BEDROCK FIELD LOG SHEET

PROJECT: NCZGMRS	**DRILLING METHOD:**
BORING ID: CH-2	Wireline Coring
LOGGED BY: S. Wang and C. Greene	**CORE DIAMETER:** 2.5"
BEGIN DATE: October 10, 2006	**LAT** 35 37 07.376
END DATE: October 31, 2006	**LON** 79 45 20.385

LITHOLOGIC DESCRIPTION			FRACTURE INFO				
INTERVAL	RECOVERY	DESCRIPTION * ' = foot/feet; " = inch/inches ** Dip Angle: V = Vertical, SV = Sub-vertical, M = Medium, SH = Sub-horizontal, H = Horizontal Rock names used in description: Tuff = weakly metamorphosed felsic tuff; lapilli tuff = weakly metamorphosed lapilli tuff	** DIP ANGLE	# ANNEALED	# OPEN	H2O BEARING	MINERALS
37'7"	2'11"	Lapilli tuff, light gray, weathered, slightly welded and foliated. Elongated lapilli or lithic clasts ranging from 0.05"x0.1" to 0.1"x0.4". Vesicles observed on the core surface and micro-vesicles in groundmass. Flow bands dip 60 to 75 degrees apparently, highly fractured, a small weathered shearing fault zone noted at 38.5', approximately 3" wide. Appears to bear water. Heavy Fe and Mn leaching stain on fracture planes.	V	1			Feldspar and mica/sericite; secondary: hematite
TO			SV	3	1	Y	
			M		2	Y	
			SH				
40'			H		2	Y	
40'	5'	Lithic lapilli tuff, light gray, weathered, massive and slightly welded/foliated. Foliations marked or defined by alignment of lithic fragments and colored bands or interlayered discolored light gray zones. At 43'6", a shear fractured zone, approximately 2.5" wide, exhibits significant weathering. Below this zone, the rock texture becomes finer and less weathered.	V				Feldspar, mica/sericite; and quartz
TO			SV	9	1	Y	
			M		4	Y	
			SH				
45'			H				
45'	4'10"	Lapilli tuff, light gray, altered/weathered, densely compacted, but weakly welded. None to less weathered rock interlayered with strongly weathered zone. Very fractured, most fractures only open slightly without displacement. Fe leaching stain on all fracture planes, devitrification/micro-crystallization apparently occurred in welded and altered zones, very fine devitrified "flecks" abundant. Groundmass slaty at 49-50'.	V				Same as above
TO			SV	12	2	y	
			M				
			SH	3	4	Y	
50'			H				
50'	5'	Lapilli tuff, lithology similar to last core run, generally light gray, but discolored near fractures. Weathered and highly fractured. Most fractures sub-vertically dipping (63-67 degrees), either parallel to flow banding/foliation or intersecting at a small angle. At 54', a fractured zone appears to be water bearing.	V				Same as above
TO			SV	5	9	Y	
			M				
			SH		3		
55'			H				

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55'	5'1"	Tuff to lapilli tuff, light gray to gray, weathered and fractured zones interlayered with fresh layers beginning with an 1-inch-thick weathered and fractured slaty layer, followed by a fresh and very densely compacted and weakly welded flinty zone. Less fractured to fresh rock at the bottom of the core run, light gray to white veinlets characterize sealed fractures. Alternate finer ash and coarser (lapilli) grain layers. Sampled at 56'.	V				Same as above
TO			SV	1			
			M	3	5	Y	
			SH				
60'			H				
60'	5'	Lapilli tuff, gray, altered, densely compacted (most likely devitrified and silicified) and partially welded. Minerals include quartz, feldspar, sericite, biotite, and chlorite. Very brittle but less fractured than last core run. Fractures with an apparent dip of approximate 45 degrees appear to be water bearing.	V				Quartz, feldspar, sericite, biotite and chlorite
TO			SV	1		N	
			M	5	4	Y	
			SH		4	N	
65'			H	1		N	
65'	4'5"	Lapilli tuff, lithology similar to the last core run, gray, but minor fracture pattern change. Almost vertical fracture at 66'7". Another set of fractures apparently dipping 50-60 degrees intersected with a second fracture set apparently dipping 15-25 degrees. The set with the higher angle fractures is parallel or nearly parallel to flow banding or foliation. Pumice clast sizes ranged up to 0.25". Abundant sericite.	V		1	?	Sericite
TO			SV	2			
			M	1	3		
			SH		5		
70'			H				
70'	5'7"	Lapilli tuff, lithology similar to last core run. At 72', a small discolored parallel foliation parting zone, aproximately 2 inches wide. Irregular vesicles between 73' and 74'6". Apparent dip of open fractures becomes less steep from top to bottom of the run: from 75 degrees to less than 45 degrees, to almost horizontal, but dipping in the same direction. Fe leaching stain on some fracture planes. Sizes of pumice clasts vary.	V	1			
TO			SV	2	1		
			M		3		
			SH		3		
75'			H		1		

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75'	5'	Lithic tuff, medium gray to pale-medium green at 78'2", welded. Erosion surfaces noted at 75'11", 77', and 78'4". Significant loss of circulation water and vertical fractures. Brittle and broken core occurred from 78'4"-79.0', with Fe leaching along fracture planes (indicating water activity). Highly devitrified, and vesicles abundant at the bottom of this run.	V		4	?	Chlorite, quartz, and feldspar
TO			SV				
			M				
			SH		4		
80			H				
80'	5'	Lithic lapilli tuff, light to medium gray, welded. Vuggy rock at 81'8". Highly fractured (open fractured zone) at 82'4". Sub-horizontal fractures at 81' appear to contain water. Medium dipping fracture at 83' with Fe leaching stain along the fracture. Significant Fe leaching stain typically on high angle fractures. Bleaching along a vertical orientated cross-cutting joint at 83'6"-84'2". Erosion surface of pyroclastic flow at 84'.	V	3	4	?	Quartz and feldspar
TO			SV	4	5	?	
			M	16	4	Y	
			SH	3	6	?	
85'			H				
85'	4'6"	Lithic lapilli tuff, light to medium gray, lithology similar to last core run, but not welded. Increase in size of pumice clasts and rock fragments and overall vesicularity. Fewer fractures. Fe leaching stain on fracture plans at 86'2" and 87'7", with mild rock leaching. Conjugate joints set at 88'10" and 88'11". More lithic fragments at 87'7", with broken devitrified clasts and moderate size (average 0.15"). Perlitic fractured pumice clasts. Fractured at 89'8"-90' (medium to sub-vertical dipping). A conjugate set of annealed joints noted at bottom of the run.	V				Quartz and feldspar
TO			SV	1		?	
			M	1			
			SH				
90'			H				
90'	5'	Tuff to lithic lapilli tuff, light to medium gray, various size of pumice clasts and lithic fragments, 0.05 - 0.5". "Bleached" zone at 91'-91'7". Multiple fractures, including open vertical fracture at 90'2"-92', conjugate open fracture set at 94'5", erosion surfaces at 93'1" and 92'5", and annealed stylolitic (irregular columnar) fracture at 91'5". Pumice clasts at 94' exhibit rotation. Sampled at 93'.	V		2		Quartz and feldspar
TO			SV	6			
			M	15	6		
			SH				
95'			H				

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95'	3'	Lithic lapilli tuff, light to medium gray, lithology similar to last run, but with coarser pumice and lithic clasts or fragments. Annealed fractures well developed at 96'7" - 96'11" and 97'7"-97'2". A stylolitic fracture at 97'-97'2" with possible secondary mineralization. Hydrothermal alteration evidenced by the highly siliceous matrix. Corehole terminated at 98' due to lodged fragment in outer core barrel that would have entailed retraction of tools to advance to proposed depth.	V	5			Quartz and feldspar
TO			SV				
			M	15	3		
			SH				
98			H				