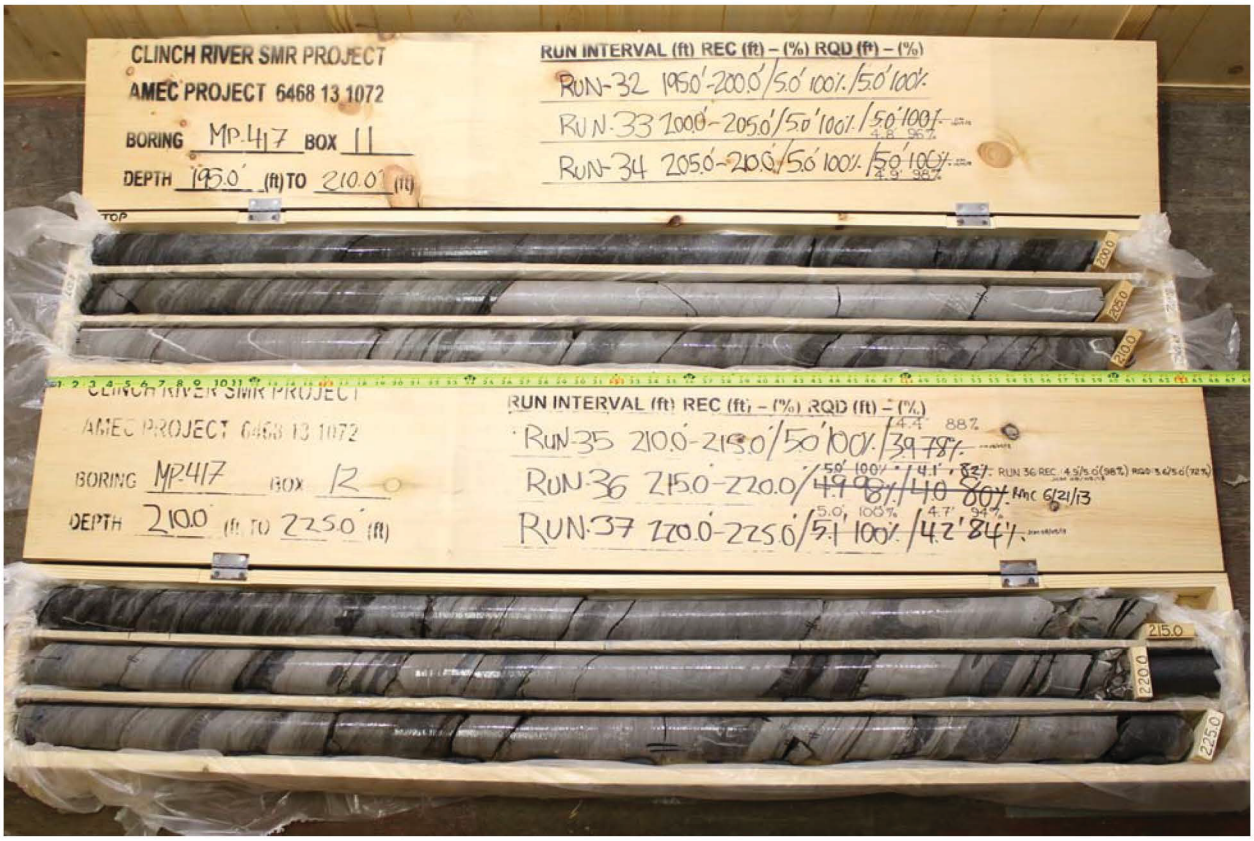
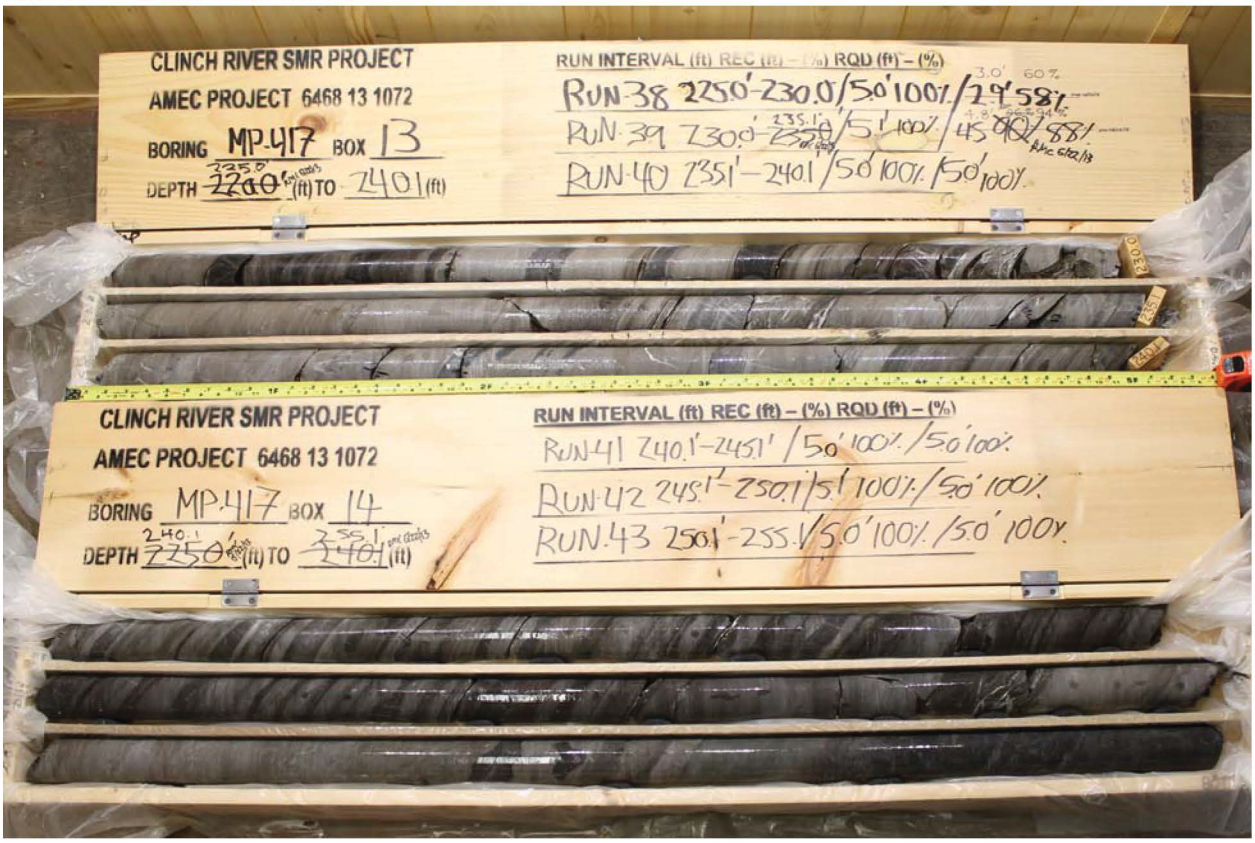
MP-417 – Boxes 9 and 10

MP-417 – Boxes 11 and 12



MP-417 – Boxes 13 and 14



MP-417 – Boxes 15 and 16

MP-417 – Boxes 17 and 18

MP-417 – Box 19

GEOTECHNICAL BORING LOG

Prepared By: MBL Date: 3/5/14

Checked By: JCM Date: 3/5/14

SHEET 1 OF 1

BECHTEL NO.: 25847	AMEC PROJECT NO.: 6468-13-1072	COUNTY: Roane, TN	GEOLOGIST: M. Flanik
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee		DRILLER: J. Landeros/N. Molinalara	Boring Orientation
BORING NO.: MP-418	DRILL METHOD: Mud Rotary/Core	DRILL MACHINE: CME-550X (P)	Inclination: Vertical
GROUND ELEV.: 811.6 ft (NAVD88)	NORTHING: 570,500 US ft (NAD83)	EASTING: 2,447,030 US ft (NAD83)	Azimuth: NA
TOTAL DEPTH: 87.8 ft	SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08	ROD TYPE: AWJ	HAMMER (ID):140-lb Auto (337153)
DATE STARTED: 6/6/13	COMPLETED: 6/11/13 / HOLE DIA.: 4" / CASING DEPTH: 81.8 ft	CORE SIZE:HQ3	BITS USED: 4" Roller Cone

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL DESCRIPTION AND REMARKS
811.6					Ground Surface			
811.6	0.0	9	8	8	16	SS-1		FILL: SILTY GRAVEL with Sand (GM), light gray (10R 7/1), medium dense, moist, fine to coarse subangular to angular gravel, little medium to coarse sand, little non-plastic fines, strong HCl reaction
808.1	3.5	8	6	5	11	SS-2		3.5ft: As above, to reddish gray (2.5YR 6/1), few fine to medium sand
805.4	6.2	2	4	6	10	SS-3		805.6 / 6.0 — FILL: Sandy ELASTIC SILT with gravel (MH), reddish brown (2.5YR 5/4), stiff, moist, moderately plastic fines, little fine to medium sand, little fine to coarse angular gravel, strong HCl reaction
803.4	8.2	7	11	20	31	SS-4		803.6 / 8.0 — FILL: SILTY GRAVEL (GM), gray (5YR 6/1), dense, moist, fine to coarse angular gravel, little non-plastic fines, few fine to coarse sand, strong HCl reaction
799.6	12.0	10	9	10	19	SS-5		12.0ft: As above, to weak red (10R 5/2), medium dense, subangular to angular gravel, few medium sand
797.6	14.0	5	11	15	26	SS-6		14.0ft: As above, to weak red (7.5YR 4/2), medium dense, some non-plastic fines, little medium sand
793.0	18.6	10	15	14	29	SS-7		18.6ft: As above, subangular gravel, some low to moderately plastic fines, little medium to coarse sand
788.0	23.6	10	10	9	19	SS-8		23.6ft: As above, to weak red (10R 4/3), some non-plastic fines
783.0	28.6	8	18	13	31	SS-9		784.6 / 27.0 — RESIDUAL SOIL: Sandy SILT (ML), reddish yellow (7.5YR 6/8), hard, moist, non-plastic fines, some fine to coarse sand, few angular fine gravel, no HCl reaction
778.1	33.5	4	7	11	18	SS-10		779.6 / 32.0 — RESIDUAL SOIL: FAT CLAY (CH), reddish yellow (5YR 6/8) mottled with light gray (5YR 7/1), very stiff, moist, moderate to high plasticity fines, no HCl reaction
772.8	38.8	3	2	2	4	SS-11		774.6 / 37.0 — RESIDUAL SOIL: SILT (ML), yellowish brown (10YR 5/6), soft, moist, low plastic fines, no HCl reaction
767.8	43.8	19	50/0.3		50/0.3	SS-12		768.6 / 43.0 — WEATHERED ROCK: LIMESTONE, sampled as CLAYEY GRAVEL (GC) to SILTY GRAVEL (GM), reddish gray (2.5YR 6/1), to gray (10YR 5/1-7.5YR 5/1), very dense, moist, fine to coarse subangular gravel, little moderately to low and non-plastic fines, few to little medium to coarse sand, strong HCl reaction
766.3	45.3	34	50/0.2		50/0.2	SS-13		
764.9	46.7	50/0.1			50/0.1	SS-14		764.8 / 46.8 — Soil drilling halted. Log continues on geotechnical coring log

Observed water levels:

See last page of core log.

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

GEOTECHNICAL CORING LOG

Prepared By: MBL Date: 3/5/14

Checked By: JCM Date: 3/5/14

BECHTEL PROJECT NO.: 25847	AMEC PROJECT NO.: 6468-13-1072	COUNTY: Roane, TN	GEOLOGIST: M. Flanik
SITE DESCRIPTION: Clinch River SMR Project, Roane County, Tennessee		DRILLER: J. Landeros/N. Molinalara	Boring Orientation
BORING NO.: MP-418	DRILL METHOD: Mud Rotary/Core	DRILL MACHINE: CME-550X (P)	Inclination: Vertical
GROUND ELEV.: 811.6 ft (NAVD88)	NORTHING: 570,500 US ft (NAD83)	EASTING: 2,447,030 US ft (NAD83)	Azimuth: NA
TOTAL DEPTH: 87.8 ft	SAMPLE METHODS: ASTM D 1586-11; 2488-09a; 2113-08; 6032-08		HAMMER (ID): 140-lb Auto (337153)
DATE STARTED: 6/6/13	COMPLETED: 6/11/13	CASING DEPTH: 81.8 ft	CORE BARREL TYPE: HQ3/Diamond Impregnated core bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	LOG	ROCK DESCRIPTION AND REMARKS
								Begin Coring @ 46.8 ft
764.8	46.8	2.2	2:17 3:18	(1.8) 82%	(0.0) 0%	Run 1		764.8 LIMESTONE (MICRITE), grayish brown (10YR 5/2), weak, moderately bedded, moderately weathered, trace laminated Calcareous SILTSTONE; trace pits, strong HCl reaction **(Lincolnshire Formation-Eidson Member-Unit A)** 46.8
762.6	49.0	5.0	1:26/0.2 1:12 0:02 0:02 1:04 0:28	(1.8) 36%	(0.0) 0%	Run 2		762.2 46.8-46.9ft: FZ, 25-45°, SR, mechanically broken 49.4 47.1,47.2,47.4,47.6,47.8,47.9,48.2,48.3ft: BJ, 20°, PS-US, T-O, D, III 47.1-47.2ft: FZ, 45-10°, SR, MO, H, IV 48.0ft: J, 45°, SR, VW, G, IV 49.0-49.2ft: FZ, 30°, PR, O, D, III CAVITIES/VOIDS with WEATHERED ROCK and CLAY, recovered material is LIMESTONE (MICRITE), grayish brown (10YR 5/2) to brown (10YR 5/3), extremely weak to weak, completely weathered to FAT CLAY (CH) with few thin beds of medium strong, moderately weathered rock; strong to weak HCl reaction
757.6	54.0	5.0	2:29 2:55 0:07 0:09 0:02	(0.6) 12%	(0.0) 0%	Run 3		50.0ft: Lost drill fluid circulation 50.0-52.0ft: Rod drop/fast drilling 54.4ft: Regained drill fluid circulation 55.6ft: Lost drill fluid circulation for remainder of boring 56.0-59.0ft: Rod drop/fast drilling
752.6	59.0							59.0-60.2ft: Washed out advancing casing
751.4	60.2	3.7	4:46/0.7 8:12 0:47 1:14	(1.6) 43%	(0.7) 19%	Run 4		751.4 60.2 750.2 LIMESTONE (MICRITE), gray (5YR 6/1), medium strong, very thinly to moderately bedded, slightly weathered, trace to few very thin to thin chert beds (dark gray to black); trace stylolites, trace to few calcite filled pits and sparry calcite "bird eyes", strong HCl reaction 61.4 CAVITY/VOID-No Recovery, soil fill if any washed away during coring
747.7	63.9	4.9	2:52/0.9 9:27 0:26 5:14 15:17	(2.4) 49%	(1.5) 31%	Run 5		748.1 61.4-63.5ft: Fast drilling with rod drops 63.5 LIMESTONE (MICRITE), as described above 746.4 63.9-64.0ft: Washed out advancing casing 65.2 64.0-64.5ft: FZ, 25-45°, US, PO, C, III CAVITY/VOID-No Recovery, soil fill if any washed away during coring 743.9 65.2-67.7ft: Fast drilling with rod drops 67.7
747.6	64.0							LIMESTONE (MICRITE), as described above, 68.9-69.0ft: Washed out advancing casing
742.7	68.9							68.7ft: J, 45°, PS, PO, B, III
742.6	69.0	5.1	7:36 5:33 1:12 0:32 1:20/1.1	(2.5) 49%	(0.9) 18%	Run 6		741.9 69.3ft: BJ, 30°, SS, O, B, II 69.7 741.1 CAVITY/VOID-No Recovery, soil fill if any washed away during coring 70.5 740.1 LIMESTONE (MICRITE), as described above 71.5 CAVITY/VOID-Poor Recovery, recovered material is FAT CLAY (CH), yellowish red (5YR 5/6), with few fragments and lenses of moderately to slightly weathered LIMESTONE (MICRITE)
737.5	74.1	5.0	5:52 1:20 0:36 2:24 0:06	(2.5) 50%	(0.0) 0%	Run 7		71.5-74.1ft: Fast drilling with rod drops 75.1-79.1ft: Fast drilling with rod drops
732.5	79.1	5.0	1:05 2:57 10:33 10:50 13:04	(3.1) 62%	(0.0) 0%	Run 8		79.1-81.1ft: Fast drilling with rod drops 730.6 81.0 LIMESTONE (MICRITE), as described above
727.5	84.1	2.5	10:50 13:39 9:36/0.5	(2.4) 96%	(1.5) 60%	Run 9		81.1-83.1ft: FZ, 25-45, PS-PL, C, III 83.3,83.6,84.8ft: J, 45°, SS-UR, B-C, I-III 85.2,85.4,85.6,86.3ft: SH, 45°, PL-UL, C, III, with calcite
725.0	86.6	1.2	20:46 26:35/0.2	(0.0) 0%	(0.0) 0%	Run 10		723.8 86.6-87.8ft: NO RECOVERY-drilled thru casing with core barrel, recovered metal pieces. Boring terminated at final depth drilled and abandoned/backfilled per AMEC and BECHTEL agreement; boring replaced with offset boring MP-418A 87.8
723.8	87.8							Boring and coring terminated at 87.8 feet. Observed water levels: 13.8 ft, bgs, AM 6/8/13 54.1 ft bgs, AM 6/9/13 54.1 ft bgs, AM 6/10/13 53.9 ft bgs, AM 6/11/13

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