

FLY ASH ANALYSIS

Report To: Ash Grove Resources, L.L.C. **Date:** 12/04/2009

Laboratory No.: NBCCOMP18-09 **Date Received:** 10/30/2009

Sample Identification: Nebraska City Power Plant

CHEMICAL COMPOSITION (mass %):	ASTM C 618-08 Criteria	
	<u>Class F</u>	<u>Class C</u>
Silicon Oxide (SiO ₂)	36.2	
Aluminum Oxide (Al ₂ O ₃)	19.2	
Iron Oxide (Fe ₂ O ₃ (T))	6.1	
SUM (SiO ₂ +Al ₂ O ₃ +Fe ₂ O ₃ (T))	61.5	....70.0 min. ....50.0 min.
Sulfur Trioxide (SO ₃)	2.4	.....5.0 max. ....5.0 max.
Calcium Oxide (CaO)	25.2	
Magnesium Oxide (MgO)	5.0	
Moisture Content	0.2	.....3.0 max. ....3.0 max.
Loss on Ignition	0.4	.....6.0 max. ....6.0 max.

PHYSICAL TEST RESULTS:

Fineness			
Retained on a 45-µm sieve, (%)	16.6	....34 max.	....34 max.
Strength Activity Index			
With Portland Cement, (%)			
Ratio to Control @ 28 days	105	.....75 min.	.....75 min.
Ratio to Control @ 7 days	92	.....75 min.	.....75 min.
Water Requirement, (% of Control)	96	....105 max.	....105 max.
Soundness			
Autoclave Expansion, (%)	0.03	....0.8 max.	....0.8 max.
Density (grams per cubic cm)	2.57		

REMARKS:

18th composite sample for 2009; represents ash from 10/12 through 10/23/2009.
7-day Paste Strength = 190 psi
Setting Time = 240 minutes

Materials Analysis & Research Laboratory - Participants in the Cement & Concrete Reference Laboratory pozzolan testing program.

Analysis Approved: 
Dr. Scott Schlorholtz, Scientist - MARL