participation – Local agencies like the IEUA must receive a clear mandate to participate in, and collect user fees for, dairy waste management.
- State funding and participation – State regulations, state policies, and state funding must be added to the mix. Consistency is a must. Appropriate state agencies must step up and participate.
- Federal funding and participation – Congress must recognize the national interest in seeing Chino Basin succeed and provide the funding and policy support to make this a successful model.

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**Title:**           **How Much? Perception of Rate Fairness**

**Originator:**   Cork

***Barrier Description:***

One of the primary questions asked by the ratepayers is “How Much?” If the public—even those not impacted by noneconomic issues generated by the various projects—perceives that they are paying for services not related to their needs, they will voice their opposition.

***Importance:***

This is not an easy issue. The dairy industry manure production far exceeds the amount of biosolids generated. The dairy industry also has the largest impact on groundwater quality in the basin. Rational ratepayers (yes, they do exist) will revolt if they perceive that they are subsidizing an industry unfairly.

***How Do You Propose Overcoming This Barrier?***

- Fund with grants and other outside sources.
- Ensure that the dairies pay a realistic portion of the costs, including capital costs (system development charges) and ongoing operating costs.
- Disclose clear and certified project costs.
- Clear progress reports to the public that show the results of their costs.

The IEUA is in the lead role for this project. They must be proactive, credible, and honest regarding the project costs, project successes and failures, and the overall public perception. Prompt and complete response to member agencies and public participation and comment is essential.

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**Title:**           **Cost of Composting Dairy Manure Cannot Be More Than Milk Production Can Generate**

**Originator:**   Gillette

***Barrier Description:***

The price of milk is regulated. If this cost does not allow the dairy industry to make a profit, the dairies will not stay in business. If the dairies leave, the generation of feed fuel will not be available.

***Importance:***

The dairies have to stay in business to make this work.

The dairy industry provides the manure to generate the cogeneration fuel as well as a reason to allow a composting facility. The dairy industry also provides a screen for the composting trucking, odors, dust, etc.

***How Do You Propose Overcoming This Barrier?***

The dairy cost for composting may have to be subsidized or further subsidized. The health of dairy farms should be monitored.

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**Title:**           **Show Me the Money!**

**Originator:**   Hill

***Barrier Description:***

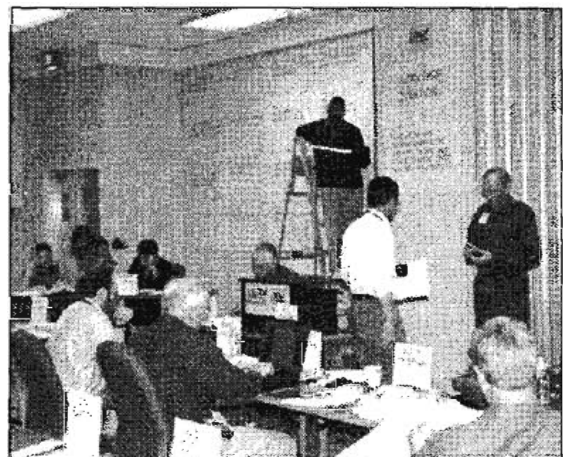
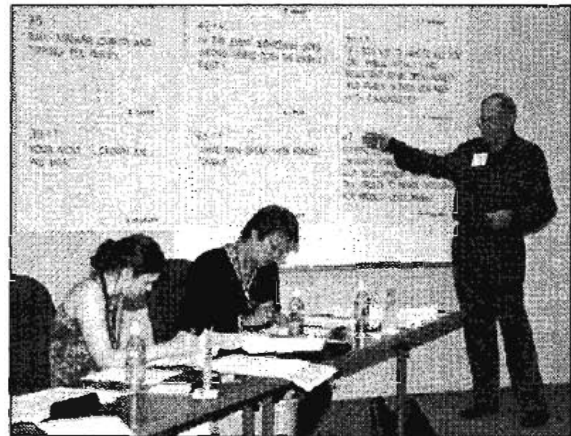
At its best, this will be a costly process; costly to engineer, construct, operate, and maintain. In the beginning, there will be grants for pilot projects and, later, there will probably be grants for engineering and construction. As long as a crisis exists, money will be available. But what happens 10 years from now, when the facilities are no longer new and pretty, when maintenance and operating costs go up, and no one in Sacramento or Washington D.C. is paying attention?

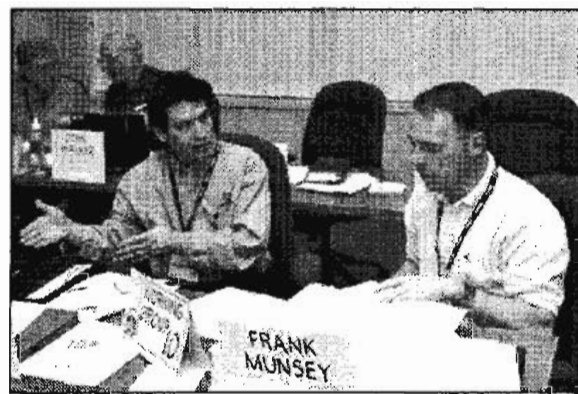
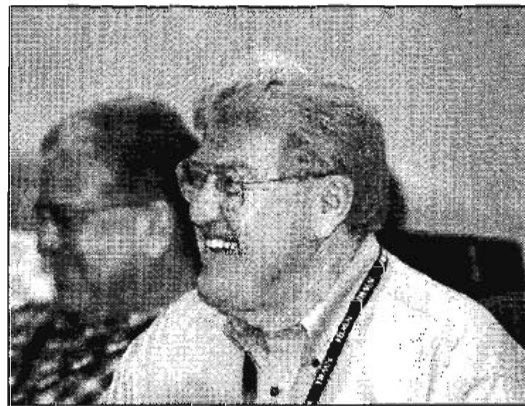
***Importance:***

As a representative of a city whose residents and businesses fund the IEUA operations, long-term funding for operations and maintenance is a concern.

***How Do You Propose Overcoming This Barrier?***

Create a long-term operations and maintenance fund as an integral component of the Chino Basin Organics Management Strategy Business Plan.







## **Consistently Generate High-Quality Products**

**Originators:**

Bastian on behalf of himself, Chang, Gillette, Graham, Lester, Mears, and Munsey

*The following barriers were consolidated under the above title:*

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**Title:**           **Consistently Generate High-quality Products**

**Originator:**   Bastian

***Barrier Description:***

The ability to consistently generate high-quality products is imperative to successfully implement the Chino Basin Organics Management concept.

***Importance:***

Unless high-quality products can be consistently generated by the new processing facilities, the Chino Basin Organics Management concept will not likely be successfully implemented. Inconsistent quality products will undermine the marketability of the products and likely erode public acceptance of the overall program.

***How Do You Propose Overcoming This Barrier?***

Use the best available technology and create partnerships with groups that have demonstrated the ability to operate facilities that consistently produce high-quality products.

---

**Title:**           **Waste Characterization – Quantities, Physical and Chemical Properties, and Their Seasonal Variations**

**Originator:**   Chang

***Barrier Description:***

The physical and chemical properties of various waste streams need to be accurately characterized. The quantity of wastes and temporal and spatial distribution of the wastes in the Chino Basin also need to be known.

***Importance:***

The use potential of organic wastes is dependent on their physical and chemical characteristics (i.e., quantity, quality, and purity). This information is needed in feasibility studies, in transportation planning, and in process and equipment designs. These will determine the unit processes needed in handling and treating the waste material; thus, the scale of operation and the cost of production. The information will also determine the quality and value of the finished products.

***How Do You Propose Overcoming This Barrier?***

- Develop models to inventory and project the generation of wastes and to predict the changes in their characteristics.
- Sample wastes to determine the variability of waste characteristics.
- Identify the undesirable components in the waste streams.

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**Title:**           **Performance-based Technical Specification for Organic Soil Amendments**

**Originator:**   Chang

***Barrier Description:***

Specifications are used to categorize products according to certain technical criteria. Current specifications for biosolids and their derivatives mostly are public health- and pollution control-based. They do not accurately depict what the products will be able to perform.

***Importance:***

Organic soil amendments are used in landscaping, horticultural productions, plant nurseries, and crop production. The quality requirements for each use are different. Products in the market are identified by the source of the material and/or the brand name. Their performance, when used, is not always predictable. In addition, many other organic material may fill the same needs. An industry-wide performance-based technical specifications will standardize all of the products in the market according to their function. It will be a guide for producers to target their products for customers and to build customer confidence in the performance of products. It will allow project managers to specify appropriate material for the project. In this manner, biosolids-based products may become mainstream organic soil amendments.

***How Do You Propose Overcoming This Barrier?***

Develop performance-based technical specifications for organic soil amendments.

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**Title:**           **Foreign Matter, Odor, and Dust in the Final Compost**

**Originator:**   Gillette

***Barrier Description:***

Odors in the compost cause an odor nuisance at the reuse site. Plastic, hair, and rags reduce the desirability of the end product. The reuse of the compost is dependent on the production of a product that people want to use.

***Importance:***

The product has to be viable or it will not be used by farmers, home gardeners, or horticulturists – let alone sold to recover some of the costs.

***How Do You Propose Overcoming This Barrier?***

- Foreign Material – Provide fine influent screens and effective screening washers. Alternately, provide a screening process in the sludge process before or after digestion, or fine screen the compost.
  - Odors – Completely compost and cure the material until the odors are gone.
  - Dust – Maintain the water content of the final product so the dust is minimized.
- 

***Title:***            **Focused Attention on National, State, and Regional End-product Certification and Verification Standards**

***Originator:***    Graham

***Barrier Description:***

Follow developments of:

- Proposed Canadian standards.
- California's organics certification and verification standards.
- The Bark and Soil Producers Association standards.
- The U.S. "National Organics Program."
- Other targeted states' certification standards (relative to the "plans" targeted markets).

***Importance:***

Consistency and quality of the material will enhance market price and demand opportunities.

### ***How Do You Propose Overcoming This Barrier?***

- Design and define the targeted material consistence and quality goals.
  - Begin the application process for registering with all key certification organizations.
  - Implement testing and monitoring of generators' materials.
  - Synchronize end-product goals with generator blending capabilities and the research you are having your university(s) focus on.
- 

***Title:***            **Raw Manure Quality and Tipping Fee Issues**

***Originator:***    Lester

### ***Barrier Description:***

- For manure in particular, tipping fees at the organics management facilities (which might be in the range of \$25-35/ton) will be higher than the tipping fees the dairy farmers might find for spreading on agricultural lands in and out of the basin (\$7-12/ton).
- Feed stock quality affects final compost quality and energy content.
- Upcoming changes: Stormwater (NPDES) requirements limit agricultural land spreading. Increased resistance at out-of-basin locals to manure spreading.

### ***Importance:***

If there is more revenue derived for manure-based compost, it is important to ensure feedstocks.

Final compost quality depends in part on feedstock quality.

### ***How Do You Propose Overcoming This Barrier?***

- Assess the impact of stormwater and out-of-basin restrictions on dairy tipping/removal costs.
- Assess the impact of manure quality of organics management facility economics (e.g., freshness, the effect of on-farm amendments).

- If favorable, consider reduced tipping fees for compliant dairies. Work with the Milk Producers Council and Western United Dairymen.
  - Research need: Determine optimal manure qualities.
- 

***Title:***            **Aerated Static Pile Compost Technology Produces Blended Organics Compost**

***Originator:***    Mears

***Barrier Description:***

Biosolids do not contain adequate carbon to produce enough heat to kill pathogens. The Chino Basin Organics Management center(s) will need to add organics in rather large quantities, possibly as much as 200 percent of the amount of biosolids or manure.

The State and University of California, Davis are expected to release guidelines on the salt content in manure to be land applied in the next 90 days. These guidelines could further impact the need for additional dilution and product blending.

***Importance:***

Manure has some advantages and has a much higher acceptance rate by the gardeners and organic farmers than biosolids. The salt guidelines may impact the ease to market and may require additional labeling.

***How Do You Propose Overcoming This Barrier?***

There is very limited information on plant uptake and processes or ways to minimize the salts in manure. Research needs to be done to find a simple solution to the problem. Some effort is now underway, but the solution/technology will be applied during the treatment process.

The University of California, Davis, has said there are no affordable polymers to solve this problem. Would need to research the effect of polymers in the soil and water.

---

**Title:**           **Seasonal Sales and High Inventory Buildup**

**Originator:**   Mears

***Barrier Description:***

Seasonal market and inventory buildup – no brand identity – no customer base for bagged product. If Chino Basin Organics sell their product to Scott's, or other similar retailers, there will be a minimum profit margin, no market identity, and, as volume grows, will be dependent on third-party outlets.

Repeat sales and customer loyalty are necessary for the long-term success of Chino Basin Organics.

***Importance:***

The market for a bagged product is seasonal, and inventories will build up. Biosolids and manure are generated on a daily basis and in large volume, with manure peaking in October and April, when corrals are scraped. Green waste is also seasonal, with a noticeable shortfall of organic amendment material several months of the year. A commercial source of material, such as sawdust, needs to be found. Food waste could be a good alternative, but odor control would be a consideration.

***How Do You Propose Overcoming This Barrier?***

Food processors would be a good source for additional organic materials, but sawdust would be superior in adjusting the carbon/nitrogen (C/N) ratio of the finished product. No producer of compost is catering to the needs of the organic farmer and commercial nurseryman by providing custom blended soils with C/N ratios of 30:1, balanced pH, and minimum and consistent salt levels.

---

**Title:** Compost an Umbrella World

**Originator:** Mears

***Barrier Description:***

You do not know what you are buying, and if you like it and it works, can you buy it again?

***Importance:***

Put the Chino Basin seal on third-party products similar to Intel.

***How Do You Propose Overcoming This Barrier?***

Develop recipes to produce consistent high-quality products for specific applications and markets.

---

**Title:** Inland Empire Utilities Agency Responsible for Use

**Originator:** Munsey

***Barrier Description:***

Responsible final use cannot be delegated by the IEUA to their marketing partners. The IEUA must take responsibility for providing proper use information and ensuring that the information is widely and appropriately distributed.

***Importance:***

Essential to long-term success.

***How Do You Propose Overcoming This Barrier?***

- Develop ongoing supportive relationships with “experts” in the area that are credible with the potential users or neighbors of users.



- Create a research foundation that conducts appropriate demonstration trials of composted products in various applications.
- Use local people who will speak on the outcomes and who can be called to answer the many challenges that will occur.
- Help local experts connect with national experts so that they develop a broader-based support group.
- Create long-term (10-20 years) demonstration plots for typical uses of products.
- Provide measurements of key parameters of success and compare these parameters to competitors.
- Identify user needs.
- Identify how these products will fulfill the needs.
- Develop local demonstration test plots.
- Have test results communicated locally. The IEUA needs to take responsibility for the proper use of compost.



## **Distrust of Public Officials and Their Representatives**

**Originators:**

Epstein on behalf of himself, Anderson, McCalley, Sanden, and Watson

*The following barriers were consolidated under the above title:*

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**Title:**            **Distrust of Public Officials and Their Representatives**

**Originator:**    Epstein

***Barrier Description:***

Many of the public distrust public officials and do not believe what they say or promise. This applies to commissioners, managers, consultants, and elected officials. They will cite instances where an individual indicated that something would be done, but nothing had been implemented.

***Importance:***

Trust is an important commodity. Unless the community feels that the people responsible have the authority to do what they say, the community will doubt the agency.

***How Do You Propose Overcoming This Barrier?***

- Select a spokesperson that the community trusts.
- Implement a feedback system that the community feels will protect them and ensure that what is promised will be implemented.
- Make sure the Citizens Advisory Committee or citizen representatives are involved in the decision making.

- Show the community similar facilities in the planned area. Take citizens and their representatives to see these facilities.
- 

**Title:**           **“If I Told You, I’d Have to Kill You” or: Public Agencies Are Reluctant to Be Open, Honest, and Timely in Their Dealings with Stakeholders**

**Originator:**   Anderson

***Barrier Description:***

Well-run bureaucracies believe that they have “the answer” and resent unwelcome and uninvited advice from others. This generates distrust and resistance from stakeholders who expect to have direct and unfettered access to public-policy decision making.

***Importance:***

Early understanding, buy-ins and support from the broad community around us, is essential for projects that are as big and complex as this one.

***How Do You Propose Overcoming This Barrier?***

- Public agency governing boards and their staffs must first understand this principle of openness.
- Develop a policy to be open, honest, and timely.
- Train staff to be open, honest, and timely.
- Monitor and enforce the practice.

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**Title:** "Where is Ted Danson When You Need Him?" We Need a Spokesperson for This Problem

**Originator:** Anderson

***Barrier Description:***

Without an understanding of the immense implications of this problem by legislators, city councils, and the public, we will have a limited ability to fund and implement large-scale environmental and water resources improvements.

***Importance:***

We cannot move without a shared vision.

***How Do You Propose Overcoming This Barrier?***

Find a champion who is credible, well known, and knowledgeable. Does Martha Stewart want to help? Recycling: it's a good thing.

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**Title:** "Trust Me – I Know What I Think I'm Saying!"

**Originator:** McCalley

***Barrier Description:***

Disposal speaks to waste. We must consistently speak of value/benefit in common terms. As we make a transition from a throwaway society, we must redefine our vocabulary to share value versus disposal.

***Importance:***

Perception is a critical emotional factor. If we fail to address the emotion, the economic and scientific aspects are moot.

We must keep our words simple and direct, and we must speak to both the emotional and physical needs of people.

### ***How Do You Propose Overcoming This Barrier?***

- Gain consensus on how we approach this issue.
  - Define and use our vocabulary carefully.
- 

***Title:***            **White Man Speak with Forked Tongue**

***Originator:***    Sanden

### ***Barrier Description:***

The absolute requirement to move a steady amount of biosolids product, regardless of rain, shine, or the quality of farm operation over the last 8 years, has resulted in many documented cases of over-application, record falsification, insufficient irrigation, and ill-timed cultural practices. The POTWs and commercial contractors have taken advantage of insufficient staff, initially at the Regional Quality Control Boards and subsequently at county regulatory agencies, to “just get rid of material,” even when agronomic practice is improper. The POTWs have continued to do business with these contractors because they are “trapped” and must dispose of material.

### ***Importance:***

Farmers, regulators, and residents of the San Joaquin Valley municipalities see these practices and end up with the attitude that the southland cities do not care and just want to dump their waste. This attitude, coupled with public concerns over health issues, results in zero public confidence that the waste management community “wants to do the right thing.” The public perception is that this is the twenty-first century equivalent of the industrial despots of the late nineteenth century as they created the pollution-ridden industrial revolution.

### ***How Do You Propose Overcoming This Barrier?***

The POTWs and municipalities must be rigorous in inspections and cut relationships with contractors and farmers who are not exercising “good practice.” They must be willing to raise contractor fees if necessary and diversify “fail-safe options.”

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**Title:**            **Participatory Decision-Making Policies**

**Originator:**    Watson

***Barrier Description:***

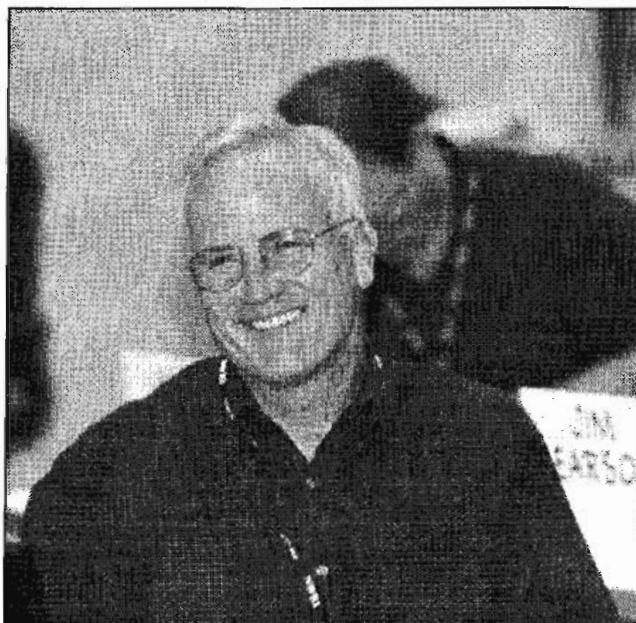
The apparent lack of experience in using methods to address fears/concerns of neighbors (our partners in time and space) and other interested parties leads to deteriorating relationships and the growth of public dissatisfaction.

***Importance:***

The number one cause of composting facility closures is public opposition. Neighbors' will shutdown a facility that they do not feel is adding to their standard of living. Sustainability must have as a component on-going relationship-building that reflects change (demographics).

***How Do You Propose Overcoming This Barrier?***

Training and aggressive policy development on participatory decision making is required. Investigations into neighbor concerns are a must prior to the first siting discussions. Neighbors should feel some measure of control over operations to mitigate nuisance odor.





## **Federal/State Legislation Supporting Organics Management Research and Development That Include Tax Credits to Private Corporations for Product Development**

**Originators:**

Atwater of behalf of himself and Graham

*The following barriers were consolidated under the above title:*

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**Title:**           **Federal Legislation Supporting Organics Management Research and Development That Include Tax Credits to Private Corporations for Product Development**

**Originator:**   Atwater

***Barrier Description:***

Need federal financial support for national research and development to develop new technologies to produce excellent organic fertilizer products and clean, renewable biogas.

***Importance:***

Coordinate federal research and technology development. The USDOE, USDA, and USEPA need to coordinate programs and research priorities. See Clinton's Executive Order on biogas and biomass (August 1999). Recommend one hundred million dollars per year program (five-year authorization) for multiple federal agencies, including support of academic and private research and development partnerships.

***How Do You Propose Overcoming This Barrier?***

Congressional legislation to authorize support research and development.

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**Title:** Missed Opportunities: Not Monitoring Tax Credits, Rebates, Exemptions, and Incentives Development

**Originator:** Graham

***Barrier Description:***

Lost opportunities to both participate and influence current and developing projects.

***Importance:***

Limits the plan's ability to demonstrate design and implement the multi-faceted aspects of the plan in the shortest period of time.

***How Do You Propose Overcoming This Barrier?***

- Tie together key programs with the multiple frameworks of project strategies.
  - Continually monitor key identified programs and legislative activities.
  - Interface with key legislative decision makers to help developments.
  - Help the decision makers be more knowledgeable about the processes, technologies, and economic benefits of composting.
- 

**Title:** Where Was I Yesterday During the AB1466 Legislative Hearing?

**Originator:** Graham

***Barrier Description:***

Read AB1466 as introduced by Florez, February 23, 2001.

***Importance:***

Lost opportunity to be a part of the bill's outcome.

***How Do You Propose Overcoming This Barrier?***

- Contact and find out what happened at the hearing.
  - Inquire how we can help define or construct a bill.
  - How do we want to help?
  - Continue to monitor AB1466.
- 

***Title:***            **Waste Energy: Cause and Effects**

***Originator:***    Graham

***Barrier Description:***

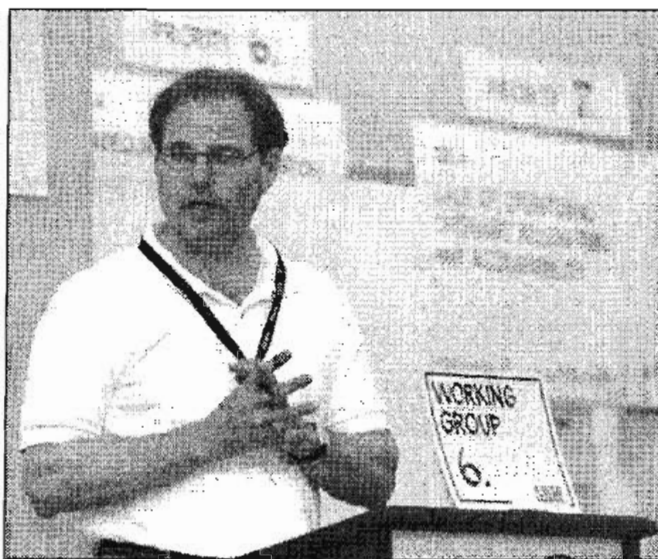
Educating both the public and legislators.

***Importance:***

The general public underestimates the value of waste energy.

***How Do You Propose Overcoming This Barrier?***

Educate the public on the secondary effects of energy efficiency on air pollution. Reductions in air pollution are projected due to the proposed energy efficiency opportunities. In general, the electrical energy savings will decrease emissions at utility's power generating station, including carbon dioxide, sulfur, carbon, and oxides of nitrogen.



## **Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure**

**Originators:**

Dusault on behalf of himself and Mears

*The following barriers were consolidated under the above title:*

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**Title:**           **Animal Health/Disease Issues and Their Potential to Derail the Transportation of Manure**

**Originator:**   Dusault

***Barrier Description:***

Hoof and mouth disease, mad cow disease, and other existing and future infectious agents may limit movement of manure off-farm. Public health impacts, perception, and fear may drive this issue.

***Importance:***

Fear that is instilled on-farm and among the public is powerful and could prevent manure from moving to organic management facilities.

***How Do You Propose Overcoming This Barrier?***

- Quality assurance/quality control.
  - Preemptive measures.
  - Public education.
  - Decontamination protocols.
- 

***Title:***           **How Will the IEUA Implement and Support Biosecurity for the Chino Basin Dairies?**

***Originator:***   Mears

***Barrier Description:***

The establishment of the Chino Basin Organics Management center could become a target for legal action due to all the truck traffic from the facility(s) to all of the dairies.

***Importance:***

An animal virus carried in the waste stream could shut down the facility. Where did the virus come from?

USA Today – Washington 4/17/01. Federal emergency officials are preparing for a U.S. outbreak of foot-and-mouth disease, a prospect they see as highly likely. About 75 federal officials from agencies ranging from Agriculture to the CIA met Wednesday to review plans for addressing an outbreak of a highly infectious animal virus.

It has been estimated that the cost to the U.S. dairy industry would be a billion dollars a day in livestock reduction.

***How Do You Propose Overcoming This Barrier?***

Employ a Closed Waste Management System where all the waste stream could be collected on a daily basis. Data can be collected, and all of the solids and liquids can be tracked. Additionally, the waste may be treated and processed, and the byproducts of electricity, bedding, and pasteurized nutrient-rich soil amendment may be produced.

## **Keeping All Options Open**

**Originators:**

Dusault on behalf of himself, Cork, and Skapik

*The following barriers were consolidated under the above title:*

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**Title:**           **Keeping All Options Open**

**Originator:**   Dusault

***Barrier Description:***

- Siting a new facility is harder than keeping an existing one.
- A de facto solution is to keep and upgrade the existing site.

***Importance:***

If the siting process fails, operations can continue at the existing site.

***How Do You Propose Overcoming This Barrier?***

Develop a contingency plan to continue using the existing site.

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**Title:**           **What Is Wrong With the Existing Site?**

**Originator:**   Cork

***Barrier Description:***

The IEUA owns and operates, on contract, an existing co-composting site. The site is large enough to accommodate at least one of the proposed enclosed facilities. Transportation routes are established, and the facility is located in reasonably close proximity to the diaries. Biosolids, being a much smaller fraction of the total organic load to the facility, should not drive the siting process. Phased construction, albeit more difficult and more expensive, is a recognized technique that has been used in the past to upgrade facilities to “state-of-the-art” status. Urban pressure is no greater at this site than at other potential sites and, since the site is existing, is potentially much less.

***Importance:***

Fiscal responsibility, or at least the appearance of such, is critical to the credibility of the IEUA. The additional cost for phased construction is far outweighed by the savings from additional land purchases and potentially could avoid a long, expensive and, at worst, unsuccessful siting process.

***How Do You Propose Overcoming This Barrier?***

Additional analysis should be conducted to determine real costs, both capital and operational, at the existing site to determine a realistic plan to maintain the facility at the existing site. A workshop with construction, composting, traffic analysis, and odor control experts could help to identify an implementable plan to accomplish this goal.



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**Title:**           **Enclosure of the Existing Facility**

**Originator:**   Skapik

***Barrier Description:***

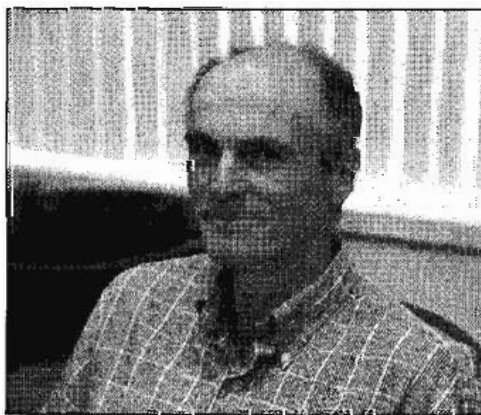
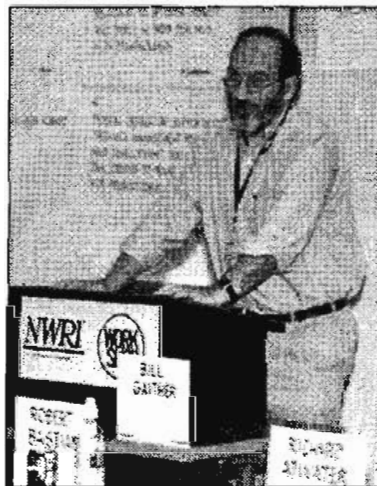
Overcome the concept that the existing facility must be moved. The existing facility was commissioned in 1995 and, at the time, was a state-of-the-art facility. This facility is only 6 years old and should continue to operate. Determine how to enclose the existing facility.

***Importance:***

The existing facility is currently located in an area that is agricultural and is not close to a residential community. It may be less expensive to enclose the existing facility given the fact that this facility is already sited, and because litigation would probably occur with relocation.

***How Do You Propose Overcoming This Barrier?***

Look to Synagro Technologies, Inc., who is enclosing an existing facility. Monitor its progress and their strategy.



## **Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets**

**Originators:**

Bastian on behalf of himself, Dusault, Joy, and Storelli

*The following barriers were consolidated under the above title:*

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**Title:**           **Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets**

**Originator:**   Bastian

***Barrier Description:***

Unreasonable expectations of significant cost savings via energy recovery from methane generated by anaerobic digestion of manure and biosolids and air emissions reductions could greatly impact the financial viability of the Chino Basin Organics Management concept.

***Importance:***

Promises of significant energy recovery from methane generated by anaerobic digestion of manure and biosolids will create expectations of a reliable energy source that may create unreasonable expectations for the program to provide a significant new source of energy. Similarly, promises of increased energy recovery efficiencies and emissions reductions, by use of microturbines and fuel cells when operated by entities without the expertise of those operation demonstration facilities, may not fully live up to expectations. While the program has the potential to generate a significant amount of energy to offset much of the energy demand and air emissions associated with operating the processing biosolids and manure facilities and possibly those of Inland's POTWs, care should be taken to avoid overstating these savings. Variability of feedstock quality and the inconsistent performance of digesters and energy recovery systems may lead to a failure to meet projected levels of energy production and recovery.

***How Do You Propose Overcoming This Barrier?***

- Be realistic in the energy production and recovery expectations of the planned facilities.
  - Avoid overdependence upon the projected energy recovery of these facilities and ensure adequate alternative and back-up sources of energy.
- 

***Title:***           **“I Wish I Had Gas,” Anaerobic Digesters Mostly Fail**

***Originator:***   Dusault

***Barrier Description:***

- In the U.S., the vast majority of digesters that process manure/agricultural material have failed.
- There is a lack of experience/technical expertise.
- European technology is based on European conditions.
- Composting is a piece of cake compared to anaerobic digesters.

***Importance:***

- Digesters use much less land.
- If the digesters do not work, a major portion of the organic management concept will fail.
- Digesters are a lot more powerful air pollution control technology.
- Digesters can generate a lot more revenue.
- Digesters can result in the greatest benefit.

***How Do You Propose Overcoming This Barrier?***

- Require due diligence on technology.
- Bring in those with the most expertise.

- Expect the unexpected.
  - Commit substantial resources to fine-tuning operations.
  - Recommend long-term commitment to U.S.-based digester technology.
- 

**Title:**           **Air Emissions Permits and the Need of Emission Reduction Credits for the Proposed Facility**

**Originator:**   Joy

***Barrier Description:***

The Business Plan recommends the Energy Recovery Technology and Costs with a goal of 50 megawatts by 2006 and enclosing the compost facility to control odors. The facility will require air emission permits, which did not appear to be considered in the plan. The facility will require New Source Review, and the emissions will need to be offset or emission reduction credits (ERCs) will need to be purchased. The availability of the ERCs may be questionable or costly. The air quality permits and associated costs should be addressed in this plan.

***Importance:***

The costs associated with ERCs may be high; one pound of emissions could be on the order of \$75,000. The availability of ERCs may be a challenge, especially with the current energy crisis. New power generation facilities are attempting to tap into the ERC reserves designated for essential public services.

***How Do You Propose Overcoming This Barrier?***

- Need an assessment of the type of equipment to be used for the energy generation and the odor controls on the composting facility.
- Need to determine whether air emission permits are required and the availability, if needed, for ERCs, and then incorporate costs in the economic analyses.
- Need to work with the SCAQMD to determine the availability of ERCs.

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**Title:**           **Renewable Energy Production Is Emerging**

**Originator:**   Storelli

***Barrier Description:***

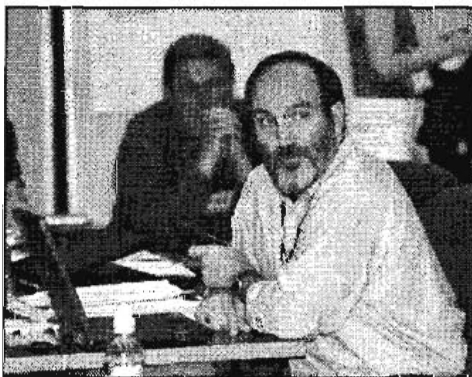
There is a lack of proven technologies for emerging renewable energy production. Energy productions from renewable energy sources are not off-the-shelf and can be problematic.

***Importance:***

If renewable energy technologies do not perform as well as expected, significant revenue will be lost and additional costs will be incurred.

***How Do You Propose Overcoming This Barrier?***

Convene a working group of renewable energy producers and people knowledgeable with the performance of the technology (i.e., California Energy Commission and the USDOE's National Renewable Energy Lab).



## **Obtaining a Reasonable Return for the Products**

**Originators:**

Bastian on behalf of himself and Sanden

*He following barriers were consolidated under the above title:*

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**Title:**           **Obtaining a Reasonable Return for the Products**

**Originator:**   Bastian

***Barrier Description:***

Obtaining a reasonable return for the products generated by the program is imperative to successfully implementing the Chino Basin Organics Management concept.

***Importance:***

Unless a reasonable return can be made from the sale of the products generated by the processing facilities, the surplus product will likely accumulate, and the Chino Basin Organics Management concept will not likely be successfully implemented without significant economic subsidies.

***How Do You Propose Overcoming This Barrier?***

- Better identify the needs of the intended customers for the products that are to be generated by the facilities and then produce the types of products that they want and are willing to purchase.
- The development of sustainable markets and the appropriate pricing of products should support the continued operations of the new proposed facilities for implementing the Chino Basin Organics Management concept.
- Build strong partnerships with organizations that can handle the processed materials as products rather than simply to "get rid of this stuff" for the generators.

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**Title:**        **Lack of Consistent, Proven, Economic Benefits of Compost Applications in Field Trials for Production Agriculture in the San Joaquin Valley**

**Originator:**    Sanden

***Barrier Description:***

For 12 replicated field trials – from Bakersfield to Modesto – conducted by the University of California farm advisors and specialists over the last 7 years, yield increases following compost applications have been slight to none when compared to conventional fertilizer applications. This has been true for a variety of composts and co-composts: gin trash, urban green waste, biosolids/gin trash/green waste, and chicken/dairy/gin trash. Trial durations varied from 1 to 3 years on alfalfa, corn, cotton, garlic, leafy vegetables, and pistachios.

In separate trials on five plantings of winter wheat over 2 years in three fields, the land application of Class B biosolids on marginal ground significantly increased the protein content and improved infiltration on sodic alkali clay loam. Net economic benefit, however, in tonnage and protein premium was no more than \$50.

***Importance:***

Field crop growers must make a profit and will not invest or even bother with practices that do not have a proven economic benefit. Bulk compost costs of \$10/ton plus average freight in Kern County at \$7 and spread at \$3 means a 5 wet ton/acre (ac) application costs \$100/ac. This may be 10 to 25 percent of the gross income of the field crop at current commodity prices.

With southland municipalities potentially producing more than 1 million tons of compost per year, this requires 100,000 acres of farmland for bulk spreading at 10 ton/ac. This level of acreage will be available for “clean composts” without biosolids, but only if the material is next to free for growers. Many current compost sites simply apply 50 to 100+ ton/ac on adjacent land when they run out of room in their yards.

***How Do You Propose Overcoming This Barrier?***

All farmers agree that organic matter additions are of benefit to our high oxidation rate mineral soils in the Central Valley, but they still have to make money. If material is delivered to the field site, farmers will apply it.

The municipalities/industry must fund innovative research for “site specific” application techniques for intensive vegetable crop production to generate proven profitable results.



## **Project Size May Inhibit Full Implementation**

**Originators:**

Eubanks on behalf of herself and Munsey

*The following barriers were consolidated under the above title:*

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**Title:**           **Project Size May Inhibit Full Implementation**

**Originator:**   Eubanks

***Barrier Description:***

The sheer size of the project and the number of areas being explored at one time are very large. Conceptually, the project is doable, but is it practical and implementable? Technology is available, but to the size required?

***Importance:***

Hindrance to the concept can occur when planning to build and operate the project. How do you train staff and educate them in all these areas? Technology is required to make the project successful.

***How Do You Propose Overcoming This Barrier?***

While not a stumbling block, the process must be considered at each implementation step. Project follow-through and monitoring must be written into project development. Pilot projects will begin training of staff.

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**Title:**           **Get Real – Staged Implementation**

**Originator:**   Munsey

***Barrier Description:***

Unrealistic expectations to fully implement in total as a concept. This is particularly true for new site requirements.

***Importance:***

Need to be realistic. Do what can be done.

***How Do You Propose Overcoming This Barrier?***

- Set priorities on immediate needs and benefits.
- Get real on siting issues.
- New sites will take a long time.



## **Preoccupation of Scientific and Rational Response to Public Opposition**

**Originator:**

Dusault

***Barrier Description:***

Public opposition to waste-processing facilities is rarely based primarily on an objective assessment of the issues. The emotional nature of opposition is often not recognized, and its consideration appears absent from existing strategy.

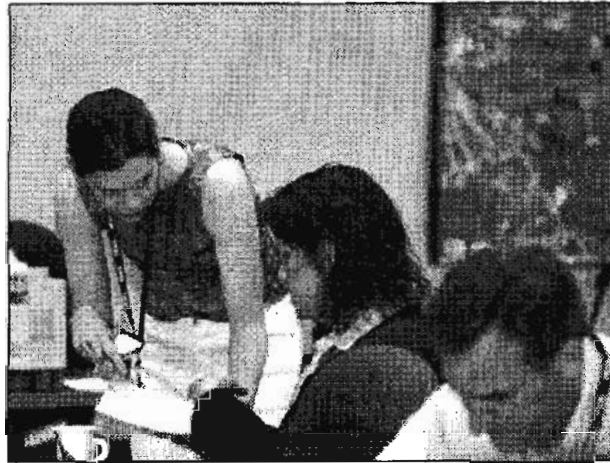
***Importance:***

Emphasizing logic, science, or process alone is unlikely to sway opposition. If it does not, it is unlikely to overcome this barrier.

***How Do You Propose Overcoming This Barrier?***

Speak to the non-scientific and “emotional” issues:

- Compensation/revenue sharing.
- Do not overpromise.
- Inclusion.
- Site visits to well-run existing facilities.
- Design participation.



## STRENGTH OF FEELING ANALYSIS

Strength-of-Feeling describes a quantitative method of determining the degree of agreement (or disagreement) among participants as they ranked major barrier groups. When the NGT workshop was finished, the 28 participants had consolidated the 101 individual barriers into 21 major barrier groups. After this was done, each participant ranked his or her ten highest priority responses to the workshop question on a ranking sheet that was signed to identify the participant. On the ranking sheet, the barrier ranked number one received ten points, the number-two barrier received 9 points, on down to the tenth-ranked barrier, which receive only one point. All unranked barriers receive zero points.

Also, the 28 individuals were assigned to one of five sub-groups comprising (1) Consultant Participants, (2) Corporate Participants, (3) Public-utility Participants, (4) Regulator Participants, and (5) University-research Participants. As each individual's top-ten responses were entered into the computer analysis program, the sub-group to which he or she belonged was also entered. At the stroke of a key, the priority ranking of all participants was printed as was the priority ranking of each of the sub-groups. These results appear in the following six tables.

After each barrier description is a column containing two numbers separated by a slash. These are the times picked and the total number of points that the participants assigned that particular barrier. In Table 1 there were 28 participants who could have all selected one particular barrier description as their highest priority. If that happened, then the total number of points would have been  $28 \times 10 = 280$ . But that didn't happen. The 28 participants gave their highest-ranking major barrier only 155 points out of the possible 280 points.

The second column of the table shows the Strength-of-Feeling as a percentage. This was computed as  $155/280 \times 100 = 55.4\%$ .

It is usually informative to examine the priorities of the sub-groups. Differences in perspective based on professional responsibility show up clearly. For example, the entire group of 28 seems to have relatively weak agreement about the most important barrier. By contrast, the five Corporate Participants were in total agreement about their highest priority barrier. The University-research Participants were in nearly as close agreement about the highest-priority barrier shown by their 97.5% Strength-of-Feeling.

But look at the contrast! The top-priority barrier unanimously selected by the Corporate Participants was not selected, even once, by the University-research Participants. The top priority barrier selected by University-research Participants was ranked third by the Corporate Participants.

**Table 1**

Barriers (21) Ranked by all Participants (28)

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
1.	Siting	18/155	55.4%
2.	Public Nuisance Associated with Odors, Dust, Vectors, Traffic, Noise, Etc.	19/136	48.6%
3.	Coordinated Regional Multi-Media Environmental Policies That Encourage the Recycling of Organic Material in a Long-Term Sustainable Manner	21/133	47.5%
4.	Fear of Public Health Dangers	17/118	42.1%
5.	Public Opposition	17/112	40.0%
6.	Inadequate Public Information	23/110	39.3%
7.	Lack of Operational Oversight, Follow-through, and Accountability	19/102	36.4%
8.	Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring Really Work?	17/84	30.0%
9.	Unforeseen Circumstances and Costs	14/77	27.5%
10.	Diverse Marketing Approaches and Manufacturing Products That Meet Customer Needs – “Customer Service”	16/76	27.1%
11.	Lack of Political Leadership	16/74	26.4%
12.	Lack of an Acceptable Financial Plan	10/68	24.3%
13.	Consistently Generate High-Quality Products	11/59	21.1%

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
14.	Distrust of Public Officials and Their Representatives	10/46	16.4%
15.	Federal/State Legislation Supporting Organics Management Research and Development That Includes Tax Credits to Private Corporations for Product Development	8/36	12.9%
16.	Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure	7/36	12.9%
17.	Keeping All Options Open	9/33	11.8%
18.	Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets	7/30	10.7%
19.	Obtaining a Reasonable Return for the Products	6/29	10.4%
20.	Project Size May Inhibit Full Implementation	5/15	5.4%
21.	Preoccupation on Scientific and Rational Response to Public Opposition	4/9	3.2%

**Table 2**

Barriers (21) Ranked by Consultant Participants (5)

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
1.	Siting	4/38	76.0%
2.	Public Opposition	4/35	70.0%
3.	Fear of Public Health Dangers	5/29	58.0%
4.	Public Nuisance Associated with Odors, Dust, Vectors, Traffic, Noise, Etc.	5/26	52.0%
5.	Unforeseen Circumstances and Costs	4/24	48.0%
6.	Inadequate Public Information	5/21	42.0%
7.	Keeping All Options Open	2/19	38.0%
8.	Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring Really Work?	4/18	36.0%
9.	Lack of Acceptable Financial Plan	2/11	22.0%
10.	Diverse Marketing Approaches and Manufacturing of Products That Meet Customer Needs – “Customer Service”	2/10	20.0%
11.	Lack of Political Leadership	2/10	20.0%
12.	Lack of Operational Oversight, Follow-through, and Accountability	2/10	20.0%
13.	Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure	1/9	18.0%



<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
14.	Coordinated Regional Multi-Media Environmental Policies That Encourage the Recycling of Organic Material in a Long-Term Sustainable Manner	4/7	14.0%
15.	Preoccupation on Scientific and Rational Response to Public Opposition	2/5	10.0%
16.	Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets	1/2	4.0%
17.	Project Size May Inhibit Full Implementation	1/1	2.0%

**Table 3**

Barriers (21) Ranked by Corporate Participants (5)

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
1.	Siting	5/50	100.0%
2.	Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring Really Work?	4/24	48.0%
3.	Coordinated Regional Multi-Media Environmental Policies That Encourage the Recycling of Organic Material in a Long-Term Sustainable Manner	4/22	44.0%
4.	Public Nuisance Associated with Odors, Dust, Vectors, Traffic, Noise, etc.	3/22	44.0%
5.	Diverse Marketing Approaches and Manufacturing Products That Meet Customer Needs – “Customer Service”	3/20	40.0%
6.	Unforeseen Circumstances and Costs	4/19	38.0%
7.	Public Opposition	3/18	36.0%
8.	Fear of Public Health Dangers	2/16	32.0%
9.	Lack of Operational Oversight, Follow-through, and Accountability	5/13	26.0%
10.	Inadequate Public Information	3/12	24.0%
11.	Federal/State Legislation Supporting Organics Management Research and Development That Includes Tax Credits to Private Corporations for Product Development	2/12	24.0%
12.	Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure	2/10	20.0%

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
13.	Lack of Political Leadership	2/10	20.0%
14.	Lack of Acceptable Financial Plan	1/9	18.0%
15.	Keeping All Options Open	2/6	12.0%
16.	Project Size May Inhibit Full Implementation	1/4	8.0%
17.	Consistently Generate High-Quality Products	2/4	8.0%
18.	Distrust of Public Officials and Their Representatives	1/2	4.0%

**Table 4**

Barriers (21) Ranked by Public-Utility Participants (7)

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
1.	Siting	5/39	55.7%
2.	Public Nuisance Associated with Odors, Dust, Vectors, Traffic, Noise, Etc.	6/34	48.6%
3.	Lack of Acceptable Financial Plan	5/32	45.7%
4.	Fear of Public Health Dangers	4/30	42.9%
5.	Coordinated Regional Multi-Media Environmental Policies That Encourage the Recycling of Organic Material in a Long-Term Sustainable Manner	4/29	41.4%
6.	Inadequate Public Information	6/28	40.0%
7.	Diverse Marketing Approaches and Manufacturing Products That Meet Customer Needs – “Customer Service”	5/27	38.6%
8.	Lack of Political Leadership	6/26	37.1%
9.	Lack of Operational Oversight, Follow-through, and Accountability	4/26	37.1%
10.	Distrust of Public Officials and Their Representatives	5/25	35.7%
11.	Public Opposition	4/23	32.9%
12.	Consistently Generate High-Quality Products	3/19	27.1%
13.	Unforeseen Circumstances and Costs	3/14	20.0%

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
14.	Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets	2/9	12.9%
15.	Project Size May Inhibit Full Implementation	2/7	10.0%
16.	Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure	1/6	8.6%
17.	Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring Really Work?	1/4	5.7%
18..	Preoccupation on Scientific and Rational Response Public Opposition	1/3	4.3%
19.	Keeping All Options Open	2/3	4.3%
20.	Federal/State Legislation Supporting Organics Management Research and Development That Includes Tax Credits to Private Corporations for Product Development	1/1	1.4%

**Table 5**

Barriers (21) Ranked by Regulator Participants (7)

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
1.	Coordinated Regional Multi-media Environmental Policies That Encourage the Recycling of Organic Material in a Long-term Sustainable Manner	5/36	51.4%
2.	Lack of Operational Oversight, Follow-through, and Accountability	5/35	50.0%
3.	Public Nuisance Associated with Odors, Dust, Vectors, Traffic, Noise, Etc.	6/33	47.1%
4.	Inadequate Public Information	6/32	39.3%
5.	Fear of Public Health Dangers	3/29	41.4%
6.	Siting	4/28	40.0%
7.	Public Opposition	4/21	30.0%
8.	Consistently Generate High-Quality Products	4/21	30.0%
9.	Obtaining a Reasonable Return for the Products	4/18	25.7%
10.	Lack of Political Leadership	3/18	25.7%
11.	Lack of Acceptable Financial Plan	2/16	22.9%
12.	Unforeseen Circumstances and Costs	2/16	22.9%
13.	Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets	3/16	22.9%
14.	Distrust of Public Officials and Their Representatives	2/15	21.4%

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
15.	Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring Really Work?	4/14	20.0%
16.	Diverse Marketing Approaches and Manufacturing Products That Meet Customer Needs – “Customer Service”	4/13	18.6%
17.	Federal/State Legislation Supporting Organics Management Research and Development That Includes Tax Credits to Private Corporations for Product Development	3/9	12.9%
18.	Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure	2/9	12.9%
19.	Keeping All Options Open	3/5	7.1%
20.	Preoccupation on Scientific and Rational Response Public Opposition	1/1	1.4%

**Table 6**

Barriers (21) Ranked by University-Research Participants (4)

<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
1.	Coordinated Regional Multi-media Environmental Policies That Encourage the Recycling of Organic Material in a Long-term Sustainable Manner	4/39	97.5%
2.	Will the Composting Facility Design, Including Layout, Structural Materials, Mixing, Materials Handling, Aeration, Odor Control, and Process Monitoring Really Work?	4/24	60.0%
3.	Public Nuisance Associated with Odors, Dust, Vectors, Traffic, Noise, Etc	4/21	52.5%
4.	Lack of Operational Oversight, Follow-through, and Accountability	3/18	45.9%
5.	Inadequate Public Information	3/17	42.5%
6.	Public Opposition	2/15	37.5%
7.	Consistently Generate High-Quality Products	2/15	37.5%
8.	Fear of Public Health Dangers	3/14	35.0%
9.	Federal/State Legislation Supporting Organics Management Research and Development That Includes Tax Credits to Private Corporations for Product Development	2/14	35.0%
10.	Obtaining a Reasonable Return for the Products	2/11	27.5%
11.	Lack of Political Leadership	3/10	25.0%
12.	Diverse Marketing Approaches and Manufacturing Products That Meet Customer Needs – “Customer Service”	2/6	15.0%



<b>Rank</b>	<b>Title</b>	<b>Times Picked/Pts</b>	<b>Strength of Feeling</b>
13.	Unforeseen Circumstances and Costs	1/4	10.0%
14.	Distrust of Public Officials and Their Representatives	2/4	10.0%
15.	Project Size May Inhibit Full Implementation	1/3	7.5%
16.	Avoid Unreasonable Expectations of Energy Production, Recovery, and Emissions Offsets	1/3	7.5%
17.	Animal Health and Disease Issues and Inadequate Biosecurity Plan and Their Potential to Derail the Transportation and Processing of Manure	1/2	5.0%



## APPENDIX A

### ACRONYMS

AQMD	Air Quality Management District
BACT	best available control technology
BIIMBY	Build It In My Backyard
BOD	biological oxygen demand
CAC	citizens advisory committee
CEQA	California Environmental Quality Act
CIWMB	California Integrated Waste Management Board
CRWQCB	California Regional Water Quality Control Board
CWEA	California Water Environment Association
DOE	Department of Energy
EIR	environmental impact report
EMS	Environment Management System
ERC	emission reduction credit
IEUA	Inland Empire Utilities Agency
ISO	Internal Quality Standard
NBP	National Biosolids Partnership
NEPA	National Environmental Policy Act
NIMBY	Not In My Backyard
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Lab
NWRI	National Water Research Institute
PM	particulate matter
POTW	Publicly Owned Treatment Works
PUC	Public Utility Commission

RFP	Request for Proposals
RWQCB	Regional Water Quality Control Boards
SARI	Santa Ana River Interceptor
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SDC	system development charges
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
UNDP	United Nations Development Program
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WEF	Water Environment Federation

## APPENDIX B

### PREVIOUS NGT WORKSHOPS CONDUCTED BY NWRI

*Desalination Research & Development.* Report of a workshop sponsored by NWRI in cooperation with the United States Bureau of Reclamation. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, January 19-21, 2001. 185p.

*Knowledge Management.* Report of a workshop sponsored by NWRI. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA January 5-7, 2001. 169 p.

*Oxygenate Contamination.* Report of a workshop sponsored by NWRI in cooperation with the United States Bureau of Reclamation. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, September 15-17, 2001: 258p.

*Utility Leadership.* Report of a workshop sponsored by NWRI in cooperation with Malcolm Pirnie, Inc., the University of Southern California, and the University of South Florida. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, October 24-26, 1999: 154p.

*Non-potable Water Recycling.* Report of a workshop sponsored by NWRI in cooperation with Irvine Ranch Water District and the Orange County Water District. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, May 23-25, 1999: 174p.

*Conjunctive Use Water Management Program.* Report of a workshop jointly sponsored by NWRI, Association of Ground Water Agencies, and the Metropolitan Water District of Southern California. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, May 27-29, 1998: 157p.

*Barriers to Providing Safe Drinking Water Through Small Systems.* Report of a workshop jointly sponsored by NWRI, Pan American Health Organization, and NSF International/WHO Collaborative Center. Pan American Health Organization Headquarters, Washington, D.C., May 13-15, 1998: English report: 175p., Spanish report: 188p. (Bound in a single volume.)

*Barriers to Harvesting Stormwater.* Report of a workshop jointly sponsored by NWRI, Los Angeles County Department of Public Works, County of Orange Public Facilities & Resources Department, Southern California Coastal Water Project, and the American Oceans Campaign. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, September 22-24, 1997: 159p.

*Groundwater Disinfection Regulations Benefits Conference.* Report of a conference sponsored by NWRI. Arnold and Mabel Beckman Center, National Academies of Sciences and Engineering, Irvine, CA, March 17, 1997: 75p.

*Groundwater Disinfection Regulation.* Report of a workshop jointly sponsored by NWRI and the USEPA. Arnold and Mabel Beckman Center, National Academies of Sciences and Engineering, Irvine, CA, January 6-8, 1997: 209p.

*Membrane Biofouling.* Report of a workshop jointly sponsored by NWRI, UNESCO Centre for Membrane Science and Technology, and CRC for Waste Management and Pollution Control, LTD. UNSW Institute of Administration, Sydney, Australia, November 15-17, 1996: 176p.

*The Santa Ana River Watershed.* Report of a workshop jointly sponsored NWRI and the Santa Ana Watershed Project Authority. Co-sponsors included: City of San Bernardino Water Department, City of Riverside, Western Municipal Water District, and Orange County Water District. Kellogg West Conference Center/Hotel, California State Polytechnic University, Pomona, CA, August 23-25, 1995: 182p.

*The New River.* Report of a workshop jointly sponsored by NWRI and the County of Imperial, California. Barbara Worth Country Club, Holtville, CA, May 19-21, 1995: English report: 134p., Spanish report: 134p. (Bound in a single volume)

*Establishment of The Middle-East Water and Energy Research and Technology Centre.* Report of a workshop jointly sponsored by NWRI and the Sultanate of Oman through the Worldwide Desalination Research and Technology Survey. Muscat, Oman: September 21, 1994: 29p.

*Risk Reduction in Drinking Water Distribution Systems.* Report of a workshop jointly sponsored by NWRI and the Environmental Criteria and Assessment Office of the USEPA. Arnold and Mabel Beckman Center, National Academies of Sciences and Engineering, Irvine, CA, February 27-28, 1994: 142p.

*Fouling and Module Design.* Report of a workshop jointly sponsored by NWRI and the National Science Foundation (NSF). Virden Conference Center of the University of Delaware, Lewes, DE, October 30 – November 1, 1993: 115p.

*Groundwater Disinfection Rule.* Report of a workshop jointly sponsored by NWRI and the USEPA in collaboration with the Weston Institute. Virden Conference Center of the University of Delaware, Lewes, DE. June 7-8, 1992: 103p.

## APPENDIX C

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## APPENDIX D

### PARTICIPANTS' BIOGRAPHICAL SKETCHES

#### **Blake P. Anderson**

*General Manager*

*Orange County Sanitation District*

As General Manager of the Orange County Sanitation District (California), Blake Anderson is responsible for ensuring compliance with regulatory requirements for a facility that provides wastewater collection, treatment, and disposal services to over two million people. He is active in watershed management issues and is co-Chair of the Santa Ana River Watershed Group, which is working on water supply, water quality, and habitat issues in an urbanized watershed in Southern California. He was also a member of the National Research Council's Water Science and Technology Board Committee on Watershed Management, and has written on the concept of watershed protection as a management tool for state and local governments. Anderson received a B.S. in Civil Engineering from California State Polytechnic University, Pomona.

#### **Richard W. Atwater**

*CEO/General Manager*

*The Inland Empire Utilities Agency*

Rich Atwater has over 20 years experience in water resources management. He has pioneered award-winning projects and implemented numerous innovative water resource management programs, and has been CEO/General Manager of the Inland Empire Utilities Agency – which distributes imported water and provides industrial/municipal wastewater collection and treatment services in San Bernardino County (California) – since 1999. In addition, he was the former General Manager of the West and Central Basin Municipal Water Districts and also managed the Resources Division for the Metropolitan Water District of Southern California. Atwater received a B.S. in Geology and Environmental Science from Stanford University and an M.S. in Urban and Regional Planning from the University of Southern California.

#### **Robert K. Bastian**

*Senior Environmental Scientist, Municipal Technology Branch*

*Office of Wastewater Management, U.S. Environmental Protection Agency*

Bob Bastian has been with the U.S. Environmental Protection Agency since 1973, serving in numerous technical assistance roles to various programs in the Office of Water. He has dealt with a wide range of issues associated with organics management (both national and international) and his efforts, among others, have included the development of both policy and technical guidance documents regarding sewage sludge/biosolids use and disposal practices, especially for land application practices involving use in agriculture, forestry, and reclamation activities. Bastian received a B.S. and M.S. in Biology, Mathematics, and Environmental Sciences at Bowling Green State University in Ohio.

**Anne Briggs**

*Senior Environmental Compliance Analyst  
Eastern Municipal Water District*

Anne Briggs has worked with the Eastern Municipal Water District (California) for 8.5 years and, previously, for the Virginia State Water Control Board for 15 years. She is co-Chair of the Biosolids Committee for the Southern California Alliance of Publicly Owned Treatment Works and has served as an Officer for the Biosolids Recyclers of Southern California, a biosolids outreach group that includes academia, private contractors, and publicly owned treatment works representatives. She was also on the Peer/Stakeholder Review Group for the California Water Environment Association's *Manual of Good Practice for the Agricultural Land Application of Biosolids*. Briggs received a B.S. in Environmental Science from the University of Virginia.

**Andrew C. Chang, Ph.D.**

*Professor, Department of Soil & Environmental Sciences  
University of California, Riverside*

Andrew Chang has been an instructor and researcher in the University of California system since 1971. His research interests are in land applications of municipal sewage sludge, water reuse, environmental chemistry of phosphorous in soils and sediments, and hydraulic and pollutant retention properties of soils and other porous media. He teaches courses in water quality, solid wastes, and professional development, and also consults for engineering companies and government agencies (both national and international). Chang received a B.S. in Agricultural Engineering from National Taiwan University, an M.S. in Agricultural Engineering from Virginia Polytechnic Institute, and a Ph.D. in Agricultural Engineering from Purdue University.

**Tracy D. Cork, P.E.**

*Wastewater Process Engineer  
Fluid Solutions*

Since 1986, Tracy Cork's consulting experience has included a wide variety of wastewater treatment, material handling, and solids processing projects. He is a wastewater process engineer and process design specialist with expertise in the evaluation, design, construction, and start-up of wastewater facilities and operations assistance as well as in solids handling, biological treatment, and odor control projects. He has been extensively involved in both wastewater treatment and residual projects for the Unified Sewerage Agency of Washington County (Oregon) and has recently worked on projects in Nevada, California, and Washington, DC. Cork received a B.S. in Civil Engineering and an M.S. in Civil/Sanitary Engineering from Oregon State University.

**Allen Dusault**

*Senior Project Manager  
Sustainable Conservation*

Allen Dusault has over 15 years experience in water-quality issues, waste management, and land-use planning that spans both public and private sectors. At Sustainable Conservation (California), he manages the implementation of the Dairies Projects, which aims to reduce the impact of dairy waste runoff on water quality. Prior to this, he was a private consultant to corporations and government agencies in California, focusing on work related to preventing polluted runoff. He also ran the State of Massachusetts' composting and biosolids reuse program. Currently, he is an Associate with the California Dairy Quality Assurance Program. Dusault received a B.S. in Soil Science from the University of Wisconsin, Madison, an MBA from the University of Redlands, and an M.S. in Resource Management from the University of Guelph in Ontario, Canada.

**James Earsom**

*District Conservationist  
U.S. Department of Agriculture – Natural Resources Conservation Service*

Jim Earsom has worked for the U.S. Department of Agriculture Natural Resource Conservation Service for the past 24 years. As District Conservationist, he supervises all technical assistance in dealing with the ways to manage animal waste for the sustainability of croplands. This service is offered to all private landowners who request assistance. Earsom received a B.S. in Natural Resources from Humboldt State University and an M.S. in Biology from California State University, San Bernardino.

**Eliot Epstein, Ph.D.**

*President and Chief Environmental Scientist  
E&A Environmental Consultants*

Eliot Epstein specializes in composting and biosolids management, solid waste, land application, and waste disposal. A soil physicist-agronomist by training, Epstein has participated in major composting programs in North America, Europe, and Asia. He is President of E&A Environmental Consultants (Mass.), directing all studies in the fields of sewage sludge, septage, and solid waste management, and is also Adjunct Professor at the Boston University School of Public Health. His company has been involved in over 850 composting projects around the world, and has been a consultant/advisor to the United Nations Development Program, California Integrated Waste Management Board, and the U.S. EPA, among others. Epstein received a B.S. in Forestry from New York State College of Forestry, an M.S. in Agronomy at the University of Massachusetts, and a Ph.D. in Soil Physics from Purdue University.

**Marsha H. Eubanks***Administrative Services Officer**Las Virgenes Municipal Water District*

As Administrative Services Officer, Marsha Eubanks assists in all issues relating to the water and wastewater industries, including policy development, project management, and resources negotiations, for the Las Virgenes Municipal Water District (California). Among her responsibilities, she manages contracts and lease negotiations for district facilities, including cell site and sludge injection farm leases, and sales of compost and reclaimed water. She also manages the department budget for potable water, reclaimed water, composting, and administrative functions. Eubanks received a B.A. in English Literature from Southern Methodist University and a M.A. in English Literature from the University of Iowa.

**Robert A. Gillette, P.E.***Principa**Carollo Engineers*

Robert Gillette has over 28 years experience as a civil engineer, with expertise in wastewater treatment and facilities, sludge thickening and dewatering, and biosolids reuse. He is a member of the Water Environment Federation's Biosolids and Residuals Committee and is Chair and founder of the California Water Environment Association (CWEA) Biosolids Committee, which developed the Biosolids Land Application Training Course, Biosolids Conference, and the *Biosolids Land Application Manual of Good Practice*. In addition, he is a certified biosolids land application management technologist and a principal with Carollo Engineers (California). Gillette has both a B.S. and M.S. in Civil Engineering from San Jose State University.

**John F. Graham***Chief Knowledge Officer**Environmental Products & Technologies Corporation*

John Graham has over 23 years experience as an information and knowledge management specialist involved with the study and application of information content sciences, including architectural frameworks, processes, applications, uses, distribution channels, and high-level research techniques. Since 1998, he has been Chief Knowledge Officer for Environmental Products & Technologies Corporation (California), which manufactures animal wastes and food waste management systems, and is responsible for on-going high-level research and for overseeing the construction and management of knowledge libraries at the corporation. Graham was also a speaker at the 1993 Information Industry's 25<sup>th</sup> Silver Anniversary Convention and Global Congress, focusing on information, technology, and business in the 1990s.

**James A. Hill, P.E.**

*Assistant Director of Public Works/Assistant City Engineer  
City of Chino, California*

Jim Hill has over 20 years experience as a civil engineer. He has been with the City of Chino (California) since 1982 and, as Assistant Director of Public Works, manages the City's Water Utility, Environmental, Land Development, and Capital Improvements sections. He has been the Chino representative to the Inland Empire Utilities Agency's Sewerage Program Technical Committee since 1982, and is the Chino representative to the monthly Inland Empire Utility Agency's Organics Management Facilities Program Workshop. Hill received a B.S. in Civil Engineering from California Polytechnic University, Pomona.

**Michael G. Hoover, P.E.**

*Project Manager, Organics Management Program  
Inland Empire Utilities Agency*

During his 34-year career, Mike Hoover has focused on water resource management and engineering on projects throughout the Southwest. He has served as Project Engineer/Manager for projects involving comprehensive groundwater investigations, watershed management, biosolids management, and the planning and design of reclaimed water, wastewater, and regional solids treatment facilities. Notably, he was Chief Engineer/Project Manager for two of the largest water and reclaimed water projects in the U.S.: the Los Angeles Aqueduct Filtration Plant and West Basin Municipal Water District's Reclamation Program. He is also Director of Water Resources at Tetra Tech ASL (California). Hoover received a B.S. in Civil Engineering from California State University, San Diego.

**Jayne E. Joy, P.E.**

*Director, Environmental & Regulatory Compliance  
Eastern Municipal Water District*

As the new Director of Environmental & Regulatory Compliance, Jayne Joy manages and integrates a variety of functions, programs, and staff engaged in the regulatory air and water quality issues affecting the Eastern Municipal Water District's (California) water, wastewater, and reclamation responsibilities. Prior to this position, Joy was Head of the Environmental Engineering Division for the Environmental Security Office at the Marine Corps Base at Camp Pendleton (1992-January 2001). There, she was responsible for developing and executing the Base Water Quality, Air Quality, Installation Restoration, Underground Storage Tank, and Solid Waste programs. Joy received a B.S. in Chemical Engineering from the University of California, San Diego.



**Harold “Chip” D. Leslie, III**

*Senior Associate, Planning/Environmental Services  
RBF Consulting*

Chip Leslie has over 21 years experience with public and private sectors, including redevelopment, land development, zoning administration, general plan programming, growth management, environmental coordination, historic preservation, and other areas of Planning. He is extremely involved at RBF (California) in planning and project management of large-scale community plans, and is currently responsible for directing RBF’s Land Development Planning efforts on projects for the Catellus Residential Group. Included in his work with RBF, Leslie was the Community Development Director with the City of Lake Elsinore for 4.5 years on a contract basis. Prior to joining the private sector, he worked for the Cities of Whittier and Ontario (California) in public sector planning. Leslie received a B.S. in Urban Planning from California State Polytechnic University, Pomona.

**Julia C. Lester, Ph.D.**

*Program Supervisor, Particulate Matter Strategies Section  
South Coast Air Quality Management District*

At the South Coast Air Quality Management District (California), Julia Lester is responsible for preparing air quality plans, regulations, and inventories for airborne small particulate matter, including primary sources and precursors, such as ammonia. Her current interests include an ammonia emissions inventory for Southern California and developing regulations to reduce ammonia emissions from livestock waste and composting operations. Lester received a B.S. in Chemical Engineering from Purdue University and both a M.S. and Ph.D. in Chemical Engineering from the California Institute of Technology.

**Lorrie L. Loder**

*Director of Customer and Community Relations  
Synagro Technologies, Inc.*

Since 1999, Lorrie Loder has been the principal liaison with the Riverside (California) community for Synagro Technologies, Inc, which is the nation’s leading manager of biosolids facilities. Among her responsibilities, she maintains communications with business, community, and environmental groups; elected officials; and operators of municipal water treatment plants. In addition, she assists Synagro as its Riverside County spokesperson and in developing communications and marketing programs to support Synagro’s environmental operations. Loder received B.S. degrees in Business and Marketing from California State University Long Beach.

**Steve McCalley**

*Director, Environmental Health Services Department  
County of Kern, California*

For more than 10 years, Steve McCalley has served as the Director of Kern County's Environmental Health Services Dept., where he is responsible for the protection of public health and the environment in regard to food, milk and dairy, hazardous material/waste surveillance and enforcement, water supply, and solid and infectious waste, just to name a few. His department also includes the Animal Control Services Division. In addition, he has been actively involved with the implementation of the Kern County Biosolids Ordinance and has served as Chair of the Kern County Dairy Technical Advisory Committee. McCalley received a B.S. in Agriculture from the University of Arizona and an MBA from the University of LaVerne.

**R. Marvin Mears**

*Chief Executive Officer  
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Marvin Mears is founder and Chief Executive Officer of Environmental Products & Technologies Corporation (a publicly traded company), which manufactures animal wastes and food waste management systems. Currently, he is developing the corporation to apply technology to industries where problems that impact the environment have caused local concerns. Mears has been past President of Corporate Capital Resources, Inc., a publicly traded venture capital company, and is presently on the Board of Directors for Chatsworth Products, Inc. and Robert T. Doris and Associates. Mears received his education in Industrial Management at Brigham Young University and El Camino College.

**Frank Munsey**

*United Water Operations Manager  
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Frank Munsey is the United Water Operations Manager for the Milwaukee Metropolitan Sewerage District (Wisconsin), which recycles 95 percent of its biosolids (60,000 dry tons/year) and has multiple options, including the sale of dried solids, Milorganite, land application of liquid as Agri-Life, and others. The District also won the U.S. Environmental Protection Agency's First Place Excellence Award for biosolids in 1999. Munsey received a B.S. in Chemical Engineering from Tufts University, an M.S. in Civil Engineering from Pennsylvania State University, and an MBA from the University of Wisconsin.

**Albert L. Page, Ph.D.**

*Professor Emeritus, Department of Environmental Sciences  
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For more than 50 years, Al Page has been a researcher and instructor in the University of California System, spending a majority of that time at the University of California, Riverside. He specializes in soil chemistry, ion-exchange equilibria, and the biochemistry of trace elements, and has contributed to the improved understanding of the chemistry of trace elements in soils and its influence on trace-element bioavailability and mobility as well as to the fate and effects of trace elements in municipal and industrial waste when applied to soils. Page received a B.A. in Chemistry from the University of California, Riverside and a Ph.D. in Soil Science from the University of California, Davis.

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As the Irrigation & Agronomy Advisor for the University of California Extension Program, Blake Sanden is responsible for educational and research programs relating to irrigation system management, salinity/fertility (soil) management, and field crops agronomy in Kern County, California. He also conducts field trials and seminars on a variety of resource management issues, such as water supply, green-waste compost, the application of biosolids to farmland, salinity management, wells and pumps, drip irrigation, irrigation system uniformity, and irrigation scheduling. Sanden received both a B.S. in International Agricultural Development/Agronomy and an M.S. in Water Science/Irrigation and Drainage from the University of California, Davis.

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Geralyn Skapik is a Partner at the Riverside (California) office for Burke, Williams & Sorensen, LLP. She has extensive experience in the organization and litigation of complex multi-million dollar toxic tort matters, and has represented Fortune 500 companies in landmark environmental/toxic tort cases. Further, she has organized and litigated the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and endangered species matters, and has supervised cases involving Superfund clean-up, eminent domain and land-use issues, and the preparation and implementation of Hazardous Communication Standard programs. In addition, she is a volunteer mediator for the Riverside County Courts. Skapik received a B.S. in Animal Science from California State Polytechnic University, Pomona and a J.D. from Western State University College of Law.

**Stephen J. Storelli***Integrated Waste Management Specialist**State of California Integrated Waste Management Board*

Stephen Storelli has been with the State of California Integrated Waste Management Board since 1990. Prior to that, he was the Associate Hazardous Materials Specialist with the California Department of Health Services as well as a Research Analyst (Economics) for the California Air Resources Board. In addition, he is the author of numerous publications, including the "Quarterly Report on California's Recycling Markets," published by the California Integrated Waste Management Board. Storelli received both a B.S. and M.S. in Economics from California State University, Sacramento.

**John M. Walker, Ph.D.***Leader, Biosolids Program Implementation Team & Senior Physical Scientist**Office of Water, U.S. Environmental Protection Agency*

John Walker is one of the U.S. Environmental Protection Agency's leading experts on biosolids. He leads the team responsible for implementing the biosolids program, and he is a managing member of the National Biosolids Partnership, whose goal is to support, promote, and maintain a viable program for the beneficial use of biosolids in the U.S. Walker has a special interest in the public acceptance of biosolids treatment and recycling, especially regarding the issue of odor, and has written papers concerning odor and bioaerosols. Recently, he also helped develop guidelines for the field storage of biosolids and animal manures. Walker received a B.S. from Rutgers University, and both an M.S. and Ph.D. in Soil Fertility and Plant Nutrition from Purdue University.

**Jeff Watson***Integrated Waste Management Specialist**State of California Integrated Waste Management Board*

As an Integrated Waste Management Specialist, Jeff Watson investigates the regulatory and operational challenges that compostable material processors must face in California. He is a regulatory lead in the Board's Local Enforcement Agency Support Services Branch, which means that he facilitates the preparation of proposed regulations for compostable materials, and he has worked for the State of California since 1987 as a trainer, field inspector, and information duty officer. Watson received a B.A. in Environmental Studies/Chemistry from California State University, Sacramento.

**Robert C. Wilkinson**

*Adjunct Senior Research Associate*

*Rocky Mountain Institute*

Bob Wilkinson is Adjunct Senior Research Associate at the Rocky Mountain Institute and a Lecturer at the University of California, Santa Barbara, focusing on environmental policy issues, energy and water policy, climate change and variability impact analysis, and urban environmental issues and sustainable communities. In 1990, he established the Graduate Program in Environmental Sciences and Policy at the Central European University (Hungary), and has worked extensively in Europe, the former Soviet Union, and Central Asia. Presently, he is working with the Inland Empire Utilities Agency on an integrated, landscape-level planning process for the utility's service area. Wilkinson received a B.A. in Environmental Studies and an M.A. and Ph.D. Candidacy in Political Science at the University of California, Santa Barbara.

## APPENDIX E

### CHINO BASIN TOUR AGENDA

Wednesday, April 18, 2001

2:00 P.M. – Depart Kellogg West Center Lobby

2:30 P.M. – Tour IEUA's Co-Composting Facility

In 1995, the Co-Composting Facility, which was endorsed by the Santa Ana Regional Water Quality Control Board and the Milk Producers' Council, was built for a place to recycle the biosolids generated at IEUA's water recycling facilities and help with the removal of dairy manure that contributes to the contamination of the Chino groundwater basin.

IEUA is the owner and manager of the co-composting facility located at 8100 Chino-Corona Road, Chino, California. The day-to-day operation of the facility is contracted out to two companies: EKO Systems, Inc. which composts manure with municipal biosolids and Earthwise Organics, Inc., which composts manure only.

3:00 P.M. – Tour Regional Plant No. 5 Construction Site

Property acquisition for RP-5 began 1996. Construction began in September 2000 and the first phase is scheduled to be completed mid 2003. First phase will process 15 MGD without solids processing. One proposal at RP-5 is to install digesters to process dairy manure then compost into organic fertilizer.

Regional Plant No. 5 Community Assets

1. New Administration Office Building
2. Wholesale Nursery
3. Demonstration Farm (4-H)
4. Native Plant/Prado Habitat Area
5. Recreation Facilities
  - Soccer/Softball Fields
  - Park
  - Chino Creek Trails

3:15 P.M. – Continue Tour of Chino Basin.

Tour three potential sites located near RP-5

- In addition to sites located near RP-5, sites near RP-4, RP-1, and the site in the City of Colton are under consideration as the consultants feel more than one site will be needed.

4:15 P.M.- Arrive at Kellogg West Center Lobby

# Inland Empire Utilities Agency\* Co-Composting Facility

## FACT SHEET

*Inland Empire Utilities Agency* (formed in 1950 and formerly known as the Chino Basin Municipal Water District) is the owner and manager of the co-composting facility located at 8100 Chino-Corona Road, Chino, California.

The day-to-day operation of the facility is contracted out to two companies: EKO Systems, Inc., which composts manure with municipal biosolids and Earthwise Organics, Inc., which composts manure only.

### History

In 1995, the Co-Composting Facility, which was endorsed by the Santa Ana Regional Water Quality Control Board and the Milk Producers' Council, was built for a place to recycle the biosolids generated at the Agency's water reclamation facilities and help with the removal of dairy manure that contributes to the contamination of the Chino groundwater basin.

### What is Co-Composting?

Composting is an environmentally friendly means of turning a nutrient rich organic waste material - such as municipal biosolids or dairy cow manure - into a recycled product of organic fertilizer and soil amendment. IEUA composts biosolids and manure together, thus we are co-composting. The co-composted product provides nutrients and organic matter that can be used beneficially for agricultural or horticultural purposes. The compost supplies valuable nutrients, nitrogen and phosphorus, to the soil.

### How Does The Process Work?

Manure and biosolids are blended together in long piles called windrows. Periodically they are watered and aerated with a self-propelled mixing machine. As the solids decompose, the volume of the windrow reduces. Optimum moisture content helps increase the temperature of the compost to about 135 degrees F. Increased temperatures within the windrows will ultimately kill pathogenic bacteria to produce a product that is about 60% solids. By the end of the first 30 days, the compost disinfection is complete. To achieve the desired product characteristics and assure complete stabilization, curing of the compost will continue for another four to six weeks.

### Addressing Environmental Concerns

Although the Co-Composting Facility was never intended to be the sole solution to all the dairy manure produced annually in the Chino Dairy Agricultural Preserve (estimated at about 1-million tons annually), it has made a sizable dent (15% to 20%) in the local dairy industry's manure composted at the facility, thereby decreasing the amount of dissolved solids and nitrates that percolate to the local water supplies.

The manure processing features of the project make a re-usable product of a waste material that prevents further water quality degradation from occurring. It is less expensive to remove salt using the Co-Composting Facility by preventing salt from contaminating water supplies, than it is to construct desalination plants to remove salt from contaminated water supplies.

### Facility Description

The facility consists of two 2,300' long by 600' wide cement pads. The biosolids/manure composting area is sealed with a 9.6" of compacted soil-cement, and capped with 2" of asphalt. The manure-only composting bay is sealed with 13" of soil cement, with no asphalt cap. Runoff protection is contained by perimeter berms and a large 216' by 1,240' catch basin, with an approximate capacity of 12 million gallons. The facility was designed with a low permeability surface cover to prevent infiltration of salts that could leach from the manure to the groundwater.

### Funding

The Co-Composting Facility is supported from the Agency's Water Reclamation Treatment Plant Fund and local dairies who pay 65 cents, if they are inside the Agency's service area, and \$1.00, if they are outside the Agency's service area. The Water Reclamation Treatment Plant Fund is used because that is where the Agency's treatment plants biosolids are processed.

This method of biosolids processing keeps monthly user rates low by reducing costs by roughly \$500,000 per year. It is also a cost competitive, reliable method of processing bio-solids that many Southern California biosolids producers are considering.

The Inland Empire Utilities Agency is proud of an environmentally friendly means of handling a waste material that is also cost effective. It is the Agency's intent to continue to improve the project by enhancing the marketability and the methods of producing these products.

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