



City of San Diego Long-Term Resource Management Options Strategic Plan (LRMOSP)



Resource Management Advisory Committee

Third Meeting
February 20, 2008

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Agenda

- I. Welcome & Introductions – Lewis Michaelson (Katz & Associates)
- II. Refined Screening Criteria – Katz & Associates
- III. Zero Waste – Clements Environmental
- IV. Resource Recovery Parks – Clements/BAS
- V. Conversion Technologies – Clements
- VI. Waste to Energy – Clements
- VII. Landfill Optimization Techniques – Bryan A. Stirrat & Associates
- VIII. Alternative Disposal Options – Bryan A. Stirrat & Associates
- IX. Next Meeting

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II. Refined Screening Criteria

High – Medium – Low Feasibility

- Financial Viability
- Technical Viability
- Regional Viability
- Environmental Viability
- Capacity Optimization
- Sustainability

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III. Zero Waste

Paradigm Shift



Chip Clements, P. E. - Clements Environmental
Stephen Grealy – City of San Diego/ESD

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ZERO WASTE

What is it?

Paradigm Shift: from Waste Disposal to Resource Management

The goal of zero waste is to reduce, reuse, recycle, or convert to beneficial use the resources now going to disposal so as to achieve improved diversion levels.

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Examples of Zero Waste Actions

• UPSTREAM

- Increase useful life of consumer products
- Reduce the amount of waste in products and packaging
- Increase recycled content of products and packaging
- Make products and packaging more recyclable

• DOWNSTREAM

- Consumption: Reduce consumption habits of society
- Collection Sector: Increase diversion rates
- Processing Sector:
 - Increase processing capacity for recovery and recycling
 - Develop Conversion Technologies
- Disposal Sector
 - Convert existing landfills to BioCells or reclaim through mining
 - Transform landfills to Inert Residuals Repositories

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What is the City Doing, Now?

- Council Ordinances/Policies/Regulations
- Expansion of Organics Diversion
- Outreach and Education
- Legislative Initiatives

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Zero Waste Infrastructure Examples

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SAFE Center (Solvents, Automotives, Flammables & Electronics)



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Transfer Station - CLARTS



Central Los Angeles Recycling and Transfer Station

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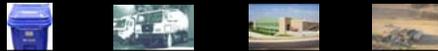




Transfer Station II (Oxnard)



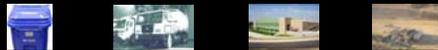
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Loading Transfer Truck



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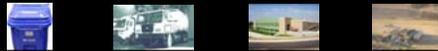




Curbside MRF



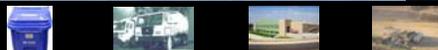
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Commercial MRF



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C&D Processing



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Sorting C&D



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C&D Products



Greenwaste Chip & Grind





Composting



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IV. Resource Recovery Parks



Chip Clements, PE,
Clements Environmental

Christine Arbogast, PE,
Bryan A. Stirrat & Associates

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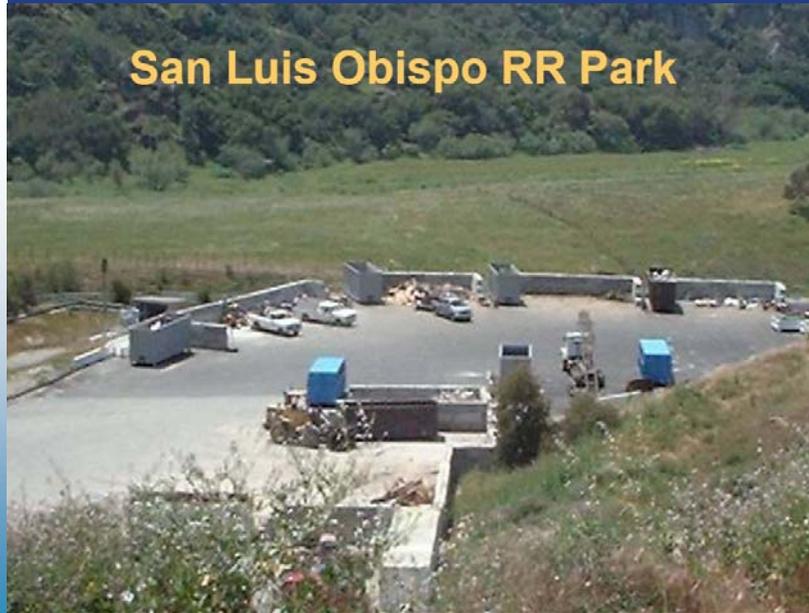
Recovery Parks

- **Industrial:** Provide campus for symbiotic zero waste facilities (recycling, power, manufacturing)
- **Public Service:** Provide convenient drop off for local residents (usually free), ReUse Store

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San Luis Obispo RR Park





Monterey Resource Recovery Park



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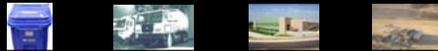




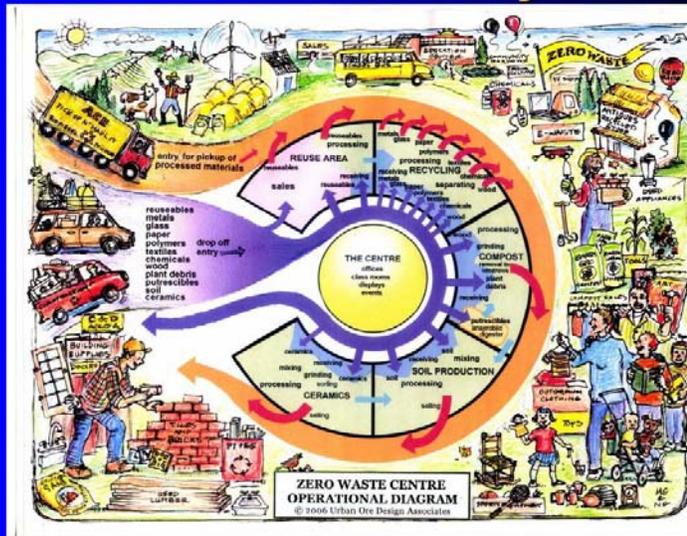
Urban Ore RR Park, Berkeley CA



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Resource Recovery Park

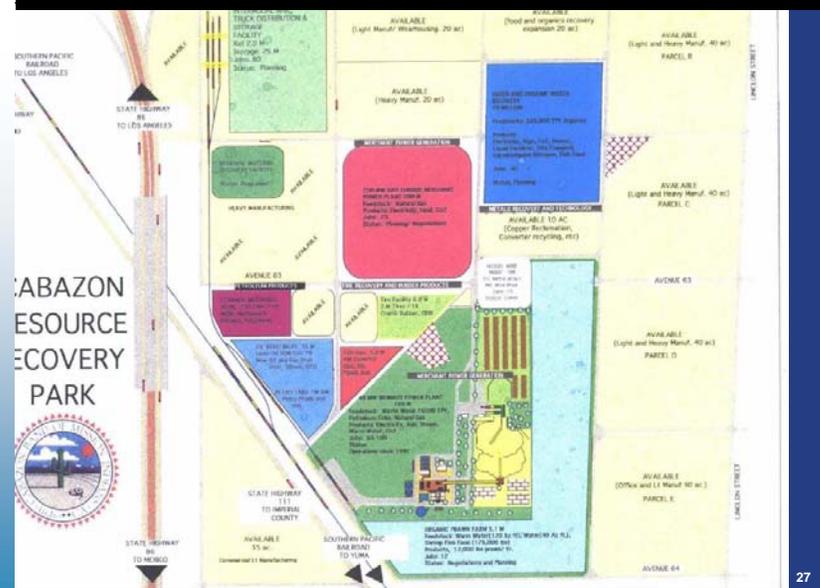


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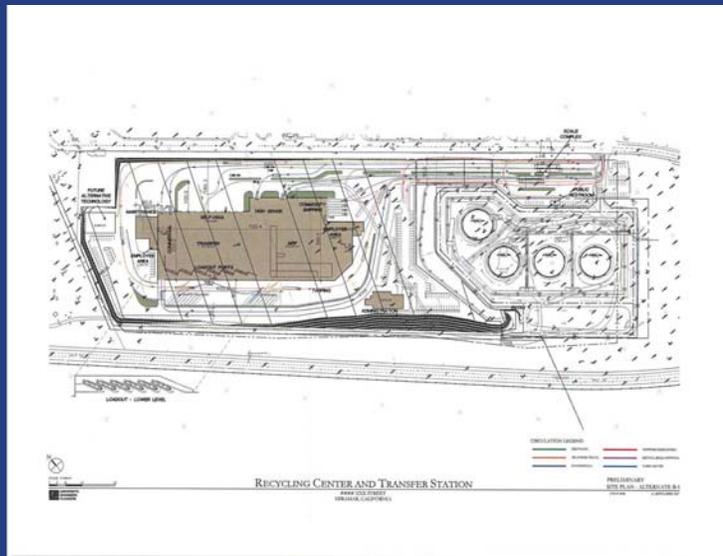
Cabazon Resource Recovery Park



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Miramar Recycling & Transfer Station Feasibility Study



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V. Conversion Technologies



Chip Clements, PE,
Clements Environmental



CONVERSION TECHNOLOGIES

Organic Materials

Gasification & Pyrolysis

Over 60 plants in Japan. Big renewable energy producer. Minimal residual.

▶ STEAM, ELECTRICITY, FUELS

Anaerobic Digestion

Over 80 plants in Europe. All biological process. Major product is compost.

▶ COMPOST, HEAT, ELECTRICITY, FUELS

MSW Composting

Several full scale plants in North America. Simple operation.

▶ COMPOST

Autoclave

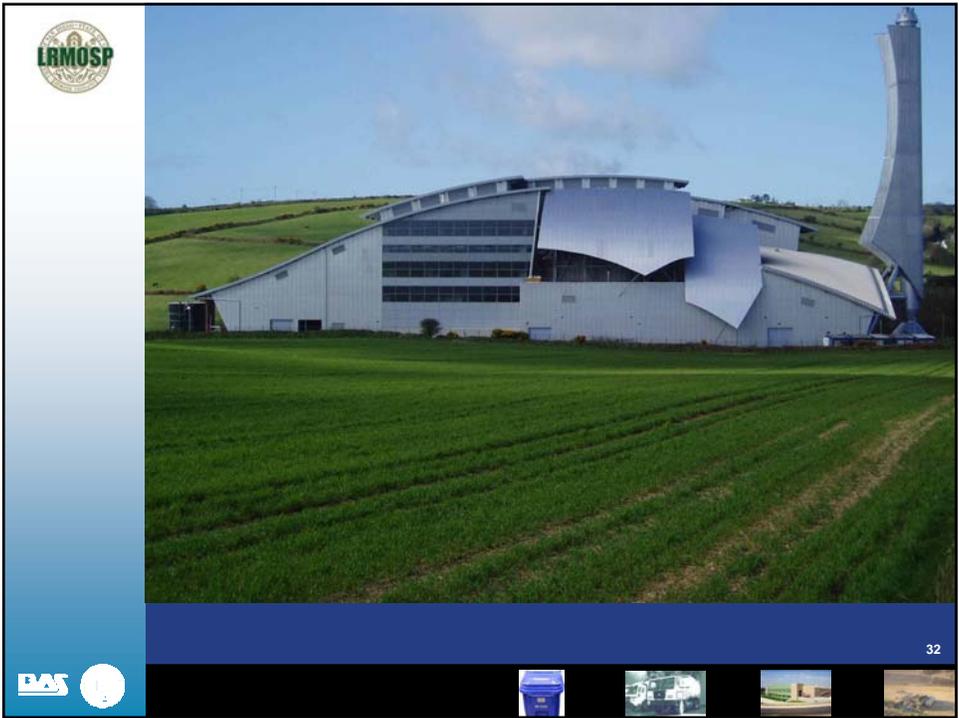
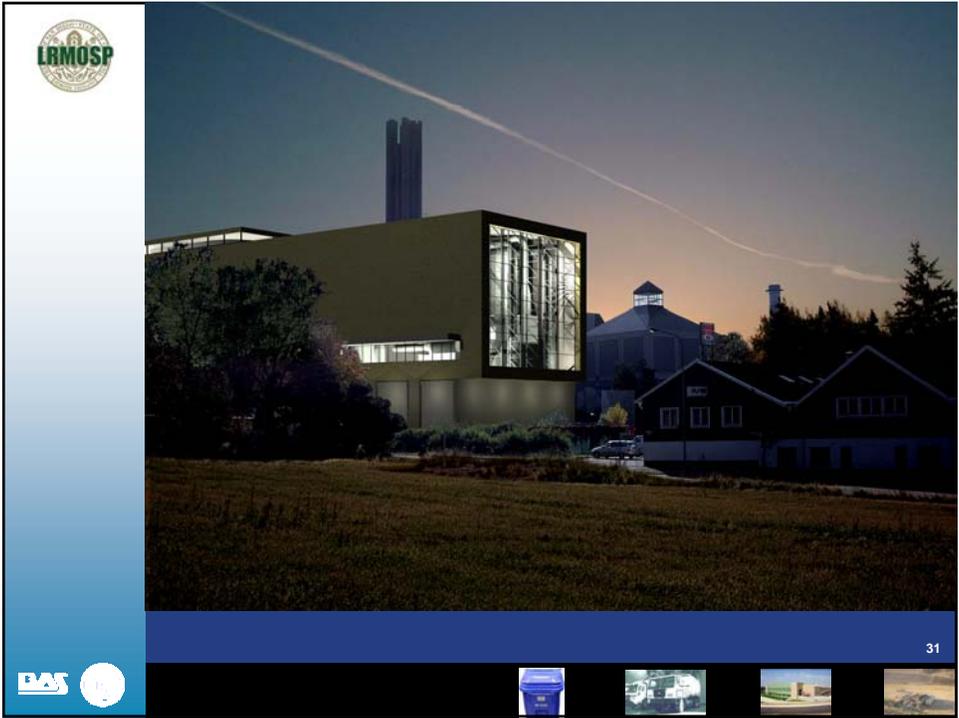
First 2 plants in construction in U.S. Flexibility of products. Potential front-end for other CTs.

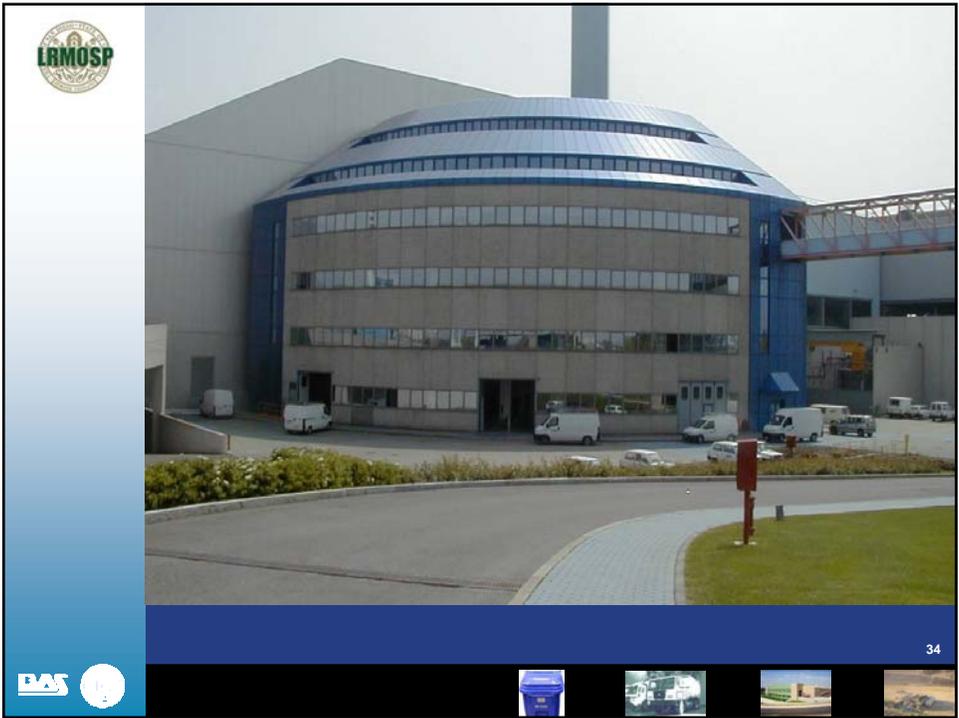
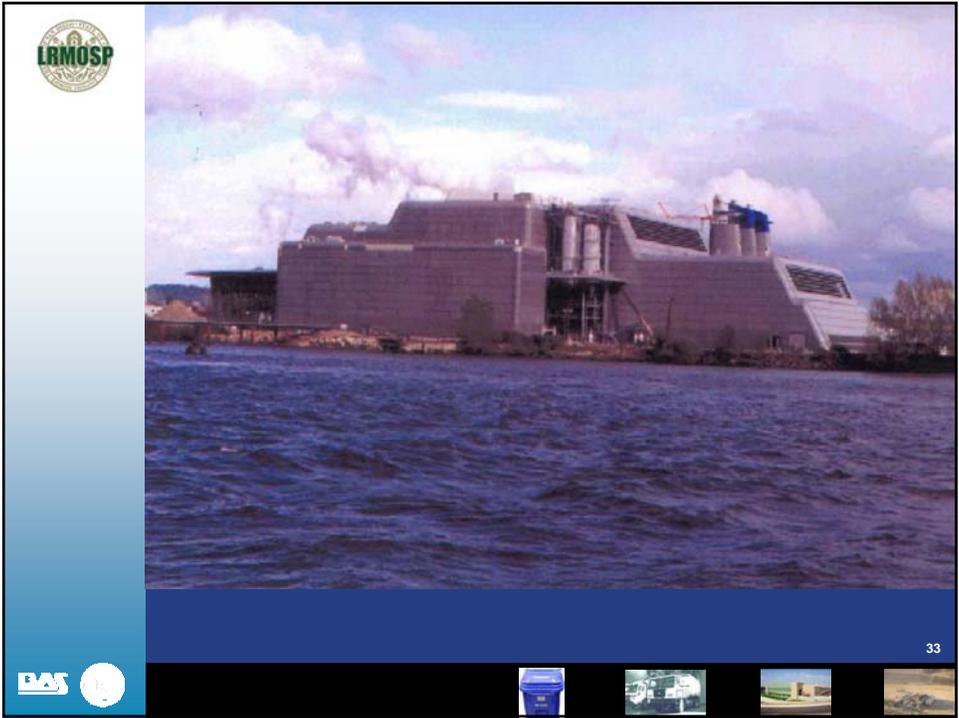
▶ PAPER PULP, RECYCLABLES, GREEN ENERGY, COMPOST

Fermentation

Huge demand for product - ethanol. First plants on-line using waste beverages.

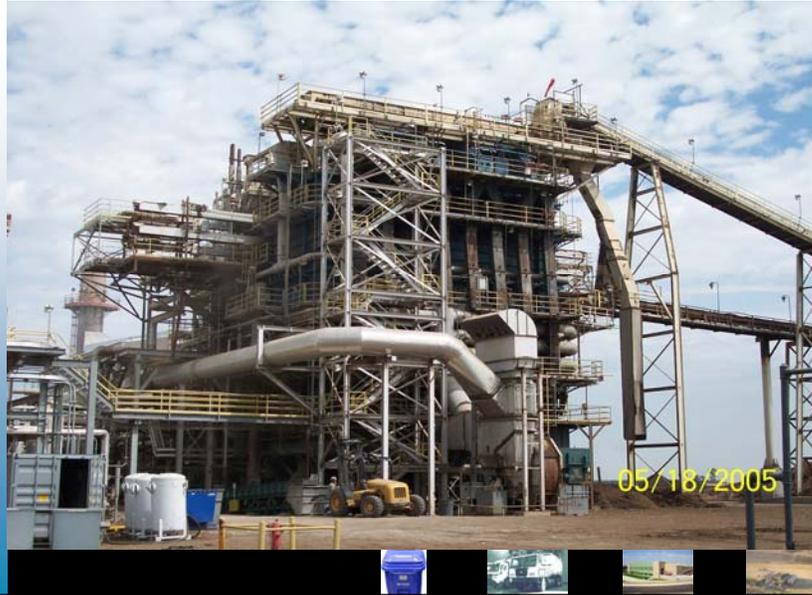
▶ ETHANOL, CHEMICALS, GREEN ENERGY







Biomass Power Plant (Madera)



DRANCO (Brecht, Belgium)



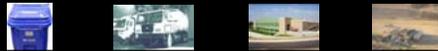


ENTRY AND WEIGH SCALES



GAS PRESSURE EQUALIZATION TANK, DIGESTER BEHIND

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DIGESTER RESIDUE FROM DEWATERING



FORCED AIR SYSTEM – AEROBIC MATURATION

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Thermoselect Facility, Chiba, Japan



Power Plants Around the World

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Valorga Facility Freiberg, Germany





Changing World Technologies Carthage, MO



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Changing World (Synthetic Fuels)



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California CT Update

City of Los Angeles

- Phase I: CT Feasibility Study and short list (complete)
- Phase II: RFP for commercial scale (>800 TPD) & emerging technology (<200 TPD)
 - 12 responses received
 - Siting study ongoing

County of Los Angeles

- Phase I & II Feasibility Studies Complete
- RFO issued January 2008
- 4 CTs and 4 MRFs in competition

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California CT Update (cont.)

City & County of Santa Barbara

- Phase I - Feasibility and short list (complete)
- Phase II - RFI issued; RFP development underway
 - Site selected at Tajiguas Landfill

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• **Zero Waste Plans including CT elements**

- City of LA
- City of San Diego
- City of San Jose

• **California Government**

- CIWMB support
- AB 32 Climate Action
- Renewable Fuels
- Renewable Energy (RPS 20%)

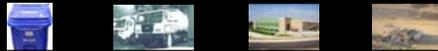
• **Private Sector involvement in CT feasibility and project concepts**

- CR&R (Perris)
- Rainbow (Huntington Beach)
- Burrtec (Riverside)
- Community Recycling (Sun Valley)
- Republic (Anaheim)

• **Private Sector CT projects and demonstration plants**

- Blue Fire Ethanol (Lancaster) (El Sobrante)
- IES (Romoland)
- World Waste International (Anaheim)
- CR3 Autoclave (Salinas)

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• **Responses:**

• **Commercial Plants**

- Zia Metallurgical (Thermal)
- Interstate Waste Technologies (Gasification)
- Covanta Energy (WTE)
- Wheelabrator (WTE)
- WRSI (AD)
- Community Recycling (MRF, AD, Biomass Power, Composting)
- Carbon Sequestration (Gasification)
- CR+R & ArrowBio (AD)
- Urbaser & Keppel Seghers (WTE, Gasification, AD)
- Rainbow & IES (Gasification)

– **Emerging Technology**

- Plasco (Gasification)
- CR+R & ArrowBio (AD)

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Siting Factors

- Zoning Issues
 - Prop H limitations
- Access - major roads
- Close access to freeways
- Distant from “sensitive receptors”
 - Residential areas
 - Schools
 - Hospitals
- Equitable distribution across City
- Service Area: Regional Vs. Local washed
- Reduction in truck traffic
- Aesthetics



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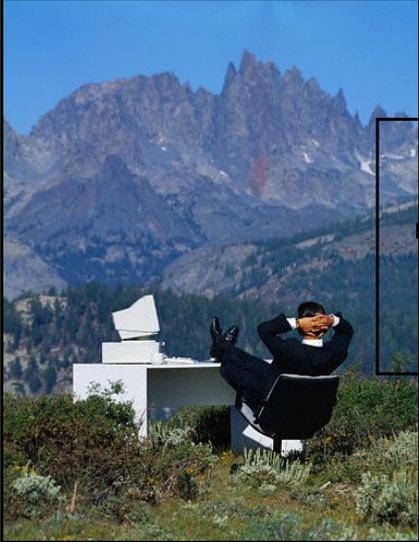
Key Features

- Environmental Impacts
- Aesthetics
- Overall Diversion (including recycling)
- Resource Recovery
- Renewable Energy
- Cost (bang for buck)
- Enhance existing system
- Economic Benefit
- Other Products



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“Some people see things as they are and say why?
dream of things that never were and say why not?”
- Robert Kennedy



VI. Waste to Energy



Chip Clements, PE,
Clements Environmental

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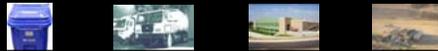




WTE Plant – SERRF (Long Beach, CA)



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Lee County, Florida



Power Plants Around the World

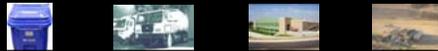
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BREAK TIME !!!

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VII. Landfill Optimization Techniques

Paradigm Shift



Sonia Nasser, PE
Bryan A. Stirrat & Associates

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Landfill Optimization

1. **Compaction**
2. **Alternative Daily Cover**
3. **Leachate Recirculation**
4. **Steam Injection**
5. **Bio-cell – Bioreactor**
6. **Landfill Reclamation**

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1. Compaction

- Uniform lift thickness
- Cell Capacity Extended
- Less Cover Material



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2. Alternative Daily Cover - Tarps



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3. Leachate Recirculation



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4. Steam Injection Miramar Landfill Pilot Study



Photo: STI Engineering

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Push-In Collectors & Injectors



Photo: STI Engineering

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Steam Injector



Photo: STI Engineering

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Boiler – Creates Steam



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Steam Injection Pipeline



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5. BioReactor



Yolo County Landfill – California

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6. Landfill Reclamation



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Landfill Reclamation



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Landfill Reclamation



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Landfill Reclamation



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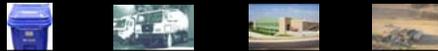
VIII. Alternative Landfill Disposal Options

Paradigm Shift

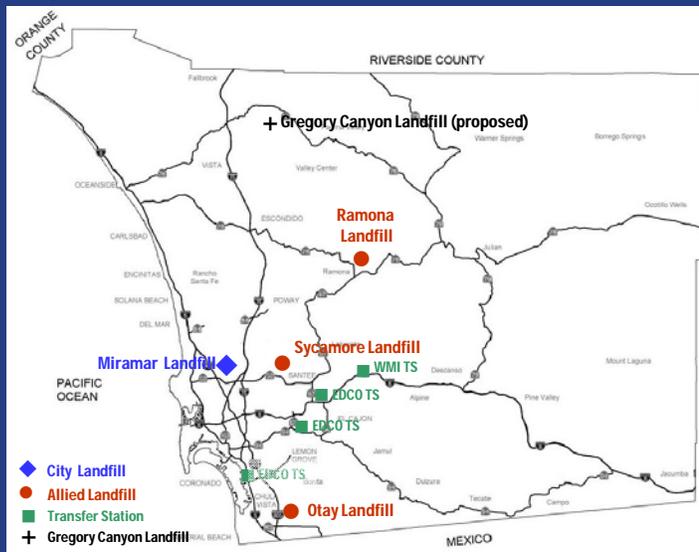


Christine Arbogast, PE
Bryan A. Stirrat & Associates

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In-County Disposal Sites



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Sycamore Landfill



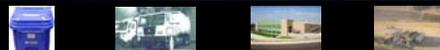
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Gregory Canyon, San Diego

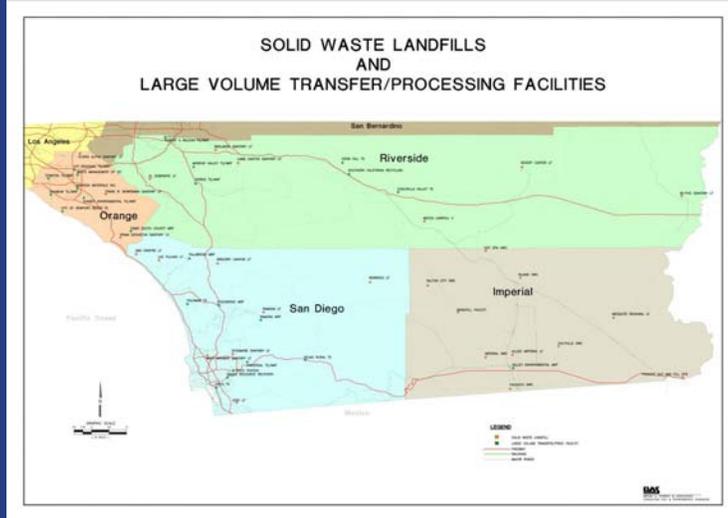


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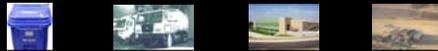




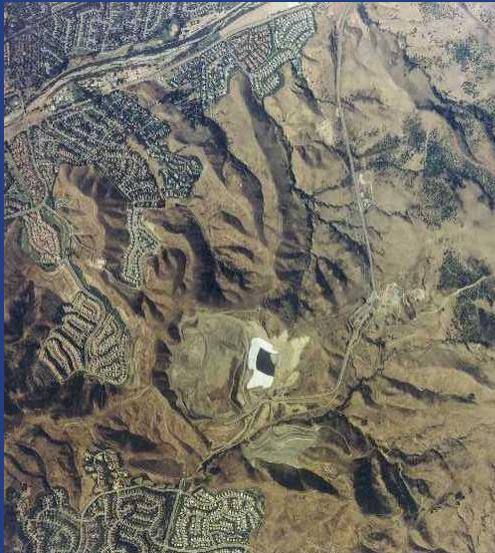
Out-of-County Disposal Options



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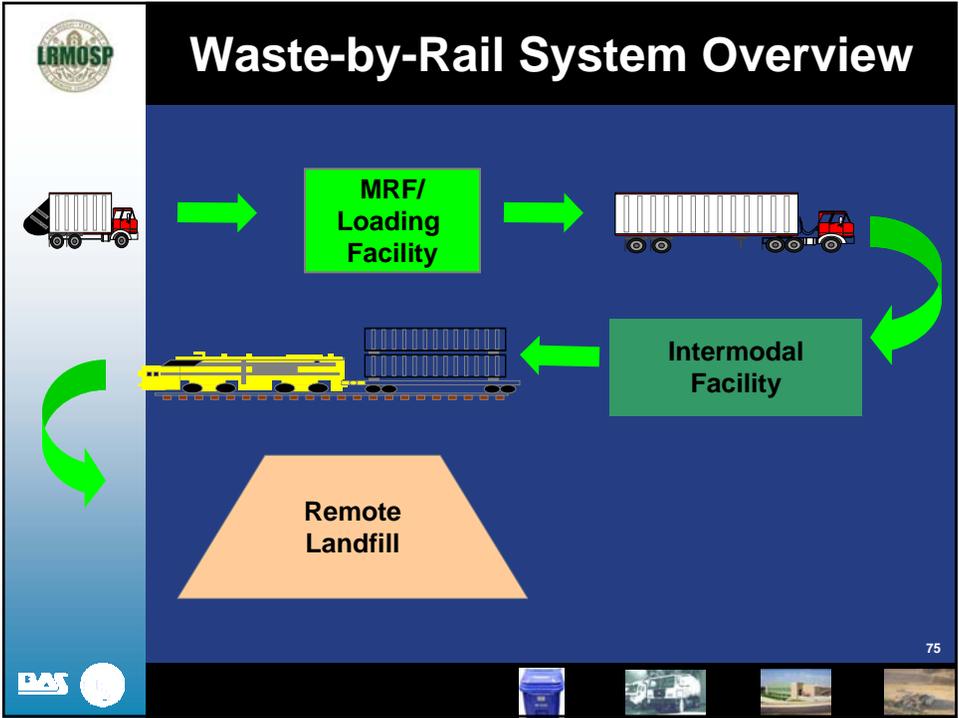


Prima Deshecha, Orange County, CA



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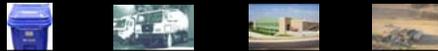




Puente Hills MRF



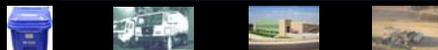
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Typical Intermodal Operations



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Puente Hills Intermodal Facility



Puente Hills Intermodal Facility



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Rail Haul



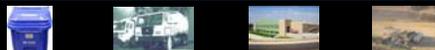
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Rail Haul Mesquite Regional Landfill Imperial County



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IX. Next RMAC Meeting

Save the Date:

**Wednesday
April 30, 2008
2:00 pm**

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