

Marshall Space Flight Center (MSFC) Update

Roger Bunnell
2009 NASA RAP/P2 Workshop
May 19, 2009



Agenda

- Cardboard Recycling
- P2 Water Conservation Project





Cardboard Recycling at MSFC

**Presented By:
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MSFC Environmental Engineering
& Occupational Health Office**

Federal Requirement

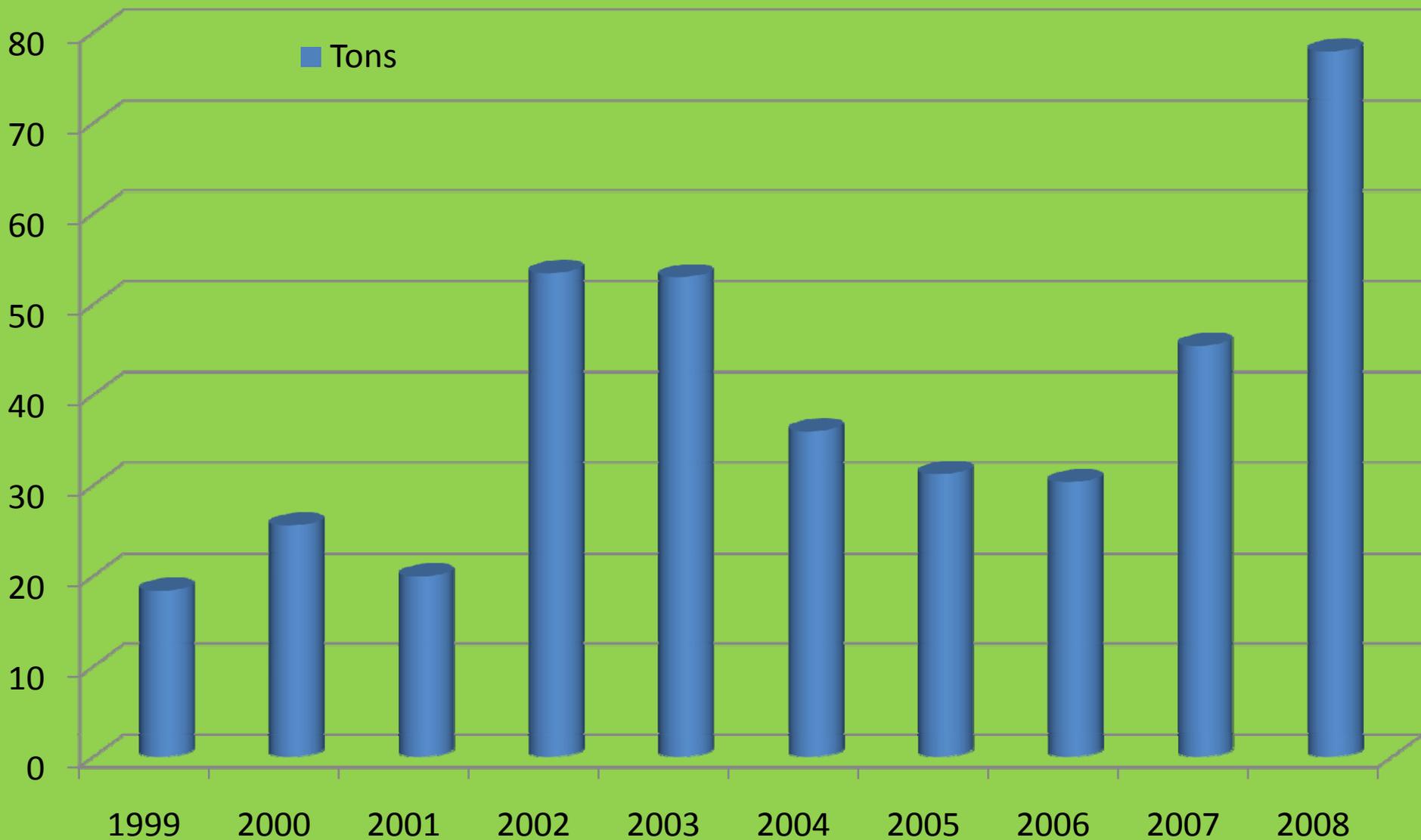
- 40 CFR 246.202-1: “Any commercial establishment generating 10 or more tons of waste corrugated containers per month shall separately collect and sell this material for the purpose of recycling.”



Each Ton of Cardboard Recycled

- **Saves 17 Full Grown Trees**
- **Saves, 390 kWh of energy, 1.1 barrels (46 gallons) of oil, and 6.6 million Btu's of energy**
- **Saves 9 cubic yards of landfill space**
- **Saves 24% of the total energy needed for virgin cardboard**
- **Saves half the emission of sulfur dioxide need for virgin cardboard**

Cardboard Recycled At MSFC



How to Recycle Cardboard

- Remove everything (e.g. paper, plastic, and styrofoam) but the cardboard from corrugated cardboard boxes then place near normal trash collection locations within the building and designate as “recycle.”
- If necessary work with the custodial staff to designate cardboard collection locations for the building

Call for Pick-up

- Call 544-7974 for cardboard pickup whenever necessary (e.g. blocking path way, house keeping, creates a fire hazard, VIP tour scheduled, etc...)

Preferred Drop Off Location is Bldg 4391/Cardboard Compactor

- Remove everything (e.g. paper, plastic, and Styrofoam) but the cardboard from corrugated cardboard boxes before placing in the 4391 drop off cage



Bldg 4391/Cardboard Compactor



The cardboard compactor is located off Digney Road in Bldg 4391.

Bldg 4391/Cardboard Compactor



Cardboard
Drop Off Cage



4707 Before



4707 After



4631 After



4200



4650



4650



Audits & Inspections

- Audits/inspections are conducted by EG&G and AS10 personnel
- Findings are entered into SHEtrak as an “Env Recycling/Green Purchasing” and tracked to closure
- The user is instructed on the proper corrective action
- All findings are reported to Center Management



P2 Water Conservation Project





Fish Kill

December 2007

MSFC Environmental Engineering & Occupational Health (EEOH) Office

What Happened

Monday, December 10th, the Environmental Engineering and Occupational Health Office was notified that dead fish were observed in a ditch behind the Shipping & Receiving Building.



Water Quality Data

The pH, total residual chlorine, and dissolved oxygen were measured. All measurements were in the normal range.

Source of Fish Kill

The only source of water identified was a storm water sewer line discharging water into the ditch. MSFC's NPDES permit allows the discharge of cooling water and there are no chlorine limits for this particular outfall.



Regulators Notified

- The Alabama Department of Environmental Management (ADEM) was notified.
- ADEM requested that the Alabama Department of Conservation and Natural Resources (ADCNR) also be notified.
- EEOH followed ADEM's request and consequently two biologists arrived at the scene that afternoon.

Biologists' Findings

- Approximately 193 fish were found to be dead in the ditch.
- ADCNR stated that the fish could be stressed due to the chlorine concentrations and the temperature inversion that occurred over the weekend may have contributed to the fish's death.
- ADCNR returned for a subsequent visit (December 19) with a mussel biologist who determined that there were negligible effects to the clams and snails in the ditch.

Temperature Inversion

Date	Temperature (°F)		
	Mean	Maximum	Minimum
Wednesday 12/05/2007	52	60	44
Thursday 12/06/2007	37	46	28
Friday 12/07/2007	54	64	46
<i>Monday 12/10/2007*</i>	<i>70</i>	<i>77</i>	<i>62</i>
Tuesday 12/11/2007	68	77	60
Wednesday 12/12/2007	68	71	64

**Note: 12/10/2007 is the day that the dead fish were first observed.*

Temperature readings from the National Weather Service Redstone Arsenal station.

Follow Up

- ADEM issued a fine for the dead fish and required MSFC to submit an engineering report with appropriate corrective actions identified
- MSFC's Environmental Office is working with the Facility's Office to replace the once-through-cooling water system with a recirculating system
- This will cause the ditch to dry up (except during rain events).
- Without any water present, fish from the Tennessee River should not be able to swim up into the ditch, thereby, preventing any future fish from dying in the ditch.
- Actual cause of death has not been determined

Facility Project

- Water Recirculation System where over 80 gallon per minute (gpm) of potable is continuously going down the drain.
- Water is from 22 different sources within Building 4619.
- The project costs to install a water re-circulating system and five (5) water meters for continuous measurement and verification is \$301K.
- Project start date (May 6, 2009)
- Estimated project completion date (September 6, 2009)

Recycling Funds

- FY07 = \$3,626.32
- FY08 = \$5,731.28
- FY09 = \$52,196.67



Pollution Prevention Benefits

- Water costs at MSFC = \$6.87/1000 gallons
- Gallons per minute (gpm) of water being discharged = 82 gpm
- Total quantity of water discharged annually = Over 40 million gallons
- Conservative estimated annual savings (at 80%) = 32 million gallons
- Annual savings = \$220K
- Payback for the Project = 1.4 years

Point of Contact

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Back Up Slides





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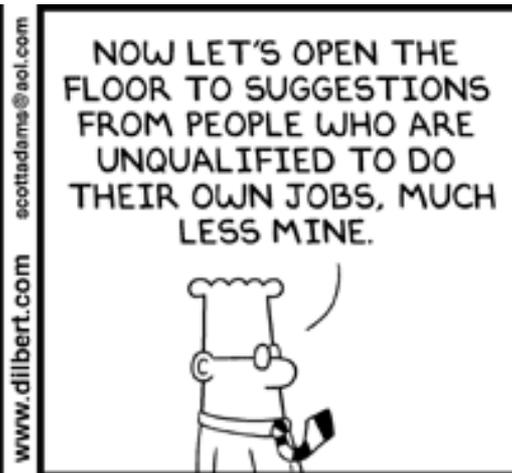
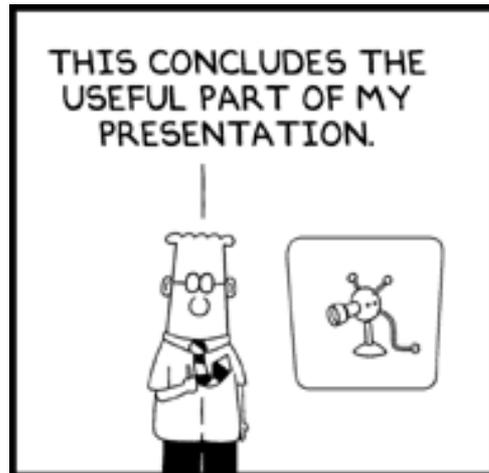


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