

RECYCLED/RECLAIMED MATERIAL USE IN HIGHWAY CONSTRUCTION

JOE SCHROER, PE
FIELD MATERIALS ENGINEER

2008 AGC/MoDOT
COOPERATIVE MEETING



Environmental Efficiencies & Innovations in Contracting “Nothing Leaves the Road”

Kirk Juranas – District Engineer 8, Leader

General Services

Project Delivery Subteam

Patty Lemongelli, D5 – CM
Subteam Leader

Dennis Bryant, CO – CM

Joyce Foster, CO – BR

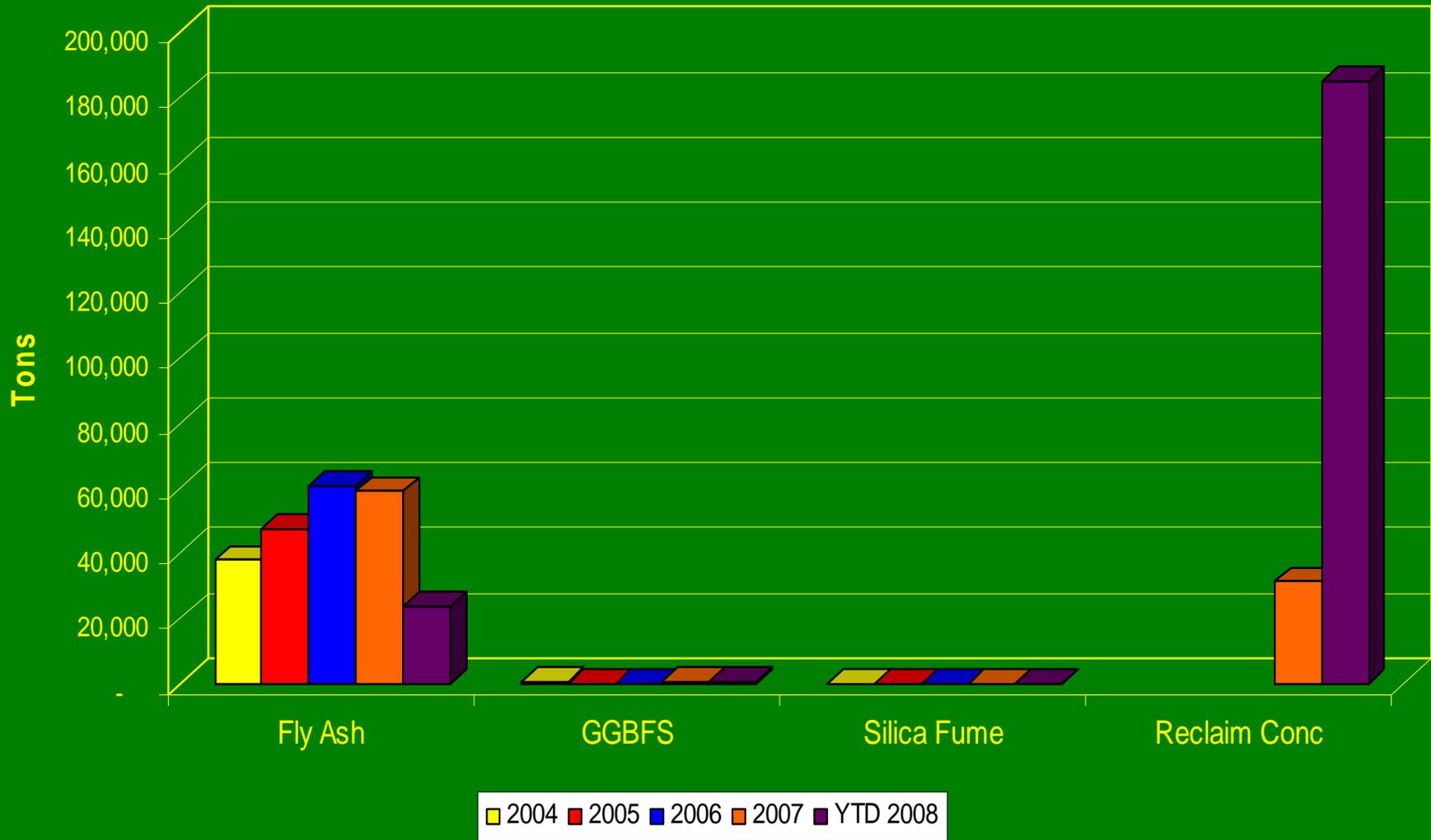
Lians Taylor, CO – DE

Joe Schroer, CO – CM



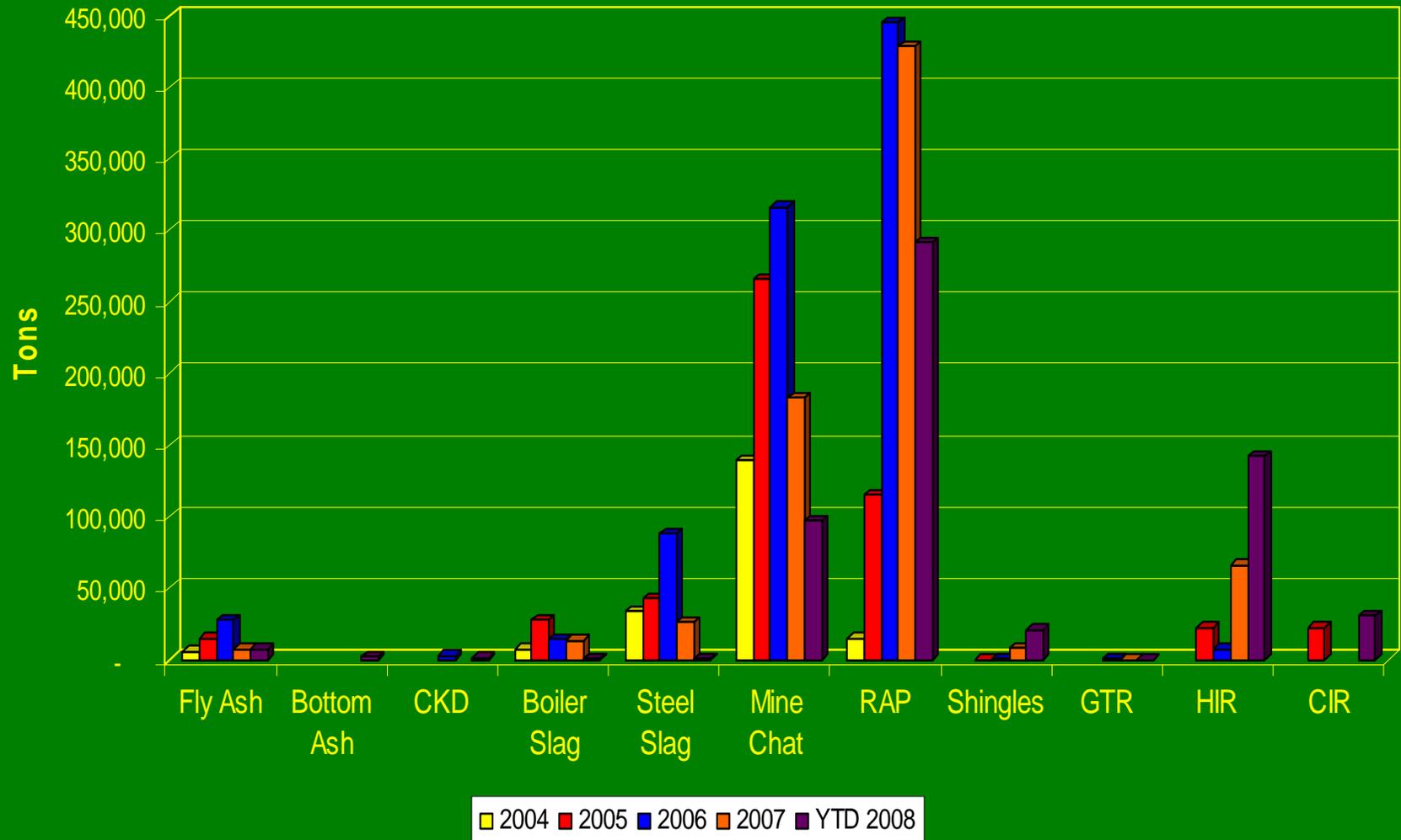
Recycled Materials in Concrete

447,000 Tons



Recycled Materials in HMA

2.9 Million Tons



Recycle

- means to use, reuse or reclaim a material
- to treat or process used or waste materials so as to make suitable for reuse

Reclaim

- make useful again; transform from a useless or uncultivated state
- material is "reclaimed" if it is processed to recover a usable product or if it is regenerated.

Solid Waste Laws

- Title 10 Division 80 of Code of State Regulations – Solid Waste Management
- Material Considered Solid Waste?
- Must Have Viable End Use And Be Able To Provide Documentation Of Usage
- Long Term Speculative Accumulation May Be Considered Disposal And Result In Enforcement Action

State Regulation Exemption

- 10 CSR 80-2.020
 - (9) Permit Exemptions
 - (A) ... provided that pollution, a public nuisance or a health hazard is not created:
 - 5. The use of solid waste in the processing or manufacturing of products. (asphalt & concrete considered manufactured)
 - 11. The beneficial use of bottom ash or boiler slag generated primarily from the combustion of coal or other fossil fuels for snow and ice control; and
 - 12. The beneficial use of fly ash generated primarily from the combustion of coal or other fossil fuels for concrete/flowable fill additive.



Work Around for Materials Not Exempted

- (B)... exemption from having to obtain a solid waste disposal area permit for a proposal to beneficially reuse solid waste, provided that beneficial use and/or reclamation can be demonstrated and provided that pollution, a public nuisance or a health hazard will not be created...
- (C)... exemptions for small scale pilot projects or demonstration projects...

Beneficial Use Exemptions

- New By Following State Rules
- Existing BUE
 - Most Coal-fired Power Plants
 - Concrete & Asphalt

DNR Recommendations

- Importance of clean loads w/ minimal debris
- On-site sorting of mixed loads triggers processing facility permitting requirements
- Processing facility is “facility where solid wastes are salvaged and processed”
- 10 CSR 80-5.010 Processing Facility Regulations
- 5% Rule of Thumb for debris in source separated material

New Materials

- Existing Beneficial Use Exemption
- Material Hazards
- Engineering Properties
 - Chemical Stability
 - Standard Aggregate Tests (if applicable)
 - Durability
 - Deleterious Effects
 - Mixture Effects

Reclaimed Asphalt Pavement Reclaimed Asphalt Shingles



Reclaimed Concrete



Reclaimed Concrete Benefit



Tires



Coal Combustion Byproducts



Lead Mining Waste



Hot In-Place Recycling

Cold In-Place Recycling



New Uses

- Wood Mulch and Compost
- Coal Combustion Byproducts (CCB)
- Tires

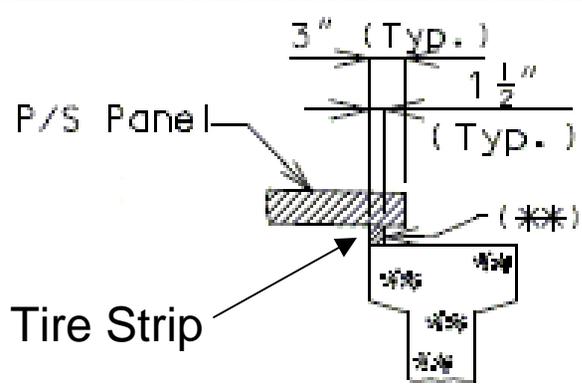
Wood/Compost



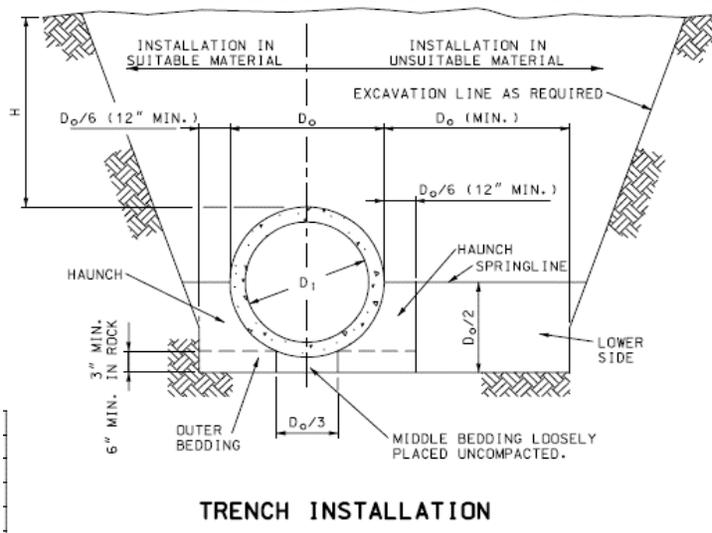
CCB



Tires



Glass



Miscellaneous



MISSOURI RECYCLES

