CTL | THOMPSON MATERIALS ENGINEERS, INC.

Chemical and Physical Analysis of Fly Ash

Developed For: *Headwaters Resources*
16817 - 155th Pl SE
Renton, WA 98058

Ticket: *9314*	**Plant of Origin:** *Centralia US*	**Sample Date Range:** *11/03/2009*
Job: *14708*	**Sample ID:** *Ce-048-09*	**to:** *11/06/2009*
Report Date: *12/24/2009*	**Docket:** *3032990 - 3033039*	**Date Received:** *11/12/2009*

Chemical Composition (%)

(by Wyoming Analytical Laboratories, Inc.)

			CSA A3000-08 Specifications Class F	Class CI
Total Silica, Aluminum, Iron:	*71.6*			
Silicon Dioxide:		*49.0*		
Aluminum Oxide:		*16.5*		
Iron Oxide:		*6.1*		
Sulfur Trioxide:	*0.8*		5.0 Max	5.0 Max
Calcium Oxide:	*15.5*		8 Max	8 - 20
Moisture Content:	*0.0*		3.0 Max	3.0 Max
Loss on Ignition:	*0.1*		8.0 Max	6.0 Max

Physical Test Results

		CSA A3000-08 Specifications Class F	Class CI
Fineness, Retained on #325 Sieve (%):	*19.0*	34 Max	34 Max
Optional Strength Activity Index (%)			
ASTM C-311 (28 Days @ 23 C):	*100.3*	75 Min	75 Min
Water Requirement, % of Control:	*95.0*		
Soundness, Autoclave Expansion (%):	*0.02*	0.8 Max	0.8 Max
Density Mg/m^3:	*2.66*		

Comments:

CTL | Thompson Materials Engineers, Inc.

COLORADO REGISTERED ORVILLE R. WERNER II 14540 12/24/2009 PROFESSIONAL ENGINEER

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