

FLY ASH ANALYSIS

Report To: Ash Grove Resources, L.L.C. **Date:** 07/21/2011
Laboratory No.: NBCCOMP10-11 **Date Received:** 06/09/2011

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)	35.4	
Aluminum Oxide (Al ₂ O ₃)	19.1	
Iron Oxide (Fe ₂ O ₃ (T))	5.5	
SUM (SiO ₂ +Al ₂ O ₃ +Fe ₂ O ₃ (T))	60.0	....70.0 min. ....50.0 min.
Sulfur Trioxide (SO ₃)	2.3	.....5.0 max. ....5.0 max.
Calcium Oxide (CaO)	25.5	
Magnesium Oxide (MgO)	5.0	
Moisture Content	0.1	.....3.0 max. ....3.0 max.
Loss on Ignition	0.6	.....6.0 max. ....6.0 max.

PHYSICAL TEST RESULTS:

Fineness			
Retained on a 45-µm sieve, (%)	14.7	....34 max.	....34 max.
Strength Activity Index			
With Portland Cement, (%)			
Ratio to Control @ 28 days	99	.....75 min.	.....75 min.
Ratio to Control @ 7 days	91	.....75 min.	.....75 min.
Water Requirement, (% of Control)	95	....105 max.	....105 max.
Soundness			
Autoclave Expansion, (%)	0.05	....0.8 max.	....0.8 max.
Density (grams per cubic cm)	2.56		

REMARKS:

10th composite sample for 2011; represents ash from 5/16 through 5/27/2011.
7-day Paste Strength: 2240 psi
Setting Time: 100 minutes

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

Analysis Approved:



Dr. Scott Schlorholtz, Scientist - MARL