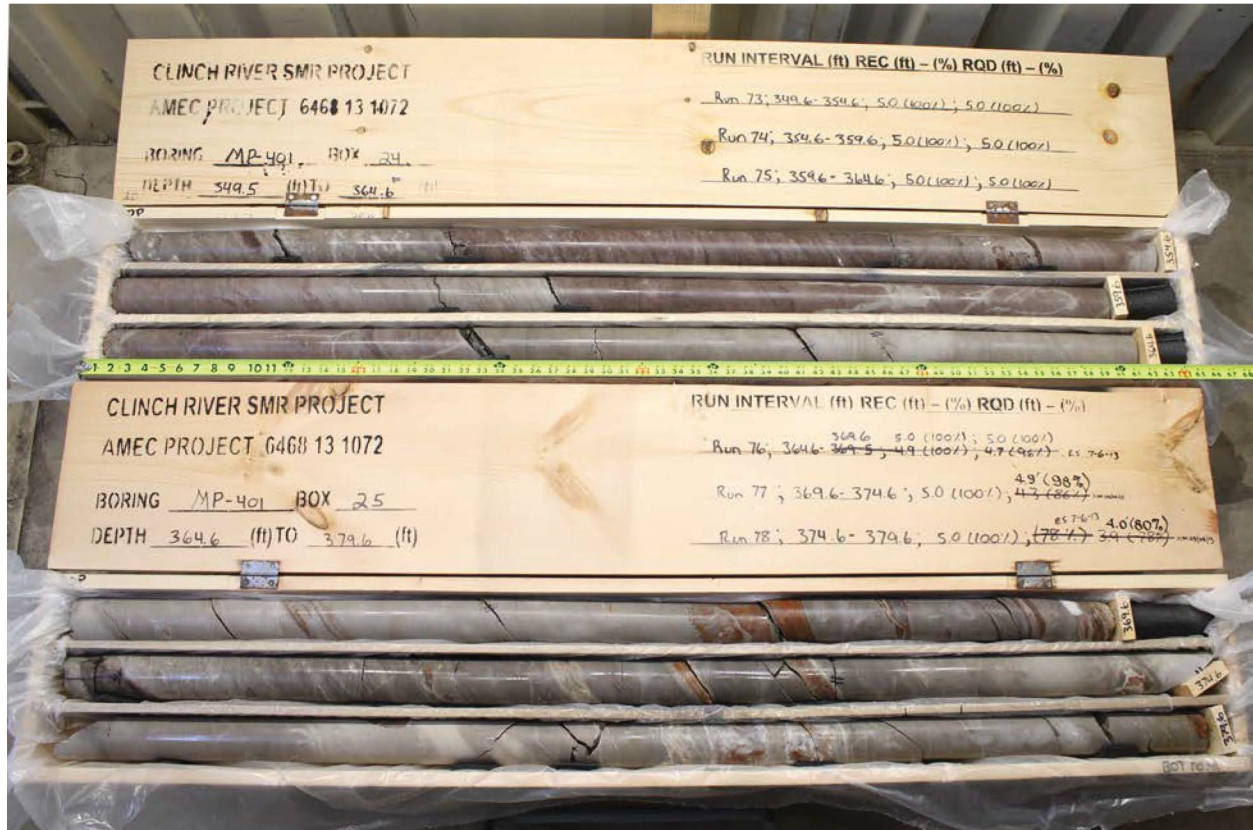


## MP-401 – Boxes 24 and 25



## MP-401 – Boxes 26 and 27



MP-401 – Box 28







## GEOTECHNICAL BORING LOG

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

SHEET 1 OF 1

BECHTEL NO.: 25847		AMEC PROJECT NO.: 6468-13-1072		COUNTY: Roane, TN		GEOLOGIST: E. Shrum								
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: B. Akins/J. Criss		Boring Orientation								
BORING NO.: MP-402		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: D-120 (MW-1)		Inclination: Vertical								
GROUND ELEV.: 816.5 ft (NAVD88)		NORTHING: 571,941 US ft (NAD83)		EASTING: 2,447,480 US ft (NAD83)		Azimuth: NA								
TOTAL DEPTH: 199.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08		ROD TYPE: AWJ		HAMMER (ID): 140-lb Auto (027)								
DATE STARTED: 8/18/13		COMPLETED: 8/22/13		HOLE DIA.: 4"		CASING DEPTH: 17.5 ft								
CORE SIZE: HQ3		BITS USED: 4" Roller Cone												
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL DESCRIPTION AND REMARKS		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
816.5					Ground Surface							816.5	0.0	
816.5	0.0	WOH	2	3						SS-1		FILL: LEAN CLAY with Gravel (CL), strong brown (7.5YR 4/6), medium stiff, moist, low to moderate plasticity fines, little fine to coarse angular gravel, few fine to coarse sand, trace organics, no HCl reaction (PP=1.0 tsf)		
814.0	2.5	4	6	9						SS-2		814.5	2.0	RESIDUAL SOIL: LEAN CLAY (CL), yellowish red (5YR 4/6), stiff, moist, low to moderate plasticity fines, few fine angular gravel, few fine to coarse sand, no HCl reaction (PP=1.7 tsf)
811.7	4.8	11	10	11						SS-3		812.0	4.5	RESIDUAL SOIL: Sandy LEAN CLAY with Gravel (CL), yellowish red (5YR 4/6), very stiff, wet, low to moderate plasticity fines, little fine to coarse angular gravel, little fine to coarse sand, no HCl reaction (PP=3.2 tsf)
809.1	7.4	4	6	9						SS-4		809.5	7.0	RESIDUAL SOIL: FAT CLAY with Sand (CH), yellowish red (5YR 4/6), stiff to very stiff, moist, moderate to high plasticity fines, little fine to coarse sand, few to little fine to coarse angular gravel, no HCl reaction (PP=2.7-2.5 tsf)
806.7	9.8	3	7	14						SS-5		804.5	12.0	RESIDUAL SOIL: FAT CLAY (CH), strong brown (7.5YR 5/6), medium stiff to very soft, moist, moderate to high plasticity fines, few fine to coarse sand, trace fine gravel, no HCl reaction (PP=1.5-0.3 tsf)
804.1	12.4	2	3	3							SS-6			
801.7	14.8	WOH	WOH	WOH							SS-7			
												799.7	16.8	
												Bit refusal at 16.8 feet; begin rock coring		
												Soil drilling halted. Log continues on geotechnical coring log		
												Observed water levels:		
												17.0 ft bgs, AM 8/19/13		
												16.8 ft bgs, AM 8/20/13		
												36.5 ft bgs, AM 8/21/13		
												39.5 ft bgs, AM 8/22/13		

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 4

BECHTEL PROJECT NO.: 25847				AMEC PROJECT NO.: 6468-13-1072				COUNTY: Roane, TN		GEOLOGIST: E. Shrum	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: B. Akins/J. Criss			Boring Orientation
BORING NO.: MP-402				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: D-120 (MW-1)			Inclination: Vertical
GROUND ELEV.: 816.5 ft (NAVD88)				NORTHING: 571,941 US ft (NAD83)				EASTING: 2,447,480 US ft (NAD83)		Azimuth: NA	
TOTAL DEPTH: 199.3 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (027)		
DATE STARTED: 8/18/13			COMPLETED: 8/22/13		CASING DEPTH: 17.5 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.	L O G	ROCK DESCRIPTION AND REMARKS			
								Begin Coring @ 16.8 ft			
799.7	16.8	2.4	5:35	(2.4)	(2.3)	Run 1		799.7	CRYSTALLINE DOLOMITE, fine grained, light gray (10YR 7/1), medium strong to strong, thinly bedded, fresh, trace chert nodules (strong brown to light brownish gray); trace stylolites, weak/delayed HCl reaction ( <b>Knox Group-Newala Formation</b> )		16.8
797.3	19.2	5.1	2:40/0.4	(5.1)	(5.0)	Run 2		797.1	16.8-17.1ft: J, 70°, VT, A, I, with calcite and spaced at about 0.1' 22.9ft: J, 30°, UR, PO, C, II 19.2ft: BJ, 25°, SR, O, B, II		19.4
792.2	24.3	5.0	6:51 6:11 4:32 5:55 7:24/1.1	(5.0) 100%	(4.5) 90%	Run 3			LIMESTONE (MICRITE), light gray (10YR 7/1) to gray (10YR 6/1-5/1) with dark grayish brown (10YR 4/2) mottling, strong, very thinly bedded, slightly weathered to fresh, with scattered coarse dolomite crystals in groundmass and along bedding planes, interbedded with some, very thin to moderately bedded, CRYSTALLINE DOLOMITE, fine to coarse grained, locally nodular, and trace chert beds (dark brown to dark gray); trace to few stylolites, trace calcite filled pits, strong to weak/delayed HCl reaction 26.6ft: J, 35-40°, UR-PR, T-PO, C, III 28.0,28.6ft: J, 40-50°, PS, T-PO, C, II 28.3ft: J, 60°, PS, T, C, III		
787.2	29.3	5.0	6:24 4:40 5:22 5:31 4:24	(5.0) 100%	(4.9) 98%	Run 4		787.7	CRYSTALLINE DOLOMITE, fine grained, weak red (10R 5/2-2.5YR 4/2), with gray (N 6/-N 5/) mottling that mimics bedding and pre-dolomitization fractures, grading to gray (7.5YR 5/1) with dark gray (7.5YR 4/1), strong, laminated to thinly bedded, fresh; trace to few stylolites, weak/delayed to no HCl reaction 28.9ft: J, 40-50°, PS, T-PO, C, II 31.6ft: J, 10°, PS, PO, B, II, mechanically ground with slight core loss 33.8ft: BJ, 40°, UR, PO, D, III, stylolite		28.8
782.2	34.3	5.0	3:16 3:13 3:32 4:25 3:48	(4.9) 98%	(4.9) 98%	Run 5			34.5,38.1ft: BJ, 30-40°, UR, VT, A, I, stylolite 35.9,38.8ft: BJ, 30°, UR, PO, D, III, stylolite		
777.2	39.3	5.0	4:19 3:41 4:47 4:24 4:10	(5.0) 100%	(5.0) 100%	Run 6			40.3ft: J, 30°, UR, PO, G, II 41.8ft: J, 35°, PS, T-PO, C, II		
772.2	44.3	5.0	3:03 3:09 3:10 3:15 4:39	(5.0) 100%	(5.0) 100%	Run 7		773.9	LIMESTONE (MICRITE), light gray (10YR 7/1), strong, very thin to thinly bedded, fresh, with some coarse dolomite crystals through-out, moderate interbed of very thinly bedded CRYSTALLINE DOLOMITE, fine grained, gray (10YR 6/1) mottled with weak red (10YR 5/2) from 45.0' to 46.6'; few stylolites, strong to weak HCl reaction 42.6,43.0ft: BJ, 30°, PS, PO, D, III 43.0ft: J, 35°, PS, T-PO, C, II 46.3ft: J, 80°, VT, A, I, with calcite 46.6,46.8,47.2ft: BJ, 30°, PS, T-PO, C-D, III		42.6
767.2	49.3	5.0	3:50 2:40 3:46 4:00 3:47	(5.0) 100%	(4.8) 96%	Run 8		768.2	CRYSTALLINE DOLOMITE, fine grained, gray (10YR 6/1) mottled with weak red (10YR 5/2), to reddish gray (10R 6/1) and gray (7.5YR 6/1), to weak red (10R 5/2-4/2) mottled with gray (N 6/) and greenish gray (10Y 6/1), to light gray (10YR 7/1) to gray (N 6/) mottled with weak red (10R 5/2), and reddish gray (2.5YR 6/1-5/1) to gray (10YR 5/1) with spotty dark reddish gray (2.5YR 4/1-3/1) mottling, strong, laminated to thinly bedded, locally with moderate to thick beds, fresh, with trace very thin to thin chert beds, lenses, and nodules (very dark gray to dark brown); healed fractures with calcite/dolomite through-out, trace to few stylolites, trace dolomite and calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 49.1ft: J, 50°, PS, PO, B, III 49.7,49.8ft: BJ, 40°, PS, PO, D, III 50.2,50.9,51.5ft: J, 80°, VT, A, I, with calcite 53.3ft: BJ, 30°, UR, PO, G, II, stylolite 53.9ft: BJ, 25°, PS, PO, C, II 55.0ft: J, 30°, PR, PO, G, II 56.7ft: J, 50°, PS, T, G, II 57.6-58.6ft: SZ, 70° and 30°, calcite-healed and closely spaced 58.1,58.6ft: BJ, 35-40°, PR, T, D-G, II-III 59.2ft: J, 60°, VT, A, III, with calcite 59.1-60.6ft: FZ, 60-65°, VT, A, I, with dolomite 60.5ft: BJ, 10-30°, PR, O, D, III 63.2,63.3ft: J, 60°, VT, A, I 64.7,65.6ft: BJ, 30-40°, PS-PR, O, C, II-III 64.7-65.4ft: FZ, 50-55°, VT, A, I, with dolomite		48.3
762.2	54.3	5.0	4:27 4:16 3:34 3:26 3:21	(5.0) 100%	(4.8) 96%	Run 9					
757.2	59.3	5.0	3:22 2:59 2:56 3:18 3:16	(5.0) 100%	(5.0) 100%	Run 10					
752.2	64.3	5.0	3:55 3:24 3:25 3:12 3:04	(5.0) 100%	(4.8) 96%	Run 11					
		5.0	6:01	(5.0)	(4.8)						

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: E. Shrum			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: B. Akins/J. Criss			Boring Orientation		
BORING NO.: MP-402				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: D-120 (MW-1)			Inclination: Vertical		
GROUND ELEV.: 816.5 ft (NAVD88)				NORTHING: 571,941 US ft (NAD83)				EASTING: 2,447,480 US ft (NAD83)			Azimuth: NA		
TOTAL DEPTH: 199.3 ft			SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (027)				
DATE STARTED: 8/18/13			COMPLETED: 8/22/13		CASING DEPTH: 17.5 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				
747.2	69.3	5.0	4:36 4:29 4:05 4:15	100%	96%								
		5.0	3:55 3:48 3:29 3:56 4:08	(5.0) 100%	(5.0) 100%	Run 12			CRYSTALLINE DOLOMITE, fine grained, gray (10YR 6/1) mottled with weak red (10YR 5/2), to reddish gray (10R 6/1) and gray (7.5YR 6/1), to weak red (10R 5/2-4/2) mottled with gray (N 6/) and greenish gray (10Y 6/1), to light gray (10YR 7/1) to gray (N 6/) mottled with weak red (10R 5/2), and reddish gray (2.5YR 6/1-5/1) to gray (10YR 5/1) with spotty dark reddish gray (2.5YR 4/1-3/1) mottling, strong, laminated to thinly bedded, locally with moderate to thick beds, fresh, with trace very thin to thin chert beds, lenses, and nodules (very dark gray to dark brown); healed fractures with calcite/dolomite through-out, trace to few stylolites, trace dolomite and calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction (continued) 65.4ft: BJ, 10°, PR, O, C, II 67.7ft: BJ, 35°, PR, PO, D, III, stylolite 68.1,68.4ft: J, 50° and 60°, PS, T-PO, B, III 69.3,70.3,72.4ft: J, 30-50°, PS, T, C, III 71.3-72.8ft: FZ, 40-65°, VT, A, I-III, with calcite and dolomite 73.5ft: BJ, 20°, UR, PO, G, II, stylolite 74.7ft: J, 50°, VT, A, I, with dolomite				
742.2	74.3	5.0	4:09 4:38 3:34 4:46 4:54	(5.0) 100%	(5.0) 100%	Run 13		741.7	CRYSTALLINE DOLOMITE, fine grained, gray to dark gray (2.5Y 6/1-4/1), mottled with weak red (10R 5/2), strong, laminated to moderately bedded, locally nodular, fresh, bedding disturbed to planar, with trace, very thin partially dolomitized LIMESTONE (MICRITE) beds, trace chert nodules, and locally with some, very thin to thin dolomite and calcite cemented medium grained rounded to subrounded quartz sand lenses; healed fractures with calcite and dolomite through-out, trace to few stylolites, trace calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 77.6,77.8ft: J, 50°, VT, A, I, with dolomite 76.8ft: J, 30°, PS, PO, G, II 79.3-80.0ft: FZ, 40-60°, VT, A, I, with dolomite and spaced at about 0.1' 79.5ft: J, 30°, PR, VT, A, I 81.2,81.8ft: J, 25-30°, PS, T, C, III 82.1-84.6ft: FZ, 20-60°, VT, A, I, with calcite and dolomite and spaced at about 0.2'				
737.2	79.3	5.0	5:46 4:31 5:17 6:11 5:45	(5.0) 100%	(5.0) 100%	Run 14			84.5,84.6,85.5,85.6,85.9ft: BJ, 35-40°, PS, T, C, III LIMESTONE (MICRITE), gray to dark gray (10YR 5/1-4/1), strong, very thinly bedded and nodular, fresh, with trace very thin chert beds (dark gray); trace stylolites, trace calcite filled pits and vugs (separate/non-touching), strong HCl reaction 88.2ft: J, 75-80°, PR, PO, C, III				
732.2	84.3	5.0	5:58 6:06 6:23 6:42 6:26	(5.0) 100%	(4.0) 80%	Run 15		730.5	88.6,89.0ft: BJ, 30°, PR, PO, C-D, II 86.8ft: J, 55°, VT, A, I, with calcite 88.6,89.1ft: J, 35-45°, VT, A, I, with calcite				
		5.0	5:51 5:24 5:31 5:07 6:09	(5.0) 100%	(5.0) 100%	Run 16			CRYSTALLINE DOLOMITE, fine grained, weak red (10R 5/2) mottled with gray to dark gray (N 5/N 4/), and gray to dark gray (10YR 5/1-4/1), mottling mimics bedding and pre-dolomitization fractures, strong, very thinly to moderately bedded, fresh, with trace scattered subrounded quartz grains; healed fractures with dolomite and calcite through-out, trace stylolites, trace calcite filled pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 89.3-94.3ft: J, 45-70°, VT, A, I, with calcite and dolomite and spaced at about 0.2-0.3' 90.8ft: BJ, 30°, UR, T, D, II, stylolite 93.2ft: BJ, 30°, PS, T, C, II 93.4ft: J, 60°, PS, T, C, III				
727.2	89.3	5.0	5:21 4:06 4:22 5:45 5:02	(5.0) 100%	(4.5) 90%	Run 17		727.2	94.5-102.7ft: SZ/FZ, 25-60°, shears healed with calcite and dolomite and spaced at about 0.2' 95.3ft: BJ, 65°, UR, PO, D, II, stylolite 96.5,97.2,97.6,98.2ft: BJ, 30-40°, T-O, B-D, III 98.8ft: J, 50°, PR, PO, B-C, III				
		5.0	5:41 6:40 5:43 6:14 5:50	(4.9) 98%	(4.8) 96%	Run 18		717.2	LIMESTONE (MICRITE), gray (10YR 6/1) to dark gray (10YR 4/1), with spotty very dark gray (5YR 3/1) mottling, strong, laminated to thinly bedded, fresh, with thinly to moderately bedded chert (dark reddish brown), few laminated SILTSTONE, greenish gray (10Y 5/1), and a moderate bed of CRYSTALLINE DOLOMITE, fine grained, gray (10YR 6/1) mottled with weak red (10R 5/3) from 104.4'-105.2'; locally with irregular/wispy nodules of dark gray medium to coarse grained chert and chert cemented sand, healed fractures with calcite through-out, trace calcite filled pits and vugs (separate/non-touching), strong HCl reaction 100.4ft: J, 60°, PR, PO, C, III 101.6,102.7,103.8ft: J, 20-30°, PR, T-PO, C-D, II-III 107.1,107.2ft: J, 10°, PR, PO, C, III 107.6,108.5ft: BJ, 25-30°, PR-SR, PO-O, D-G, II				
712.2	104.3	5.0	5:41 6:40 5:43 6:14 5:50	(5.0) 100%	(4.6) 92%	Run 19		707.9	CHERT with LIMESTONE (MICRITE), black (7.5YR 2.5/1), olive (5Y 4/3), and dark red (10R 3/6), mottled with gray (10YR 6/1), strong, very thinly to moderately bedded, fresh, grading to LIMESTONE (MICRITE) with little, very thin to thin, dolomite and calcite cemented medium grained rounded to subrounded quartz sand lenses at 109.2'; weak to strong HCl reaction 108.8ft: BJ, 25-30°, PR, PO, D, II				
707.2	109.3	4.9	2:31 4:12 4:20 4:27 4:05/0.9	(4.9) 100%	(3.6) 73%	Run 20 L7-12		706.2					

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: E. Shrum			
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee								DRILLER: B. Akins/J. Criss		Boring Orientation			
BORING NO.: MP-402				DRILL METHOD: Mud Rotary/Core				DRILL MACHINE: D-120 (MW-1)		Inclination: Vertical			
GROUND ELEV.: 816.5 ft		(NAVD88)		NORTHING: 571,941		US ft (NAD83)		EASTING: 2,447,480		US ft (NAD83)			
TOTAL DEPTH: 199.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb Auto (027)					
DATE STARTED: 8/18/13		COMPLETED: 8/22/13		CASING DEPTH: 17.5 ft		CORE BARREL TYPE: HQ3/Diamond Impregnated core bits							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		ROD (ft) %	SAMP. NO.	L O G	ROCK DESCRIPTION AND REMARKS				
Continued from previous page													
702.3	114.2	5.0	4:11 3:38 3:28 3:37 6:09	(5.0) 100%	(5.0) 100%	Run 21			LIMESTONE (MICRITE), light gray (10YR 7/1) with some spotty dark grayish brown (2.5Y 4/2) mottling, and gray (10YR 6/1) to dark gray (10YR 4/1), strong, laminated to very thinly bedded, fresh to slightly weathered, interbedded with little laminated SILTSTONE, dark gray (N 4/) to dark greenish gray (5GY 4/1), and few to little laminated to thin chert beds and lenses (dark reddish brown to dark reddish gray), and locally to partially dolomitized, with moderate to thickly bedded intervals of CRYSTALLINE DOLOMITE, fine grained, weak red (10R 5/2), gray (10YR 6/1, N 5/) to dark gray (N 4/, 10YR 4/1), and dark reddish gray (10R 3/1), locally mottled; healed fractures with calcite and dolomite through-out, trace to few calcite and dolomite filled pits and vugs (separate/non-touching, few open), trace to few stylolites, strong HCl reaction (continued) 110.3,110.6,111.0,111.3,111.5,111.8,112.4ft: BJ, 30°, PS, T, C, II 112.6,112.9,113.0,113.1,113.8,114.0ft: BJ, 30°, PS, T, C, II 113.5ft: J, 60°, PS, PO, C, II 116.0-118.5ft: FZ, 40-50°, VT, A, I, with dolomite and spaced at about 0.5' 116.9ft: J, 0-40°, PR, T, C, III 118.1ft: J, 40°, PR, T, C, III 121.0,121.3ft: BJ, 30-40°, PS, T, B, II-III 125.6,128.4ft: BJ, 30°, PR, T-PO, C, III 128.6ft: J, 60°, VT, A, I, with calcite				
697.3	119.2	5.1	7:53 7:39 4:59 5:06 4:49/1.1	(5.1) 100%	(5.1) 100%	Run 22							
692.2	124.3	5.0	5:05 4:27 4:31 4:49 3:43	(5.0) 100%	(5.0) 100%	Run 23							
687.2	129.3	5.0	6:04 4:28 4:20 4:38 5:01	(5.0) 100%	(5.0) 100%	Run 24		686.5	CRYSTALLINE DOLOMITE, fine grained, variably weak red (10R 5/2) with gray (N 5/) mottled, to gray (10YR 6/1-5/1) and dark gray (10YR 4/1) mottled, to dark reddish gray (2.5YR 4/1-3/1) with gray (N 5/) mottled, and gray, dark gray, and very dark gray (10YR 5/1-3/1), strong, laminated to moderately bedded, slightly weathered to fresh, most bedding appears disturbed, with trace very thin chert beds (dark reddish brown); healed fractures with calcite/dolomite through-out, trace calcite and dolomite filled pits and vugs (separate/non-touching), trace few stylolites, weak/delayed to no HCl reaction 130.6,130.8ft: J, 80°, VT, A, I, with dolomite 133.0-134.3ft: FZ, 85-90°, VT, A, I, with calcite and spaced at about 0.1' 134.4ft: J, 40-50°, VT, A, I, with dolomite 135.3-137.0ft: J, 50-55°, VT, A, I, with calcite and spaced at about 0.3' 138.2ft: BJ, 30°, UR, PO, C, II 138.5-139.3ft: FZ, 75-90°, VT, A, I, with dolomite 139.0ft: BJ, 30°, PR, T, C, II 140.9ft: J, 50°, VT, A, I, with calcite 142.2ft: BJ, 40°, PR, PS, C-D, II, stylolite				
682.2	134.3	5.0	5:19 4:44 4:56 5:14 4:43	(5.0) 100%	(5.0) 100%	Run 25							
677.2	139.3	5.0	4:22 3:59 3:35 4:09 3:42	(5.0) 100%	(5.0) 100%	Run 26							
672.2	144.3	5.0	3:38 4:09 4:08 3:18 4:07	(5.0) 100%	(4.6) 92%	Run 27 L7-13			144.6ft: J, 70°, VT, A, I, with calcite 145.1,148.3,148.5ft: BJ, 40-50°, PR, T, G, II 145.6-148.1ft: J, 60°, VT, A, I, with calcite and spaced at about 0.4' 146.5ft: J, 55°, PR, T, C, II 146.9ft: BJ, 45°, UR, T, D, II, stylolite 148.8ft: J, 45°, PR, PO, C, III				
667.2	149.3	5.0	4:43 4:12 5:17 5:43 3:59	(5.0) 100%	(4.9) 98%	Run 28		666.2	LIMESTONE (MICRITE), gray (10YR 5/1), strong, laminated to thinly bedded, locally nodular, fresh, interbedded with trace to few, very thin to thin chert lenses and nodules (reddish black to very dark gray), and partially dolomitized with few moderate to thick beds of CRYSTALLINE DOLOMITE, fine grained, gray (10YR 6/1) mottled with light gray (10YR 7/1), fresh to slightly weathered; healed fractures with calcite through-out, trace calcite and dolomite filled pits and vugs (separate/non-touching, few open), trace to few stylolites, strong HCl reaction 152.8-154.2ft: As above with fine to coarse grained, rounded to subrounded, carbonate and chert cemented quartz SANDSTONE, gray to dark gray (10YR 5/1-4/1) and reddish brown (2.5YR 4/3), and trace laminated SILTSTONE; strong HCl reaction 150.6,153.3,153.7,154.1,154.2ft: BJ, 30°, PS, T-PO, C II 154.3-154.7,154.9-155.8ft: J, 90°, VT, A, I, with calcite 154.8ft: BJ, 25°, PS, T, C, II, stylolite 155.0ft: J, 60-70°, VT, A, I, with calcite 155.9ft: J, 25°, PS, T, C, II 157.9ft: J, 50°, PR, T, C, II 158.2ft: J, 30°, PR, PO, D, II 159.4-159.6ft: FZ, 50-60°, VT, A, I, with calcite and spaced at about 0.05' 160.8ft: BJ, 30°, PR, T-PO, C, II				
662.2	154.3	5.0	4:45 5:14 5:04 4:48 4:09	(5.0) 100%	(4.6) 92%	Run 29							
657.2	159.3	5.0	4:35 3:07 4:18	(5.0) 100%	(5.0) 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: E. Shrum	
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee				DRILLER: B. Akins/J. Criss		Boring Orientation  Inclination: Vertical  Azimuth: NA
BORING NO.: MP-402		DRILL METHOD: Mud Rotary/Core		DRILL MACHINE: D-120 (MW-1)		
GROUND ELEV.: 816.5 ft (NAVD88)		NORTHING: 571,941 US ft (NAD83)		EASTING: 2,447,480 US ft (NAD83)		
TOTAL DEPTH: 199.3 ft		SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08			HAMMER (ID): 140-lb Auto (027)	
DATE STARTED: 8/18/13		COMPLETED: 8/22/13	CASING DEPTH: 17.5 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								
652.2	164.3	5.0	3:52 2:43	(5.0) 100%	(5.0) 100%	Run 31		163.1ft: J, 40°, PS, PO, C, III CRYSTALLINE DOLOMITE, fine grained, gray (10YR 6/1) mottled with light gray (10YR 7/1), becoming gray to very dark gray (10YR 5/1-3/1) with very dusky red to reddish black (2.5YR 2.5/2-2.5/1) mottling, strong, very thinly bedded, most bedding disturbed and locally nodular, slightly weathered to fresh; healed fractures through-out, locally silicified, trace stylolites, trace calcite filled and lined pits and vugs (separate/non-touching), weak/delayed to no HCl reaction 168.8-169.4ft: J, 60°, VT, A, I, closely-spaced, calcite healed
647.2	169.3	5.0	3:02 3:17 3:17 3:31 3:10	(5.0) 100%	(5.0) 100%	Run 32		169.8 170.9 CHERT CEMENTED CONGLOMERATE, dolomite clasts (10YR 5/1), mostly rounded to subrounded, in black (10YR 2/1) to white (N 8/) chert cement/matrix, very strong, moderately bedded, fresh; few open calcite and quartz lined pits and vugs (separate/non-touching) LIMESTONE (MICRITE), gray (10YR 6/1-5/1) to dark gray (10YR 4/1), strong, laminated to very thinly bedded and nodular, fresh, partially dolomitized with coarse dolomite crystals, interbedded with few scattered, fine to medium grained, rounded to subrounded quartz sand grains, laminations, and very thin discontinuous lenses, trace chert nodules (jasperoid, red to dark red), and with moderately bedded CHERT, very dark gray (N 3/), with some, medium to coarse sand and fine to coarse gravel sized subangular to angular clasts of LIMESTONE (MICRITE), gray (10YR 7/1) from 175.0'-178.0'; trace to few stylolites, locally silicified, strong HCl reaction 172.8ft: J, 20°, PS, T, C, III
642.2	174.3	5.0	5:27 3:05 3:54 3:40 4:42	(5.0) 100%	(5.0) 100%	Run 33		180.3ft: J, 55°, PR, T-PO, B, III 181.1ft: J, 40°, PR, T-PO, C, III 183.2,183.7ft: BJ, 30°, PR, T-PO, C, II
637.2	179.3	5.0	5:31 6:36 6:29 7:22 5:26	(5.0) 100%	(5.0) 100%	Run 34		632.7 CRYSTALLINE DOLOMITE, fine grained, gray to dark gray (10YR 5/1-4/1, 2.5Y 5/1-4/1) with trace dark gray (5YR 4/1) mottling, strong, very thinly to thinly bedded, fresh, with trace laminated to very thin dolomite cemented medium grained rounded to subrounded quartz SANDSTONE, trace very thin to thin, laminated SILTSTONE, dusky red (2.5YR 3/2) to greenish gray (10GY 5/1), and trace chert nodules; trace stylolites, trace calcite filled pits, weak/delayed to no HCl reaction 184.4-185.9ft: J, 85°, VT, A, I 184.6ft: J, 20°, PR, PO, C, II 185.8-186.6ft: FZ, 30-40°, PS-PR, T-VT, A, I, spaced at about 0.1' 185.9ft: J, 40°, PR, T, B, II 188.5,188.6ft: BJ, 30°, PR, O, K, II 190.4ft, 191.5ft: BJ, 30-35°, PR-SR, T, D, III, stylolites
632.2	184.3	5.0	5:09 3:25 3:09 4:11 3:05	(5.0) 100%	(5.0) 100%	Run 35		191.6 CRYSTALLINE DOLOMITE, fine grained, gray (10YR 5/1) mottled with gray to light gray (10YR 6/1-7/1), grading to dark reddish gray (2.5YR 4/1-3/1) with trace greenish gray (10Y 5/1) mottling, strong, laminated to thinly bedded, slightly weathered to fresh, with few scattered, fine to medium grained, rounded to subrounded quartz sand grains; trace stylolites, trace open pits, weak/delayed to no HCl reaction 195.5ft: BJ, 40°, PR, PO, C, II 197.5,198.5ft: BJ, 35-40°, PR, D, II
627.2	189.3	5.0	3:23 2:34 2:42 2:43 1:53	(5.0) 100%	(5.0) 100%	Run 36		624.9 617.2 Boring and coring terminated at 199.3 feet.
622.2	194.3	5.0	2:01 2:34 2:25 2:38 2:29	(4.7) 94%	(4.7) 94%	Run 37		
617.2	199.3							

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