Cement

LAFARGE

bringing materials to life

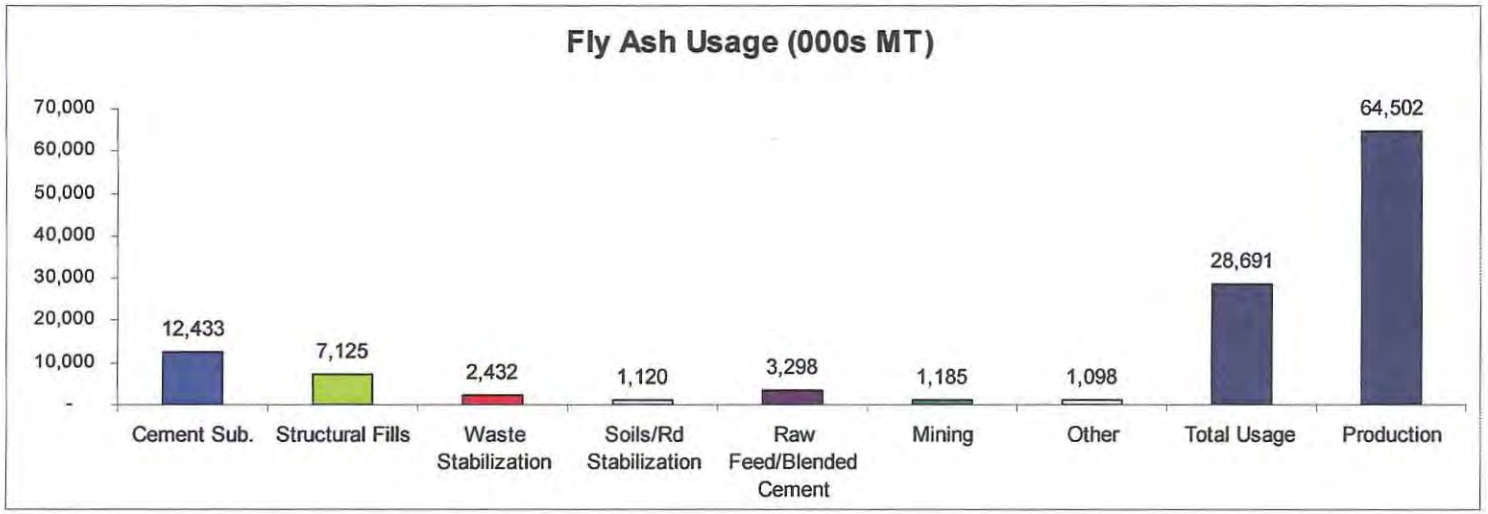
Implications of Hazardous Waste Classification on Coal Combustion Products (CCP's)

Lafarge Perspective

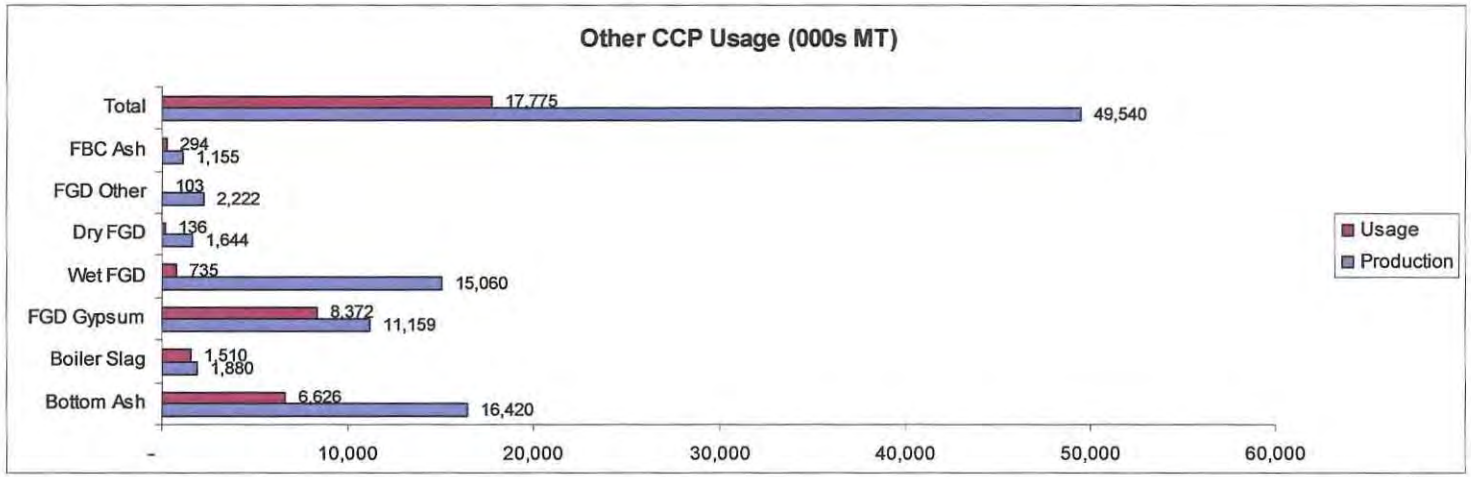
August 2009

US CCP Utilization (from ACAA)

- Utilization of Fly Ash Bulk Powder reached 44%



- Utilization of other CCPs reached 35%



Lafarge Annual CCP Utilization-Primary Applications

- Volumes for North America (K-MT)

Region	Coal Ash Concrete/Cement Replacement	Coal Ash Soil/Base Treatment	Coal Ash Raw Feed	Coal Ash Underground Mine Stabilization	Syn Gyp Wallboard	TOTAL
Lakes & Seaway	700	100	300	500		1600
River	600	500	200	300		1600
East			200			200
West	500	100	100			700
Gypsum					2000	2000
	1800	700	800	800	2000	6100

Implications of Hazardous Waste Designation on Cement Replacement

- Specifiers would not want it in their buildings, projects
  - Hampering sustainable development (LEED credits)
  - Not in my schools, churches, stadiums!
- DOT's would procure other more costly materials for their projects
- Additional CO2 generation at cement plants to produce add'l OPC to fill binder needs for these projects
- Marketers through end users would not want the risk associated with the product
- Increased Tort exposure

Self Cementing Fly Ash -Types of Soil/Base Treatment

- Soils
  - Clays – used in lieu of manufactured lime to reduce shrink/swell potential
  - Granular Soils – used in lieu of Portland Cement to increase strength of soil
- Base Materials
  - Natural Aggregates – used in lieu of Portland Cement to increase strength of the aggregate base
  - Recycled Asphalt Pavement – used in lieu of asphalt emulsions and other bituminous binders to cement and increase strength of pulverized asphalt pavement

Benefits of Self-Cementing Fly Ash for Soil and Base Treatment

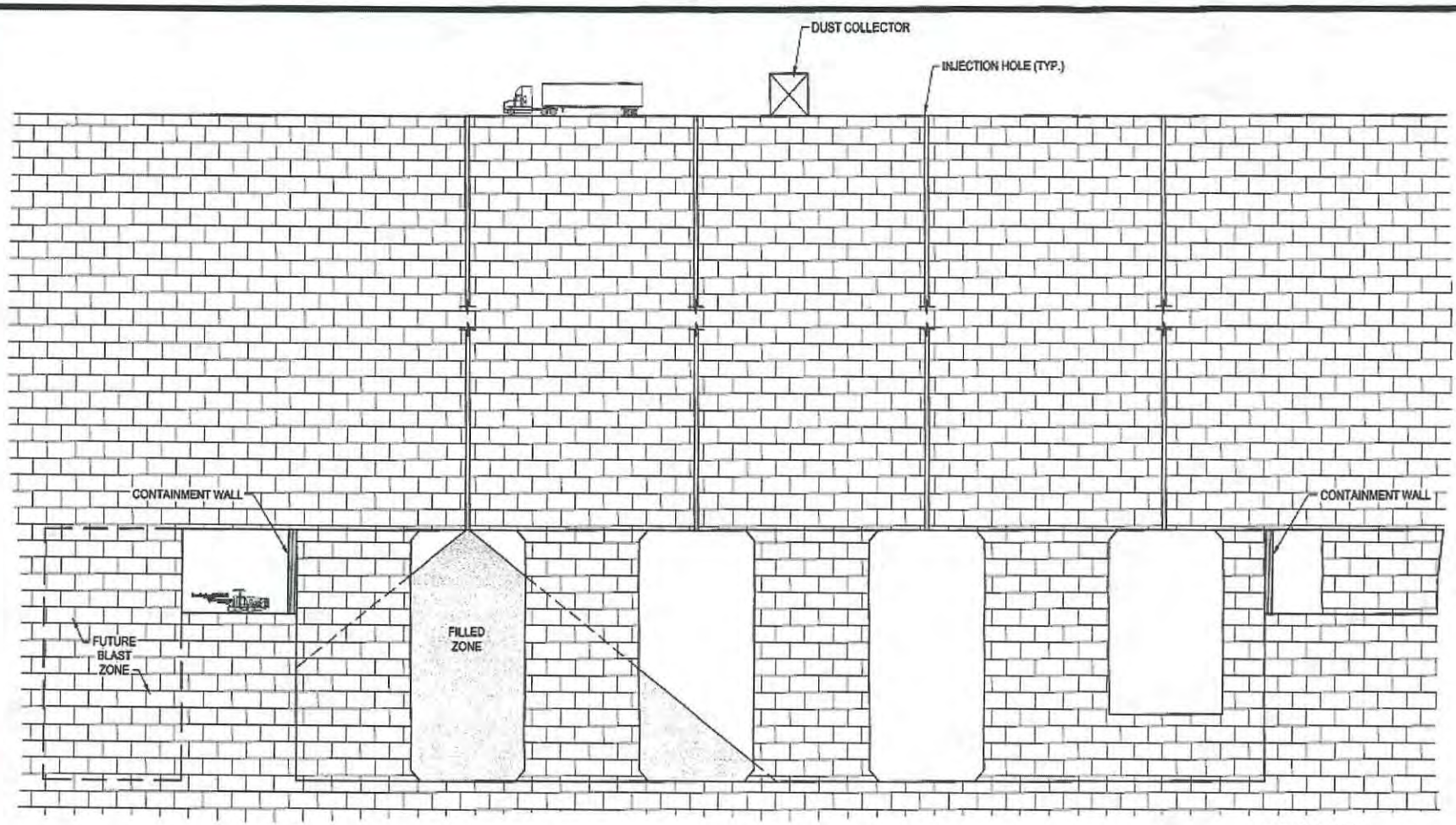
- Improves Engineering properties of soils and base materials (strength, shrink swell, etc.)
- Economics of improving properties of in-situ soils and therefore not having to remove and replace with select virgin materials
- Ability to recycle in place existing deteriorated asphalt pavements already paid for with tax dollars
- Less CO2 generated – less hauling of virgin soils/aggregates, less Portland Cement and manufactured lime production
- Conserving natural resources
- Specified by state DOT's
- State utilization/implementation plans work (ie. WI, MN, MO)

Ingredient in the Manufacture of Portland Cement (Raw Feed)

- Why it's utilized
  - Primarily used as an alumina source (important ingredient in the recipe)
  - Often get added fuel benefit that fly ash still contains unburned carbon
  - Utilizing the fly ash often results in less cement kiln dust wasted
  - Previously used mined aggregates increased plant voc's
  - Conserve natural resources

Implications of Hazardous Waste Designation on CCP's in the Manufacture of Portland Cement

- Cement manufacturers would not want to utilize as an ingredient in their product
- Additional costs to mine other natural materials
- Additional VOC's emitted with these other natural materials
- Additional solid fuel consumption due to loss of fuel benefit of fly ash



NOT TO SCALE

URS
8300 College Blvd., Suite 200
Overland Park, Kansas 66210

CLIENT: LAFARGE NORTH AMERICA INC.

LOCATION: JOLIET, ILLINOIS

TITLE: UNDERGROUND MINE COOL COMBUSTION BY-PRODUCT FILL CROSS SECTION

DRAWN BY	CHECKED BY	APPROVED BY
TMS	GWS	LBV
PROJECT NO.	DATE	DRAWING NO.
16530222	JAN. 2007	2

January 12, 2007 3:27:19 pm (tms)
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Drilling of Injection Holes

Underground Mine Stabilization vs. Surface Mine Reclamation

- Underground Stabilization
  - Appropriate geo-hydrological conditions
  - Surface water runoff not an issue
  - No fugitive dusting
  - Self cementing fly ash used develops significant strength
  - Potential for future mine collapse is eliminated
  - Mine stabilization necessary for future surface development
- Surface Reclamation
  - Site conditions vary significantly
  - Surface runoff of concern
  - Significant potential for fugitive dusting
  - Non-cementing fly ash most often used
  - Mine collapse is not an issue
  - Opportunities for surface development without ash reclamation, golf course, lake, etc.

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Ingredient in Wallboard Manufacture

A Hazardous Waste Designation Would

- Create a Negative Impression in the Minds of Consumers that Wallboard Products Are Dangerous
- Homeowners Whose Houses Already Contain Wallboard Manufactured with FGD Could Suffer Perceived Loss in the Value of their Homes
- A Perfect Example of Beneficial Use of a Recycled Material Would be Eliminated
- Elevate Product Liability (Insurance Costs)
- Tort Exposure
- Effectively Eliminate 100% of Lafarge's 2009 Capacity
- Hundreds of Jobs Would Be Lost

Summary Takeaways

- A hazardous designation of CCP's would have a negative impact on:
  - CO2 generation – increase carbon footprint
  - Sustainable development initiatives
  - Conservation of natural resources
  - Concrete performance and durability
  - Costs – to manufacture concrete, manufacture cement, manufacture wallboard, stabilize sub bases
  - Utility/Marketer/End User perception and liability concerns
  - Utility would need to construct additional landfills to handle increased disposal volumes