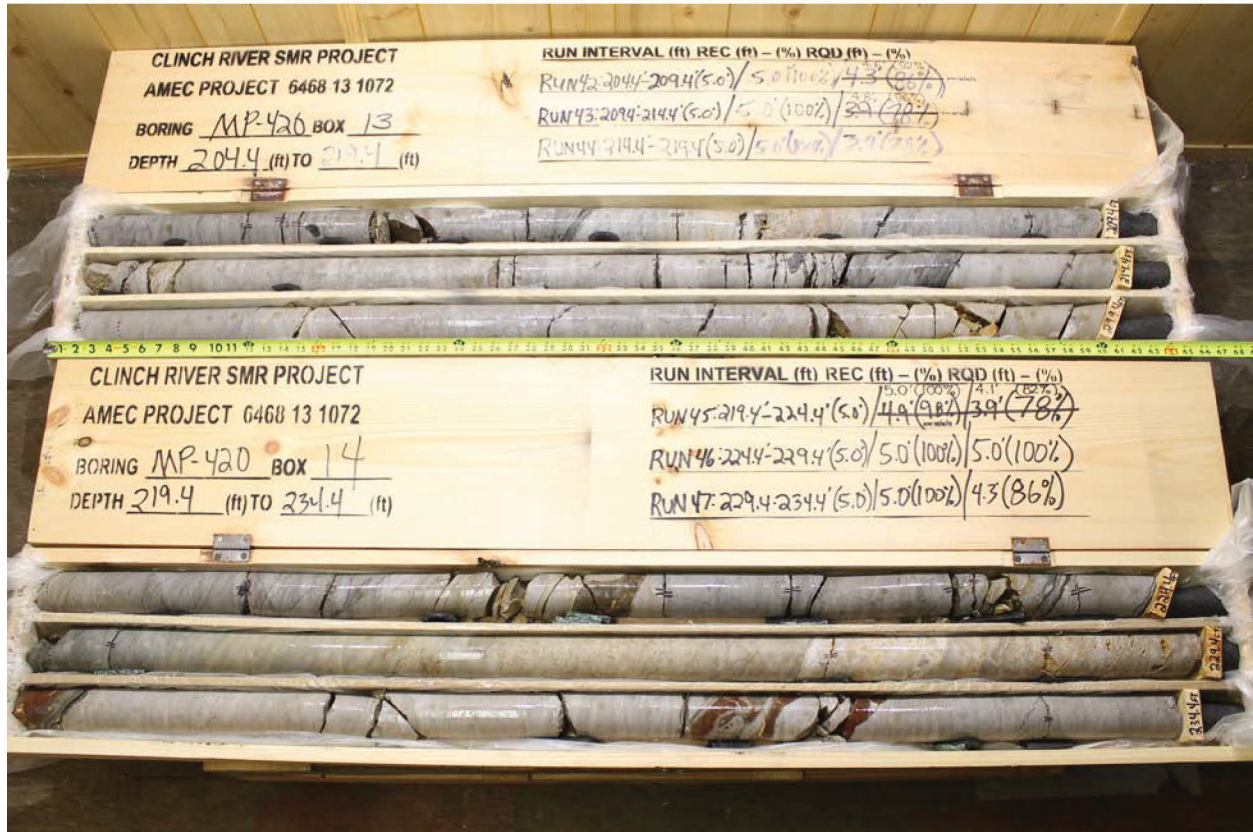


# MP-420 – Boxes 13 and 14



# MP-420 – Boxes 15 and 16





## MP-420 – Boxes 17 and 18



## MP-420 – Boxes 19 and 20







# GEOTECHNICAL BORING LOG

Prepared By: MBL Date: 3/5/14

Checked By: JCM Date: 3/5/14

SHEET 1 OF 2

BECHTEL NO.: 25847				AMEC PROJECT NO.: 6468-13-1072						COUNTY: Roane, TN				GEOLOGIST: R. Clark					
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee										DRILLER: S. Snow/D. King				Boring Orientation					
BORING NO.: MP-421				DRILL METHOD: Mud Rotary/Core						DRILL MACHINE: CME-55 (TSD)				Inclination: Vertical					
GROUND ELEV.: 803.6 ft (NAVD88)				NORTHING: 570,532 US ft (NAD83)						EASTING: 2,446,440 US ft (NAD83)				Azimuth: NA					
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08								ROD TYPE: AWJ		HAMMER (ID): 140-lb Auto (373705)							
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		HOLE DIA.: 4"		CASING DEPTH: 49.0 ft		CORE SIZE: HQ3		BITS USED: 4" Roller Cone									
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	L O G	SOIL DESCRIPTION AND REMARKS						
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.								
803.6					Ground Surface								803.6	0.0					
803.6	0.0	3	4	4															

CLINCH RIVER SMR BORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14








## GEOTECHNICAL CORING LOG

Prepared By: MBL Date: 3/5/14Checked By: JCM Date: 3/5/14

SHEET 1 OF 6

BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: S. Snow/D. King		Boring Orientation Inclination: Vertical Azimuth: NA	
BORING NO.: MP-421				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (TSD)			
GROUND ELEV.: 803.6 ft (NAVD88)				NORTHING: 570,532 US ft (NAD83)				EASTING: 2,446,440 US ft (NAD83)			
TOTAL DEPTH: 320.3 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (373705)		
DATE STARTED: 7/5/13			COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits				
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %RQD (ft) %		SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS			
								Begin Coring @ 48.9 ft			
754.7 753.4	48.9 50.2	1.3 5.0	5:55 2:08/0.3	(0.8) 62%	(0.0) 0%	Run 1		754.7 753.4	WEATHERED ROCK: LIMESTONE (MICRITE), light gray (5Y 7/1) and weak red (10R 5/2), weak to strong, highly weathered, with interbedded chert; weak to strong HCl reaction		48.9 50.2
			5:35 5:00 6:37 5:18 2:45	(4.7) 94%	(2.0) 40%	Run 2		LIMESTONE (MICRITE), light gray (5Y 7/1), weak to medium strong and strong, laminated to very thinly bedded, moderately to slightly weathered, slightly argillaceous, interbedded with few to little, very thin to thin chert beds, lenses, and nodules (jasperoidal, weak red, dark reddish brown to reddish gray with olive brown, few with red specks, calcite filled tensional fractures orthogonal to bedding through-out); trace calcite filled pits, strong HCl reaction ( <b>Lower Blackford Formation-Unit A</b> )			
									50.2-51.5ft: FZ/J, 30°/60-70°, PR-SR, T-O, B-D, II-III, 0.3' core loss 51.9,52.8ft: BJ, 30°, PS, T, B, II-III 52.5ft: J, 0°, PR, PO, B, II 53.0-53.8ft: BJ/FZ, 30°/55-70°, PS, T, B, II 54.1,54.3,54.5,54.6ft: BJ, 30-35°, PS, T, B, II 56.1ft: J, 10°, PS, T-PO, B, III 56.4,56.8,57.0,57.2,57.4,58.1,58.3,58.4,59.2ft: BJ, 30-35°, PS, T-PO, B, II 57.7ft: J, 45°, PS, VT, A, II		
									60.4,60.7,61.1,61.2,61.8,63.4,63.1ft: BJ, 30-35°, PS, T, B, II 63.2,63.6,63.9,64.2,64.4,64.6,64.8,65.0ft: BJ, 30-35°, PS, T, B, II 60.8ft: J, 60°, PS, T, B, III 62.7ft: J, 35°, UR, PO, B, III		
748.4	55.2	5.0	4:00 5:29 5:02 5:40 9:16	(5.0) 100%	(2.9) 58%	Run 3					
743.4	60.2	5.0	5:27 5:18 5:26 5:37 6:55	(5.0) 100%	(2.2) 44%	Run 4					
738.4	65.2	5.0	3:00 5:40 4:32 4:59 5:34	(4.6) 92%	(3.3) 66%	Run 5		738.4	LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), gray (5Y 6/1) to bluish gray (5PB 6/1), weak to medium strong, laminated and thinly bedded into moderately to thickly bedded repeating fining upward sequences, slightly weathered to fresh, argillaceous, interbedded with trace to few laminated to very thin clayey Calcareous SILTSTONE, dark gray (N 4/) to black (N 2.5/), wispy to diffuse bedding, and with scattered medium to coarse sand sized, angular chert clasts/fragments (reddish brown); slight bioturbation with disturbed bedding and slightly nodular appearance, few stylolites, fenestral with sparry calcite "bird eyes" through-out, strong HCl reaction		65.2
733.4	70.2	5.0	3:45 3:08 2:53 2:45 2:59	(5.0) 100%	(5.0) 100%	Run 6			65.5,66.0,66.2,66.6,67.2,67.4,67.6,68.9,69.0,69.6ft: BJ, 30-35°, PS, T, B, II 65.8ft: J, 60°, PS, VT, A, II 66.2,66.6ft: FZ, core loss, moderately weathered 66.9ft: J, 20°, PR, T, B, II 71.5,72.2,72.9,74.7ft: BJ, 25-30°, PS, T, B, II		
728.4	75.2	5.0	3:40 3:03 3:22 3:31 3:42	(5.0) 100%	(5.0) 100%	Run 7			78.0ft: BJ, 30°, PS, T, B, II 78.4ft: J, 50°, PS, T, B, II		
723.4	80.2	5.0	3:33 2:54 3:21 2:15 3:00	(5.0) 100%	(5.0) 100%	Run 8			83.7ft: BJ, 30°, US, T, B, II, stylolites		
718.4	85.2	5.0	3:08 2:41 2:48 2:38 2:41	(5.0) 100%	(4.4) 88%	Run 9 L7-25			86.3ft: J, 80°, PR, PO, B, III 86.7ft: J, 60°, PR, PO, B, III 86.1,86.3,87.5ft: BJ, 20-35°, PR, T, B, II		
								715.1			88.5
713.4	90.2	5.0	2:45 2:00 1:53 2:04 2:13	(5.0) 100%	(5.0) 100%	Run 10			LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), bluish gray (5PB 5/1), gray (N 6/-N 5/) to dark gray and very dark gray (N 4/-N 3/), grading to black (N 2.5/) and reddish black (10R 2.5/1), with little greenish gray (10Y 5/1), weak to medium strong, laminated to moderately bedded, locally thickly bedded, fresh, argillaceous, interbedded with little to some, laminated to moderately bedded, clayey Calcareous SILTSTONE, weak red (7.5R 4/2; 5R 4/1) to dark greenish gray (10Y 4/1) and very dark gray (2.5Y 3/1), wispy/wavy to mostly diffuse bedding, and with trace scattered, subangular coarse sand to fine gravel sized clasts of chert, limestone, and dolomite; slight to moderate bioturbation, fenestral with sparry calcite "bird eyes", strong HCl reaction 88.6,89.7,89.8ft: BJ, 20-35°, PR, T, B, II 92.9,93.5ft: BJ, 20°, PR, PO, B, III 94.2ft: BJ, 35°, PS, PO, B, III		
708.4	95.2	5.0	2:30 2:21	(5.0) 100%	(5.0) 100%	Run 11					

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14

BECHTEL PROJECT NO.: 25847			AMEC PROJECT NO.: 6468-13-1072			COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee						DRILLER: S. Snow/D. King			Boring Orientation
BORING NO.: MP-421			DRILL METHOD: Mud Rotary/Core			DRILL MACHINE: CME-55 (TSD)			Inclination: Vertical
GROUND ELEV.: 803.6 ft		(NAVD88)	NORTHING: 570,532		US ft (NAD83)	EASTING: 2,446,440		US ft (NAD83)	Azimuth: NA
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08					HAMMER (ID): 140-lb Auto (373705)		
DATE STARTED: 7/5/13		COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits			
ELEV.	DEPTH	RUN	DRILL RATE	RUN		SAMP.	L	O	ROCK DESCRIPTION AND REMARKS
(ft)	(ft)	(ft)	(Min/ft)	REC.	ROD	NO.	O	G	
				(ft)	(ft)				
				%	%				
Continued from previous page									
703.4	100.2	5.0	2:08 2:05 2:43			Run 12			LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), bluish gray (5PB 5/1), gray (N 6/-N 5/1) to dark gray and very dark gray (N 4/-N 3/), grading to black (N 2.5/1) and reddish black (10R 2.5/1), with little greenish gray (10Y 5/1), weak to medium strong, laminated to moderately bedded, locally thickly bedded, fresh, argillaceous, interbedded with little to some, laminated to moderately bedded, clayey Calcareous SILTSTONE, weak red (7.5R 4/2; 5R 4/1) to dark greenish gray (10Y 4/1) and very dark gray (2.5Y 3/1), wispy/wavy to mostly diffuse bedding, and with trace scattered, subangular coarse sand to fine gravel sized clasts of chert, limestone, and dolomite; slight to moderate bioturbation, fenestral with sparry calcite "bird eyes", strong HCl reaction (continued) 101.6-102.0ft: Mechanically reduced to rubble 102.0ft: BJ, 35°, PS, T, C, III 103.6ft: J, 65°, PS, T, B, II 110.0ft: BJ, 30°, PR, PO-O, B, III
698.4	105.2	5.0	2:12 1:55 1:48 2:08 2:39	(4.8) 96%	(4.6) 92%	Run 13			
693.4	110.2	5.0	2:06 1:55 1:38 1:54 2:38	(5.0) 100%	(5.0) 100%	Run 14	693.6		DOLOMITIC LIMESTONE (MICRITE/MUDSTONE/WACKESTONE), greenish gray (10Y 5/1; 5GY 6/1), dark gray to very dark gray (N 4/-N 3/), dark bluish gray (5PB 4/1), weak to strong, thinly to thickly bedded, fresh, interbedded with trace to few, clayey Calcareous SILTSTONE, weak red (5R 4/1) to dark reddish gray (10R 3/1), locally planar to diffuse bedding, and with trace to little, coarse sand to fine gravel sized, angular to subangular clasts of chert and dolomite (reddish brown to gray and dark gray); trace bioturbation, trace calcite filled pits, trace stylolites, weak HCl reaction 111.5,113.4ft: BJ, 35°, US, T, B, II 111.7,112.3,113.7ft: J, 80°, VT, A, I, with calcite 112.6,113.2ft: BJ, 35°, PS, T, B, III 115.4ft: BJ, 40°, SR, T-PO, C, II, stylolite 116.4ft: J, 50°, PS, T, B, III 117.7,117.9ft: BJ, 30°, UR-PR, PO, C, II-III 118.5ft: J, 75°, PS, T, B, III
688.4	115.2	5.0	2:39 2:06 2:05 3:19 3:29	(4.9) 98%	(4.7) 94%	Run 15			
683.4	120.2	5.0	2:22 2:45 2:59 3:08 3:01	(5.0) 100%	(4.6) 92%	Run 16	684.1		CRYSTALLINE DOLOMITE, fine grained, dark gray to very dark gray (2.5Y 4/1-3/1), with light gray (2.5Y 7/1), and trace weak red (7.5R 4/2) and grayish green (5GY 5/2), weak to strong, very thinly to moderately bedded, fresh; healed fractures with dolomite and calcite through-out, trace stylolites (typically with greenish gray indurated clay mineralization), locally with calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (Knox Group-Newala Formation) 119.6-125.2ft: FZ, 60-75°, VT, A, I, with calcite and spaced at about 0.2' 120.3,120.8,121.1,121.9,122.6,122.9,123.3ft: BJ, 25-35°, US-PS, T, B, II 123.1-123.3ft: Mechanically reduced to rubble 123.5ft: J, 40°, PR-UR, T-PO, C, II 125.0-126.6ft: FZ, 50-60°,VT, A, I, with calcite and spaced at about 0.4' 126.3,126.7,127.7ft: BJ, 30°, PR-SR, PO, B, II 127.0ft: J, 45°, PR, PO, B, II
678.4	125.2	5.0	2:51 3:09 5:36 3:25 4:31	(4.9) 98%	(3.6) 72%	Run 17			
673.4	130.2	5.0	3:45 5:29 3:45 3:31 2:59	(5.0) 100%	(4.8) 96%	Run 18	670.2		133.2ft: J, 70°, PR, T, B, II
668.4	135.2	5.0	2:27 2:05 2:39 2:47 2:00	(5.0) 100%	(5.0) 100%	Run 19			CRYSTALLINE DOLOMITE, fine to locally coarse grained, mostly gray (2.5Y 6/1-5/1, N 5/1) to dark gray (2.5Y 4/1) and very dark gray (2.5Y 3/1), with trace to little dark reddish gray (2.5YR 4/1) and weak red (2.5YR 4/2), locally mottled along pre-dolomitization fractures and bedding, strong, very thinly to moderately bedded, locally thickly bedded, fresh, trace chert nodules (dark gray); trace to few stylolites (most with black to grayish brown to greenish gray clay mineralization), trace to few calcite and dolomite filled pits and vugs (separate/non-touching), locally with trace open pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 133.6,134.5ft: J, 50°, PS, T, B, II 134.7ft: J, 70°, VT, A, I, with dolomite 139.4ft: BJ, 25°, PS, T, B, II 140.3-142.4ft: FZ, 40-70°, VT, A, I, with calcite and spaced at about 0.3' 140.4ft: BJ, 30°, PR, T, B, II 142.0ft: J, 40°, PS, T, B, II 143.6-144.7ft: FZ, 50-70°, VT, A, I, with calcite and spaced at about 0.1' 144.0ft: J, 30°, US, O, C, III
663.4	140.2	5.0	2:53 2:37 2:22 2:38 3:09	(5.0) 100%	(5.0) 100%	Run 20			
658.4	145.2	5.0	2:42 2:06 2:08 2:31 2:36	(5.0) 100%	(5.0) 100%	Run 21			
		5.0	1:57	(5.0)	(5.0)	Run 21			

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14





BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: R. Clark			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: S. Snow/D. King				Boring Orientation	
BORING NO.: MP-421				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (TSD)				Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)				NORTHING: 570,532 US ft (NAD83)				EASTING: 2,446,440 US ft (NAD83)				Azimuth: NA	
TOTAL DEPTH: 320.3 ft				SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (373705)			
DATE STARTED: 7/5/13				COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits					
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		RQD (ft) %	SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS				
									Continued from previous page				
653.4	150.2		2:38 3:39 3:08 2:35	100%	100%				CRYSTALLINE DOLOMITE, fine to locally coarse grained, mostly gray (2.5Y 6/1-5/1, N 5/) to dark gray (2.5Y 4/1) and very dark gray (2.5Y 3/1), with trace to little dark reddish gray (2.5YR 4/1) and weak red (2.5YR 4/2), locally mottled along pre-dolomitization fractures and bedding, strong, very thinly to moderately bedded, locally thickly bedded, fresh, trace chert nodules (dark gray); trace to few stylolites (most with black to grayish brown to greenish gray clay mineralization), trace to few calcite and dolomite filled pits and vugs (separate/non-touching), locally with trace open pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (continued) 147.0ft: J, 65°, UR, T, B, II 148.3ft: BJ, 30°, PS, T, B, II 150.2,151.5,151.9,152.9,154.0ft: BJ, 30°, US, T, C, II, stylolites 152.3ft: J, 65-75°, PR, T, B, II 153.2-154.7ft: FZ, 60-65°, VT, A, I, with dolomite and spaced at about 0.2' 153.4ft: BJ, 20°, US, T, B, II 155.3,156.0,156.2,156.9,159.5ft: BJ, 30-35°, US, T, C, II, stylolites 156.6-157.6ft: J, 70-90°, VT, A, I 159.0-159.7ft: FZ, 90° and 55°, VT, A, I, with dolomite				
648.4	155.2	5.0	2:50 2:57 2:40 2:05 2:43	(5.0) 100%	(5.0) 100%	Run 22							
643.4	160.2	5.0	2:21 2:13 1:57 2:08 2:15	(5.0) 100%	(4.7) 94%	Run 23							
638.4	165.2	5.0	2:40 2:18 3:08 2:47 2:34	(5.0) 100%	(4.9) 98%	Run 24			164.7ft: J, 65°, PR, O-VW, B, II, with mechanical abrasion				
633.4	170.2	5.0	3:56 2:29 2:33 1:40 3:03	(5.0) 100%	(5.0) 100%	Run 25			165.3-167.5ft: FZ, 60-90°, VT, A, I, with dolomite and spaced at about 0.1' 165.9-166.2ft: J, 70°, PS, VT, A, I 166.5ft: J, 40°, PR, T, B, II 166.6-167.1,169.6-169.8,171.4-171.9ft: J, 80-90°, VT, A, I, with greenish gray clay mineralization 169.4ft: BJ, 30°, PS, T, B, III 171.4ft: BJ, 45°, PS, T, B, II 170.2-170.4ft: As above with red (5R 4/4), thin, indurated clayey siltstone/mineralization filling fracture				
628.3	175.3	5.1	3:49 3:28 3:05 5:11 4:43/1.1	(4.9) 96%	(4.6) 90%	Run 26	631.5		172.1				
623.3	180.3	5.0	4:40 3:01 3:05 3:23 3:41	(4.9) 98%	(4.1) 82%	Run 27 L7-26	628.3		CRYSTALLINE DOLOMITE, coarse to fine grained, dark reddish gray (5R 4/1) to weak red (7.5R 4/2) with gray (5Y 6/1; N 5/) and gray to dark gray (2.5Y 5/1-4/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to moderately bedded, fresh; trace stylolites, trace dolomite filled and partially filled pits, weak HCl reaction 172.8-173.5ft: FZ, 80°, VT, A, I, with calcite and spaced at about 0.1' 174.2ft: BJ, 30°, PS, T, B, II 174.3ft: J, 20°, PS, PO, B, III				
618.3	185.3	5.0	5:11 3:08 3:45 4:18 4:10	(5.0) 100%	(4.1) 82%	Run 28			CRYSTALLINE DOLOMITE, fine grained, reddish gray (5R 5/1) to weak red (7.5R 4/2) and pale red (5R 6/2), with gray (5Y 6/1; N 5/) to light gray (2.5Y 7/1, 7.5YR 7/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to thin bedded, locally to moderately bedded, fresh, and trace to few thin to very thin and laminated, chert beds (black) and chert/dolomite cemented, subrounded to rounded, fine to medium grained quartz sand lenses (gray to greenish gray); calcite and dolomite healed fractures through-out, trace stylolites, trace calcite and dolomite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 175.3ft: Dark reddish brown (2.5YR 2.5/3), very thin, indurated clayey siltstone/mineralization filling fracture 175.5ft: J, 50°, PS, T, B, II 176.8ft: J, 10°, PR, PO, B, II 177.2ft: BJ, 40°, PS, T, B, II 178.0-178.3ft: FZ, 30°, PS, T, B, II-III 178.7ft: J, 25°, UR, T-PO, C, II 179.5ft: J, 50°, VT, A, I 179.8ft: J, 45°, PS, T, B, III 180.0ft: J, 25°, UR-SR, O, C, II, stylolite 181.8,182.8,183.6,184.5ft: BJ, 20-35°, US, T, B, II, stylolites 186.2,186.5ft: BJ, 30°, PR/PS, T, B, II 186.7ft: J, 60°, PS, T, B, II 188.9,189.4ft: J, 70-45°, US, PO, C, II, stylolites 190.9,191.4,193.6,193.7ft: BJ, 20-30°, PS, T, B, II				
613.3	190.3	4.9	4:06 3:35 4:25 3:39	(4.9) 100%	(4.9) 100%	Run 30							

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847			AMEC PROJECT NO.: 6468-13-1072			COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee						DRILLER: S. Snow/D. King		Boring Orientation	
BORING NO.: MP-421			DRILL METHOD: Mud Rotary/Core			DRILL MACHINE: CME-55 (TSD)		Inclination: Vertical	
GROUND ELEV.: 803.6 ft (NAVD88)			NORTHING: 570,532 US ft (NAD83)			EASTING: 2,446,440 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 320.3 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08					HAMMER (ID): 140-lb Auto (373705)	
DATE STARTED: 7/5/13			COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits		
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS	
								Continued from previous page	
608.4	195.2	5.1	4:09/0.9 4:37 2:57 4:23 3:29 3:18/1.1	(5.0) 98%	(5.0) 98%	Run 31		CRYSTALLINE DOLOMITE, fine grained, reddish gray (5R 5/1) to weak red (7.5R 4/2) and pale red (5R 6/2), with gray (5Y 6/1; N 5/) to light gray (2.5Y 7/1, 7.5YR 7/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to thinly bedded, locally to moderately bedded, fresh, and trace to few thin to very thin and laminated, chert beds (black) and chert/dolomite cemented, subrounded to rounded, fine to medium grained quartz sand lenses (gray to greenish gray); calcite and dolomite healed fractures through-out, trace stylolites, trace calcite and dolomite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (continued) 197.3ft: BJ, 45°, US, PO, B, II, stylolite 197.9,199.7,201.0,202.0,203.5,204.3ft: BJ, 35°, PS, T, B, II 200.9ft: J, 10°, PS, B, T, II 201.5ft: J, 45°, SS, T, B, II 203.7ft: SH, 60°, VT, A, I, with dolomite	
603.3	200.3	4.9	3:41 4:08 4:34 4:25 4:52/0.9	(4.9) 100%	(4.9) 100%	Run 32		205.6,208.0ft: BJ, 30°, US, T, C, II, stylolites 206.9ft: BJ, 35°, PS, O, B, II 207.9-209.2ft: FZ, 40-60°, VT, A, I, with dolomite and spaced at about 0.1' 208.6ft: BJ, 25°, PS, T, B, II 206.9-210.1ft: As above, very dark gray (2.5Y 3/1) to dark reddish gray (2.5YR 3/1)	
598.4	205.2	5.0	3:39 4:50 6:50 4:15 5:41	(5.0) 100%	(5.0) 100%	Run 33		210-214.4ft: FZ, 50-60°, VT, A, I, with dolomite and spaced at about 0.3' 212.1ft: BJ, 35°, UR, O, C, II, stylolites	
593.4	210.2	5.0	4:24 4:19 3:30 3:14 3:21	(5.0) 100%	(5.0) 100%	Run 34		215.2ft: As above, becomes pinkish gray (5YR 7/1) with reddish gray (5R 5/1) 215.5,216.2,216.4ft: J, 60-70°, VT, A, I, with dolomite 217.2ft: BJ, 30°, UR, PO, C, IV, stylolite 218.3ft: J, 40°, PS, T, B, II 216.7ft: Dark reddish gray (2.5YR 3/1), very thin, with indurated clayey siltstone/mineralization filling irregular fracture	
588.4	215.2	5.0	3:47 4:01 4:29 3:30 4:07	(5.0) 100%	(5.0) 100%	Run 35		583.2	
583.4	220.2	5.0	3:30 3:08 4:44 2:55 4:05	(5.0) 100%	(4.8) 96%	Run 36		CRYSTALLINE DOLOMITE, fine to coarse grained, gray to very dark gray (2.5Y 5/1-3/1), with trace to some dusky red (7.5R 3/3) to dark reddish gray (2.5YR 4/1-3/1) mottling, strong, very thinly to thinly bedded, locally to moderately bedded, fresh, with trace irregular, very thin chert nodules (dark gray); locally with irregular dolomite and calcite filled fractures and vugs, few with indurated, dark reddish brown (2.5YR 2.5/3-3/3) clayey mineralization/filling, trace calcite and dolomite filled pits and vugs (separate/non-touching) through-out, trace stylolites, healed fractures through-out, weak/delayed to no HCl reaction 224.8-225.4ft: As above, to greenish gray (10GY 5/1), silicified 220.5ft: J, 75°, US, T-PO, C, II, stylolite 222.2-224.0ft: FZ, 60-70°, VT, A, I, spaced at about 0.3 222.3ft: BJ, 35°, US, PO, B, II 224.9ft: J, 70°, VT, A, I 225.4-226.9ft: FZ, 60°, VT, A, I, with dolomite and spaced at about 0.3' 228.8ft: J, 40°, PR, T, B, II 229.2-230.0ft: FZ, 85° and 50°, VT, A, I, with dolomite and spaced at about 0.1' 230.1,230.4ft: BJ, 35-40°, PS, T, B, II 231.3ft: J, 50°, PS, T-PO, B, III 233.1ft: BJ, 30°, UR, T, C, II, stylolite 234.2ft: J, 20°, UR, PO, C, II 234.6ft: BJ, 35°, US, T, B, II	
578.4	225.2	5.0	3:42 3:10 2:35 3:35 4:44	(5.0) 100%	(4.8) 96%	Run 37 L7-27		236.3-237.6ft: FZ, 50-60°, VT, A, I, with dolomite and spaced at about 0.2' 238.9ft: BJ, 30°, UR, T, C, III, stylolite 239.9ft: J, 10°, PL-SR, T, C, II, stylolite	
573.4	230.2	5.0	4:49 2:33 4:36 3:09 4:12	(5.0) 100%	(4.8) 96%	Run 38		241.9ft: BJ, 20°, US, T, C, II, stylolite 242.6ft: BJ, 20°, US, VT, C, II, stylolite	
568.4	235.2	5.0	3:42 3:00 3:48 4:09 4:15	(5.0) 100%	(5.0) 100%	Run 39			
563.4	240.2	5.0	4:48 3:15 3:25	(5.0) 100%	(5.0) 100%	Run 40			

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14





BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: R. Clark	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: S. Snow/D. King			Boring Orientation Inclination: Vertical Azimuth: NA
BORING NO.: MP-421				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: CME-55 (TSD)			
GROUND ELEV.: 803.6 ft (NAVD88)				NORTHING: 570,532 US ft (NAD83)				EASTING: 2,446,440 US ft (NAD83)			
TOTAL DEPTH: 320.3 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (373705)		
DATE STARTED: 7/5/13			COMPLETED: 7/17/13		CASING DEPTH: 49.0 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits				
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		RQD (ft) %	SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS		
									Continued from previous page		
558.4	245.2		3:53 4:13						245.2-246.5ft: As above, with little to some, scattered to laminated and very thin lenses of well rounded, medium grained quartz sand		
		5.0	3:57 3:36 3:37 2:18 3:12	(5.0) 100%	(4.9) 98%	Run 41	557.1		245.6,246.5ft: BJ, 30°, PS, VT, B, II		
									246.5		
									LIMESTONE (MICRITE), gray (N 6/-N 5/) to pinkish gray (7.5R 7/1), medium strong, very thinly bedded, fresh, interbedded with little, laminated to very thin Calcareous SILTSTONE, reddish gray (2.5YR 4/1) to greenish gray (10Y 5/1); strong HCl reaction		
									248.5		
553.4	250.2								247.7,248.4ft: BJ, 30-35°, PS, T, B, II		
		5.0	3:21 5:42 4:31 4:08 5:23	(5.0) 100%	(4.5) 90%	Run 42			CRYSTALLINE DOLOMITE, fine to coarse grained, greenish gray (10GY 6/1) to gray (N 6/), dark gray (N 4/), and pinkish gray (5R 7/1), with some weak red (5R 4/3), strong, very thinly to moderately bedded, fresh, with trace to few jasperoid chert nodules, red (7.5R 5/6), and locally with some, well rounded, medium quartz sand lenses and scattered grains; healed fractures through-out, trace to few calcite and dolomite filled pits and irregular vugs (separate/non-touching), weak/delayed to no HCl reaction		
548.4	255.2								248.5,249.7ft: BJ, 30-35°, PS, T, B, II		
		5.0	3:32 3:58 4:33 3:45 3:51	(4.8) 96%	(4.8) 96%	Run 43	548.0		250.4,250.6ft: J, 70°, VT, A, I, with dolomite		
									251.4-251.7ft: J, 70°, PS, PO, B, III		
									251.7-252.5ft: FZ, J, 50-60° and 20-30°, PS PO, B, III, spaced at about 0.2-0.4'		
									253.9ft: J, 60°, PS, T, B, III		
									255.5ft: J, 30°, US, T-PO, B, II		
543.4	260.2	4.9	3:50 3:40 3:25 3:33 3:19/0.9	(4.9) 100%	(4.8) 98%	Run 44			CRYSTALLINE DOLOMITE, fine grained, weak red (2.5YR 5/2) to dark reddish brown (5YR 3/2), with some gray (5Y 6/1), mottled along pre-dolomitization fractures and bedding, strong, very thinly to thinly bedded, locally to moderately bedded, fresh, with trace angular chert nodules (dark gray), and trace to few scattered, subrounded, medium grained quartz sand; trace stylolites, weak/delayed to no HCl reaction		
									262.0ft: BJ, 20°, PS, T-PO, B, II		
538.5	265.1	5.0	5:00 3:39 3:54 3:33 3:29	(5.0) 100%	(4.6) 92%	Run 45			266.7ft: J, 50°, PS, T, B, II		
									267.1ft: BJ, 0-45°, SR, T, C, II, stylolite		
									535.6		
533.5	270.1	5.0	5:55 4:30 3:35 3:47 3:14	(4.9) 98%	(4.4) 88%	Run 46			CRYSTALLINE DOLOMITE, fine to coarse grained, gray (2.5Y 6/1-5/1) with dark reddish gray (10R 4/1), to gray and very dark gray (2.5Y 5/1-3/1) and pale red (5R 6/2) with some gray (10YR 5/1), mottled, strong, very thin to moderately bedded, fresh, with trace chert nodules (dark gray and white) and few scattered rounded to subrounded medium grained quartz sand grains; healed fractures through-out, trace stylolites, trace dolomite and calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction		
									268.0ft: BJ, 30°, UR-SR, T-PO, C, II, stylolite		
									268.6-269.0ft: FZ, 60°, VT, A, I, with dolomite		
528.5	275.1	5.0	4:53 2:53 3:41 2:49 3:54	(5.0) 100%	(4.8) 96%	Run 47			270.5-270.8ft: FZ, BJ, 35°, PS, T, B, II		
									272.8,273.2ft: BJ, 35°, UR, T, C, II, stylolites		
									237.5-274.9ft: FZ, 65-85°, VT, A, I, with folomite and spaced at about 0.1'		
									270.5-270.8ft: As above, with dark reddish brown (2.5YR 3/3), indurated clay/siltstone mineralization filled fracture		
									276.4ft: BJ, 35°, PS, T, B, II		
									276.6ft: BJ, 35°, PS, T, B, II		
									276.6-277.7ft: J, 80°, PS, VT, A-B, III		
523.5	280.1	5.0	3:11 3:39 3:20 4:11 4:58	(5.0) 100%	(4.5) 90%	Run 48			279.5ft: BJ, 25°, PS, T, C, III		
									276.4-276.6ft: As above, with SILTSTONE, dusky red (2.5YR 3/2), laminated, with some lenses of medium grained quartz sandstone, dark gray (N 4/)		
									280.4,281.4,281.7ft: J, 60-70°, PR, T, C, III		
									282.3ft: BJ, 35°, SR, T, C, II, stylolite		
									520.1		
518.5	285.1	5.0	4:56 5:18 5:28 4:57 4:48	(5.0) 100%	(5.0) 100%	Run 49			283.4-283.5ft: As above, greenish gray (5G 5/1), silicified, with coarse dolomite crystals		
									283.5		
									LIMESTONE (MICRITE), gray (2.5Y 6/1-5/1), strong, very thinly to thinly bedded, fresh, with few stylolites, and scattered dolomite crystals through-out, strong HCl reaction; becomes mostly DOLOMITIC LIMESTONE at 289.4' to 289.9': CRYSTALLINE DOLOMITE, fine grained, dark reddish gray (2.5YR 3/1), strong, very thinly bedded, fresh, weak/delayed to HCl reaction to 290.9': LIMESTONE (MICRITE), as above to 292.5': Jasperoidal chert to 292.7'		
									287.0ft: BJ, 30°, SR, T-PO, C, II, stylolite		
513.5	290.1	5.0	3:51 3:39	(5.0) 100%	(4.8) 96%	Run 50			292.5,292.7ft: BJ, 30°, PS, T-PO, B, II		

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14



BECHTEL PROJECT NO.: 25847		AMEC PROJECT NO.: 6468-13-1072		COUNTY: Roane, TN	GEOLOGIST: R. Clark
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: S. Snow/D. King	Boring Orientation
BORING NO.: MP-421		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: CME-55 (TSD)	
GROUND ELEV.: 803.6 ft (NAVD88)		NORTHING: 570,532 US ft (NAD83)		EASTING: 2,446,440 US ft (NAD83)	Inclination: Vertical
					Azimuth: NA
TOTAL DEPTH: 320.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08			HAMMER (ID): 140-lb Auto (373705)
DATE STARTED: 7/5/13		COMPLETED: 7/17/13	CASING DEPTH: 49.0 ft	CORE BARREL TYPE: HQ3/Diamond Impregnated core bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
Continued from previous page								
508.5	295.1	5.1	2:43 2:44 2:42			Run 51		510.9 CRYSTALLINE DOLOMITE, fine grained, weak red (5R 4/2), with gray (N 6/) mottling through-out that mimics bedding and pre-dolomitization healed fractures, strong, thinly bedded, fresh; trace stylolites, weak/delayed to no HCl reaction 294.1ft: J, 75°, PS, VT, B, II 298.3ft: BJ, 35°, UR, T, C, II, stylolite
503.4	300.2	5.0	2:31 2:18 1:58 2:15 2:52/1.1	(5.1) 100%	(5.1) 100%	Run 52		301.4ft: BJ, 45°, PS, T, C, II 304.4ft: BJ, 30°, SR, T, C, II, stylolite 304.8ft: BJ, 30°, PS, T, B, II
498.4	305.2	5.0	3:56 3:30 3:05 3:30 3:19	(5.0) 100%	(5.0) 100%	Run 53 L7-28		497.8 LIMESTONE (MICRITE), gray (2.5Y 6/1-5/1), strong, very thinly to thinly bedded, fresh, with few stylolites, and scattered dolomite crystals through-out, strong HCl reaction; becomes nodular with dolomite matrix at 308.0' to 308.3': CRYSTALLINE DOLOMITE, fine grained, dark reddish gray (2.5YR 3/1), strong, thinly to moderately bedded, fresh, with trace thin jasperoidal chert lenses, and some medium grained, subrounded to rounded quartz sand, weak/delayed to no HCl reaction; silicified from 309.4' to 309.6': LIMESTONE (MICRITE), as above to 311.8'
493.4	310.2	5.0	7:49 6:48 5:14 3:12 3:18	(5.0) 100%	(5.0) 100%	Run 54		491.8 306.0-307.0ft: FZ/SZ, 70-80°, VT, A, I, spaced at 0.1-0.3' 309.6ft: BJ, 20°, PS, T, B, II 308.3-309.6ft: FZ, 80-90°, VT, A, I, spaced at about 0.1'
488.4	315.2	5.1	4:40 2:59 3:04 3:55 3:30/1.1	(5.0) 98%	(5.0) 98%	Run 55		311.8 CRYSTALLINE DOLOMITE, fine grained, dark reddish gray (5R 4/1), with gray (5Y 6/1) mottling through-out that mimics bedding and pre-dolomitization fractures, strong, laminated to thinly bedded, fresh, with trace very thin, chert and dolomite cemented, medium grained, subrounded to rounded quartz sand lenses; healed fractures through-out, trace dolomite and calcite filled pits and irregular vugs (separate/non-touching), weak/delayed to no HCl reaction 313.2ft: BJ, 35°, PS, T, B, II 313.3-314.3ft: FZ, 50-55°, VT, A, I, with dolomite; spaced about 0.1' 315.7ft: BJ, 40°, PS, T, C, II, stylolite 319.0ft: BJ, 25°, PS, T-PO, B, II
483.3	320.3							483.3 Boring and coring terminated at 320.3 feet.

CLINCH RIVER SMR CORE FINAL CLINCH FINAL LOGS.GPJ CLINCH BORING DATA TEMPLATE.GDT 3/5/14