Bell Bend Nuclear Power Plant Boring Logs

(Refer to FSAR Figure 2.5-107 for the Location of Borings)



Bell Be	Bell Bend NPP PROJECT NO. 07-3891									
LOG OF BORING NO. B-301										
ELEVATION (FEET MSL)	HE (E	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL			
LEVA'	DEPTH (FEET)	AMPLE R RUN	OW/6' R % F & (RC	COVE	PROFILE	SURFACE EL: 666.38	USCS SY	REMARKS		
шш		δŌ	BL	Ä		DESCRIPTION	Š			
	0				80	Shelby Tube	sm	100-150 psi pressure to push		
	_				6			tube, bottom of tube was crushed due to cobbles		
		ST-1		1.5	0.00					
	_					2.01				
664.4	2 —				8	2.0' Well-Graded Sand with Gravel (sw) - 10% cobbles, 25% gravel, 60%	sw			
	_	S-1	3-7 42	1.0		sand, 5% silt, fine to coarse, rounded to angular, elongate gravel, subangular to rounded, fine to coarse sand, 1 1/2" max particle size,				
	_	3-1	(49)	1.0		nonplastic, light brown (5Y 5/6) and moderate brown (5 YR 4/4), dry, no reaction to HCl, dense, contained fine-grained sandstone cobble				
662.9	_					encountered at 4.5'. 3.5' Well-Graded Sand with Gravel (sw) - 25% cobbles, 10% gravel, 60%	sw			
	4 —		32-25			sand, 5% silt, fine-grained sandstone cobbles and boulders, angular,				
	_	S-2	26 (51)	1.2		hard, coarse, subangular gravel, fine to coarse, subrounded to subangular sand, 1.5" max size, nonplastic, moderate brown (5Y 3/4)				
661.4	_				117001	and light gray (N7), wet, no reaction to HCl, very dense. 5.0'	SW-			
	_		8-14		11137110 161119711	Well Graded Sand with Silt and Gravel (SW-SM) - 20% cobbles, 20% gravel, 55% sand, 5% silt, fine to coarse, subangualar gravel, fine to	SM			
	6 —	S-3	21 (35)	1.3	100 100 100 100 100 100 100 100 100 100	coarse, rounded to subrounded sand, max particle size 1½", hard, nonplastic, moderate brown (5YR 4/4), dry, no reaction to HCl, dense,				
659.9	J				1:1:196	encountered cobble at 6.0'. 6.5'				
039.9						Well-Graded Sand with Gravel (sw) - 20% gravel, 75% sand, 5% silt, subangular, fine to coarse gravel, subrounded to subangular, fine to	sw			
	_	S-4	13-34 47	1.4		coarse sand, max particle size 1½", hard, nonplastic, pale brown (5 YR 5/2), dark gray (N3) shale fragments, dry, no reaction to HCl,				
	_		(81)			very-dense. 8.0'				
658.4	8 —					Well-Graded Gravel with Silt and Sand (GW-GM) - 40% gravel, 50%	GW- GM			
	_	S-5	24-34 31	1.3		sand, 10% silt, subangular, fine to coarse gravel subrounded to subangular, fine to coarse sand, max particle size 1½", hard,				
	_		(65)			nonplastic, pale brown (5Y 5/2) and pinkish gray (5YR 8/1), dry, no reaction to HCl, very-dense.				
656.9	_					9.5' Well-Graded Gravel with Silt and Sand (GW-GM) - 10% cobbles, 40%	GW-			
	10 —	S-6	8-20 25	0.8		gravel, 40% sand, 10% silt, subangular, fine to coarse sand and gravel, max particle size 1½", hard, nonplastic, moderate brown (5	GM			
	_	3-0	(45)	0.0		YR 4/4), grayish pink (5R 8/2) and light gray (N3), dry, no reaction to HCl, dense.				
655.4	_				8,5	11.0' Well Graded Sand with Silt and Gravel (sw-sm) - 55% sand, 35%	sw-	Set casing to 10.0' began		
	_	6 -	50/5"	o -	61131111 51811111 681611	gravel, 10% silt, fine to coarse, subangular to subrounded gravel, fine to coarse, subrounded to subangular sand, 1½" max size, hard, low	sm	Tricone Mud Rotary.		
	12 —	S-7	(50+)	0.5	i pias:	plasticity, high dry strength, no dilatancy, no toughness, moderate brown (5YR 4/4) and moderate red (5YR 5/4), wet, no reaction to HCl,				
	_				1.60 19.91 1.1.1.1.2	very dense.				
	_				9					
	_	S-8	15-50/3 (50)	0.6	[][6][6][]					
652.4	14 —					14'				
552.						Well Graded Gravel with Sand (gw) - 60% cobbles, 15% gravel, 20% sand, 5% silt, subangular, coarse gravel, hard, subangular to angular	gw			
	STARTE		0/9/07		1	DEPTH: 13' DATE/TIME: 10/14/07	NO	TES: Bedrock part of the		
l	COMPLE [*] GEOLOG		0/11/07 .AK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation		
	GEOLOG KED BY:		AR AR		DKILI	LING MILTHOD. SETTHICOHEMIQ ROCK CORE				
APPRO	OVED BY	: RJ	В		DRIL	LER: Scott Zeien HELPER: Brian N.	RIG	6: CME 850		
DRILLI	NG CO.:	Terraco	n							



Bell Be	end NPP					LOC OF BODING NO. B 204		PROJECT NO. 07-3891
TION MSL)	#.f.	N N O.	BLOW/6" & (N) OR % REC. & (RQD)	:RY (ft.)	ILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO OR RUN NO.	LOW/6 OR % I & (RC	RECOVERY	PROFILE	SURFACE EL: 666.38	USCS S	REMARKS
		••	22-21		2-2-2	DESCRIPTION fine to coarse sand, soft, max particle size 1½", nonplastic, dark gray	⊃	
	-	S-9	13 (34)	0.9		(N4) shale cobble and grayish red (5R 4/6) sandstone, wet, no reaction to HCl, dense to very dense.		
	16 —	S-10	17-50/3" (50)	0.8				
649.4	_					Well Graded Gravel (gw) - 75% cobbles, 15% gravel, 5% sand, 5% silt, coarse, subrounded to angular gravel, fine to medium,	gw	
	18 —	S-11	50/2" (50+)	0.2		subangular sand, 1½" max size, hard, nonplastic, medium dark gray (N4) shale, wet, no reaction to HCl, very dense. 18.5'		
647.9	- -	S-12	19-19 22 (41)	1.2		Well-Graded Sand with Gravel (sw) - 15% cobbles, 30% gravel, 55% sand, subangular, fine to coarse gravel, rounded, fine to coarse sand, max particle size 1½", hard, nonplastic, medium-light gray (N6), contains moderate red (5R 5/4) sandstone cobbles, wet, no reaction to HCI, dense.	sw	
646.4	20 —	S-13	20-50 40 (90)	1.0		Well-Graded Gravel with Sand (gw) - 65% gravel, 30% sand, 5% silt, fine to coarse, subrounded to angular gravel, fine to coarse, subangular sand, nonplastic, moderate reddish brown (10 R 4/6) and medium bluish gray (5B 5/1), slight odor, wet, no reaction to HCl, very-dense.	gw	
644.9	22 	S-14	30-38 40 (78)	1.2		Well-Graded Gravel (gw) - 30% cobbles, 55% gravel, 10% sand, 5% silt, coarse, angular shale gravel and cobbles, medium hard, fine to coarse, subangular sand, nonplastic, medium gray (N5) and moderate yellowish brown (10 YR 5/4) wet, no reaction to HCl, very dense.	gw	
643.4	24 —	S-15	18-13 13 (26)	1.1		Well-Graded Gravel with Silt and Sand (gw-gm) - 10% cobbles, 50% gravel, 30% sand, 10% silt, subrounded to subangular, fine to coarse sand, angular shale and sandstone, fine to coarse gravel, elongated and flat, nonplastic, medium gray (N5), wet, no reaction to HCl, medium-dense.	gw- gm	
641.9	- -	S-16	35-50/5 (50)	0.9		24.5' Well-Graded Gravel with Sand (gw) - 10% cobbles, 60% gravel, 25% sand, 5% silt, subangular, fine to coarse gravel, elongated and flat, hard, subangular fine to coarse sand, nonplastic, medium gray (N5), moderate red (5R 4/6), and moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, very dense.	gw	
640.4	26 -	S-17	50/2 (50+)	0.2		Well-Graded Gravel (gw) - 95% cobbles, 5% silt, rounded, spherical cobbles, hard, nonplastic, medium gray (N5) shale cobbles, wet, no reaction to HCl, very dense.	gw	
638.9	_					Well-Graded Gravel with Silt and Sand (gw-gm) - 10% cobbles, 60%	gw-	
	28 —	S-18	15-17 15 (32)	1.0		gravel, 25% sand, 10% silt, subrounded to subangular, fine to coarse gravel, subrounded, fine to coarse sand, nonplastic, moderate yellowish brown (10 YR 5/4), moist, no reaction to HCl, dense.	gm	
637.4	_					29.0' Well-Graded Sand with Gravel (sw) - 10% cobbles, 30% gravel, 60%	sw	
DATE	STARTEI COMPLE GEOLOG	TED: 10			GWL:	DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation
APPRO	(ED BY: OVED BY NG CO.:	: RJ			DRILL	.ER: Scott Zeien HELPER: Brian N.	RIG:	: CME 850



Bell Be	Bell Bend NPP PROJECT NO. 07-3891								
Dell D.	THU IN I		•		· ·	LOG OF BORING NO. B-301			
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339151.791 E 2405430.679 SURFACE EL: 666.38	SYMBOL	REMARKS	
ELE) (FEE	DE (F	SAMI OR F	SLOW OR o	ECO,	P. P.		nscs		
			Ш	~	::: * £:#:;	DESCRIPTION sand, subrounded, fine to coarse gravel, hard, subrounded fine to	⊃		
	30 —	S-19	12-13 14 (27)	1.0		coarse sand, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCI, slight organic odor, medium dense.			
	-	S-20	15-14 23 (37)	1.2		Well-Gaded Sand with Gravel (sw) - 5% cobbles, 30% gravel, 60% sand, 5% silt, subrounded, fine to coarse gravel, hard, subrounded fine to coarse sand, nonplastic, moderate yellowish brown (10 YR 5/4), slight organic odor, wet, no reaction to HCl, dense, contains a few black (N1) coal fragments.			
634.4	32 —				1:1 <u>0</u> 213	Well-Graded Sand with Gravel and Silt (sw-sm) - 5% cobbles, 25%	sw- sm		
	_	S-21	22-21 14 (35)	1.1		gravel, 60% sand, 10% silt, subrounded, fine to coarse sand, subrounded to subangular, fine to coarse gravel, nonplastic, moderate yellowish brown (10 YR 5/7), wet, no reaction to HCl, dense. 33.5'	3111		
632.9	34 —	S-22	18-23 30 (53)	1.2		Well-Graded Gravel with Sand (gw) - 5% cobbles, 60% gravel, 30% sand, 5% silt, subangular to subrounded, fine to coarse sand, subangular to subrounded, fine to coarse gravel, hard nonplastic, moderate yellowish brown (10 YR 5/4) and moderate red (5R 4/6), wet, no reaction to HCl, very-dense.	gw		
631.4	_		17-26			Well-Graded Sand with Gravel (sw) - 5% cobbles, 25% gravel 65% sand, 5% silt, subrounded to angular, fine to coarse gravel, hard,	sw		
	36 —	S-23	46 (72)	1.2		subrounded to subangular, fine to coarse sand, nonplastic, moderate brown (5YR 3/4) to dark yellow brown (10YR 4/2), contains medium gray (N5) shale fragments, wet, no reaction to HCl, very-dense. 36.5'			
629.9	_	S-24	19-39 15 (54)	1.2		Well-Graded Gravel with Sand (gw) - 65% gravel, 30%sand, 5% silt, subrounded, fine to coarse gravel, hard, subrounded, fine to coarse sand, nonplastic, moderate yellowish brown (10YR 5/4) and medium gray (N5), wet, no reaction to HCl, very-dense.	gw		
628.4	38 —	S-25	30-50 29 (79)	0.6		38.0' Well-Graded Gravel (gw) - 60% cobbles, 35% gravel, 5% silt, angular, elongated and flat, cobbles and gravel, nonplastic, moderate red (5R 5/4) and dark yellowish orange (10 YR 6/6) wet, no reaction to HCl, very dense, fine-grained sandstone cobbles.	gw		
626.9						39.5'			
520.0	40 —	S-26	25-50/3 (50)	0.6		Well-Graded Gravel (gw) - 90% gravel, 10% sand, subangular fine to coarse gravel, hard, subrounded, fine sand, nonplastic, moderate yellowish brown (10 YR 5/4) moderate red (5R 4/6) and dark greenish yellow (10 Y 6/6), wet, no reaction to HCl, very-dense.	gw		
625.4	_ _					Silty Shale - Moderately hard, dark gray (N4) fresh, moderately fractured, fracture located 42.5' - 42.7' not healed, noncalcareous, thickly bedded, no reaction to HCl.		Special care sample at 46.7'-48.5'	
	42 —					,,			
	_								
	_								
					014/1	DEDTIL 401 DATE TIME 40/44/07	N/0	TEO D	
	STARTED COMPLE		0/9/07 0/11/07			DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock part of the Mahantango Formation	
	GEOLOG		AK		DRILI	LING METHOD: SPT/Tricone/NQ Rock Core			
l	KED BY: OVED BY:		AR R		י וופט	ED: Contt Zoion HELDED: Drian N	DIC.	. CME 950	
	NG CO.:				I DKILL	LER: Scott Zeien HELPER: Brian N.	KIG	G: CME 850	



Bell Bend NPP PROJECT NO. 07-3891								
Bell Bena NPP	LOG OF BORING NO. B-301		PROJECT NO. 07-3891					
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339151.791 E 2405430.679	SYMBOL						
LEVATIO EET MS DEPTH (FEET) (MPLE N R RUN N R R REG R R REG R R REG	N 339151.791 E 2405430.679 SURFACE EL: 666.38	(S S)	REMARKS					
SA SA OR OF	DESCRIPTION	nscs						
44 —	Silty Shale - Moderately hard, dark gray (N4) fresh, moderately fractured, fracture located 42.5' - 42.7' not healed, noncalcareous, thickly bedded, no reaction to HCI.							
48 —	Silty Shale - Moderately hard dark gray (N4) fresh, moderately fractured, fracture from 49.7' - 49.8', not healed, noncalcareous, thickly bedded, no reaction to HCl.							
54 — (96%) 54 — (96%) - (96%) - (100%) - (78%) 5.0	Silty Shale - Moderately hard dark gray (N4) fresh, moderately fractured, fractured from 56.0'-56.5' approximately 70° to rock core, thickly bedded, noncalcareous, no reaction to HCl.							
DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07	GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES	S: Bedrock part of the Mahantango Formation					
FIELD GEOLOGIST: RAK CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLING METHOD: SPT/Tricone/NQ Rock Core DRILLER: Scott Zeien HELPER: Brian N.	RIG: C	:ME 850					



	Bell Bend NPP PROJECT NO. 07-3891								
Bell Be	end NPP					LOG OF BORING NO. B-301		PROJECT NO. 07-3891	
ELEVATION (FEET MSL)	тн ET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL	DEMARKO.	
EV#	DEPTH (FEET)	MPL R RU	2W/6 R % 8 (R	SOVE	PRO	SURFACE EL: 666.38	SS S	REMARKS	
□ 		δ. Q.	BL(REC		DESCRIPTION	nscs		
	60 — 62 — 64 — 66 — 70 —	R-4	100% (86%)	5.0		Silty Shale - Moderately hard medium gray (N5) from 59.5'-60.5' than dark gray (N4) fresh, slightly fractured, from 60.9'-61.0' and 61.0'-61.1' approximately 45° to core barrel, noncalcareous, thickly bedded, no reaction to HCl. Silty Shale - Moderately hard dark gray (N4), fresh, slightly fractured, at 65.5'-65.6' approximately 70°, contains pyrite pockets at 69.3'-69.8', not healed, thickly bedded, noncalcareous, no reaction to HCl. Silty Shale - Moderately hard, dark gray (N4), fresh, moderately fractured, fracture located from 73.6'-73.9 approximately 60° to core and 70.8' - 70.9' fracture approximately 45° to core, nonhealed, noncalcareous, pyritic inclusion in small fractures, thickly bedded, no reaction to HCl.			
	72 								
DATE (DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR					DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation	
APPRO	OVED BY: ING CO.:				DRIL	LER: Scott Zeien HELPER: Brian N.	RIG:	: CME 850	



Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend NPP		LOG OF BORING NO. B-301		PROJECT NO. 07-3891					
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)		COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL						
LEVATIO EEET MSI DEPTH (FEET) MMPLE N R RUN N S RUN N S REG & (RQD)	PROFILE	SURFACE EL: 666.38	(S S)	REMARKS					
SA OF		DESCRIPTION	OSC						
74— R-6 100% (95%) 10 76— 78— 80— 82— R-7 100% (100%) 5.0 84— BATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK	Silty mod ends ends ends ends ends ends ends end		NOTE	ES: Bedrock part of the Mahantango Formation					
CHECKED BY: DAR APPROVED BY: RJB	DRILLER:	Scott Zeien HELPER: Brian N.	RIG:	CME 850					
DRILLING CO.: Terracon									



Bell Bend NPP PROJECT NO. 07-3891								
Dell Della NFF	LOG OF BORING NO. B-301	PROJECT NO. 07-3091						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339151.791 E 2405430.679	REMARKS SCORO						
DEPTH (FEET) MMPLE N N R RUN N R RUN N R REG RQD)	N 339151.791 E 2405430.679 SURFACE EL: 666.38	κ REMARKS						
SA SA OF PERCENTION OF PERCENT	DESCRIPTION	OSC .						
88 — R-8 100% (93%) 10 90 — R-8 100% (93%) 10 92 — 94 — 94 — 100% (94%) 10 DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK	Silty Shale - Moderately hard dark gray (N4), fresh, very slightly fractured, fracture from 103.1'-103.3' approximately 70° to rock core, slightly calcareous to calcareous, thickly bedded, slight reaction to HCI. GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahantango Formation						
CHECKED BY: DAR APPROVED BY: RJB	DRILLER: Scott Zeien HELPER: Brian N.	RIG: CME 850						
DRILLING CO.: Terracon								



Rell Rend	Bell Bend NPP PROJECT NO. 07-3891								
Bell Bella			,		LOG OF BORING NO. B-301		1100E01110.07-3031		
ELEVATION (FEET MSL)	(FEET) SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL			
EVA:	(FEET) (MPLE N	2W/6 R % I	OVE	PROFILE	SURFACE EL: 666.38	SS)	REMARKS		
(F)	SA	BLC	REC		DESCRIPTION	nscs			
10		100%	6.0		Silty Shale - Moderately hard dark gray (N4), fresh, unfractured, calcareous to slightly calcareous, thickly bedded, slight reaction to HCl.		Special care sample at 107.1'-108.6'		
11	0 — — — — — — — — — — — — — — — — — — —	100%	5.0		Silty Shale - Moderately hard dark gray (N4), fresh, unfractured, noncalcareous from 110.5'-110.9', moderately calcareous throughout, contains pockets of fossils 112.1' - 112.8' and pyrite at 114.5'-115.5', thickly bedded, reaction to HCl.				
11 DATE STA	6 — - - - - - - 	10/9/07		1	Silty Shale - Moderately hard dark gray (N4), fresh, unfractured, contains pockets of pyrite from 115.5' - 115.9' and calcareous fossils from 117.1'-118.6', noncalcareous, thickly bedded, moderate reaction to HCI. DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock part of the Mahantango Formation		
FIELD GEO CHECKED APPROVE	BY:	RAK DAR JB			LING METHOD: SPT/Tricone/NQ Rock Core LER: Scott Zeien HELPER: Brian N.	RIG	:: CME 850		
DRILLING	CO.: Terrad	on							



Pall B	Bell Bend NPP PROJECT NO. 07-3891								
Bell B	ena NPP		,		,	LOG OF BORING NO. B-301		PROJECT NO. 07-3891	
ELEVATION (FEET MSL)	ŦE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL		
EVA EET	DEPTH (FEET)	MPL	N/6 R % I 8 (R(OVE	PROFILE	SURFACE EL: 666.38	S S	REMARKS	
		S O	BLC	REC		DESCRIPTION	nscs		
DATE FIELD	118 — 120 — 120 — 122 — 124 — 126 — 130 — STARTED COMPLET GEOLOG	ΓED: 10 IST: R	AK	10.0	GWL:	Silty Shale: Moderately hard dark gray (N4), fresh, unfractured, contains fossils throughout, contains veins of calcite, thickly bedded, noncalcareous, no reaction to HCI. DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation	
APPR	KED BY: OVED BY:	RJI			DRIL	LER: Scott Zeien HELPER: Brian N.	RIG	: CME 850	
DRILL	ING CO.:	Terraco	n						



134 - 136 - 138 - 140 - R-14 10% R-14 142 - R-14 142 - R-14 142 - R-14 142 - R-14 145 f, fractured, from 142.4" - 142.6" approximately 60" to rock core, thickly bedded.	Bell Bend NPP PROJECT NO. 07-3891								
134 — 136 — 138 — 140 — R-14 100% (95%) 10.0 Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5 to 145.5, fractured, from 142.4 - 142.6 approximately 60° to rock core, thickly bedded. Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5 to 145.5, fractured, from 142.4 - 142.6 approximately 60° to rock core, thickly bedded.	Dell Bellu NFF		LOG OF BORING NO. B-301		PROJECT NO. 07-3091				
132— 136— 138— 138— 140— R-14 100% (96%) 10.0 Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5 to 145.5, fractured, from 142.4 - 142.6' approximately 60" to rock core, thickly bedded. Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5 to 145.5, fractured, from 142.4 - 142.6' approximately 60" to rock core, thickly bedded.	MSL) MSL) TH TH TH TNO. A NO. A RC. A D)	RY (ft.)		/MBOL					
132— 136— 138— 138— 140— R-14 100% (96%) 10.0 Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5 to 145.5, fractured, from 142.4 - 142.6' approximately 60" to rock core, thickly bedded. Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5 to 145.5, fractured, from 142.4 - 142.6' approximately 60" to rock core, thickly bedded.	LEVA LEVA DEP' (FEE MPLI R RUI & (RC	COVE	SURFACE EL: 666.38	SS S	REMARKS				
Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5' to 145.5, fractured, from 142.4' - 142.6' approximately 60' to rock core, thickly bedded. Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5' to 145.5, fractured, from 142.4' - 142.6' approximately 60' to rock core, thickly bedded.	S S O B O O	REC .	DESCRIPTION)SN					
Silty Shale - Moderately hard dark gray (N4), fresh, slightly fractured, calcareous with pyrite from 145.5'-145.7' then slightly calcareous 151.6'-153.1' DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon Special care sample at 151.6'-153.1' Special care sample at 151.6'-153.1' DATE/TIME: 10/14/07 GWL: DEPTH: 13' DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core RIG: CME 850	134— 136— 138— 140— R-14 142— 144— 144— 144— 146— DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR APPROVED BY: RJB	GWL	Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, from 142.4' - 142.6' approximately 60° to rock core, thickly bedded. Silty Shale - Moderately hard dark gray (N4), fresh, moderately to lightly fractured, noncalcareous, calcareous fossils from 144.5' to 145.5, fractured, from 142.4' - 142.6' approximately 60° to rock core, thickly bedded. Silty Shale - Moderately hard dark gray (N4), fresh, slightly fractured, calcareous with pyrite from 145.5'-145.7' then slightly calcareous 145.7'-146.0', fracture at 153.2' totally healed with calcite, DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		TES: Bedrock part of the Mahantango Formation				



Dall D	Bell Bend NPP PROJECT NO. 07-3891								
Bell B	end NPP		•		•	LOG OF BORING NO. B-301		PROJECT NO. 07-3691	
ELEVATION (FEET MSL)	TH (TE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL		
EVA EET	DEPTH (FEET)	MPL RUI	3W/6 R % & (R(OVE	PROFILE	SURFACE EL: 666.38	.S S.	REMARKS	
日子		SA	BLC	REC		DESCRIPTION	nsc		
DATE	156 — 158 — 160 — STARTED COMPLE	ΓED: 10	100% (98%) 100% (95%) 0/9/07 0/11/07	10.0	GWL	Silty Shale - Moderately hard dark gray (N4), fresh, slightly fractured, calcareous with pyrite from 145.5'-145.7' then slightly calcareous 145.7'-146.0', fracture at 153.2' totally healed with calcite, microfaulting, no reaction to HCI. Siltstone - Hard dark gray (N4) fresh, very slightly fractured, calcareous, seam at 158.5' vertical direction fractures at 165.0' - 165.5' from 165.0'-165.2' approximately 70° to rock core, no reaction to HCI.	NOTE	ES: Bedrock part of the Mahantango Formation	
	GEOLOG KED BY:		AK AR		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core			
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Brian N.	RIG:	CME 850	
	DRILLING CO.: Terracon								



Ball Band NDD		DDO IECT NO. 07 2004
Bell Bend NPP	LOG OF BORING NO. B-301	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339151.791 E 2405430.679	TO REMARKS
LEVATIO EEET MS DEPTH (FEET) MMPLE N R RUN N S RUN N S REG 8 (RQD)	N 339151.791 E 2405430.679 SURFACE EL: 666.38	κ REMARKS
SA SA OF OF	DESCRIPTION	SOSO
162 — 164 — 166 — 170 — R-17 100% (98%) 10.0 172 — 174 — 174 — DATE STARTED: 10/9/07 10/11/07	Siltstone - Hard dark gray (N4) fresh, very slightly fractured, calcareous inclusion at 167.2' and 173.0' folded and faulting fracture at 175.1'-175.3' vertical, noncalcareous, very thickly bedding, no reaction to HCl. GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation
FIELD GEOLOGIST: RAK	DRILLING METHOD: SPT/Tricone/NQ Rock Core	
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian N.	RIG: CME 850



Dall David NDD							DDO 1507 NO. 07 2004
Bell Bend NPP					LOG OF BORING NO. B-301		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET)	OR RUN NO. BLOW/6" & (N)	OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339151.791 E 2405430.679 SURFACE EL: 666.38	USCS SYMBOL	REMARKS
ELE' (FEE Di (F	OR F	Q ⊗)	ECO	H AR		scs	
			₩.		DESCRIPTION Siltstone - Hard dark gray (N4) fresh, unfractured, noncalcareous,	>	
176 —	-18 I		10.0	GWL	Siltstone - Hard dark gray (N4), fresh, very slightly fractured, massive bedding, fractured at 188.2' approximately 60° to rock core, partial slickenside fracture at 192.6' approximately 60° of rock core, noncalcareous, contains few pockets of calcite, from .193.5'- 195.5', no reaction to HCI.	NOTE	S: Bedrock part of the
DATE COMPLETED FIELD GEOLOGIST CHECKED BY:	: RAK DAR			DRILL	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
APPROVED BY: DRILLING CO.: Ter	RJB rracon			DRILL	LER: Scott Zeien HELPER: Brian N.	RIG:	CME 850



Bell Bend NPP PROJECT NO. 07-3891											
Dell Dellu NFF	LOG OF BORING NO. B-301	FROJECT NO. 07-5001									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339151.791 E 2405430.679	REMARKS SCORO									
LEVATIO DEPTH (FEET) NMPLE N R RUN N R RUN N R R REG R RQD)	N 339151.791 E 2405430.679 SURFACE EL: 666.38	က် REMARKS									
	DESCRIPTION	OS									
R-19 100% (98%) 10.0 10.	Siltstone - Hard dark gray (N4), fresh, very slightly fractured, not healed fractures at 196.7' 198.4', 199.4' and 201.4' horizontal fractures, slightly calcareous, massive bedding, slight reaction to HCl. GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	Special care sample at 196.7'-198.9'. NOTES: Bedrock part of the Mahantango Formation									
CHECKED BY: DAR APPROVED BY: RJB		RIG: CME 850									
DRILLING CO.: Terracon											



Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend NPP	LOG OF BORING NO. B-301	PROJECT NO. 07-3091							
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339151.791 E 2405430.679	REMARKS SAWBOL							
DEPTH (FEET) MMPLE N R RUN N R RUN N R REG RQD)	N 339151.791 E 2405430.679	ဖ် REMARKS							
SA OF OI REC	DESCRIPTION	OSO							
206— 208— 210— R-21 100% 10.0 212— 214— 216— 218— 218— 218—	Siltstone - Hard dark gray (N4), fresh, very slightly fractured, slightly to moderately calcareous from 205.5'-208.4', remaining noncalcareous, massive bedding, slight reaction to HCl. Siltstone - Hard dark gray (N4), fresh, very slightly fractured, noncalcareous, massive bedding, fracture at 215.2' - 215.4' approximate 70° from rock core, no reaction HCl.								
DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR	GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahantango Formation							
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian N.	RIG: CME 850							



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP	LOG OF BORING NO. B-301	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339151.791 E 2405430.679	REMARKS REMARKS									
LEVATIO DEPTH (FEET) MMPLE N R RUN N R REK R R R R R R R R R R R R R R R R R R R	N 339151.791 E 2405430.679 SURFACE EL: 666.38	κ REMARKS									
SA OR OF	DESCRIPTION	OSO									
型き	Siltstone - Hard dark gray (N4), fresh, very slightly fractured, fractured at 234.0, approximately 45° to rock core, noncalcareous, no reaction to HCI.	SN S									
DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK	GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahantango Formation									
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian N.	RIG: CME 850									



Bell Bend N	PP 				LOG OF BORING NO. B-301		PROJECT NO. 07-3891
(FEET MSL) DEPTH	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL	
EET MSI	MPLE RUN	W/6" 8 % F (RC	OVE	PROFILE	SURFACE EL: 666.38	SSY	REMARKS
	SAN]] R 8	REC		DESCRIPTION	USC	
236 238 240 242 244 246	- R-24	100%	10.0		Siltstone - Hard dark gray (N4), fresh, unfractured, noncalcareous, massive bedding, no reaction to HCI. Siltstone - Hard dark gray (N4), fresh, unfractured, noncalcareous, massive bedding, no reaction to HCI.		Special care sample at 240.0'-242.4'.
DATE STAR DATE COMF FIELD GEOL CHECKED E	PLETED: .OGIST:			GWL:	DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO ⁻	TES: Bedrock part of the Mahantango Formation
APPROVED DRILLING C	BY: R	JB		DRILI	LER: Scott Zeien HELPER: Brian N.	RIG	: CME 850



Rell R	Bell Bend NPP PROJECT NO. 07-3891										
ם וושם	elia NFF			-		LOG OF BORING NO. B-301		FROJECT NO. 07-3031			
ELEVATION (FEET MSL)	HT:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ille	COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL				
EVA EET	DEPTH (FEET)	MPL	2W/6 R % I R (R(OVE	PROFILE	SURFACE EL: 666.38	SSS	REMARKS			
EL FI		SA	BLC Of	REC		DESCRIPTION	OSC				
	250 — 252 — 254 — 256 — 258 — 260 — 262 — STARTED		100% (90%)	10.0	GWL	Siltstone - Hard dark gray (N4), fresh, slightly fractured, fracture from 251.2' - 252.9' and 259.1'-259.5' approximately 70° of rock core, noncalcareous, massive bedding, no reaction to HCI. Siltstone - Hard dark gray (N4), fresh, unfractured, calcareous from 261.0'-267.4' remaining, noncalcareous, massive bedding, reaction to HCI. DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A		ES: Bedrock part of the Mahantango Formation			
FIELD	DATE COMPLETED: 10/11/07 GWL: DEPTH: N/A DATE/TIME: N/A FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rock Core										
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Scott Zeien HELPER: Brian N.	RIG:	CME 850			



ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL	PROJECT NO. 07-3891					
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. OR RUN NO. SLOW/6" & (N) OR % REC. & (RQD)	N 339151.791 E 2405430.679 SURFACE EL: 666.38	SYMBOL						
ELEVA' (FEET I DEP' (FEE SAMPLI OR RUI OR RUI S(RU S(RU) ECOVE		8						
AS S S S S S S S S S		ပ္လ	REMARKS					
		OSC						
264 — R-27 100% 10.0 266 — 270 —	Siltstone - Hard dark gray (N4), fresh, moderately fractured, slightly calcareous at 272.2' moderately to very calcareous from 273.0'-278.0', remaining noncalcareous, fracture from 272.2'-273.0' approximately 70' from rock core, not healed horizontal fracture at 276.8' totally healed with calcite, massive bedding, reaction to HCl. GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES	S: Bedrock part of the Mahantango Formation					
FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rock Core CHECKED BY: DAR								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian N.	RIG: C	CME 850					



Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend NPP	LOG OF BORING NO. B-301	PROJECT NO. 07-3891							
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 339151.791 E 2405430.679	OBWAS REMARKS							
LEVATIO EET MSI DEPTH (FEET) AMPLE N R RUN N R R REG R (RQD)	N 339151.791 E 2405430.679 SURFACE EL: 666.38	တ် REMARKS							
	DESCRIPTION	USCS							
280 — 282 — 284 — 286 — 290 — 292 —	Siltstone - Hard dark gray (N4), fresh, unfractured, slightly to moderately calcareous, massive bedding, reaction to HCl. Siltstone - Hard dark gray (N4), fresh, unfractured, contains fossils calcareous burrows from 293.8' - 294.8', and veins of pyrite throughout remaining noncalcareous, massive bedding, no reaction to HCl. GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	Special care sample at 296.1'-297.6'. NOTES: Bedrock part of the Mahantango Formation							
APPROVED BY: RJB	DRILLER: Scott Zeien HELPER: Brian N.	RIG: CME 850							
DRILLING CO.: Terracon									



DATE STARTED: 10/907 R-31	Pall Pa	and NDD							PROJECT NO. 07-3891
298 — R-30 (100%) 10.0 298 — Sillstone - Hard dark gray (N4), fresh, moderately fractured, massive bedding, noncalcareous, fractured from 309.5-309.9' along bedding, no reaction to HCl. 302 — 304 — R-31 (100%) 10.0 202 perpendicular to bedding, fractured from 309.5-309.9' along bedding, no reaction to HCl. 306 — 307 — R-31 (100%) 10.0 202 perpendicular to bedding, fractured from 309.5-309.9' along bedding, no reaction to HCl. 307 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 308 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 309 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 309 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 300 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl.	Dell De	ena NFF					LOG OF BORING NO. B-301		PROJECT NO. 07-3091
298 — R-30 (100%) 10.0 298 — Sillstone - Hard dark gray (N4), fresh, moderately fractured, massive bedding, noncalcareous, fractured from 309.5-309.9' along bedding, no reaction to HCl. 302 — 304 — R-31 (100%) 10.0 202 perpendicular to bedding, fractured from 309.5-309.9' along bedding, no reaction to HCl. 306 — 307 — R-31 (100%) 10.0 202 perpendicular to bedding, fractured from 309.5-309.9' along bedding, no reaction to HCl. 307 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 308 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 309 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 309 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 300 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl.	TION MSL)	ĦE.	N N O	" & (N) REC. 2D)	:RY (ft.)	:ILE		/MBOL	
298 — R-30 (100%) 10.0 298 — Sillstone - Hard dark gray (N4), fresh, moderately fractured, massive bedding, noncalcareous, fractured from 309.5-309.9' along bedding, no reaction to HCl. 302 — 304 — R-31 (100%) 10.0 202 perpendicular to bedding, fractured from 309.5-309.9' along bedding, no reaction to HCl. 306 — 307 — R-31 (100%) 10.0 202 perpendicular to bedding, fractured from 309.5-309.9' along bedding, no reaction to HCl. 307 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 308 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 309 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 309 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl. 300 — R-31 (100%) 10.0 202 perpendicular to bedding, no reaction to HCl.	EVA. EET	DEP (FEE	MPL	2W/6 R % I R (R(OVE	ROF	SURFACE EL: 666.38	S S	REMARKS
298 — 300 —	E (F)		SA	BEC .	REC	"	DESCRIPTION	nsc	
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Brian N. RIG: CME 850	DATE	296 — 298 — 300 — 302 — 304 — 306 — STARTED COMPLET	R-31	98% (80%)		GWL:	bedding, noncalcareous, fractured from 300.0'-300.2' perpendicular to bedding, fractured from 309.5'-309.9' along bedding, no reaction to HCl. DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A		TES: Bedrock part of the Mahantango Formation
							TILLE LIV. DIIdii IV.	1.10	



Bell Bend NPP	LOG OF BORING NO. B-301	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339151.791 E 2405430.679	NS SYMBOL REMARKS
LEVATIO EET MSI DEPTH (FEET) MMPLE N R RUN N R RUN N R R REG R (RQD)	N 339151.791 E 2405430.679 SURFACE EL: 666.38	κ REMARKS
SAI SEC OF SEC O	DESCRIPTION	nsc
308 — 310 — 312 — 314 — R-32 100% (85%) 10.0 318 — 320	Siltstone - Hard dark gray (N4), moderately fractured, fresh, noncalcareous, nonhealed, fractured from 315.2'-315.4' and 319.4'-319.5', no reaction to HCl. Siltstone - Hard dark gray (N4), unfractured, fresh, noncalcareous, massive bedding, no reaction to HCl.	
DATE STARTED: 10/9/07 DATE COMPLETED: 10/11/07 FIELD GEOLOGIST: RAK	GWL: DEPTH: 13' DATE/TIME: 10/14/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahantango Formation
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian N.	RIG: CME 850



Bell P	Bell Bend NPP PROJECT NO. 07-3891										
Deli D	+					LOG OF BORING NO. B-301	•	FROJECT NO. 07-0001			
ELEVATION (FEET MSL)	王 <u>(</u>	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL				
EVA ⁻	DEPTH (FEET)	MPLE	3W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 666.38	S SY	REMARKS			
山 山 		SA	BLC Of	REC	"_	DESCRIPTION	nsc				
	322 — 324 — 326 — 338 — 330 — 3332 — 3336 — 3336 — STARTED	R-34	100% (100%)	10.0	GWL:	Siltstone - Hard dark gray (N4), unfractured, fresh, noncalcareous, massive bedding, no reaction to HCI.		TES: Bedrock part of the			
	COMPLET GEOLOG		0/11/07 RAK			: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation			
CHEC	KED BY:	D	DAR		DIVILL						
	OVED BY: LING CO.:				DRILI	LER: Scott Zeien HELPER: Brian N.	RIG:	: CME 850			
PINIEL	,, ,, ,, , , , , , , , , , , , , , , ,	101100	<u> </u>		—						



Ball Ba	Bell Bend NPP PROJECT NO. 07-3891										
Dell Del	IIU NFF					LOG OF BORING NO. B-301		PROJECT NO. 07-3091			
ELEVATION (FEET MSL)	HE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL				
EVA.	DEPTH (FEET)	MPLF RUN	3.W/6' 7.% F 8. (RG	OVE	PROFILE	SURFACE EL: 666.38	S S	REMARKS			
		SA	BLC	REC		DESCRIPTION	nscs				
	338 —	R-35	100%	7.5		Siltstone - Hard dark gray (N4), very slightly fractured, fresh, fractures horizontal from 340.8'-340.9', noncalcareous, massive bedding.		Special care sample at 338.5'-340.8'.			
	344 —		100%			Siltstone - Hard dark gray (N4), unfractured, fresh, noncalcareous, massive bedding, no reaction to HCl.					
DATE C	TARTED COMPLET GEOLOGI	ED: 10		10.0	GWL:	DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation			
	ED BY: VED BY: NG CO.:	RJ			DRILL	LER: Scott Zeien HELPER: Brian N.	RIG	: CME 850			



COG BORING NO. B-301 CORNING NO. B-301	Dall D	and NDD							DDO IECT NO. 07 2004
358 — Sillstone - Hard dark gray (N4), unfractured, fresh, noncalcareous. 358 — R-37 100% 10.0 362 — R-37 100% 10.0 362 — A	Bell B	ena NPP					LOG OF BORING NO. B-301		PROJECT NO. 07-3891
358 — Sillstone - Hard dark gray (N4), unfractured, fresh, noncalcareous. 358 — R-37 100% 10.0 362 — R-37 100% 10.0 362 — A	TION MSL)	H.E.	N N O O	" & (N) REC. 2D)	RY (ft.)	ILE I		MBOL	
358 — Sillstone - Hard dark gray (N4), unfractured, fresh, noncalcareous. 358 — R-37 100% 10.0 362 — R-37 100% 10.0 362 — A	EVA.	DEP.	MPLI	2W/6 R % I & (RC	OVE	ROF	SURFACE EL: 666.38	SS S	REMARKS
356 — Sillstone - Hard dark gray (N4), unfractured, fresh, noncalcareous, massive bedding, no reaction to HCL 368 — 369	J) 13		SA		REC		DESCRIPTION	OSC	
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Brian N. RIG: CME 850	DATE FIELD	354 —): 1 ⁽ FED: 1 ⁽	100% (88%)	10.0	GWL:	DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A	NO	barrel going over the core sample more than once. TES: Bedrock part of the
						DRIII	FR: Scott Zeien HEI PER: Rrian N	RIC	: CME 850
							TIELEN, BIGHTY.	1	SINE 000



	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-301		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339151.791 E 2405430.679	SYMBOL					
EVA:	DEPTH (FEET)	MPLE RUN	2 % F R R (RG	OVE	PROFILE	SURFACE EL: 666.38	SS	REMARKS				
급비		SA	BLC OF	REC	<u> </u>	DESCRIPTION	nscs					
	366 — 368 —	R-38	98% (45%)	4.9		Siltstone - Hard dark gray (N4), unfractured, fresh, noncalcareous, massive bedding, no reaction to HCl.		Low RQD due to core barrel jamming with core fragments.				
	370 — - - - - 372 —					Siltstone - Hard dark gray (N4), slightly fractured, fresh, cast located at 374.6' partially filled with calcite, noncalcareous, massive bedding, no reaction to HCl.		Lower RQD due to difficult drilling				
	374 —	R-39	98% (87%)	5.9								
	376 — - - 378 — - -					Siltstone - Hard dark gray (N4), very slightly fractured, fresh, slightly to moderately calcareous, massive bedding, no reaction to HCI.						
	380 —											
DATE FIELD	STARTED COMPLET GEOLOG	ΓED: 10 IST: R	AK		GWL:	DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation				
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRIL	LER: Scott Zeien HELPER: Brian N.	RIG	s: CME 850				



Bell B	end NPP					LOG OF BORING NO. B-301		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H E E	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL	
EVA	DEPTH (FEET)	MPLI RUI	8 / W/6 / W/6 / W/6 / W/6	OVE	ROF	SURFACE EL: 666.38	SS	REMARKS
II E		SAN	BP. 8	REC	P	DESCRIPTION	nsc	
DATE	382 — 384 — 386 — 389 — 390 — 392 — 394 — 394 —	R-40	100% (100%)	10.0	GWI	Siltstone - Hard dark gray (N4), very slightly fractured, fresh, slightly calcareous fractured 395.5'-396.0', not healed, massive bedding, slight reaction to HCl.	NO	Special Care Sample 393.8'-395.4'.
DATE FIELD	COMPLE ^T GEOLOG	ΓED: 10 IST: R	0/11/07 AK		GWL:	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
	KED BY:		AR					
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Brian N.	RIG	:: CME 850
DKILL	ING CO.:	ı erraco	П					



Bell B	end NPP					LOG OF BORING NO. B-301		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ile	COORDINATES N 339151.791 E 2405430.679	USCS SYMBOL	
EVA EET	ОЕРТН (FEET)	MPLI	3 % F	OVE	PROFILE	SURFACE EL: 666.38	S S)	REMARKS
EL (FE		SAI	BLC OF	REC		DESCRIPTION	nsc	
	396 —	R-42	100% (100%)	4.0		Siltstone - Hard dark gray (N4), unfractured, fresh, noncalcareous, massive bedding, no reaction to HCl.		
266.4	400 — 402 — 404 — 406 — 408 —					BOTTOM OF BORING 400'		
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 1	0/9/07 0/11/07 AK AR		GWL:	DEPTH: 13' DATE/TIME: 10/14/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	FES: Bedrock part of the Mahantango Formation
APPR	OVED BY:	RJ	В		DRILL	LER: Scott Zeien HELPER: Brian N.	RIG	: CME 850



LOG OF BORING NO. B-302	T NO. 07-3891
COORDINATES N 339243.091 E 2405420.594	
Δ !!! Θ E! Ε Δ S S S S	KS
DESCRIPTION DESCRIPTION	
Sandy Lean Clay (CL) - 5% cobbles, 75% sand, 20% silt, subangular spherical, fine to coarse sand, coarse gravel, 1.0" max size, hard, nonplastic, grayish brown (5YR, 3/2) to pale brown (5YR 5/2), dry, no reaction HCl, loose.	
S-2 S-2 (25) Sandy Silty Clay (CL-ML) - 5% cobbles, 75% sand, 20% silt, Subangular spherical, fine to coarse sand, coarse gravel, 1.0" max size, hard, nonplastic, grayish brown (5YR, 3/2) to pale brown (5YR 5/2), dry, no reaction HCl, medium dense.	
665.3 — Well Graded Gravel with Sand (gw) - 45% cobbles, 30% sand, 25% gw	
S-3	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
8 - Well Graded Sand with Silt and Gravel (SW-SM) - 70% gravel, 25% Sand, 5% silt, fine to coarse, elongated and flat, subangular sand and gravel, 0.75" max size, hard, nonplastic, pale red (10 R 6/2) to	
658.8 Graylsh red (10R 4/2) dry, no reaction to HCI, very dense. 9.5' 11.78' 9.5' 12.78' 9.5' 12.78' 9.5' 13.78	
S-6 S-6 S-6 S-6 S-6 S-6 S-6 S-6	
12—	
655.8 Poorly Graded Gravel (gp) - 5% cobbles, 65% gravel, 30% sand, subangular, spherical, fine gravel, subrounded, fine to coarse sand,	
655.0 0.75" max size, hard, nonplastic, grayish red (10 R 6/2), moist, nd 3.3' reaction to HCl, dense.	
Well Graded Sand (sw) - 75% sand, 20% gravel, 5% silt, fine to coarse, rounded, spherical gravel, 0.05" max size, hard, nonplastic,0' grayish red (10R 6/2) with light gray (N5), moist, no reaction to HCl, very dense.	
DATE STARTED: 9/13/07 GWL: DEPTH: +3.0 DATE/TIME: 9/15/07 NOTES: Bedrock part of Mahantango Fo	
DATE COMPLETED: 9/15/07	mauon
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850 DRILLING CO.: Terracon	



Bell Be	end NPP							PROJECT NO. 07-3891
<u> </u>					, ,	LOG OF BORING NO. B-302	· ·	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339243.091 E 2405420.594 SURFACE EL: 668.31	SYMBOL	REMARKS
ELE)	ᆸᄠ	SAM OR F	SLOV OR	ECO	_R	DESCRIPTION	nscs	
		S-8	32-38	0.8	222	Well Graded Gravel (gw) - 40% cobbles, 50% gravel, 10% sand,		
652.8	- - 16 		39 (77) 14-7			subrounded, elongated and flat gravel, angular to subangular fine to coarse sand, 3.0" max size, hard, nonplastic, grayish red (10R 6/2).5' moist, no reaction to HCl, very dense. Poorly Graded Sand with Silt and Gravel (SP-SM) - 30% gravel, 65% sand, 5% silt, subrounded to subangular, fine to coarse gravel,	SP- SM	
651.3	_	S-9	9 (16)	1.1	1.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rounded to subangular, fine to coarse sand, hard, nonplastic, dark yellowish brown (10 YR 4/2), moist, no reaction to HCl, medium dense.		
001.0	_ 18 	S-10	13-18 50/5" (68)	1.0		Well Graded Gravel (gw) - 95% cobbles, 5% gravel, subangular, flat and elongated cobbles and gravel, hard, 3.0" max size, nonplastic, dark gray (N3), wet, no reaction to HCl, very dense.	gw	
649.8	_	S-11	13-14 18 (32)	1.1		Well Graded Gravel with Silt and Sand (GW-GM) - 30% gravel, 60% sand, 10% silt, subrounded, spherical, fine to coarse gravel, hard, subrounded, fine to medium sand, 0.75" max size, nonplastic, grayish red (10 R 6/2) and dark yellowish brown (10 YR 4/2), moist, no reaction to HCl, dense.	GW- GM	
	20 —	S-12	28-24 40 (64)	1.4				
	- 22 — - -	S-13	50/2" (50+)	0.2				
644.3	24 — — — — 26 —	S-14	24-37 50/3" (87)	1.3		Poorly Graded Gravel with Sand (GP) - 25% cobbles, 30% gravel, 45% sand, subangular, elongated and flat, coarse gravel and cobbles, hard, subrounded to subangular fine to coarse sand, 0.75" max size, nonplastic, grayish red (10 R 6/2) and dark gray (N3), wet, no reaction to HCI, very dense.	GP	
641.8	-	S-15	50/1" (50+)	0.1		Well Graded Gravel (gw) - 90% gravel, 10% sand, subangular, flat, fine to coarse gravel and sand, 1" max size, nonplastic, dark gray (N3), wet, no reaction to HCl, very dense, moderately weathered, shale fragments.	gw	
639.6	28 -	S-16	50/2"-0 0 (0)	0.2		28.7' Shale- Moderately hard, dark gray (N3) slightly weathered to fresh, intensely to moderately fractured, partly healed noncalcareous, no		
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 9/	/13/07 /15/07 AK AR		GWL:	DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle	NOTI	ES: Bedrock part of the Mahantango Formation
—	OVED BY: NG CO.:				DRILL	.ER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850



Bell Be	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	Η. Ε.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339243.091 E 2405420.594	SYMBOL	
EVA EET	DEPTH (FEET)	MPL RU	2W/6 R % (R(SOVE	PROFILE	SURFACE EL: 668.31	SSS	REMARKS
 		S O	BLC	REC		DESCRIPTION	nscs	
633.8	30 — 32 — 34 — 36 — 40 — 42 — 42 —	R-1	98% (58%)	5.9		reaction to HCl. 34.5' Siltstone- Moderately hard, dark gray (N3) fresh, very slightly fractured, partly healed, joint located from 44.0' to 44.5', noncalcareous.		
	STARTED COMPLE		/13/07 /15/07		1	DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock part of the Mahantango Formation
	GEOLOG				1	.ING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		U
	KED BY:		AR			Angle	D.C.	OME 050
	OVED BY: ING CO.:				J DRILI	.ER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850



	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL					
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 668.31	SS S	REMARKS				
EL (F		SA	BLC	REC		DESCRIPTION	OSC					
DATE	44 —	R-3	91% (82%)	9.1	GWL	Siltstone- Moderately hard, dark gray (N3), fresh, very slightly fractured, partly healed, noncalcareous, no reaction to HCl. Siltstone- Moderately hard, dark gray (N3) fresh, very slightly fractured, partly healed, noncalcareous, no reaction to HCl.		Special care sample 51.6' - 52.9'.				
	COMPLET GEOLOG		/15/07 AK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		Mahantango Formation				
CHEC	KED BY:	D	AR			Angle						
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850				
DRILL	ING CO.:	ı erraco	n									



	LUDD							PD0 1507 NO 07 0004
Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	표()	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL	
EVA	DEPTH (FEET)	MPLI	3 % F RCRC	OVE	PROFILE	SURFACE EL: 668.31	(S S)	REMARKS
日 日 日 日 日		SAI	BLC OF	REC		DESCRIPTION	nsc	
	60 — 62 — 64 — 66 — 70 — 72 —	R-5	67% (62%)	6.7		Siltstone- Moderately hard, dark gray (N3), fresh, very slightly fractured, partly healed, noncalcareous, no reaction to HCI. Siltstone- Moderately hard, dark gray (N3), fresh, slightly fractured, partly healed, noncalcareous, joint located from 74.5' to 74.9', approximately 20° from rock core, no reaction to HCI.		
DATE	STARTED COMPLE	ΓED: 9	/13/07 /15/07		GWL:	DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: N/A	NOTE	S: Bedrock part of the Mahantango Formation
	GEOLOG		AK		DRILI	LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle		
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG: (CME 850
		. 511400	••					



								DD0 I507 NO. 07 0004
Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL	
EVA	DEPTH (FEET)	MPLI RUI	2 % F RC RC	OVE	PROFILE	SURFACE EL: 668.31	(S S)	REMARKS
 		SA		REC	"	DESCRIPTION	OSO	
1	74 — 76 — 78 — 80 — 82 — 84 — 86 — STARTED COMPLET		99% (96%)	9.9		Siltstone- Moderately hard, dark gray (N3), fresh, very slightly fractured, partly healed, noncalcareous, joint located at 76.6' to 76.7', fractured zone located from 83.0' to 83.2', no reaction to HCI. Siltstone- Moderately hard to hard, dark gray (N3), fresh, slightly fractured, partly healed, noncalcareous, contains veins of pyrite from 92.5' to 93.1', no reaction to HCI.	NOTE	ES: Bedrock part of the Mahantango Formation
1	GEOLOG		AK			LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		Č
	KED BY:		AR			Angle		OME 050
	OVED BY: ING CO.:				J DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850
		. 511400	• •		1			



								DDO IEGENO OZ 0004
Bell Be	end NPP			_		LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	il E	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL	
EVA	DEPTH (FEET)	MPL RUI	3W/6 R % & (R(OVE	PROFILE	SURFACE EL: 668.31	.S S.	REMARKS
目币		SA	BLC	REC		DESCRIPTION	OSC	
DATE	88 —	TED: 9	98% (94%)	9.8	GWL:	Siltstone- Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, noncalcareous, no reaction to HCI. DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree	NOTE	ES: Bedrock part of the Mahantango Formation
CHEC	KED BY:	D	AR			Angle		
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850
					•			



Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339243.091 E 2405420.594	SYMBOL	
EVA	DEPTH (FEET)	MPLI RUI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 668.31	SS.	REMARKS
FF (FF		SA	BLC	REC		DESCRIPTION	SOSN	
DATE FIELD CHEC	104 — 106 — 108 — 110 — 1112 — 1114 — 1116 —	TED: 9/ IST: R D	AK AR	9.9	GWL:	Siltstone- Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, noncalcareous, no reaction to HCI. Siltstone- Moderately hard to hard, dark gray (N3) fresh, very slightly fractured, contains few slightly calcareous veins from 118.8' - 119.5', fossiliferous and few pyrite pockets 123.0' - 123.2', slight reaction to HCI. DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: N/A ING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle		Special care sample 109.9' - 111.2'. TES: Bedrock part of the Mahantango Formation
	OVED BY: ING CO.:				J DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	6: CME 850
DIXILL	IIVG CU	i c iraco	11					



Dall D	and NDD							PDO IFCT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339243.091 E 2405420.594	SYMBOL	
EVA EET	DEPTH (FEET)	MPL RU	3W/6 7 % 8 (R(OVE	PROFILE	SURFACE EL: 668.31	SS	REMARKS
- III - III - III		SA	BLC	REC		DESCRIPTION	nscs	
	118 — 120 — 122 — 124 — 126 — 130 — 130 —	R-11	99% (99%)	9.9		Sittstone- Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, slightly calcareous, calcite veins at 129.1 and few pyrite veins, slight reaction to HCl.		
1	STARTED		/13/07			DEPTH: +3.0 DATE/TIME: 9/15/07	NOTI	ES: Bedrock part of the
I I						DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
	GEOLOG KED BY:		AK AR		DRILI	LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle		
	KED BY: OVED BY:				DRII	LER: Scott Zeien HELPER: Dave Dwyer	BIC.	CME 850
	ING CO.:				PKILI	LEN. Scott Zeieii HELFER. Dave Dwyei	INIG.	OIVIL 000
							•	



132									
132 — 134 — 136 — 137 — 138 — 140 — R-13	Bell Be	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
132 — 134 — 136 — 137 — 138 — 140 — R-13	TION MSL)	TH (T)	. ON 2.	'& (N) REC. 2D)	RY (ft.)	ILE		'MBOL	
132 — 134 — 136 — 137 — 138 — 140 — R-13	EVA'	JEP.	MPLI RUI	8 % F	OVE	RO	SURFACE EL: 668.31	S S	REMARKS
134	EL (FE		SAI	BLC OF	REC		DESCRIPTION	nsc	
FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850		134 — 136 — 138 — 140 — 142 — 144 — 146 — STARTED	v: 9/	99% (94%)			Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, noncalcareous, no reaction to HCI. DEPTH: +3.0 DATE/TIME: 9/15/07	NOT	ES: Bedrock part of the Mahantango Formation
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850							LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		-
· ·						DD:::		D10	CME 050
						I DRILL	LEK: SCOTT Zelen HELPEK: Dave Dwyer	KIG:	CIME 850



Bell Bend NPP PROJECT NO. 07-3891							
Bell Bena	NPP				LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH	(FEET) SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE I	COORDINATES N 339243.091 E 2405420.594	SYMBOL	
EVA EET	(FEET) MPLE N	2 % I	OVE	PROFILE	SURFACE EL: 668.31	SSS	REMARKS
	A S P	BLO	REC		DESCRIPTION	nscs	
14 15 15 15 DATE STA	0 — R-14 2 — 4 — 6 — 8 — 6 — 7 R-15	(80%) 0/13/07	9.7		Siltstone- Hard, dark gray (N3) and with light gray (N7), fresh, unfractured, calcareous, reaction to HCl. Siltstone- Hard, dark gray (N3) and light gray (N7), fresh, slightly fractured, calcareous, reaction to HCl, joints located at 159.8' to 160.1' approximately 70° to rock core and 165.2' to 165.5' approximately 40° to rock core.	NO	Special Care Sample 160.1' - 161.5'.
DATE COMPLETED: 9/15/07					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle Angle							
APPROVE	D BY: R	IB		DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	6: CME 850
DRILLING	CO.: Terraco	on					



B. II B								DDO 1507 NO. 07 2004
Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL	
EVA	DEPTH (FEET)	MPLI RUI	2 % F RCRC	OVE	PROFILE	SURFACE EL: 668.31	S S	REMARKS
 		SA	BLC Of	REC		DESCRIPTION	OSC	
l	162 — 164 — 166 — 168 — 170 — 174 — STARTED		100% (99%)	10.0		Siltstone- Hard, dark gray (N3) interlayered with light gray (N7) fresh, unfractured, contains veins of calcareous sand from 165.7' - 166.1' and fossils at 173.7' and 174.1' slight reaction to HCl,. DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: 9/15/07	NOTE	ES: Bedrock part of the Mahantango Formation
DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: RAK						LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		ss.igo i omiduon
CHEC APPR	KED BY: OVED BY:	D RJ				Angle LER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850
DRILL	ING CO.:	Terraco	n					



Bell Bend NPP		PROJECT NO. 07-3891
Don Bond Hi i	LOG OF BORING NO. B-302	1 NOCEST NO. 07 0001
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339243.091 E 2405420.594 SURFACE EL: 668.31	OSCS SYMBOL SEMARKS
	DESCRIPTION SEES Siltetone, Hard, dark gray (N3), fresh, unfractured, contains few yeins	ñ
176— 178— 180— R-17 100% (100%) 10.0 182— 184— 186— 188— 190— DATE STARTED: 9/13/07	Siltstone- Hard, dark gray (N3), fresh, unfractured, contains few veins of pyrite throughout core run, noncalcareous, no reaction to HCl. Siltstone- Hard, dark gray (N3), fresh, unfractured, noncalcareous, contains few pockets of pyrite throughout core run, no reaction to HCl. GWL: DEPTH: +3.0 DATE/TIME: 9/15/07	NOTES: Bedrock part of the
DATE COMPLETED: 9/15/07	GWL: DEPTH: N/A DATE/TIME: N/A	Mahantango Formation
FIELD GEOLOGIST: RAK CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle	
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850



Bell B	Bell Bend NPP PROJECT NO. 07-3891								
Deli D	ena mi		•	-		LOG OF BORING NO. B-302		FROJECT NO. 01-3031	
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL		
EVA:	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 668.31	(S S)	REMARKS	
EL (F)		SA	BLC	REC		DESCRIPTION	osn		
	192 — 194 — 196 — 198 — 200 — 202 — 204 — 204 — STARTED		100% (100%)	9.0		Siltstone- Hard, dark gray (N3) and light gray (N7) layers, fresh, unfractured, slightly calcareous, slight reaction to HCI. Siltstone- Hard dark gray (N3) and light gray (N7) layers, fresh, DEPTH: +3.0 DATE/TIME: 9/15/07	NOTES	S: Bedrock part of the	
1	COMPLE ^T GEOLOG		/15/07 AK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		Mahantango Formation	
	KED BY:		AR AR		DKILI	Angle			
APPRO	OVED BY:	RJ	В		DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG: 0	CME 850	
DKILL	ING CO.:	rerraco)[1						



Bell Bend NPP PROJECT NO. 07-3891							
Deli Delia Ni i	LOG OF BORING NO. B-302						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339243.091 E 2405420.594	TO REMARKS					
LEVATIO EET MS DEPTH (FEET) AMPLE N R RUN N R RUN N R R REG	N 339243.091 E 2405420.594	က် REMARKS					
SA OF	DESCRIPTION	nscs					
206 — R-20 100% 6.0 208 — 210 — 212 — 214 — 214 — 214 — 214 —	DESCRIPTION unfractured, slightly calcareous, slight reaction to HCl. Siltstone- Hard, dark gray (N3) and light gray (N7) layers, fresh, unfractured, slightly calcareous, slight reaction to HCl.	Preserved sample for laboratory analysis from 213.1' - 215.1'.					
DATE STARTED: 9/13/07 DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR	GWL: DEPTH: +3.0 DATE/TIME: 9/15/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle	NOTES: Bedrock part of the Mahantango Formation					
APPROVED BY: RJB	-	RIG: CME 850					
DRILLING CO.: Terracon							



Bell Bend NPP PROJECT NO. 07-3891							
LOG OF BORING NO. B-302		PROJECT NO. 07-3891					
COORDINATES N 339243.091 BLOW//6" & (N) OR % REC. OR RUN NO. OR % (RQD) OR % REC. SUBJECT H OR WITHOUT STATE STATE OF HE TO S	SYMBOL						
N 339243.091 E 2405420.594 C	SS	REMARKS					
DESCRIPTION	nscs						
224 — R-22 100% 10.0 Siltstone- Hard, dark gray (N3) and light gray (N7) layers, fresh, unfractured, slightly calcareous, slight reaction to HCl. 228 — 230 — Siltstone- Hard, dark gray (N3) with some light gray (N7) fresh, slightly fractured incorporation graph graph (N7) fresh, slightly fractured incorporation graph grap		Artesian condition at 230'. TES: Bedrock part of the Mahantango Formation					
FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree CHECKED BY: DAR Angle							
PPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG	G: CME 850					
PRILLING CO.: Terracon	"						



[
Bell Bend NPP	LOG OF BORING NO. B-302	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339243.091 E 2405420.594	REMARKS SSAWBOL
LEVATIO EET MS DEPTH (FEET) MMPLE N R RUN N R % REC R % REC	N 339243.091 E 2405420.594 SURFACE EL: 668.31	κ REMARKS
SAI SAI OR OR OR OR SAI OR	DESCRIPTION	nsc
R-23 96% 9.6 236 —	Siltstone- Hard, dark gray (N3), slightly fractured, slightly healed, joint at 240.5' - 240.5' approximately 70° rock core, many slightly calcareous intrusions at 243.8' - 250.5', and at 244.0', breccia zone at 243.7' and 245.5'.	
DATE STARTED: 9/13/07 DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: RAK	GWL: DEPTH: +3.0 DATE/TIME: 9/15/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree	NOTES: Bedrock part of the Mahantango Formation
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	Angle DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850



Bell Bend NPP			PROJECT NO. 07-3891
	LOG OF BORING NO. B-302		
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) CRCOVERY (ft.)	COORDINATES N 339243.091 E 2405420.594	SYMBOL	
LEVATION FEET MSL DEPTH (FEET) AMPLE NG AWN/6" & (DWW/6" & (DWW/	SURFACE EL: 668.31	SS S	REMARKS
SAS	DESCRIPTION	nscs	
252— 254—			: Bedrock part of the Mahantango Formation
	IG METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		
CHECKED BY: DAR	Angle	DIC C	ME 050
APPROVED BY: RJB DRILLEI	R: Scott Zeien HELPER: Dave Dwyer	RIG: CI	M ∟ 850



Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891	
ELEVATION (FEET MSL)	FË.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL		
EVA:	DEPTH (FEET)	MPLI RUI	8 % F	OVE	R R	SURFACE EL: 668.31	SS	REMARKS	
		SAN	BP 8	REC	Δ.	DESCRIPTION	nsc		
DATE	264 — 266 — 268 — 270 — 272 — 274 — 276 — 3TARTED	R-26	99% (99%)	9.9		Siltstone- Hard, dark gray (N3), fresh, unfractured, contains veins of calcite and fossils at 270.5' - 275.0', encountered breccia zone at 275.0', slight reaction to HCI.	NO	Special Care Sample 270.5'-272.3'.	
	COMPLE					DEPTH: N/A DATE/TIME: N/A	110	Mahantango Formation	
FIELD GEOLOGIST: RAK						LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree			
	KED BY:		AR			Angle			
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	:: CME 850	
DRILL	ING CO.:	Terraco	n						



Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL	
ET I	DEPTH (FEET)	APLE RUN	W/6' 8 F (RG	OVE	PROFILE	SURFACE EL: 668.31	SSY	REMARKS
		SAN	BLO OR &	REC		DESCRIPTION	USC	
	278		96% (93%)	9.1		Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, slightly calcareous vein at 281.4' - 282.1' along bedding plane, slight reaction to HCl. Siltstone- Hard, dark gray (N3), slightly fractured, fresh, fractured zone from 290.0' to 290.6', noncalcareous, no reaction to HCl. DEPTH: +3.0 DATE/TIME: 9/15/07 DEPTH: N/A DATE/TIME: 9/15/07		TES: Bedrock part of the Mahantango Formation
						LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		3
FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree CHECKED BY: DAR Angle								
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG:	: CME 850
	ING CO.:							



Selection Sele	Ball B	Bell Bend NPP PROJECT NO. 07-3891										
294 — R-29	Bell B	ena NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891			
294 — R-29	TION MSL)	HE:	N N N O N O	" & (N) REC. 2D)	:RY (ft.)	ILE		/MBOL				
294 — R-29	EVA EET	DEP (FEE	MPL RUI	3W/6 7 % 1 8 (RC	OVE	ROF	SURFACE EL: 668.31	S S	REMARKS			
R-29 R-29 R-29 R-30 R-30			SA	BLC	REC	"	DESCRIPTION	OSC				
FIELD GEOLOGIST: RAK CHECKED BY: DAR APPROVED BY: RJB DRILLER: Scott Zeien RIG: CME 850	I	296 — 298 — 300 — 302 — 304 — 306 — 306 — STARTED	R-30	99% (90%)	9.9	1	and pyrite, some pyrite perpendicular to bedding plane from 304.0' to 310.0'. DEPTH: +3.0 DATE/TIME: 9/15/07		ES: Bedrock part of the			
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850	I								Mahantango Formation			
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850						DRILI	LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle					
· · · · · · · · · · · · · · · · · · ·						DRILL		RIG.	CME 850			
							The End Sure Swyon					



Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	FF	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339243.091 E 2405420.594	SYMBOL	
EVAT	DEPTH (FEET)	APLE RUN	W/6" % F	JAVE	PROFILE	SURFACE EL: 668.31	SSY	REMARKS
ELE (7E		SAN	BLO OR 8	REC	<u> </u>	DESCRIPTION	nscs	
DATE	308 — 310 — 312 — 314 — 316 — 318 — 320 — 320 — 3314 — 320 — 3314 —	R-31	100% (87%) 96% (91%)	5.5 9.6	GWL	Siltstone- Hard, dark gray (N3), fresh, slightly fractured, fossiliferous, noncalcareous, no reaction to HCI. Siltstone- Hard, dark gray (N3), fresh, slightly fractured, fossiliferous, contains calcite veins at 322.5 to 322.7' perpendicular to bedding plane, slight reaction to HCI.		Special Care Sample 317.3' - 318.8'. TES: Bedrock part of the
DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: RAK					1	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree		Mahantango Formation
	KED BY:		AR			Angle		
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850
DRILL	ING CO.:	Terraco	n					



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LOG OF BORING NO. I		ROJECT NO. 07-3691							
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339243.091 E 240542	1 € 1								
DEPTH (FEET) MMPLE N N R RUN N R RUN N R REG RQD)	N 339243.091 E 240542	(S F	REMARKS							
	DESCRIPTION	nso								
324 — 324 — 326 — 328 — R-33 100% (99%) 5.00 330 — 332 — 334 — 334 — 334 — 336 — R-34 100% (100%) 10.00 10	Siltstone- Hard, dark gray (N3), fresh, very sl at 327.2', slightly calcareous, slight reaction to veins of calcite, fossiliferous, calcareous, reaction of calcite, fossilife	ghtly fractured with tion to HCl. NOTES: Bedrock Mahanta	s part of the ango Formation							
APPROVED BY: RJB	RILLER: Scott Zeien HELPER: Dav	e Dwyer RIG: CME 850								
DRILLING CO.: Terracon										



Bell B	end NPP					LOG OF BORING NO. B-302		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339243.091 E 2405420.594	USCS SYMBOL	
EVA'	DEPTH (FEET)	MPLE RUI	% % F % (RC	OVE	PROFILE	SURFACE EL: 668.31	SSY	REMARKS
日 日 日 日		SAI	BLO OF	REC	-	DESCRIPTION	nsc	
327.8	342 — 344 — 346 — 348 — 350 —	R-35	99% (97%)	9.9		340.5' Siltstone- Hard, dark gray (N3), fresh, very slightly fractured at 346.9' and 347.7', calcareous, reaction to HCl.		Special Care Sample 342.4' - 344.3'.
DATE STARTED: 9/13/07 DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: RAK					GWL:	: DEPTH: +3.0 DATE/TIME: 9/15/07 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Core Incline Boring at 30 Degree Angle	NO	TES: Bedrock part of the Mahantango Formation
APPRO	KED BY: OVED BY: ING CO.:	: RJI			DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	6: CME 850



	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-303		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	ΞF	. O N O .	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339142.987 E 2405338.529	SYMBOL					
EVA-	DEPTH (FEET)	SAMPLE NO OR RUN NO.	7W/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 664.18		REMARKS				
E E		AS Q	BLC	REC	"	DESCRIPTION	USCS					
	0					Shelby Tube						
	_	U-1		1.9								
	_					2.0'						
662.2	2 —					Shelby Tube	SM					
	_	U-2		1.0		Silty Sand (SM)						
	_											
000.0	_					4.0'						
660.2	4 —				119551 61 51 11	Well Graded Sand with Silt and Gravel (SW-SM) - 80% sand, 15% gravel, 5% silt, subrounded, fine to coarse gravel, hard, subrounded	sw- sm					
		S-1	8-8 10 (18)	1.0	Page"	fine to coarse sand, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), no reaction to HCL, medium						
			(10)			dense, moist.						
	6 —				13.19.199 1891.199 1891.199		SW- SM					
	6—	S-2	10-9 8 (17)	0.9								
657.2			(,			7.0'						
057.2						Well-Graded Gravel with Clay and Sand (GW-GC) - 60% sand, 20% gravel, 20% silt, fine to coarse, subangular, elongated and flat,	gw- gc					
	8 —	S-3	13-22 33 (55)	1.3		gravel, hard, fine to coarse, subrounded sand, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet,						
	_					no reaction HCL, very-dense.	O14/					
	_		22.22				GW- GC					
	_	S-4	33-33 28 (61)	1.2								
654.2	10 —					10.0'						
001.2	-		19-19			Well Graded Gravel with Silt and Sand (GW-GM) - 55% gravel, 15% sand, 30% silt, subrounded to subangular, elongated and flat, fine to	gw- gm					
	_	S-5	19 (38)	0.9		medium gravel, hard, fine to coarse, subrounded sand, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10						
	_					YR 4/2), wet, no reaction HCl, dense.	GW-					
	12 —		49-30				GM					
	_	S-6	30 (60)	8.0								
651.2	_					13.0' Well Graded Gravel with Silt and Sand (gw-gm) - 70% gravel, 20%	gw-					
	_		40-49			sand, 10% silt, subangular to subrounded, fine to coarse gravel, hard, subrounded, fine to coarse sand, 1" max size, nonplastic, browninsh	gm					
	14 —	S-7	49 (98)	1.0	红	black (5YR 2/1), moist, no reaction to HCl, very dense.						
649.7	_				然生	14.5'						
	STARTEI COMPLE		/16/07 /17/07		1	: DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 : DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock part of the Mahantango Formation				
	GEOLOG		/MP		1	LING METHOD: SPT/Tricone/NQ Rock Core		•				
	KED BY:		AR									
	OVED BY NG CO.:				DRIL	LER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG	: CME 55 Track				
		. 3 400										



Bell Bend	d NDD							PROJECT NO. 07-3891
Dell Dell	<u> </u>					LOG OF BORING NO. B-303		1 100E01 110.07-3031
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339142.987 E 2405338.529 SURFACE EL: 664.18 DESCRIPTION	USCS SYMBOL	REMARKS
	_ _ 16 —	S-8	24-50/3 (50)	0.6		Well Graded Gravel with Silt and Sand (GW-GM) - 70% gravel, 20% sand, 10% silt, angular to subangular, fine to coarse gravel, hard, subrounded, fine to coarse sand, 1" max size, nonplastic, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to dark gray (N2) to grayish red (5R 4/2), wet, no reaction to HCI, very dense.	gw- gm	
	- - -	S-9	22-30 27 (57)	0.9				
	18 - -	S-10	39-33 32 (65)	1.0			GW- GM	
643.7	20 -	S-11	26 (51)	0.8		20.5' Well-Graded Gravel with Silt and Sand (gw-gm) - 5% cobble, 65% gravel, 20% sand, 10% silt, fine to coarse, angular to subangular	gw-	
642.2	22 —	S-12	40-50/4 (50)	0.1		gravel, hard, fine to coarse, subrounded to angular sand, hard, nonplastic, light gray (N7), wet, no reaction to HCl, very dense, intensely fracrtured.	gw-	
	- - -	S-13	16-19 25 (44)	1.2		Well-Graded Gravel with Silt and Sand (GW-GM) - 70% gravel, 20% sand, 10% silt, fine to coarse, subangular to angular, elongated and flat gravel, hard, fine to coarse, subrounded sand, hard, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction HCl, very dense.	gm	
	24 	S-14	12-23 19 (42)	0.8			GW-	
	_ 26 —	S-15	17-49 27 (76)	0.8		26.5'	GM	
637.7	28 —	S-16	48-17 12 (29)	1.2		Poorly Graded Gravel with Clay and Sand (GP-GC) - 40% gravel, 40% sand, 10% silt and clay, dark gray (N3) to grayish black (N2), wet, no reaction to HCL, medium dense to very dense.	GP- GC	Top of weathered rock at approximately 26.6 ft.
		S-17	26-50/4 (50)	0.8				
DATE CO	DATE STARTED: 9/16/07 DATE COMPLETED: 9/17/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 DEPTH: N/A DATE/TIME: N/A ING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation
APPROVI DRILLING	ED BY:	RJI	В		DRILL	ER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG	: CME 55 Track



Dall 5	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-303		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339142.987 E 2405338.529 SURFACE EL: 664.18	SYMBOL	REMARKS			
E.E.		SAN	BLO OR &	SECC		DESCRIPTION	nscs				
634.7					23/4/2	29.5'					
034.7	30 —	S-18 R-1	50/0 (50) 95% (85%)	1.9		Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, moderately fractured, slight reaction to HCI.					
	32 —					Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, slightly fractured, fossiliferous zone at 35.5', slight reaction to HCl.					
	34 —	R-2	98% (92%)	4.9							
	36 —		100%			Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded very slightly fractured, fossiliferous zone at 41', slight reaction to HCl.					
	40 —	R-3	(94%)	5.0		Siltstone - Dark gray (N3) to grayish black (N2) noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, very slightly fractured, no to very slight reaction to HCI.		Special care sample taken at 43.9'-46.0'			
	-										
DATE :	STARTED); 9,	I /16/07		GWI:	DEPTH: 9.7' DATE/TIME: 9/17/07 16:50	NO	I TES: Bedrock part of the			
	COMPLE					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation			
1	GEOLOG		/MP		DRILI	LING METHOD: SPT/Tricone/NQ Rock Core					
APPRO	KED BY: OVED BY: NG CO.:	RJ			DRILI	LER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG	S: CME 55 Track			



Dell Devel AIRD										
Bell Bend NPP	LOG OF BORING NO. B-303	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339142.987 E 2405338.529	TOBWAS REMARKS								
LEVATIO EET MS DEPTH (FEET) MMPLE N R RUN N R % REC R % REC	N 339142.987 E 2405338.529 SURFACE EL: 664.18	တ် REMARKS								
1 1 1 1 1 -	DESCRIPTION	nscs								
44 R-4 100% 5.0 46 -										
DATE STARTED: 9/16/07 DATE COMPLETED: 9/17/07	GWL: DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation								
FIELD GEOLOGIST: WMP	DRILLING METHOD: SPT/Tricone/NQ Rock Core									
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG: CME 55 Track								



Pall Pand NRD											
Bell Bend NPP	LOG OF BORING NO. B-303	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339142.987 E 2405338.529	NORWAS REMARKS									
DEPTH (FEET) (MPLE N R RUN N R RUN R R % REC	N 339142.987 E 2405338.529 SURFACE EL: 664.18	κ REMARKS									
SA SA OF OIL	DESCRIPTION	osn									
R-7 98% (98%) 4.9 60	Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded very slightly fractured. GWL: DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation									
FIELD GEOLOGIST: WMP CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ Rock Core										
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG: CME 55 Track									



Dell Board NDD											
Bell Bend NPP	LOG OF BORING NO. B-303		PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	СООRDINATES N 339142.987 E 2405338.529	SYMBOL									
DEPTH (FEET) MPLE N R RUN N R W REG R % REG R % REG SOVERY	N 339142.987 E 2405338.529 SURFACE EL: 664.18	SSY	REMARKS								
SA OR OR OR SA SEC	DESCRIPTION	nscs									
74 — R-10 96% (96%) 4.8	Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded very slightly fractured no to little reaction to HCI.		Special care sample taken at 79.0'-81.0'								
78— - R-11 100% (100%) 5.0											
82 —	Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured, no to little reaction to HCl.	;									
84 — R-12 100% 5.0											
	Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured, no to slight reaction to HCI.										
DATE STARTED: 9/16/07 DATE COMPLETED: 9/17/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	GWL: DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIC	G: CME 55 Track								



B.II B.	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-303		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	Ŧ£	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339142.987 E 2405338.529	SYMBOL				
EVA.	DEPTH (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 664.18	S S)	REMARKS			
		S O	BLC	REC		DESCRIPTION	nscs				
567.7	88 — 90 — 92 —	R-13	100% (100%)	5.0		Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured, no to slight reaction to HCl. Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured.		Pyrite, quartz, and calcite, foliated layers at 93.6'.			
562.7	_ _ 102 —					101.5'					
DATE C	DATE STARTED: 9/16/07 DATE COMPLETED: 9/17/07 FIELD GEOLOGIST: WMP					DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO ⁻	TES: Bedrock part of the Mahantango Formation			
APPRO	OVED BY:	RJI	В		DRILI	LER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG	: CME 55 Track			



LOG OF BORING NO. B-303 COORDINATES N 339142807 E 240338.259 SURFACE EL: 664.18 DESCRIPTION 104 — R-16 (60%) 5.0 Sillstone - Dark gray (N3) to graysh black (N2), noncalcareous to very slightly exchanged, moderably hard, blackly to very thickly bedded unincutured. Special care sample taken at 108.8-110.8 AR-17 (60%) 5.0 Sillstone - Dark gray (N3) to graysh black (N2), noncalcareous to very slightly exchanged unincutured. Special care sample taken at 108.8-110.8 Special care sample taken at 108.8-110.8 Special care sample taken at 108.8-110.8 AR-18 (60%) 5.0 Sillstone - Dark gray (N3) to graysh black (N2), noncalcareous to very slightly exchanged unincutured. Special care sample taken at 108.8-110.8 Special care sample taken at 108.8-110.8 Special care sample taken at 108.8-110.8 AR-18 (60%) 5.0 Sillstone - Dark gray (N3) to graysh black (N2), noncalcareous to very slightly exchanged unincutured. Special care sample taken at 108.8-110.8 NOTES: Sedrook part of the Malantiango Formation DATE COMPLETED: SPITTIONENDR ORCK Core DATE TAKE: NAA DATE/TIME: 91770 105.0 DATE COMPLETED: SPITTIONENDR ORCK Core DRILLIEM SETTIONENDR ORCK CORE DRILLIEM SETTIONENDR ORCK CORE DRILLIEM SETTION SPITTIONENDR ORCK CORE									
Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly calcaneous, mostly fresh to very slightly weathered. R-17 100% 15.0 Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly veathered. R-18 100% 100% 15.0 Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly veathered. Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Authorized taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized t	Bell B	end NPP					LOG OF BORING NO. B-303		PROJECT NO. 07-3891
Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly calcaneous, mostly fresh to very slightly weathered. R-17 100% 15.0 Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly veathered. R-18 100% 100% 15.0 Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly veathered. Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Authorized taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized t	rion MSL)	Ξ£.	. NO.	& (N)	RY (ft.)	ILE		MBOL	
Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly calcaneous, mostly fresh to very slightly weathered. R-17 100% 15.0 Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly veathered. R-18 100% 100% 15.0 Sitistone - Dark gray (N3) to gray/sh black (N2), nonceleareous to very slightly veathered. Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized taken at 108.8-110.8' Authorized taken at 108.8-110.8' Authorized taken at 108.8-110.8' Special care sample taken at 108.8-110.8' Authorized t	EVA]	JEP1 (FEE	MPLE RUI	* % F	OVE	ROF	SURFACE EL: 664.18	SSY	REMARKS
Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly catalcaroous, moderately hard, thickly to very thickly bedded unfractured. R-17 150% (100%) 5.0 110 — R-18 150% (100%) 5.0 Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured. 111 — R-18 150% (100%) 5.0 Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very slightly weathered. Sitistone - Dark gray (N3) to grayish black (N2), noncalcaroous to very s	<u> </u>		SAI	BLO GF	REC	_G	DESCRIPTION	nsc	
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Jason Tousley, Mike RIG: CME 55 Track	DATE	106 — 108 — 110 — 1112 — 114 — STARTED COMPLET	R-17 R-18 D: 9/TED: 9/	(96%) 100% (100%) 100% (100%)	5.0	GWL:	very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured. Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 DEPTH: N/A DATE/TIME: N/A	NO.	TES: Bedrock part of the
APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Jason Tousley, Mike RIG: CME 55 Track	1					DRIL	LING METHOD: SPT/Tricone/NQ Rock Core		
						DRIL	LER: Sam Silverman HELPER: Jason Tousley, Mike	RIG	S: CME 55 Track
DRILLING CO.: Terracon Steinbrook						5. (12.	Steinbrook	10	. OWE OF TRUCK



D.II.D	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-303		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	тн (ТЭ	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339142.987 E 2405338.529	SYMBOL				
EVA EET	ОЕРТН (FEET)	MPL R RU	DW/6 R % & (R(SOVE	PROFILE	SURFACE EL: 664.18	SS S	REMARKS			
 		S O	BLC	REC	"	DESCRIPTION	nscs				
						moderately hard, thickly to very thickly bedded very slightly to slightly fractured, no to slight reaction to HCI.					
	118 —										
	110										
	_	D 40	98%	4.0							
	_	R-19	(98%)	4.9							
	_										
	120 —										
	_										
	_										
	400					Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered,					
	122 —					moderately hard, thickly to very thickly bedded unfractured to very slightly fractured, fossiliferous, trace amounts of pyrite, no to slight					
	_					reaction to HCl.					
	_										
	_										
	124 —	R-20	100%	5.0							
	124	N-20	(98%)	3.0							
	_										
	_										
	_										
	126 —										
	_										
						Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered,					
	_					moderately hard, thickly to very thickly bedded unfractured, no to little					
	_					reaction to HCl.					
	128 —										
	_										
		R-21	100%	5.0							
		Γ-ΖΙ	(100%)	3.0							
	130 —										
	_										
	_										
DATE). ()	<u> </u> /16/07	L	GWI	Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to DEPTH: 9.7' DATE/TIME: 9/17/07 16:50	NO	ΓΕS: Bedrock part of the			
1	COMPLE ^T					DEPTH: N/A DATE/TIME: 9/17/07 16:50	'\\	Mahantango Formation			
1	GEOLOG		/MP		1	LING METHOD: SPT/Tricone/NQ Rock Core					
	KED BY:		AR								
	OVED BY:				DRIL	LER: Sam Silverman HELPER: Jason Tousley, Mike	RIG	: CME 55 Track			
DRILL	ING CO.:	Terraco	n			Steinbrook					



D.11 B	end NPP							DDO 1507 NO. 07 2004
Bell B	ena NPP					LOG OF BORING NO. B-303		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339142.987 E 2405338.529	SYMBOL	
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 664.18	SSS	REMARKS
<u> </u>		S O	BLC	REC	"	DESCRIPTION	nscs	
	132 —					very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded unfractured to very		
	_					slightly fractured, fossiliferous, no to little reaction to HCl.		
	_							
	_		100%					
	134 —	R-22	(100%)	5.0				
	_							
	_							
	136 —							
	_					Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to		
	_					very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded very slightly fractured,		
	_					no to slight reaction.		
	138 —							
	_							
	_	R-23	98%	4.9				
			(98%)					
	140 —							
	_							
	_							
	_					Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered,		Special care sample taken at
	142 —					moderately hard, thickly to very thickly bedded moderately to slightly		141.9'-143.5'
	_					fractured, no to slight reaction to HCI.		
			94%					
	144 —	R-24	(94%)	4.7				
	_		(94 /8)					
	_							
	146 —			L_			L	
DATE	STARTED): 9,	/16/07		GWL	: DEPTH: 9.7' DATE/TIME: 9/17/07 16:50	NO	TES: Bedrock part of the
DATE	COMPLE	TED: 9	/17/07		1	: DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
	GEOLOG		/MP		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core		
	KED BY:		AR		<u></u>	LED 0 01 151555 1 5 1 151		OMESSET
	OVED BY: ING CO.:				J DRIL	LER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG	6: CME 55 Track
DUILL	ING CO.:	ı c ııaco	71.1		<u> </u>			



Bell Bend I	NPP				LOG OF BORING NO. B-303		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH	(FEET) SAMPLE NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339142.987 E 2405338.529 SURFACE EL: 664.18	USCS SYMBOL	REMARKS
	o C) 18	8		DESCRIPTION	SN	
148 150 512.7	- - R-2	5 98% (98%)	4.9		Siltstone - Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded very slightly fractured, no to slight reaction to HCl.		
152 154 156 158	4 — - - - 6 — - 8 —				BOTTOM OF BORING 151.5'		
DATE STAF DATE COM FIELD GEO CHECKED	MPLETED: DLOGIST:	9/16/07 9/17/07 WMP DAR		GWL:	DEPTH: 9.7' DATE/TIME: 9/17/07 16:50 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation
APPROVED DRILLING	D BY: F	RJB		DRILI	LER: Sam Silverman HELPER: Jason Tousley, Mike Steinbrook	RIG	: CME 55 Track



Bell Be	end NPP							PROJECT NO. 07-3891
L						LOG OF BORING NO. B-304		
ELEVATION (FEET MSL)	Ξ£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RY (ft.)	ILE	COORDINATES N 339060.244 E 2405438.615	SYMBOL	
LEVA :EET	DEPTH (FEET)	AMPL R RUI	OW/6 R % & (RC	RECOVERY	PROFILE	SURFACE EL: 660.78		REMARKS
回巴		γ <u>α</u>	BLO	REC		DESCRIPTION	nscs	
	0	S-1	2-4 4 (8)	1.5		Clayey Silty Sand (SM-SC) - 40% sand, 60% clay, fine to medium, rounded sand, low plasticity, low dry strength, no dilatancy, low toughness, moderate yellow brown (10YR 5/4) and dusky yellowish brown (10YR 2/2), dry, no reaction to HCL, loose to medium-dense.	sm- sc	
	2 —	S-2	3-4 9 (13)	1.5			SM- SC	
657.8	-	S-3	8-9 34	1.3		3.0' Silty Sand (SM) - 5% gravel, 90% sand, 5% silt, angular to subangular gravel, hard, fine to coarse grained, subangular sand, hard, nonplastic, dark yellowish brown (10 YR 4/2) dry, no reaction to	sm	
	4 —		(43)			HCI, medium dense to dense.	SM	
654.8	-	S-4	10-9 8 (17)	1.4		6.0'		
004.0	6 - -	S-5	15-23 29 (52)	1.5		Clayey Silty Sand with Gravel (SM-SC) - 65% gravel, 25% sand 10% silt, fine to coarse grained, angular to subangular gravel, hard, fine to coarse, subangular sand, 1" max size, nonplastic, dark moderate pink (5R 7/4) and moderate red (5R 5/4), moist, no reaction to HCl, verydense.	SM- SC	
653.3	8 —	S-6	9-17 33 (50)	1.2		7.5' Well Graded Gravel with Sand (gw) - 60% gravel, 40% sand, fine to coarse grained, angular to subangular gravel, hard, fine to coarse, subangular sand, 1" max size, nonplastic, yellowish brown (10YR 4/2), moist, no reaction to HCl, dense.	gw	
651.8	-	S-7	15-18 22	1.2		9.0' Well Graded Sand with Gravel (sw) - 60% sand, 40% gravel, subangular to angular, fine to coarse grained gravel, hard, fine to coarse, subrounded to subangular sand, nonplastic, dark yellowish	sw	
650.3	10 —		(40)			brown (10 YR 4/2) wet, no reaction to HCl, dense. 10.5' Poorly Graded Gravel with Sand (gp) - 10% cobble, 50% gravel, 35%	gp	
	-	S-8	9-50/6" (50)	0.8		sand, 5% silt, very hard sandstone cobble, fine to coarse, subangular to angular gravel, hard, fine to coarse, subangular sand, hard, nonplastic, dark pale brown (5 Y 5/2) wet, no reaction to HCl, dense.		
648.8	12 	S-9	17-22 25 (47)	1.1	0 9 7 7 7 7 9 7 7 9 9 7 9 9 9 9 9 9 9 9	Well Graded Sand with Clay and Gravel (SW-SC) - 70% gravel, 30% sand, fine to coarse grained, angular to subangular, hard, gravel, fine to coarse, angular to subangular, hard sand, nonplastic, pale brown (5Y 5/2) wet, no reaction to HCl, dense.	SW- SC	
647.3	- 14 — -	S-10	27-21 21 (42)	1.1		Well Graded Sand with Gravel (sw) - 15% cobble, 30% gravel, 55% sand, very hard, fine grained, fractured sandstone cobble, fine to coarse, subangular to angular gravel, elongated and flat, hard, fine to coarse grained, subangular sand, hard, nonplastic, pale brown (5Y 5/	sw	
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 9/			GWL	DEPTH: 9.0' DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle	NOT	TES: Bedrock part of the Mahantango Formation
APPRO	OVED BY NG CO.:	: RJ	В		DRIL	LER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850



Bell Be	end NPP							PROJECT NO. 07-3891	
		i				LOG OF BORING NO. B-304			
ELEVATION (FEET MSL)	Ξ£.	. ON S	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339060.244 E 2405438.615	SYMBOL		
LEVA'	DEPTH (FEET)	SAMPLE NO OR RUN NO	OW/6' R % F & (RC	COVE	PROFILE	SURFACE EL: 660.78		REMARKS	
== ==		\% O	BLO	RE(-	DESCRIPTION	nscs		
0.45.0					255	2) to light gray (N7), wet, no reaction to HCl, dense.			
645.8	_					Poorly Graded Gravel with Sand (gp) - 15% cobble, 50% gravel, 30% sand, 5% silt, small sandstone cobbles, fine to coarse grained,	gp		
	16 —	S-11	23-21 19 (40)	1.3		subangular to angular, elongated and flat, gravel, hard, fine to coarse grained, hard, subangular sand, nonplastic, pale brown (5Y 5/2), wet, no reaction HCL, dense.			
	_								
	_	S-12	22-19 24	0.9					
	_	0	(43)	0.0		400			
642.8	18 —					Well Graded Gravel with Silt and Sand (GW-GM) - 15% cobbles,	GW-		
	_	S-13	28-17 12 (29)	1.2		60% gravel, 25% sand, fine to coarse, subangular to angular, hard gravel, fine to coarse, subangular, sand, hard, nonplastic, pale yellowish brown (10YR 6/2) to dusky yellowish brown (10YR 2/2), wet	GM		
044.0			(==)			no reaction HCI, medium dense. 19.5'			
641.3	_					Well Graded Gravel with Silt and Sand (GW-GM) - 90% gravel, 10% sand, fine to coarse grained, hard, angular to subangular, elongated	GW- GM		
	20 —	S-14	15-22 50/6" (72)	1.3		and flat gravel, fine to coarse, hard sand, nonplastic, moderate brown (5Y 4/4) to grayish brown (5YR 3/2), wet, no reaction HCl, dense.			
639.8	_					21' Well Graded Sand with Gravel (sw) - 10% cobbles, 30% gravel, 60%	sw		
	_		22-26			sand, fine to coarse, subangular to angular, hard gravel, fine to coarse, subangular, hard sand, nonplastic, moderate brown (5Y 4/4),			
	22 —	S-15	27 (53)	1.0		wet, no reaction to HCl, very dense.			
638.3	_					22.5'	au.		
	_		22-25			Well Graded Gravel (gw) - 90% gravel, 10% sand, fine to coarse, subangular to angular, hard gravel, fine to coarse, subangular, hard sand, nonplastic, grayish brown (5YR 2/2), wet, no reaction to HCl,	gw		
	_	S-16	50/5" (75)	1.1		very dense.			
	24 —								
	_		0-50/2"						
	_	S-17	0 (50)	0.2					
635.3	_					25.5'	CVA		
000.0	26 —		00.04			Well Graded Gravel with Silt and Sand (GW-GM) - 10% cobbles, 80% gravel, 10% sand, intensely fractured, fresh, medium hard, shale	GW- GM		
	_	S-18	30-21 20 (41)	0.9		cobbles, fine to coarse, hard, subangular to angular gravel, fine to coarse, subangular, sand, nonplastic, moderate brown (5YR 2/2) to dark gray (N3), wet, no reaction to HCl, dense,			
i	_					Well Graded Gravel (gw) - 75% gravel, 20% sand, 5% silt, fine to	gw		
	_ 28 	S-19	20-18 16 (34)	1.0		coarse, subangular to angular, hard, elongated and flat gravel, fine to coarse, subangular sand, nonplastic, moderate brown (5YR 2/2), wet, no reaction to HCl, dense.			
632.3	20					28.5'			
032.3	_		12-8			Well Graded Gravel with Silt and Sand (GW-GM) - 30% gravel, 70% sand, fine to coarse, hard, subangular to angular gravel, fine to coarse, hard, subangular sand, nonplastic, moderate brown (5YR 2/	GW- GM		
DATE:	STARTE	D: 9/	16/07		GWL:	DEPTH: 9.0' DATE/TIME: 9/16/07	NOT	ES: Bedrock part of the	
	COMPLE					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation	
	GEOLOG KED BY:		AK AR		DRILL	ING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle			
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850									
DRILLI	NG CO.:	Terraco	n						



Bell B	end NPP					LOC OF BODING NO. B 204		PROJECT NO. 07-3891
N ()		<u>3</u> <u>3</u>	Î,	′ (ft.)		COORDINATES N 339060.244 E 2405438.615	BOL	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO OR RUN NO.	BLOW/6" & (OR % REC & (RQD)	RECOVERY	PROFILE	SURFACE EL: 660.78	S SYMBOL	REMARKS
		SAN	BLO OF 8	REC		DESCRIPTION	nscs	
	_	S-20	8 (16)	1.1		2), wet, no reaction to HCI, medium dense.		
630.8	30 —					30' Well Graded Gravel with Sand (gw) - 15% cobbles, 60% gravel, 20% sand, 5% silt, medium hard cobbles with shale fragments, fine to	gw	
	_	S-21	23-18 16 (34)	0.6		coarse, hard, subangular to angular gravel, fine to coarse, hard, subangular to subrounded sand, nonplastic, moderate brown (5YR 2/2) to dark gray (N3), wet, no reaction to HCl, dense. 31.5'		
629.3	32 —	S-22	26-21 12 (33)	0.7		Well Graded Gravel (gw) - 100% cobbles, small to large cobbles, hard to very hard, nonplastic, wet, no reaction to HCl, dense.	gw	
627.8	_					33'	00	
	34 —	S-23	10-15 16 (31)	1.2		Clayey Gravel with Sand (GC) - 50% silt, 20% clay, 20% sand 10% gravel, fine to coarse grained, hard gravel, fine to coarse, hard, subangular sand, medium plasticity, medium dry strength, slow dilatancy, low toughness, medium gray (N5) to moderate red (5R 4/6), wet, no reaction to HCl, very-stiff to hard.	GC	
626.3	- -	S-24	10-15 26 (41)	0.9		Silty Clayey Gravel with Sand (GM-GC) - 50% silt, 20% clay, 20% sand 10% gravel, fine to coarse grained, hard gravel, fine to coarse, hard, subangular sand, medium plasticity, medium dry strength, slow dilatancy, low toughness, medium gray (N5) to moderate red (5R 4/6), wet, no reaction to HCl, very-stiff to hard.	GM- GC	
624.8	36 — 	S-25	21-19 19 (38)	1.2		Well Graded Gravel with Sand (gw) - 70% gravel, 25% sand, 5% silt, fine to coarse, hard, angular to subangular gravel, fine to coarse, subangular, hard sand, nonplastic, moderate brown (5 Y/R 4/4) and medium gray (N5), wet, no reaction to HCl, dense.	gw	
623.3	38 —	S-26	15-16 23	1.2		Well Graded Sand with Silt and Gravel (sm) - 65% sand, 25% gravel, 10% silt, fine to coarse, hard, subangular to angular gravel, fine to coarse, subangular, hard sand, nonplastic, medium gray (N5), wet, no	sm	
	_	-	(39)			reaction to HCI, dense.		
621.8	40 —	S-27	29-24 50/6" (74)	1.2		Well Graded Gravel with Silt and Sand (GW-GM) - 20% cobbles, 20% gravel, 50% sand, 10% silt, hard, angular, sandstone cobbles, fine to coarse, hard, angular to subangular gravel, fine to coarse, hard, subangular sand, nonplastic, medium gray (N5) wet, no reaction to HCl, very dense.	GW- GM	
620.3	_	S-28	50/2 (50+)	0.2		Well Graded Gravel (gw) - 100% gravel, fine to coarse gravel, hard, nonplastic, medium gray (N5), wet, no reaction to HCl, very dense.	gw	
618.3	42 —	S-29	50/1 (50+)	0.1		42.5' Siltstone- Moderately hard, dark gray (N3), fresh, slightly fractured, clean, joints at 43.0' and 47.2', noncalcareous, moderately fractured, no reaction to HCl.		
DATE	CTADTC	<u> </u>	16/07		CWI	DEDTH: 0.01 DATE/TIME: 0/46/07	NO	TEC: Dadraak part of the
	STARTEI COMPLE		′16/07 ′18/07			DEPTH: 9.0' DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock part of the Mahantango Formation
	GEOLOG				DRILL	LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle		
1	KED BY: OVED BY		AR B		DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	:: CME 850
	NG CO.:				1			



Bell Be	end NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339060.244 E 2405438.615	SYMBOL	
EVA	DEPTH (FEET)	MPLI RUI	2 % F RC RC	OVE	PROFILE	SURFACE EL: 660.78	SS S	REMARKS
 		SA	BLC	REC		DESCRIPTION	nscs	
DATE	44 — — — — — — — — — — — — — — — — — —	R-1	96% (87%)	5.0	GWI	Siltstone- Moderately hard, dark gray (N3), fresh, moderately to slightly fractured, joints from 52.5' - 52.9', noncalcareous, moderately fractured, no reaction to HCI. Siltstone- Moderately hard, dark gray (N3), fresh moderately to slightly fractured, joints from 59.6'-60.0', noncalcareous, no reaction to HCI.		Preserved sample for laboratory analysis from 52.9' - 53.9'.
DATE	COMPLE	ΓED: 9	/18/07		GWL:	DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
1	GEOLOG KED BY:		AK AR		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle		
	KED BY: OVED BY:				DRIL	LER: Scott Zeien HELPER: Dave Dwyer	RIG	G: CME 850
	ING CO.:							



Bell Bend NPP	LOG OF BORING NO. B-304	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339060.244 E 2405438.615	REMARKS SOSO
LEVATIO EEET MSI DEPTH (FEET) MMPLE N R RUN N S RUN N S REG & (RQD)	의 N 339060.244 E 2405438.615 SURFACE EL: 660.78	κ REMARKS
SA SA OF OIL	DESCRIPTION	osn
R-3 96% 9.6 60	Siltstone- Moderately hard, dark gray (N3), fresh, slightly fractured, possible joints from 66.1-66.3' and 72.8'-72.9', clean, noncalcareous, moderately bedded, no reaction to HCl.	NOTES: Bedrock part of the
DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle	Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850



Bell Be	end NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339060.244 E 2405438.615	SYMBOL					
EVA'	DEPTH (FEET)	MPLE	2 % F	OVE	PROFILE	SURFACE EL: 660.78	(S S)	REMARKS				
 		SA	PEC 8	REC		DESCRIPTION	nscs					
DATE	74 — 76 — 78 — 80 — 82 — 84 — 86 — STARTED	R-5	100% (96%)	10.0		Siltstone- Moderately hard, dark gray (N3), fresh, slightly fractured, joints from 74.5'-74.9', 77.0'-77.2', 83.9'-84.0', contains very light gray/ white intrusion of possible quartz along bedding from 84.1'-84.2', noncalcareous, moderately bedded, no reaction to HCI. Siltstone- Moderately hard, dark gray (N3), fresh, very slightly fractured, joints from 89.5'-89.7', clean, slightly calcareous throughout, contain few pockets of fossils, moderately bedded, slight reaction to HCI.		Fractured zone encountered from 74.5'- 74.9. TES: Bedrock part of the				
I	COMPLE ^T GEOLOG		/18/07 AK		1	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		Mahantango Formation				
CHEC	KED BY:	D	AR			Degree Angle						
	OVED BY:				DRIL	LER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850				
DRILL	ING CO.:	ı erraco	n									



Poll Pond NDD		DDO IECT NO. 07 2004
Bell Bend NPP	LOG OF BORING NO. B-304	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339060.244 E 2405438.615	REMARKS SAWBOL
DEPTH (FEET) MMPLE N R RUN N R RUN N R REGN R ROD) SOVERY	N 339060.244 E 2405438.615 SURFACE EL: 660.78	ြ ဖ် REMARKS
SA OF	DESCRIPTION	osn
88 — R-6 100% (99%) 10.0	Siltstone- Moderately hard, dark gray (N3), fresh, slightly fractured to very slightly fractured, joints from 93.8'- 99.1', rough core texture, slightly calcareous throughout, moderately bedded, reaction to HCl.	NOTES: Bedrock part of the
DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: RAK	GWL: DEPTH: 9.0 DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle	Mahantango Formation
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850



104 -									
Sitistone-Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, ploral at 111.9-112.2°, calcareous, moderately bedded, reaction to HCl. 108— 110— 11	Bell B	end NPP			_		LOG OF BORING NO. B-304		PROJECT NO. 07-3891
Sitistone-Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, ploral at 111.9-112.2°, calcareous, moderately bedded, reaction to HCl. 108— 110— 11	LION MSL)	ΞĒ	. NO.	& (N) REC. 2D)	RY (ft.)	I E		'MBOL	
Sitistone-Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, ploral at 111.9-112.2°, calcareous, moderately bedded, reaction to HCl. 108— 110— 11	EVA'	DEPT (FEE	MPLE RUI	W/6 8 % F (RC	OVE.	ROF	SURFACE EL: 660.78	SSY	REMARKS
Silistone- Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, joint at 111,9*112.2', calcareous, moderately bedded, reaction to HCl. 108— 108— 110— 1114— 114— 116— DATE STARTED. 9/16/07 DATE COMPLETED: 9/16/07 DATE CO			SAN	BLO 9F	REC		DESCRIPTION	nsc	
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850	DATE	106 — 108 — 110 — 1112 — 114 — 116 — STARTED COMPLET	D: 9/ TED: 9/	/16/07 //18/07	10.0	GWL:	fractured, joint at 111.9'-112.2', calcareous, moderately bedded, reaction to HCl. Siltstone- Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, slightly open from 121.1'-121.3', noncalcareous, moderately bedded, no reaction to HCl. DEPTH: 9.0' DATE/TIME: 9/16/07: DEPTH: N/A DATE/TIME: N/A		laboratory analysis from 109.0' - 110.6'. TES: Bedrock part of the
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850						DRILI	LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		
· · · · · · · · · · · · · · · · · · ·						DPII		BIC	: CMF 850
						1 DKILL	LEN. SCOUL ZEIEH HELPER: DAVE DWYER	RIG	D. CIVIE 00U



	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339060.244 E 2405438.615	SYMBOL				
EVA EET	DEPTH (FEET)	MPL RUI	3W/6 7 % 1 8 (RC	OVE.	PROFILE	SURFACE EL: 660.78	S S	REMARKS			
 - -		SA	BLC	REC	"	DESCRIPTION	nscs				
DATE	118 — 120 — 122 — 124 — 126 — 130 — STARTED COMPLE	ΓED: 9		10.0	GWL	Siltstone- Moderately hard to hard, dark gray (N3), fresh, unfractured, noncalcareous, moderately bedded, no reaction to HCI.	NOT	TES: Bedrock part of the Mahantango Formation			
FIELD	GEOLOG	IST: R	AK			LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30					
CHECKED BY: DAR Degree Angle											
	OVED BY:				DRIL	LER: Scott Zeien HELPER: Dave Dwyer	RIG:	: CME 850			
DIXILL	DRILLING CO.: Terracon										



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bellu NFF		LOG OF BORING NO. B-304		PROJECT NO. 01-3031						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)		COORDINATES N 339060.244 E 2405438.615	SYMBOL							
LEVATIO EET MSI DEPTH (FEET) MMPLE N R RUN N R RUN N R RCD)	PROFILE	SURFACE EL: 660.78	(S S)	REMARKS						
SA OFO OFO OFFO OFFO OFFO OFFO OFFO OFFO		DESCRIPTION	nscs							
132 — 134 — 136 — 138 — R-11 99% (99%) 9.9 140 — 142 — 144 — 146 — DATE STARTED: 9/16/07 DATE COMPLETED: 9/18/07	GWL: E	Siltstone- Moderately hard to hard, dark gray (N3), fresh, slightly open, very slightly fractured, contains fine sand seam at 136.6' and rough fracture from 144.3'-144.5', moderately bedded. Siltstone- Hard, dark gray (N3), fresh, slightly fractured, slightly open, calcareous, microfaulted inclusions from 148.4'-148.6' and fracture zone from 153.5'-153.6', moderately bedded, reaction to HCI. DEPTH: 9.0' DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: N/A NG METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30	NOTES	S: Bedrock part of the Mahantango Formation						
FIELD GEOLOGIST: RAK CHECKED BY: DAR										
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLE	Degree Angle ER: Scott Zeien HELPER: Dave Dwyer	RIG: (CME 850						



D.11.D	Bell Bend NPP PROJECT NO. 07-3891											
Bell B	end NPP		-			LOG OF BORING NO. B-304		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339060.244 E 2405438.615	USCS SYMBOL					
EVA	DEPTH (FEET)	MPLI RUI	2 % I	OVE	PROFILE	SURFACE EL: 660.78	S S	REMARKS				
급 		SA	BLC	REC		DESCRIPTION	OSC					
	148 — 150 — 152 — 154 — 156 — 160 — 160 —	R-12	100% (93%)	10.0		Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, contains a slightly calcareous intrusion at 156.6' along bedding plane, very slightly calcareous.						
1	STARTED COMPLET		/16/07 /18/07			DEPTH: 9.0' DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock part of the Mahantango Formation				
1	GEOLOG		AK			ING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		• • • • • •				
CHEC	KED BY:	D	AR			Degree Angle						
	OVED BY:				DRILI	ER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850				
DKILL	ING CO.:	DRILLING CO.: Terracon										



Ball B	Bell Bend NPP PROJECT NO. 07-3891												
Bell B	ena NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891					
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339060.244 E 2405438.615	SYMBOL	DEMON(0)					
EVA	DEPTH (FEET)	MPLI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 660.78	S S	REMARKS					
 - -		SA	BLC	REC		DESCRIPTION	nscs						
1	162 — 164 — 166 — 170 — 172 — 174 — STARTED COMPLET		100% (99%) 100% (99%)	5.0	1	Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, contains calcareous intrusion along bedding plane from 165.6'-166.4', moderately bedded, rock very slightly calcareous. Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, contains slightly calcareous intrusion at 171.7', rock very slightly calcareous, moderately bedded, slight reaction to HCl. Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, very thin fractures, very slightly calcareous, moderately bedded, slight reaction to HCl. DEPTH: 9.0' DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: 9/16/07		Preserved sample for laboratory analysis from 170.0' - 171.5'.					
1	GEOLOG		AK		1	LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		•					
CHEC	CHECKED BY: DAR Degree Angle												
	OVED BY:				DRIL	LER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850					
DKILL	ING CO.:	rerraco	DRILLING CO.: Terracon										



Poll Pand NDD											
Bell Bend NPP	LOG OF BORING NO. B-304	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339060.244 E 2405438.615	REMARKS SOSO									
LEVATIO DEPTH (FEET) MMPLE N R RUN N R RUN N R REC R ROD)	N 339060.244 E 2405438.615 SURFACE EL: 660.78	κ REMARKS									
SA OF OI BLC	DESCRIPTION	osn									
176 — R-16 100% 5.0 178 —	Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, very thin fractures, moderately bedded. Siltstone- Hard dark gray (N3), very slightly fractured, fresh, very thin fractures, contains few fossils and fracture zone 190.3' - 190.5',										
DATE STARTED: 9/16/07 DATE COMPLETED: 9/18/07	slightly calcareous, reaction to HCl. GWL: DEPTH: 9.0' DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation									
FIELD GEOLOGIST: RAK	DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle										
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850									



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LOG OF BORING NO. B-304	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 339060.244 E 2405438.615	TO BWAS REMARKS								
DEPTH (FEET) (MPLE N R RUN N R RUN N R REGE ROD) (COVERY)	N 339060.244 E 2405438.615	တ် REMARKS								
SA SA OF	DESCRIPTION	USCS								
192 — 194 — R-18 100% (96%) 10.0	Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, noncalcareous, moderately bedded, no reaction to HCl. Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, GWL: DEPTH: 9.0' DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle	NOTES: Bedrock part of the Mahantango Formation								
APPROVED BY: RJB	DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850								
DRILLING CO.: Terracon										



	Bell Bend NPP PROJECT NO. 07-3891										
Reli P	ena NPP					LOG OF BORING NO. B-304		PKUJECI NU. U/-3091			
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 -	COORDINATES N 339060.244 E 2405438.615	USCS SYMBOL				
EVA	DEPTH (FEET)	MPLE	3W/6' R % I 8 (RC	OVE	PROFILE	SURFACE EL: 660.78	(8.8)	REMARKS			
급 (SA OF	BLC	REC	"_	DESCRIPTION)SN				
	206 — 208 — 210 — 212 — 214 — 216 — 218 — 3 STARTED	R-20	99% (95%)	9.9		Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, noncalcareous, moderately bedded, no reaction to HCI.		S: Bedrock part of the			
I	COMPLET GEOLOG		/18/07 AK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		Mahantango Formation			
CHEC	KED BY:	D	AR			Degree Angle	DIC:	CME 850			
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850			



Bell B	end NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	ITH (F:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339060.244 E 2405438.615	USCS SYMBOL					
EVA'	DEPTH (FEET)	MPLE	W/6' 8 % F (RC	OVE	PROFILE	SURFACE EL: 660.78	SSY	REMARKS				
d f		SAI	BLC	REC		DESCRIPTION	nsc					
	220 — 222 — 224 — 226 — 228 — 230 — 232 — 232 — 234 — 334 — STARTED		100% (100%)	10.0		Siltstone- Hard dark gray (N3), fresh, unfractured, non calcareous, moderately bedded, no reaction to HCl.	NO	Preserved sample for laboratory analysis from 230.3' - 232.3'.				
I	COMPLE ^T GEOLOG		/18/07 AK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		Mahantango Formation				
CHECKED BY: DAR Degree Angle												
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	6: CME 850				
DKILL	DRILLING CO.: Terracon											



COORDINATE COO											
236 — 242 — 244 — 246 — 248 —	Bell B	end NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891		
236 — 242 — 244 — 246 — 248 —	TION MSL)	HE.	N NO.	" & (N) REC. AD)	:RY (ft.)	ILE		YMBOL			
236 — 242 — 244 — 246 — 248 —	EVA EET	DEP (FEE	MPL	2W/6 R % 8 (R(OVE	ROF	SURFACE EL: 660.78	SS S	REMARKS		
238 — R-23 100% (100%) 242 — 244 — 244 — 246 — 248 —	H) EL		SA	BLC	REC		DESCRIPTION	OSC			
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850		238 — 240 — 242 — 244 — 246 — 248 — STARTED	······	(100%)			Siltstone- Hard dark gray (N3), fresh, unfractured, non calcareous, moderately bedded.	NOT	ES: Bedrock part of the Mahantango Formation		
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850							LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30				
· · · · · · · · · · · · · · · · · · ·	STEGRED BT. BAR								CME 850		
							LEK: Scott Zeien HELPEK: Dave Dwyer	KIG:	CIVIE 85U		



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP	LOG OF BORING NO. B-304	PROJECT NO. 07-3091									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339060.244 E 2405438.615	REMARKS REMARKS									
LEVATIO TEET MSI DEPTH (FEET) NMPLE N R RUN N R RUN N R REG R RQD)	N 339060.244 E 2405438.615 SURFACE EL: 660.78	REMARKS									
SA OF OF REC	DESCRIPTION	OSO									
R-24 100% 10.0 10.0 250 — R-24 100% 10.0 10.	Siltstone- Hard, dark gray (N3), fresh, unfractured, slightly calcareous, moderately bedded, slight reaction to HCI.	NOTES: Bedrock part of the Mahantango Formation									
DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: RAK	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30	Manantango i omiation									
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	Degree Angle DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850									



Bell B	end NPP					LOG OF BORING NO. B-304		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	Ξ£	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	I E	COORDINATES N 339060.244 E 2405438.615	SYMBOL	
EVA] EET I	DEPTH (FEET)	MPLE	% % F (RC	OVE	PROFILE	SURFACE EL: 660.78	SSY	REMARKS
		SAI	BLO P.S.	REC		DESCRIPTION	uscs (
	264 — 266 — 268 — 270 — 272 — 274 — 276 — 3 STARTED		100% (83%)	10.0	GWL:	Siltstone- Hard, dark gray (N3), fresh, slightly fractured, clean, fractured at 267.8'-268.0', contains possible ripple marks, moderately bedded. Shale: Hard dark gray (N3), fresh, slightly fractured, very thin, fractured from 277.3' - 278.2' along bedding and 280.9'.	NO	Preserved sample for laboratory analysis from 272.4' - 274.6'. TES: Bedrock part of the Mahantango Formation
FIELD	GEOLOG	IST: R	RAK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		g
	KED BY:		AR		<u> </u>	Degree Angle	Bic	0145 050
	OVED BY:				DRILL	LER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850
NKILL	ING CO.:	rerraco	41					



	B UB LINDS										
Bell B	end NPP				· .	LOG OF BORING NO. B-304		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339060.244 E 2405438.615	USCS SYMBOL				
EVA	DEPTH (FEET)	MPLI	2 % F	OVE	PROFILE	SURFACE EL: 660.78	SS	REMARKS			
d E		SA	BLC	REC		DESCRIPTION	OSO				
1	278		100% (83%)	10.0		Siltstone: Hard, dark gray (N3), fresh, very slightly fractured, micro faulting occurring from 292.4' slightly calcareous, normal fracturing at 293.6' and 294.6', moderately bedded, slight reaction to HCI.		ES: Bedrock part of the			
1	COMPLE ^T GEOLOG		18/07 AK			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		Mahantango Formation			
	KED BY:		AR AR		DKILL	Degree Angle					
APPR	OVED BY:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG:	CME 850			
DRILL	ING CO.:	I erraco	n								



Bell Bend NPP PROJECT NO. 07-3891										
De.: 2	· · · ·		•			LOG OF BORING NO. B-304		1 1100201 110.07 000.		
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 339060.244 E 2405438.615	SYMBOL			
EVA:	DEPTH (FEET)	MPLE	NW/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 660.78	S SY	REMARKS		
∃ F.		S O	BLC	REC		DESCRIPTION	nscs			
DATE	294 — 296 — 298 — 300 — 302 — 304 — 306 — STARTED COMPLET GEOLOG	ΓED: 9/	100% (99%)	10.0	GWL:	Siltstone- Hard, dark gray, fresh, very slightly fractured, fractured zones at 296.0' - 296.2' and 299.8' - 299.9', moderately bedded, slightly calcareous. Siltstone- Hard, dark gray (N3), fresh, very slightly fractured, fractured zones at 307.0', slightly calcareous, moderately bedded, slight reaction to HCl. DEPTH: 9.0' DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: 9/16/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		Preserved sample for laboratory analysis from 304.5' - 306.0'.		
CHEC	FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 CHECKED BY: DAR Degree Angle									
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Dave Dwyer	RIG	6: CME 850		
DIVILL	40 00	TOTTACO	11		<u> </u>					



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bellu NFF	LOG OF BORING NO. B-304	PROJECT NO. 01-3031									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339060.244 E 2405438.615	NSCS SYMBOL REMARKS									
DEPTH (FEET) MMPLE N R RUN N R RUN N R REGN R ROD) SOVERY	N 339060.244 E 2405438.615 SURFACE EL: 660.78	κ REMARKS									
SA SA OF OIL	DESCRIPTION										
308 — R-30 100% 10.0 10.0 310 — R-31 100% 10.0 318 — R-31 100% 10.0 320 — R-31 100% 10.0	Siltstone- Hard, dark gray (N3), fresh, unfractured, noncalcareous, moderately bedded, no reaction to HCl. GWL: DEPTH: 9.0' DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation									
FIELD GEOLOGIST: RAK	DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30										
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	Degree Angle DRILLER: Scott Zeien HELPER: Dave Dwyer	RIG: CME 850									



Bell Bend NPP PROJECT NO. 07-3891										
LOG OF BORING NO. B-304		PROJECT NO. 07-3891								
COORDINATES N 339060.244 E 2405438.615 SURFACE EL: 660.78 WE COVERY (#) DESCRIPTION DESCRIPTION	SYMBOL									
N 339060.244 E 2405438.615 N 339060.244 E 2405438.615 SURFACE EL: 660.78	SS	REMARKS								
DESCRIPTION	NSCS									
324 — 328 — 328 — 330 — R-32 100% 10.0 330 — 331 — 332 — 333 — 334 — 336 — ATE STARTED: 9/16/07 ATE COMPLETED: 9/18/07 ATE COMPLETED: 9/18/07 BLD GEOLOGIST: RAK BCKED BY: DAR BUILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30 Degree Angle Degree Angle	NC	Preserved sample for laboratory analysis from 336.7' - 338.2'. DTES: Bedrock part of the Mahantango Formation								
PPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer	RIC	G: CME 850								
RILLING CO.: Terracon										



Second S	Bell Be	Bell Bend NPP PROJECT NO. 07-3891										
348 — R-33 (94%) 10.0 Siltstone-Hard, dark gray (N3), fresh, slightly fractured, fractures at 336.7 and 340.2′, rough along fractures. 346 — R-34 (100%) 5.5 Siltstone-Hard, dark gray (N3), fresh, unfractured. 348 — BOTTOM OF BORING 350′ BOTTOM OF BORING 350′ BOTTOM OF BORING 350′ DATE STARTED: 9/16/07 GWL: DEPTH: 9.0′ DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A BORILONG SPIT/Ironen/NQ Rock Core Incline Boring at 30 Final part of the Mahantango Formation					1		LOG OF BORING NO. B-304	,	. 1.00201 110.07 0001			
348 — R-33 (94%) 10.0 Siltstone-Hard, dark gray (N3), fresh, slightly fractured, fractures at 336.7 and 340.2′, rough along fractures. 346 — R-34 (100%) 5.5 Siltstone-Hard, dark gray (N3), fresh, unfractured. 348 — BOTTOM OF BORING 350′ BOTTOM OF BORING 350′ BOTTOM OF BORING 350′ DATE STARTED: 9/16/07 GWL: DEPTH: 9.0′ DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A BORILONG SPIT/Ironen/NQ Rock Core Incline Boring at 30 Final part of the Mahantango Formation	TION MSL)	TH (T:	N N NO .	" & (N) ZEC. 2D)	RY (ft.)	ורב		/MBOL				
348 — R-33 (94%) 10.0 Siltstone-Hard, dark gray (N3), fresh, slightly fractured, fractures at 336.7 and 340.2′, rough along fractures. 346 — R-34 (100%) 5.5 Siltstone-Hard, dark gray (N3), fresh, unfractured. 348 — BOTTOM OF BORING 350′ BOTTOM OF BORING 350′ BOTTOM OF BORING 350′ DATE STARTED: 9/16/07 GWL: DEPTH: 9.0′ DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: N/A BORILONG SPIT/Ironen/NQ Rock Core Incline Boring at 30 Final part of the Mahantango Formation	EVA:	DEP'	MPLI	2 % F R R R R	OVE	ROF	SURFACE EL: 660.78	SSS)	REMARKS			
344 — 344 — 310.0% (100%) 5.5 Siltstone- Hard, dark gray (N3), fresh, slightly fractured, fractures at 336.7 and 340.2°, rough along fractures. 310.8 350 — BOTTOM OF BORING 350' DATE STARTED: 9/18/07 GWL: DEPTH: 9.0° DATE/TIME: 9/16/07 GWL: DEPTH: N/A DATE/TIME: 19/16/07 Mahantango Formation	EL (F		SA	BLC	REC		DESCRIPTION	OSC				
DATE STARTED: 9/16/07 DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: RAK BOTTOM OF BORING 350' BOTTOM OF BORING 350' DATE/TIME: 9/16/07 DATE/TIME: 9/16/07 DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A DATE/TIME: N/A		340 — 342 — 344 — 346 — 348 —		100%			336.7' and 340.2', rough along fractures.					
DATE COMPLETED: 9/18/07 GWL: DEPTH: N/A DATE/TIME: N/A Mahantango Formation FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30	0.0.0	_					BOTTOM OF BORING 350'					
DATE COMPLETED: 9/18/07 GWL: DEPTH: N/A DATE/TIME: N/A Mahantango Formation FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30		_										
FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rock Core Incline Boring at 30								NOT	FES: Bedrock part of the Mahantango Formation			
CHECKED BY: DAR Degree Angle							Degree Angle					
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Dave Dwyer RIG: CME 850	APPRO	OVED BY:	RJ	В		DRIL	ER: Scott Zeien HELPER: Dave Dwyer	RIG	: CME 850			
DRILLING CO.: Terracon	DRILLI	ING CO.:	Terraco	n								



Bell Bend NPP PROJECT NO. 07-3891											
						LOG OF BORING NO. B-305					
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339160.185	S SYMBOL	REMARKS			
E (FE	_	SAI	BLC OF	REC	-	DESCRIPTION	nscs				
666.8	0 -	S-1	4-5 5 (10)	1.3		Sandy Silt (ml) - 5% gravel, 55% silt, 40% sand, subrounded to subangular, spherical, fine to coarse gravel, moderate hardness, fine to coarse, rounded sand, low plasticity, low dry strength, slow dilatancy, low toughness, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), odor of manure, moist, no reaction to HCl, loose.	ml				
665.3	2 —	S-2	10-10 3 (13)	0.9		Poorly Graded Gravel with Silt and Sand (GP-GM) - 35% gravel, 40% silt, 25% sand, subrounded to subangular, spherical, fine to coarse gravel, moderate hardness, fine to coarse, rounded sand, low plasticity, low dry strength, slow dilatancy, low toughness, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), odor of manure, moist, no reaction to HCl, medium-dense.	GP- GM				
003.3	4 	S-3	15-25 22 (47)	0.9		Well-Graded Sand with Silt and Gravel (SW-SM) - 50% gravel, 40% sand, 10% silt, fine to coarse, subrounded to subangular, spherical gravel, fine to coarse, subrounded to subangular sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), moist, no reaction to HCl, dense to very-dense.	SW- SM				
662.3	- - 6 	S-4	20-20 32 (52)	1.2		6.0' Well Graded Gravel with Clay and Sand (GW-GC) - 50% gravel, 40%	GW-	Switched to mud rotary			
002.0	_	S-5	30-35 25 (60)	0.9		sand, 10% silt and clay, fine to coarse gravel, fine to coarse sand, dark yellowish brown (10YR 4/2), moist, no reaction to HCL, very dense.	GC	Owneried to midd rotary			
	8 —	S-6	40-33 40 (73)	0.0		No Recovery					
657.8	10 	S-7	22-24 30 (54)	1.3		10.5'					
007.0	-	S-8	23-30 30 (60)	1.3		Well-Graded Gravel with Clay and Sand (GW-GC) - 40% gravel, 50% sand, 10% silt, subrounded to subangular, spherical, fine to coarse gravel, fine to coarse, subrounded to subangular sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), moist, no reaction to HCl, dense to very-dense.	gw- gc				
	12 —	S-9	20-27 24 (51)	1.2		delise to very-delise.	GW- GC				
	14 — 	S-10	21-21 16 (37)	1.1							
DATE (STARTED COMPLET GEOLOG KED BY:	TED: 9/ IST: W	/13/07 /15/07 /MP AR		GWL:	DEPTH: 14.9' DATE/TIME: 15:30 on 9/15/07 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRILL	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	: CME 55 Track			



Bell Be	nd NPP							PROJECT NO. 07-3891
ļ.,		ı				LOG OF BORING NO. B-305		
ELEVATION (FEET MSL)	H (i	N NO.	BLOW/6" & (N) OR % REC. & (RQD)	:RY (ft.)		COORDINATES N 339160.185 E 2405520.631	SYMBOL	
LEVA :EET	DEPTH (FEET)	SAMPLE NO OR RUN NO	SLOW/6" & (OR % REC & (RQD)	RECOVERY	PROFILE	SURFACE EL: 668.32		REMARKS
∃ £)		<i>\$</i> □	BLO	RE		DESCRIPTION	nscs	
653.3	_					15.0' Well Graded Gravel with Clay and Sand (GW-GC), 70% gravel, 15%	gw-	
	_ 16 —	S-11	30-50/.5 (50)	0.5		sand, 15% clay, coarse, subrounded to rounded, spherical gravel, hard, fine to coarse, angular sand, 1.5" max size, medium plasticity, low dry strength, no dilatancy, low toughness, moderate yellowish brown (10YR 5/4), moist, no reaction to HCL, very dense.	gc	
	_						GW- GC	
	_	S-12	12-22 33 (55)	8.0		40.01		
650.3	18 	S-13	22-41 26 (67)	0.9		Well Graded Gravel with Sand (gw) - 80% gravel, 15% sand, 5% clay, coarse, subrounded to rounded, spherical gravel, hard, fine to coarse, angular sand, 1.5" max size, nonplastic, moderate yellowish brown (10YR 5/4), moist, no reaction to HCL, very dense.	gw	
	_							
	20 —	S-14	70-49 45 (94)	0.9				
647.3	22 —	S-15	15-40 45 (85)	0.9		Well Graded Gravel with Sand (gw) - 85% cobble/gravel, 10% sand, 5% silt, subrounded to subangular, elongated, fine to coarse gravel, subrounded to subangular, fine to coarse sand, 0.9" max size, moderately soft, nonplastic, pale yellowish brown (10 YR 6/2) to dark yellowish brown (10 YR 4/2), wet, no reaction HCl, very-dense.	gw	
645.8	- -	S-16	13-17 17 (34)	0.9		Well-Graded Gravel with Sand (gw) - 5% cobbles, 60% gravel, 30% sand, 5% silt, subrounded to subangular, fine to coarse, spherical gravel, fine to coarse, subrounded to subangular sand, 2.0" max size, moderately hard, nonplastic, dark yellowish brown (10 YR 4/2) with dark reddish brown (10 YR 3/4) wet, no reaction to HCl, dense, fine	gw	
644.3	24 —	S-17	10-11 12 (23)	0.4	61 55116 61 55116 61 55116 62 611 10 62 11 10 62	grained sandstone cobble. Well-Graded Sand with Silt and Gravel (sw-sm) - 25% gravel, 65% sand, 10% silt, fine to coarse, subangular gravel, fine to coarse, subrounded to subangular sand, 1.0" max size, moderately hard, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2) wet, no reaction to HCI, medium-dense. No Recovery	sw- sm	
	26 —	S-18	3-4 4 (8)	0.0				
641.3	28 —	S-19	6-8 12 (20)	1.3	6 10 21 2 6 10 21 2 6 10 20 6 10 20	Well-Graded Sand with Silt and Gravel (sw-sm) - 20% gravel, 70% sand, 10% sit, subrounded to subangular, fine to coarse gravel, spherical, fine to coarse, subrounded to subangular sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown (10	sw- sm	
639.8			7-11			YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium-dense. 28.5' Well-Graded Gravel with Silt and Sand (GW-GC) - 40% gravel, 50% sand, 10% sit, subrounded to subangular, fine to coarse gravel,	gw- gc	
DATE S	STARTE	D: 9/	13/07		GWL:	DEPTH: 14.9' DATE/TIME: 15:30 on 9/15/07	NO	TES: Bedrock part of the
DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: WMP						DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
APPRO	(ED BY: OVED BY NG CO.:	: RJI			DRILL	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	: CME 55 Track



Bell Be	Bell Bend NPP LOG OF BORING NO. B-305 PROJECT NO. 07-3891											
		l		$\overline{}$	1			Γ				
NOI (JSL)	ΞC	S S	& (N EC. D)	۲Y (ft.)		COORDINATES N 339160.185 E 2405520.631	SYMBOL					
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO OR RUN NO	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY	PROFILE	SURFACE EL: 668.32		REMARKS				
급단		" -	BLC	REC		DESCRIPTION	nscs					
	-	S-20	15 (26)	1.0		spherical, fine to coarse, subrounded to subangular sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown (10						
	30 —					YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium-dense.	GW- GC					
	_	S-21	11-16 20	0.8			GC					
	_		(36)			31.5'						
636.8	-					Well-Graded Gravel with Silt and Sand (gw-gm) - 60% gravel, 30% sand, 10% silt, subrounded to subangular, fine to coarse gravel,	gw- gm					
	32 —	S-22	11-30 25 (55)	0.5		spherical, subrounded to subangular, fine to coarse sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown (10						
			(88)			YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, dense to very-dense.						
	_		16-20			•						
	34 —	S-23	25 (45)	8.0								
633.8	_					34.5' Well Graded Gravel with Silt and Sand (gw-gm) - 65% gravel, 25%	gw-	Mixed more mud at 34.5'				
	_		16-27			sand, 10% silt, subrounded to subangular, spherical, fine to coarse gravel, rounded to subangular, fine to coarse sand, 1.0" max size,	gm	ivilxed more mad at 54.5				
	_	S-24	48 (75)	0.9		moderate hardness, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, very-						
632.3	36 —				95.	dense. 36.0' Well Graded Sand with Silt and Gravel (SW-SM) - 40% gravel, 50%	SW-					
	-	S-25	16-27 34	0.9	718,119	sand, 10% silt, subrounded to subangular, spherical, fine to coarse gravel, rounded to subangular, fine to coarse sand, 1.0" max size,	SM					
	_	0-25	(61)	0.5		moderate hardness, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, dense	;					
	_				1957:1:9: 1:1:81:88 1:851:169	to very-dense.						
	38 —	S-26	12-16 20	0.8	1000 8							
000.0	_		(36)		1:10:5P	39.0'						
629.3	_					Well-Graded Gravel with Silt and Sand (gw-gm) - 60% gravel, 30% sand, 10% silt, subrounded to subangular, spherical to elongate, fine	gw- gm					
	40 —	S-27	16-24 30 (54)	0.9		to coarse gravel, subrounded to subangular, fine to coarse sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown						
627.8	40 _					(10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, very dense. 40.5'						
027.0	_		12-26			Well-Graded Sand with Silt and Gravel (sw-sm) - 20% gravel, 70% sand, 10% silt, subrounded to subangular, spherical to elongate, fine	sw- sm					
	_	S-28	25 (51)	0.9		to coarse gravel, subrounded to subangular, fine to coarse sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown						
626.3	42 —				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCI, very dense.	GW-					
	_	0 00	20-24	0.0		Well-Graded Gravel with Silt and Sand (GW-GM) - 50% gravel, 40% sand, 10% silt, subrounded to subangular, spherical to elongate, fine	GM					
	-	S-29	29 (53)	8.0		to coarse gravel, subrounded to subangular, fine to coarse sand, 1.0" max size, moderate hardness, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2),dark yellowish brown						
	_	S-30	50/2 (50+)	0.2		(10 YR 4/2), wet, no reaction to HCl, very-dense.						
	STARTE		/13/07		GWL:	DEPTH: 14.9' DATE/TIME: 15:30 on 9/15/07	NO	TES: Bedrock part of the				
	COMPLE GEOLOG		/15/07 /MP		1	DEPTH: DATE/TIME: ING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation				
CHEC	KED BY:	D	AR									
	OVED BY				DRILL	.ER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	6: CME 55 Track				
DIVILLI	. 10 00	1011400			1	· · · · · · · · · · · · · · · · · · ·						



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP					LOG OF BORING NO. B-305		PROJECT NO. 07-3891				
(FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339160.185 E 2405520.631	SYMBOL					
EET MSI EET MSI DEPTH (FEET)	MPL R RU	2W/6 R % (R(OVE	PROFILE	SURFACE EL: 668.32	.S S.	REMARKS				
H (+)	A O	BLC	REC		DESCRIPTION	nscs					
44 — 623.3 — 46 — 48 — 50 —	S-31 R-1	\$0/0 (50+) 100% (80%)	0.0 0.5		Siltstone - Dark gray (3) to grayish black (2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded. Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded. Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered,	1					
52 — - - - 54 —	R-3	100% (42%) 100% (100%)	3.0		wery slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded						
56 — 58 — DATE STARTED: DATE COMPLET FIELD GEOLOGI CHECKED BY:	ED: 9/	100% (100%) /13/07 /15/07 /MP AR	5.0	GWL:	Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded DEPTH: 14.9' DATE/TIME: 15:30 on 9/15/07 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation				
APPROVED BY: DRILLING CO.:	RJ	В		DRILL	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG:	CME 55 Track				



Bell Bend NPP PROJECT NO. 07-3891										
Dell Della NFF	LOG OF BORING NO. B-305	PROJECT NO. 07-3091								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339160.185 E 2405520.631	TO BW KEMARKS								
EET MSI EET MSI DEPTH (FEET) "MPLE N R RUN N R RUN N R R REG R R R REG R R R R R R R R R R R R R R R R R R R	N 339160.185 E 2405520.631 SURFACE EL: 668.32	တ် REMARKS								
SA SA OR	DESCRIPTION	USCS								
60 — R-6 100% 5.0 64 — R-7 100% (100%) 5.0 70 — R-8 100% (100%) 5.0	Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded	Special care sample taken at 67.8'- 69.3'								
DATE STARTED: 9/13/07 DATE COMPLETED: 9/15/07	GWL: DEPTH: 14.9' DATE/TIME: 15:30 on 9/15/07 GWL: DEPTH: DATE/TIME:	NOTES: Bedrock part of the Mahantango Formation								
FIELD GEOLOGIST: WMP CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ Rock Core									
APPROVED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG: CME 55 Track								



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP		LOG OF BORING NO. B-305		PROJECT NO. 07-3891							
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	ILE ILE	COORDINATES N 339160.185 E 2405520.631	SYMBOL								
LEVATIO BEPTH (FEET) NMPLE N R RUN N R RUN N R R REG R ROD)	PROFILE	SURFACE EL: 668.32	(S S)	REMARKS							
SA SA OF		DESCRIPTION	nscs								
74 — - - 76 — - 100%	ver	tstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to ry slightly calcareous, mostly fresh to very slightly weathered, derately hard, thickly to very thickly bedded									
R-9 (100%) 5.0 78 —	ver	istone - Dark gray (N-3) to grayish black (N-2), noncalcareous to ry slightly calcareous, mostly fresh to very slightly weathered, iderately hard, thickly to very thickly bedded									
84 — 84 — 86 — 86 — 7	GWL: DEF	PTH: DATE/TIME:	NOTE	ES: Bedrock part of the Mahantango Formation							
FIELD GEOLOGIST: WMP CHECKED BY: DAR APPROVED BY: RJB		METHOD: SPT/Tricone/NQ Rock Core Sam Silverman HELPER: Mike Steinbrook, Jason	RIG:	CME 55 Track							
DRILLING CO.: Terracon		Tousley									



Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	ella NFF					LOG OF BORING NO. B-305		FROSECT NO. 07-3091			
ELEVATION (FEET MSL)	H.()	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339160.185 E 2405520.631	USCS SYMBOL				
EVA.	DEPTH (FEET)	MPLI	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 668.32	SS S	REMARKS			
EL F		SA	BLC	REC		DESCRIPTION	OSC				
568.6	88 — 90 — 92 — 94 — 96 — 98 — 100 — 98 — 98 — 98 — 98 — 98 — 98 — 98 —	R-12	100% (100%)	5.0		Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded Siltstone - Dark gray (N-3) to grayish black (N-2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded BOTTOM OF BORING 99.7'					
DATE STARTED: 9/13/07 DATE COMPLETED: 9/15/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					GWL:	DEPTH: 14.9' DATE/TIME: 15:30 on 9/15/07 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NOT	TES: Bedrock part of the Mahantango Formation			
	OVED BY: NG CO.:				DRILI	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	: CME 55 Track			



Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE I	COORDINATES N 339313.213 E 2405413.688	SYMBOL				
EET	DEPTH (FEET)	MPLI	2W/6 R % I 8 (R(OVE	PROFILE	SURFACE EL: 669.07	SS:	REMARKS			
月		SA	BIC	REC	"	DESCRIPTION	nscs				
666.1 664.6	2 — 4 —	S-1 S-2	4-6 5 (11) 4-5 21 (26)	1.1	: Y	Sandy Silt (ml) - 20% sand, 50% silt, 30% clay, subangular, spherical, fine sand, soft, 0.02" max size, medium plasticity, medium dry strength, low dilatancy, medium toughness, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), moist, no reaction to HCL, stiff, 3.0' Silty Sand (sm) - 10% cobbles, 75% sand, 15% silt, fine to medium, angular to subrounded sand, moderately hard, nonplastic, moderate yellowish brown (10YR 5/4), moist, no reaction to HCl, medium dense, 4.5' Well Graded Gravel with Sand (gw) - 55% cobbles, 15% gravel, 30%	ml sm	PPT= 1.0 tsf Sandstone cobble encountered at bottom of spoon.			
	6 —	S-3	30-40 47 (87) 21-31 25 (56)	1.4		sand, hard sandstone cobble subrounded to angular, fine to coarse gravel and sand, hard, 3.0" max size, nonplastic, light olive gray (5Y 6/1) to brownish gray (5YR 4/1) to pale yellowish, brown (10YR 6/2), dry, no reaction to HCl, very dense.	9				
658.6	10 —	S-5 S-6	23-29 26 (55)	0.7	職ない。	10.5' Silty Sand with Gravel (sm) - 20% gravel, 60% sand, 20% silt, fine to coarse gravel, spherical to flat, soft, fine to coarse, subrounded to	sm				
657.1	- 12 -	S-7 S-8	22-34 32 (66) 50/3 (50+)	0.2		subangular sand, 0.25" max size, low plasticity, low dry strength, low dilatency, low toughness, dark yellowish brown, (10YR 4/2), moist, no reaction to HCL, dense. 12.0' Well Graded Gravel (gw) - 90% cobbles, 10% gravel, subangular to angular, hard, 3.0" max size, nonplastic, dark yellowish orange (10YR 6/6), wet, no reaction to HCl, very dense.	gw				
DATE (14 — STARTEE COMPLE GEOLOG KED BY:	TED: 10 IST: JL	50/3 (50+) D/8/07 D/10/07 LO	0.25	GWL:	Well Graded Gravel (gw) - 90% cobbles, 10% gravel, fine grained cobble, hard, subangular, gravel, 3.0" max size, hard, nonplastic, yellowish gray (5Y 8/1), wet, no reaction to HCI, very dense. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation			
	OVED BY: NG CO.:				DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck			



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-306	•	
ELEVATION (FEET MSL)	H (F	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	FILE	COORDINATES N 339313.213 E 2405413.688	SYMBOL	DEMARKS.
LEVA :EET	DEPTH (FEET)	AMPL R RU	OW/6	SOVE	PROFILE	SURFACE EL: 669.07	S SO	REMARKS
<u> </u>		<i>/</i> S O	BL	RE		DESCRIPTION	nscs	
654.1	_					15.0' Well Graded Gravel with Sand and Clay (gw-gc) - 60% cobbles, 20%	gw-	Large (1 foot long) sandstone
	- 16 	S-10	28-19 17 (36)	0.8		gravel, 10% sand, 10% clay, subangular to angular, fine to coarse gravel and cobbles, hard, 3.0" max size, nonplastic, yellowish gray (5Y 7/2), wet, no reaction to HCl, very dense.	gc	boulder removed from casing advancer.
652.6	- -	S-11	14-29 22 (51)	0.8		Silty Sand with Gravel (sm) - 15% gravel, 65% sand, 10% silt, 10% clay, fine, subrounded gravel, hard, fine to coarse sand, low plasticy, no dry strength, no dilatancy, no toughness, yellowish gray (5Y 8/1), wet, no reaction to HCl, very dense.	sm	
651.1	18 	S-12	8-16 18 (34)	0.6		Well Graded Gravel with Sand and Clay (gw-gc) - 70% cobbles, 20% sand, 10% clay, fine to coarse, subangular to subrounded sand, hard, nonplastic, grayish brown (5YR 3/2), wet, no reaction to HCl, dense to very dense, contains little dark gray (N3) Shale fragments.	gw- gc	
649.6	20 —	S-13	4-5 50/3 (55)	0.5		Well Graded Gravel with Sand (gw) - 50% cobbles, 5% gravel, 40% sand, 5% clay, fine to coarse, subrounded to subanguar gravel, fine to coarse, subrounded to subangular sand, hard, nonplastic, olive gray (5Y 4/1), wet, no reaction to HCI, very dense, contains little dark gray (N3) Shale fragments.	gw	
647.5	22 — 	S-14 R-1	16-21 50/4 (71) 100%	3.6		Shale- Slight to moderate weathering, dark gray (N3) to grayish black (N2), moderately fractured, iron staining (possibly slickenside) at most fractures, both parallel and perpendicular to bedding plane, thinly bedded at approximately 30-45° angle to core, otherwise core has massive bedding, no reaction to HCl, medium hard.		
	26 —	R-2	100% (68%)	5.0		25.7'-27.4' clay in natural breaks.		
	28 —					Few fossils below 28.0' infilled with calcite		
DATE (STARTEI COMPLE GEOLOG KED BY:	TED: 1	0/8/07 0/10/07 LO AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahantango Formation
APPRO	OVED BY NG CO.:	: RJ	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	6: CME 75 Truck



D.II.D.								DD0 1507 NO 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ΞF	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339313.213 E 2405413.688	SYMBOL	
EVA'	DEPTH (FEET)	MPLE	2 % F R (RC	OVE	PROFILE	SURFACE EL: 669.07	S SY	REMARKS
급민		SA	BLC OF	REC		DESCRIPTION	nscs	
	30 — -	R-3	100% (92%)	5.0		Below 29.5' fresh to slightly weathered, slightly fractured to unfractured.		29.5-30.1' preserved for lab analysis at 0900
	32 —					Shale- Fresh to slightly weathered, dark gray (N3) to grayish black (N2), slightly fractured to unfractured, fractures parallel and		
	34 —	R-4	100%	5.0		perpendicular to bedding, massive bedding, medium hard, does not react to HCI.		
	36 — - - -		(90%)					
	38 —					Intensely fractured to crushed from 37.7-38.0' due to damage when removing from core barrel shoe Few pyrite inclusions-mostly infilling with calcite.		
	40 —	R-5	100% (84%)	5.0		39.7' fracture - edges are slightly micaceous 41.3-42.3' Intensely fractured zone		
	42 - -					Shale- Fresh to slightly weathered, dark gray (N3) to grayish black (N2), very slightly fractured to fractured, fractures parallel and		
						perpendicular to bedding, massive bedding, medium hard, does not		
DATE (STARTED COMPLET GEOLOG KED BY:	TED: 1			GWL	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	ТОИ	FES: Bedrock part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck



D.11.D	I NDD							DD0 1507 NO 07 2004
Bell B	end NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - E	COORDINATES N 339313.213 E 2405413.688	SYMBOL	
EET	DEPTH (FEET)	MPLI R RUI	DW/6 R % F & (RC	COVE	PROFILE	SURFACE EL: 669.07	SS S)	REMARKS
☐ ☐ .		S O	BLC	REC		DESCRIPTION	nscs	
	44 —					react to HCl.		
		R-6	100%	5.0		45 SI Facell care account to account		
	46 —	110	(88%)	0.0		45.5' Fossil zone parallel to core		
	_					46.45' calcite vein parallel to core- micro faulted		
	_							
	_							
	48 —							
	_							
	_							
	50							
	50 —	R-7	100%	5.0		49.0' Rough core texture, slightly calcareous, few fossils infilled with calcite.		
	_	13-7	(100%)	3.0				
	_							
	52 —							
	_					Fractures at 52.4' and 52.9'		
	_					Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh,		
	_					unfractured, sparse fossils, bedding plane only visible at breaks (approximately 30-45° to core), thin bedded, very slight reaction to HCl, rough core surface texture.		
	54 —					nci, rough core surface texture.		
		D 0	98%	4.0				
	56 —	R-8	(98%)	4.9				
	36 —							
	_							
	58 —							
DATE	STARTED). 1	0/8/07		GWI	: DEPTH: N/A DATE/TIME: N/A	NO	ΓΕS: Bedrock part of the
1	COMPLE ^T		0/8/0 <i>7</i> 0/10/07			: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A	'''	Mahantango Formation
	GEOLOG KED BY:		LO AR		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core		
APPR	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck
DRILL	ING CO.:	Terraco	n					



B-# B	! NDD							DDO 1507 NO. 07 2004
Bell Be	end NPP		•	-		LOG OF BORING NO. B-306	·	PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 339313.213 E 2405413.688	USCS SYMBOL	
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I 8 (RC	OVE	PROFILE	SURFACE EL: 669.07	S S	REMARKS
EL (F		SA	BLC	REC	ш	DESCRIPTION	OSC	
	60 — 62 — 64 — 66 — 70 — 72 —	R-10	100% (100%)	5.0 5.0		Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh weathering, unfractured, sparse fossils, rough core surface texture, thinly bedded, very slight reaction to HCl, bedding planes only visible at breaks (approximately 30-45 degree's to core.		
DATE FIELD CHECI	STARTED COMPLE ^T GEOLOG KED BY:	ΓED: 1 IST: JI D	0/8/07 0/10/07 LO AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		TES: Bedrock part of the Mahantango Formation
	OVED BY: ING CO.:				DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	: CME 75 Truck



Dall B.	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	Ε.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339313.213 E 2405413.688	USCS SYMBOL	
EVA)	DEPTH (FEET)	MPLI	2W/6 R % I 8 (RC	OVE	PROFILE	SURFACE EL: 669.07	SS S	REMARKS
 		S O	BLC	REC	"	DESCRIPTION	nsc	
	- 74 -					Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh weathering, very slightly fractured, alternating rough and smooth core texture, thinly bedded, no reaction to HCl.		
	76 — - -	R-12	100%	5.0		73.4' - fracture		
	78 — - - 80 — -	R-13	100%	5.0				
	82 — - - - 84 —					82.2' pyrite inclusion with calcite around the outside. Shale- Medium hard, fresh, unfractured, thinly bedded, no reaction to HCl, color change at 83.5' from medium dark gray (N4) to grayish black (N2), pyrite and calcite pocket at 83.6', smooth core texture		
	86 —	R-14	100% (100%)	5.0				
DATE (STARTED COMPLET	ΓED: 1 IST: JI	LO		GWL	: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation
APPRO	KED BY: OVED BY: NG CO.:	RJ			DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck



D.II.B	I NDD							PD0 IE07 NO. 07 2004
Bell B	end NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	Ŧ£	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339313.213 E 2405413.688	SYMBOL	
EVA	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 669.07	S S	REMARKS
<u> </u>		SA	BLC	REC		DESCRIPTION	SOSN	
	88 —					Shale- Grayish black (N2), medium hard, fresh, very slightly fractured, thinly bedded, smooth core texture, no reaction to HCl.		
	_					Few pyrite veins around 88.8'		
	_							
	90 —							
	_	R-15	100%	5.0				
	_		(94%)	0.0				
	92 —							
	_							
	_							
	_							
	94 —							
	_							
	_							
	_	R-16	100%	5.0		95.1-96.6' Pyrite zone		
	96 —	11-10	(100%)	0.0				
	90							
	_							
	_							
	98 —					Shale, grayish black (N2), medium hard, fresh, very slightly fractured,		
	_					thinly bedded, smooth core texture, no reaction to HCI, flame structures at 98.3', oval pyrite from 100.3'-100.5', fossiliferous.		
	_							
	100 —							
	100 -	D 47	98%	4.0				
	_	R-17	(98%)	4.9				
								101.2-103.0' preserved from
								lab analysis
	102 —							
DATE	STARTED): 10	0/8/07	<u> </u>	GWL	DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock part of the
1	COMPLET					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
1	GEOLOG KED BY:		₋O AR		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core		
	OVED BY:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	S: CME 75 Truck
	ING CO.:		n			·		



Pall Pand NPP		PPO IECT NO. 07 2904
Bell Bend NPP	LOG OF BORING NO. B-306	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339313.213 E 2405413.688	REMARKS REMARKS
LEVATIO DEPTH (FEET) MMPLE N R RUN N R REK R R R R R R R R R R R R R R R R R R R	N 339313.213 E 2405413.688 O SURFACE EL: 669.07	REMARKS
SA OF OF REC	DESCRIPTION	OSO DISCONDINE
104 — R-18 100% 5.0	Shale- Grayish black (N2), medium hard, fresh, thinly bedded, smooth core texture, no reaction to HCI, few pyrite/calcite inclusions.	
108 —	Shale- Grayish black (N2), medium hard, fresh weathering, unfractured, thinly bedded, smooth core texture, no reaction to HCl.	
R-19 100% 5.0	110.2' Calcite vein- horizontal, microfaulted.	
114 — R-20 100% 5.0	113.0-115.6' Pyrite in thin veins parallel to bedding.	
DATE STARTED: 10/8/07 DATE COMPLETED: 10/10/07 FIELD GEOLOGIST: JLO CHECKED BY: DAR	GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: Terry Duncan	RIG: CME 75 Truck



Dall B	end NPP							DDO IECT NO. 07 2004
Bell B	ena NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339313.213 E 2405413.688	USCS SYMBOL	
EVA:	DEPTH (FEET)	MPLE RUN	3.W/6 7.% F 8. (RG	OVE	PROFILE	SURFACE EL: 669.07	S S)	REMARKS
급 		SA	BLC	REC		DESCRIPTION	nsc	
	- 118 -					Shale- Grayish black (N2), medium hard, fresh, unfractured, thinnly bedded, smooth core texture, no reaction to HCl.		
	120 — - -	R-21	100% (96%)	5.0		120.3' Fracture with calcite.		
	122 — — — — 124 — —					123.3' Healed fracture with calcite and pyrite inclusion.		
	126 — — — — — — 128 —	R-22	100% (100%)	5.0		Shale- Grayish black (N2), medium hard, fresh, unfractured, thinly bedded, smooth core texture, no reaction to HCl, sparse pyrite		
	130 —	R-23	100% (92%)	5.0		throughout.		
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	ΓED: 10 IST: Jl	I D/8/07 D/10/07 _O AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	FES: Bedrock part of the Mahantango Formation
APPR	OVED BY: ING CO.:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	: CME 75 Truck



Ball B	end NPP							DDO IECT NO. 07 2004
Bell B	ena NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339313.213 E 2405413.688	SYMBOL	
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 669.07	SSS	REMARKS
<u>п</u> .		S O	BLC	REC		DESCRIPTION	nscs	
	132 —	R-24	100% (96%)	5.0°		Shale- Grayish black (N2), medium hard, fresh, very slightly fractured, thinly bedded, smooth core texture, no reaction to HCI, few pyrite and calcite inclusion. Shale- Grayish black (N2), medium hard, fresh, unfractured, thinly bedded, smooth core texture, no reaction to HCI, few pyrite and calcite inclusions throughout. Shale- Grayish black (N2), medium hard, fresh weathering, unfractured, thinnly bedded, smooth core texture, no reaction to HCI, pyrite inclusions throughout		
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	ΓED: 10 IST: JI	0/8/07 0/10/07 _O AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation
APPR	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck



D.11.D	! NDD							PPO IFOT NO. 07 2004
Bell B	end NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339313.213 E 2405413.688	SYMBOL	
EVA.	ОЕРТН (FEET)	MPLI	DW/6 R % F 8 (RC	OVE	PROFILE	SURFACE EL: 669.07	SS S	REMARKS
<u> </u>		SA	BLC	REC		DESCRIPTION	nscs (
DATE FIELD CHEC	148 — 150 — 152 — 154 — 156 — 158 — 160 — STARTEE COMPLE GEOLOG KED BY:	TED: 10 IST: JI D	90% (90%) 56% (32%) 94% (80%) 0/8/07 0/10/07 O AR	4.5'	GWL:	Shale- Grayish black (N2), medium hard, fresh weathering, very slightly fractured, thinnly bedded, smooth core texture, no reaction to HCI, pyrite inclusions throughout. Fracture at 149.8' Shale- Grayish black (N2), medium hard, fresh weathering, very slightly fractured, thinnly bedded, smooth core texture, no reaction to HCI, many pyrite inclusions throughout, pyrite inclusions very concentrated between 161. 2'-162'. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTI	ES: Bedrock part of the Mahantango Formation
APPR	OVED BY:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck
DRILL	ING CO.:	I erraco	n					



Bell Bend NPP		DDO IECT NO. 07 2904
Bell Bend NPP	LOG OF BORING NO. B-306	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339313.213 E 2405413.688	TO BWAS REMARKS
LEVATIO EET MS DEPTH (FEET) (MPLE N R RUN N R REC R REC R REC R REC R REC	N 339313.213 E 2405413.688 O SURFACE EL: 669.07	S REMARKS
SA OF	DESCRIPTION	nscs
162 — R-30 100% 5.0 166 — R-31 100% 100% 170 — R-31 100% 100% 172 — 174 — 100% DATE STARTED: 10/8/07 100%	Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no bedding structures visible, many small fossil casts infilled with calcide, some pyrite inclusions and thin veins, slight reaction to HCI. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no bedding structures visible, many calcite filled fossil casts throughout, some pyrite inclusions and thin veins, slight reaction to HCI. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation
FIELD GEOLOGIST: JLO CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ Rock Core	
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: Terry Duncan	RIG: CME 75 Truck



DAIL B	end NPP							DDO IECT NO. 07 2904
Bell B	ena NPP					LOG OF BORING NO. B-306		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339313.213 E 2405413.688	USCS SYMBOL	
EVA:	ОЕРТН (FEET)	MPLE	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 669.07	SS SY	REMARKS
) EL						DESCRIPTION	OSC	
	176 — _ _	R-32	(100%)	5.0				
	178 — - -					Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh weathering, unfractured, no bedding structures visible, many calcite filled fossil casts, few pyrite masses.		
	180 —	R-33	100% (100%)	5.0				
	182 — - - -							
	184 — — —	R-34	94% (94%)	4.7				
	186 — — — —							
	188 —					Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no bedding structures visible, few calcite filled fossil casts, few pyrite masses.		
DATE FIELD	STARTED COMPLE GEOLOG KED BY:	TED: 1	0/8/07 0/10/07 LO AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation
APPR	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck



Bell B	end NPP							PROJECT NO. 07-3891
				1		LOG OF BORING NO. B-306	1 1	
ELEVATION (FEET MSL)	TH (TE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339313.213 E 2405413.688	SYMBOL	
EVA EET	ОЕРТН (FEET)	MPL R RUI	OW/6 R % & (R(SOVE	PROFILE	SURFACE EL: 669.07	.S S:	REMARKS
EI (F		δ. Q.		REC		DESCRIPTION	nscs	
	_	R-35	98% (98%)	4.9				
	192 —							
	192							
	194 —							
	_							
	_							
	_	R-36	100%	5.0				
	196 —		(100%)	0.0				
	190							
	_							
	198 —					Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh,		
	_					unfractured, no bedding structures visible, few calcite filled fossil casts, few pyrite inclusions.		
	_							
	_							
	200 —							
	200	- ·-	100%					
		R-37	(100%)	5.0				
	_							
	_					201.5' Fracture.		
	202 —					201.7-202.6' Calcite veins parallel to bedding planes.		
	_							
466.1	_					DOTTOM OF DODING COO.		
						BOTTOM OF BORING 203'		
	204							
	204 —							
DATE	STARTED)· 1/	<u> </u> 0/8/07		GWI	DEPTH: N/A DATE/TIME: N/A	NO	ΓES: Bedrock part of the
	COMPLE ^T					DEPTH: N/A DATE/TIME: N/A	'\\	Mahantango Formation
	GEOLOG		_O			LING METHOD: SPT/Tricone/NQ Rock Core		
	KED BY:		AR				<u> </u>	
	OVED BY: ING CO.:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck
DKILL	ING CO.:	remaco	11		l			



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-307		
ELEVATION (FEET MSL)	ΕE:	SAMPLE NO. OR RUN NO.	" & (N) REC. 2D)	RY (ft.)	 	COORDINATES N 339193.328 E 2405276.098	SYMBOL	
EET	DEPTH (FEET)	MPLI R RUI	BLOW/6" & (OR % REC & (RQD)	RECOVERY	PROFILE	SURFACE EL: 665.31	၂ က ၂	REMARKS
EI F)		SA OF	BLC	REC		DESCRIPTION	nsc	
	0	S-1	2-3 6 (9)	1.1		Silty Sand (sm) - 75% sand, 25% silt, hard, subrounded, fine to coarse sand, 0.04" max size, low plasticity, medium dry strength, low dilatancy, low toughness, moderate yellowish brown (10 YR 5/4), slight organic odor, dry, no reaction to HCl, loose, traces of roots.	sm	
663.8	_				*\$.7 \$	1.5' Silty Sand with Gravel (sm) - 15% gravel, 65% sand, 20% silt,	sm	
	2 —	S-2	4-5 6 (11)	1.1		subangular, elongated and flat, coarse gravel, hard, fine to coarse, rounded to subrounded sand, 0.75" max size, low plasticity, medium dry strength, no dilatancy, low toughness, moderate yellowish brown (10 YR 5/4), dry, no reaction to HCl, medium dense. 3.0'		
662.3	_					Well-Graded Sand with Cobbles (sw) - 30% cobbles, 60% sand, 10% gravel, subangular to subrounded cobbles, fine to coarse, elongated	sw	
	4 —	S-3	13-22 20 (42)	1.0	•••	and flat gravel, hard, fine to coarse sand, 2" max size, nonplastic, pale brown (5 YR 5/2), dry, no reaction to HCl, dense.		
660.8	_					4.5' No Recovery - No SPT Sample		
	-	S-4						
659.3	6 —				**,5	6.0' Well-Graded Sand with Gravel (gw) - 10% cobbles, 25% gravel, 65%	gw	
	_	S-5	6-10 15 (25)	1.0		sand, fine to coarse gravel, elongated and flat, subrounded, fine to coarse sand, hard, 1.5" max size, nonplastic, pale brown (5 YR 5/2), dry, no reaction HCI, medium dense.		
657.8	_					7.5' Well Graded Gravel with Sand (gw) - 35% cobbles, 20% gravel, 45%	gw	
	8 —	S-6	17-31 25 (56)	1.2		sand, fine grained sandstone cobbles, fine to coarse subangular, elongated and flat, hard gravel, subangular to subrounded, fine to coarse sand, 3.0" max size, nonplastic, moderate brown (5YR 5/2) and light gray (N7), dry, no reaction HCl, very dense.		
656.3	_				5 00 0	9.0' Poorly graded Sand with Gravel (sp) - 20% cobbles, 25% gravel, 55%	sp	
	10 —	S-7	40-50/5" (50)	0.9	9 0 b.	sand, hard, fine grained sandstone cobbles, fine to coarse, subrounded to subangular, elongated and flat gravel, subangular to subrounded, fine to coarse sand, 3.0" max size, nonplastic, moderate brown (5YR 5/2) and pale red (5R 6/2), dry, no reaction HCl yery dense		
654.8	_					Well Graded Gravel with Sand (gw) - 45% cobbles, 30% gravel, 25%	gw	
	_	S-8	25-24 23 (47)	1.0		sand, 5% silt, fine grained sandstone cobbles, fine to coarse, subrounded to subangular, elongated and flat gravel, hard, fine to coarse, subrounded to subangular sand, 3.0" max size, nonplastic, very pale orange (10 YR 8/2), moderate yellows brown (10 YR 5/4), and padiing yellows to said the said to said the said to said the said that		
653.3	12 	S-9	22-24 26 (50)	1.1		Well Graded Gravel with Sand and Silt (gw-gm) - 25% cobbles, 40% gravel, 25% sand, 10% silt, fine-grained sandstone cobbles, fine to coarse, subrounded, elongate and flat gravel, hard, subangular to subrounded, fine to coarse sand. 3.0" max size, nonplastic, medium	gw- gm	
651.8	_					dark gray (N4) and moderate yellowish brown (10 YR 5/4), wet, np. 7a.5' reaction to HCl, dense.		
	14 —	S-10	30-32 21 (53)	1.3		Well Graded Sand with Gravel (sw) - 15% cobbles, 25% gravel, 60% sand, fine to coarse, hard, elongated and flat gravel, subangular to subrounded, fine to coarse sand, 3.0" max size, nonplastic, medium dark grav (N4) and moderate brown (5Y4/4), wet, no reaction to HCI.		
	STARTE		0/17/2007			DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30	NO	TES: Bedrock part of the Mahantango Formation
	COMPLE GEOLOG		0/17/2007 AK	,		: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		aa.igo i oililattoii
	KED BY:		AR					
	OVED BY NG CO.:				DRIL	LER: Scott Zeien HELPER: Brian Nabholz	RIG	: CME 850
DIXILLI	ING CU	i c iiaco	11		<u> </u>			



D.II D.	Bell Bend NPP PROJECT NO. 07-3891												
Bell Be	end NPP					LOG OF BORING NO. B-307		PROJECT NO. 07-3891					
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339193.328 E 2405276.098 SURFACE EL: 665.31	USCS SYMBOL	REMARKS					
H		80	BL	RE		DESCRIPTION	nS						
650.3					345	very-dense, contains few coal fragments. 15.0'							
	_ 16 —	S-11	23-18 23 (41)	0.5		Well Graded Gravel (gw)- 90% cobbles, 10% sand, subrounded, elongated and flat, fine-grained sandstone cobbles, hard, subangular, medium to coarse sand, 3.0" max size, nonplastic, greenish gray (5GY 6/1), moderate red (5R 4/6), wet, no reaction to HCl, dense.	gw	Driller lost all fluid from 15.0'- 16.5'					
648.8	- -	S-12	16-19 31 (50)	1.0	3	Well Graded Sand with Cobbles (sw) - 45% cobbles, 55% sand, fine grained sandstone cobbles, hard, elongated and flat, subangular to subrounded, fine to coarse sand, 2" max size, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, dense.	sw	Driller regained fluid from 16.5'-18.0'					
	18 	S-13	7-16 18 (34)	0.3		19.5'							
645.8	20 —	S-14	18-23 23 (46)	1.4	•••	Well-Graded Sand (sw)- 20% cobbles, 15% gravel, 60% sand, 5% silt, subrounded, spherical cobbles and gravel, hard, angular, fine to coarse sand, medium hard, 1.5" max size, nonplastic, moderate yellowish brown (10 YR 5/4), moderate red (5Y 4/6) and medium gray (N3), wet, no reaction to HCl, dense.	sw						
642.8	22 —	S-15	29-25 20 (45)	0.7		22.5'							
0.2.0	- - 24 	S-16	18-21 18 (39)	0.9	6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Well Graded Sand with Gravel (sw) - 10% cobbles, 20% gravel, 65% sand, 5% silt, subrounded, spherical gravel and cobbles, fine to coarse, surounded to subangular sand, 3.0" max size, nonplastic, moderate yellowish brown (10 YR 5/4), moderate red (5Y 4/6) and medium gray (N3), wet, no reaction HCl, dense.	SW						
639.8	_	S-17	43-28 23 (51)	0.2		25.5'							
000.0	26 —	S-18	12-22 50/3" (72)	0.8		Well Graded Gravel with Sand (gw) - 75% cobbles, 25% sand, fine to coarse, subrounded, spherical, cobbles, fine to coarse subangular to rounded sand, 3.0" max size, nonplastic, moderate red (5Y 4/6) and medium gray (N3), wet, no reaction HCl, very dense, shale fragments.	gw						
637.8	28 					Shale- Moderately hard, dark gray (N3), moderately to slightly weathered from 27.5' - 29.0', moderately to intensely fractured, closely spaced, becoming widely spaced, contains few pockets of calcareous fossils, noncalcareous, thickly bedded, not healed, slight reaction to HCl.							
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 10	D/17/2007 D/17/2007 AK AR		GWL:	DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO.	TES: Bedrock part of the Mahantango Formation					
APPRO	OVED BY:				DRILL	.ER: Scott Zeien HELPER: Brian Nabholz	RIG	:: CME 850					



D-11 D	Bell Bend NPP PROJECT NO. 07-3891												
Bell Be	end NPP					LOG OF BORING NO. B-307		PROJECT NO. 07-3891					
ELEVATION (FEET MSL)	Ε.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339193.328 E 2405276.098	USCS SYMBOL						
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 665.31	SS S	REMARKS					
EI.		SA	BLC	REC	ш	DESCRIPTION	OSC						
DATE (FIELD CHECK	30 — 32 — 32 — 34 — 36 — 40 — 42 — STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: R D	AK AR		GWL:	Shale- Moderately hard, dark gray (N3), slightly fractured, fresh, fracture located from 35.8' horizontal, 38.7' - 39.0' and 40.6' - 40.9' approximately 70' of rock core, very thickly bedded, noncalcareous, contains pockets of calcareous fossils from 42.0' - 45.0', not healed, no reaction to HCI. DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		TES: Bedrock part of the Mahantango Formation					
	OVED BY:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	: CME 850					
DIVILLI	10 00	TOTACO			ı		<u> </u>						



D.II.D	Bell Bend NPP PROJECT NO. 07-3891											
Bell B	end NPP					LOG OF BORING NO. B-307		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339193.328 E 2405276.098	USCS SYMBOL					
EVA:	DEPTH (FEET)	MPLI RUI	2 % F RC RC	OVE	PROFILE	SURFACE EL: 665.31	(8.8)	REMARKS				
 - -		SA	BLC	REC	"	DESCRIPTION	OSC					
DATE FIELD CHEC	44 — 46 — 46 — 48 — 50 — 52 — 54 — 56 — 58 — 58 — 58 — 58 — 58 — 58 — 58	ΓED: 1 IST: R D	AK AR		GWL	Shale- Moderately hard, dark gray (N3), slightly fractured, fresh, not healed, fractured from 45.5'-45.7', 50.8'-51.1' approximately 60° to rock core, noncalcareous, except for small inclusion from 50.0'-55.0', very thickly bedded, no reaction to HCI. Shale- Moderately hard, dark gray (N3), fresh, slightly fractured, at 56.1', 56.3', horizontal and 57.4' - 57.0' approximately 60° of core, not healed, noncalcareous, very thickly bedded, no reaction to HCI. DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahantango Formation				
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	: CME 850				
			•									



Bell Bend NPP PROJECT NO. 07-3891												
Bell Bend NPP	LOG OF BORING NO. B-307	PROJECT NO. 07-3891										
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339193.328 E 2405276.098	REMARKS SOSO										
DEPTH (FEET) MMPLE N R RUN N R RUN R R % REC R (RQD)	N 339193.328 E 2405276.098 SURFACE EL: 665.31	တ် REMARKS										
SA SA OF OIL	DESCRIPTION	osn										
60 — R-4 100% (99%) 10.0 10.0 62 — 64 — 66 — 68 — 70 — R-5 100% (96%) 10.0	Shale- Moderately hard, dark gray (N3), fresh, slightly fractured, at 71.4'-71.6' approximately 60' of rock core, not healed, noncalcareous, very thickly bedded. Shale- Moderately hard, dark gray (N3), fresh, slightly fractured, at 71.4'-71.6' approximately 60' of rock core, not healed, noncalcareous, very thickly bedded, no reaction to HCI. GWL: DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation										
FIELD GEOLOGIST: RAK	DRILLING METHOD: SPT/Tricone/NQ Rock Core											
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: CME 850										



Bell Bend NPP PROJECT NO. 07-3891												
Bell Bend NPP	LOG OF BORING NO. B-307	PROJECT NO. 07-3891										
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 339193.328 E 2405276.098	TOSCS SYMBOL REMARKS										
DEPTH (FEET) (MPLE N R RUN N R REC R R REC SOVERY	N 339193.328 E 2405276.098 SURFACE EL: 665.31	တ် REMARKS										
SA SA OF	DESCRIPTION)SN										
74— 76— 78— 80— R-6 82— 84— 84— 86— R-7 100% 68%) 5.0 DATE STARTED: 10/17/2007 DATE COMPLETED: 10/17/2007	Shale- Moderately hard, dark gray (N3), fresh, very slightly fractured, not healed, very slightly calcareous, with few pockets of pyrite, from 84.0' - 85.0', very thickly bedded, slight reaction to HCI. Shale- Moderately hard, dark gray (N3), fresh, not healed, noncalcareous, very thickly bedded, massive bedding, no reaction to HCI. GWL: DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock part of the Mahantango Formation										
FIELD GEOLOGIST: RAK	DRILLING METHOD: SPT/Tricone/NQ Rock Core	Ç										
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: CME 850										



	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-307		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339193.328 E 2405276.098	USCS SYMBOL					
EET	ОЕРТН (FEET)	MPLI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 665.31	SS S)	REMARKS				
<u>П</u> Р		& Q	BLC	REC		DESCRIPTION	OSC					
565.3	88 — — — — — — — — — — — — — — — — — —	R-8	100% (100%)	10.0	GWL	Shale- Moderately hard, dark gray (N3), fresh, unfractured, not healed, noncalcareous, massive bedding, no reaction to HCI. BOTTOM OF BORING 100' DEPTH: 10.8 DATE/TIME: 10/17/2007 07:30	NOT	ΓES: Bedrock part of the				
DATE (COMPLET GEOLOG KED BY:	TED: 10			GWL:	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation				
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG	: CME 850				



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-308		
ELEVATION (FEET MSL)	ΞĒ	SAMPLE NO. OR RUN NO.	' & (N) REC. 2D)	RY (ft.)	ILE	COORDINATES N 339069.298 E 2405288.632	SYMBOL	
EET I	DEPTH (FEET)	MPLE RUN	BLOW/6" & (OR % REC & (RQD)	RECOVERY	PROFILE	SURFACE EL: 662.41		REMARKS
II F)		δ. Ω.	BL(REC		DESCRIPTION	USCS	
	0					Shelby Tube		
	_	ST-1						
660.4	2 —				188828	2.0' Silty Sand with Cobbles (sm)- 25% cobbles, 60% sand, 15% silt, very	sm	
	- -	S-1	13-24 34 (58)	1.3		hard, very intensely fractured angular cobbles, 60% salid, 13% slit, very hard, very intensely fractured angular cobbles, fine to medium grained, rounded to subrounded sand, low plasticity, low dry strength, slow dilatancy, low toughness, moderate yellow brown (10YR 5/4), light gray (N7), wet, no reaction to HCL, dense to very dense.	S	
	4 —	S-2	20-30 30 (60)	1.1				
657.4	_					5.0'	GW-	
	6 —	S-3	15-25 47 (72)	1.2		Well-Graded Gravel with Silt and Sand (GW-GM) - 30% cobbles, 60% sand, 10% silt, very hard, very intensely fractured angular sandstone cobbles, subrounded, to angular, medium grained sand, 0.75" max size, nonplastic, moderate yellow brown (10YR 5 4), light gray (N7), wet, no reaction to HCI, very dense.	GM	
655.9	_					6.5' Poorly Graded Gravel with Sand (gp)- 80% gravel, 20% sand, fine to	gp	
	-	S-4	17-18 19 (37)	0.4		medium, angular to subangular gravel, hard, elongated and flat, angular, fine to medium sand, 0.2" max size, nonplastic, dark reddish brown (10 R 3/4), wet, no reaction to HCl, dense. 8.0'		
654.4	8 —					No Recovery	gp	
	_	S-5	22-16 21 (37)	0.0				
652.9	_					9.5' Silty Sand with Cobbles (sm) - 30% cobbles, 55% sand, 15% silt,	sm	
	10 —	S-6	12-19 18 (37)	1.0		large grained, intensely fractured, elongated and flat, very hard, angular sandstone cobbles, fine to medium, subrounded to subangular sand, 1" max size, nonplastic, moderate brown (5YR 4/4), light gray (N7) cobbles, wet, no reaction to HCl, dense. 11.0'		
651.4	12 —	S-7	15-14 20 (34)	1.0		Poorly Graded Sand with Silt and Gravel (sp-sm) - 30% cobbles, 20% gravel, 40% sand, 10% silt, large grained, very hard, intensely fractured, angular cobbles, fine to medium, soft, angular gravel, fine to medium, subangular sand, 2" max size, nonplastic, moderate brown (5 YR 3/4), light gray (N7), wet, no reaction to HCl, dense.	sp- sm	
649.9	- - 14 	S-8	17-19 31 (50)	0.9		Well Graded Gravel with Silt and Sand (GW-GM) - 70% gravel, 30% sand, fine to coarse, angular to subangular, elongated and flat, hard, gravel, fine to coarse, angular, soft, sand, 1" max size, nonplastic, pale reddish brown (10 R 5/4) to grayish brown (5YR 3/2), wet, no reaction to HCl, dense to very dense.	GW- GM	
	ı 							
	STARTE		/26/07			DEPTH: 7.19 DATE/TIME: 10/1/07 1200	NO	TES: Bedrock part of the
	COMPLE GEOLOG		0/1/07 EW			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore		Mahantango Formation.
	GEOLOG KED BY:		rw AR		DKILI	LING WETHOD. SETTHICONE/NQ ROCKCORE		
APPRO	OVED BY	: RJ	В		DRIL	LER: Bob Hansen HELPER: Dan Green	RIG	:: MTS 1500
DRILLI	NG CO.:	Aquadri	II					



Bell Be	end NPP					LOC OF BODING NO. B 200		PROJECT NO. 07-3891
		Ι		·	1 1	LOG OF BORING NO. B-308		<u> </u>
ION ISL)	I (8 S	S (N	۲Y (ft.)		COORDINATES N 339069.298 E 2405288.632	SYMBOL	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY	PROFILE	SURFACE EL: 662.41	S SYI	REMARKS
E E		SA	BLC	REC	"	DESCRIPTION	nscs	
	_	S-9	16-50/5" (50)	0.8	TEST			
646.9	_					15.5' Well Graded Gravel with Sand (GW) - 60% gravel, 30% sand, 10%	GW	
	16 -	S-10	16-15 13 (28)	0.9		silt, fine to coarse, angular to subangular gravel, hard, fine to medium, subangular sand, 0.5" max size, nonplastic, dark reddish brown (10 R 3/4), wet, no reaction to HCl, medium dense.		
645.4	_				Pi Quis	17.0' Well Graded Sand with Gravel and Silt (sw-sm) - 35% gravel, 55%	sw-	
	18 —	S-11	12-12 13 (25)	0.9	6 0 0 0 1	sand, 10% silt, fine to coarse, hard, angular to subangular gravel, fine to medium, angular to subangular sand, 0.5" max size, nonplastic, dark reddish brown (10 R 3/4), wet, no reaction to HCl, medium dense.	sm	
643.9	_				11126	18.5' Poorly Graded Gravel with Sand and Silt (GP-GM) - 65% gravel, 25%	GP-	
	-	S-12	18-16 17 (33)	0.7		sand, 10% silt, fine to coarse, angular to subangular gravel, elongated and flat, hard, fine subangular sand, 0.5" max size, nonplastic, dark reddish brown (10 R 3/4), wet, no reaction to HCl, dense.	GM	
	20 —							
	-	S-13	19-16 24 (40)	0.9		24.51		
640.9	_					21.5' clayey gravel (gc) - 40% cobbles, 20% gravel, 10% sand, 30% clay,	gc	
	22 —	S-14	17-30 30 (60)	1.0		rounded to angular, elongated and flat, medium hard gravel and cobbles, fine to coarse, angular sand. 0.75" max size, low plasticity, no dry strength, low dilatency, medium toughness, dark gray (N3) and pale yellowish brown (10 YR 6/2), wet, no reaction to HCI, very dense		
	_					to dense.		
	- 24 —	S-15	15-19 20 (39)	1.3				
	_							
	_	S-16	14-18 21 (39)	0.7				
636.4	26 —				1	26.0' Well Graded Gravel with Sand (gw) - 80% gravel and cobbles, 20%	gw	
	-	S-17	0-50/4 (50)	0.5		sand, very hard, unweathered, fine grained sandstone cobbles, very soft, slightly weathered, intensely fractured shale gravel, fine to coarse, angular sand, soft, 2" max size, nonplastic, pale yellowish brown (10 YR 6/2) to dark gray (N3), wet, no reaction to HCl, very		
634.9	-					dense. 27.5' Well Graded Gravel with Clay (gw-gc) - 75% gravel, 5% sand, 20%	gw-	
	28 —	S-18	18-17 17 (34)	0.7		clay, angular, coarse gravel, very soft, fine to coarse, angular sand, 0.75" max size, low plasticity, no dry strength, no dilatancy, no toughness, very pale orange (10YR 8/2) to dark gray (N3), wet, no reaction to HCl, dense to very dense, shale fragments.	gc	
	_				733			
	STARTE		/26/07			DEPTH: 7.19 DATE/TIME: 10/1/07 1200	NO	TES: Bedrock part of the Mahantango Formation.
	COMPLE GEOLOG					DEPTH: N/A DATE/TIME: N/A ING METHOD: SPT/Tricone/NQ Rockcore		Mananango i omiation.
	KED BY:		AR		J. (ILL			
	OVED BY				DRILL	ER: Bob Hansen HELPER: Dan Green	RIG	S: MTS 1500
DRILLI	NG CO.:	Aquadri	II					



Bell Be	end NPP					LOG OF BORING NO. B-308		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339069.298 E 2405288.632 SURFACE EL: 662.41 DESCRIPTION	USCS SYMBOL	REMARKS
	30 —	S-19	48-50/3" (50)	0.6				
631.4	32 —	S-20	12-14 50/4" (64)	1.0		Well Graded Gravel with Sand (gw) - 60% gravel, 35% sand, 5% silt, fine to coarse, subangular to well rounded, elongated and flat gravel, hard, rounded to subangular, fine to coarse sand, 1.5" max size, nonplastic, moderate brown (5 YR 4/4), wet, no reaction to HCl, very dense.	gw	
629.9	- -	S-21	16-29 19 (48)	0.8		Poorly Graded Gravel with Silt and Sand (GP-GM) - 90% gravel, 10% sand, fine to coarse grained, subangular, gravel, hard, fine to medium, rounded to subangular sand, 0.5" max size, nonplastic, moderate brown (5 YR 4/4), wet, no reaction to HCl, dense.	GP- GM	
628.4	34 — _ _	S-22	29-39 44 (83)	0.7		Well Graded Gravel (gw) - 90% gravel, 10% sand, fine to coarse, subangular to angular, flat and elongated, gravel, hard, fine to medium, rounded to subrounded sand, 0.5" max size, nonplastic, medium gray (N5), wet, no reaction to HCl, very dense.	gw	
626.9	36 -	S-23	44-27 28 (55)	0.8	6 8 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Poorly Graded Sand with Silt and Gravel (SP-SM) - 70% gravel, 20% sand, 10% silt, fine to coarse, subangular to subrounded, elongated and flat, gravel, hard, medium to coarse, subangular to subrounded sand, 0.5" max size, nonplastic, medium gray (N5), wet. no reaction to HCl, very dense.	SP- SM	
625.4	38 —	S-24	21-50/2" (50)	0.6		Well Graded Gravel (gw) - 100% gravel, fine to coarse, well rounded to subangular, gravel, hard, very soft shale, very hard, unweathered, lightly fractured quartz-rich sandstone, 0.5" max particle size, nonplastic, medium gray (N5) to pale olive (10 Y 6/2), wet, no reaction to HCl, very dense.	gw	
623.4	_	S-25	50/5 (50+)	0.5		Shale- Dark gray (N4), medium hard to hard, slightly to very slightly fractured, slightly weathered in upper zone, noncalcareous, contains vertical bedding planes, moderately thick bedding.		
	40 —	R-1	71% (44%)	2.5				
	42 —					Shale- Dark gray (N3), medium hard to hard, fresh, very slightly fractured, fractures occurring at 45° of bedding, no healing, vertical bedding, noncalcareous.		
DATE (STARTEI COMPLE GEOLOG	TED: 10 BIST: P			GWL:	DEPTH: 7.19 DATE/TIME: 10/1/07 1200 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NO	TES: Bedrock part of the Mahantango Formation.
APPRO	OVED BY NG CO.:	: RJ	В		DRILI	.ER: Bob Hansen HELPER: Dan Green	RIG	S: MTS 1500



	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-308		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	王(f.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339069.298 E 2405288.632	SYMBOL					
EVA:	DEPTH (FEET)	MPLE	XW/6' R % I	ÖVE	PROFILE	SURFACE EL: 662.41	\S S.	REMARKS				
급뜨		SA OF	BLC	REC		DESCRIPTION	nscs					
	44 —	1										
'		1	100%	5.0		1	'					
'		R-2	(100%)	5.0		1	'					
'	7	1	'	1		1	'					
'	46 —	1	'	1		1	'					
'	1 -	1	'	1		1	'					
'	1]	1	'	1		1	'					
'	l J	1	!	1		1	'					
'	1 7	1		1		Shale- Dark gray (N3), medium hard to hard, fresh, very slightly fractured, fractures low angle 20° - 30°, no healing, noncalcareous.	'	Preserved Sample for				
'	48 —	1	'	1		Habituled, Habitules low angle 20 - 50 , no nothing, nonconstruction	'	Laboratory Analysis from 50.7' - 52.4'.				
'	1 -	1	'	1		1	'	30.7 - 32. 4 .				
'	1]	1	'	1		1	'					
'	1 J	1	<u>'</u>	1		1	'					
'	1 1	1	94%	1		1	'					
'	50 —	R-3	(82%)	4.7		1	'					
'	1 -	1	` '	1		1	'					
'	1]	1	'	1		1	'					
'	1 1	1	<u>'</u>	1		1	'					
'	1 7	1	'	1		1	'					
'	52 —	1	י	1		1	'					
'	1 -	1	.	 		Shale- Dark gray (N3), medium hard to hard, slightly fractured,	'					
'		i	'	1		noncalcareous, vertical bedding planes.	'					
'	1 1	1	י	1		1	'					
'	7	1	'	1		1	'					
'	54 —	1	י	1		1	'					
'	1 4	R-4	100%	4.0		1	'					
'	1	1	(75%)	1 "		1	'					
'	1 1	1	'	1		1	'					
'	7	1	<u>'</u>	1		1	'					
'	56 —	1	'	1		1	'					
'	1]	1	.]	1		Cold District (NO) and district bond to hand alightly fractured	'					
'	1 J	1	'	1		Shale- Dark gray (N3), medium hard to hard, slightly fractured, vertical bedding, noncalcareous.	'					
'	1 7	1	<u>'</u>	1		1	'					
'	1 -	1	י	1		1	'					
'	58 —	1	'	1		1	'					
			<u>'</u>	1	 		<u> </u>					
	STARTED		9/26/07			.: DEPTH: 7.19 DATE/TIME: 10/1/07 1200	NO	TES: Bedrock part of the Mahantango Formation.				
	COMPLET GEOLOG					.: DEPTH: N/A DATE/TIME: N/A .LING METHOD: SPT/Tricone/NQ Rockcore		Mananange				
	GEOLOG KED BY:		PFW DAR		DKIL	LING METHOD: SPT/Tricone/INQ ROCKCOTE						
	OVED BY:				DRIL	LER: Bob Hansen HELPER: Dan Green	RIC	G: MTS 1500				
	ING CO.:						'					



Bell B	end NPP					LOG OF BORING NO. B-308		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339069.298 E 2405288.632	USCS SYMBOL	
EVA EET	DEPTH (FEET)	MPL R RUI	2W/6 R % I R (R(OVE	PROFILE	SURFACE EL: 662.41	S S	REMARKS
H H		S O	BLC	REC		DESCRIPTION	osn	
(F	60 — 62 — 64 — 66 — 70 —	R-5	97% (97%)	5.8		Shale- Dark gray (N3), medium hard to hard, slightly fractured, vertical bedding.	OSI CONTRACTOR OF THE CONTRACT	
	72 					Shale- Dark gray (N3), medium hard to hard, very slightly fractured, vertical bedding planes, slight silty texture.		
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: P	/26/07 0/1/07 FW AR		GWL:	DEPTH: 7.19 DATE/TIME: 10/1/07 1200 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOTE	ES: Bedrock part of the Mahantango Formation.
APPRO	OVED BY:	RJ	В		DRIL	LER: Bob Hansen HELPER: Dan Green	RIG:	MTS 1500



Dall B	end NPP							DDO IECT NO. 07 2004
Bell Be	ena NPP					LOG OF BORING NO. B-308	1 .	PROJECT NO. 07-3891
ELEVATION (FEET MSL)	Ε.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339069.298 E 2405288.632	SYMBOL	
EVA.	DEPTH (FEET)	MPLI R RUI	2W/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 662.41	SS S	REMARKS
EI (F		SA	BLC	REC		DESCRIPTION	nscs	
	74 — 76 — 78 — 80 — 82 — 84 — STARTED COMPLET		100% (96%) 100% (88%) 95% (65%)	3.2		Siltstone- Dark gray (N3), medium hard to hard, very little fractures, silty, very fine grained. 85.5' Shale- Dark gray (N3), medium hard to hard, very slightly fractured, noncalcareous, no reaction to HCl.	NOT	TES: Bedrock part of the Mahantango Formation.
	GEOLOG					LING METHOD: SPT/Tricone/NQ Rockcore		a.i.a.i.go i o.i.i.a.io.ii
	KED BY:		AR					
	OVED BY:				DRIL	LER: Bob Hansen HELPER: Dan Green	RIG	: MTS 1500
DRILLI	ING CO.:	Aquadri	II					



<u></u>								
Bell B	end NPP					LOG OF BORING NO. B-308		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339069.298 E 2405288.632	USCS SYMBOL	
EVA.	DEPTH (FEET)	MPLI R RUI	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 662.41	SS SV	REMARKS
		δ. Q.	BL(REC		DESCRIPTION	nsc	
561.1	88 — 90 — 92 — 94 — 96 — 98 — 100 — 100 — 1	R-10	95% (92%)	8.4		Shale- Dark gray (N3), medium hard to hard, very slightly fractured, noncalcareous, no reaction to HCI. BOTTOM OF BORING 101.3		
	102 —							
DATE FIELD	STARTED COMPLE ^T GEOLOG KED BY:	ΓED: 10 IST: P	L /26/07 0/1/07 FW AR		GWL	: DEPTH: 7.19 DATE/TIME: 10/1/07 1200 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NO	TES: Bedrock part of the Mahantango Formation.
APPR	OVED BY:	RJ	В		DRIL	LER: Bob Hansen HELPER: Dan Green	RIG	: MTS 1500



Bell Be	end NPP							PROJECT NO. 07-3891
Dell' Be	,					LOG OF BORING NO. B-309		1100E31110.07-3031
ELEVATION (FEET MSL)	Ξ£.	SAMPLE NO. OR RUN NO.	" & (N) REC. 2D)	RECOVERY (ft.)	ורב	COORDINATES N 338998.802 E 2405333.716	SYMBOL	
EVA.	DEPTH (FEET)	MPL RUI	BLOW/6" & (OR % REC & (RQD)	SOVE	PROFILE	SURFACE EL: 659.64		REMARKS
EI (F		S, O	BL(REC		DESCRIPTION	nscs	
	0 -					Clayey Sand (sc) - 75% sand, 25% clay, fine to medium subrounded, spherical sand, 0.05" max size, low plasticity, low dry strength, low dilatancy, high toughness, dark yellowish-orange (10YR 6/6) to moderate yellowish brown (10 YR 5/4), moist, no reaction to HCL, medium-stiff.	sc	
	2 —	S-1	3-3 3 (6)	1.4				
656.6	_ _ 4	S-2	4-5 6	1.3		3.0' Silty Sand (sm) - 5% gravel, 75% sand, 20% silt, fine, subrounded to subangular, elongated and flat gravel, fine subrounded to subangular, sand, hard, 0.5" max size, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), moist, no reaction HCL,	sm	
654.6	- -	0-2	(11)	1.0		medium-dense. 5.0' Silty Sand (SM) - 30% gravel, 60% Sand, 10% silt, fine, subrounded	SM	
653.6	6 —	S-3	4-5 6 (11)	1.1	t + 3 · · · ·	to subangular, elongated and flat gravel, fine, subrounded to subangular sand, 0.5" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), 6.0' moist. no reaction HCL, medium-dense.	sp-	
	_	S-4	3-4 5 (9)	1.2		Poorly Graded Sand with Silt (sp-sm) - 90% Sand, 10% silt, fine, subrounded to subangular, elongated and flat sand, 0.5" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), moist, no reaction HCL, loose. 7.5'	sm	
652.1	8 —	S-5	3-5 9 (14)	1.1		Silty Sand (SM) - 30% gravel, 60% Sand, 10% silt, fine, subrounded to subangular, elongated and flat gravel, fine to medium, subrounded to subangular sand, 1" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), chemical odor, moist, no reaction HCL, medium-dense.	SM	
	10 —	S-6	5-7 9 (16)	1.5		40.51		
649.1	- - -	S-7	6-11 10 (21)	1.1		Silty Sand with Gravel (SM) - 15% gravel, 70% Sand, 15% silt, fine, subangular to subrounded, elongated and flat gravel, fine to coarse, subangular to subrounded sand, 0.5" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCL, medium-dense.	SM	
647.6	12 —	S-8	6-17 12 (29)	0.6	<u></u>	Poorly Graded Gravel with Sand (gp) - 10% cobbles, 65% gravel, 25% sand, fine to coarse, subangular, elongated and flat gravel, fine to coarse, subangular to subrounded sand, 1.0" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, chemical odor, no reaction to HCL, loose to medium-dense.	gp	
	14 —	S-9	2-3 3 (6)	0.5				
DATE (STARTEI COMPLE GEOLOG KED BY:	TED: 9/ BIST: JI	/24/07 /27/07 LO AR		GWL:	DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO ⁻	TES: Bedrock part of the Mahatango Formation.
APPRO	OVED BY NG CO.:	: RJ	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	:: CME 75



Bell Bend NPP							PROJECT NO. 07-3891
<u> </u>					LOG OF BORING NO. B-309	1	T
MSL) MSL)	. ON S	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	l E	COORDINATES N 338998.802 E 2405333.716	SYMBOL	
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO OR RUN NO	OW/6' DR % F & (RC	COVE	PROFILE	SURFACE EL: 659.64	USCS SY	REMARKS
шш	ŷΟ	BL	Ä	<u> </u>	DESCRIPTION	SN	
16 —	S-10	3-4 6 (10)	0.8		16.5'		
643.1	S-11	26-18 17 (35)	0.4		Well Graded Gravel with Silt and Sand (GW-GM) - 45% Gravel, 45% sand, 10% Silt, angular, elongated and flat, 1.5" max size, hard, nonplastic, medium gray (N5), wet, no reaction HCL, dense.	GW- GM	
641.6 18 —	S-12	10-11 14 (25)	0.8		Well Graded Sand with Gravel (sw) - 25% gravel, 70% sand, 5% silt, fine to coarse, angular, elongated and flat gravel, fine to coarse, angular to subrounded sand, 1.5" max size, hard, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCL, medium-dense to dense.	sw	
	S-13	6-16 26 (42)	0.9		21.0'		
22 —	S-14	5-15 28 (43)	0.7		Well Graded Gravel wtih Sand (gw) - 25% cobbles, 45% gravel, 25% sand, 5% silt, fine to coarse, angular, elongated and flat gravel, coarse, subangular sand, hard, 1.5" max size, nonplastic, medium gray (N5), wet, no reaction HCL, dense.	gw	
635.6 24	S-15	21-25 18 (43)	1.2		24.0'		
	S-16	28-50/2" (50)	0.6		Clayey Gravel with Sand (gc) - 60% gravel, 15% sand, 25% clay, fine to coarse, subrounded to subangular, elongate to spherical gravel, fine to coarse, angular to subrounded sand, 1" max size, hard, low plasticity, low dry strength, low dilatancy, medium toughness, dusky brown (5YR 2/2), wet, no reaction to HCL, very dense. Cobbles and Boulders - About 100% cobbles, angular, elongated and	gc	
26 —	R-1	74% (0%)	2.9		flat, hard, 2.0" max size, nonplastic, no toughness, no dilatancy, no dry strength, medium dark gray (N4) and dark yellowish brown (10 YR 4/2), no odor, no reaction HCL, no odor, no reaction HCL, wet.		
631.2					28.4' Cobbles and Boulders - About 100% cobbles, 5% clay, angular, elongated and flat, hard, 2.0" max size, nonplastic, no toughness, no		
DATE OF: ====		0.4/0=		[2]	dilatancy, no dry strength, medium dark gray (N4), no odor, no	,	
DATE STARTED: DATE COMPLETE FIELD GEOLOGIS	D: 9/2			GWL:	DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO.	TES: Bedrock part of the Mahatango Formation.
CHECKED BY: APPROVED BY: DRILLING CO.: Te	DA RJE erracor	3		DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG	6: CME 75



Bell Bend NPP		PROJECT NO. 07-3891
	LOG OF BORING NO. B-309	
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338998.802 E 2405333.716	Og WAS REMARKS
LEVATIO TECATIO DEPTH (FEET) AMPLE N R RUN N R RUN N R RUN N R RUN N COVERY	의 N 338998.802 E 2405333.716 오 SURFACE EL: 659.64	REMARKS
BL O SS	DESCRIPTION	Sn
30 — R-2 34% 1.7 32 — 32 — 34 — 34 — 34 — 34 — 35 — 35 — 35 — 35	reaction HCL, no odor, no reaction HCL, wet. 33.4' Cobbles and Boulders - About 100% cobbles, 5% clay, angular, elongated and flat, hard, 2.0" max size, nonplastic, no toughness, no dilatancy, no dry strength, medium dark gray (N4), no odor, no reaction HCL, no odor, no reaction HCL, wet.	
621.2	Cobbles and Boulders - About 100% cobbles, 5% clay, angular, elongated and flat, hard, 2.0" max size, nonplastic, no toughness, no dilatancy, no dry strength, medium dark gray (N4), no odor, no reaction HCL, no odor, no reaction HCL, wet. Shale, dark gray (N3), medium hard, moderately fractured GWL: DEPTH: DATE/TIME: GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahatango Formation.
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: Terry Duncan	RIG: CME 75



Bell Be	end NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - !!E	COORDINATES N 338998.802 E 2405333.716	SYMBOL	
EVA:	ОЕРТН (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 659.64	(S S)	REMARKS
EL (F		SA	BLC	REC		DESCRIPTION	nscs (
DATE (FIELD CHECK	44 — 46 — 46 — 48 — 50 — 52 — 54 — 556 — 558 — 5	ΓED: 9/ IST: JI D	92% (74%) 100% (98%)	4.6	GWL DRIL	Shale, dark gray (N3), medium hard, moderately fractured, noncalcareous, calcite veins, intensely fractured from 49.3' to 50.2' Shale, dark gray (N3), medium hard, moderately fractured, noncalcareous SHALE, dark gray (N3), medium hard, moderately fractured, noncalcareous 58.4 DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	Intensely fractured from 49.3' to 50.2'. All Special care sample taken at 53.9'-55.5' TES: Bedrock part of the Mahatango Formation.
	OVED BY: ING CO.:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	G: CME 75
			*					



Bell Be	end NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.(.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 338998.802 E 2405333.716	USCS SYMBOL	
EVA.	DEPTH (FEET)	MPLI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 659.64	SS S	REMARKS
EI (F		SA OF	BLC	REC		DESCRIPTION	วรก	
ਤ 596.2	60 — 62 — 64 — 66 — 66 — 6	R-8	100% (92%)	6.0		Shale, dark gray (N3), medium hard, moderately fractured, noncalcareous, fractures at 30 degrees to rock core at 62.4' to 62.7', pyritic veins, calcareous healed fractures 63.4' Shale: Dark gray (N3) medium-hard, moderately fractured grayish black (N2) to black (N1), noncalcareous, pyritic veins, healed with calcite veins, hard.)S()	
DATE (68 — 70 — 72 — STARTED COMPLET GEOLOG	TED: 9/	_0	5.0	GWL:	Silty Shale: noncalcareous, hard, unfractured, fresh. DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	ES: Bedrock part of the Mahatango Formation.
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75
		. 511460						



Dall D	and NDD							DDO IECT NO. 07 2004
Bell De	end NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (F)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 338998.802 E 2405333.716	USCS SYMBOL	
EVA:	DEPTH (FEET)	MPLE	2W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 659.64	\S S;	REMARKS
E E		SA	BLC	REC		DESCRIPTION	osn	
586.2	- 74 — -					73.4' Shale: Dark gray (N3) medium-hard, calcite healed fractures, calcite, oriented at 30° to rock core, slightly fractured, calcareous, fresh.		
	76 — - - - - 78 —	R-11	98% (98%)	4.9		78.4'		
581.2	80 — - - 82 —	R-12	100%	5.0		Shale; Dark gray (N3) pyrite and calcite veins, noncalcareous and very slightly fractured, medium hard, slickenlines present at 80.65.		
576.2	84 — - - -		100%			Shale: Dark gray (N3) slightly weathered, slightly fractured, medium hard, calcareous.		
DATE (86 — STARTED COMPLE GEOLOG	ΓED: 9/ IST: Jl	_0	5.0	GWL:	DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	ES: Bedrock part of the Mahatango Formation.
APPRO	KED BY: OVED BY: NG CO.:	RJI			DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75



Bell Bend NPP		DDO IECT NO. 07 2904
Bell Bend NPP	LOG OF BORING NO. B-309	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338998.802 E 2405333.716	USCS SYMBOL SYMBOL SYMBOL SYMBOL
DEPTH (FEET) MMPLE N R RUN N R RUN N R REGN R ROD) SOVERY	N 338998.802 E 2405333.716 SURFACE EL: 659.64	က် REMARKS
SA OF OF OF OF SEC	DESCRIPTION	DSN
571.2	Shale: Dark gray (N3) slightly weathered, thinly laminated bedding plane, slightly fractured, calcareous.	
90 — - - - - - - 92 — - - -	93.4'	
566.2	Shale: Dark gray (N3) slightly weathered, thinly laminated bedding plane, slightly fractured, calcareous.	
561.2 98 —	Shale: dark gray (N3) fossils (brachiopods and crinoid), calcareous, nonfractured, hard, fresh, thin bedding planes, fossiliferous.	
DATE STARTED: 9/24/07 DATE COMPLETED: 9/27/07 FIELD GEOLOGIST: JLO CHECKED BY: DAR	GWL: DEPTH: DATE/TIME: GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock part of the Mahatango Formation.
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: Terry Duncan	RIG: CME 75



Ball B	end NPP							DDO IECT NO. 07 2004
Bell B	ena NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн (ТΞ	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	-ILE	COORDINATES N 338998.802 E 2405333.716	SYMBOL	
EVA EET	ОЕРТН (FEET)	MPL	2W/6 R % 8 (R(OVE	PROFILE	SURFACE EL: 659.64	SSS	REMARKS
<u> </u>		AS PO	BLC	REC		DESCRIPTION	nscs	
556.2						103.4' Shale: dark gray (N3), fresh, unfractured, hard, fresh, non weathered,		
	104 —					thin bedding planes, fossiliferous.		
	_							
	106 —	R-17	100%	5.0				
	106 —		(100%)	0.0				
	_							
	_							
	_							
 	108 —					108.4'		
551.2	_					Shale: dark gray (N3), fresh, unfractured, hard, fresh, nonweathered, thin bedding planes, fossiliferous.		
	_					and bedding planes, resonitoreds.		
	_							
	110 —							
	_		100%					
	_	R-18	(100%)	5.0				
	_							
	112 —							
	_							
	_							
546.2	_					113.4' Shale: dark gray (N3), fresh, unfractured, hard, fresh, nonweathered,		Special care sample taken at
	114 —					thin bedding planes, fossiliferous.		116.6'-118.4'
	_							
	140	R-19	98%	4.9				
	116 —		(98%)					
DATE	STARTED): 9/	<u> </u> 24/07		GWL:	DEPTH: DATE/TIME:	NO	I TES: Bedrock part of the
DATE	COMPLE	ΓED: 9/	27/07		GWL:	DEPTH: N/A DATE/TIME: N/A		Mahatango Formation.
	GEOLOG KED BY:		₋O AR		DRILI	LING METHOD: SPT/Tricone/NQ Rock Core		
	KED BY: OVED BY:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	6: CME 75
	ING CO.:		n					



Dall D	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ıLE	COORDINATES N 338998.802 E 2405333.716	SYMBOL	
EVA'	DEPTH (FEET)	MPLE	W/6' 8 % F k (RG	OVE	PROFILE	SURFACE EL: 659.64	SS	REMARKS
日 (元 (元		SAI	BLC OF	REC	_	DESCRIPTION	SOSN	
541.2	- 118 — - - - 120 —					SILTSTONE: Medium-hard to hard, grayish-black (N2) fresh, unfractured, slightly calcareous, thin bedding planes		
536.2	122 — 124 — 126 —	R-20	100%	5.0		SILTSTONE: Medium-hard to hard grayish-black (N2) fresh, unfractured, calcareous, thinly laminated bedding planes, thinly laminated, fresh, unweathered.		
531.2 DATE	128 — 130 — STARTEE	R-22): 9,	100% (100%)	5.0	GWL	SILTSTONE: Medium-hard to hard, slightly fractured, healed with calcite, grayish black (N2), thinly laminated bedding plane, calcareous. DEPTH: DATE/TIME:	NOTE	S: Bedrock part of the
DATE FIELD	COMPLE ^T GEOLOG	TED: 9/	/27/07 LO		GWL:	DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOIE	Mahatango Formation.
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG: (CME 75



Bell Be	end NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ŦE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 338998.802 E 2405333.716	SYMBOL	
EVA	DEPTH (FEET)	MPLE RUI	W/6" 2 % F (RC	OVE	PROFILE	SURFACE EL: 659.64	SSY	REMARKS
		SA	BLO P P	REC	_	DESCRIPTION	nscs	
526.2	132 — 134 —					133.4' SILTSTONE: Medium-hard to hard, slightly fractured, healed with calcite, thinly laminated bedding plane, calcareous, grayish black (N2), unweathered.		
521.2	136 — - - - 138 — -	R-23	100% (100%)	5.0		138.4' SILTSTONE: Medium-hard to hard, slightly fractured, healed with calcite, thinly laminated bedding plane, calcareous, grayish black (N2), unweathered.		
540.0	140 — - - 142 — -	R-24	100% (100%)	5.0		143.4'		
516.2	144 — - - - 146 —	R-25	100%	5.0		SILTSTONE: Medium-hard to hard, dark gray (N3), 142.6'-144.7' calcite vein, thinly laminated bedding plane, calcareous, slightly fractured.		Special care sample taken at 146.0 - 148.0
DATE (STARTED COMPLET GEOLOG KED BY:	TED: 9/ BIST: JL			GWL:	: DEPTH: DATE/TIME: : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	TES: Bedrock part of the Mahatango Formation.
APPRO	OVED BY: ING CO.:	: RJI	IB		DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG	G: CME 75



	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-309		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 338998.802 E 2405333.716	SYMBOL				
EVA:	ОЕРТН (FEET)	MPLI	3W/6 7 % F 8 (RC	OVE	PROFILE	SURFACE EL: 659.64	S S	REMARKS			
 - -		SA	BLC	REC	"	DESCRIPTION	nscs				
1	148 — 150 — 152 — 156 — 158 — 160 — STARTED COMPLET		100% (100%) 100% (96%) 24/07 27/07	5.0		SILTSTONE: grayish black to black (N2 - N1) medium-hard, thinly bedded, fresh to slightly weathering, slightly fractured. 158' SILTSTONE: grayish black to black (N2 - N1) medium-hard, thinly bedded, fresh to slightly weathering, slightly fractured.	NOTI	ES: Bedrock part of the Mahatango Formation.			
1	GEOLOG		′27/07 ₋O			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Manatango i omiation.			
	KED BY:		AR		DIXILI	EINO METHOD. OF FITHOUSEMA NOW OUT					
APPRO	OVED BY:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75			
DRILL	DRILLING CO.: Terracon										



Dall B	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-309			PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	НТ (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 338998.802 E 2405333.716		SYMBOL			
EVA:	ОЕРТН (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 659.64		S S	REMARKS		
E E		SA	BLC	REC		DESCRIPTION		nscs			
	162 — —						163.4'				
496.2	164 — — — — — 166 —	R-29	100%	5.0		SILTSTONE: grayish black to black, medium-hard, slightly calcareous, fresh to slightly weathered, slightly fractured.	103.4				
491.2	168 — - - - 170 —					SILTSTONE: grayish black to black, medium-hard, slightly calcareous, fresh to slightly weathered, slightly fractured.	168.4'				
486.2	- 172 — - - - 174 —	R-30	100%	5.0		SILTSTONE: grayish black to black, medium-hard, slightly calcareous, fresh to slightly weathered, slightly fractured.	173.4'				
	_										
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 9/ IST: Jl	/24/07 /27/07 _O AR		GWL:	DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		NOT	ES: Bedrock part of the Mahatango Formation.		
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: Terry Duncan		RIG:	CME 75		



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	-	LOG OF BORING NO. B-309		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	:ILE	COORDINATES N 338998.802 E 2405333.716	SYMBOL							
DEPTH (FEET) (MPLE N N R RUN N R REG R % (RQD)	PROFILE	SURFACE EL: 659.64	35.53	REMARKS						
SA SA OF	"	DESCRIPTION	SOSN							
176 — R-31 100% (98%) 5.0 -		178.4' SILTSTONE: grayish black (N2) to black (N3), medium-hard, 179.5' to								
180 — - 180 — - - - 182 — -		183.4' fossiliferous zones filled with pyrite, slight to moderate calcareous, no fractures.								
476.2	t t	SILTSTONE: grayish black (N3), medium-hard, fossiliferous, filled byrite, slightly calcareous, slightly fractured.								
471.2 188 —		188.4' SILTSTONE: grayish black to black (N3 to N2), medium-hard, 192.2' - 198.4' healed calcite fractures, thinly bedded, slightly calcareous, resh.		Special care sample taken at 188.4'-189.8'						
DATE STARTED: 9/24/07 DATE COMPLETED: 9/27/07	GWL: D	EPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock part of the Mahatango Formation.						
FIELD GEOLOGIST: JLO CHECKED BY: DAR	DRILLIN	NG METHOD: SPT/Tricone/NQ Rock Core								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLE	R: Craig VanVactor HELPER: Terry Duncan	RIG	6: CME 75						



Ball B	Bell Bend NPP PROJECT NO. 07-3891											
Deli De	enu m		•			LOG OF BORING NO. B-309		FROJECT NO. 07-3031				
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 338998.802 E 2405333.716	SYMBOL					
EET	DEPTH (FEET)	MPLI	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 659.64	SS S	REMARKS				
H E		SA	BLC	REC		DESCRIPTION	nscs					
466.2	192 — - - 194 — - - 196 —	R-34 R-35	100% (100%)	5.0		193.4' SILTSTONE: grayish black (N3), medium-hard, slightly fractured, unweathered, thinly bedded.						
461.2	198 — - - - - 200 —	R-36	100% (100%)	2.8		198.4' SILTSTONE: grayish black (N3), medium-hard, slightly fractured, unweathered, thinly bedded.						
458.4	_					BOTTOM OF BORING 201.2'						
	202 — - - - 204 — -											
DATE (STARTED COMPLET GEOLOG	ΓED: 9/ IST: JI	_0		GWL:	DEPTH: DATE/TIME: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	FES: Bedrock part of the Mahatango Formation.				
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	: CME 75				



Bell Be	end NPP					LOG OF BORING NO. B-310		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	빌	COORDINATES N 338987.788 E 2405445.974	SYMBOL			
EVA7	DEPTH (FEET)	MPLE RUN	3W/6" R % F R (RC	OVE	PROFILE	SURFACE EL: 658.46	S SY	REMARKS		
 	_	SAI	BLC OF	REC		DESCRIPTION	nscs (
	0							Shelby tube 0-2.0' 500 psi downpressure		
	_	U-1						Jou hai gomilhicaanic		
	_									
	2 —							Shelby tube 2.0-4.0'		
	_							500 psi downpressure		
	_	U-2								
	_									
	4 —							Shelby tube 4.0-6.0' 1500 psi downpressure for		
		U-3						1.0'- no recovery		
	_	0-5								
652.5	6 —					6.0' Silty Sand (sm) - 60% Sand, 40% silty clay, fine to medium,	sm			
	_	S-1	6-7 8	2.0'		subrounded to rounded, spherical sand, nonplastic, soft, grayish brown (5YR 3/2) to dark yellowish brown (10YR 4/2), wet, no reaction				
	_	J-1	(15)	2.0		to HCL, medium dense.				
	_						SM			
	8 —	S-2	3-4 8 (12)	1.3'						
649.5			(12)			9.0'				
040.0	_		8-8			Silty Sand (SM) - 80% Sand, 20% silty clay, fine to medium, subrounded to rounded, spherical sand, soft, nonplastic, grayish	sm			
	10 —	S-3	8 (16)	1.1'		brown (5YR 3/2) to dark yellowish brown (10YR 4/2), wet, no reaction to HCL, loose to medium dense.				
	_						SM			
	_	S-4	6-5 6	1.2'						
	_		(11)							
	12 —									
		S-5	4-5 4 (9)	1.3'						
	_						SM			
	14 —		5-6				Sivi			
DATE		S-6	7 (13)	1.1'		DEDTIL	NO	TEO B 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	STARTEC COMPLE ⁻		'27/07 '30/07			: DEPTH: DATE/TIME: : DEPTH: DATE/TIME:	NO	TES: Bedrock part of the Mahatango Formation.		
1	GEOLOG KED BY:		/MP AR		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core				
	OVED BY:				DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason	RIG	6: CME 55 Track		
DRILLI	NG CO.:	Terraco	n			Tousely				



Bell Be	end NPP							PROJECT NO. 07-3891
			1	1		LOG OF BORING NO. B-310		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338987.788 E 2405445.974 SURFACE EL: 658.46	USCS SYMBOL	REMARKS
		0, 0	В	22		DESCRIPTION	Š	
643.5	16 —	S-7	4-4 5 (9)	1.3'		Poorly Graded Sand with Silt (SP-SM) - 85% sand, 15% silt, fine to medium, rounded sand, low plasticity, low dry strength, rapid dilatancy, low toughness, brownish gray (5YR 4/1) to dark yellowish brown (10YR 4/2), moist, no reaction to HCL, very loose to loose.	sp- sm	
	-	S-8	5-4 4 (8)	1.2'			SP- SM	
	18 	S-9	3-3 3 (6)	1.2'				
637.5	20 —	S-10	3-2 1 (3)	1.4'		21.0'	GM	
636.0	22 —	S-11	6-7 10 (17)	1.2'		Silty Gravel with Sand (GM) - 45% gravel, 20% sand, 35% silt and clay, fine to coarse gravel, fine to medium sand, dark yellowish brown (10YR 4/2), moist, no reaction to HCL, medium dense. 22.5'		
	- - 24 	S-12	9-20 22 (42)	0.9'		Well Graded Gravel with Clay and Sand (GW-GC) - 80% gravel, 15% sand, 5% silt, fine to coarse, subrounded gravel, hard, coarse, subrounded to subangular sand, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, medium dense to dense.	gw-	
	_ _ _	S-13	9-15 9 (24)	1.2'			CW	
	26 —	S-14	15-16 17 (33)	1.2'			GW- GC	
	28 —	S-15	17-11 22 (33)	0.9'		Well Graded Gravel with Clay and Sand (gw-gc) - 65% gravel, 30% sand, 5% silt, fine to coarse, subrounded gravel, hard, coarse, subrounded to subangular sand, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, medium dense to dense. 28.5'	gw- gc	
630.0	_		16-16		010	Well Graded Sand with Silt and Gravel (sw-sm) - 20% gravel, 70% sand,10% silt, fine to coarse, subrounded gravel, fine to coarse, subrounded sand, nonplastic, Pale yellowish brown (10YR 6/2) to	sw- sm	
DATE	STARTEI COMPLE GEOLOG	TED: 9/	27/07 30/07 MP		GWL:	DEPTH: DATE/TIME: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahatango Formation.
APPRO	KED BY: OVED BY NG CO.:	: RJI			DRILI	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG:	: CME 55 Track



Dall B	Bell Bend NPP PROJECT NO. 07-3891											
Reli De	ena NPP					LOG OF BORING NO. B-310		PRUJECT NO. 07-3091				
ELEVATION (FEET MSL)	тн ЕТ)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	=ILE	COORDINATES N 338987.788 E 2405445.974	SYMBOL					
EVA EET	ОЕРТН (FEET)	MPL R RU	2W/6 R % & (R(SOVE	PROFILE	SURFACE EL: 658.46	SSS	REMARKS				
] H		S O		REC		DESCRIPTION	nscs					
	30 —	S-16	25 (41)	1.0'	1186111 1186111 1186111	moderate yellowish brown (10YR 5/4), moist, no reaction to HCL, dense to very dense.						
627.0	_	S-17	50/5 (50+)	0.2'		31.5'	GW-					
	32 —	S-18	12-13 14 (27)	1.1'		Well Graded Gravel with Silt and Sand (GW-GM) - 90% gravel, 5% sand, 5% silt, coarse, subrounded to subangular gravel, hard, fine to coarse, subrounded sand, nonplastic, grayish brown (5YR 3/2) to dark yellowish brown (10YR 4/2), wet, no reaction to HCL, medium dense.	GM					
	34 —	S-19	7-8 13 (21)	0.2'								
622.5	36 — -	S-20 S-21	12-13 14 (27) 10-10 7 (17)	0.9'	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	36.0' Silty Sand with Gravel (sm) - 20% gravel, 70% sand, 10% silt, coarse, subrounded gravel, hard, fine to medium, rounded sand, nonplastic, brownish gray (5YR 2/1), wet, no reaction to HCL, medium dense.	SM					
	- 38 — -	S-22	3-5 7 (12)	1.1'			sm					
619.5	40 —	S-23	12-12 20 (32)	0.8'		39.0' Poorly Graded Gravel with Clay and Sand (GP-GC) - 85% gravel, 10% sand, 5% silt, fine to coarse, subrounded to angular gravel, hard, coarse angular sand, 2" max size, nonplastic, dark gray (N3) to grayish red (10R 4/2), wet, no reaction to HCL, dense to very dense, sandstone, siltstone and shale pieces.	GP- GC	This is not bedrock but siltstone boulders with a few hints of glacially linked "soils" such as rounded nonsiltstone (quartz and Sandstone) constituents				
	42 —	S-24	10-15 18 (33)	1.0'								
	_ _	S-25	5-10 50 (60)	1.1'								
DATE (FIELD	DATE STARTED: 9/27/07 DATE COMPLETED: 9/30/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					DEPTH: DATE/TIME: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahatango Formation.				
APPRO	OVED BY:	RJ	В		DRILL	.ER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG	6: CME 55 Track				



Ball Bar	Bell Bend NPP PROJECT NO. 07-3891											
Bell Ben	IG NPP					LOG OF BORING NO. B-310	1	PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	ΞE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338987.788 E 2405445.974	SYMBOL					
EET	DEPTH (FEET)	MPLI R RUN	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 658.46	SS S)	REMARKS				
		S O	BL(REC		DESCRIPTION	nscs					
612.0	46 —	S-26 S-27 S-28	14-19 22 (41) 13-15 13 (28) 26-25 (50) 20-25 26 (51)	1.3'		46.5' Silty Clayey Gravel with Sand (GM-GC), 75% gravel, 10% sand, 15% silt, fine to coarse, subrounded to subangular gravel, fine to coarse, angular sand, 2" max size, nonplastic, dark gray (N3), wet, no reaction to HCL, very dense.	GM- GC					
607.5	50 — - - - 52 —	S-30	50/5 (50+)	0.5'		51.0' Dark gray (N3) to grayish black (N2) SILTSTONE, noncalcareous to very slightly calcareous, very slightly weathered to mostly fresh, slightly fractured, thickly to very thickly bedded		Shale in tip				
	54 — - - - - - - -	R-1	100% (82.5%)	4.0'		53.5-53.9' moderately fractured 55.6-60.0' Intensely fractured		Special care sample taken 56.4-58.0'				
DATE ST DATE CO FIELD GE CHECKE	OMPLET EOLOG	ED: 9/	96% (86%) 227/07 30/07 /MP AR	4.8'	GWL:	DEPTH: DATE/TIME: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahatango Formation.				
APPROV DRILLING	/ED BY:	RJI	В		DRILL	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG	G: CME 55 Track				



	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-310		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 338987.788 E 2405445.974	USCS SYMBOL				
EVA	DEPTH (FEET)	MPLI	3 % F RCRC	OVE	PROFILE	SURFACE EL: 658.46	S S)	REMARKS			
 - 日 -		SAI	BLC	REC		DESCRIPTION	nsc				
DATE	60 — 62 — 64 — 66 — 70 — 72 — STARTED COMPLET	ΓED: 9	100% (100%) 100% (100%) 100% (100%)	5.0'	GWL:	Microfaulting in calcareous lens at 70.9' DEPTH: DATE/TIME: DEPTH: DATE/TIME:		TES: Bedrock part of the Mahatango Formation.			
	GEOLOG		/MP		DRILI	LING METHOD: SPT/Tricone/NQ Rock Core					
	KED BY: OVED BY:		AR B		DRII	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason	RIG	: CME 55 Track			
	ING CO.:					Tousely		. ONE OU HOUR			
					•		-				



Dall Ba	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-310		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	ΞE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338987.788 E 2405445.974	SYMBOL				
EVA.	DEPTH (FEET)	MPLI	2 % F RC RC	OVE	PROFILE	SURFACE EL: 658.46	S S	REMARKS			
		SA	BLC	REC		DESCRIPTION	nscs				
	- 74 — -					Calcareous filled fossil casts from 73.8-74.3'					
	76 — - - 78 — -	R-6	96% (96%)	4.8'							
	80 — - - - 82 —					Dark gray (N3) to grayish black (N2) SILTSTONE, noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, thickly to very thickly bedded Intensely fractured from 82.1-82.4'					
	- - 84 —	R-7	(94%)	5.0'							
	86 —		100%	F 01		Slightly to moderately calcareous from 85.0-90.0'					
DATE		R-8	(100%)	5.0'	CVA"	DEDTH: DATE/FINE.	NOT	TC: Dodrook new of the			
DATE O	STARTED COMPLET GEOLOG	ΓED: 9/ IST: W	/MP		GWL:	DEPTH: DATE/TIME: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock part of the Mahatango Formation.			
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely RIG: CME 55 Track RIG: CME 55 Track											



Ball B	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-310		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	ТН (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE IILE	COORDINATES N 338987.788 E 2405445.974	USCS SYMBOL				
EET	ОЕРТН (FEET)	MPLI R RUI	DW/6 R % I & (RC	SOVE	PROFILE	SURFACE EL: 658.46	SS S	REMARKS			
<u> </u>		& Q	BLC	REC		DESCRIPTION	OSC				
558.5	102 —	R-9	100% (100%)	5.0'		Calcareous fossil casts below 92.2' Slightly to very slightly calcareous Pyrite inclusions from 95.0-96.0' Calcareous fossil casts from 95.6-96.6'	NO.	Special care sample 93.3-95.0'			
DATE (STARTED COMPLET GEOLOG KED BY:	ΓED: 9/ IST: W	/MP		GWL:	DEPTH: DATE/TIME: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock part of the Mahatango Formation.			
APPRO	CHECKED BY: DAR APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely RIG: CME 55 Track										



Bell Be	Bell Bend NPP PROJECT NO. 07-3891										
						LOG OF BORING NO. B-311					
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339099.648	SYMBOL	REMARKS			
ILEV FEE		AMF JR R	OW 90	00	PR(SURFACE EL: 668.43	nscs				
ш =		S O	BI	RE		DESCRIPTION					
	0 _	S-1	5-8 15 (23)	1.4'		Clayey Silty Sand with Gravel (SM-SC) - 25% gravel, 50% sand, 25% silt, fine to coarse, subangular, gravel, fine to coarse, subangular sand, hard, 0.25" max particle size, low plasticity, low dry strength, no dilantancy, low toughness, light brown (5YR 6/4), moist to dry, no reaction to HCl, medium dense. 1.5'	SM- SC				
666.9	2 —	S-2	16-21 24 (45)	1.0'		Well Graded Gravel with Silt and Sand (GW-GM) - 25% gravel, 75% sand, hard, fine to coarse, subrounded to angular gravel, fine to coarse, rounded to subangular sand. 1.5" max size, nonplastic, pale yellowish brown (10YR 6/2) to moderate brown (5YR 4/4) to moderate red (5R 4/6), moist, no reaction to HCI, dense to very dense.	gw- gm				
	4 —	S-3	24-37 24 (61)	1.0'			GW-				
662.4	6 —	S-4	20-22 33 (55)	1.2'		6.0'	GM				
002.4	- -	S-5	5-12 21 (33)	1.2'		Well-Graded Sand with Silt and Gravel (SW-SM) - 25% gravel, 65% sand, 10% silt, fine, subangular, flat and elongated gravel, fine to medium, subrounded sand, 0.25" max size, nonplastic, grayish red (10R 4/2), dry, no reaction to HCl, dense.	SW- SM				
660.9	8 —	S-6	23-23 28 (51)	1.3'		Well-Graded Sand (sw) - 25% gravel, 75% sand, fine to coarse, subangular to subrounded gravel, hard, fine to coarse, subangular to subrounded sand, nonplastic, grayish red (10R 4/2), dry, no reaction to HCl, very dense.	sw				
	- 10 —	S-7	14-15 24 (39)	1.3'		10.5'					
657.9	_	S-8	32-23 21 (44)	1.2'		Well-Graded Gravel with Sand (gw) - 55% gravel, 45% sand, fine to coarse, subangular to subrounded gravel, hard, fine to coarse, subrounded to subangular sand, 1" max size, nonplastic, pale yellowish brown (10YR 6/2) and moderate red (10R 4/2) dry, no reaction to HCL, dense.	gw				
656.4	12 	S-9	42-50/1 (50)	0.6'		Well Graded Sand with Gravel (sw) - 35% gravel, 60% sand, 5% silt, fine, angular, flat gravel, hard, fine to coarse subangular to subrounded sand, nonplastic, moderate reddish brown (10YR 4/6) and medium gray (N3), dry, no reaction to HCl, very dense, fine grained sandstone.	sw				
654.9	- 14 -	S-10	17-17 16 (33)	0.9'		Poorly Graded Gravel with Silt and Sand (GW-GM) - 10% cobble, 65% gravel, 25% sand, fine to coarse, subangular gravel, coarse, subangular to subrounded sand, hard, 1.5" max particle size, nonplastic, pale yellowish brown (10YR 6/2), dry, no reaction to HCl,	GW- GM				
DATE (DATE STARTED: 10/11/07 DATE COMPLETED: 10/12/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR					DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A ING METHOD: SPT/Tricone/NQ Rockcore	NOT	FES: Bedrock part of Mahantango Formation			
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Brian Nabholz DRILLING CO.: Terracon								: CME 850 Track			



Dall B	Bell Bend NPP PROJECT NO. 07-3891									
Reli De	ena NPF		-			LOG OF BORING NO. B-311		PROJECT NO. U1-3091		
ELEVATION (FEET MSL)	∓£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339099.648 E 2405592.490	SYMBOL			
EET	DEPTH (FEET)	MPL	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 668.43	SS S	REMARKS		
 - -		SA OF	BLC	REC	"	DESCRIPTION	nscs			
653.4	_				30	dense. 15.0'	gw			
	- 16 —	S-11	17-12 50/4 (62)	0.5'		Well Graded Gravel with Sand (gw) - 70% gravel, 30% sand, fine to coarse, angular, flat gravel, soft to hard, fine to coarse, angular sand, nonplastic, moderate red (10YR 4/2) and medium gray (N3) shale, wet, no reaction to HCI, medium dense to very dense, fine grained sandstone.	gw			
	_ _ _	S-12	0-50/4 (50)	0.3'						
	18 —									
648.4	20 —	S-13	13-17 13 (30)	0.5'		20.0' Well Graded Gravel with Sand (gw) - 60% gravel, 40% sand, fine to	gw			
	_	S-14	15-17 15 (32)	0.8'		coarse, angular, flat gravel, soft to hard, fine to coarse, angular sand, nonplastic, moderate red (10YR 4/2) and medium gray (N3) shale, wet, no reaction to HCl, medium dense to very dense, fine grained sandstone. 21.5'	J			
646.9	22 —	S-15	11-11 13 (24)	0.9'		Well Graded Gravel with Sand (gw) - 40% cobbles, 20% gravel, 40% sand, coarse, subangular gravel, fine to coarse, subangular to angular sand, max size 1.5", nonplastic, grayish red (5 R 4/2), wet, no reaction to HCl, medium dense to very dense.	gw			
	- - 24 	S-16	19-19 39 (58)	0.6'						
		S-17	0-50/5 (50)	0.0'		No recovery				
	26 —		21-26			No recovery				
640.9	_	S-18	(50)	0.0'		27.5' Well Graded Gravel with Sand (gw) - 20% cobbles, 50% gravel, 30%	gw			
	28 —	S-19	14-25 25 (50)	1.1'		sand, fine to coarse, angular, flat gravel, soft, max size 1.5", nonplastic, grayish red (5R 4/2) to dark yellow brown (10YR 4/2), wet, no reaction to HCl, dense, shale fragments.				
DATE	STARTE)· 1/	<u> </u> 0/11/07		GWI:	DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock part of Mahantango		
DATE (COMPLE GEOLOG KED BY:	TED: 10 BIST: R	0/11/07 0/12/07 AK AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOIL	Formation		
	OVED BY NG CO.:			.ER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850 Track				



D.II D.	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-311		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	Ε£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RY (ft.)	ILE	COORDINATES N 339099.648 E 2405592.490	SYMBOL				
EVA:	DEPTH (FEET)	MPLE	DW/6' R % F 8 (RC	RECOVERY	PROFILE	SURFACE EL: 668.43	\S S:	REMARKS			
H F		AS G	BLC	REC		DESCRIPTION	nscs				
	30 —	S-20	13-24 13 (37)	0.6'							
	-	S-21	25-50/2 (50)	0.0'		No recovery					
636.4	32 —					32.0' Clayey Gravel with Sand (GC) - 25% cobbles, 10% sand, 5% silt, 60% clay, subrounded to rounded, fine to medium sand, low	GC				
	_	S-22	12-14 14 (28)	1.0'		plasticity, medium dry strength, slow dilatancy, medium toughness, dark yellowish orange (10 YR 6/6) to medium gray (N5), wet, no reaction to HCl, very stiff.					
	34 —										
633.4	_		42.20			35.0' Well-Graded Gravel with Sand (gw) - 70% gravel, 30% sand, fine to coarse, subrounded to subangular, elongated and flat gravel, hard,	gw				
624.0	36 —	S-23	12-28 50 (78)	0.6'		fine to coarse, well rounded sand, nonplastic, medium gray (N5), wet, no reaction to HCl, very dense. 36.5'					
631.9	- -	S-24	22-12 11 (23)	0.5'	6 69 0013 1,000 0000 6 100 0013 1,00 0013 1 69 0013	Poorly Graded Sand with silt (sp-sm) - 10% gravel, 75% sand, 15% silt, fine to coarse, subrounded to subangular, hard, elongated and flat gravel, fine to coarse, rounded sand, nonplastic, medium gray (N5), wet, no reaction to HCl, medium dense.	sp- sm				
630.4	38 —	S 25	11-10 11	0.7'		38.0' Well-Graded Sand with Gravel (sw) - 25% gravel, 70% sand, 5% silt, fine to coarse, subangular, flat and elongated gravel, soft, fine to coarse, subrounded sand, nonplastic, medium gray (N5), wet, no	sw				
	-	S-25	(21)	0.7	9000 9000 9000 9000	reaction to HCI, medium dense.	gw-				
	40 —	S-26	11-12 11 (23)	0.9'	8 8 8 9 80 9 80		SW				
627.4	42 —	S-27	7-11 10 (21)	0.5'		Well-Graded Gravel with Sand (gw) - 60% gravel, 30% sand, fine to coarse, subrounded, flat and elongated gravel, fine, subrounded sand, nonplastic, medium gray (N5), wet, no reaction to HCl, medium dense.	gw				
	- -	S-28	8-9 9 (18)	0.8'							
DATE (DATE STARTED: 10/11/07 DATE COMPLETED: 10/12/07 FIELD GEOLOGIST: RAK CHECKED BY: DAR					DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOT	ES: Bedrock part of Mahantango Formation			
APPRO	KED BY: OVED BY NG CO.:	: RJ	В		.ER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850 Track				



Poll Po	Bell Bend NPP PROJECT NO. 07-3891										
Reli De	ena NPF					LOG OF BORING NO. B-311		PROJECT NO. 07-3091			
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339099.648 E 2405592.490	SYMBOL				
EET	DEPTH (FEET)	MPLI R RUI	2W/6' R % F & (RC	COVE	PROFILE	SURFACE EL: 668.43	38.87	REMARKS			
<u> </u>		SA OF	BLC 0	REC		DESCRIPTION	nscs				
	44										
	_	S-29	9-14 11 (25)	0.5'		45.5'					
622.9	46 	S-30	18-19 49 (68)	1.5'	LI CARLE	Well Graded Sand with Silt and Gravel (SW-SM) - 40% gravel, 50% sand, 10% silt and clay, fine to coarse gravel, fine to coarse sand, medium gray (N5), wet, no reaction to HCL, very dense.	SW- SM				
621.4	- - 48 	S-31	14-7 50/2 (57)	1.7'		Well Graded Gravel (gw) - 20% cobbles, 80% gravel, fine to coarse, angular, hard gravel, dark gray (N3) to pale red (10 YR 6/2), wet, nonplastic, no reaction to HCL, very dense.	gw				
	- -	S-31b	50/0	0.0		No Recovery					
618.4	50 	S-32	(50+) 50/4	0.5'		50.0' Shale - Dark gray (N3), soft, noncalcareous, weathered, intensely	_				
	-	R-1	(50+) 75% (0%)	0.6'		fractured, fractures moderately thick, staining, unhealed, wet, no reaction to HCl. Shale - Dark gray (N3), soft, noncalcareous, thinly bedded, intensely fractured, fractures moderately thick, unhealed, intensely weathered, no reaction to HCl.					
	52 					Shale - Dark gray (N3), soft to moderately hard, noncalcareous, moderately thick bedding, slightly fractured, fractures thin, slightly weathered, rock non-weathered, no reaction to HCI.					
	-										
	54 — –										
	- - 56 	R-2	100%	10.0'							
	- -										
	- 58 										
DATE (STARTEI COMPLE GEOLOG KED BY:	TED: 10 BIST: R	D/11/07 D/12/07 AK AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOT	ES: Bedrock part of Mahantango Formation			
APPRO	NED BY: OVED BY ING CO.:	: RJ	В		DRILL	.ER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850 Track			



[Bell Bend NPP PROJECT NO. 07-3891									
Bell B	end NPP					LOG OF BORING NO. B-311		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	HT:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339099.648 E 2405592.490	SYMBOL			
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 668.43	SS S	REMARKS		
<u> </u>		S O	BLC	REC		DESCRIPTION	nscs			
DATE FIELD CHEC	60 — 62 — 64 — 66 — 70 — 72 — STARTED GEOLOG KED BY:	ΓED: 10 IST: R D	AK AR	10.0'	GWL	Shale - Dark gray (N3), moderately hard, noncalcareous, moderately thick bedding, slightly to very slightly fractured, fractures thin, unhealed, rock nonweathered, foliated calcite layer at 69.8'. Shale - Dark gray (N3), moderately hard to hard, noncalcareous, moderate bedding plane, slightly to very slightly fractured, unweathered, wet, no reaction to HCI. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore		ΓΕS: Bedrock part of Mahantango Formation		
	APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Brian Nabholz RIG: CME 850 Track DRILLING CO.: Terracon									



D.11.D	! NDD							DD0 1507 NO 07 2004		
Bell B	end NPP					LOG OF BORING NO. B-311		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339099.648 E 2405592.490	USCS SYMBOL			
EVA:	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 668.43	SS S	REMARKS		
E (F)		SA	BLC	REC		DESCRIPTION	OSC			
DATE FIELD	74 — 76 — 78 — 80 — 82 — 84 — STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: R	97% (94%)	9.7'	GWL:	Shale - Dark gray (N3), moderately hard to hard, calcareous, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, reaction to HCl. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore		TES: Bedrock part of Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRIL	LER: Scott Zeien HELPER: Brian Nabholz	RIG	: CME 850 Track		
DKILL	DRILLING CO.: Terracon									



BOTTOM OF BORING 100. B-311 COORDINATES COORDINATES N 339099-548 E 2405992-490 SURFACE EL: 668.43 DESCRIPTION Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding place, silightly for very signify fractured, unweathered, fossiliferous (crinods, brachicpods), highly calcareous, no reaction to HCI. DATE STARTED: 10/11/07 GWL DEPTH: N/A DATE/TIME: N											
Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossiliferous (crinoids, brachiopods), highly calcaneous, no reaction to HCl. 92— 94— 96— R-6 995 61% 999 Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossiliferous (crinoids, brachiopods), highly calcaneous, no reaction to HCl. 98— 100— DATE STARTED: 10/11/07 DATE COMPLETED: 10/12/07 GWIL: DEPTH: N/A DATE/TIME: N/A FIELD GEOLOGIST: RAK DRILLING METHOD: SPITTifonenNCR ROKKORP	Bell B	end NPP					LOG OF BORING NO. B-311		PROJECT NO. 07-3891		
Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossill-ferous (crinoids, brachiopods), highly calcaneous, no reaction to HCl. 94— 96— R-6 89% 9.9 Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossill-ferous (crinoids, brachiopods), highly calcaneous, no reaction to HCl. 98— 100— DATE STARTED: 10/11/07 JATE COMPLETED: 10/12/07 GWIL: DEPTH: N/A DATE/TIME: N/A POTES: Bedrock part of Mahantan, Formation Filed Disclociosist: RAK DRILLING METHOD: SPITTitionenNOR ROKKORE	(JSN	Ή£	. O O	& (N) (EC. (D)	۲۲ (ft.)	LE		MBOL			
Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossill-ferous (crinoids, brachiopods), highly calcaneous, no reaction to HCl. 94— 96— R-6 89% 9.9 Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossill-ferous (crinoids, brachiopods), highly calcaneous, no reaction to HCl. 98— 100— DATE STARTED: 10/11/07 JATE COMPLETED: 10/12/07 GWIL: DEPTH: N/A DATE/TIME: N/A POTES: Bedrock part of Mahantan, Formation Filed Disclociosist: RAK DRILLING METHOD: SPITTitionenNOR ROKKORE	EVAT	DEPT (FEE"	MPLE RUN	.W/6" 7 % F \$ (RC	OVE	ROF	SURFACE EL: 668.43	SSY	REMARKS		
Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered. 92— 94— 96— R-6 (\$153) 9.9' Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered. fossiliferous (crinoids, brachiopods), highly calcareous, no reaction to HCI. 98— BOTTOM OF BORING 100.8' BOTTOM OF BORING 100.8' DATE STARTED: 10/11/07 GML: DEPTH: N/A DATE/TIME: N/A DATE/TIME: N/A Formalion NOTES: Bedrock part of Mahantam, Formalion	EL		SAI	BLO OF	REC	-	DESCRIPTION	nsc			
DATE COMPLETED: 10/12/07 GWL: DEPTH: N/A DATE/TIME: N/A Formation FIELD GEOLOGIST: RAK DRILLING METHOD: SPT/Tricone/NQ Rockcore	567.6	90 — 92 — 94 — 96 — 98 — 100 —	R-6		9.9'		in bedding plane, slightly to very slightly fractured, unweathered, fossiliferous (crinoids, brachiopods), highly calcareous, no reaction to HCl. Shale - Dark gray (N3), moderately hard to hard, moderate thickness in bedding plane, slightly to very slightly fractured, unweathered, fossiliferous (crinoids, brachiopods), highly calcareous, no reaction to HCl.				
	DATE FIELD	DATE COMPLETED: 10/12/07 FIELD GEOLOGIST: RAK					DEPTH: N/A DATE/TIME: N/A	NOT	TES: Bedrock part of Mahantango Formation		
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Brian Nabholz RIG: CME 850 Track DRILLING CO.: Terracon	APPRO	OVED BY:	RJ	В		DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	: CME 850 Track		



Boll Bo	Bell Bend NPP PROJECT NO. 07-3891										
Dell De	ena NPP					LOG OF BORING NO. B-312a		PROJECT NO. 07-3091			
ELEVATION (FEET MSL)	¥£.	SAMPLE NO. OR RUN NO.	" & (N) REC. 2D)	:RY (ft.)	:ILE	COORDINATES N 339230.045 E 2405581.980	SYMBOL				
EET	DEPTH (FEET)	MPL R RU	BLOW/6" & (OR % REC & (RQD)	RECOVERY	PROFILE	SURFACE EL: 669.08		REMARKS			
EI (F		δ. P.	BL(REC		DESCRIPTION	nscs				
	0 -	S-1	2-2 5 (7)	1.0		Silt with Sand (ml) - 5% cobbles, 20% sand, 70% silt, 5% organics, hard cobbles, fine, subangular to rounded sand, low plasticity, low dry strength, high dilatancy, low toughness, moderate yellowish brown (10YR 5/4) to light gray (N7), organic odor, damp, no reaction to HCl, medium stiff.	ml				
667.6	2 —	S-2	5-15 14 (29)	1.1		Silty Sand (sm) - 10% gravel, 60% sand, 30% silt, subangular, fine to coarse gravel, fine to medium, subrounded to subangular sand, low plasticity, low dry strength, high dilatancy, low toughness, moderate yellowish brown (10 YR 5/4), dry, no reaction to HCl, medium dense.	sm				
666.1	4 —	S-3	50/4 (50+)	0.6	9 8 8 8 9 9 9 8 9 9 9 9	3.0' Silty Sand with gravel (sm) - 20% gravel, 60% sand, 20% silt, subangular, fine to coarse gravel, fine to medium, subrounded to subangular sand, low plasticity, low dry strength, high dilatancy, low toughness, moderate yellowish brown (10 YR 5/4), dry, no reaction to HCl, medium dense.	sm				
664.2	- - -	S-4	25-50-4" (50)	0.8		4.9' Well Graded Gravel (gw) - 90% cobble, 5% gravel, 5% sand, subangular, coarse gravel and cobbles, hard, subrounded to sudangular, fine to coarse sand, nonplastic, light gray (N7), dry, no reaction to HCl, very dense.	gw				
663.1	6 - -	S-5	18-31 21 (52)	1.5		Feaction to HCI, very dense. Sandy Silt (ml) - 10% cobble, 10% gravel, 30% sand, 50% silt, large grain, subangular gravel and cobbles, hard, 10% fine, subrounded sand, nonplastic, light brown (5YR 6/4) to pale pink (5RP 8/2), dry, no reaction to HCL, hard.	ml				
	8 —	S-6	8-15 12 (27)	1.2							
CEO C	10 —	S-7	3-13 7 (20)	0.6		10.5'					
658.6	- -	S-8	31-21 16 (37)	1.0		Sandy Silt (ml) - 10% gravel, 40% sand, 50% silt, angular to subangular, coarse gravel, angular to subangular, fine to coarse sand, nonplastic, grayish red (10R 4/2), wet, no reaction to HCl, medium dense.	ml				
657.1	12 	S-9	11-9 12 (21)	1.1	111781	Poorly Graded Sand (sp) - 5% gravel, 90% sand, 5% silt, coarse, subangular, spherical, gravel, fine to coarse, subrounded to subangular sand, 0.5 max size, nonplastic, dark yellowish brown	sp				
656.1	_					(10YR 2/2), wet, no reaction to HCL, medium dense. 13' Well-Graded Sand with Gravel (sw) - 15% gravel, 80% sand, 5% silt.	sw				
655.6	DATE STARTED: 10/16/07					angular to subangular sand and gravel, nonplastic, grayish red (1000000000000000000000000000000000000	sp				
	STARTEI COMPLE		0/16/07 0/18/07			.: DEPTH: 14.2' DATE/TIME: 10/18/07 .: DEPTH: DATE/TIME:	NO	TES: Bedrock part of the Mahatango Formation			
FIELD	GEOLOG KED BY:	SIST: J	ΓM AR			LING METHOD: SPT/Tricone NQ Rock Core					
APPRO	OVED BY: NG CO.:	: RJ	В		DRI	LER: Crain VanVactor HELPER: Logan Shipman	RIG	6: CME 75 Truck			
							•				



Ball Ba	Bell Bend NPP PROJECT NO. 07-3891										
Dell De	enu NPP					LOG OF BORING NO. B-312a		FROJECT NO. 07-3091			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339230.045 E 2405581.980 SURFACE EL: 669.08	USCS SYMBOL	REMARKS			
		s O	BI	R.		DESCRIPTION	Sn				
653.6	- 16 	S-11	9-10 10 (20)	1.1	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Well Graded Sand with Gravel (sw) - 25% gravel, 70% sand, 5% silt, fine to coarse, angular gravel, fine to medium, subangular to subrounded sand, nonplastic, dark yellowish brown (10YR 4/2), wet,	sw				
054.4	- - -	S-12	3-8 15 (23)	0.4	# 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	no reaction to HCI, medium dense.					
651.1	18 	S-13	21-38 31 (69)	0.9		Well Graded Gravel with Sand and Silt (gm-gw) - 60% gravel, 30% sand, 10% silt, angular to subangular, fine to coarse gravel, moderately soft, angular to subangular, fine to coarse sand, nonplastic, dark yellowish brown (10YR 4/2) to dark gray (N3), wet, no reaction to HCl, dense to very dense.	gw- gm				
648.1	20 —	S-14	16-23 26 (49)	0.6		21.0'	c n				
646.6	22 —	S-15	9-9 7 (16)	0.7		Poorly Graded Sand with Silt (sp-sm) - 75% sand, 15% gravel, 10% silt, coarse, angular to subangular gravel, fine to medium, subrounded to subangular sand, nonplastic, grayish red (5R 4/2), wet, no reaction to HCl, medium dense. 22.5'	sp- sm				
040.0	-	S-16	37-18 20 (38)	0.6		Well Graded Gravel with Silt (gw-gm) - 80% gravel, 10% sand, 10% silt, angular to subangular gravel, fine to coarse, angular sand, nonplastic, dark yellowish brown (10YR 4/2) to dark reddish brown (10R 3/4), wet, no reaction to HCl, dense, fine grained sandstone cobble at 22.5'-22.7'.	gw- gm				
	24 	S-17	10-15 7 (22)	0.0		No Recovery 25.5'		Significant decrease in water circulation of mud rotary at 24.5'			
643.6	26 	S-18	31-50/4" (50)	0.8		Well Graded Gravel with Sand (gw) - 75% gravel, 20% sand, 5% silt, fine grained, angular to subangular gravel, fine to medium, subrounded to subangular sand, nonplastic, dark yellowish brown (10YR 4/2),wet, dense, no reaction to HCI, very dense.	gw				
642.1	28 —	S-19	50/3 (50+)	0.1		Well Graded Gravel (gw) - 100% cobble, intensely fractured, very hard, nonplastic, grayish olive green (5GY 3/2), wet, no reaction to HCl, very dense.	gw				
640.6			23-40			28.5' Well Graded Gravel (gw) - 90% gravel, 10% sand, fine, angular to subangular gravel, fine to medium, angular to subangular sand, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl,	gw				
DATE (STARTEI COMPLE GEOLOG KED BY:	TED: 10	D/16/07 D/18/07 FM AR		GWL:	DEPTH: 14.2' DATE/TIME: 10/18/07 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone NQ Rock Core	NO	TES: Bedrock part of the Mahatango Formation			
APPRO	OVED BY NG CO.:	: RJI	В		DRILI	LER: Crain VanVactor HELPER: Logan Shipman	RIG	: CME 75 Truck			



Bell B	end NPP							PROJECT NO. 07-3891
<u> </u>						LOG OF BORING NO. B-312a		1
ELEVATION (FEET MSL)	¥£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339230.045 E 2405581.980	SYMBOL	
EVA EET	DEPTH (FEET)	MPL R RU	2W/6 R % R(R(SOVE	PROFILE	SURFACE EL: 669.08	SS S	REMARKS
급뜨				REC	"	DESCRIPTION	nscs	
		S-20	46 (86)	0.7		dense.		
639.1	30 —	1	. !			30.0' Well Graded Gravel with Sand (gw) - 70% gravel, 30% sand angular,	gw	
	-	S-21	38-38 29 (67)	0.8		coarse gravel, fine to coarse, subangular sand, nonplastic, moderate red (5R 4/6) to grayish red (10R 4/2) to dark gray (N3), wet, no reaction to HCl, very dense.		
637.6	1 -	1	!			31.5' Poorly Graded Gravel (gp) - 15% cobble, 70% gravel, 5% sand, 10%	gp	
	32 —	S-22	23-19 18 (37)	0.9		silt, very hard, intensely fractured, medium grained cobbles, angular gravel, fine, angular to subangular sand, nonplastic, moderate red (5R 4 6) to grayish red (10R 4/2) to grayish olive green (5GY 3/2), wet, no reaction to HCl, dense, sandstone boulder. 33.0'		
636.1		 				Silty Gravel (gm) - 60% gravel, 10% sand, 30% silt, coarse,	gm	
	34 —	S-23	22-17 15 (32)	0.8		subrounded, gravel, fine to coarse sand, nonplastic, moderate yellowish brown (10YR 5/4) and dark gray (N2), wet, no reaction to HCl, dense.		
634.6						BOTTOM OF BORING 34.5'		An approximately 3' long
		1	'			BORING TERMINATED AT 34.5' DUE TO UNRETRIEVABLE STEEL CASING DOWNHOLE		piece of 3" OD Steel Casing and tricone bit were
		1	'			1		unretrievable at 34. 5'. Boring terminated and abandoned.
	36 —	1	'			1		terminaled and abandoned.
		1	'			1		
		1	'			1		
		1	'			1		
	38 —	1	'			1		
		1	'			1		
	-	1	'			1		
	-	1	'			1		
	40 —	1	'			1		
	1 -	1	'			1		
	1 -	1	'			1		
	-	l	'			'		
	42 —	1	'			'		
		1	'			'		
		l	'			'		
	-	1	'			1		
DATE	STARTED): 1	10/16/07	<u> </u>	GWL:	 DEPTH: 14.2' DATE/TIME: 10/18/07	NO.	TES: Bedrock part of the
DATE	COMPLET	TED: 1	10/18/07		GWL:	: DEPTH: DATE/TIME:		Mahatango Formation
1	GEOLOG		JTM DAR		DRILL	LING METHOD: SPT/Tricone NQ Rock Core		
	KED BY: OVED BY:		DAR JB		DRIL!	LER: Crain VanVactor HELPER: Logan Shipman	RIG	G: CME 75 Truck
	ING CO.:		on Inc.					
								·



Dell Berral NDD									
Bell Bend NPP	LOG OF BORING NO. B-312b		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339230.045 E 2405581.980	USCS SYMBOL							
LEVATION EET MS (FEET) MAPLE N N R RUN N R RUN N R REGEN R R REGEN R R REGEN R R R R R R R R R R R R R R R R R R R	의 N 339230.045 E 2405581.980 SURFACE EL: 669.08	S SY	REMARKS						
1 1 1 1 1 1 -	DESCRIPTION	OSO							
0	SWL: DEPTH: DATE/TIME: SWL: DEPTH: DATE/TIME:	NC	Tricone/Casing Advancer from 0'-21'; no SPT samples collected. Start NQ core barrel at 21'.						
FIELD GEOLOGIST: JTM	GWL: DEPTH: DATE/TIME: DRILLING METHOD: SPT/Tricone/NQ Rockcore		Manantango i offiation						
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon Inc.	ORILLER: Craig Vanvactor HELPER: Logan Shipman	RIC	G: CME 75 Truck						



	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-312b		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (TE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	il E	COORDINATES N 339230.045 E 2405581.980	SYMBOL				
EVA EET	DEPTH (FEET)	MPL R RU	2W/6 R % & (R(SOVE	PROFILE	SURFACE EL: 669.08	.S S.	REMARKS			
] H		δ Q	BL(REC		DESCRIPTION	nscs				
	16 — 18 — 20 — 22 — 24 — 26 — 28 — STARTED COMPLET		26% (0.0%)	3.3		Cobbles - About 100% cobbles, medium gray (N5) to dark gray (N3), siltstone. Cobbles - About 100% cobbles, very light gray (N8) to medium gray (N5) mixture of fine to medium grained sandstones, rounded edges, medium bluish gray (5B 5/1), sandstone, moderate brown (5YR 4/4), limestone, fossiliferous (brachiopods), medium gray (N5) fine to medium grained limestone, light gray (N7) to white (N9) mixture of fine to medium graded sandstone, dark reddish brown (10R 3/4) fine to medium grained sandstone, dark gray (N3) highly fossiliferous limestone, mixture of gravel, well rounded, fine to coarse grained.	NOT	ES: Bedrock part of the Mahantango Formation			
FIELD	GEOLOG	IST: J	ГМ			LING METHOD: SPT/Tricone/NQ Rockcore					
	KED BY:		AR					0.45 75 7			
	APPROVED BY: RJB DRILLER: Craig Vanvactor HELPER: Logan Shipman RIG: CME 75 Truck										
DIVILL	DRILLING CO.: Terracon Inc.										



Bell Be	end NPP					LOG OF BORING NO. B-312b		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339230.045 E 2405581.980	USCS SYMBOL	
EVA:	DEPTH (FEET)	MPLF RUF	W/6'	OVE	PROFILE	SURFACE EL: 669.08	SS	REMARKS
		SAN	BLO PP S	REC		DESCRIPTION	nsc	
634.3	30 — 32 — 34 — 36 — 40 — 42 — STARTED	R-3	98% (86%) 100% (94%)	4.9	GW-1	Shale - Medium gray (N5) to dark gray (N3), intensely fractured to very slightly fractured, fresh vertical bedding planes, no reaction to HCl, medium to hard.	NO	TES: Bedrock part of the
DATE	COMPLET	TED: 10	0/19/07		GWL:	DEPTH: DATE/TIME:		Mahantango Formation
	GEOLOG		TM AR		DRIL	LING METHOD: SPT/Tricone/NQ Rockcore		
	KED BY: OVED BY:				DRII	ER: Craig Vanvactor HELPER: Logan Shipman	BIC	: CME 75 Truck
	ING CO.:					TILLI LIV. Logan Shipman	'\'\	. ONE TO HUCK
					•		•	



Dall B	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	ena NPP					LOG OF BORING NO. B-312b		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339230.045 E 2405581.980	USCS SYMBOL				
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 669.08	\S S:	REMARKS			
<u> </u>		SA	BLC	REC		DESCRIPTION	osn				
	44 —										
						Shale - Medium gray (N5) to dark gray (N3), slightly fractured to very					
	_					slightly fractured, unhealed, fresh, no reaction to HCl, medium hard to hard.					
	46 —										
	_										
	_	R-5	100%	5.0							
	_	K-0	(100%)	5.0							
	48 —										
	_										
	_										
	_					Chala Dark grow (N2) maderately hard climbth front and unbacked					
	50 —					Shale - Dark gray (N3), moderately hard, slightly fractured, unhealed, no reaction to HCl, vertical fracture from 52.9' to 54', fresh,					
						moderately thick bedding.					
	_										
	_										
	52 —	R-6	100%	5.0							
			(80%)	0.0							
	_										
	54 —										
	_					Obele Dedenos (NO) and add been a stable for the					
	_					Shale - Dark gray (N3), moderately hard, very slightly fractured, unhealed, no reaction to HCl, moderately thick bedding.					
	_										
	56 —										
		R-7	100%	5.0							
			(98%)	0.0							
	58 —										
DATE	STARTED): 10	0/16/07		GWL	: DEPTH: DATE/TIME:	NOT	ES: Bedrock part of the			
1	COMPLET				1	: DEPTH: DATE/TIME:		Mahantango Formation			
	GEOLOG KED BY:		ΓM AR		L DKIL	LING METHOD: SPT/Tricone/NQ Rockcore					
APPR	OVED BY:	RJ	В		DRIL	LER: Craig Vanvactor HELPER: Logan Shipman	RIG:	: CME 75 Truck			
DRILL	ING CO.:	Terraco	n Inc.								



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LOG OF BORING NO. B-312b	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339230.045 E 2405581.980	TOBWARKS REMARKS								
DEPTH (FEET) MMPLE N R RUN N R % REC (RCD)	N 339230.045 E 2405581.980 SURFACE EL: 669.08	က် REMARKS								
SA SA OF	DESCRIPTION	SOSO								
60 — R-8 100% (50%) 5.0 66 — R-9 100% (100%) 5.0 70 — 70 — 72 — 100%	Shale - Dark gray (N3), moderately hard, very slightly fractured, unhealed, no reaction to HCl, moderately thick bedding, large vertical fracture from 62.3' to 64.6', unhealed, very slightly weathered. Shale - Dark gray (N3), moderately hard, very slightly fractured, unhealed, no reaction to HCl, moderately thick bedding. Shale - Dark gray (N3), moderately hard, very slightly fractured, unhealed, no reaction to HCl, moderately thick bedding, horizontal fracture at 70.5', thin, unhealed, fresh.									
DATE STARTED: 10/16/07 DATE COMPLETED: 10/19/07	GWL: DEPTH: DATE/TIME: GWL: DEPTH: DATE/TIME:	NOTES: Bedrock part of the Mahantango Formation								
FIELD GEOLOGIST: JTM CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ Rockcore									
APPROVED BY: RJB DRILLING CO.: Terracon Inc.	DRILLER: Craig Vanvactor HELPER: Logan Shipman	RIG: CME 75 Truck								



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP		LOG OF BORING NO. B-312b		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.) PROFILE	COORDINATES N 339230.045 E 2405581.980	USCS SYMBOL							
DEPTH (FEET) MMPLE N R RUN N R RUN N R REG	SOVERY (SURFACE EL: 669.08	SS S	REMARKS						
SAS OF	REC	DESCRIPTION	OSC							
74 — —										
76 —	5.0	Shale - Dark gray (N3), moderately hard, very slightly fractured, unhealed, no reaction to HCI, fresh, moderately thick bedding.								
80 — 82 — 82 — R-12 98% (98%) — 84 — 84 — 84 —	4.9									
R-13 98% (98%) DATE STARTED: 10/16/07 DATE COMPLETED: 10/19/07		Shale - Dark gray (N3), moderately hard, unfractured, very slight reaction to HCl, moderately thick bedding. DEPTH: DATE/TIME: DEPTH: DATE/TIME:	NOT	TES: Bedrock part of the Mahantango Formation						
FIELD GEOLOGIST: JTM CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon Inc.	DRIL	LING METHOD: SPT/Tricone/NQ Rockcore LER: Craig Vanvactor HELPER: Logan Shipman	RIG	: CME 75 Truck						



D. II D	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-312b		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339230.045 E 2405581.980	USCS SYMBOL				
EVA:	DEPTH (FEET)	MPLI R RUI	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 669.08	SS S	REMARKS			
H H		SA OF	BLC	REC		DESCRIPTION	OSC				
568.4	88 — 90 — 92 — 94 — 96 — 100 — 102 —	R-14	100% (100%)	5.0		Shale - Dark gray (N3), moderately hard, unfractured, moderate reaction to HCl, moderately thick bedding, fresh. Shale - Dark gray (N3), moderately hard, unfractured, moderate reaction to HCl, moderately thick bedding, fresh. BOTTOM OF BORING 100.7'					
DATE FIELD	STARTED COMPLE GEOLOG KED BY:	TED: 10	I D/16/07 D/19/07 ГМ AR		GWL	DEPTH: DATE/TIME: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/NQ Rockcore	NO	TES: Bedrock part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig Vanvactor HELPER: Logan Shipman	RIG	: CME 75 Truck			



Boll B	end NPP							PROJECT NO. 07-3891
Dell Be	eliu NPP					LOG OF BORING NO. B-313		PROJECT NO. 07-3091
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338917.237 E 2405379.263 SURFACE EL: 657.42 DESCRIPTION	USCS SYMBOL	REMARKS
	0			<u> </u>		Silt (ml) - 10% cobbles, 10% sand, 80% silt, fine, subrounded to	ml	
	- - 2 -					subangular sand, medium plasticity, low dry strength, rapid dilatancy, low toughness, moderate yellowish-brown (10 YR 5/4), pale yellow brown (10 YR 6/2), and medium dark gray (N4), wet, no reaction to HCl, soft.		
654.7	4 —	S-1	2-2 2 (4)	1.5		Silty Sand (sm) - 5% cobbles, 75% sand, 20% silt, fine, subangular to subrounded sand, low plasticity, no to low dry strength, no to slow dilatancy, low toughness, brownish gray (5YR 4/1), wet, no reaction to HCI, very loose to medium dense.		
	6 	S-2	3-4 6 (10)	1.4				
	- 8 - -	S-3	4-5 6 (11)	1.3				
	10 —	S-4	5-6 5 (11)	1.1				
644.9	12 - -	S-5	4-4 3	1.2		12.5' Silty Sand (sm) - 5% cobbles, 85% sand, 10% silt, subrounded to subangular, fine to medium sand, nonplastic, brownish gray (5YR 4/1) to medium-dark gray (N4), wet, no reaction HCl, very loose to loose.	sm	
	- 14 -		(7)					
DATE :	STARTED COMPLE ^T GEOLOG KED BY:	ΓED: 10 IST: W	/30/07 D/02/07 /MP AR		GWL	.: DEPTH: N/A DATE/TIME: N/A .: DEPTH: N/A DATE/TIME: N/A .:LING METHOD: SPT/Tricone/ NQ Rock Core	NO ⁻	TES: Bedrock Part of the Mahantango Formation
	OVED BY: NG CO.:				DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG	: CME 55 Track rig



D.II.D	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP		_			LOG OF BORING NO. B-313		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 338917.237 E 2405379.263	SYMBOL				
EVA EET	DEPTH (FEET)	MPL R RUI	2W/6 R % (R(ÖVE	PROFILE	SURFACE EL: 657.42	SSS	REMARKS			
13 H)		AS O	BLC	REC		DESCRIPTION	nscs				
634.9 633.9	16 — 18 — 20 — 22 — 24 — 26 — 28 —	S-6 S-7 S-8 S-10	4-4 5 (9) 4-3 4-7 7 (14) 7-10 10 (20) 49-16 13 (29)	1.2 1.3 1.4 1.0		Silty Sand (sm) - 5% cobbles, 70% sand, 25% silt, subrounded fine sand, low plasticity, low dry strength, slow dilatancy, low toughness, moderate yellowish brown (10YR 5/4), wet, no reaction to HCI, medium dense. 23.5' Well-Graded Gravel with sand (gw) - 15% cobbles, 70% gravel, 15% sand, fine to coarse, subrangular gravel, fine to coarse, subrounded to angular sand, nonplastic, moderate yellowish-brown (10 YR 5/4), wet, no reaction to HCI, medium dense.	sm				
DATE FIELD	STARTEI COMPLE GEOLOG	TED: 10	/30/07 0/02/07 /MP		GWL	: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ΓΕS: Bedrock Part of the Mahantango Formation			
APPRO	KED BY: OVED BY: ING CO.:	: RJ			DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG:	: CME 55 Track rig			



Dall Br	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-313		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338917.237 E 2405379.263	SYMBOL	
EVA'	ОЕРТН (FEET)	MPLF RUI	3. % F R (RC	OVE	PROFILE	SURFACE EL: 657.42	S SY	REMARKS
 		SAI	BLO P.P.	REC	^	DESCRIPTION	nscs (
624.9	30 —	S-12	7-7 9 (16)	0.9		32.5' Silty Gravel with Sand (gm) - 65% gravel, 20% sand, 15% silt, fine to coarse gravel, fine to coarse, subrounded to subangular sand,	gm	
	34 —	S-13 S-14	13-13 13 (26) 	0.7		coarse graver, line to coarse, subrounded to subangular sand, nonplastic, moderate yellowish-brown (10 YR 5/4) to moderate brown (5YR 4/4), wet, no reaction to HCI, medium-dense to dense. No Recovery		
	38—	S-15	24-20 13 (33)	0.7				
614.9	- - 42 — -	S-16	9-19 17 (36)	0.6		42.5' Silty Gravel with Sand (gm) - 65% gravel, 20% sand, 10% silt, 5% clay, fine to coarse, subangular gravel, fine to coarse, subangular to subrounded sand, nonplastic, medium gray (N5) to medium dark gray	gm	
DATE (STARTED COMPLET GEOLOG	TED: 10 BIST: W	/MP	1.1	GWL:	(N4) and moderate brown (5YR 3/4), wet, no reaction to HCI, medium-dense to dense. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		ES: Bedrock Part of the Mahantango Formation
APPRO	KED BY: OVED BY: ING CO.:	: RJI			DRILL	ER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG:	CME 55 Track rig



Ball Ba	Bell Bend NPP PROJECT NO. 07-3891										
Dell De	eliu ive r		•	-	. ,	LOG OF BORING NO. B-313		FROJECT NO. 07-3031			
ELEVATION (FEET MSL)	тн :Т)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 338917.237 E 2405379.263	USCS SYMBOL				
EVA EET	DEPTH (FEET)	MPL RUI	XW/6 R % & (R(OVE	PROFILE	SURFACE EL: 657.42	\S S\	REMARKS			
EL (F		SA OF	BLC	REC		DESCRIPTION	OSC				
	44 —	S-18	21-17 18 (35)	1.2							
609.9	48 —	S-19	32-90 33 (123)	1.2		47.5' Silty Sand with Gravel (sm) - 20% gravel, 65% sand, 10% silt, 5% clay, coarse, subangular, flat gravel, fine to coarse, subangular to subrounded sand, nonplastic, medium gray (N5) to medium dark gray (N4), wet no reaction HCl, very dense.	sm				
	50 —	S-20	16-22 35 (57)	1.1							
603.4	54 — - -	S-21	37-60 50/4" (110) 80% (0%)	0.8		54.0' Siltstone - Dark gray (N3) with grayish-red (10R 4/2), non-calcareous to very slightly calcareous. Siltstone - Dark gray (N3), intensely to moderately fractured, weathered, with assorted gravel and sand infilling joints, non-calcareous to very slightly calcareous.					
DATE (56 — 58 — STARTEL COMPLE	TED: 10	82% (10%) (30/07 (0/02/07 (MP	3.3	GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation			
APPRO	KED BY: OVED BY: NG CO.:	: RJI			DRILL	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG:	CME 55 Track rig			



D.II D.	Bell Bend NPP PROJECT NO. 07-3891										
Bell Bel	nd NPP					LOG OF BORING NO. B-313	_	PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 338917.237 E 2405379.263	SYMBOL				
EVA	DEPTH (FEET)	MPLI RUI	2 % F RCRC	OVE	PROFILE	SURFACE EL: 657.42	(S S)	REMARKS			
급흥		SAI	BLC	REC		DESCRIPTION	nscs				
	60 —	R-3	90% (40%)	0.9		Siltstone - Dark gray (N3), moderately to slightly fractured, non-calcareous to very slightly calcareous, intensely fractured zones between 60.1' to 60.2', 60.8' to 61.3', and 61.5' to 61.9', intensely fractured zones exhibit clay and rock fragments in fractures.					
	62 — - - - 64 —	R-4	82% (38%)	4.1							
	66 —	R-5	100% (96%)	5.0		Siltstone - Dark gray (N3), slightly to very slightly fractured, non-calcareous to very slightly calcareous, fresh to slightly weathered, calcitic vein at 65.5', very thickly bedded.					
	68 — - - 70 — -		(30 /0)			Siltstone - Dark gray (N3), very slightly fractured, very slightly to slightly calcareous, fresh to slightly weathered, very thickly bedded.		Special Care Sample 70.0' - 71.2'			
	72 — - -	R-6	100% (96%)	5.0							
DATE C	STARTED COMPLET GEOLOG	ΓED: 1 IST: W	/30/07 0/02/07 /MP AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation			
APPRO	VED BY:	RJ	В		DRILI	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG	: CME 55 Track rig			



Dall D	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-313		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	ТН (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 338917.237 E 2405379.263	SYMBOL				
EVA:	ОЕРТН (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 657.42	\S S:	REMARKS			
E.		SA	BLC	REC		DESCRIPTION	nscs				
	74 — - -					Siltstone - Dark gray (N3), very slightly fractured, very slightly to slightly calcareous, slightly weathered in fractures, very thickly					
	76 — 78 —	R-7	100% (98%)	5.0		bedded.					
577.4	80 — — — 82 — —	R-8	98%	4.9		Shale - Dark gray (N3), very thickly bedded, unfractured, slightly to moderately calcareous, calcite filled fossil at 81.8'.					
	84 — - - 86 —		100%			Shale - Dark gray (N3), very thickly bedded, very slightly fractured, very slightly calcareous to slightly calcareous, calcite layer microfaulted at 86.4', with calcite-filled fossils.					
	_	R-9	(100%)	5.0							
DATE FIELD	STARTED COMPLE ^T GEOLOG KED BY:	TED: 10 IST: W	/30/07 0/02/07 /MP AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJI	В		DRILI	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG:	CME 55 Track rig			



Bell Bend NPP		LOG OF BORING NO. B-313		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.) PROFILE	COORDINATES N 338917.237 E 2405379.263	USCS SYMBOL	
LEVATIO EET MSI DEPTH (FEET) MMPLE N R RUN N S RUN N S RUN N S RUN N S REG	COVERY PROFILE	SURFACE EL: 657.42	SSY	REMARKS
SAI SAI OR OF	REC P	DESCRIPTION	nsc	
88 —		Shale - Dark gray (N3), very thickly bedded, very slightly fractured, fossiliferous with calcite-filled fossils throughout, random pyrite at 91.5'. Shale - Moderately hard, dark gray (N3), thickly to very thickly bedded, fresh, unfractured to very slightly fractured, noncalcareous to very slightly calcareous. BOTTOM OF BORING 100' BOTTOM OF BORING 100'		Special Care Sample 95.0'-96.8'. TES: Bedrock Part of the Mahantango Formation
DATE COMPLETED: 10/02/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR		: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		Manantango i omiation
APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/ Jason Tousely	RIG	6: CME 55 Track rig



Bell Be	end NPP							PROJECT NO. 07-3891
Den D	fliu ivi i					LOG OF BORING NO. B-314		FROSEOT NO. 01-0001
ELEVATION (FEET MSL)	ГН :T)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE I	COORDINATES N 338916.472 E 2405288.197	SYMBOL	
EVA'	DEPTH (FEET)	MPLE RUN	NW/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 658.29	S SY	REMARKS
급단		SA	BLC	REC		DESCRIPTION	nscs	
	0	S-1	1-3 3 (6)	1.5	# 60 0000 # 460 0000 # 60 0000 # 60 0000 # 60 0000 # 460 0000	Poorly-Graded Sand with Silt (sp-sm) - 90% sand, 10% silt, well rounded, fine to medium sand, low plasticity, low dry strength, moderate dilatancy, and low toughness, Grayish brown (5YR 3/2) to moderate brown (5YR 3/4), slight organic odor, moist, weak reaction to HCI, loose.	sp- sm	
	2 —	S-2	2-3 3 (6)	1.2	F 69 30 13 0 5 3 3 3 3 5 0 5 3 3 3 5 0 5 3 3 3 5 0 6 3 3 3 3 3	3.0'		
655.3	4 —	S-3	2-3 3 (6)	1.0		Clayey Sand (sc) - 60% sand, 20% clay, 10% silt, fine to medium, rounded to subrounded sand, moderate plasticity, moderate dry strength, rapid dilatancy, moderate toughness, light brown (5YR 6/4), moist, no reaction to HCI, loose.	sc	
653.8	6 —	S-4	10-13 7 (20)	0.9		Silty Sand (sm) - 85% sand, 15% silt, subrounded to subangular, fine to coarse sand, max size 25 mm, nonplastic, brownish gray (5YR 4/1), wet to moist, no reaction to HCl, medium-dense.	sm	
050.0	-	S-5	4-5 5 (10)	0.9		7.5'		
650.8	8 —	S-6	9-8 5 (13)	1.2	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Well-Graded Sand with Gravel (sw) - 20% gravel, 80% sand, fine to coarse, subangular gravel, hard, fine to coarse, subrounded sand, max size 25 mm, nonplastic, yellow brown (10 YR 5/4), moist, no reaction to HCl, dense.	SW	
	10 —	S-7	11-11 21 (32)	0.5	900 900 900 900 900 900 900 900 900 900			
646.2	-	S-8	11-15 15 (30)	1.0	6 00 kg	12'		
646.3	12 	S-9	17-17 38 (55)	1.0		Well-Graded Sand with Gravel (sw) - 10% gravel, 80% sand, 5% silt, 5% clay, fine to coarse, subangular gravel, fine to coarse, hard, subrounded sand, max size 25 mm, nonplastic, yellow brown (10 YR 5/4), moist, no reaction HCl, very dense.	sw	
	14 —	S-10	35-23 36 (59)	0.9	8 8 08 9 8 8 0 8 8 0 8 8			
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 10 IST: P	0/13/07 0/15/07 FW AR		GWL:	DEPTH: 5.12 DATE/TIME: 10/13/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILL	.ER: Scott Zeien HELPER: Brian Nabholz	RIG:	: CME 850



Bell Be	end NPP							PROJECT NO. 07-3891
		i				LOG OF BORING NO. B-314	1	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338916.472 E 2405288.197 SURFACE EL: 658.29 DESCRIPTION	USCS SYMBOL	REMARKS
643.3					000	15.0'		
040.5	- 16 —	S-11	15-17 18 (35)	0.8		Well-Graded Gravel (gw) - 90% gravels, 10% sand, subrounded to rounded, fine to coarse, hard gravel, subrounded to rounded, fine to coarse sand, nonplastic, moderate yellowish brown (10 Y/R 5/4), wet, no reaction to HCl, dense.	gw	
	_	S-12	23-25 31	0.9				
	18 —		(56)					
	- -	S-13	19-20 19 (39)	0.3				
	_							
	20 —	S-14	8-11 16 (27)	0.5				
637.3	_	S-15	3-9 16	0.9		Well-Graded Gravel (gw) - 100% gravel, subrounded to rounded, fine to coarse, hard, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, dense.	gw	
635.8	22 —		(25)			22.5'		
000.0	-	S-16	11-5 18 (23)	0.7		Well-Graded Gravel with Sand (gw) - 80% gravel, 15% sand, 5% silt, subrounded to subangular, fine to coarse gravel, subrounded to subangular, fine to coarse sand, hard, nonplastic, light brown (10 YR 5/6) to moderate yellowish brown (10YR 5/6), wet, no reaction to HCl, dense.	gw	
	24 —							
	_	S-17	2-15 14 (29)	0.7				
	26 	S-18	7-8 10 (18)	0.6				
	_	S-19	50/5 (50+)	0.2				
	28 —							
	_	S-20	15-50/4" (50)	0.2				
DATE (DATE STARTED: 10/13/07 DATE COMPLETED: 10/15/07 FIELD GEOLOGIST: PFW					DEPTH: 5.12 DATE/TIME: 10/13/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO.	TES: Bedrock Part of the Mahantango Formation
APPRO	KED BY: OVED BY NG CO.:	: RJ			DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG	6: CME 850



Bell Be	end NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338916.472 E 2405288.197 SURFACE EL: 658.29	USCS SYMBOL	REMARKS
ш		ν Ο	B	RE	M	DESCRIPTION	Sn	
628.3	30 —	S-21	6-7 8 (15)	1.0		30.0' Well-Graded Gravel (gw) - 90% gravel, 10% sand, fine to coarse, angular, elongated and flat gravel, fine to coarse, rounded, sand, soft, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense, weak cementation.	gw	
626.8	32 —	S-22	5-11 18	0.9		31.5' Well-Graded Gravel (gw) - 85% gravel, 10% sand, 5% clay, fine to coarse, rounded gravel, fine to coarse, subangular sand, soft, nonplastic, dark gray (N3) wet, no reaction to HCI, medium dense.	gw	
625.3	- -	S-23	(29) 11-14 18	1.5		Clayey Gravel (gc) - 70% gravel, 10% sand, 5% silt, 15% clay, fine to coarse, rounded gravel, fine to coarse, subangular sand, nonplastic, dark gray (N3), wet, no reaction to HCL, dense.	gc	
623.8	34 — - -	S-24	16-30 50/4"	0.9		34.5' Well-Graded Sand with gravel (sw) - 15% gravel, 80% sand 5% silt, fine to coarse, elongated and flat, subangular gravel, soft, fine to coarse, rounded to subangular sand, nonplastic, dark gray (N3), wet,	sw	
	36 	S-25	(80) 10-50/2" (50)	0.2	60 0 60 0 60 0 60 0 60 0 60 0 60 0 60 0	no reaction to HCI, very dense.		
	- 38 — -	S-26	18-21 10 (31)	0.8	90 90 90 90 90 90 90 90 90 90 90 90 90 9	39'		
619.3	40 —	S-27	22-50/4" (50)	0.6		Well Graded Gravel with Sand (gw)- 70% gravel, 25% sand, 5% silt, subangular to rounded, fine to coarse,flat and elongated gravel, soft, subangular, fine to coarse sand, nonplastic, dark gray (N3), wet, no reaction to HCl, very dense.	gw	
	- 42 	S-28	30-38 50/4" (88)	0.6				
	- -	S-29	22-50/4" (50)	0.5		43.5'		
614.8		R-1	60%	1.2		Cobbles- About 100%, comprised of medium gray (N5) siltstone,		
DATE (FIELD	STARTEI COMPLE GEOLOG KED BY:	TED: 10 BIST: P	0/13/07 0/15/07 FW AR		GWL:	DEPTH: 5.12 DATE/TIME: 10/13/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	S: Bedrock Part of the Mahantango Formation
APPRO	OVED BY NG CO.:	: RJ	В		DRILL	ER: Scott Zeien HELPER: Brian Nabholz	RIG: (CME 850



D-11 D-								
Bell Be	end NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	Ŧ£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	[COORDINATES N 338916.472 E 2405288.197	SYMBOL	
EVA:	DEPTH (FEET)	MPLF R RUI	2W/6 R % I	OVE	PROFILE	SURFACE EL: 658.29	SS S	REMARKS
 ਜ਼ ਜ਼ 		SA OF		REC		DESCRIPTION	nscs	
	44 —	1	(55%)		3.	unfractured, no odor, medium hardness, no reaction to HCl.		
	46 —	R-2	47%	1.4		Cobbles- About 100%, comprised of sandstone from 45.5'-46.0', fine to medium grained, medium hardness, shale from 46.0'-46.9', dark gray (N3), moderate hardness, no odor, no reaction to HCI.		
	48 —	R-3	16%	0.4		Cobbles- About 100%, fine to coarse grained, subrounded to subangular, dark gray (N3), moderate hardness, no reaction to HCl, no odor.		
	52 —	R-4	0% (0%)	0.0		No Recovery		
	54 —	1	'		. 3	1		
603.8		S-30 S-31	40-50/5" (50)	0.6		54.5' Silty Sand with Gravel (sm) - 15% gravel, 60% sand, 15% silt, 10% clay, fine to coarse, rounded to angular gravel, elongated and flat, rounded, fine sand, nonplastic, Dark gray (N3), wet, no reaction to HCI, very dense.	SM	
	58 —	S-32	30-50/5" (50)	0.8				
	STARTED		0/13/07			: DEPTH: 5.12 DATE/TIME: 10/13/07	тои	ΓES: Bedrock Part of the
FIELD (COMPLET GEOLOG KED BY:	SIST: P	0/15/07 PFW DAR			: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
APPRO	OVED BY: ING CO.:	: RJI	JB	<u> </u>	DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	: CME 850



- up		DD0 (F0T N0 07 0004
Bell Bend NPP	LOG OF BORING NO. B-314	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338916.472 E 2405288.197	TORWARKS REMARKS
DEPTH (FEET) MMPLE N R RUN N R RUN R R % REC R (RQD)	N 338916.472 E 2405288.197	KEMARKS
SA OR OF OF SEC	DESCRIPTION	nscs
S-33 34-50/4" 0.8 60 — S-34 50/4" 0.4 62 — S-35 50/3" 0.3 64 — R-4 87% (53%) 1.3 66 — 70 — 70 — 72 — 72 — 1 73 — 1 73	Shale- Moderately hard, dark gray (N3), moderately fractured, fresh, moderately healed with calcite, noncalcareous, thinly bedded, no reaction to HCI. Shale- Highly brecciated, highly fractured and healed with calcite, reaction to HCI, contains quartz inclusions, hard, medium gray (N5). Shale- Moderately hard, dark gray (N3), unfractured, noncalcareous, no reaction to HCI.	
DATE STARTED: 10/13/07 DATE COMPLETED: 10/15/07 FIELD GEOLOGIST: PFW CHECKED BY: DAR	GWL: DEPTH: 5.12 DATE/TIME: 10/13/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: CME 850



Ball B	end NPP							DDO IECT NO. 07 2004
Bell B	ena NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
EVA:	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 658.29	SS S	REMARKS
EL (F)		SA	BLC	REC		DESCRIPTION	OSC	
DATE	74 — 76 — 78 — 80 — 82 — 84 — 86 — — STARTED COMPLET GEOLOG	ΓED: 1	99% (99%)	9.9	GWL:	Shale- Moderately hard, dark gray (N3), fresh, calcareous, fossiliferous, unfractured, reaction to HCl. DEPTH: 5.12 DATE/TIME: 10/13/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ΓΕS: Bedrock Part of the Mahantango Formation
CHEC	KED BY:	D	AR				D: 5	OME 050
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG	: CME 850



D. II D d NDD			DD0 IF07 NO. 07 2004
Bell Bend NPP	LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
LEVATIO EET MS DEPTH (FEET) MMPLE N R RUN N R RUN N R REC	N 338916.472 E 2405288.197 SURFACE EL: 658.29	(8 8)	REMARKS
SA SA OF PEC	DESCRIPTION	DSN	
90 —	Shale- Moderately hard, dark gray (N3), calcareous, fossiliferous, pyrite replacement, slight to no fractures, nonhealed, bedding planes are vertical, reaction to HCl. Shale- Moderately hard, dark gray (N3), calcareous, slightly to no fractures, not healed, slightly fossiliferous, vertical bedding planes, reaction to HCl. GWL: DEPTH: 5.12 DATE/TIME: 10/13/07 GWL: DEPTH: N/A DATE/TIME: N/A		S: Bedrock Part of the Mahantango Formation
FIELD GEOLOGIST: PFW CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ Rock Core		
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: 0	CME 850



Bell B	end NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
EVA	DEPTH (FEET)	MPLI RUI	2 % I	OVE	PROFILE	SURFACE EL: 658.29	SS	REMARKS
日 日 日 日		SAI	BLC OF	REC		DESCRIPTION	nsc	
DATE FIELD CHEC	112 — 114 — 116 — STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: P D	FW AR	9.0	GWL: GWL: DRILI	Siltstone- Moderately hard, dark gray (N3), noncalcareous to slightly calcareous, fresh, thickly bedded, very slightly fractured, no reaction to HCI. DEPTH: 5.12 DATE/TIME: 10/13/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		ES: Bedrock Part of the Mahantango Formation
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850



Bell B	end NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	I E	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
EVA'	DEPTH (FEET)	APLE RUI	W/6' 8 % F (RG	OVE	PROFILE	SURFACE EL: 658.29	SSY	REMARKS
ELF (FE		SAN	BLO OF	REC		DESCRIPTION	USC	
	118 — 120 — 122 — 124 — 126 — 130 — STARTED COMPLET		95% (95%)	9.5		Siltstone - Moderately hard, dark gray (N3), noncalcareous to slightly calcareous, fresh, thickly bedded, very slightly fractured, slight reaction to HCl. DEPTH: 5.12 DATE/TIME: 10/13/07 DEPTH: N/A DATE/TIME: N/A		TES: Bedrock Part of the Mahantango Formation
FIELD	GEOLOG	IST: P	FW			LING METHOD: SPT/Tricone/NQ Rock Core		
	KED BY:		AR			ED. 0447-i UELDED D. V. V.	D:-	OME OFO
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG	: CME 850
PKILL	ING CO.:	remaco	71 l		l		<u> </u>	



- II	LNDD							PD0 IF07 NO. 07 0004
Bell B	end NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
EVA EET	DEPTH (FEET)	MPLI RUI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 658.29	S S	REMARKS
II E		SA	BLC Of	REC		DESCRIPTION	OSC	
DATE FIELD	132 — 134 — 136 — 138 — 140 — 144 — 146 — STARTEE COMPLE GEOLOG	ΓED: 10 IST: P	FW	10.0	GWL:	Siltstone- Moderately hard, dark gray (N3), noncalcareous, to slightly calcareous, fresh, thickly bedded, very slightly fractured, no reaction to HCI. DEPTH: 5.12 DATE/TIME: 10/13/07: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation
APPR	KED BY: OVED BY:	RJ			DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850
DRILL	ING CO.:	Terraco	n					



Pall B	end NPP							PROJECT NO. 07-3891
Bell B	ena NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	I E	COORDINATES N 338916.472 E 2405288.197	SYMBOL	
EVA'	DEPTH (FEET)	MPLE	7W/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 658.29	SS SY	REMARKS
EL (F		SA	BLC	REC	"	DESCRIPTION	nscs	
DATE FIELD CHEC	STARTED COMPLET GEOLOG KED BY:	TED: 1 IST: P D	FW AR	10.0	GWL GWL DRIL	Shale- Moderately hard, dark gray (N3), noncalcareous, slightly fossiliferous, pyritic intrusions, thinly laminated vertical bedding planes, no reaction to HCI. DEPTH: 5.12 DATE/TIME: 10/13/07: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		ES: Bedrock Part of the Mahantango Formation
	OVED BY: ING CO.:				DRIL	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850
			•					



Dall B	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP			_		LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ГН T)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
EVA]	DEPTH (FEET)	MPLE RUN	3 % F RC R (RC	OVE	PROFILE	SURFACE EL: 658.29	S SY	REMARKS
 円 fi		SA	BLC	REC		DESCRIPTION	nsc	
DATE	162 — 164 — 166 — 168 — 170 — 172 — 174 — STARTEE	R-15	100% (100%)	10.0		Shale- Moderately hard, dark gray (N3), noncalcareous, no fractures, thinly laminated vertical bedding planes, no reaction to HCl.		TES: Bedrock Part of the
DATE FIELD	COMPLET GEOLOG KED BY:	TED: 10	0/15/07		GWL:	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
	OVED BY: ING CO.:				DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	: CME 850



Bell B	end NPP				-	LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 338916.472 E 2405288.197	USCS SYMBOL	
EVA:	DEPTH (FEET)	MPLF RUI	3W/6' 7 % F 8 (RC	OVE	PROFILE	SURFACE EL: 658.29	(S S;	REMARKS
		SA	BLC	REC	Ш	DESCRIPTION	OSC	
478.3	176 —	R-17	100% (100%)	10.0	GWL	Siltstone- Moderately hard, dark gray (N3), noncalcareous, no fractures, thin vertical bedding planes, micaceous grains, no reaction to HCI.	NOTE	ES: Bedrock Part of the
DATE	COMPLET	ΓED: 10	0/15/07		GWL:	DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the Mahantango Formation
	GEOLOG KED BY:		FW AR		DRILI	LING METHOD: SPT/Tricone/NQ Rock Core		
APPR	OVED BY:	RJI	В		DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850



Dall B	end NPP							PROJECT NO. 07-3891
Bell Be	ena NPP					LOG OF BORING NO. B-314		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338916.472 E 2405288.197	SYMBOL	
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 658.29	SS SV	REMARKS
EI F)		S OF	BLC	REC		DESCRIPTION	nscs	
458.3	192 — 194 — 196 — 198 — 200 —	R-18	100% (100%)	10.0		BOTTOM OF BORING 200'		
DATE (202 — 204 — STARTED COMPLET GEOLOG	ΓED: 1 IST: P	FW		GWL	: DEPTH: 5.12 DATE/TIME: 10/13/07 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	ΓΕS: Bedrock Part of the Mahantango Formation
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRIL	LER: Scott Zeien HELPER: Brian Nabholz	RIG	: CME 850



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-315	·	
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE ILE	COORDINATES N 338820.623 E 2405297.698	SYMBOL	
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I 8 (RC	OVE	PROFILE	SURFACE EL: 656.90	S S	REMARKS
밀민		SA PO	BLC	REC	"	DESCRIPTION	nscs	
	0	S-1	1-2 2 (4)	0.8		Sandy Clay (cl) - 50% clay, 20% silt, 30% sand, spherical, rounded, fine sand, medium plasticity, medium dry strength, no dilantancy, low toughness, dark yellowish orange (10YR 6/6), dry, no reaction to HCl, soft.	cl	
654.4	2 —	S-2	5-6 8 (14)	1.3		2.5' Silty Sand (sm) - 75% sand, 25% silt, fine sand, hard, 0.07" max size, nonplastic, moderate yellowish brown (10 YR 5/4) dry, no reaction to HCl. medium-dense.	sm	
651.9	4 —					5.0' Well graded gravel (gw) - 95% cobbles, 5% silt, subangular to	gw	
	6 —	S-3	15-20 20 (40)	1.1		subrounded cobbles, 3" max size, nonplastic, moderate yellowish brown (10 YR 5/4) and medium gray (N5), moist, no reaction to HCl, dense.		
649.4	8 —	S-4	50/0" (50)	0.0		7.5' No Recovery		
646.9	- 10 — -	S-5	27-33 35 (68)	1.1		Poorly Graded Gravel (gp) - 90% cobbles, 5% gravel, 5% sand, coarse gravel, fine to coarse, subangular to subrounded sand, nonplastic, moderate yellowish brown (10 YR 5/4) and medium gray (N5), moist, no reaction to HCl, very dense.	gp	
644.4	12 					Poorly Graded Gravel with Sand (gp) - 15% cobbles, 65% gravel,	gp	
	14 —	S-6	31-50/4" (50)	0.3		20% sand, subangular to subrounded, elongated and flat, fine to coarse gravel, hard, fine to coarse sand, 0.75" max size, nonplastic, moderate yellowish brown (10 YR 5/4), and medium gray (N5), moist no reaction to HCl, very-dense.		
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 10 IST: R	D/16/07 D/17/07 AK AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOTE	ES: Bedrock Part of Mahantango Formation.
APPRO	OVED BY:	RJ	В		DRILL	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850
DRILLI	NG CO.:	Terraco	n					



Dall B	! NDD							DDO 1507 NO. 07 2004
Bell be	end NPP					LOG OF BORING NO. B-315		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн :T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	- : [E	COORDINATES N 338820.623 E 2405297.698	SYMBOL	
EVA	ОЕРТН (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 656.90	S S	REMARKS
EL (FI		SA	BLC OI	REC		DESCRIPTION	nscs	
	16 —	S-7	9-17 23 (40)	0.8				
639.4	- 18 	S-8	24-18 13 (31)	0.8		Well-Graded Gravel with Sand (gw) - 10% cobbles, 65% gravel, 25% sand, subangular to subrounded, coarse gravel, fine to coarse, subangular to subrounded, sand, 1.0" max size, nonplastic, moderate yellowish brown (10 YR 5/4) and moderate red (5R 4/6), wet, no reaction to HCl, dense to very dense.	gw	
	20 —	S-9	15-24 46 (70)	0.8				
634.4	22 — - - 24 — -	S-10	13-8 9 (17)	0.8		Well-Graded Sand with Silt and Gravel (sw-sm) - 25% gravel, 65% sand, 10% silt, subrounded, elongated and flat, hard, fine to coarse gravel, fine to coarse sand, 1" max size, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, medium dense to dense.	sw- sm	
	26 — — — — 28 —	S-11 S-12	19-16 16 (32) 15-15 13 (28)	0.5				
DATE	STARTED COMPLET GEOLOG	TED: 10	0/16/07 0/17/07 AK		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of Mahantango Formation.
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILL	.ER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850



Ball B	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-315		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338820.623 E 2405297.698 SURFACE EL: 656.90	SYMBOL	REMARKS
ELE (FEI	۵۳)	SAM	BLOV OR &	KECC	4	DESCRIPTION	nscs	
	_			ш.		BESSIAI HON		
626.9	30 —	S-13	10-8 6 (14)	0.4		Poorly-Graded Sand with Gravel (sp) - 15% cobbles, 15% gravel, 70% sand, subangular, fine gravel, subrounded to subangular, medium to coarse sand, 0.75" max size, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, medium-dense.	sp	
624.4	32 — — — — 34 —	S-14	15-9 8 (17)	0.8		32.5' Clayey Sand with Gravel (sc) - 15% gravel, 60% sand, 25% silty clay, subangular, elongated and flat, fine to coarse gravel, hard, fine to coarse sand, 0.25 max size, hard, medium plasticity, low dry strength, low dilantancy, low toughness, moderate yellowish brown (10 YR 5/4) and medium gray (N5), wet, no reaction to HCl, medium-dense.	sc	
621.9	36—	S-15	10-11 11 (22)	0.8		35.0' Well-Graded Sand with Gravel (sw) - 20% gravel, 75% sand, 5% silt, subangular to subrounded, fine to coarse gravel, elongated and flat, subangular to subrounded, fine to coarse sand, hard, 0.25" max size, nonplastic, medium gray (N5), wet, no reaction to HCl, mediumdense.	sw	
	38 —	S-16	14-11 8 (19)	0.8			sw	
616.9	40 — - -	S-17	10-8 6 (14)	0.5		Well-Graded Gravel with Sand (gw) - 10% cobbles, 65% gravel, 25% sand, subangular to subrounded, elongated and flat, fine to coarse, hard gravel, fine to coarse, subangular to subrounded, sand, 0.75" max size, nonplastic, medium gray (N5), wet, no reaction to HCl, medium-dense.	gw	
614.4	42 - -	S-18	21-15 14 (29)	0.9		Well-Graded Sand (sw) - 10% gravel, 85% sand, 5% silt, fine to coarse, elongated and flat, subangular to subrounded gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, hard, nonplastic, medium gray (N5), wet, no reaction to HCl, mediumdense.	sw	
DATE FIELD	STARTED COMPLE ^T GEOLOG KED BY:	ΓED: 10 IST: R	0/16/07 0/17/07 AK AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOTE	ES: Bedrock Part of Mahantango Formation.
APPRO	OVED BY:	RJ	В		DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850



Bell Be	end NPP							PROJECT NO. 07-3891
			-			LOG OF BORING NO. B-315		
ELEVATION (FEET MSL)	тн :т)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 338820.623 E 2405297.698	SYMBOL	
EET	DEPTH (FEET)	MPLI R RUI	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 656.90	SS SS	REMARKS
EI (F		SA OF	BLC	REC		DESCRIPTION	nscs	
	44							
	_					45'		
611.9	46 —	S-19	17-39 41 (80)	1.1		Well-Graded Sand with Gravel (sw) - 10% cobbles, 25% gravel, 65% sand, fine to coarse, elongated and flat, subangular to subrounded gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, hard, nonplastic, medium gray (N5), wet, no reaction to HCl, very-dense, encounter shale cobbles at 45.8'.	sw	
609.4	48 —	S-20	50/1 (50+)	0.1		47.5' Clayey Gravel (gc) - 10% cobbles, 45% gravel, 45% clay, fine to coarse, subangular to subrounded, elongated and flat gravel, 0.75" max size, hard, slightly plastic, low strength, medium toughness, medium gray (N5), wet, no reaction to HCl, very-dense.	gc	
606.9	50 —					50.0'		
606.9	50 —	S-21	50/2 (50+)	0.0		No Recovery		
	_	R-1	6% (0%)	0.0				
	_							
	52 —					52.5'		
604.4	_	S-22	0-50/2	0.2		Shale - Very-soft dark gray (N3), noncalcareous, subrounded, no odor, high strength and low toughness, no dilantancy, nonplastic, wet, no reaction to HCI.		
			(50)					
	54 — _							
	_					Shale - Very-soft dark gray (N3) noncalcareous, subangular, no odor, high strength and low toughness, no dilatancy, nonplastic, wet.		
	56 -	S-23	33-50/3" (50)	0.4				
	_					57.5'		
599.4	58 	S-24	43-50/4" (50)	0.6		Gravelly Lean Clay (cl) - 40% gravel, 60% silty clay, soft, fine to coarse, angular, elongated and flat gravel, 0.75" max size, low dilantancy, high strength, medium toughness, low plasticity, medium	cl	
DATE	STARTED)/16/07		GWL:	gray (N5) to dark gray (N3), wet, no reaction to HCl, very-dense. DEPTH: N/A DATE/TIME: N/A	NOTE	S: Bedrock Part of Mahantango
	COMPLE		0/17/07			DEPTH: N/A DATE/TIME: N/A		Formation.
	GEOLOG		AK ^D		DRILI	LING METHOD: SPT/Tricone/ NQ Rock Core		
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG: (CME 850
PINIEL	140 00	i c iiaco	11					



Dall D	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-315		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE IILE	COORDINATES N 338820.623 E 2405297.698	SYMBOL	
EVA:	ОЕРТН (FEET)	MPLI R RUI	3W/6 7 % F 8 (RC	OVE	PROFILE	SURFACE EL: 656.90	(8 8)	REMARKS
 - (된		SA	BLC	REC		DESCRIPTION	nscs	
596.9	60 —	S-25	0-50/2"	0.2		Shale - Very-soft dark gray (N3), noncalcareous, no odor, low strength and toughness, no dilatancy, nonplastic, wet, no reaction to HCl.		
595.4	_ _		(50)	•		61.5' No Recovery		
	62 — –	S-26	0-50/0" 0 (50)	0.0		No Recovery		
593.9	64 —	R-2	100%	7.0		Shale - Moderately hard, dark gray (N3), fresh, intensely fractured, nonhealed, noncalcareous, fractures approximately located at 63.5'-63.7', 64.5'-64.7', 65.7'-66.0', 67.0'-67.2' and 68.2'-68.4' horizontal fractures at 68.9', 65.0', 68.8', very thickly bedded, few pockets of pyrite from 78.0'-80.0'.		
DATE	70 — - 72 — - STARTED): 1 ₁	0/16/07		GWI	Shale - Moderately hard, dark gray (N3), fresh, noncalcareous, moderately to slightly fractured, slightly to moderately calcareous, fossils throughout fracture approximately 70° opposite core from 75.5'-75.8', very thickly bedded. DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of Mahantango
DATE FIELD	COMPLET GEOLOG KED BY:	ΓED: 1 IST: R	0/17/07 0/17/07 AK AR		GWL:	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		Formation.
APPRO	OVED BY: ING CO.:	RJ	В		DRILI	.ER: Scott Zeien HELPER: Brian Nabholz	RIG:	CME 850



Pall Band NPP		DDO 1507 NO. 07 0004
Bell Bend NPP	LOG OF BORING NO. B-315	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338820.623 E 2405297.698	TO BWARKS REMARKS
LEVATIO EEET MSI DEPTH (FEET) MMPLE N R RUN N S RUN N S REG R (RQD)	의 N 338820.623 E 2405297.698 SURFACE EL: 656.90	က် REMARKS
SA SA OR OR OR	DESCRIPTION	USCS
74— R-3 100% (84%) 10.00 76— 78— 80— 82— 84— 84— 84— 86— 100% (100%) 10.00 DATE STARTED: 10/16/07 DATE COMPLETED: 10/17/07 FIELD GEOLOGIST: RAK	Shale - Moderately hard dark gray (N3), fresh, unfractured, noncalcareous, pockets of calcareous fossils, very thickly bedded, no reaction to HCI. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rock Core	NOTES: Bedrock Part of Mahantango Formation.
CHECKED BY: DAR APPROVED BY: RJB	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: CME 850
DRILLING CO.: Terracon		



Dell Desid NDD					DD0 IE0T NO 07 2004
Bell Bend NPP			LOG OF BORING NO. B-315		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. OR RUN NO. OR % REC.	RECOVERY (ft.)	:ILE	COORDINATES N 338820.623 E 2405297.698	SYMBOL	
DEPTH DEPTH (FEET) (MPLE N R RUN N R R R R R R R R R R R R R C R R C R C R	ZOVE	PROFILE	SURFACE EL: 656.90	SS S)	REMARKS
S S O O O O O O O O O O O O O O O O O O	REC		DESCRIPTION	nscs	
88 — 90 — 90 — 92 — 92 — 94 — 96 — 98 — 98 — 98 — 98 — 102 — 102 — 102 — 104 TO	10		Shale - Moderately hard, dark gray (N3), fresh, slightly fractured, horizontal fracture at 92.9', 45° fracture at 93.3' (opposite direction than bedding), very thickly bedded, contains few pockets of calcareous fossils, rock noncalcareous. BOTTOM OF BORING 100' BOTTOM OF BORING 100' DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of Mahantango Formation.
FIELD GEOLOGIST: RAK CHECKED BY: DAR			LING METHOD: SPT/Tricone/ NQ Rock Core		
APPROVED BY: RJB DRILLING CO.: Terracon		DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG	:: CME 850



NOTE COORDINATES N 338882.235 E 2405513.386 SURFACE EL: 656.82 DESCRIPTION Silty Sand (sm)-75% sand, 25% silt, rounded, spherical, hard sand, 0.05" max size, low plasticity, low dry strength, low dilatancy, medium toughness, moderate yellowish orange (10YR 7/4), no reaction to HCl, loose. South of the control of the co	Ball Ba	and NDD							DDO IECT NO. 07 2004
Same	Bell De	ena NFF					LOG OF BORING NO. B-316		PROJECT NO. 07-3891
Same	ATION MSL)	тн ET)	LE NO.	3" & (N) REC. (QD)	ERY (ft.)	FILE		YMBOL	DEMARKS
Same	LEV/	DEF (FE	AMPL R RU	OW/6 R % & (R	SOVE	PRO	SURFACE EL: 656.82	SS S	REMARKS
0.05° max size, low plasticity, low dry stength, low distancy, medium to provide the provided spherical fine to medium sand, 0.05° max size, low plasticity, low dry stength, low distancy, medium to provide spherical fine to medium sand, 0.05° max size, low plasticity, low dry stength, low distancy, medium to plasticity, low strength, low distancy, medium to plasticity, low strength, low distancy, medium to plants, medium to plants, medium to plants, medium tolephase, brownish gray (S Y A41) and an an an analysis of the plants o	ш₩		% o	BLO	REC			nsc	
FIELD GEOLOGIST: WMP CHECKED BY: DAR APPROVED BY: RJB OWL: BET M: W/W BY CHIMIC: N/W DRILLING METHOD: SPT/Tricone/NQ Rock Core DRILLING METHOD: SPT/Tricone/NQ Rock Core DRILLING METHOD: SPT/Tricone/NQ Rock Core RIG: CME 55 Track	651.8	2 — 2 — 4 — 6 — 7 — 7 — 7 — 7 — 7 — 7 — 7 — 7 — 7	S-1 S-2 S-3 S-4	3-4 4 (8) 7-5 5 (10) 	1.2	6.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0	Silty Sand (sm)- 75% sand, 25% silt, rounded, spherical, hard sand, 0.05" max size, low plasticity, low dry strength, low dilatancy, medium toughness, moderate yellowish brown (10 YR 5/4) and dark yellowish orange (10YR 7/4), no reaction to HCl, loose. Poorly Graded Sand with Silt (sp-sm)- 90% sand, 10% silt, rounded, spherical, fine to medium sand, 0.05" max size, low plasticity, low dry strength, low dilatency, medium toughness, brownish gray (5 YR 4/1) to olive gray (5Y 4/1), wet, no reaction to HCl, loose. Silty Sand (sm)- 75% sand, 25% silt, rounded, spherical, fine to medium sand, hard, 0.05" max size, low plasticity, low strength, low dilatancy, medium toughness, brownish gray (5 YR 4/1) and dark yellowish orange (10YR 7/4), wet, no reaction to HCl, very loose.	sm sp-sm	
CHECKED BY: DAR APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Jason Tousley, Michael RIG: CME 55 Track	DATE	COMPLET	ΓED: 10	0/12/07		GWL	: DEPTH: N/A DATE/TIME: N/A		
APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Jason Tousley, Michael RIG: CME 55 Track						DRIL	LING METHOD: SPT/Tricone/NQ Rock Core		
	l					DRIL	LER: Sam Silverman HELPER: Jason Tousley,Michael	RIG	: CME 55 Track
	DRILLI	NG CO.:	Terraco	n					



Bell Be	end NPP					LOG OF BORING NO. B-316		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RY (ft.)	ILE	COORDINATES N 338882.235 E 2405513.386	SYMBOL	
EVA'	ОЕРТН (FEET)	MPLE	DW/6' R % F & (RC	RECOVERY	PROFILE	SURFACE EL: 656.82	SS SY	REMARKS
13 F)		AS O	BLC	REC		DESCRIPTION	uscs	
	_ _ 16 —	S-6	0-0 0 (0)	1.5		Silty Sand (sm) - 65% sand, 20% silt, 15% clay, fine sand, hard, 0.02 max size, low plasticity, low dry strength, low dilatancy, medium toughness, medium dark gray (N4), wet, no reaction to HCl, very loose.	sm	
	- -					Silty Sand (sm) - 5% gravel, 70% sand, 20% silt, 5% clay, angular,	sm	
	18 	S-7	1-3 8 (11)	0.7		hard fine gravel, fine, subrounded to subangular sand, hard, 0.02 max size, low plasticity, low dry strength, rapid dilatancy, medium toughness, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCI, medium-dense.		
636.8	20 —					20.0'		
030.0	20 — –	S-8	9-17 14 (31)	0.6		Well Graded Gravel with Sand (gw) - 5% cobbles, 75% gravel, 15% sand, 5% silt, fine to coarse, subrounded gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCI, dense.	gw	
634.3	22 —					22.5' Well Graded Sand with Gravel (sw) - 25% gravel, 70% sand, 5% silt,	sw	
	_	S-9	11-19 13 (32)	1.0		coarse, angular gravel, hard, subrounded to subangular fine to coarse sand, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, dense.		
	24 -				\$ 000 p			
631.8	-	S-10	10-20 26	0.9		Well Graded Gravel (gw)- 5% cobbles, 85% gravel, 10% sand, 5% silt, fine to coarse gravel, 0.75" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 4/2),	gw	
	26 — —		(46)			wet, no reaction to HCI, medium dense.		
	28 	S-11	8-8 11 (19)	0.9				
DATE	STARTEI	٠٠٠٠٠٠)/11/07		CWI	DEDTH: 4.0 DATE/TIME: 40/40/07.00:00	NOT	TES: Bodrock Part of the
DATE FIELD	STARTEL COMPLE GEOLOG KED BY:	TED: 10 BIST: W	0/11/07 0/12/07 /MP AR		GWL:	DEPTH: 4.0 DATE/TIME: 10/12/07 09:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOI	FES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY NG CO.:	: RJ	В		DRIL	LER: Sam Silverman HELPER: Jason Tousley,Michael Steinbrook	RIG	: CME 55 Track



Bell Bend NPP		PROJECT NO. 07-3891
Bell Bella NPP	LOG OF BORING NO. B-316	PROJECT NO. 07-3691
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338882.235 E 2405513.386 SURFACE EL: 656.82	TO MW REMARKS
ELE (FEE (FEE OR F		USCS
	DESCRIPTION Page 1	<u> </u>
626.8 30 — S-12 9-16 12 (28) 0.0	Well Graded Gravel with Sand (gw) 5% cobbles, 75% gravel, 20% sand, fine to coarse gravel, fine to coarse, subrounded to subangular sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium-dense.	gw
32 — 624.3 — S-13 18-14 18 (32) 0.6	32.5' Well Graded Gravel (gw)- 95% gravel, 5% sand, subangular, fine to coarse, elongated and flat gravel, fine to coarse sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, dense.	gw
621.8 - S-14 9-7 (14) 0.0	Well Graded Sand with Gravel (sw)- 55% sand, 45% gravel, 5% silt, subrounded, fine to coarse, spherical gravel, hard, subrounded to subangular, fine to coarse sand, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium-dense.	sw
619.3	37.5' Well Graded Sand with Silt and Gravel (sw-sm)- 55% sand, 35% gravel, 10% silt, fine to coarse gravel, fine to coarse, subrounded to subangular sand, nonplastic, dark yellowish brown (10 YR 4/2) to moderate brown (10 YR 5/4), wet, no reaction to HCl, medium dense.	sw- sm
616.8 40 — S-16 8 (32) 0.0	40' No Recovery	
614.3	42.5' Silty Gravel with Sand (gm) - 50% gravel, 25% sand, 25% silt, elongated and flat, subrounded, fine to coarse gravel, fine to coarse, subrounded to subangular sand, 0.75" max size, hard, nonplastic, grayish brown (5 YR 3/2), wet, no reaction to HCl, medium dense.	gm
DATE STARTED: 10/11/07 DATE COMPLETED: 10/12/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	GWL: DEPTH: 4.0 DATE/TIME: 10/12/07 09:00 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousley,Michael Steinbrook	RIG: CME 55 Track



Bell Bo	Bell Bend NPP PROJECT NO. 07-3891								
						LOG OF BORING NO. B-316	•		
ELEVATION (FEET MSL)	두 <u>(</u>	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 338882.235 E 2405513.386	SYMBOL		
EVA EET	DEPTH (FEET)	MPL R RU	2W/6 R % R(R(COVE	PROFILE	SURFACE EL: 656.82	SS S	REMARKS	
급비		SA OF	BLC	REC		DESCRIPTION	nscs		
	44 —	<u> </u>	<u> </u>	[·····	XXX.	·			
611.8		S-18	7-7 10	0.4		45.0' Well Graded Gravel with Sand (gw) - 5% cobbles, 65% gravel, 20 % sand, 10% silt, subangular, fine to coarse, elongated and flat gravel, rounded to angular, fine to coarse sand, 0.75" max size, hard,	gw		
	46 	3-10	(17)	0.4		nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium-dense.			
609.3	- 48 —	S-19	8-10 14 (24)	0.6		47.5' Well Graded Gravel with Sand (gw)- 5% cobbles, 65% gravel, 25% sand, 5% silt, elongated and flat, subangular, fine to coarse gravel, fine to coarse, subrounded to subangular sand, 0.75" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, medium-dense to	gw		
	50 —					dense.			
	- - 52 - -	S-20	16-32 17 (49)	0.4					
602.8	- - 54 —	S-21	11-15 15 (30)	1.0	22.12.13	54' Siltstone- Dark gray (N3), thickly bedded to very thickly bedded,			
	- - -	R-1	(80%)	0.8		moderately hard, very slightly fractured, slightly calcareous, fresh, to very slightly weathered, slight reaction to HCl. Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, slightly calcareous, fresh to very slightly weathered, pyrite inclusion at 59.6', slight reaction to HCl.			
	56 - - -		100%						
	- 58 	R-2	(100%)	5.0					
DATE (FIELD	STARTED COMPLE ^T GEOLOG KED BY:	TED: 10 BIST: W	0/11/07 0/12/07 WMP DAR		GWL:	DEPTH: 4.0 DATE/TIME: 10/12/07 09:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	TES: Bedrock Part of the Mahantango Formation	
APPRO	OVED BY: ING CO.:			<u> </u>	DRILL	LER: Sam Silverman HELPER: Jason Tousley,Michael Steinbrook	RIG	: CME 55 Track	



Pall Pand NRD									
Bell Bend NPP	LOG OF BORING NO. B-316	PROJECT NO. 07-3891							
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338882.235 E 2405513.386	TOBWAS REMARKS							
LEVATIO EET MS DEPTH (FEET) MMPLE N R RUN N R R REG R % (RQD)	N 338882.235 E 2405513.386 이 SURFACE EL: 656.82	ဖြင့် REMARKS							
SA SA OF SEC	DESCRIPTION	nscs							
60 — R-3 100% 5.0 64 — R-4 100% (100%) 5.0 68 — R-5 100% (100%) 5.0 DATE STARTED: 10/11/07 DATE COMPLETED: 10/12/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, slightly calcareous, fresh to very slightly weathered, slight reaction to HCl. GWL: DEPTH: 4.0 DATE/TIME: 10/12/07 09:00 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation							
APPROVED BY: RJB	DRILLER: Sam Silverman HELPER: Jason Tousley,Michael Steinbrook	RIG: CME 55 Track							
DRILLING CO.: Terracon	Steinbrook								



Bell Bend NPP PROJECT NO. 07-3891								
Bell Bend NPP					LOG OF BORING NO. B-316		PROJECT NO. 07-3891	
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	l E	COORDINATES N 338882.235 E 2405513.386	SYMBOL		
EET MS EET MS DEPTH (FEET)	MPLI R RUI	2W/6 R % F RC	OVE	PROFILE	SURFACE EL: 656.82	S S	REMARKS	
EL EL	SA OF	BLC	REC		DESCRIPTION	nscs		
74 —								
76 — - - - 78 —	R-6	100% (100%)	5.0		Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, slightly calcareous, fresh, to very slightly weathered, calcareous fossil at 76.2', slight reaction to HCI.			
80 — F	R-7	98% (92%)	4.9		Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, calcareous slightly, fresh, calcareous fossil from 82.5'- 83.0', moderately fractured from 82.4'-83.4', slight reaction to HCI.			
84 — - - - 86 — - - - -	R-8	100%	5.0		Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, slightly calcareous, fresh, moderately fractured from 85.4'-89.8', slight reaction to HCl.			
DATE STARTED: DATE COMPLETED FIELD GEOLOGIST CHECKED BY:	D: 10	/11/07 /12/07 MP		GWL:	DEPTH: 4.0 DATE/TIME: 10/12/07 09:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation	
APPROVED BY: DRILLING CO.: Te	RJB	3		DRILI	LER: Sam Silverman HELPER: Jason Tousley,Michael Steinbrook	RIG:	CME 55 Track	



Bell B	Bell Bend NPP PROJECT NO. 07-3891								
Don 2			•	·		LOG OF BORING NO. B-316	•	111000011101010101	
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 338882.235 E 2405513.386	USCS SYMBOL		
EVA:	ОЕРТН (FEET)	MPL! RUI	2W/6 R % I & (R(SOVE	PROFILE	SURFACE EL: 656.82	SS SV	REMARKS	
田田		& Q	BLC	REC		DESCRIPTION	nsc		
556.8	88 — 90 — 92 — 94 — 96 — 98 — 100 — 100 — 1	R-9	100% (100%)	4.9		Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, slightly calcareous, slight reaction to HCI. Siltstone- Dark gray (N3), thickly bedded to very thickly bedded, moderately hard, very slightly fractured, slightly calcareous, slight reaction to HCI. BOTTOM OF BORING 100'			
DATE (102 — STARTED COMPLE GEOLOG	TED: 10	/MP		GWL:	DEPTH: 4.0 DATE/TIME: 10/12/07 09:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	TES: Bedrock Part of the Mahantango Formation	
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Sam Silverman HELPER: Jason Tousley, Michael Steinbrook	RIG	: CME 55 Track	



Bell Be	Bell Bend NPP PROJECT NO. 07-3891									
502			•			LOG OF BORING NO. B-317				
ELEVATION (FEET MSL)	TH ET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338888.053 E 2405571.696	SYMBOL	DELIADI(O		
-EVA EET	DEPTH (FEET)	MPL R RU	OW/6 R % 8 (R	SOVE	log	SURFACE EL: 656.59	SSS	REMARKS		
H H		S, PO	BL(REC		DESCRIPTION	SOSN			
	0 _	S-1	1-2 3 (5)	1.3		Silty Clay with Sand (CL-ML) - 25% sand, 50% silt, 25% clay, fine, spherical, rounded sand, 0.1" max size, low plasticity, no dry strength, slow dilatancy, high toughness, moderate yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, soft.	CL- ML	PP= 1.0 tsf		
655.1	2 —	S-2	4-3 3 (6)	1.5		Well Graded Sand with Silt (SW-SM) - 75% sand, 25% silt, fine, spherical, rounded to subrounded sand, soft, 0.2" max size, low plasticity, no dry strength, rapid dilatancy, high toughness, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2) to medium dark gray (N4), moist to wet, no reaction to HCl, loose.	sw- sm			
	4 —	S-3	2-3 2 (5)	1.2	1:1:1:1:1: 1:1:1:1:1:1: 1:1:1:1:1:1: 1:1:1:1:		SW- SM			
652.1	- - -	S-4	2-3 3 (6)	1.5		4.5' Poorly Graded Sand (sp) - 95% sand, 5% silt, spherical, rounded, fine to medium sand, soft, 0.2" max size, nonplastic, medium dark gray (N4), moist to wet, no reaction to HCI, loose to medium dense.	sp			
	6 —	S-5	4-5 6 (11)	1.5						
	8 —	S-6	8-8 8 (16)	1.2						
	10 —	S-7	5-4 5 (9)	0.9						
	_	S-8	5-4 5 (9)	1.0						
	12 	S-9	2-2 2 (4)	0.9						
643.1	14 —	S-10	2-2 2 (4)	1.1		13.5'	SM			
DATE (FIELD	DATE STARTED: 10/3/07 DATE COMPLETED: 10/10/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR				GWL:	DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of Mahantango Formation.		
APPROVED BY: RJB DRILLING CO.: Terracon					DRILL	LER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG	: CME 55 track rig		



Rell Re	end NPP							PROJECT NO. 07-3891
Dell De	eliu ivi i				-	LOG OF BORING NO. B-317		FROJECT NO. 01-3031
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338888.053 E 2405571.696 SURFACE EL: 656.59	USCS SYMBOL	REMARKS
		<i>ω</i> Ο	BI	RE		DESCRIPTION	S)	
	- 16 —	S-11	3-3 3 (6)	1.3		Silty Sand (sm) - 90% sand, 10% silt, spherical, rounded, fine to medium sand, soft, 0.2" max size, low plasticity, no dry strength, rapid dilatancy, low toughness, medium dark gray (N4), moist to wet, no reaction to HCl, very loose.	sm	
	-	S-12	1-2 1 (3)	1.3		18.0'	SM	
638.6	18 -	S-13	2-0 0 (0)	1.5		Sandy Silt (ML) - 10% gravel, 55% sand, 35% silt, fine, rounded to subrounded, gravel, spherical, rounded to subrounded, fine sand, soft, 2" max size, low plasticity, no dry strength, high dilatancy, high toughness, medium dark gray (N4), moist to wet, no reaction with HCl, very loose.	ML	
	20 	S-14	0-0 0 (0)	1.5		2. 5.	ML	
635.6	22 —	S-15	2-3 6 (9)	1.0		21.0' Silty Sand (sm)- 70% sand, 20% silt, 10% clay, fine, rounded to subrounded sand, low plasticity, low dry strength, high dilatancy, low toughness, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCI, loose.	sm	
634.1	- -	S-16	5-6 8 (14)	0.6		22.5'	GW- GM	
	24 —	S-17	4-6 10 (16)	0.4		Well Graded Gravel with Silt and Sand (GW) - 60% gravel, 35% sand, 5% silt, subangular, elongated and flat, fine to coarse gravel, coarse, subangular sand, 0.5" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium-dense.		
629.6	26 —	S-18	13-13 13 (26)	1.2		27.0'		
320.0	- 28 	S-19	20-13 15 (28)	1.3	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Well Graded Sand with Gravel (sw) - 35% gravel, 60% sand, 5% silt, subangular, fine gravel, elongated and flat, subangular, fine to coarse sand, 0.5 max size, hard, nonplastic, medium dark gray (N4) and yellowish brown (10 YR 4/2), wet, no reaction to HCl, dense.	SW	
	_		14-14		::0 🕞			
DATE (DATE STARTED: 10/3/07 DATE COMPLETED: 10/10/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR				GWL	.: DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50 .: DEPTH: N/A DATE/TIME: N/A .LING METHOD: SPT/Tricone/ NQ Rock Core	NOTES	S: Bedrock Part of Mahantango Formation.
APPRO	OVED BY:	RJI	3		DRIL	LER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG: C	CME 55 track rig



Bell Be	end NPP							PROJECT NO. 07-3891
	1		1			LOG OF BORING NO. B-317		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338888.053 E 2405571.696 SURFACE EL: 656.59	USCS SYMBOL	REMARKS
		S-20	ന 24	1.1	2.5	DESCRIPTION	Š	
626.6	30 —	S-21	12-20 28 (48)	0.4		Well Graded Gravel with Silt and Sand (gw-gm) - 65% gravel, 25% sand, 10% silt, subangular, elongated and flat, fine to coarse gravel, subangular to angular, fine to coarse sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl. dense.	gw- gm	
623.6	32 —	S-22	20-30 25 (55)	0.7		33.0'		
023.0	34 —	S-23	62-62 69 (131)	0.2		Poorly Graded Gravel (gp) - 95% cobbles, 5% gravel, subangular, elongated and flat, fine to coarse gravel 1.0" max size, hard, nonplastic, dark gray (N3) wet, no reaction to HCl. very-dense,	gp	
622.1	_	S-24	12-13 15 (28)	0.4		34.5' Well-Graded Gravel with Silt and Sand (gw-gm) - 10% cobbles, 65% gravel, 15% sand, 10% silt, subangular, elongated and flat, fine to coarse gravel, fine to coarse, subangular sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2) and dark gray (N3), wet, no reaction to HCI, medium dense.	gw- gm	
	36 — 	S-25	20-11 10 (21)	0.7				
0.47.0	38 	S-26	7-9 11 (20)	0.5		39.0'		
617.6	40 —	S-27	20-26 11 (37)	1.0		Well-Graded Sand with Silt and Gravel (sw-sm) - 10% cobbles, 20% gravel, 60% sand, 10% silt, subangular, elongated and flat, fine to coarse gravel, fine to coarse, subangular sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, dense.	sw- sm	
614.6	- 42 	S-28	11-10 6 (16)	0.6		42.0'		
	74 - -	S-29	20-30 35 (65)	0.6		Well-Graded Gravel with Sand and Silt (gw-gm) - 10% cobbles, 60% gravel, 20% sand, 10% silt, subangular, elongated and flat, fine to coarse gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, very dense.	gw- gm	
613.1						Well-Graded Gravel with Silt and Sand (GW-GM)- 5% cobbles, 45%	GW-	
DATE (FIELD	STARTED COMPLE GEOLOG (ED BY:	ΓED: 10 IST: W	0/3/07 0/10/07 /MP AR		GWL:	DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50 DEPTH: N/A DATE/TIME: N/A ING METHOD: SPT/Tricone/ NQ Rock Core	NOTE	ES: Bedrock Part of Mahantango Formation.
APPRO	OVED BY:	RJ	В		DRILL	ER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG:	CME 55 track rig



Bell Bo	Bell Bend NPP PROJECT NO. 07-3891									
						LOG OF BORING NO. B-317		111002011101010101		
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338888.053 E 2405571.696	SYMBOL	REMARKS		
ELEV FEE	믬	AMF OR R	-0W OR %	:00	PR(SURFACE EL: 656.59	nscs (
ш		σ O		RE		DESCRIPTION				
611.6	44 -	S-30	11-31 13 (44)	0.8		gravel, 45% sand, 5% silt, subangular, elongated and flat, fine to coarse gravel, subangular ro subrounded, fine to coarse sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, dense. 45.0'	GM			
	46 —	S-31	4-11 9 (20)	0.9		Clayey Sand with Gravel (sc)- 25% gravel, 60% sand, %15 clay, subangular, elongated and flat, fine to coarse gravel, subangular to subrounded, fine to coarse sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCI, medium dense.	sc			
610.1	-	S-32	8-15 13 (28)	0.3	6 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Well-Graded Sand with Silt and Gravel (sw-sm)- 20% gravel, 70% sand, 10% silt, subangular to subrounded, elongated and flat, fine to coarse gravel, subrounded to subangular, fine to coarse sand, 0.75" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, medium-dense to dense.	sw- sm			
	48 —	S-33	15-15 20 (35)	1.0		40.51				
607.1	50 —	S-34	13-16 15 (31)	1.0		Well-Graded Gravel with Sand (GW)- 65% gravel, 25% sand, 10% silt, subangular, elongated and flat, fine to coarse gravel, subangular to subrounded, fine to coarse sand, 0.5" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, dense.	GW			
605.6	52 	S-35	27-15 30 (45)	1.2		Well-Graded Sand with Silt and Gravel (sw-sm) - 25% gravel, 65% sand, 10% silt, subangular, elongated and flat, fine to coarse gravel, rounded to angular, fine to coarse sand, 0.75" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, dense.	sw- sm			
604.1	-	S-36	13-49 35 (84)	1.1		Well Graded Gravel with Sand (gw)- 15% cobbles, 60% gravel, 20% sand, 5% silt, angular to subrounded, elongated and flat, fine to coarse gravel, subrounded to angular, fine to coarse sand, 1" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, verydense.	gw			
602.6	54 — -	S-37	25-50/4" (50)	8.0		Well Graded Sand with Silt (sw-sm) - 10% gravel, 80% sand, 10% silt, elongated and flat, subagnular gravel, fine to coarse, subrounded to subangular sand, 1.0" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, very dense.	sw- sm			
601.6	56 —	-				Siltstone- Dark gray (N3), moderately hard, slightly to very weathered to fresh, moderately fractured at 56.4' to 56.8', very slightly calcareous, thickly to very thickly bedded, slight reaction to HCI.				
	- 58 —	R-1	100% (100%)	5.0						
DATE (FIELD	STARTE COMPLE GEOLOG	ETED: 10 GIST: W	MP AR		GWL:	DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOTE	ES: Bedrock Part of Mahantango Formation.		
APPRO	OVED BY		В		DRILL	LER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG:	CME 55 track rig		



Bell Bend NPP PROJECT NO. 07-3891								
Bell Bend NPP	LOG OF BORING NO. B-317	PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338888.053 E 2405571.696	TO BW.						
EEVATIO EET MSI DEPTH (FEET) "MPLE N R RUN N R REC R R REC S (RQD)	N 338888.053 E 2405571.696 SURFACE EL: 656.59	က် REMARKS						
SA OF OF OF SEC	DESCRIPTION	nsos						
60 — R-2 96% (96%) 2.4 62 — R-3 100% (100%) 2.0 64 — R-4 100% (100%) 5.0	Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, unfractured, very slightly calcareous, thickly bedded, slight reaction to HCI. Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, unfractured, very slightly calcareous, thickly bedded, slight reaction to HCI. Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, very slightly fractured, very slightly calcareous, thickly bedded, slight reaction to HCI.							
70 — 72 — R-5 100% 5.0 DATE STARTED: 10/3/07 10/10/07 10/	Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, very slightly fractured at 70.1 - 71.3, very slightly calcareous, thickly bedded, slight reaction to HCI. GWL: DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rock Core	NOTES: Bedrock Part of Mahantango Formation.						
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG: CME 55 track rig						



Paul David NIPP								
Bell Bend NPP		LOG OF BORING NO. B-317		PROJECT NO. 07-3891				
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)		COORDINATES N 338888.053 E 2405571.696	SYMBOL					
LEVATIO EET MS DEPTH (FEET) (MPLE N R RUN N R R RE(RD)	PROFILE	SURFACE EL: 656.59	SS.	REMARKS				
SA OR OF		DESCRIPTION	nscs					
74— 76— - R-6 100% 5.0		Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, very slightly fractured, very slightly to slightly calcareous, thickly bedded, slight reaction to HCI, fossiliferous 74.5'-82.0', fossils replaced by pyrite 78.8'-79.5'.						
80 — - - - - - - - - - - - - -)	Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, very slightly fractured, very slightly to slightly calcareous, thickly bedded, slight reaction to HCI, fossiliferous 79.5'-82.0, few veins of pyrite.						
84 — - - - - - - - - - - - - -)	Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, very slightly fractured, very slightly calcareous, thickly bedded, slight reaction to HCl.						
DATE STARTED: 10/3/07 DATE COMPLETED: 10/10/07 FIELD GEOLOGIST: WMP	GWL	: DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO ⁻	TES: Bedrock Part of Mahantango Formation.				
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG	: CME 55 track rig				



Pall Pand NRD								
Bell Bend NPP	LOG OF BORING NO. B-317	PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338888.053 E 2405571.696	TO BALL REMARKS						
LEVATIO TEET MS DEPTH (FEET) (MPLE N R RUN N R REC R RCD)	의 N 338888.053 E 2405571.696 SURFACE EL: 656.59	κ REMARKS						
SA OF	DESCRIPTION	nscs						
90 — 92 — R-9 98% (98%) 4.9 94 — 96 — R-10 100% (100%) 5.0 98 — 7 — 7 — 7 — 7 — 7 — 7 — 7 — 7 — 7 —	Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, unfractured, very slightly calcareous, thickly bedded, slight reaction to HCl. Siltstone- Dark gray (N3), moderately hard, slightly to very slightly weathered to fresh, very slightly fractured, very slightly to slightly calcareous, thickly bedded, slight reaction to HCl, pyritic fossil 95.3', calcite replaced fossil 97.7', few veins of pyrite. BOTTOM OF BORING 99.5'							
DATE STARTED: 10/3/07	GWL: DEPTH: 4.0' DATE/TIME: 10/10/07 at 16:50	NOTES: Bedrock Part of Mahantango						
DATE COMPLETED: 10/10/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rock Core	Formation.						
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousely, Mike Steinbrook	RIG: CME 55 track rig						



Bell Be	Bell Bend NPP PROJECT NO. 07-3891										
Den 2						LOG OF BORING NO. B-318	· ·	1100201110.01 000.			
ELEVATION (FEET MSL)	H.()	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	LE	COORDINATES N 339436.134 E 2405520.540	SYMBOL				
EVA:	DEPTH (FEET)	MPLE	7W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 672.30	S S	REMARKS			
EL (F		SA	BLC	REC		DESCRIPTION	nscs				
	0 -	S-1	3-4 5 (9)	1.5		Sandy Silt (ML) - 75% sand, 25% silt, fine to medium, rounded to subangular sand, 0.04" max size, low plasticity, low dry strength, slow dilatancy, low toughness, dark yellow orange (10YR 6/6) to moderate yellow brown (10YR 5/4), dry, no reaction to HCL, loose to medium dense.	ML				
660.2	2 —	S-2	4-3 3 (6)	1.1		3.0'					
669.3	4 —	S-3	7-8 7 (15)	1.4		Silty Clayey Sand (SC-SM) - 75% sand, 25% silt and clay, fine to coarse sand, moderate yellow brown (10YR 5/4), dry, no reaction to HCL, loose to medium dense.	SM- SC				
666.3	- 6 	S-4	4-4 4 (8)	1.4		6.0' Well Creded Send with Crevel and Silt (am. sw.) 25% grovel 65%	SW-				
	-	S-5	4-9 18 (27)	1.2		Well Graded Sand with Gravel and Silt (sm-sw) - 25% gravel, 65% sand, 10% silt, fine to coarse, subangular to angular, elongated gravel, fine to coarse, subrounded to angular sand, hard, nonplastic, grayish pale brown (5YR 5/2), dry, no reaction to HCl, medium dense to very dense.	sm				
	8 —	S-6	13-30 50/4" (80)	1.2		9.0'					
663.3	10 —	S-7	50/4 (50+)	0.2		Well Graded Gravel with Sand (gw) - 75% gravel, 25% sand, angular, flat, fine to coarse gravel, very hard, fine to coarse, subangular sand, hard, 3.0" max size, nonplastic, light gray (N7), dry, no reaction to HCI, very dense.	gw				
661.8	- -	S-8	13-39 50/5 (89)	0.5		Well Graded Gravel with Sand (gw) - 40% cobbles, 40% gravel, 20% sand, fine grained, angular to subangular, flat, hard cobbles, poorly graded angular to subangular, hard, elongated gravel, fine grained, subangular sand, 1.0" max size, nonplastic, medium dark gray (N4) to dark reddish brown, wet, no reaction to HCl, very dense.	gw				
660.3	12 -	S-9	7-21 33 (54)	0.7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Well Graded Sand with Gravel and Silt (sw-sm) - 5% cobbles, 25% gravel, 60% sand, 10% silt, very hard fine-grained sandstone cobbles and shale fragments, angular to subrounded, elongated and flat gravel, subangular to subrounded, fine to coarse sand, 1" max size, nonplastic, very dark red (5R 2/6) to dark gray (N4) shale fragments, and the substantial state of the subs	sw- sm				
658.8	- 14 -	S-10	10-15 28 (43)	0.5	1:1:196.1:	and grayish orange (10YR 7/4), wet, no reaction to HCl, very dense 5' Well Graded Sand (sw) - 10% gravel, 90% sand, fine to coarse angular to subangular, elongated and flat, gravel, medium hardness, angular to subangular, fine to coarse sand, nonplastic, dark gray (N4), very dark red (5R 2/6) and pale brown (5YR 5/2), wet, no	sw				
DATE (FIELD	DATE STARTED: 10/5/07 DATE COMPLETED: 10/7/07 FIELD GEOLOGIST: JTM CHECKED BY: DAR					DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rockcore	NO1	TES: Bedrock Part of the Mahantango Formation			
	OVED BY: NG CO.:				DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck			



Dall Da	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-318		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339436.134 E 2405520.540	SYMBOL	
EET	ОЕРТН (FEET)	MPLI R RUI	DW/6 R % F & (RC	SOVE	PROFILE	SURFACE EL: 672.30	SS S)	REMARKS
]] 		δ. Q.	BL(REC		DESCRIPTION	nscs	
	_		50/6"			reaction to HCl, dense.		
	_	S-11	(50+)	0.3				
	16 —							
	_	S-12	50/5"	0.5				
	_	3-12	(50+)	0.5				
	_							
	18 —	S-13	50/1" (50+)	0.0		No Recovery		
	_		(50+)					
	_							
	_							
	20 —	S-14	20-50/6"	0.0				
	_	0 14	(50+)	0.0		04.01		
651.3	_				r (1117) (4614)	Poorly Graded Sand with Silt (SP-SM) - 5% gravel, 95% sand,	sp-	
	_	S-15	21-13 12	0.4	F (3 3 3 3) F (3 3 3 4) F (3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	angular to subangular gravel, moderately hard, fine to medium, rounded to angular sand, nonplastic, dark reddish brown (10R 3/4)	sm	
	22 —	0 .0	(25)	•	r () () () ()	and medium dark gray (N4), wet, no reaction to HCl, medium dense.		
	_				F 69 3513 F 69 3513 F 69 313		SP- SM	
	_	S-16	8-8 8	0.7			Oivi	
	_		(16)		, 69 9-1- U () () .1.	24.0'		
648.3	24 —					No Recovery		
	_	S-17	16-16 18	0.0				
			(34)		• •	25.5'		
646.8	-	S-18	27-50/4"	0.5		Silty Gravel (gm) - 70% gravel, 10% sand, 20% silt, spherical, rounded to angular gravel, soft, fine, subrounded to angular sand,	gm	
	26 —		(50+)	0.0		0.1" max size, nonplastic, medium gray (N5), wet. no reaction to HCl, very dense.		
645.2						27.0'		
645.3		S-19	13-50/3" (50+)	0.8	0	Poorly Graded Sand with Gravel (sp) - 25% gravel, 70% sand, 5% silt, fine to coarse, elongated and flat, subrounded gravel, coarse,	sp	
644.3	28 —					subrounded to subangular sand, medium hardness, 1.0" max size, nonplastic, moderate red (5R 4/2) and medium gray (N4), wet, n&8.0'		
643.9	20	S-20	50/4" (50+)	0.4		\reaction to HCl, very dense. 28.4' \rangle Shale - 90% hard, fractured angular shale, 10% highly plastic clay,		
	_					subangular, medium strength, slow dilatancy, low toughness, dark gray (N3), wet no reaction to HCl, very dense.		
DATE:	STARTED	D: 10	 0/5/07		GWL	DEPTH: N/A DATE/TIME: N/A	NOTI	ES: Bedrock Part of the
DATE	COMPLE	TED: 10	0/7/07		GWL:	DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
l	GEOLOG KED BY:		ΓM AR		DRILI	LING METHOD: SPT/Tricone/ NQ Rockcore		
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck
DRILLI	ING CO.:	Terraco	n					



	Bell Bend NPP PROJECT NO. 07-3891											
Bell B	end NPP					LOG OF BORING NO. B-318		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339436.134 E 2405520.540	SYMBOL	REMARKS				
ILEV FEE		AMP R R	OW, AC	00	PRC	SURFACE EL: 672.30	nscs (
		ω O	BI	RE		DESCRIPTION	SN					
	30 —	R-1	90% (16%)	3.9		Siltstone - Soft, dark gray (N3), thinly bedded, intensely fractured, fresh, very intensely fractured zone from 31.0' 32.0', fracture at 31.6 displays medium grain quartz healing, contains grayish-olive (10 Y 4/2) sandstone lenses from 29.0'-29.1', fresh.						
	32 — - - -	R-2	100%	1.9		Siltstone - Soft, dark gray (N3), thinly bedded, moderately to intensely fractured, fresh, very intensely fractured zone from 34.3'-34.6', fracture at 34.5' thin, totally healed with calcite, no reaction to HCI.						
	34 —					Siltstone - Soft, dark gray (N3), thinly bedded, moderately to intensely fractured, fresh, totally healed, 34.6 - 35.0 brecciated zone, healed, vuggy at 35.5', no reaction to HCl.						
	36 —	R-3	80% (46%)	4.0								
	40 —					Siltstone - Moderately soft, dark gray (N3), fresh, moderately thick bedding, very slightly to slightly fractured, no reaction to HCl.		Special Care Sample 39.6' - 42.1'				
	42 —		92% (80%)	4.6		DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the Mahantango Formation				
	COMPLE ^T GEOLOG					DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rockcore		aa.igo i omidion				
	KED BY:		AR		DIVILI	and married. Of 17 modilo 114 modicole						
	OVED BY:				DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG	G: CME 75 Truck				
DRILL	ING CO.:	Terraco	n									



Roll Bond NDI	<u> </u>		Bell Bend NPP PROJECT NO. 07-3891											
Bell Bella NFF					LOG OF BORING NO. B-318		PROJECT NO. 07-3091							
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339436.134 E 2405520.540	USCS SYMBOL								
EET MSI EET MSI DEPTH (FEET)	MPLE	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 672.30	S S	REMARKS							
	SA	BLC	REC		DESCRIPTION	OSC								
46 —	R-5	90% (88%)	4.5		Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, slightly to very slightly fractured, clean, no reaction to HCI.									
50 —		98%			Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, very slightly fractured, fracture at 50.1' moderately thin, fractures at 52.1', no reaction to HCI.									
54 —	R-6	(98%)	4.9		Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, slightly to very slightly fractured, no reaction to HCl.									
56 —	R-7	100% (86%)	5.0											
DATE STARTE DATE COMPLI FIELD GEOLO CHECKED BY:	ETED: 1 GIST: J	0/5/07 0/7/07 TM 0AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rockcore	NOT	FES: Bedrock Part of the Mahantango Formation							
APPROVED BY DRILLING CO.	Y: RJ	В		DRILI	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	: CME 75 Truck							



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP	LOG OF BORING NO. B-318	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339436.134 E 2405520.540	OBW REMARKS									
DEPTH (FEET) MMPLE N R RUN N R RUN R R % REC R (RQD)	N 339436.134 E 2405520.540	κ REMARKS									
SA OR	DESCRIPTION	SOSO									
60 — R-8 100% (96%) 5.0 5.0 5.0 5.0 5.0 68 — R-10 72 — R-10 72 — R-10 98% (98%) 5.0 5.0											
DATE STARTED: 10/5/07 DATE COMPLETED: 10/7/07 FIELD GEOLOGIST: JTM	GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rockcore	NOTES: Bedrock Part of the Mahantango Formation									
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: Terry Duncan	RIG: CME 75 Truck									



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP		LOG OF BORING NO. B-318		PROJECT NO. 07-3891							
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)		COORDINATES N 339436.134 E 2405520.540	SYMBOL								
LEVATIO DEPTH (FEET) (MPLE N R RUN N R RUN R R R RE(R R R REC	PROFILE	SURFACE EL: 672.30	\S S:	REMARKS							
SA SA OF		DESCRIPTION	nscs								
74 — - 76 — - - - - - - - - - - - - -		Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, very slightly fractured, calcite healed fracture at 76.0' totally healed, thin, no reaction to HCI.									
R-11 (98%) 4.9 (98%) 4.9 (98%) 4.9 (98%) 4.9 (98%) 5.0		Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, slightly to very slightly fractured, no reaction to HCI.									
84 — - - - - - - - - - - - - -		Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, slightly to very slightly fractured, clean, totally healed calcite fracture, no reaction to HCl.									
DATE STARTED: 10/5/07 DATE COMPLETED: 10/7/07	GWL	: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A	NOT	ES: Bedrock Part of the Mahantango Formation							
FIELD GEOLOGIST: JTM CHECKED BY: DAR	DRIL	LING METHOD: SPT/Tricone/ NQ Rockcore									
APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck							



Bell B	end NPP							PROJECT NO. 07-3891
				i		LOG OF BORING NO. B-318		
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 339436.134 E 2405520.540	USCS SYMBOL	
EVA:	ОЕРТН (FEET)	MPLE	DW/6' R % F 8 (RC	OVE	PROFILE	SURFACE EL: 672.30	S S	REMARKS
급표		SA	BLC	REC		DESCRIPTION	OSO	
	88 — 90 — 92 — 94 — 96 — 98 —	R-14	98% (92%)	4.9		Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, slightly to very slightly fractured, brecciated zone at 94.2' totally healed with calcite, no reaction to HCl. Siltstone - Moderately soft, dark gray (N3), fresh, thinly bedded, slightly to very slightly fractured, no reaction to HCl.		Special Care Sample 92.7' - 94.2'.
	100 —	R-16	100%	1.0				
571.7	_		(100%)			DOTTOM OF BODING 400 C		
	_					BOTTOM OF BORING 100.6'		
	_							
	102 —							
DATE STARTED: 10/5/07 DATE COMPLETED: 10/7/07 FIELD GEOLOGIST: JTM CHECKED BY: DAR					GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rockcore	NO	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILL	ER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck



Boll B	Bell Bend NPP PROJECT NO. 07-3891												
Dell B	eliu NFF					LOG OF BORING NO. B-319		FROJECT NO. 07-3091					
ELEVATION (FEET MSL)	HT:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339429.847 E 2405462.375	SYMBOL						
EVA:	ОЕРТН (FEET)	MPLI R RUI	2W/6 R % F 8 (RC	OVE	PROFILE	SURFACE EL: 672.20	\S S	REMARKS					
EL (F)		SA	BLC	REC		DESCRIPTION	nscs						
						Shelby Tube							
	2 —	U-1		2.0									
	_	0-1		2.0									
669.2	_					3.0' Shelby Tube	SM						
	_					Silty Sand (SM)							
	4 —	U-2		2.0									
	_												
	_	*											
	_												
	6 —												
	_												
						7.5'							
664.7	_		20-31		1 (2) (2) 1 (4) (2)	Well-Graded Sand with Silt and Gravel (SW-SM)- 5% cobbles, 45% gravel, 40% sand, 10% silt, subangular, fine to course, elongated and	SW- SM						
	8 —	S-1	50/2 (81)	1.1) (60 a 6	flat sand and gravel, 1.5" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 4/2),							
					Pi (.i.&) !:P3}si: P@50:1:	and grayish red (5R 4/2), moist to wet, no reaction to HCl, very dense.							
	_				91.1.1.1. 11199111 11199111								
	10 —						SW-						
	_		14-19		18 1.96		SM						
	_	S-2	22 (41)	1.0	300								
	_				P. 13.1.P. 1.1.13.1.								
	12 —				19:50								
659.7	_					12.5' Well-Graded Gravel with Silt and Sand (GW-GM)- 5% cobbles, 45%	GW-						
	_	S-3	17-24 50/3 (74)	1.1		gravel, 40% sand, 10% silt, subangular, fine to course, elongated and flat sand and gravel, 1.5" max size, hard, nonplastic, moderate	GM						
	_		(74)			yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 4/2), and grayish red (5R 4/2), moist to wet, no reaction to HCl, very							
	14 —					dense.							
0.55	_					15.0'							
657.2	_		29-20			Poorly Graded Gravel with Clay and Sand (GP-GC) - 5% cobbles, 50% gravel, 40% sand, 5% silt, subangular, fine to course, elongated	gp- gc						
1	STARTED		<u> </u> /18/07		1	DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07		TES: Bedrock Part of the					
1	COMPLET GEOLOG		/19/07 /MP		1	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation					
CHEC	KED BY:	D	AR										
	OVED BY:				DRILI	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG:	: CME 55 Track					
DIVILLI		. 511460	••		<u> </u>	•							



Bell Be	end NPP							PROJECT NO. 07-3891
			1			LOG OF BORING NO. B-319		
SL)	т 🙃		(S) (S)	Υ (ft.)	Щ	COORDINATES N 339429.847 E 2405462.375	SYMBOL	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	SURFACE EL: 672.20	SYN	REMARKS
ELE (FEE	□ (SAM OR F	SLOV OR	ECO	H	DESCRIPTION	nscs	
		S-4	50/2	0.8	1.0/9/	and flat gravel, subrounded to subangular, fine to coarse sand, 1.5"		
	16 		(70)			max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 4/2), wet, no reaction to HCI, medium dense to very dense.		
	18 —						GP- GC	
	- - -	S-5	18-18 19 (37)	1.1				
	20 —							
	_	S-6	13-12 12 (24)	0.6				
	_							
	22 —					22.5'		
649.7	- -	S-7	7-7 7 (14)	1.0	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Well-Graded Sand with Gravel (sw) - 5% cobbles, 30% gravel, 60% sand, 5% silt, subangular, fine to course, elongated and flat gravel, fine to coarse, subrounded to subangular sand, 1.5" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium dense.	sw	
	24 —							
						25.0'		
647.2	26 —	S-8	8-12 50 (62)	1.1		Well-Graded Sand with Silt and Gravel (SW-SM) - 5% cobbles, 50% gravel, 40% sand, 5% silt, subrounded, fine to course, elongated and flat gravel and sand, 1.5" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4), dark yellowish brown (10 YR 4/2) and blackish red (5R 2/2), wet, no reaction to HCl, very dense.	SW- SM	
	_				7 10 9 p			
644.7	_ 28 	S-9	50/0 (50+)	0.0		27.5' No Recovery Well Graded Gravel (gw) - 100% cobbles, dark gray (N3) to grayish black (N2) moderately hard siltstone, pale yellowish brown (10YR 6/2)	gw	
	_	R-1	100% (71.4%)	2.1		to light olive gray (5Y 5/2), fine grained, very hard sandstone, moderately fractured, fresh to very slightly weathered, a brecciated calcite and quartz zone in siltstone below 28.5'		
642.6	30 —			*****	34	29.6' Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered,		
	STARTE		18/07			DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07	NOTE	S: Bedrock Part of the
FIELD	COMPLE GEOLOG KED BY:	IST: W	19/07 /MP AR			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
APPRO	OVED BY NG CO.:	: RJI	В		DRILL	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG:	CME 55 Track



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP	LOG OF BORING NO. B-319	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339429.847 E 2405462.375	TO REMARKS									
DEPTH (FEET) (MPLE N R RUN N R % REC 8 (RQD)	N 339429.847 E 2405462.375 SURFACE EL: 672.20	S REMARKS									
SA SA OF CORRECT OR CORRECT OF CO	DESCRIPTION	SOS									
32	DESCRIPTION moderately hard, with calcite and quartz brecciated zones, moderately fractured, no reaction to weak reaction to HCI. Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, moderately fractured, no reaction to weak reaction to HCI. Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, no reaction to weak reaction to HCI.	Special care sample taken at 40.2'-41.9'									
44 —											
DATE STARTED: 9/18/07 DATE COMPLETED: 9/19/07 FIELD GEOLOGIST: WMP	GWL: DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation									
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG: CME 55 Track									



Bell Bend NPP PROJECT NO. 07-3891												
Bell Bend NPP	LOG OF BORING NO. B-319		PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339429.847 E 2405462.375	SYMBOL										
DEPTH (FEET) (MPLE N R RUN N R RUN R R R REC	N 339429.847 E 2405462.375 SURFACE EL: 672.20	(8.8)	REMARKS									
SA OR OF SEC	DESCRIPTION	USCS (
46 — R-5 100% 5.0 48 —	Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, no reaction to weak reaction to HCl. Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, moderately fractured, no reaction to weak reaction to HCl. GWL: DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07 GWL: DEPTH: N/A DATE/TIME: N/A	Ca	Calcite and quartz filled layer at 54.2' ES: Bedrock Part of the Mahantango Formation									
FIELD GEOLOGIST: WMP	DRILLING METHOD: SPT/Tricone/NQ Rock Core											
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG:	CME 55 Track									



Bell Be	Bell Bend NPP PROJECT NO. 07-3891											
Dell Be	ilu NPP			•	1 1	LOG OF BORING NO. B-319		PROJECT NO. 07-3091				
ELEVATION (FEET MSL)	H (F.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	l e	COORDINATES N 339429.847 E 2405462.375	SYMBOL					
EET	DEPTH (FEET)	MPL R RU	DW/6 R % & (R(COVE	PROFILE	SURFACE EL: 672.20	SSS	REMARKS				
EL F		SA	BLC	REC		DESCRIPTION	SOSN					
	60 —	R-8	100% (100%)	5.0		Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, very slightly fossiliferous, moderately fractured. Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, mostly fresh to very slightly weathered,		Calcite filled layer at 62.6'.				
	66 —	R-9	100% (100%)	5.0		moderately hard, thickly to very thickly bedded, very slightly fossiliferous, no reaction to weak reaction to HCI.						
	70 — 72 — 74 — STARTED		98% (98%)	4.9		DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07	NO	TES: Bedrock Part of the				
FIELD (COMPLE ⁻ GEOLOG KED BY:	IST: W	/19/07 /MP AR			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation				
APPRO	OVED BY:	RJ	В		DRILI	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	: CME 55 Track				



Dall Band I	Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend I	NPP					LOG OF BORING NO. B-319		PROJECT NO. 07-3891				
ELEVATION (FEET MSL) DEPTH	(FEET) SAMPLE NO.	N ON N	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339429.847 E 2405462.375	SYMBOL					
EET	(FEET)	Z RU	2W/6 R % 8 (R	SOVE	SS	SURFACE EL: 672.20	SSS	REMARKS				
	SA	P.	BLC	REC		DESCRIPTION	nscs					
78	R-	11	100% (94%)	5.0		Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, no reaction to weak reaction to HCI, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, very slightly fossiliferous, brecciated zone from 75.8' to 79.0'. Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, no reaction to weak reaction to HCI, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded, highly brecciated.						
84 86 88	4 — - R-	13	92% (90%)	4.6	GWL	Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, no reaction to slight reaction to HCI, mostly fresh to slightly weathered, moderately hard, thickly to very thickly bedded. DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07	NO	Fracture along bedding plane at 84.6' TES: Bedrock Part of the				
DATE STARTED: 9/18/07 DATE COMPLETED: 9/19/07 FIELD GEOLOGIST: WMP					GWL:	DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation				
CHECKED APPROVED DRILLING (D BY:	RJE			DRILI	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	6: CME 55 Track				



Dall Br	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-319		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	Ε.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339429.847 E 2405462.375	USCS SYMBOL				
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 672.20	SS S	REMARKS			
H H		S O	BLC	REC		DESCRIPTION	osn				
	90 —	R-14	96% (96%)	4.8		Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, no reaction to slight reaction to HCI, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded.		Special care sample taken at 89.7'- 91.3'			
	94 — - 96 — - 98 —	R-15	100%	5.0							
570.5	100 —	R-16	100% (100%)	2.1		Siltstone- Dark gray (N3) to grayish black (N2), noncalcareous to very slightly calcareous, no reaction to slight reaction to HCl, mostly fresh to very slightly weathered, moderately hard, thickly to very thickly bedded. BOTTOM OF BORING 101.7'					
DATE (STARTED COMPLE ^T GEOLOG KED BY:	TED: 9/	 18/07 19/07 MP AR		GWL:	: DEPTH: 16.5' DATE/TIME: 0800 on 9/19/07 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRIL	LER: Sam Silverman HELPER: Mike Steinbrook, Jason Tousley	RIG	: CME 55 Track			



Bell Be	Bell Bend NPP PROJECT NO. 07-3891												
						LOG OF BORING NO. B-320							
ELEVATION (FEET MSL)	H.E	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	LE	COORDINATES N 338748.655 E 2405771.438	SYMBOL						
EVA'	DEPTH (FEET)	MPLE RUN	7 % F R (RC	OVE	PROFILE	SURFACE EL: 657.52	ഗ	REMARKS					
[SA	BLC	REC	"	DESCRIPTION	nsc						
	0 _	S-1	1-1 2 (3)	0.4		Sandy Silt (ml) - 70% silt, 30% sand, subrounded, spherical, fine sand, moderate hardness, low plasticity, no dry strength, slow dilatancy, low toughness, moderate yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 6/6), wet, no reaction to HCl, very soft, with trace organics.	ml	PP= 0.0 TSF					
656.0 656.0	2 	S-2A S-2B	2-2 4 (6)	0.5 1.0		Silty Sand (sm) - 60% sand, 40% silt, fine to medium sand, moderate hardness, low plasticity, no dry strength, slow dilatation, low toughness, pale yellowish brown (10 YR 6/2) to moderate yellowish brown (10 YR 5/4), moist, no reaction to HCl, loose.	sm	PP=0.0 TSF					
	4 —	S-3	4-4 2 (6)	1.4		Silty Sand (sm) - 80% sand, 20% silt, fine to medium, subrounded, spherical sand, moderate hardness, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, loose.	sm						
	-	S-4	2-5 5 (10)	0.9		Silty Sand (sm)- 85% sand, 15% silt, fine to medium, subrounded, spherical sand, moderate hardness, no plasticity, moderate brownish gray (5YR 4/1) to grayish brown (5 YR 3/2), wet, no reaction to HCl, loose.	sm						
651.5	6 —	S-5	7-9 9 (18)	1.1		Poorly Graded Sand (sp) - 95% sand, 5% silt, fine to medium, subrounded, spherical sand, moderate hardness, no plasticity, dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, mediumdense, becoming less silty with depth, coarser sand.	sp						
	8 	S-6	9-10 14 (24)	1.0		Poorly Graded Sand (sp) - 5% gravel, 90% sand, 5% silt, fine to coarse, subrounded to subangular gravel, spherical, fine to coarse, subrounded to subangular sand, moderate hardness, nonplastic, dark yellowish brown (10 YR 4/2), moist to wet, no reaction to HCl, medium dense.							
648.5	10 —	S-7	21-18 23 (41)	1.1		Silty Sand (sm) - 80% sand, 20% silt, subrounded, spherical, fine to medium sand, moderate hardness, rapid dilatancy, dark yellowish brown (10 YR 4/2) to grayish brown (5 YR 3/2) wet, no reaction to HCl, dense.	sm	Encountered medium dark gray (N3) cobble from 10. 0'-10.5'.					
647.0	- - 12 	S-8	9-12 24 (36)	0.9	9 800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Silty Sand with Gravel (sm) - 20% gravel, 60% sand, 20% silt, subrounded to subangular, spherical, fine to coarse gravel, subrounded to subangular, fine to coarse sand, moderate hardness, nonplastic, dark yellowish brown (10 YR 4/2), no reaction to HCl, dense.	sm						
044.0	- -	S-9	38-50/2" (50)	0.4		13.5'							
644.0	14 — 	S-10	22-31 28 (59)	0.8	X	Well Graded Gravel (gw) - 80% cobbles, 10% gravel, 5% sand, 5% silt, spherical cobbles, fine to coarse, subanular gravel, subrounded to subangular, fine to coarse sand, nonplastic, grayish orange (10 YR 7/4) and moderate brown (5 YR 4/4), wet, no reaction to HCl, very-	GW						
DATE (STARTED COMPLE GEOLOG (ED BY:	TED: 1	0/26/07 1/07/07 /MP/RAK AR		GWL	L: DEPTH: 0.0 DATE/TIME: 11/06/07/09:15 L: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ rock core	NO	TES: Bedrock Part of the Mahantango Formation					
APPRO	OVED BY:	RJI	В		DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/Russell Whitaker	RIG	: CME 55 Track					



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-320	1	
ELEVATION (FEET MSL)	ΞE.	NO.	BLOW/6" & (N) OR % REC. & (RQD)	RY (ft.)	빌	COORDINATES N 338748.655 E 2405771.438	SYMBOL	
_EVA`	DEPTH (FEET)	SAMPLE NO OR RUN NO	OW/6 R % F & (RC	RECOVERY	PROFILE	SURFACE EL: 657.52	SS SV	REMARKS
		λ Q	BLO	REC		DESCRIPTION	nscs	
	_					dense. Well Graded Gravel (gw) - 85% cobbles, 5% gravel, 5% sand, 5% silt,		
	16 	S-11	34-49 46 (95)	1.1		spherical cobbles, fine to coarse, subangular gravel, subrounded to subangular, fine to coarse sand, nonplastic, medium dark gray (N4), grayish orange (10YR 7/4), moderate brown (5YR 4/4), and dark yellowish brown (5 YR 4/2) wet, no reaction to HCl, very-dense.		
641.0	_ _ _	S-12	23-24 16 (40)	0.8		Well-Graded Sand with Silt and Gravel (sw-sm)- 40% gravel, 50% sand, 10% silt, fine to coarse gravel, moderately hard, subrounded to subangular, fine to coarse sand, nonplastic, dark yellowish brown (5 YR 4/2), wet, no reaction to HCl, dense.	sw- sm	
	18 	S-13	10-9 11 (20)	1.1		Well-Graded Sand with Silt and Gravel (sw-sm) - 20% gravel, 70% sand, 10% silt, fine to coarse, spherical, coarse gravel, subrounded to subangular, fine to coarse sand, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCI, medium dense.		
638.0	_					19.5' Well-Graded Sand (sw)- 10% gravel, 85% sand, 5% silt, fine to	sw	
	20 —	S-14	8-8 8 (16)	0.4		coarse, spherical gravel, subrounded to subangular, fine to coarse sand, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCI, medium dense.	· · ·	
636.5	_				~ X X	21.0' Well Graded Gravel (gw) - 80% cobbles, 5% gravel, 10% sand, 5%	gw	
	22 —	S-15	20-36 40 (76)	0.8		silt, spherical cobbles, fine to coarse gravel, subrounded to subangular, fine to coarse sand, nonplastic, grayish orange (10 YR 7/4), and dark yellowish brown (5 YR 4/2) wet, no reaction to HCl, verydense.		
635.0	- -	S-16	21-16 50/5" (66)	0.9		Well-Graded Sand with Cobbles and Gravel (sw) - 25% cobbles 20% gravel, 55% sand, subrounded, spherical, fine to coarse gravel, subrounded to subangular, fine to coarse gravel, 0.75 inch max size, hard, nonplastic, moderate brown (5YR 3/4) and medium gray (N5), wet, no reaction to HCl, very-dense.	sw	
633.5	24 —				• • •	No Recovery		Encountered red sandstone
	_	S-17	50/0 (50+)	0.0				cobble from 24. 0'-25.5'
632.0	_					25.5' Well-Graded Gravel with Sand (gw) - 20% cobbles, 60% gravel, 20%	gw	
	26 —	S-18	8-13 15 (28)	1.1		sand, fine to coarse, spherical, subangular to angular gravel, fine to coarse, subrounded to angular sand, 1.0" max size, hard, nonplastic, moderate brown (5 YR 4/2), medium gray (N4), wet, no reaction to HCl, medium dense.		
630.5	_					27.0' Well Graded Gravel (gw) - 50% cobbles, 40% gravel, 10% sand, fine	gw	
	28 —	S-19	13-12 23 (35)	1.0		to coarse, subrounded, spherical gravel, hard, fine to coarse, subrounded to subangular sand, nonplastic, light gray (N7) and medium dark gray (N4), wet, no reaction to HCI, dense.		
629.0	-		28-18			28.5' Well-Graded Sand with Gravel (sw) - 25% cobbles, 30% gravel, 45% sand, fine to coarse, subangular to angular gravel, hard, fine to coarse, subrounded to subangular sand, 1.0" max size, nonplastic,	sw	
DATE	STARTE	D: 10	0/26/07		GWL:	DEPTH: 0.0 DATE/TIME: 11/06/07/09:15	NO.	TES: Bedrock Part of the
	COMPLE					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
	GEOLOG KED BY:		/MP/RAK AR		DRILL	LING METHOD: SPT/Tricone/NQ rock core		
l .	OVED BY				DRILL	LER: Sam Silverman HELPER: Mike Steinbrook/Russell	RIG	6: CME 55 Track
DRILLI	NG CO.:	Terraco	n			Whitaker		



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-320		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	ECOVERY (ft.)	PROFILE	COORDINATES N 338748.655 E 2405771.438 SURFACE EL: 657.52	USCS SYMBOL	REMARKS
			a 35	2	Name of	DESCRIPTION	ň	
627.5	30 —	S-20	(53)	1.0		very light gray (N8) and medium gray (N5), wet, no reaction to HCI, very-dense, contains quartz sandstone cobble from 28.5' to 28.8'. No Recovery		
626.0	_	S-21	50/5 (50+)	0		31.5'		
626.0	32 —	S-22	50/6 (50+)	0.2		Well Graded Gravel (gw) - 100% cobbles, subrounded, spherical, 1.0" max size, hard, nonplastic, medium gray (N5), wet, no reaction to HCl, very-dense.	gw	
624.5	_	S-23	13-15 18	0.7		33.0' Well-Graded Gravel with Sand (gw) - 20% cobbles, 60% gravel, 20% sand, subangular, spherical gravel, coarse, subangular sand, 1.5" max size, hard, nonplastic, medium gray (N5) wet, no reaction to HCl,	gw	
623.0	34 —	3-23	(33)	0.7		dense. 34.5' Well-Graded Gravel (gw) - 75% cobbles, 20% gravel, 5% sand, angular, spherical cobbles and gravel, hard, coarse, subanglar sand,	gw	
621.5	36 —	S-24	13-19 14 (33)	1.0		1.5" max size, nonplastic, medium gray (N5), wet, no reaction to HCl, dense.		
02110	- -	S-25	12-17 21 (38)	1.0		Well Graded Gravel (gw) - 50% cobbles, 40% gravel, 10% sand, fine to coarse, subangular, spherical cobbles and gravel, fine to coarse, subangular sand, 1.5" max size, hard, nonplastic, medium gray (N5), wet, no reaction to HCl, dense.	gw	
620.0	38 —	S-26	12-13 13 (26)	1.0		Well-Graded Sand with Gravel (sw) - 80% sand, 15% gravel, 5% silt, spherical, subrounded, fine gravel, hard, 0.5" max size, nonplastic, medium dark gray (N4), wet, no reaction to HCl, medium-dense.	sw	
	-	S-27A	10-9 (9)	0.5		Well-Graded Sand with Gravel (sw)- 75% sand, 25% gravel, fine to coarse, subrounded, spherical gravel and sand, 0.75" max size, hard,		
617.0	40 — - -	S-27B S-28	10-10 (10) 13-17 45	0.7		nonplastic, medium gray (N5), wet, no reaction to HCl, mediumdense. 40.5' Well Graded Gravel with Sand (gw)- 15% cobbles, 60% gravel, 20% sand,5% silt, fine to coarse, subrounded, spherical gravel, fine to coarse, subrounded to subangular sand, 1.0"max size, nonplastic,	gw	
	42 —		(62)			medium gray (N5) and moderate red (5R 4/6), wet, no reaction to HCl, very-dense. Well Graded Gravel with Sand (gw) - 60% cobbles, 25% gravel, 15% sand, hard to medium hard, subangular to angular cobbles, fine to		
614.0	_	S-29	16-34 39 (73)	1.1		coarse, subangular gravel, medium to coarse, subangular sand, 1.0" max particle size, nonplastic, medium gray (N5) with olive gray (5Y 4/1), wet, no reaction to HCl, very-dense.		
						Well Graded Gravel (gw) - 100% cobbles, medium hard to hard,	gw	
DATE (TED: 1	0/26/07 1/07/07 'MP/RAK AR		GWL:	DEPTH: 0.0 DATE/TIME: 11/06/07/09:15 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ rock core	NOTES	: Bedrock Part of the Mahantango Formation
	OVED BY NG CO.:	: RJI			DRILL	ER: Sam Silverman HELPER: Mike Steinbrook/Russell Whitaker	RIG: C	ME 55 Track



Bell B	end NPP							PROJECT NO. 07-3891
Dell D						LOG OF BORING NO. B-320		1 100E31 110. 07-3031
ELEVATION (FEET MSL)	Ε£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 338748.655 E 2405771.438	SYMBOL	
LEVA EEET	DEPTH (FEET)	AMPL R RUI	OW/6 R % I & (R(SOVE	PROFILE	SURFACE EL: 657.52	SS S	REMARKS
E)		γ <u>ο</u>	BLO	REC		DESCRIPTION	nscs	
	44	S-30	30-46 23 (69)	0.9		angular, spherical, 1.0" max size, nonplastic, medium dark gray (N4), wet, no reaction to HCl, very-dense.		
			10.14		X			
	46 —	S-31	12-14 50/5" (64)	1.1				
610.5					张	47.0'		
010.5	_					Shale- Soft dark gray (N3), fresh, intensely fractured (FD6), not healed, calacreous, from 47.0'to 47.9', nocalcareous remainder,		
	48 —	R-1	95%	1.9		closely spaced fractures, thinly bedded, moderateley rough fractures.		
	_		(45%)					
	_					Shale- About 75% shale, 25% silty clay, subangular, very-soft, low dilatancy, low toughness, round, high plasticity, low strength, dark gray (N3), no odor, no reaction to HCl, wet.		
	50 —					Shale- Soft dark gray (N3), slightly to medium weathered, intensely		
	_					fractured, slighlty healed with silty clay, very closely spaced, (FD4) thinly bedded, rough to moderately rough, calcareous with fossils from 51.6'-52.1', fractures located from 51.5'-51.6' and 53.5'-54.0'		
	_					approximatley 45° of core.		
	52 —	R-2	94% (94%)	4.7				
	_		(5470)					
	_							
	54 —					Shale- Soft to moderately soft, dark gray (N3), slightly weathered, slightly healed with clay, intensely to moderately fractured (FD6)		
						moderately spaced, very thin to slightly open, fracture zone located at 56.4'-56.7', 58.4'- 58.6', fracture at 58.0'-58.4' approximatley 70° of		
	_					core, noncalcareous except where fossils are located, thinly to moderately bedded.		
	56 —							
	_	R-3	100%	5.0				
	_							
	_							
	58 —							
	STARTE		0/26/07			DEPTH: 0.0 DATE/TIME: 11/06/07/09:15	NO	TES: Bedrock Part of the Mahantango Formation
	DATE COMPLETED: 11/07/07 FIELD GEOLOGIST: WMP/RAK					DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ rock core		aa.igo i omiation
	KED BY: OVED BY		AR B		DRII	LER: Sam Silverman HELPER: Mike Steinbrook/Russell	BIG	i: CME 55 Track
	ING CO.:				DIVIL	Whitaker	NIG	. ONE SO HACK



Dall B	and NDD							DDO IFCT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-320		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338748.655 E 2405771.438	SYMBOL	REMARKS
LEV.	DEI (FE	AMP R RU	OW/ S & (F	COV	PRC	SURFACE EL: 657.52	uscs s	REMARKO
ш		<i>⊗</i> 0	BL	RE		DESCRIPTION	SN	
	60 —	R-4	100% (94%)	5.0		Shale- Moderately soft, dark gray (N3), slightly fractured (FD3) moderately to widely spaced, very thin, open, fresh, not healed fractures at 62.3' - 62.4' approximatley 45° of core, 62.5' horizontal fracture, 63.8'-64.0' approximatley 70° to the core, non calcareous, moderately bedded.		
	64 —	R-5	100%	5.0		Shale- Moderately soft to hard, dark gray (N3), moderately fractured to slightly fractured (FD4) moderately spaced, very thin, slightly open to moderately open, fresh, not healed, fracture from 64.0'-64.4', vertical fracture 64.8'-65.3' approximatley 70° to core, noncalcareous, no reaction to HCI, moderatley to thickly bedded.		
	68 —	R-6	100%	5.0		Shale- Moderately soft to hard, dark gray (N3), slighlty fractured (FD3) widely spaced, thin becoming very thinly open, rough, fresh, not healed, fracture at 70.8' horizontal, and from 73.8'-74.0 approximately 60° of core, noncalcareous, no reaction to HCI, moderately thick bedding.		
	72 — - -		(92%)	5.0				
DATE (STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: W			GWL:	DEPTH: 0.0 DATE/TIME: 11/06/07/09:15 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ rock core	NOT	ES: Bedrock Part of the Mahantango Formation
	OVED BY: ING CO.:				DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/Russell Whitaker	RIG:	CME 55 Track



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LOG OF BORING NO. B-320	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338748.655 E 2405771.438	OBW REMARKS								
DEPTH (FEET) (MPLE N R RUN N R RUN N R REC	N 338748.655 E 2405771.438 SURFACE EL: 657.52	κ REMARKS								
SA SA OF PEC	DESCRIPTION	nscs								
74 —	Shale- Moderately hard, dark gray (N3), very slightly fractured (FD1) very widely spaced, very thin to slightly open, rough, fresh, not healed, fracture from 74.5'-74.8' approximately 60° of core, contains pockets of calcareous fossils with a strong reaction to HCI, otherwise noncalcareous, moderately bedded.									
	Shale- Moderately hard, dark gray (N3), very slightly fractured (FD1) very widely spaced, very thin, slightly open, rough fresh, not healed, fracture from 80.0'-80.2' approximatley 45° of core.									
R-8 100% 5.0	Shale- Moderately hard, dark gray (N3), unfractured (FD0), fresh, noncalacreous, no reaction to HCl.									
B6 — R-9 100% 5.0 DATE STARTED: 10/26/07 DATE COMPLETED: 11/07/07	GWL: DEPTH: 0.0 DATE/TIME: 11/06/07/09:15 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock Part of the Mahantango Formation								
FIELD GEOLOGIST: WMP/RAK CHECKED BY: DAR	DRILLING METHOD: SPT/Tricone/NQ rock core	DIC: OME 55 Teach								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbrook/Russell Whitaker	RIG: CME 55 Track								



Dall B	Bell Bend NPP PROJECT NO. 07-3891										
Dell Re	ena NPP					LOG OF BORING NO. B-320		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 338748.655 E 2405771.438	USCS SYMBOL				
EVA.	DEPTH (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 657.52	SS SY	REMARKS			
<u> </u>		SA	BLC	REC		DESCRIPTION	nsc				
	88 — 90 — 92 — 94 — 96 — 98 —	R-10	100% (100%)	5.0		Shale- Moderately hard, dark gray (N3), unfractured (FD0), fresh, contains few calcareous intrusions, noncalcareous, no reaction to HCI. Shale- Moderately hard, dark gray (N3), unfractured (FD0), fresh, contains few calcareous intrusions.					
DATE (FIELD	- - -	ΓED: 1 [·] IST: W		1.0	GWL:	Shale- Moderately hard, dark gray (N3), unfractured (FD0), fresh. BOTTOM OF BORING 100' DEPTH: 0.0 DATE/TIME: 11/06/07/09:15 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ rock core	NOT	ΓΕS: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRIL	LER: Sam Silverman HELPER: Mike Steinbrook/Russell Whitaker	RIG	: CME 55 Track			



Bell Be	end NPP					LOG OF BORING NO. B-321		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	E F.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338752.662 E 2405830.208	SYMBOL	
EVAT	DEPTH (FEET)	MPLE	3 % F 8 (RC	OVE	PROFILE	SURFACE EL: 658.02	S SY	REMARKS
H (F)		SAI	BLC Of	REC		DESCRIPTION	nscs	
655.5	0 - - 2 — - - 4 — -	S-1	4-4 3 (7)	1.4		2.5' Clayey Sand (sc) - 80% sand, 15% clay, 5% silt, fine to medium, rounded sand, flat and elongated, low plasticity, low dry strength, low dilatancy, low toughness, no reaction to HCl, low dilatancy, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), moist to wet, no reaction to HCL, loose to medium dense	sc	Solid stem augers
650.5	6 — - - 8 — - -	S-2 S-3	2-5 6 (11)	1.4	THE CONTROL OF THE CO	7.5' Well-Graded Sand with Silt (sw-sm) - 85% sand, 5% clay, 5% silt, rounded, fine to coarse, flat and elongated sand, hard, no plasticity, grayish red (5R 4/2), wet, no reaction to HCl, medium dense.	sw- sm	7.5'-8.0 cave in
645.5	10 — 12 — -	S-4	2-5 18 (23)	1.5	NAKAN NAKAN	Shale cobble at 11.4' 12.5' Silty Sand with Gravel (sm) - 15% gravel, 70% sand, 15% silt, fine,	sm	Set 10.0', 4" temporary steel casing, mixed mud (QuickTrol LV: Quick gel) with tri-cone bit
	14 —	S-5	24-27 19 (46)	0.8		subangular, flat and elongated gravel, hard, fine to coarse, subrounded to subangular sand, 1/2" maximum particle size, no plasticity, grayish brown (5 YR 3/2) wet, no reaction to HCl, dense.		
	STARTED COMPLET		0/20/2007			DEPTH: NA DATE/TIME: NA	NO	TES: Bedrock Part of the Mahantango Formation
FIELD	GEOLOG KED BY:	IST: JL	0/21/2007 LO AR			DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tri-cone/NQ Rockcore		aago i omiauon
APPRO	OVED BY:	RJI	В		DRILI	LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 Truck



Bell Be	end NPP							PROJECT NO. 07-3891
Belli Be						LOG OF BORING NO. B-321		- 1 NOULOT NO. 07-3031
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338752.662 E 2405830.208 SURFACE EL: 658.02	S SYMBOL	REMARKS
		SAN	BLO OR 8	REC	<u> </u>	DESCRIPTION	nscs	
643.0	_				988	15.0'		Switched to casing advancer
	16 	S-6	15-16 44 (60)	0.7		Silty Sand with Gravel (sm) - 50% sand, 30% gravel, 20% silt, fine to coarse, subrounded gravel, flat and elongated, fine to coarse grained, angular to rounded sand, 3/4" maximum particle size hard, nonplastic, grayish brown (5YR 3/2), wet, no reaction to HCl, dense to very dense, larger gravel/cobbles at bottom of spoon.	sm	
640.5	_					17.5'	αw	
0.10.10	18 	S-7	50/4" (50)	0.4		Well Graded Gravel (gw) - 100% cobbles, subrounded to angular, flat and elongate, 1 1/2" maximum particle size, hard, no plasticity, dark gray (N3), wet, no reaction to HCl, very dense.	gw	
638.0	20 —				9:9:	20.0' Well-Graded Sand with Gravel (sw) - 10% cobbles, 45% sand, 40%	sw	
	_	S-8	15-20 17 (37)	1.0	6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	gravel, 5% silt, fine to coarse grained, subrounded, flat and elongated gravel, fine to coarse grained, subangular to rounded sand, 3/4" maximum particle size, hard, no plasticity, dark gray (N3), wet, no reaction to HCl, dense, some large sandstone cobbles (some with calcite veins).		
	22 —							
635.5	_	S-9	25-34 37 (71)	1.5		Well Graded Gravel with Sand (gw) - 45% cobbles, 25% gravel, 25% sand, 5% clay, subangular, flat and elongated gravel and cobbles, fine to coarse grained, subangular to rounded sand, 1 1/2" maximum particle size, hard, nonplastic, pale yellowish brown (10YR 6/2), wet, no reaction to HCl, very dense.	gw	22.5'-23.7 cave in
	24 —							
633.0	_				X	25.0' Well Graded Gravel (gw) - 80% cobbles, 10% gravel, 10% sand, fine	gw	
	26 —	S-10	24-29 23 (52)	1.0		to coarse, flat and elongated cobbles and gravel, 1 1/2" maximum particle size, hard, no plasticity, dark gray (N3) to moderately yellowish brown (10YR 6/2), wet, no reaction to HCl, very dense.	9	25.5', began to loose water (very minimal)
	_							
	-				3			
	28 —	S-11	19-24 32 (56)	0.2				
	_							
	STARTE		0/20/2007			DEPTH: NA DATE/TIME: NA	NO	TES: Bedrock Part of the Mahantango Formation
l	COMPLE GEOLOG		0/21/2007 ₋O	,		: DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tri-cone/NQ Rockcore		manantango i omiation
l	KED BY:		AR				F:-	ONE 75 T
	OVED BY: NG CO.:				DRIL	LER: Craig VanVactor HELPER: L. Shipman	RIG	6: CME 75 Truck
					-			



Bell Be	end NPP					LOG OF BORING NO. B-321		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338752.662 E 2405830.208 SURFACE EL: 658.02	SYMBOL	REMARKS
EE	<u>П</u>	SAMF OR R	LOW OR 9	00	P.R.		scs	
			В	R	****	DESCRIPTION	SN	
628.0	30 —					30.0' Well-Graded Sand (sw) - 90% sand, 5% gravel, 5% silt, fine to coarse	sw	
	_	S-12	2-4 6 (10)	0.7		sand, flat and elongated, 0.5" maximum particle size, no plasticity, dusky brown (5YR 2/2), wet, no reaction to HCl, loose.		
	32 —							32.0', no water circulation
625.5	- - -	S-13	10-14 15 (29)	0.6		32.5' Well-Graded Gravel with Sand (gw) - 25% cobbles, 60% gravel, 15% sand, fine to coarse grained, angular, flat and elongated cobbles, fine to coarse, shale and sandstone gravel, 3/4" maximum particle size, hard, no plasticity, dark gray (N3), wet, no reaction to HCl, medium dense to very dense.	gw	
	34 —							Water returns (not completely)
	_ 36 —	S-14	19-43 27 (70)	0.8				35.0', water returns (not completely) Used approximately 600 gallons to get from S-14 to S-
620.5	_					37.5'		15 Used 200 gallons total from S-1 to S-14
020.0	38 —	S-15	22-19 19 (38)	0.8		Well Graded Gravel (gw) - 75% cobbles, 20% gravel, 5% sand angular, elongated and flat cobbles and sand, 1 1/2" maximum particle size, hard, no plasticity, dark gray (N3), wet, no reaction to HCl dense. Shale and sandstone cobbles - Shale is highly weathered to degraded into clay, sandstone is fairly fresh.	gw	
618.0	40 —	S-16	50/0 (50+)	0.0		40.0' No Recovery		Start 10/21/07 R-1 lost 0.6' from above
	42 —							gravel
615.6	- -	R-1	88% (20%)	4.4	~	Shale - Dark gray (N3), medium hard Bedding plane visible at breaks, thinly bedded at 30°-45° to core, no reaction to HCl, closely to intensely fractured, moderate to severely weathered.		No water circulation - Used 500 gallons of water for 5.0'
DATE (STARTED COMPLET GEOLOG KED BY:	ΓED: 10 IST: JI	0/20/2007 0/21/2007 _O AR		GWL:	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tri-cone/NQ Rockcore	NO	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILL	.ER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 Truck



<u> </u>	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-321		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.(.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 338752.662 E 2405830.208	SYMBOL				
EVA'	DEPTH (FEET)	MPLE R RUN	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 658.02	SS SY	REMARKS			
<u>∃</u> ∃		S O	BL(REC		DESCRIPTION	nscs				
	44 — - - -					44.4', fresh weathering, unfractured, little pyrite in thin horizontal vein					
	46 —					45.6', few fossils, calcite highly effervescent little pyrite throughout					
	- - -	R-2	94% (74%)	4.7		Shale, dark gray (N3), medium hard, thinly bedded at 30° - 4.5° to core, no reaction to HCL, closely to intensely fractur ed, moderate to severe weathering					
	48 —							At approximately 48.0' water returns, not full return			
	50 —	R-3	100%	5.5		49.5'-50.0', intensely fractured to crushed due to difficulties removing from shoe of core barrel Shale, dark gray (N3), medium hard, thinly bedded at 30°-45° to					
	_ _ _		(92%)			core, no reaction to HCL, closely to intensely fractured, moderate to severe weathering					
	52 — - -										
	54 — - -	R-4	100%	4.5		55.0'-57.0', calcite inclusions are thin, discontinuous and horizontal					
	56 		(100%)			Shale - Dark gray (N3), medium hard, thinly bedded at 30°-45° to core, no reaction to HCl.					
	- - 58 					58.3'- 60.2', abundant pyrite and fossil zone, pyrite in masses with no					
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 10 IST: JI	D/20/2007 D/21/2007 _O AR		GWL:	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tri-cone/NQ Rockcore	NO	FES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 Truck			



Dall B	Bell Bend NPP PROJECT NO. 07-3891								
Bell De	ana NFF		-			LOG OF BORING NO. B-321		PRUJEUT NU. 07-3091	
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 338752.662 E 2405830.208	SYMBOL		
EVA EET	DEPTH (FEET)	MPLI R RUI	3W/6 R % I 8 (R(OVE	PROFILE	SURFACE EL: 658.02	\S S;	REMARKS	
E F		SA	BLC Of	REC	"	DESCRIPTION	nscs		
						particular orientation, fossils are mainly brachiopods			
	60 —	R-5	100% (100%)	5.0		59.65', Well-preserved brachiopod Shale - Grayish black (N2), medium hard, no reaction to HCl, fresh, unfractured, few fossils, few pyrite wisps.			
	64 —	R-6	100% (100%)	5.0		Shale - Grayish black (N2), medium hard, no reaction to HCl, fresh, unfractured, few fossils, few pyrite wisps.			
	68 —	R-7	100% (100%)	5.0					
DATE (72 — - STARTED COMPLET GEOLOG	ΓED: 1	0/20/2007 0/21/2007		GWL:	: DEPTH: NA DATE/TIME: NA : DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tri-cone/NQ Rockcore	NOT	ES: Bedrock Part of the Mahantango Formation	
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Craig VanVactor HELPER: L. Shipman	RIG:	CME 75 Truck	



Dall David NDD		DD0 I507 NO. 07 2004
Bell Bend NPP	LOG OF BORING NO. B-321	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338752.662 E 2405830.208	OBWAS REMARKS
LEVATIO DEPTH (FEET) MMPLE N R RUN N R REC R R REC R R REC	N 338752.662 E 2405830.208 SURFACE EL: 658.02	κ REMARKS
SA OF OF OF OF	DESCRIPTION	nscs
日本	T4.9'-75.0', fracture filled in with clay, nonplastic Shale - Grayish black (N2), medium hard, no reaction to HCI, fresh, few fossils, few pyrite wisps, very slightly fractured, few fossils filled in with calcite. T8.8' clean fracture (rounded edges) Shale - Grayish black (N2), medium hard, no reaction to HCI, fresh, few fossils, very slightly fractured.	SN S
84 — R-10 100% 5.0 86 — R-10 94%) DATE STARTED: 10/20/2007 DATE COMPLETED: 10/21/2007 FIELD GEOLOGIST: JLO CHECKED BY: DAR	84.0'-84.3' intensely fractured zone Shale - Grayish black (N2), medium hard, no reaction to HCl, fresh, few fossils, very slightly fractured, few calcite inclusions throughout. 87.6' pyrite flake in break GWL: DEPTH: NA DATE/TIME: NA GWL: DEPTH: NA DATE/TIME: NA DRILLING METHOD: SPT/Tri-cone/NQ Rockcore	NOTES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: L. Shipman	RIG: CME 75 Truck



	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	end NPP					LOG OF BORING NO. B-321		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 338752.662 E 2405830.208	USCS SYMBOL			
EVA.	DEPTH (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 658.02	S S	REMARKS		
日子		SA OF	BLC	REC		DESCRIPTION	OSC			
558.0	88 — 90 — 92 — 94 — 96 — 100 — 102 —	R-11	100% (100%)	4.8		Shale - Grayish black (N2), medium hard, no reaction to HCI, fresh. Shale - Grayish black (N2), medium hard, no reaction to HCI, fresh, very slightly fractured. BOTTOM OF BORING 100'				
DATE (STARTED COMPLE ^T GEOLOG KED BY:	ΓED: 1 IST: JI	L 0/20/2007 0/21/2007 _O AR		GWL	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tri-cone/NQ Rockcore	NO	TES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 Truck		



Bell B	Bell Bend NPP PROJECT NO. 07-3891										
			•			LOG OF BORING NO. B-322					
ELEVATION (FEET MSL)	тн (Т≡	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - E	COORDINATES N 338922.541 E 2405754.786	SYMBOL				
EVA EET	ОЕРТН (FEET)	MPL R RU	OW/6 R % & (R)	SOVE	PROFILE	SURFACE EL: 657.24	SSS	REMARKS			
⊞ ₩		δ _. Δ	BLO	REC		DESCRIPTION	nscs				
	0	S-1	2-3 3 (6)	1.5		Sandy Lean Clay (cl) - 40% sand, 60% clay, subrounded to subangular, spherical, fine to medium sand, low to medium plasticity, low dry strength, slow to no dilatancy, low toughness, mottled dark yellowish orange (10YR 6/6) and light gray (N7), moist, no reaction to HCl, medium stiff, traces of roots.	cl	pp=0.50 tsf			
655.2	2 —	S-2a	3-3			2'					
	_	S-2b	4 (7)	1.2		Silty Sand (sm) - 5% gravel, 80% sand, 15% silt, subangular to subrounded, spherical, fine gravel, subangular to subrounded, fine to coarse sand, 2" max size, medium hard, nonplastic, dark yellowish brown (10YR 4/2), moist, no reaction to HCl, loose. 3.0'	sm				
654.2	_					Silty Sand (sm) - 60% sand, 40% silt, subrounded to subangular, spherical, fine to medium sand, 0.07" max size, medium hard,	sm				
	4 —	S-3	1-2 2 (4)	1.5		nonplastic, dark yellowish brown (10YR 4/2) and olive gray (5Y 3/2), wet, no reaction to HCl, very loose.					
054.0	-	S-4	1-2 3 (5)	1.3		6.0'					
651.2	6 —	S-5	3-4 6 (10)	1.0		Poorly Graded Sand with Silt (sp-sm) - 90% sand, 10% silt, subrounded to subangular, spherical, fine to medium sand, 0.07" maximum particle size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2) to grayish brown (5YR 3/2), wet, no reaction to HCl, loose. 7.5'	sp- sm				
649.7	8 —	S-6	3-4 6 (10)	1.0		Poorly Graded Sand (sp)- 95% sand, 5% silt, subrounded to subangular, spherical, fine to medium sand, 0.07" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCI, loose to medium dense.	sp				
646.7	10 —	S-7	4-6 7 (13)	0.9		10.5'					
040.7	12 —	S-8	3-4 5 (9)	1.0		Silty Sand (sm) - 85% sand, 15% silt, fine sand, subrounded to sub angular, spherical, fine to medium sand, 0.07" max size, moderate hardness, nonplastic to low plasticity, low dry strength, rapid dilatancy, low toughness, brownish gray (5YR 4/1) to dark yellowish brown (10YR 4/2), wet, no reaction to HCl, loose.	sm				
	- - -	S-9	3-4 4 (8)	1.0							
	14 —	S-10	3-2 2 (4)	0.9							
	STARTED		0/23/07	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07	NO	TES: Bedrock Part of the Mahantango Fotmation					
FIELD	COMPLE [*] GEOLOG KED BY:	IST: W	0/25/07 /MP AR	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		ivianantango Fotination					
APPRO	OVED BY:	RJI	В		DRILL	LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG	6: CME 55 Track			



Bell Be	end NPP							PROJECT NO. 07-3891		
		1				LOG OF BORING NO. B-322				
rion MSL)	ΞF	. ON .	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	빌	COORDINATES N 338922.541 E 2405754.786	SYMBOL			
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	DW/6" R % F & (RC	OVE	PROFILE	SURFACE EL: 657.24	SS SY	REMARKS		
□ 		δΩ	BL(REC		DESCRIPTION	nscs			
	_									
	16 	S-11	2-2 2 (4)	1.0		16.5'				
639.7	_	S-12a	1-0 0 (0)	1.5		Silty Sand with Clay (sm)- 60% sand, 40% clayey silt, subangular to subrounded, spherical, fine sand, 0.07" max size, low hardness, low plasticity, low dry strength, rapid dilatancy, low toughness, medium dark gray (N4) to dark gray (N3), slightly organic odor, wet, no 17.5'		pp=0.0 tsf		
039.7	18 —	S-12b				\reaction to HCl, very loose Sandy Fat Clay (ch)- 70% silty clay, 30% sand, subangular to	ch	pp=0.0 tsf		
638.7	_	S-13a S-13b	0-0 9 (9)	1.0		subrounded, spherical, fine sand, low hardness, high plasticity, low dry strength, slow dilatancy, low toughness, dark gray (N3) to dark 5.5 yellowish orange (10YR 6/6), slight organic odor, wet, no reaction to HCI, very soft. Well Graded Gravel (gw) - 90% cobbles, 10% silty sand, fine to coarse, subrounded to subangular, spherical gravel, fine to coarse,	gw			
	20 —	S-14	15-49 15 (64)	0.7		subrounded to subangular, sand, 3.0" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.				
	22 —	S-15	22-14 12 (26)	0.0		No Recovery 22.5'				
634.7	- -	S-16	20-15 15 (30)	0.9		Well Graded Gravel with Sand (gw) - 80% cobbles, 20% silty sand, subrounded to subangular, fine to coarse sand, spherical, 3.0" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense to dense.	gw			
	24 - -	S-17	10-14 20 (34)	0.8						
	26 — 	S-18	9-15 20 (35)	1.0		27.0'				
630.2	28 —	S-19	9-9 10 (19)	0.8		Well Graded Gravel with Sand (gw) - 75% cobbles, 5% gravel, 10% sand, 10% silt, fine to coarse, spherical gravel, subrounded to subangular, fine to coarse sand, 3.0" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.	gw			
	_		21-14							
DATF :	STARTE	L D: 10	NO	I TES: Bedrock Part of the						
	COMPLE		0/23/07 0/25/07		1	: DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 : DEPTH: N/A DATE/TIME: N/A	```	Mahantango Fotmation		
	GEOLOG		/MP		DRIL	LING METHOD: SPT/Tricone/NQ Rock Core				
I	KED BY:		AR		<u> </u>		<u> </u>			
	NG CO :				DRIL	LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG	G: CME 55 Track		
DKILLI	DRILLING CO.: Terracon									



Bell Be	end NPP					LOG OF BORING NO. B-322		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338922.541 E 2405754.786 SURFACE EL: 657.24	USCS SYMBOL	REMARKS
		S-20	12	0.8	STORES.	DESCRIPTION	ŝ	
	30 —		(26)					
	_	S-21	9-10 11 (21)	0.6		31.5'		
625.7	32 —	S-22	9-20 24 (44)	0.9	00 00 00	Well Graded Sand with Gravel (sw) - 60% sand, 30% gravel, 10% silt, fine to coarse, angular gravel, medium to coarse, subangular sand, 0.25" max size, nonplastic, dark yellow brown (10YR 4/2), wet, no reaction to HCL, dense.	sw	
624.2	34 —	S-23	19-25 19 (44)	1.1		33.0' Well-Graded Gravel with Silt and Sand (gm) - 60% gravel, 30% sand, 10% silt, fine to coarse, spherical, subrounded to subangular gravel, fine to coarse, subrounded to subangular sand, 1" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, dense.	gm	
622.7	- -	S-24	15-15 13 (28)	1.1		Well-Graded Sand with Silt and Gravel (sw-sm) - 25% cobbles, 30% gravel, 35% sand, 10% silt, fine to coarse gravel, fine to coarse sand, subrounded to subangular, spherical, coarse gravel, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.	sw- sm	
621.2	36 — 	S-25	11-16 32 (48)	0.6		Well Graded Sand with Silt (sm) - 20% gravel, 70% sand, 10% silt, fine to coarse, spherical gravel, fine to coarse, subrounded to subangular sand, 0.25" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.	sm	
619.7	38 —	S-26	19-24 13 (37)	0.8		Well Graded Gravel with Sand and Silt (gw-gm) - 75% cobbles, 15% sand, 10% silt, fine to coarse cobbles, fine to coarse, subrounded to subangular sand, 3.0" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCI, dense.	gw- gm	
	-	S-27	8-6 4 (10)	0.0		No Recovery		
616.7	40 — - -	S-28	4-5 6 (11)	0.2		Well Graded Gravel with Sand (gw) - 70% cobbles, 25% sand, 5% silt, fine to coarse cobbles, fine to coarse, subrounded to subangular sand, spherical, 3.0" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.	gw	
615.2	42 —	S-29	4-5 6 (11)	0.7		Well-Graded Sand with Gravel (sw) - 10% cobbles, 60% sand, 25% gravel, fine to coarse, spherical, subrounded to subangular, gravel, fine to coarse, subrounded to subangular, sand, 0.5" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.	sw	
	_					Well-Graded Sand with Gravel (sw) - 75% sand, 25% gravel, fine to		
DATE STARTED: 10/23/07 DATE COMPLETED: 10/25/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					GWL:	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Fotmation
APPRO	OVED BY NG CO.:	: RJ	В		DRILL	.ER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG	: CME 55 Track



Dall D	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-322		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338922.541 E 2405754.786 SURFACE EL: 657.24	SSYMBOL	REMARKS
크린		SAI	BLC OF	REC	-	DESCRIPTION	nscs	
	44	S-30	2-1 3 (4)	0.3		coarse, subrounded to subangular, spherical gravel, fine to coarse, subrounded to subangular sand, 0.5" maximum particle size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, very loose.		
612.2	46 —	S-31	5-6 2 (8)	1.5		Well-Graded Sand (sw) - 5% gravel, 90% sand, 5% silt, fine gravel, fine to coarse, subangular to subrounded, spherical sand, 0.25" maximum particle size, moderate hardness, nonplastic, medium gray (N5) and brownish gray (5YR 4/1), wet, no reaction to HCl, loose.	sw	
610.7	- -	S-32	10-30 25 (55)	1.0		Well-Graded Gravel (gw) - 80% cobbles, 10% sand, 10% gravel, fine to coarse gravel, fine to coarse, subrounded to subangular, spherical sand, 0.5" max size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2) and lesser moderate yellowish brown (10YR 5/4), wet, no reaction to HCl, very dense.	gw	
609.2	48 	S-33	16-34 19 (53)	0.8		Well-Graded Gravel with Silt and Sand (sw-sm) - 60% gravel, 30% sand, 10% silt, fine to coarse, subrounded to subangular, spherical gravel, fine to coarse, subrounded to subangular sand, 1" coarse gravel maximum particle size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, dense to very dense	gw- gm	
	50 —	S-34	4-17 20 (37)	0.5		51.0'		
606.2	52 —	S-35	16-22 9 (31)	0.9		Well-Graded Gravel with Silt and Sand (gw-gm) - 30% cobbles, 35% gravel, 20% sand, 15% silt, fine to coarse, subrounded to subangular, spherical gravel, fine to coarse, subrounded to subangular sand, 1" maximum particle size, moderate hardness, nonplastic, dark yellowish brown (10YR 4/2) to medium dark gray (N4), wet, no	gw- gm	
604.7	- - -	S-36	4-8 28 (36)	0.8		reaction to HCl, dense. 52.5' Sandy Lean Clay (cl) - 10% gravel, 20% sand, 10% silt, 50% clay, fine to coarse, subrounded to subangular, spherical gravel, fine to coarse subrounded to subangular sand, 0.25" maximum particle size, moderate hardness, medium plasticity, low dry strength, rapid dilatancy, medium toughness, dark yellowish brown (10YR 4/2) to medium dark grav (NA), wet no reaction to HCl, hard, 54.0'	cl	
603.2	54 	S-37	15-16 16 (32)	0.8		medium dark gray (N4), wet, no reaction to HCl, hard. Clayey Sand with Gravel (sc) - 25% gravel, 50% sand, 25% clay, subrounded to angular, spherical, coarse gravel, subrounded to angular, fine to coarse sand, 1" max size, moderate hardness, low plasticity, low strength, low dilatancy, low toughness, medium dark gray (N4), moist, no reaction to HCl, dense.	sc	
	56 -	S-38	11-16 22 (38)	1.2				
	- 58 —	S-39	20-24 35 (59)	1.3				
DATE STARTED: 10/23/07 DATE COMPLETED: 10/25/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					GWL:	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	ТОИ	TES: Bedrock Part of the Mahantango Fotmation
APPRO	OVED BY	: RJ	В		DRILL	.ER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG	: CME 55 Track



Dall B	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	ena NPP					LOG OF BORING NO. B-322		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	Ε.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 338922.541 E 2405754.786	SYMBOL			
EVA:	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 657.24	S S	REMARKS		
EL (F		SA	BLC	REC		DESCRIPTION	SOSN			
	- 60 —	S-40 S-41	22-20 26 (46) 50/2 (50+)	1.5						
596.2	62 —	R-1	97% (77%)	3.4		61' Siltstone- Moderately hard, dark gray (N3), noncalcareous to slightly calcareous, breccia zone from 61.0'-61.9', highly fractured, massive bedding, fresh to slightly weathered.				
	64 —					Siltstone- Moderately hard, dark gray (N3), slightly calcareous, fresh, massive bedding, few fractures healed with calcite and quartz, slightly calcareous.				
	68 — - - - 70 —	R-2	100%	5.0		Siltstone- Moderately hard, dark gray (N3), fresh, unfractured slightly clacareous, massive bedding.				
DATE	72 — - - - - STARTED	R-3	100% (100%)	5.0	GWL	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07	NOT	ES: Bedrock Part of the		
FIELD	COMPLETED BY:	IST: W	0/25/07 /MP		1	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Fotmation		
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG:	CME 55 Track		



Ball B	Bell Bend NPP PROJECT NO. 07-3891									
Bell B	end NFF					LOG OF BORING NO. B-322		FROJECT NO. 07-3091		
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338922.541 E 2405754.786	SYMBOL			
EVA EET	DEPTH (FEET)	MPLI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 657.24	S S	REMARKS		
II E		SA	BLC	REC	"	DESCRIPTION	nscs			
	74 — - - -					Siltstone- Moderately hard, dark gray (N3), fresh, very slightly to slightly fractured, massive bedding, fossiliferous, noncalcareous.				
	76 — - - 78 — -	R-4	100% (100%)	5.0						
	80 — - - - 82 —	R-5	100%	5.0		Siltstone- Moderately hard, dark gray (N3), fresh, very slighlty calcareous with pyrite, fractured from 82.5'-84.5, fossiliferous.				
	84 —					Siltstone- Moderately hard, dark gray (N3), noncalcareous, to slightly calacareous, fresh, very slighlty fractured, massive bedding.				
DATE	86 — - - - STARTED COMPLE	ΓED: 10		5.0	GWL:	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the Mahantango Fotmation		
CHEC APPR	GEOLOG KED BY: OVED BY: ING CO.:	D RJ				LING METHOD: SPT/Tricone/NQ Rock Core LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG:	CME 55 Track		



Ball B	Bell Bend NPP PROJECT NO. 07-3891									
Dell De	ena NPP					LOG OF BORING NO. B-322		PROJECT NO. 07-3091		
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 338922.541 E 2405754.786	SYMBOL			
EVA.	DEPTH (FEET)	MPLI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 657.24	SSS	REMARKS		
		δ. Q.	BL(REC		DESCRIPTION	nscs			
	90 —		100%			Siltstone- Moderately hard, dark gray (N3), noncalcareous, to slightly calacareous, fresh, very slighlty fractured, massive bedding.				
	92 — 94 —	R-7	98%	4.9		Siltstone- Moderately hard, dark gray (N3), noncalcareous, to slightly calacareous, fresh, very slighlty fractured, massive bedding.				
	98 — 100 —	R-9	100%	5.0		Siltstone- Moderately hard, dark gray (N3), noncalcareous, to slightly calacareous, fresh, very slighlty fractured, massive bedding.				
DATE FIELD	STARTED COMPLE ^T GEOLOG): 10 ΓED: 10	(100%) 0/23/07 0/25/07 /MP		GWL:	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	ES: Bedrock Part of the Mahantango Fotmation		
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG:	CME 55 Track		



Bell Bend NPP		PROJECT NO. 07-3891
Deli Deliu NFF	LOG OF BORING NO. B-322	FROJECT NO. 07-3091
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338922.541 E 2405754.786	OBWAS REMARKS
DEPTH (FEET) (MPLE N R RUN N R RUN R R % REC	N 338922.541 E 2405754.786 SURFACE EL: 657.24	တ် REMARKS
SA SA OF OIL	DESCRIPTION	USCS
104		<u>S</u>
116 — 100% DATE STARTED: 10/23/07	GWL: DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07	NOTES: Bedrock Part of the
DATE COMPLETED: 10/25/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	Mahantango Fotmation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG: CME 55 Track



Bell Bend NPP		PROJECT NO. 07-3891
Deli Deliu NFF	LOG OF BORING NO. B-322	FROJECT NO. 07-3091
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338922.541 E 2405754.786	TO BWAS REMARKS
LEVATIO TEET MSI DEPTH (FEET) NMPLE N R RUN N R RUN N R REG R (RQD)	N 338922.541 E 2405754.786 SURFACE EL: 657.24	κ REMARKS
SA SA OF	DESCRIPTION	SOS
R-12 (100%) 5.0 118	Siltstone- Moderately hard, dark gray (N3), fresh, noncalcerous, slightly fractured, healed with calcite, fossiliferous, reaction to HCl, contains pockets of pyrite. Siltstone- Moderately hard, dark gray (N3), fresh, noncalcerous, slightly fractured, healed with calcite, fossiliferous, reaction to HCl, contains pockets of pyrite, calcite fossils at 131.6'-131.8'. Siltstone- Moderately hard, dark gray (N3), fresh, noncalcerous, slightly fractured, healed with calcite, fossiliferous reaction to HCl, contains pockets of pyrite.	
DATE STARTED: 10/23/07 DATE COMPLETED: 10/25/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	GWL: DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Fotmation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG: CME 55 Track



Bell Bend NPP PROJECT NO. 07-3891										
Dell D	CHU NEF					LOG OF BORING NO. B-322		1 NOOLO1 NO. 01-3031		
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338922.541 E 2405754.786	SYMBOL			
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 657.24	SS SV	REMARKS		
<u> </u>		SA	BLC	REC		DESCRIPTION	SOSN			
DATE	144 — - - - - 146 —	R-15 R-16	100% (100%)	5.0 5.0		Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous. Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous. Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous.		S: Bedrock Part of the Mahantango Fotmation		
	COMPLE ^T GEOLOG		0/25/07 /MP			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		ivianantango Fotmation		
APPR	KED BY: OVED BY: ING CO.:	RJ			DRILI	LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG:	CME 55 Track		



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bena NPP	LOG OF BORING NO. B-322		PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 338922.541 E 2405754.786	SYMBOL									
LEVATIO EET MS DEPTH (FEET) AMPLE N R RUN N R RCOD)	N 338922.541 E 2405754.786 SURFACE EL: 657.24	888	REMARKS								
SA SA OR	DESCRIPTION	nscs									
148 — R-18 100% 5.00 100% 150 — 152 — R-19 100% 100% 5.00 15	Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to verslighlty fractured, massive bedding, noncalcareous, calcite filled fossils at 153.5'.										
154 — 156 — R-20 100% 5.00	Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slighlty fractured, massive bedding, noncalcareous.										
DATE STARTED: 10/23/07 DATE COMPLETED: 10/25/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slighlty fractured, massive bedding, noncalcareous. GWL: DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTE	S: Bedrock Part of the Mahantango Fotmation								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: M. Steinbrook, R. Whitak	er RIG: (CME 55 Track								



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LOG OF BORING NO. B-322	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 338922.541 E 2405754.786	TOBWAKS REMARKS								
LEVATIO EEET MS DEPTH (FEET) MMPLE N R RUN N S RUN N S ROD)	N 338922.541 E 2405754.786 SURFACE EL: 657.24	က် REMARKS								
SA SA OF OIL	DESCRIPTION	nscs								
162 — R-21 100% 5.0 164 —	Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous. Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous. Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous.									
DATE STARTED: 10/23/07 DATE COMPLETED: 10/25/07	GWL: DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock Part of the Mahantango Fotmation								
FIELD GEOLOGIST: WMP	DRILLING METHOD: SPT/Tricone/NQ Rock Core									
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG: CME 55 Track								



Ball B	Bell Bend NPP PROJECT NO. 07-3891										
Dell B	ena NPP					LOG OF BORING NO. B-322		PROJECT NO. 07-3091			
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 338922.541 E 2405754.786	USCS SYMBOL				
EVA EET	DEPTH (FEET)	MPL RUI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 657.24	SS SS	REMARKS			
_ - - - - - - - - - - - - - - - - - - -		SA	BLC Of	REC		DESCRIPTION	OSN				
	176 — 178 — 180 — 182 — 184 — 186 — 188 — 190 —	R-24	100% (100%)	5.0		Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous. Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous. Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slightly fractured, massive bedding, noncalcareous.	30				
DATE	STARTED COMPLE	ΓED: 10			GWL:	DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 DEPTH: N/A DATE/TIME: N/A	NOTES	S: Bedrock Part of the Mahantango Fotmation			
1	GEOLOG KED BY:		/MP AR		DRILI L	LING METHOD: SPT/Tricone/NQ Rock Core					
APPR	OVED BY:	RJ	В		DRILI	LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG: C	CME 55 Track			
DRILL	APPROVED BY: RJB DRILLER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker RIG: CME 55 Track DRILLING CO.: Terracon										



Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-322		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	DEPTH (FEET) SAMPLE NO. OR RUN NO.		BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338922.541 E 2405754.786	USCS SYMBOL			
EVA'	DEP'	MPLE	3.W/6 7.% F 8. (RG	OVE	PROFILE	SURFACE EL: 657.24	S S	REMARKS		
크		SA	BLC OF	REC		DESCRIPTION	nsc			
457.7	192 —	R-27	100% (100%)	5.0		Siltstone- Moderately hard, dark gray (N3), fresh, unfractured to very slighlty fractured, massive bedding, noncalcareous.				
DATE	200 — 202 — 204 — STARTED COMPLE	TED: 1	0/23/07 0/25/07 /MP		GWL:	: DEPTH: 1.8' DATE/TIME: 09:50, 10/26/07 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Fotmation		
CHECK APPRO	KED BY: OVED BY: ING CO.:	D RJ	AR B			LER: Sam Silverman HELPER: M. Steinbrook, R. Whitaker	RIG:	CME 55 Track		



Bell Bend NPP PROJECT NO. 07-3891										
Dell Be	enu NPP					LOG OF BORING NO. B-323		PROJECT NO. 07-3091		
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338927.919 E 2405815.577	SYMBOL	REMARKS		
LEV.	DEF (FE	AMPI R RU	OW// S (R	00	PRO	SURFACE EL: 657.68	nscs s	KLIMAKKO		
ш		δO	BL	RE		DESCRIPTION				
	0 - - 2 —	S-1	2-4 5 (9)	1.3		Silty Sand (sm)- 75% sand, 5% clay, 20% silt, subangular, fine to coarse sand, 0.02" max size, soft, low plasticity, low dry strength, low dilatancy, medium toughness, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black (N1), dry, no reaction to HCI, loose.	sm			
652.7	4 —	S-2	13-47 50/3 (97)	1.0		5.0' Silty Sand (sm)- 15% cobbles, 70% sand, 15% silt, subangular to subrounded, fin e to coarse sand, low plasticity, low dry strength, low dilatancy, low toughness, dark yellowish brown (10YR 4/2), moist, no reaction to HCl, very dense.	sm			
650.2	8 —	S-3	32-18 20 (38)	0.9	10.40.40.40	7.5' Well Graded Gravel with Silt and Sand (gw-gm) - 10% cobbles, 40% gravel, 40% sand, 10% silt, fine to coarse, subangular, elongated and flat gravel, fine to coarse, subangular to subrounded sand, nonplastic, moderate yellowish brown (10YR 5/4) to pale reddish brown (10R 5/4), dark yellowish brown (10YR 4/2), no reaction to HCl, dense, wet.	gw- gm			
647.7	10 — - -	S-4	14-8 7 (15)	0.9		Silty Sand (sm) - 5% gravel, 75% sand, 20% silt, fine, subrounded gravel, fine to coarse, rounded to subangular sand, 0.25" max size, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium-dense.	sm			
	12 — — — — 14 —	S-5	5-6 10 (16)	0.5		Silty Sand (sm) - 10% gravel, 65% sand, 25% silt, fine, angular gravel, medium to coarse, subangular sand, hard 0.25" max size, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium-dense.				
DATE (DATE STARTED: 10/12/07 DATE COMPLETED: 10/14/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOTE	ES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	: RJ	В		DRIL	LER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG:	CME 55		



Bell Be	nd NPP					LOG OF BORING NO. B-323		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338927.919 E 2405815.577	SYMBOL	REMARKS		
I EV	E (FE	AMP R RU	OW/ S (F	SO	PRC	SURFACE EL: 657.68	nscs 8	TALIVII WATE		
ш		S O	B	R		DESCRIPTION	Sn			
642.7	16 —	S-6	7-16 17 (33)	0.8		Silty Gravel with Sand (gm) - 5% cobbles, 60% gravel, 15% sand, 20% silt, fine to coarse, subangular to subrounded gravel, fine to coarse, subrounded to subangular sand, 1" max size, hard, nonplastic, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, dense.	gm			
	- 18 — -	S-7	15-21 25 (46)	0.8						
637.7	20 —	S-8	7-7 9 (16)	0.1		Well Graded Gravel (gw) - 100% cobbles, subangular, 3.0" max size, hard, elongated and flat, nonplastic, medium gray (N5), wet, no reaction to HCl, medium dense.	gw			
635.2	22 —	S-9	12-40 25 (65)	1.0		Well Graded Gravel with Sand and Silt (gw-gm) - 5% cobbles, 65% gravel, 20% sand, 10% silt, fine to coarse, subangular to subrounded gravel, fine, subangular to subrounded sand, hard, nonplastic, dark yellowish brown (10YR 5/4) and olive gray (5Y 4/1), wet, no reaction to HCl, very dense.	gw- gm			
	26 —	S-10	10-30 30 (60)	0.6		Well Graded Gravel with Sand and Silt (gw-gm) - 10% cobbles, 55% gravel, 25% sand, 10% silt, subangular to subrounded, elongated and flat gravel, fine to coarse, subangular to subrounded sand, 1.0" max size, hard, nonplastic, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), wet, no reaction to HCl, very dense.				
630.2	28 —	S-11	31-17 17 (34)	0.7		Well Graded Sand with Gravel and Silt (sw-sm) - 40% gravel, 50% sand, 10% silt, fine to coarse, subangular to subrounded gravel, fine, subangular to subrounded sand, hard, 0.75" max size, nonplastic, moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2), wet, no reaction to HCl, very dense.	sw- sm			
DATE STARTED: 10/12/07 DATE COMPLETED: 10/14/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR					GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation		
APPRO	VED BY	: RJ	В		DRILI	LER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG:	CME 55		



Ball B	Bell Bend NPP PROJECT NO. 07-3891										
Dell B	enu NPP					LOG OF BORING NO. B-323		FROJECT NO. 07-3891			
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 338927.919 E 2405815.577 SURFACE EL: 657.68 DESCRIPTION	USCS SYMBOL	REMARKS			
	_			ш		BESSKII TION					
627.7	30 —	S-12	16-17 18 (35)	0.7		Well Graded Gravel with Sand and Silt (gw-gm) - 60% gravel, 30% sand, 10% silt, subrounded to subangular, fine to coarse gravel, subrounded to subangular, fine to coarse sand, 1" max size, hard, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCL, dense to very dense.	gw- gm				
	32 — - -		20-28								
	34 	S-13	20 (48)	0.8							
	36 —	S-14	21-25 21 (46)	0.8							
	- 38 — -	S-15	40-50/6 (50)	0.8							
	40 —	S-16	50/0 (50)	0.0		No recovery					
615.2	- 42 — -					42.5'	l aw				
	<u> </u>	S-17	13-38 43 (81)	0.9		Well Graded Gravel with Sand (gw) - 60% gravel, 30% sand, 10% silt subangular to subrounded, fine to coarse gravel, subangular to subrounded, fine to coarse sand, 0.75" max size, hard, nonplastic, dark yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 5/4), wet, no reaction to HCl, very dense.	gw				
DATE FIELD	STARTED COMPLE ^T GEOLOG KED BY:	ΓED: 10 IST: W	0/12/07 0/14/07 /MP AR		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A ING METHOD: SPT/Tricone/ NQ Rock Core	NOTES	S: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY: NG CO.:				DRILL	ER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG: C	ME 55			



Bell Be	end NPP							PROJECT NO. 07-3891
<u> </u>			1		1 1	LOG OF BORING NO. B-323	- 	
ELEVATION (FEET MSL)	тн :т)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 338927.919 E 2405815.577	USCS SYMBOL	
EVA.	DEPTH (FEET)	MPL RUI	3W/6 R % & (R(SOVE	PROFILE	SURFACE EL: 657.68	.S S.	REMARKS
<u> </u>		SA OF	BLC	REC		DESCRIPTION	OSO	
610.2	44 — 46 — 48 — 50 — 52 — 54 — 56 — 58 —	S-18 S-20 S-21	12-16 11 (27) 15-31 12 (43) 12-19 14 (33) 6-8 13 (21)	0.7 0.4 0.5		Well Graded Gravel (gw) - 90% gravel, 10% sand, fine to coarse, subrangular gravel, fine to coarse, subrounded to angular sand, 1.5" max size, hard, nonplastic, medium dark gray (N3) and grayish brown (5R 3/2) and olive gray (5Y 3/2), wet, no reaction to HCl, dense.	gw	
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 10	I 0/12/07 0/14/07 /MP AR	<u> </u>	GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOTE	S: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILL	.ER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG: (CME 55



Bell Bend NPP PROJECT NO. 07-3891										
Beli Bend NPP	LOG OF BORING NO. B-323	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 338927.919 E 2405815.577 SURFACE EL: 657.68 DESCRIPTION	NSCS SYMBOL REMARKS								
599.2	Well Graded Gravel with Sand (gw) - 80% gravel, 15% sand, 5% silt,	gw								
S-23 12-12 25 (37) 0.9	fine to coarse, subrounded to angular gravel, fine to coarse, subrounded to angular sand, 1.5" max size, soft, nonplastic, dark gray (N3), wet, no reaction to HCl, dense.									
S-24 14-22 27 (49) 0.9										
595.2 S-25 50/6 (50+) 0.3	Well Graded Gravel (gw) - 95% gravel, 5% silty clay, very soft siltstone cobbles, 1.5" max size, soft, nonplastic, dark gray (N3), 62€0,	gw								
$-$ R-1 $\begin{vmatrix} 80\% \\ (80\%) \end{vmatrix}$ 0.8	\no reaction to HCI, dense. Siltstone- Dark gray (N3), moderately hard, slightly calcareous thin foliated layer within bedding at 63.2' bedding is 60° to rock core.									
64 —	Siltstone- Dark gray (N3), moderately hard, calcareous to slightly calcareous, fresh, very thickly bedded, very slightly fractured to unfractured, calcareous filled fracture at 65.0'.									
66 — R-2 100% 5.0										
68 — — — — 70 —	Siltstone- Dark gray (N3), moderately hard, very thickly bedded, slightly calcareous to calcareous, very slightly fractured.									
72 — R-3 100% (98%) 5.0										
DATE STARTED: 10/12/07	GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock Part of the								
DATE COMPLETED: 10/14/07 FIELD GEOLOGIST: WMP CHECKED BY: DAR	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rock Core	Mahantango Formation								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG: CME 55								



Bell Bend NPP PROJECT NO. 07-3891										
Dell Della NFF					LOG OF BORING NO. B-323		FROJECT NO. 07-3091			
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 338927.919 E 2405815.577	SYMBOL				
EET MS EET MS DEPTH (FEET)	MPL RUN	200//6 7 % F (RG	OVE	PROFILE	SURFACE EL: 657.68	SSS	REMARKS			
	χ RO	PP S	REC		DESCRIPTION	nscs				
74 — 76 — 78 —	R-4	100%	5.0		Siltstone- Dark gray (N3), moderately hard, very thickly bedded, slightly calcareous to calcareous, very slightly fractured.					
80 —	R-5	100% (100%)	5.0		Siltstone- Dark gray (N3), moderately hard, very thickly bedded, very slightly calcareous, very slightly fractured to fractured, calcareous, fossiliferous throughout, very few pyrite viens throughout.					
82 — - - 84 — - -					Siltstone- Dark gray (N3), moderately hard, very thickly bedded, very slightly calcareous to noncalcareous, very slightly fossiliferous, fossils calcareous, pyrite present at 86.1', unfractured.					
DATE STARTED:		100% (100%) /12/07	5.0		DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the			
DATE COMPLETED FIELD GEOLOGIST CHECKED BY:		MP			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation			
APPROVED BY: DRILLING CO.: Te	RJB	3		DRILI	LER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG:	CME 55			



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP		LOG OF BORING NO. B-323		PROJECT NO. 07-3091						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	COORDINATES N 338927.919 E 2405815.577	USCS SYMBOL							
DEPTH DEPTH (FEET) MMPLE N R RUN N R RUN N R REC	COVERY	SURFACE EL: 657.68	S SY	REMARKS						
S A S O S O S O S O S O S O S O S O S O	REC	DESCRIPTION	OSC							
92 — (98%)	4.9 4.9	Siltstone- Dark gray (N3), moderately hard, very thickly bedded, slightly calcareous to noncalcareous, very slightly fractured. Siltstone- Dark gray (N3), moderately hard, very thickly bedded, fresh, unfractured, noncalcareous. Siltstone- Dark gray (N3), moderately hard, very thickly bedded, fresh, unfractured, noncalcareous. BOTTOM OF BORING 100' DEPTH: N/A DATE/TIME: N/A		ES: Bedrock Part of the						
DATE COMPLETED: 10/14/07 FIELD GEOLOGIST: WMP	GWL:	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation						
CHECKED BY: DAR APPROVED BY: RJB DRILLING CO.: Terracon	DRILL	LER: Sam Silverman HELPER: J. Tousely/ M. Steinbrook	RIG:	CME 55						



Bell Be	end NPP					LOG OF BORING NO. B-324		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ПН (T)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339323.655 E 2405190.958	SYMBOL	
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 669.45	SS)	REMARKS
크린		SA	BLC	REC	"	DESCRIPTION	nscs	
668.0	0 -				111411111	1.5' Silty Sand with Gravel (SM) - 55% sand, 25% gravel, 20% silt, fine to	SM	
	2 —	S-1	6-7 6 (13)	1.0		coarse, angular gravel, fine to medium, rounded to subrounded sand, 1" max size, hard, nonplastic, dark yellowish-orange (10 YR 6/6), dry to moist, no reaction to HCl, medium-dense.	Olvi	
	4 —	S-2	3-15 39 (54)	1.1		Silty Sand with Gravel (sm) - 55% sand, 15% gravel, 30% silt, fine to coarse, subangular gravel, fine to medium, rounded to subrounded sand, 1" max size, hard, medium plasticity, high dry strength, no dilatancy, low toughness, dark yellowish-orange (10 YR 6/6), dry, no reaction to HCl, very dense.		
	-	S-3	23-50/6" (50)	0.9		Silty Sand with Gravel (SM) - 55% sand, 25% gravel, 20% silt, fine to coarse, subangular, flat, fine to coarse, subrounded to angular sand, 1" max size, hard, nonplastic, dark yellowish-orange (10 YR 6/6) with grayish-red (5R 4/2) and light gray (N7), dry, no reaction to HCL, very dense, gravel consists of crushed sandstone. 6.0'	SM	
663.5	6 —	S-4	6-17 29 (46)	1.0		Well Graded Gravel with Sand (gw) - 60% gravel, 35% sand, 5% silt, fine to coarse, angular, spherical to flat gravel, angular to rounded, fine to coarse sand, 1.5" max size, hard, nonplastic, pale red (10R 6/2) to light gray (N7), dry, no reaction to HCL, dense.	gw	
662.0	8 	S-5	9-11 50/2" (61)	0.9		7.5' Silty Sand with Gravel (SM) - 50% sand, 35% gravel, 10% silt, 5% clay, fine to coarse sand, fine to coarse gravel, nonplastic fines, pale red (10R 6/2), dry, no reaction to HCL, very dense.	SM	
660.5	10 —	S-6	2-7 50/2 (57)	0.9		9.0' Silty Sand with Gravel (sm) - 10% cobbles, 20% gravel, 55% sand, 15% silt, subangular, flat, fine to coarse gravel, fine to coarse, subangular to subrounded sand, 1" max size, nonplastic, pale brown (5YR 5/2) to dark yellowish-brown (10 YR 4/2), dry, no reaction to HCl, very dense.	sm	Set 4.0" Temporary Casing to 10.0' Start mud rotary with casing advancer.
659.0	- -	S-7	19-50/4 (50)	0.6		Poorly Graded Gravel with Clay and Sand (GP-GC) - 30% cobbles, 50% gravel, 20% sand, course, angular to subrounded gravel, flat, fine to coarse, subangular to subrounded sand, 1" max size, nonplastic, dark reddish-brown (10 R 3/4), wet, no reaction to HCI, very dense.	GP- GC	
657.5	12 -	S-8	14-18 14 (32)	1.0		Well Graded Gravel with Silt and Sand (gw-gm) - 10% cobbles, 40% gravel, 40% sand, 10% silt, fine to coarse angular, flat gravel, fine to coarse, subangular to subrounded sand, 1" max size, hard, nonplastic, dark reddish-brown (10 R 3/4), wet, no reaction to HCl, dense.	gw- gm	
656.0	14 	S-9	11-11 7 (18)	0.8	1 2 1 X X X X X X X X X X X X X X X X X	Poorly Graded Sand with Clay and Gravel (SP-SC)- 45% sand, 45% gravel, 5% silt, 5% clay, fine to coarse sand, fine gravel, dark reddish brown (10R 3/4), wet, no reaction to HCL, medium dense.	SP- SC	
l	STARTED COMPLE		0/03/07 0/04/07			DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the Mahantango Formation
l	GEOLOG		.O			LING METHOD: SPT/Tricone/NQ Rock Core		. J
l	KED BY: OVED BY:		VZ B		DRILL	LER: Craig Vanvactor HELPER: Terry Duncan	RIG	3: CME 75
	NG CO.:			_	5111	TILL LIV. 1611y Dulloan		. SIVIL 10



Bell Be	Bell Bend NPP PROJECT NO. 07-3891								
Belli Be	ond Wi					LOG OF BORING NO. B-324		1 NOULOT NO. 07-3031	
ELEVATION (FEET MSL)	тн ЕТ)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339323.655 E 2405190.958	SYMBOL		
_EVA :EET	DEPTH (FEET)	MPL R RUI	20W/6 R % R(R(SOVE	PROFILE	SURFACE EL: 669.45	SS SV	REMARKS	
111 (1)		% Q	BL(REC		DESCRIPTION	nscs		
654.5	_					Poorly Graded Gravel with Silt and Sand (GP-GM) - 55% gravel, 35%	GP-		
	16 —	S-10	11-14 17 (31)	1.1		sand, 5% silt, 5% clay, subrounded, flat, 1" max size, hard, nonplastic, dark yellowish-brown (10 YR 4/2), wet, no reaction to HCl, dense.	GM		
653.0	- -	S-11	11-24 26 (50)	0.6		Well-Graded Gravel with Sand (gw) - 55% gravel, 40% sand, 5% silt, subrounded, flat gravel, 1" max size, hard, subrounded to subangular, fine to coarse sand, nonplastic, dark yellowish-brown (10 YR 4/2), wet, no reaction to HCl, dense.	gw		
651.5	18 - -	S-12	18-26 50/2 (76)	0.8		Poorly Graded Gravel with Sand (gp) - 10% cobbles, 55% gravel, 35% sand, subangular, flat gravel, subrounded to subangular, fine to coarse sand, 1" max size, hard, nonplastic, dark yellowish-brown (10 YR 4/2), wet, no reaction to HCl, very dense.	gp		
	20 —	S-13	11-50/3" (50)	0.3		21.0'			
648.5	22 —	S-14	28-50/3" (50)	0.6		Poorly Graded Gravel with Clay and Sand (GP-GC) - 50% gravel, 45% sand, 5% clay, fine to coarse, subangular, flat gravel, 4" max size, hard, nonplastic, grayish-black (N2) to black (N1), wet, no reaction to HCl, very dense.	GP- GC		
647.0	_	S-15 R-1	50/0 (50+) 100% (100%)	0.0 1.0		22.5'			
	24 —					Siltstone - Dark gray (N3) to grayish black (N2), medium-hard, fresh to slightly weathered, thinly bedded, calcite veins horizontal to bedding and along bedding, slight reaction to HCl.		Special Care Sample 27. 0' - 28.1'	
	_								
	26 -	R-2	100% (92%)	5.0					
	28 —								
	_					29.9'-33.5' veins of pyrite parallel to bedding planes			
DATE STARTED: 10/03/07 DATE COMPLETED: 10/04/07						DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NO.	TES: Bedrock Part of the Mahantango Formation	
	GEOLOG		_O			LING METHOD: SPT/Tricone/NQ Rock Core		0 1 111	
	KED BY:		VZ			ED. Onis Vanuatas USI DED. T. D.	D: 6	OME 75	
	OVED BY:				J DRILI	LER: Craig Vanvactor HELPER: Terry Duncan	RIG	6: CME 75	
							-		



	LNDD							PRO 1507 NO. 07 0004
Bell Be	end NPP					LOG OF BORING NO. B-324		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339323.655 E 2405190.958	USCS SYMBOL	
EVA:	DEPTH (FEET)	MPLI	2W/6 R % I 8 (RC	OVE	PROFILE	SURFACE EL: 669.45	S S	REMARKS
EL (F)		SA	BLC	REC		DESCRIPTION	OSO	
	30 — 32 — 34 — 36 — 38 — 40 — 42 —	R-3	96% (96%)	4.8 5.0		Siltstone - Dark gray (N3) to grayish black (N2), medium-hard fresh to slightly weathered, rough texture from 36.0-38.5', moderate reaction to HCl, possible natural break at 37.0' (slightly rounded edges), thinly bedded. 40.8 - 42.5 fossiliferous, with veins of pyrite oriented along bedding and small brachiopod fossil casts infilled with calcite.		
	_					Siltstone - Dark gray (N3) to grayish black (N2) medium-hard, fresh to		
	STARTED		0/03/07			DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the
	COMPLET GEOLOG		0/04/07 _O			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
	KED BY:		VZ		DIXILI	ENGINETHOD. OF ITHIOUNGING NOOK COILE		
	OVED BY:				DRILI	LER: Craig Vanvactor HELPER: Terry Duncan	RIG:	CME 75
DKILLI	ING CO.:	теггасо	11		<u> </u>			



D-11 D	I NDD							PRO 1507 NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-324		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339323.655 E 2405190.958	USCS SYMBOL	
EVA.	DEPTH (FEET)	MPLE	DW/6	OVE	PROFILE	SURFACE EL: 669.45	S S)	REMARKS
EL (F		SA	BLC	REC		DESCRIPTION	osn	
	44 — - 46 —	R-6	100% (100%)	5.0		slightly weathered, fossiliferous, veins of pyrite and calcite along bedding below 48.8', moderate reaction to HCI.		
	48 —	R-7	100%	5.0		Sparse brachiopod fossils and pyrite in masses below 48.5'		
DATE	54 — 56 — 58 — STARTED	R-8	100% (100%)	5.0	GWL	Siltstone - Dark gray (N3) to grayish black (N2), medium-hard, fresh to slightly weathered, veins of pyrite and calcite parallel to bedding, bedding and pyrite in masses, moderate reaction to HCl. DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the
DATE (STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: J	0/03/07 0/04/07 LO VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	ES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig Vanvactor HELPER: Terry Duncan	RIG:	CME 75



D-11 D	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	end NPP					LOG OF BORING NO. B-324		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	тн =Т)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339323.655 E 2405190.958	SYMBOL	PEMPK		
EV#	ОЕРТН (FEET)	MMPL RRU	20W/6 R % R (R	SOVE	PROFILE	SURFACE EL: 669.45	28.82	REMARKS		
 		δ. Q.	BL(REC		DESCRIPTION	nscs			
	60 —	R-9	100% (100%)	5.0		Siltstone - Grayish-black (N2), medium-hard, fresh to slightly weathered, unfractured, fossiliferous veins of pyrite and fossils infilled with calcite, slight reaction to HCI, zones of rough texture react moderately to HCI. Siltstone - Grayish-black (N2), medium-hard, fresh to slightly weathered, unfractured, fossiliferous, veins of pyrite, fossils infilled with calcite, slight reaction to HCI, zones of rough texture react moderately to HCI.				
	66 — - -	R-10	98% (98%)	4.8		67.55'-67.65' - Calcite and pyrite vein subparallel to bedding. Calcite				
	68 —	R-11	100%	5.0		is microfaulted and continues through half the length of the R-11 core.				
	72 — – –									
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 1	0/03/07 0/04/07 LO VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	ES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig Vanvactor HELPER: Terry Duncan	RIG:	CME 75		



Roll Rond NRD								
Bell Bend NPP	LOG OF BORING NO. B-324	PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339323.655 E 2405190.958	TOBWAS REMARKS						
DEPTH (FEET) MMPLE N R RUN N R RUN N R REGE ROD) SOVERY	N 339323.655 E 2405190.958 O SURFACE EL: 669.45	တ် REMARKS						
SA OF	DESCRIPTION	USCS						
74— 76— R-12 98% (98%) 4.9 78— 80— 100%	Siltstone - Grayish-black (N2), medium-hard, fresh to slightly weathered, unfractured, fossiliferous - fossil casts infilled with calcite, very slight reaction to HCI.							
R-13 (100%) 5.0 82 — 84 — 84 — 86 — R-14 (96%) 5.0 DATE STARTED: 10/03/07 DATE COMPLETED: 10/04/07 FIELD GEOLOGIST: JLO	Few pyrite and calcite masses GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	Very slow advancement 87.0-88.5' NOTES: Bedrock Part of the Mahantango Formation						
CHECKED BY: EVZ APPROVED BY: RJB	DRILLER: Craig Vanvactor HELPER: Terry Duncan	RIG: CME 75						
DRILLING CO.: Terracon								



Dall D	Bell Bend NPP PROJECT NO. 07-3891								
Bell Be	end NPP					LOG OF BORING NO. B-324		PROJECT NO. 07-3891	
ELEVATION (FEET MSL)	HE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339323.655 E 2405190.958	USCS SYMBOL		
EVA'	DEPTH (FEET)	MPLE	NW/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 669.45	S SY	REMARKS	
EL (F		SA	BLC	REC		DESCRIPTION	OSC		
	88 — 90 — 92 —	R-15	100%	5.0		Siltstone - Grayish-black (N2), medium-hard, fresh to slightly weathered, unfractured, very slightly effervescent, with few fossils.		Special Care Sample 91.0' - 92.4'	
	94 — 96 — 98 —	R-16	100% (100%)	5.0					
500.0	100 —	R-17	100%	2.1		Siltstone - Grayish-black (N2), medium-hard, fresh to slightly weathered, unfractured, no reaction to HCl, with few fossils, smooth core texture.			
568.9	- 102 —					BOTTOM OF BORING 100.6'			
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 10 IST: JI			GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation	
APPRO	OVED BY: ING CO.:				DRILI	LER: Craig Vanvactor HELPER: Terry Duncan	RIG	e: CME 75	



Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend NPP					LOG OF BORING NO. B-325		PROJECT NO. 07-3891		
(FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339328.285 E 2405252.941 SURFACE EL: 668.9	SYMBOL	REMARKS		
ELE (FE ()	SAN	BLO OR &	ZECC	l g	DESCRIPTION	USCS			
0 -	S-1	1-2 2 (4)	1.5		Silt with Sand (ml)- 60% silt, 30% sand, 10% clay, well rounded, fine sand, 4 mm max size, medium plasticity, slightly organic, low dry strength, low toughness, no dilatancy, medium brown (5YR 5/6), dry, no reaction to HCl, soft.	ml			
2 —					2.5'				
-	S-2	4-8 8 (16)	0.9		Silty Clayey Sand (SC-SM)- 60% sand, 15% silt, 15%clay, 10% gravel, fine to medium, flat and elongated, subangular gravel, well rounded, fine to coarse sand, max 8 mm size, nonplastic, medium brown (5YR 5/6), no reaction to HCl, medium dense.	SC- SM			
663.9					5.0' Poorly Graded Sand (sp)- 10% gravel, 90% sand, well rounded, fine	sp			
6 —	S-3	16-50/5 (50)	0.5		to medium sand, coarse, angular, elongated and flat gravel, 8 mm max size, nonplastic, pale brown (5YR 5/2), dry, no reaction to HCl, very dense.				
8—	S-4	19-16 21 (37)	1.2	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Poorly Graded Sand with Gravel (sp)- 30% gravel, 65% sand, 5% silt, angular, coarse, flat gravel, fine to coarse, rounded sand, 1.0" max size, nonplastic, pale reddish brown (10 R 5/4,) and pale brown (5 YR 5/2), dry, no reaction to HCl, dense to very dense.				
10 —	S-5	45-42 50/5 (92)	0.9	\$					
12 —				0000 ST 8000 B 8000 ST					
655.9 -	S-6	19-26 22 (48)	0.9		Well-Graded Gravel with Silt and Sand (GW-GM) - 60% gravel, 30% sand, 5% silt, 5% clay, fine to coarse sand, well-rounded, angular, coarse gravel, 6 mm max size, nonplastic, pale brown (5YR 5/2), wet, no reaction to HCl, dense.	GW- GM			
DATE STARTED: 10/12/07 GWL: DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 DATE COMPLETED: 10/13/07 GWL: DEPTH: N/A DATE/TIME: N/A FIELD GEOLOGIST: PFW DRILLING METHOD: SPT/Tricone/NQ Rock Core CHECKED BY: EVZ							TES: Bedrock Part of the Mahantango Formation		
APPROVED BY: DRILLING CO.:	RJI	3		DRIL	LER: Scott Zeien HELPER: Brian Nabholz	RIG	6: CME 850		



Poll Pa	end NPP							DDO IECT NO. 07 2904
Bell De	ena NPF					LOG OF BORING NO. B-325		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339328.285 E 2405252.941	SYMBOL	
EVA EET	DEPTH (FEET)	MPL	2W/6 R % 8 (R(OVE	PROFILE	SURFACE EL: 668.9	SS.	REMARKS
EL (F)		SA	BLC	REC	"	DESCRIPTION	nscs	
653.4	-					15.5' Well-Graded Sand (sw)- 30% gravel, 70% sand, well rounded,	sw	
	16 	S-7	10-14 19 (33)	1.1		subangular, coarse gravel, fine to coarse, subrounded to subangular sand, 6 mm max size, nonplastic, pale brown (5YR 5/2), moist, no reaction to HCl, dense.		
650.9	18 	S-8	35-25 28 (53)	0.7		Well-Graded Gravel with Silt (gw-gm) - 80% gravel, 10% sand, 10% silt, angular, elongated and flat gravel, fine to coarse, subrounded to subangular sand, 6 mm max size, low hardness, nonplastic, medium gray (N5), wet, no reaction to HCl, very dense.	gw- gm	
647.9	20 — - -	S-9	44-50/1 (50)	0.6		21'		Pressure meter test from 21.0-22.5', no recovery
	22 — - -					22.51		
645.4	24 — - -					Shale- Dark gray (N3)		
	26 	D. 4	71%	.				
	28 —	R-1	(40%)	5.0				
DATE STARTED: 10/12/07 DATE COMPLETED: 10/13/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					GWL:	DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO.	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILL	LER: Scott Zeien HELPER: Brian Nabholz	RIG	:: CME 850



Bell Bend NPP	LOG OF BORING NO. B-325		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339328.285 E 2405252.941	USCS SYMBOL	
LEVATIONETET MS DEPTH (FEET) AMPLE N R RUN N R R REG R R REG R R REG SOVERY	N 339328.285 E 2405252.941 O SURFACE EL: 668.9	SSY	REMARKS
SA SA OR OR OF S	DESCRIPTION	OSO	
日本 100% 7.5 38 100% 7.5 38 100% 7.5		OSN OSN	Pressure meter test from 30.5-33.0', no recovery
A0 — 40 — 42 — 42 — 8-3	Shale- Dark gray (N3) GWL: DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core		TES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIC	9: CME 850



Solid Company Compan	Dall D	and NDD							DDO 1507 NO. 07 2004
A44	Bell Be	end NPP					LOG OF BORING NO. B-325		PROJECT NO. 07-3891
A44	TION MSL)	HT (T:	N N N O N O	' & (N) REC. 2D)	RY (ft.)	ILE		'MBOL	
A44	EVA.	DEP (FEE	MPLI	2W/6 R % I & (RC	OVE	- ROF	SURFACE EL: 668.9	SSS)	REMARKS
## A	EL (F		SA	BLC	REC	"	DESCRIPTION	nsc	
APPROVED BY: RJB DRILLER: Scott Zeien HELPER: Brian Nabholz RIG: CME 850	DATE	46 — 48 — 50 — 54 — 54 — 556 — 558 — STARTER COMPLE	R-5): 10 FED: 10	(96%) 100% (92%) 0/12/07 0/13/07		GWL	Shale- Dark gray (N3), moderately hard to hard, thinnly bedded-vertical, noncalcareous, no odor, slightly to very slightly fractured, fresh. DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 DEPTH: N/A DATE/TIME: N/A	NO	
						DRII	I FR: Scott Zeien HEI DER: Brian Nahholz	RIC	: CME 850
						- DIVIL	TILLI LIV. DIIAII INAUIIUIZ	1110	. ONE 000



Dall Band NDD		DDO 1507 NO. 07 200
Bell Bend NPP	LOG OF BORING NO. B-325	PROJECT NO. 07-389
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339328.285 E 2405252.941	NSCS SYMBOL REMARKS
LEVATIO TEET MS DEPTH (FEET) (MPLE N R RUN N R REC R RCD)	N 339328.285 E 2405252.941 SURFACE EL: 668.9	ြ က် REMARKS
SA OF	DESCRIPTION	OSO OSO
60 — 62 — 64 — R-6 100% (93%) 10.0 68 — 70 — 72 — DATE STARTED: 10/12/07 10/13/07	Shale- Dark gray (N3), moderately hard to hard, thinly bedded, bedding vertical, slightly fossiliferous throughout, slight reaction to HCl, slightly to very slightly fractured, fresh. Shale- Dark gray (N3), moderately hard to hard, thinly bedded, bedding vertical, very few fossils, fresh, slightly fractured, fractures at approximately 30 degrees to the core, rock noncalcareous, no odor. GWL: DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 GWL: DEPTH: N/A DATE/TIME: N/A	NOTES: Bedrock Part of the Mahantango Formation
FIELD GEOLOGIST: PFW CHECKED BY: EVZ	DRILLING METHOD: SPT/Tricone/NQ Rock Core	
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: CME 850



Dall Dand NDD		PPO IECT NO. 07 2004
Bell Bend NPP	LOG OF BORING NO. B-325	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339328.285 E 2405252.941	REMARKS SOSO
EVATIO EET MS DEPTH (FEET) MMPLE N R RUN N R REC R % REC	N 339328.285 E 2405252.941 SURFACE EL: 668.9	κ REMARKS
SA OF OF OI OI SEC	DESCRIPTION	osn
74—	Shale- Dark gray (N3), moderately hard to hard, thinly bedded bedding vertical, rock noncalcareous, very few fossils, fresh, unfractured, no odor. GWL: DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 GWL: DEPTH: N/A DATE/TIME: N/A	Continuous piece NOTES: Bedrock Part of the Mahantango Formation
FIELD GEOLOGIST: PFW CHECKED BY: EVZ	DRILLING METHOD: SPT/Tricone/NQ Rock Core	
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Brian Nabholz	RIG: CME 850



Bell Be	end NPP					LOG OF BORING NO. B-325		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339328.285 E 2405252.941	USCS SYMBOL	
EVA] EET I	DEPTH (FEET)	MPLE RUI	3.W/6" 7.% F 8.(RC	OVE	PROFILE	SURFACE EL: 668.9	S SY	REMARKS
밀		SAI	BLC OF	REC	_	DESCRIPTION	OSO	
578.4	88 — 90 — 92 — 94 — 96 — 98 — 100 — 100 — 1	R-9	98% (98%)	9.8		Shale- Dark gray (N3), moderately hard to hard, thinly bedded bedding vertical, rock noncalcareous, very few fossils, fresh, unfractured, no odor. Shale- Dark gray (N3), moderately hard to hard, thinly bedded bedding vertical, rock noncalcareous, very few fossils, fresh, unfractured, no odor. BOTTOM OF BORING 100.5'	5'	
	102 —							
DATE (STARTED COMPLET GEOLOG KED BY:	ΓED: 10 IST: P	0/12/07 0/13/07 FW VZ		GWL:	DEPTH: 14.00 DATE/TIME: 10/14/07, 1415 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO ⁻	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY: ING CO.:	RJ	В		DRILI	LER: Scott Zeien HELPER: Brian Nabholz	RIG	6: CME 850



Bell Be	end NPP							PROJECT NO. 07-3891
Dell De	and Mili					LOG OF BORING NO. B-326		1 NOULO 1 NO. 07-3031
ELEVATION (FEET MSL)	Ξ£.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	.RY (ft.)	 E	COORDINATES N 339454.708 E 2405176.410	SYMBOL	
EVA.	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(RECOVERY	PROFILE	SURFACE EL: 675.31		REMARKS
用币		SA	BLC	REC	"	DESCRIPTION	nscs	
	0 -	S-1	5-5 4 (9)	1.5		Silty Sand (sm)- 10% gravel, 60% sand, 30% silt, spherical, round, elongated and flat, fine to coarse gravel, fine to coarse, subrounded to subangular sand, 0.5" max size, soft to hard, low plasticity, high toughness, no dilatancy, low dry strength, moderate yellowish brown (10 YR 5/4), dry, no reaction to HCl, loose to medium dense.		
	2 —						SM	
	_	S-2	4-4 5 (9)	1.2				
	_							
	4 —	S-3	8-9 9 (18)	1.1				
	- - -	S-4	9-13 17 (30)	1.5		Silty Sand (sm) - 10% cobbles, 70% sand, 15% silt, 5% gravel, fine to coarse, subangular, elongated and flat, gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, hard, nonplastic, moderate yellowish brown (10 YR 5/4), dry, no reaction to HCl, medium dense.		
	6 —	S-5	8-6 11 (17)	1.5		Silty Sand (SM) - 70% sand, 15% silt, 10% clay, 5% gravel, subangular, elongated and flat, fine to coarse sand, hard, nonplastic, moderate yellowish brown (10 YR 5/4), moist, no reaction to HCl, medium-dense.	SM	
667.8	8 —	S-6	13-15 16 (31)	1.5		7.5' Poorly Graded Gravel with Silt and Sand (GP-GM) - 55% gravel, 35% sand, 10% silt, subangular, elongated and flat, 0.75" max size, hard, nonplastic, grayish red (5R 4/2) and moderate red (5R 5/4), dry, no reaction to HCl, dense.	GP- GM	
666.3	10 —	S-7	8-7 7 (14)	1.5		9.0' Silty Clayey Sand with Gravel (SC-SM)- 70% sand, 15% gravel, 10% silt, 5% clay, fine to coarse sand, fine gravel, grayish red (5R 4/2), moist, no reaction to HCL, medium dense.	SC- SM	
664.8	-	C 0	14-16	1.0		10.5' Poorly Graded Gravel with Sand (gp) - 10% cobbles, 60% gravel, 30% sand, subangular, fine, elongated and flat, gravel, fine to coarse, subangular to subrounded sand, 0.5" max size, hard, nonplastic,	gp	
000.0	-	S-8	13 (29)	1.3	3	grayish red (5 R 4/2), wet, no reaction to HCl, medium dense.		
663.3	12 	S-9	34-28 20 (48)	1.1		Silty Gravel with Sand (GM)- 52% gravel, 30% sand, 10% silt, 8% clay, soft, shale pieces, subangular, elongated and flat, fine to coarse gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, nonplastic, grayish red (5 R 4/2), wet, no reaction to HCl, dense.	GM	
	14 —	S-10	18-17 17 (34)	1.4				
DATE (STARTEI COMPLE GEOLOG	TED: 9/			GWL	: DEPTH: 8.90 DATE/TIME: 9/20/07, 0830 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation
APPRO	KED BY: OVED BY NG CO.:	: RJ			DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG	:: CME 850



	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-326		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	ET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	ERY (ft.)	PROFILE	COORDINATES N 339454.708 E 2405176.410	SYMBOL	DEMARKO			
LEV/	DEPTH (FEET)	AMPI R RU	OW/(8	RECOVERY	PRO	SURFACE EL: 675.31	uscs s	REMARKS			
ш		δ°	BL	RE		DESCRIPTION	SN				
660.3	_					15' Well-Graded Gravel with Sand (gw)- 10% cobbles, 60% gravel, 30%	gw				
	16 	S-11	15-14 15 (29)	1.0		sand, subangular, elongated and flat, fine to coarse gravel, fine to coarse, subangular to subrounded sand, 0.75" max size, nonplastic, moderate yellowish brown (10 YR 5/4), wet, no reaction to HCl, medium dense to dense.					
657.3	- - 18 	S-12	16-19 20 (39)	1.2		18.0'					
	- -	S-13	14-15 17 (32)	1.4		Poorly Graded Gravel with Clay and Sand (GP-GC)- 60% gravel, 35% sand, 5% clay, fine to coarse gravel, medium to coarse sand, nonplastic, moderate yellowish brown (10YR 5/4), wet, no reaction to HCL, dense.	GP- GC				
655.8	20 —	S-14	18-25 50/5" (75)	1.4		Well-Graded Gravel with Sand (gw) - 20% cobbles, 65% gravel, 15% sand, subangular, elongated and flat, fine to coarse gravel, fine to coarse, subangular to subrounded sand, 1.0" max size, nonplastic, moderate red (5R 4/6) and dark gray (N3), moist, no reaction to HCl, very dense.	gw				
654.3	_	S-15	50/6" (50+)	0.6		21.0' Shale- Very soft, dark gray (N3)- weathered, intensely fractured, fractures clean, moderately hard to hard, vertical bedding.					
	22 —					Shale- Moderately hard to hard, dark gray (N3), highly fractured, vertical bedding, laminated slightly calcareous, fractures vertically healed with calcite, fractures at 45° fresh, moderately bedded.		Begin coring at 22.0-ft			
	24 — 	R-1	100%	3.0							
	26 —										
	28 —	R-2	95%	6.2							
	_		(8%)								
DATE STARTED: 9/19/07 DATE COMPLETED: 9/19/07 FIELD GEOLOGIST: RAK CHECKED BY: EVZ					GWL:	DEPTH: 8.90 DATE/TIME: 9/20/07, 0830 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY NG CO.:	RJ	В		DRILI	LER: Scott Zeien HELPER: Dave Dyan	RIG	6: CME 850			



Dell Devid NDD										
Bell Bend NPP	LOG OF BORING NO. B-326	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339454.708 E 2405176.410	TO BWAS REMARKS								
DEPTH (FEET) (MPLE N R RUN N R R REC R R REC SOVERY	N 339454.708 E 2405176.410 SURFACE EL: 675.31	κ REMARKS								
SAS OF	DESCRIPTION	SOSU								
30 — 30 — 32 — 34 — R-3 100% (10%) 4.0 34 — 38 — 38 — 38 — 40 — R-4 (77.6%) 8.3 — 42 — 42 — 42 — 42 — 42 — 42 — 42 — 4	Shale- Moderately hard to hard, dark gray (N3), highly fractured, breccia zone encountered, healed with calcite, calcareous intrusions, vertical bedding planes.	Preserved sample for laboratory analysis from 40.4' - 41.7'.								
DATE COMPLETED: 9/19/07 FIELD GEOLOGIST: RAK	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rock Core	Mahantango Formation								
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dyan	RIG: CME 850								



D.11.D	! NDD							DD0 IE0T NO 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-326		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (TE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 FILE	COORDINATES N 339454.708 E 2405176.410	USCS SYMBOL	DELLARIO
_EVA :EET	DEPTH (FEET)	MPL R RU	OW/6 R % 8 (R	SOVE	PROFILE	SURFACE EL: 675.31	SS SS	REMARKS
		δ. Q.	BL(REC		DESCRIPTION	nsc	
DATE FIELD	44 — 46 — 48 — 50 — 52 — 54 — 56 — 58 — 58 — 58 — 58 — 58 — 58 — 58	ΓED: 9 IST: R		9.3	GWL	Shale- Moderately hard to hard, dark gray (N3), highly fractured, breccia zone encountered, healed with calcite, calcareous intrusions, vertical bedding planes. Shale- Moderately hard, dark gray (N3), slightly to very slightly fractured, partly healed with calcite, slightly calcareous, slight vertical intrusions, bedding planes laminated, weak reaction to HCl. DEPTH: 8.90 DATE/TIME: 9/20/07, 0830 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation
	OVED BY: ING CO.:				DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG:	CME 850
DIVILL	10 00	TOTACC	'I I		1		l	



								DD0 1507 NO 07 0004
Bell B	end NPP					LOG OF BORING NO. B-326		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339454.708 E 2405176.410	USCS SYMBOL	
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I R (RC	OVE	PROFILE	SURFACE EL: 675.31	S S	REMARKS
] [F]		SA	BLC	REC		DESCRIPTION	OSC	
DATE FIELD	60 — 62 — 64 — 66 — 70 — 72 — STARTEE	ΓED: 9, IST: R	100% (94%) 100% (74%) /19/07 AK VZ	10.0	GWL:	Shale- Moderately hard to hard, dark gray (N3), slightly to very slightly fractured, fractures occuring at 45L to rock core, vertical fractures completely healed. DEPTH: 8.90 DATE/TIME: 9/20/07, 0830 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		TES: Bedrock Part of the Mahantango Formation
APPR	KED BY: OVED BY:	RJ	В		DRILI	LER: Scott Zeien HELPER: Dave Dyan	RIG:	: CME 850
DRILL	ING CO.:	Terraco	n				<u> </u>	



Dall B	Bell Bend NPP PROJECT NO. 07-3891									
Bell B	ena NPP					LOG OF BORING NO. B-326		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	ТН (Т)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339454.708 E 2405176.410	USCS SYMBOL			
EVA:	DEPTH (FEET)	MPLE	2W/6' R % F R (RG	OVE	PROFILE	SURFACE EL: 675.31	S S	REMARKS		
EL (F		S O O	BLC	REC		DESCRIPTION	OSC			
DATE FIELD	74 — 76 — 78 — 80 — 82 — 84 — STARTED COMPLET GEOLOG KED BY:	ΓED: 9/ IST: R		10.0	GWL	Shale- Moderately hard to hard, dark gray (N3), slightly to moderately fractured, highly fractured zone at 74.0°, slightly calcareous, weak reaction to HCl. Shale- Moderately hard to hard, dark gray (N3), moderately to intensely fractured, vertical bedding planes, encountered void from 86.0′ - 87.0′, slightly calcareous, weak reaction to HCl.	NOT	ES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:				DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG:	: CME 850		
DIXILLI	10 00	TOTACO	""		ı					



Bell Be	end NPP					LOG OF BORING NO. B-326		PROJECT NO. 07-3891
(JSI/	H (8 8 9 9	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	LE	COORDINATES N 339454.708 E 2405176.410	USCS SYMBOL	
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	1W/6" 7 % R 7 (RQ	OVEF	PROFILE	SURFACE EL: 675.31	SSY	REMARKS
- 교원		SAI	BLO PO PO S	REC	_	DESCRIPTION	nsc	
575.3	88 — 90 — 92 — 94 — 96 — 98 — 100 —	R-9	88% (67%)	6.0		Shale- Moderately hard to hard, dark gray (N3), moderately to intensely fractured, vertical bedding planes, encountered void from 86.0' - 87.0', slightly calcareous, weak reaction to HCl.		Preserved sample for laboratory analysis from 95.8' - 97.0'.
DATE	102 — STARTED	ΓED: 9			GWL	DEPTH: 8.90 DATE/TIME: 9/20/07, 0830 DEPTH: N/A DATE/TIME: N/A	NO ⁻	TES: Bedrock Part of the Mahantango Formation
CHECK APPRO	GEOLOG KED BY: OVED BY: ING CO.:	E RJ	VZ B			LING METHOD: SPT/Tricone/ NQ Rock Core LER: Scott Zeien HELPER: Dave Dyan	RIG	:: CME 850



Ball Ba	Bell Bend NPP PROJECT NO. 07-3891									
Dell De	ena NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3091		
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339452.089 E 2405233.062	SYMBOL			
EVA'	ОЕРТН (FEET)	MPLE	7 % F R (RC	OVE	PROFILE	SURFACE EL: 675.38	S S	REMARKS		
 급 년		SA	BLC	REC		DESCRIPTION	nscs			
	0					SHELBY TUBE				
	_	ST-1		2.3						
	_					2'				
673.4	2 —					SHELBY TUBE Silty Sand (SM) - 65% sand, 20% silt, 10% clay, 5% gravel, fine to	SM			
		ST-2		0.7		medium sand, fine gravel.				
	_	31-2		0.7						
	4 —									
	_									
670.4	_					5' Well-Graded Sand with Silt (sw-sm) - 10% gravel, 80% sand, 10%	sw-			
	6 	S-1	10-13 18 (31)	1.1	101010101 101010101 101010101 101010101	silt, fine subangular, elongated and flat gravel, well-rounded, fine to coarse sand, 0.5" max size, hard, nonplastic, light brown (5YR 5/6) and moderate brown (5YR 4/4), moist, no reaction to HCl, dense.	sm			
	-				1:1:1:1:1: 1:1:1:1:1:					
	_				1:1:1:1:1:1: 1:1:1:1:1:1: 1:1:1:1:1:1: 1:1:1:1:1:1:1:					
667.9	_					7.5' Silty Sand (sm) - 10% gravel, 75% sand, 10% silt, 5% clay coarse to	sm			
	8 —	S-2	11-9 18 (27)	1.1		fine, subangular, elongated and flat gravel, well-rounded, fine to medium, subangular sand, nonplastic, light brown (5YR 5/6) and moderate brown (5YR 4/4), moist, no reaction to HCl, medium dense.				
	_									
	_									
665.4	10 —					Well-Graded Sand (sw) - 5% gravel, 85% sand, 10% silt, fine,	sw			
	_	S-3	12-13 12	1.3		elongated and flat, subrounded gravel, fine to medium, rounded to subangular sand, light brown (5YR 5/6) and moderate brown (5YR 4/4), dry, no reaction to HCl, medium dense.				
			(25)			4), dry, no reaction to rior, medium dense.				
	12 —									
662.9	_				-	12.5' Well-Graded Gravel (gw) - 95% gravel, 5% sand, subangular, fine to	gw			
	_	S-4	21-30 21	0.6		coarse gravel, fine to medium sand, nonplastic, moderate red (5R 4/6), wet, no reaction to HCl, dense to very dense.				
	_	J- 4	(51)	0.0						
	14 —									
	STARTE		<u> </u> '16/07			DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30	NO	TES: Bedrock Part of the		
	COMPLE [*] GEOLOG		′18/07 FW			DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation		
1	GEOLOG KED BY:		rvv VZ		DKILL	LING MILTHOD. OF ITHICOHETING ROCK COIL				
	OVED BY				DRILI	LER: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850		
DKILLI	NG CO.:	ı erraco	n				<u> </u>			



Dall Da	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	Ŧ£	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE I	COORDINATES N 339452.089 E 2405233.062	SYMBOL				
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 675.38	SS S	REMARKS			
EI (F		SA	BLC	REC		DESCRIPTION	nscs				
	_				X						
	- 16 -	S-5	17-21 24 (45)	0.8							
657.9	_					17.5' Well-Graded Gravel (gw) - 90% gravel, 10% sand, subangular, fine to	gw				
	18 - -	S-6	15-11 22 (33)	0.7		coarse, elongated and flat, gravel, hard, fine to coarse sand, nonplastic, dark yellow brown (10YR 4/2), wet, no reaction to HCI, dense.	3				
654.9	20 	S-7	50/3" (50)	0		20.5' Shale - Moderately hard, medium-gray (N4) to dark gray (N3), highly					
	- - 22 					fractured, healed with calcite, vertical fractures ranging from 0.1' to 0.3' in width, bedding planes nearly vertical, broken sections, bedding plane laminated.					
	- -										
	24 — 	R-1	95% (6%)	6.2							
	- -										
	26 					Shale - Moderately hard to hard, medium gray (N5), highly fractured,					
	_ 28 —					healed with calcite, fractures at 45° from horizontal, breccia zone at 33.5' to 34.5', thinly bedded, vertical bedding.					
	- -										
DATE (STARTED COMPLE ^T GEOLOG KED BY:	TED: 9/	/16/07 /18/07 FW VZ		GWL:	DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	TES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY: NG CO.:	RJI	В		DRILL	ER: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850			



Bell Bend NPP	LOG OF BORING NO. B-327		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339452.089 E 2405233.062	USCS SYMBOL	
DEPTH (FEET) MMPLE N R RUN N R % REC (RCD)	N 339452.089 E 2405233.062 O SURFACE EL: 675.38	SSY	REMARKS
SAI SAI OR OF	DESCRIPTION	NSC	
30 — R-2 96% (48%) 7.2 32 — 34 — 36 — 38 — 40 — R-3 100% (78%) 10.0	Shale - Moderately hard to hard, dark gray (N3), moderately fractured, healed with calcite, vertical bedding planes, slight reaction to HCI. GWL: DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 GWL: DEPTH: DATE/TIME:	NO	Special Care Sample at 33.5' - 34.5'.
FIELD GEOLOGIST: PFW CHECKED BY: EVZ	DRILLING METHOD: SPT/Tricone/ NQ Rock Core		, and the second
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dyan	RIG	:: CME 850



Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	E	COORDINATES N 339452.089 E 2405233.062	USCS SYMBOL			
EVA:	DEPTH (FEET)	MPLI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 675.38	SSS	REMARKS		
□ □		δ Q	BL(REC		DESCRIPTION)SN			
DATE FIELD	44 — 46 — 46 — 48 — 50 — 52 — 54 — 56 — 58 — STARTED GEOLOG KED BY:	ΓED: 9/		10.0	GWL	Shale - Moderately hard to hard, dark gray (N3), slightly fractured, fresh to slightly healed fractures (calcareous), vertical bedding planes. Shale - Moderately hard to hard, dark gray (N3), slightly to little fractures healed with calcite, noncalcareous, trace fossils, fractures at 45° to rock core, no reaction to HCl. DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME:		FES: Bedrock Part of the Mahantango Formation		
	OVED BY:				DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850		
DIVILL	10 00	TOTTACO	11		1					



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP	LOG OF BORING NO. B-327	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 339452.089 E 2405233.062	REMARKS SOSO									
DEPTH (FEET) (MPLE N R RUN N R REC R REC R REC	N 339452.089 E 2405233.062 O SURFACE EL: 675.38	တ် REMARKS									
SA SA OF	DESCRIPTION	DSN									
R-5 99% 9.9 60 62 62 64 66 68 68 68 68 68 68	Shale - Moderately hard to hard, dark gray (N3), slightly fractured, very little vertical fractures healed with calcite, fractures at 45°, fresh.	NOTES: Bedrock Part of the									
DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	GWL: DEPTH: DATE/TIME: DRILLING METHOD: SPT/Tricone/ NQ Rock Core	Mahantango Formation									
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dyan	RIG: CME 850									



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP		LOG OF BORING NO. B-327		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)		COORDINATES N 339452.089 E 2405233.062	USCS SYMBOL							
LEVATIO DEPTH (FEET) MMPLE N R RUN N R RUN N R REC R ROD)	PROFILE	SURFACE EL: 675.38	S S	REMARKS						
SA SA OF OIL		DESCRIPTION	OSO							
74— 76— 78—	Sh fra slig			Special Care Sample at 80.9' - 82.4'. TES: Bedrock Part of the Mahantango Formation						
DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	GWL: DEF	PTH: DATE/TIME: 6 METHOD: SPT/Tricone/ NQ Rock Core		manantanyo i oililatioii						
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER:	: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850						



Bell Bend NPP PROJECT NO. 07-3891										
Deli Delia NFF		LOG OF BORING NO. B-327		PROJECT NO. 07-3091						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	:ILE	COORDINATES N 339452.089 E 2405233.062	USCS SYMBOL							
LEVATIO DEPTH (FEET) MMPLE N R RUN N R RUN N R REC R ROD)	PROFILE	SURFACE EL: 675.38	SS S	REMARKS						
SAS OF		DESCRIPTION	OSC							
88 — R-8 100% 10.0 10.0 90 — R-8 100% 10.0 1	1	Shale - Moderately hard to hard, dark gray (N3), slightly to very slightly fractured, vertical bedding, calcareous. DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME:	NOT	TES: Bedrock Part of the Mahantango Formation						
FIELD GEOLOGIST: PFW CHECKED BY: EVZ	1	LING METHOD: SPT/Tricone/ NQ Rock Core								
APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850						



COORDINATES COORDINATES N 339452.089 E 2405233.062 SURFACE EL: 675.38 DESCRIPTION	Dall D	Bell Bend NPP PROJECT NO. 07-3891											
106— R-10 65% (72%) 5.1 110— Shale - Moderately hard to hard, dark gray (N3), fresh, unfractured, thinly bedded, vertical bedding planes, calcareous, no fossils or infills, weak reaction to HCl, laminate bedding planes.	Bell B	ena NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891				
106— R-10 85% (72%) 5.1 110— Shale - Moderately hard to hard, dark gray (N3), fresh, unfractured, thinly bedded, vertical bedding planes, calcareous, no fossils or infills, weak reaction to HCl, laminate bedding planes.	TION MSL)	HT.	N N O O	" & (N) ZEC. 2D)	RY (ft.)	ורב		MBOL					
106— R-10 85% (72%) 5.1 110— Shale - Moderately hard to hard, dark gray (N3), fresh, unfractured, thinly bedded, vertical bedding planes, calcareous, no fossils or infills, weak reaction to HCl, laminate bedding planes.	EVA.	DEP'	MPLI	2W/6 R % F R(RC	OVE	ROF	SURFACE EL: 675.38	S S	REMARKS				
108— 108— 110— Shale - Moderately hard to hard, dark gray (N3), fresh, unfractured, thinly bedded, vertical bedding planes, calcareous, no fossils or infills, weak reaction to HCl, laminate bedding planes.	EL (F)		SA	BLC	REC		DESCRIPTION	OSC					
DATE STARTED: 9/16/07 DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon DATE STARTED: 9/16/07 GWL: DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DATE/T	DATE FIELD CHEC APPR	106 — 108 — 110 — 1112 — 1114 — 1116 — STARTEE COMPLE: GEOLOG CKED BY: OVED BY:	R-11 D: 9/ IED: 9/ IST: P E RJ	100% (100%) (16/07 /18/07 FW VZ B		GWL: GWL: DRIL	thinly bedded, vertical bedding planes, calcareous, no fossils or infills, weak reaction to HCl, laminate bedding planes. DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	Mahantango Formation				



	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339452.089 E 2405233.062	SYMBOL				
EVA'	DEPTH (FEET)	MPLE	DW/6' R % F 8 (RC	OVE	PROFILE	SURFACE EL: 675.38	SS	REMARKS			
<u> </u>		S O	BLC	REC		DESCRIPTION	nscs				
DATE FIELD CHEC	118 — 120 — 122 — 124 — 126 — 130 — STARTED COMPLET GEOLOG KED BY: OVED BY:	ΓED: 9/ IST: P E	FW VZ	10.0	GWL	Shale - Moderately hard to hard, dark gray (N3), unfractured, vertical bedding, thinly bedded, calcareous, no fossils or infills, laminated bedding planes. Shale - Moderately hard to hard, dark gray (N3), slightly to very slightly fractured, nonhealed, vertical bedding, thinly bedded, calcareous, weak reaction to HCI. DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core		Special Care Sample at 133.1'-134.6'. TES: Bedrock Part of the Mahantango Formation			
CHECI APPRO		E RJ	VZ B			LER: Scott Zeien HELPER: Dave Dyan	RIG	6: CME 850			



Dall B	Bell Bend NPP PROJECT NO. 07-3891											
Bell B	ena NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339452.089 E 2405233.062	USCS SYMBOL					
EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 675.38	SSS	REMARKS				
		& Q	BLC	REC		DESCRIPTION	OSC					
DATE FIELD CHEC	132 — 134 — 136 — 138 — 140 — 144 — 146 — STARTED GEOLOG KED BY: 0// SP PX	ΓED: 9/ IST: P E	FW VZ	9.9	GWL:	Shale - Moderately hard to hard, dark gray (N3), slightly to very slightly fractured, vertical bedding, slightly calcareous, weak reaction to HCl. DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core		TES: Bedrock Part of the Mahantango Formation				
	OVED BY: ING CO.:				DKILI	LER: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850				
_			_		_							



D-11 B	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339452.089 E 2405233.062	USCS SYMBOL				
EVA:	DEPTH (FEET)	MPLE	2W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 675.38	S S	REMARKS			
E E		S O	BLC	REC		DESCRIPTION	OSC				
1	148 — 148 — 150 — 152 — 154 — 156 — 156 — 156 — 157 — 158 — 157 — 158 — 15		90% (86%)	9.0		Shale - Moderately hard to hard, dark gray (N3) fresh, very slightly fractured, vertical bedding planes, healed with calcite, fractured at 45° to rock core. Shale - Moderately hard to hard, dark gray (N3), very slightly fractured, healed with calcite, vertical bedding planes, thinly bedded, DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30	NOT	ES: Bedrock Part of the			
1	COMPLE ^T GEOLOG		/18/07 FW			: DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation			
CHEC	KED BY:	Е	VZ								
	OVED BY: ING CO.:				DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG:	CME 850			
		. 511400									



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LOG OF BORING NO. B-327	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 339452.089 E 2405233.062	TO BWAS REMARKS								
DEPTH (FEET) (MPLE N R RUN N R R R REC R R REC SOVERY	N 339452.089 E 2405233.062 SURFACE EL: 675.38	ဖ် REMARKS								
SA SA DIA O O O O O O O O O O O O O O O O O O O	DESCRIPTION	nscs								
162 — 164 — 166 — 168 — 170 — 172 — R-17 98% (98%) 5.4 174 — DATE STARTED: 9/16/07	Shale - Moderately hard to hard, dark gray (N3), fresh, very slightly fractured, healed with calcite, vertical bedding planes, bedding planes larninated. GWL: DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30	NOTES: Bedrock Part of the Mahantango Formation								
DATE COMPLETED: 9/18/07 FIELD GEOLOGIST: PFW	GWL: DEPTH: DATE/TIME: DRILLING METHOD: SPT/Tricone/ NQ Rock Core	manantango Formation								
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Scott Zeien HELPER: Dave Dyan	RIG: CME 850								



BALLB	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	ena NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (F)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339452.089 E 2405233.062	SYMBOL				
EVA:	DEPTH (FEET)	MPLE	2W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 675.38	S S)	REMARKS			
H H		S O	BLC	REC		DESCRIPTION	nscs				
DATE FIELD	176 —	ΓED: 9/ IST: P	FW	10.0	GWL:	Shale - Moderately hard to hard, dark gray (N3), very slightly to slightly fractured, slightly calcareous, weak reaction to HCl. DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME: LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ΓΕS: Bedrock Part of the Mahantango Formation			
APPR	KED BY: OVED BY:	RJ			DRILI	LER: Scott Zeien HELPER: Dave Dyan	RIG	: CME 850			
DRILL	ING CO.:	Terraco	n								



Dall D	Bell Bend NPP PROJECT NO. 07-3891										
Dell B	ena NPP					LOG OF BORING NO. B-327		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	ТН (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339452.089 E 2405233.062	SYMBOL				
EVA'	ОЕРТН (FEET)	MPLE	DW/6' R % F 8 (RC	OVE	PROFILE	SURFACE EL: 675.38	SS SV	REMARKS			
<u> </u>		SA	BLC	REC		DESCRIPTION	nscs				
	192 — 194 — 196 — 198 — 200 — 202 — 204 — STARTEE COMPLE		100% (99%)	5.0		Shale - Moderately hard to hard, dark gray (N3), very slightly to slightly fractured, slightly calcareous, weak reaction to HCl. BOTTOM OF BORING 201' DEPTH: 7.19 DATE/TIME: 9/18/07 at 08:30 DEPTH: DATE/TIME:	NO	TES: Bedrock Part of the Mahantango Formation			
FIELD CHEC	GEOLOG KED BY:	IST: P	FW VZ		DRILI	LING METHOD: SPT/Tricone/ NQ Rock Core					
	OVED BY: ING CO.:				DRIL	LER: Scott Zeien HELPER: Dave Dyan	RIG	:: CME 850			



Bell Be	end NPP				Bell Bend NPP PROJECT NO. 07-3891											
			•			LOG OF BORING NO. B-327A										
ELEVATION (FEET MSL)	H.(F.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339452.229 E 2405255.487	SYMBOL									
EVA:	DEPTH (FEET)	MPLI RUI	3.W/6 7.% F 8. (RC	OVE	PROFILE	SURFACE EL: 675.30	(S S)	REMARKS								
밀		SA	BLC OF	REC		DESCRIPTION	nscs									
	0	S-1	2-1 4 (5)	1.3		Sandy Fat Clay (ch), 50% clay, 50% sand, fine, spherical, rounded, 0.5" max size, soft sand, medium plasticity, medium toughness, low dry strength, medium dilatancy, moderate yellowish brown (5Y 3/4), moist, no reaction to HCl, soft.	ch									
672.8	2 					2.5' Poorly Graded Sand with Silt (sp-sm), 80% sand, 10% gravel, 10%	sp-									
	4 —	S-2	3-4 5 (9)	1.4	616 4 0 00 616 4 000 1000 0 00 616 0 000 400 0 00 616 0 00	silt, fine to coarse sand, fine, hard, subangular, elongated, 0.5" max size gravel, nonplastic, moderate yellowish brown (5Y 3/4), dry, no reaction to HCl, loose to medium dense.	sm									
	- -															
	6 	S-3	5-6 5 (11)	1.4	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6											
667.8	_					7.5' Silty Sand with Gravel (sm), 65% sand, 20% silt, 15% gravel, sub angular, spherical, 0.5" max size, soft gravel, nonplastic, moderate	sm									
	8 	S-4	4-4 5 (9)	1.5		brown (5Y 3/4), dry, no reaction to HCl, loose.										
007.5	-					10.0'										
665.3	10 —	S-5	9-10 11 (21)	1.5	91.0	Well Graded Sand with Gravel (sw), 65% sand, 25% gravel, 5% silt, 5% cobbles, fine to coarse sand and gravel, sub angular, elongated and flat, 0.75" max size sand and gravel, nonplastic, moderate brown (5Y 3/4) and moderate red (5R 4/6), dry, no reaction to HCl, medium dense.	sw									
662.8	12 				I MAN	12.5' Well Graded Gravel with Silt and Sand (gw-gm), 50% gravel, 30%	gw-									
	- 14 	S-6	11-11 8 (19)	1.0		sand, 10% silt, 10% cobbles, fine to coarse, hard, sub angular, elongated, 0.75" max size sand and gravel, nonplastic, moderate brown (5Y 3/4), moderate red (5R 4/6) and light gray (N7), dry, no reaction to HCl, medium dense.	gm									
DATE	- CTADTC). 4	1/1/1/07			DEDTH: N/A DATE/TIME, N/A	NOT	ES: Energy Test was Demissions -								
l	STARTED COMPLE		1/14/07 1/14/07			DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NOT	ES: Energy Test was Performed on CME 75 Truck Rig By GRL								
	GEOLOG		AK			ING METHOD:		Bedrock Part of the Mahantango Formation								
l	KED BY:		VZ			Continuous Flight Augers										
	OVED BY:				DRILL	.ER: Craig VanVactor HELPER: Logan Shipman	RIG:	CME 75 Truck								
DKILLI	NG CO.:	rerraco	11													



<u> </u>	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP			_		LOG OF BORING NO. B-327A		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	тн =т)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	-ILE	COORDINATES N 339452.229 E 2405255.487	SYMBOL				
_EVA :EET	DEPTH (FEET)	MPL RU	2W/6 R % (R	SOVE	PROFILE	SURFACE EL: 675.30	3S S	REMARKS			
<u> </u>		S O	BL(REC		DESCRIPTION	nscs				
660.3	_					15.0' Well Graded Gravel with Clay and Sand (gw-gc), 50% gravel, 20%	gw-				
	- 16 	S-7	6-16 22 (38)	0.9		sand, 20% cobbles, 10% fat clay, fine to coarse, subangular, elongated and flat, 1.5" max size, hard sand and gravel, nonplastic, moderate brown (5Y 3/4), moderate red (5R 4/6), and light gray (N7), moist, no reaction to HCl, dense.	gc				
657.8	_					17.5' Well Graded Gravel with Sand (gw), 70% cobbles, 20% gravel, 10%	gw				
	18 	S-8	12-22 16 (38)	0.8		sand, fine to coarse grained, sub angular, elongated and flat, 3.0" max size, hard sand and gravel, nonplastic, moderate brown (5Y 3/4), light red (5R 6/6), and dusky yellow (5Y 6/4), moist to wet, no reaction to HCl, dense.					
	_										
655.3	20 —	S-9	50/5	0.4	Y. Y	20.0' Shale- Dark gray (N3), noncalcareous with silt and sand, medium					
654.9	_	0.0	(50)	0.4		weathering, low hardness, very dense. BOTTOM OF BORING 20.4'					
	_					BOTTOM OF BOTTING 20.1					
	_										
	22 —										
	_										
	_										
	_										
	24 —										
	_										
	_										
	_										
	26 —										
	_										
	_										
	_										
	28 —										
	_										
	_										
l	STARTED COMPLE		1/14/07 1/14/07			DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NOT	ES: Energy Test was Performed on CME 75 Truck Rig By GRL			
l	GEOLOG		1/14/07 AK			LING METHOD:		Bedrock Part of the Mahantango Formation			
CHEC	KED BY:	Е	VZ			Continuous Flight Augers	<u> </u>				
	OVED BY: ING CO.:				DRILL	LER: Craig VanVactor HELPER: Logan Shipman	RIG:	CME 75 Truck			
DIVILLI	10 00	Torraco	11		<u> </u>		ı.				



Bell Bend NPP		PROJECT NO. 07-3891
	LOG OF BORING NO. B-328	
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339176.764 E 2405699.737 SURFACE EL: 667.16 DESCRIPTION	REMARKS SCORO
658.7	Poorly Graded Sand with Gravel (sp) - 25% gravel, 75% sand, fine to coarse, subangular, elongated gravel, rounded, fine sand, nonplastic, grayish brown (5YR 3/2) to brownish gray (5R 4/1), wet, no reaction to HCl, very dense.	sp SC
10 —	Poorly Graded Gravel with Sand (gp)- 75% gravel, 25% sand, rounded, fine to coarse, flat and elongated gravel, fine to coarse sand, nonplastic, moderate olive brown (5Y 4/4), wet, no reaction to HCl, dense. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	gp NOTES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousley	RIG: CME 55 Track



Bell Bend NPP		Bell Bend NPP PROJECT NO. 07-3891											
LOG OF BORING NO. B-328													
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339176.764 E 2405699.737	Og W. KEMARKS											
LEVATIO EET MS DEPTH (FEET) AMPLE N R RUN N R R R R R R R R R R R R R R R R R R	N 339176.764 E 2405699.737 SURFACE EL: 667.16	κ REMARKS											
SAS OF	DESCRIPTION	NSCS											
648.7	Poorly Graded Gravel with Sand (gp)- 75% gravel, 25% sand, rounded to subangular, fine to coarse, flat and elongated gravel, fine to medium, subrounded to subangular sand, nonplastic, light brown (5YR 6/1), wet, no reaction to HCl, very dense.	gp											
20 —	23.5' Silty Gravel with Sand (GM)- 45% gravel, 40% sand, 10% silt, 5% clay, rounded to subangular, fine to coarse, flat and elongated gravel, fine to medium, subrounded to subangular sand, nonplastic, brownish gray (5YR 4/1) and brownish black (5YR 2/1), wet, no reaction to HCl, dense.	GM											
28 — 28 — 14-15 DATE STARTED: 8/21/07 DATE COMPLETED: 8/25/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	28.5' Well Graded Gravel with Sand (gw)- 75% gravel, 25% sand, fine to coarse, subangular to angular gravel, hard, fine to coarse, subrounded to angular sand, nonplastic, olive gray (5Y 3/2), wet, no GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	gw NOTES: Bedrock Part of the Mahantango Formation											
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Jason Tousley	RIG: CME 55 Track											



Bell Bend NPP PROJECT NO. 07-3891											
Dell Delle	u 181 .					LOG OF BORING NO. B-328		FROSEOT NO. 07-0001			
ELEVATION (FEET MSL)	ΞE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 E	COORDINATES N 339176.764 E 2405699.737	SYMBOL				
.EVA ⁻ .EET I	DEPTH (FEET)	.MPLE RUI	3W/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 667.16	SS SY	REMARKS			
ヨト				REC	"	DESCRIPTION	nscs				
005.0	30 —	S-6	73.5%	2.5		31.9' Cobbles - 100% cobbles, mostly very hard, fine grained sandstone, some soft shale, medium dark gray (N4) very light gray (N8) dark gray (N3) and dark reddish brown (10R 3/4), slight reaction to HCl, slightly weathered throughout, open and clean fractures, unfractured to intensely fractured.		Because of poor recovery- intervals are extrapolated, interpreted units (top/ bottom) from 31.9-45.3'			
	34 —	R-2	50% (20%)	2.5		Cobbles - 100% cobbles, mostly very hard, fine grained sandstone, some soft to moderately soft shale, medium dark gray (N4) very light gray (N8), dark gray (N3), grayish brown (5 YR 3/2), olive gray (5Y 4/1) to dark greenish gray (5G 4/1), slight reaction to HCl, slightly weathered, intensely fractured, unhealed thin to clean fractures.					
626.9	40 —		56%			40.3' Shale- Soft to moderately soft, dark gray (N3), slightly weathered, slightly to very slightly fractured, very thin to clean fractures.					
	- -	R-3	(46%)	2.8							
DATE STARTED: 8/21/07 DATE COMPLETED: 8/25/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	TES: Bedrock Part of the Mahantango Formation			
APPROVE DRILLING	ED BY:	RJI	В		DRILL	.ER: Sam Silverman HELPER: Jason Tousley	RIG	: CME 55 Track			



	LNDD	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-328		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	TH (TE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	-ILE	COORDINATES N 339176.764 E 2405699.737	SYMBOL					
EVA EEET	DEPTH (FEET)	MPL R RU	20W/6 R % & (R(SOVE	PROFILE	SURFACE EL: 667.16	SS S	REMARKS				
□ 		S G	BL(REC		DESCRIPTION	nscs					
	44 —											
621.9						45.3' Cobbles- About 100% cobbles of fine to coarse sandstone, very hard,						
	46 — –					some soft shale, light brownish gray (5YR 6/1), grayish red (10R 4/2), very dusky red (10R 2/2) medium gray (N5) and dark gray (N3), no reaction to HCl, unfractured to intesley fractured, clean, very thin to open fractures, bottom 2/3 of sample vuggy.						
	-		80%		•							
	-	R-4	(38%)	3.2								
	48 —				.,							
	-											
617.9						49.3' Shale- Moderately to highly weathered, medium gray (N5) to dark						
	50 —					gray (N3), well rounded to subangular, gravel to cobble size fragments.						
	_					Ç						
	_	R-5	43%	1.5								
	_		(0%)									
	52 —											
614.4	_				40.03	52.8'						
	_		13-8			subrounded, coarse grained sandstone pebbles, low plasticity,	gw	Due to elevated blow counts returned to rock coring				
	-	S-7	45 (53)	0.8	000	medium bluish gray (5B 5/1), moderate reddish brown (10R 4 6) and dark reddish brown (10R 3/4) no odor, no reaction to HCl, moderately dense, wet, no dilatancy.						
	54 —					dense, wet, no dilatancy.						
	_											
	_											
	56 —											
	_				0.00							
	-											
609.6	-					57.6' Shale- Soft to moderately soft, dark gray (N3), slightly weathered,						
	58 —					slightly to very slightly fractured, very thin to clean, open, not healed, fracture at 58.8' at 30°.						
l	STARTED		21/07			DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the Mahantango Formation				
	COMPLE ^T GEOLOG		'25/07 FW			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		mananango i omiation				
CHEC	CHECKED BY: EVZ											
	OVED BY: ING CO.:				DRILI	LER: Sam Silverman HELPER: Jason Tousley	RIG	6: CME 55 Track				
	_				_							



BEIL Bend NPD (FEET MSL) (FE	LOG OF BORING NO. B-328 COORDINATES N 339176.764 E 2405699.737 SURFACE EL: 667.16 DESCRIPTION Shale- Soft to moderately soft, dark gray (N3), unfractured .	USCS SYMBOL	PROJECT NO. 07-3891 REMARKS
R-6 92% 2.1	N 339176.764 E 2405699.737 SURFACE EL: 667.16 DESCRIPTION	USCS SYMBOL	REMARKS
R-6 92% 2.1	DESCRIPTION	USCS SY	REMARKS
R-6 92% 2.1	DESCRIPTION	OSO	
R-6 2.1	Shale- Soft to moderately soft, dark gray (N3), unfractured .		
60 — R-7 100% 5.0 602.3 -	62.3-64.0' interbedded layers of pyritic material (pale yellowish brown (10YR 6/2) and additional fine grain sand, silty shale, moderate hardness, dark gray (N3) 64.0' Silty Shale- Moderately hard, dark gray (N3), slightly weathered, unfractured, noncalcareous, moderate bedding. 64.9' Shale- Moderately hard, slightly fractured, dark gray (N3), slightly weathered, no reaction to HCI.		
66 — R-8 100% 5.0 68 — 70 — 72 — R-9 96% (88%) 4.8 DATE STARTED: 8/25/07 EIELD GEOLOGIST: PEW	Shale- Soft to moderately hard, dark gray (N3), slightly to very slightly fractured, very thin to clean, open unhealed fractures, no reaction to HCI. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricope/NO Rock Core	NOTES	S: Bedrock Part of the Mahantango Formation
FIELD GEOLOGIST: PFW CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRILLING METHOD: SPT/Tricone/NQ Rock Core DRILLER: Sam Silverman HELPER: Jason Tousley	RIG: C	ME 55 Track



Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-328		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	Ξ£	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339176.764 E 2405699.737	SYMBOL			
EVA'	DEPTH (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 667.16	SSSY	REMARKS		
		S O	BLC	REC		DESCRIPTION	nscs			
	74 — - -					Shale- Moderately hard to hard, dark gray (N3), slightly to very slightly fractured, very thin to clean, open fractures, noncalcareous,				
	76 — - - - 78 —	R-10	100% (92%)	5.0		moderately bedded, no reaction to HCl. 75.3' Fracture angle 45°, not healed, open		Fractures at 45° angle, healed is horizontal		
	_					Fracture - healed with calcite at 79.0'				
	80 					Shale- Moderately hard to hard, very slightly fractured, open and not healed, noncalcareous, no reaction to HCl.				
	82 — - -	R-11	97% (92%)	4.85						
	84 —					Shale- Moderately hard to hard, no fractures, noncalcareous, dark gray (N3), no reaction to HCI.				
	86 — - -	R-12	100%	5.0						
DATE FIELD	DATE STARTED: 8/21/07 DATE COMPLETED: 8/25/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation		
APPR	OVED BY:	RJI	В		DRILI	LER: Sam Silverman HELPER: Jason Tousley	RIG	: CME 55 Track		



Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-328		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339176.764 E 2405699.737	USCS SYMBOL			
EVA'	ОЕРТН (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 667.16	S SY	REMARKS		
<u> </u>		S O	BLC	REC		DESCRIPTION	OSC			
567.3	88 — 90 — 92 — 94 — 96 — 100 — 102 —	R-13	98% (94%)	4.9		Shale- Moderately hard to hard, calcareous, some fractures widely spaced, reaction to HCl. Shale- Moderately hard to hard, widely spaced fractures, slightly to very slightly fractured, very thin to clean, open fractures, calcareous, not healed fractures (95.0' and 97.9') angle at 20° from horizontal. BOTTOM OF BORING 99.9'				
DATE STARTED: 8/21/07 DATE COMPLETED: 8/25/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ						DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	TON	FES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRILI	LER: Sam Silverman HELPER: Jason Tousley	RIG	: CME 55 Track		



Bell Be	end NPP							PROJECT NO. 07-3891	
50						LOG OF BORING NO. B-329			
ELEVATION (FEET MSL)	H.(;	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339189.556 E 2405802.664	SYMBOL		
EET	DEPTH (FEET)	MPLF RUI	2W/6' R % I & (RC	OVE	PROFILE	SURFACE EL: 667.49	(8.8)	REMARKS	
E.		SA	BLC	REC		DESCRIPTION	nscs		
	0 - - - 2 -					Silty Sand (sm)- Fine grained silty sand, trace gravel, light brown (5YR 6/4).	sm	0.0'-3.0' Description gathered via test pit.	
664.5	4 —	S-1	3-7 14 (21)	1.0		3.0' Silty Sand (sm)- 10% gravel, 60% sand, 30% silt, fine to coarse, subangular, elongated and flat gravel, fine to medium, subrounded sand, nonplastic, light brown (5YR 5/6), dry, no reaction to HCl, medium dense.	sm		
659.5	8 — - - 10 —	S-2	22-25 20 (45)	1.1	्रहें हुए हैं है जिल्हा कि कि क	8.0' Well-Graded Sand with Gravel (sw) - 40% gravel, 60% sand, fine to coarse, subangular gravel, medium to coarse, rounded to subrounded sand, nonplastic, moderate brown (5YR 4/4), no reaction to HCl, wet, dense,	sw		
654.5	12 — - - 12 — - - 14 — - STARTED	S-3	23-10 10 (20)	1.0	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	Poorly Graded Gravel with Silt and Sand (GP-GM)- 50% gravel, 40% sand, 5% silt, 5% clay, fine to coarse subangular to angular gravel, fine to coarse subangular to angular sand, nonplastic, very pale orange (10YR 8/2) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, medium dense. DEPTH: N/A DATE/TIME: N/A	GP- GM	TES: Approximately 600 gallons of	
DATE COMPLETED: 8/27/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					GWL	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	INO	drilling fluid was lost at a depth between 50' and 57'. Bedrock Part of the Mahantango Formation.	
APPRO	OVED BY:	RJ	В		DRIL	LER: Sam Silverman HELPER: Jason Tousley	RIG	6: CME 550 Track	
DRILLING CO.: Terracon									



Section Composition Comp	Ball Band NDD											
649.5 18 — Well-Graded Sand with Cravel (ew) - 15% gravel, 85% sand coarse subcounded sand,	Bell Bend NPP	LOG OF BORING NO. B-329		PROJECT NO. 07-3891								
649.5 18 — Well-Graded Sand with Cravel (ew) - 15% gravel, 85% sand coarse subcounded sand,	MSL) TH		MBOL									
649.5 18 — S-4 11.5 1.2 2.5 Well-Graded Sand with Crawel (sw) - 15% gravel, 85% and coarse subrounded sand,	EVA' EET I DEP' (FEE MPLI NMPLI R RUK 8 (RC	SURFACE EL: 667.49	(\$ 8)	REMARKS								
649.5 18 — Well-Graded Sand with Gravel (sw) - 15% gravel. 85% sand coarse subrounded sand, nonplisatic, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), wet, no reaction to HCl, loose. Well-Graded Gravel with Sand (gw)- 85% gravel, 15% sand, fine to coarse, subrounded sand, nonplisatic, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 5/4), wet, no reaction to HCl, loose. Well-Graded Gravel with Sand (gw)- 85% gravel, 15% sand, fine to coarse, subrounded to subangular, elongated and flat gravel, fine to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonplisate light brown (5YR 6/6), dire to medium well rounded sand, nonpl	SA SA OR		OSC									
639.5 28 — Well-Graded Gravel with Sand (gw)- 85% gravel, 15% sand, fine to coarse, subrounded to subangular, elongated and flat gravel, fine to medium well rounded sand, nonplastic light brown (5 YR 5/6), dark gray (N3) and very pale orange (10 YR 8/2), wet, no reaction to HCI, dense. Well-Graded Gravel with Sand (gw)- 85% gravel, 15% sand, fine to coarse, subrounded to subangular, elongated and flat gravel, fine to medium well rounded sand, nonplastic light brown (5 YR 5/6), dark gray (N3) and very pale orange (10 YR 8/2), wet, no reaction to HCI, dense. Well-Graded Gravel (gw) - 10% cobbles, 90% gravel, shale cobbles, fine to coarse, subrounded to subangular gravel, nonplastic, medium brown (5 YR 4/4), dark gray (N3) and moderate orange pink (10 R 7/4), wet, no reaction to HCI, dense. DATE STARTED: 8/26/07 DATE COMPLETED: 8/27/07 DATE COMPLETED: 8/27/07 DATE COMPLETED: 8/27/07 DATE GOMPLETED: 8/27/07 DATE COMPLETED: 8/27/07 DATE GOMPLETED: 8/27/0	649.5 18 — S-4 11-5 (10) 1.2	Well-Graded Sand with Gravel (sw) - 15% gravel, 85% sand coarse subangular to subrounded gravel, fine to coarse, subrounded sand, nonplastic, moderate yellowish brown (10YR 5/4) to dark yellowish brown (10 YR 4/2), wet, no reaction to HCl, loose.	sw									
639.5 28 — Well-Graded Gravel (gw) - 10% cobbles, 90% gravel, shale cobbles, fine to coarse, subrounded to subangular gravel, nonplastic, medium brown (5 YR 4/4), dark gray (N3) and moderate orange pink (10 R 7/4), wet, no reaction to HCl, dense. DATE STARTED: 8/26/07 DATE COMPLETED: 8/27/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ Well-Graded Gravel (gw) - 10% cobbles, 90% gravel, shale cobbles, fine to coarse, subrounded to subangular gravel, nonplastic, medium brown (5 YR 4/4), dark gray (N3) and moderate orange pink (10 R 7/4), wet, no reaction to HCl, dense. ROTES: Approximately 600 gallons of drilling fluid was lost at a deposition of the Mahantango formation.	644.5	Well-Graded Gravel with Sand (gw)- 85% gravel, 15% sand, fine to coarse, subrounded to subangular, elongated and flat gravel, fine to medium well rounded sand, nonplastic light brown (5 YR 5/6), dark gray (N3) and very pale orange (10 YR 8/2), wet, no reaction to HCI,	gw									
	639.5 28 — S-6 12-17 27 (44) 0.4 DATE STARTED: 8/26/07 DATE COMPLETED: 8/27/07 FIELD GEOLOGIST: PFW	Well-Graded Gravel (gw) - 10% cobbles, 90% gravel, shale cobbles, fine to coarse, subrounded to subangular gravel, nonplastic, medium brown (5 YR 4/4), dark gray (N3) and moderate orange pink (10 R 7/4), wet, no reaction to HCl, dense. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A		drilling fluid was lost at a depth between 50' and 57'. Bedrock Part of the Mahantango								
DRILLING CO.: Terracon	APPROVED BY: RJB	DRILLER: Sam Silverman HELPER: Jason Tousley	RIG: CN	Formation.								



Dall B	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	and NPP					LOG OF BORING NO. B-329		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	F.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339189.556 E 2405802.664	SYMBOL					
EVA:	DEPTH (FEET)	MPLF	% % F (RC	OVE	PROFILE	SURFACE EL: 667.49	(\$ 8)	REMARKS				
- 교교		SA	BLC	REC		DESCRIPTION	nscs					
630.5	30 — 32 — 34 — 36 — 38 — 40 —	S-7	8-5 9 (14)	0.4		Well-Graded Gravel (gw)- 10% cobbles, 90% gravel, subangular to angular shale cobbles, medium to coarse, subangular to angular gravel, elongated, nonplastic, moderate brown (5YR 4/4), wet, no reaction to HCl, medium dense. Silty Clayey Sand with Gravel (SC-SM) - 35% gravel, 45% sand, 10% silt, 10% clay, fine to coarse, subangular gravel, fine to medium, subangular sand, hard, low plasticity, low dry strength, medium bluish gray (5B 5/1), wet, no reaction to HCl, medium dense.	SM					
DATE (42 — 42 — STARTED COMPLET GEOLOG KED BY:	TED: 8/	50/3 /26/07 /27/07 PFW	0.2	GWL:	Poorly Graded Gravel (gp)- 100% gravel, fine to coarse, subangular, elongated and flat gravel, moderately hard, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCl, very dense. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	gp NOTI	ES: Approximately 600 gallons of drilling fluid was lost at a depthe between 50' and 57'. Bedrock Part of the Mahantango Formation.				
	OVED BY:				DRILL	LER: Sam Silverman HELPER: Jason Tousley	RIG:	CME 550 Track				
DRILLI	ING CO.:	Terraco	n									



Rall B	end NPP							PROJECT NO. 07-3891
Den D.	ena INF I					LOG OF BORING NO. B-329		PROJECT NO. 07-500.
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339189.556 E 2405802.664	SYMBOL	
EVA".	DEPTH (FEET)	MPLE	XW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 667.49	S SY	REMARKS
- I - I - I - I - I - I - I - I - I - I		SA		REC		DESCRIPTION	nscs	
	44 —		(50)					
	_							
	46 —							
	_							
	_							
620.0	_		700/			47.5' Shale- Dark gray (N3), moderately hard to soft, unfractured, non-		
	48 —	R-1	70% (40%)	0.7'		calcareous, no reaction to HCI, fragments broken into gravel, wet, intensely weathered.		
619.0	-					48.5' Silty Sand (sm)- 10% gravel, 75% sand, 15% silt, fine to coarse, subangular gravel, fine to coarse, subangular sand, nonplastic, dark	sm	
		S-10	9-19 50/4 (69)	0.75'		gray (N3), no reaction to HCI, very dense.		
C47.F	-		(69)			50.0'		
617.5	50 —					Shale- Dark gray (N3), soft to moderately hard, intensely fractured, angular to subangular fragments, noncalcareous, no reaction to HCI.		
	_							
	_							
	52 —							
	_	R-2	34% (8%)	1.7'				
	_		(0%)					
	_							
	54 —							
	_							
	-					Shale- Soft to moderately hard, very intensely fractured, angular to subangular fragments, dark gray (N3) to dark reddish brown (10R 3/		
	_		50%			4), noncalcareous, no reaction to HCI.		
	56 —	R-3	(0%)	1.0'				
						Shale- Soft to moderately hard, dark gray (N3), very intensely fractured, angular to sub angular fragments, noncalcareous, no		
	58 —	R-4	25%	0.5'		reaction to HCl.		
		1\-4	(0%)	0.5				
DATE STARTED: 8/26/07 DATE COMPLETED: 8/27/07					1	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	ТОИ	TES: Approximately 600 gallons of drilling fluid was lost at a depth
	GEOLOG				1	LING METHOD: SPT/Tricone/ NQ Rock Core		between 50' and 57'. Bedrock Part of the Mahantango
	KED BY: OVED BY:		VZ R		יווסס	ED: Com Cilvormon UEL DED: Josep Tavalari	DIC	Formation.
	ING CO.:				DKILI	LER: Sam Silverman HELPER: Jason Tousley	RIG	: CME 550 Track



Bell Be	end NPP					LOG OF BORING NO. B-329		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ТН (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339189.556 E 2405802.664	SYMBOL	
EVA:	DEPTH (FEET)	MPLE	2W/6' R % F R (RG	OVE	PROFILE	SURFACE EL: 667.49	S S	REMARKS
] F)		SA	BLC	REC		DESCRIPTION	nscs	
	60 —	R-5	50% (20%)	0.5'		Shale- Soft to moderately hard, dark gray (N3), slightly to moderately weathered, moderately to intensely fractured, nearly vertical fractures, healed with dark gray silty clay, noncalcareous, no reaction to HCI. Shale- Soft to moderately hard, dark gray (N3), slightly to very slightly fractured, nearly vertical fractures and unhealed, 63.0'-64.4' highly fractured breccia zone healed with calcite, noncalcareous, no		
	62 —	R-6	100% (86%)	5.0'		fractured breccia zone healed with calcite, noncalcareous, no reaction to HCl. Shale- Soft to moderately hard, dark gray (N3), slightly to very slightly		
597.5	66 — - - - 68 — - - 70 —	R-7	100% (90%)	5.0'		fractured, thin and clean fractures unhealed, noncalcareous, no reaction to HCl.		
397.3	70 — - - 72 —					BOTTOM OF BORING 70'		
DATE (FIELD	DATE STARTED: 8/26/07 DATE COMPLETED: 8/27/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ				GWL	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Approximately 600 gallons of drilling fluid was lost at a depth between 50' and 57'. Bedrock Part of the Mahantango Formation.
APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Jason Tous DRILLING CO.: Terracon							RIG:	CME 550 Track



Dall Da	Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	ena NPP					LOG OF BORING NO. B-330		PROJECT NO. 07-3891				
ELEVATION (FEET MSL)	H.()	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339200.551 E 2405916.031	SYMBOL					
EVA EET	DEPTH (FEET)	MPL R RUI	2W/6 R % I & (R(OVE	PROFILE	SURFACE EL: 668.91	S S	REMARKS				
.⊟ .F		S O	BLC	REC		DESCRIPTION	nscs					
665.7	0	S-1	6-12 18 (30)	1.2		3.2' Silty Sand (sm)- 10% gravel, 70% sand, 20% silt, subangular, elongated and flat, medium hard, 0.75" max size, nonplastic, dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4), and dark yellowish brown (10YR 4/2), very pale orange (10YR 8/2) and very light gray (N8), no reaction to HCI, medium dense, pieces of possible brick and charcoal.	sm	Cultural Sample at 4.0'.				
DATE	8 — - 10 — - 12 — - 14 — - STARTED COMPLE	ΓED: 8/	22-50/5 (50+) 	1.0	GWL:	Poorly Graded Gravel with Silt and Sand (GP-GM) - 60% gravel, 30% sand, 5% silt, 5% clay, fine to coarse gravel, fine to coarse sand, subangular, elongated and flat, medium hard, 0.75" max size, nonplastic, dark yellowish orange (10YR 6/6) and moderate yellowish brown (10YR 5/4), and dark yellowish brown (10YR 4/2), very pale orange (10YR 8/2) and very light gray (N8), dry, no reaction to HCI, very dense. Silty Gravel with Sand (gm) - 60% gravel, 20% sand, 20% silt, subangular, elongated and flat gravel, angular to subrounded, fine to coarse sand, 0.75" max size, medium hard, nonplastic, dark yellowish DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core		TES: Bedrock Part of the Mahantango Formation				
APPRO	KED BY: OVED BY:	RJI			DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	c: CME 75 Truck				
DRILLI	NG CO.:	Terraco	n		<u> </u>							



Bell Be	end NPP							PROJECT NO. 07-3891
<u> </u>			1 1			LOG OF BORING NO. B-330		
TION MSL)	H.E.	NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339200.551 E 2405916.031	SYMBOL	
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	OW/6 DR % F	COVE	PROFILE	SURFACE EL: 668.91	USCS S	REMARKS
ш=						DESCRIPTION	SN	
	16 — - - - 18 —	S-3	(48)	1.1		orange (10YR 6/6) and moderate yellowish brown (10YR 5/4), and dark yellowish brown (10YR 4/2), very pale orange (10YR 8/2) and very light gray (N8), wet, no reaction to HCl, dense.		
650.1	20 —	S-4	6-16 50/6 (66)	1.3		Well Graded Gravel with Silt and Sand (GW-GM) - 50% gravel, 35% sand, 10% silt, 5% clay, fine to coarse, subrounded, elongated and flat gravel, 0.75" max size, hard, nonplastic, dark yellowish orange (10YR 6/6), moderate yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/2), very pale orange (10YR 8/2) and very light gray (N8), wet, no reaction to HCI, very dense.	GW- GM	
645.1	24 —	S-5	10-31 50/5 (81)	1.0		23.8' Silty Gravel with Sand (gm)- 65% gravel, 15% sand, 20% silt, fine to coarse, subangular, elongated and flat gravel, fine to coarse, subrounded to subangular sand, 0.07" max size, medium hard, nonplastic, dark yellowish brown (10YR 4/2) and grayish brown (5YR 3/2), no reaction to HCl, wet, very dense, gravel mostly shale.	gm	
642.2	26 —		40%			Well Graded Gravel (gw) - 100% cobbles, 12" max size elongated, subrounded, hard, high dry s rength, nonplastic, no dilatancy, low toughness, grayish red (10R 4/2), light gray (N7) and medium dark gray (N4), no odor, no reaction to HCl, wet.	gw	
DATE	STARTED): A	/20/07		GWI ·	DEPTH: NA DATE/TIME: NA	NOTE	ES: Bedrock Part of the
DATE (COMPLET GEOLOG	ΓED: 8, IST: JI	/29/07 LO		GWL:	DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core	14012	Mahantango Formation
APPRO	KED BY: DVED BY: NG CO.:	RJ			DRILL	.ER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck



D 11 D 11 D 11 D 1								
Bell Bend NPP	LOG OF BORING NO. B-330	PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	СООRDINATES N 339200.551 E 2405916.031	NOR REMARKS						
LEVATIO EET MSI DEPTH (FEET) MPLE N R RUN N R % REC R % REC	N 339200.551 E 2405916.031 O SURFACE EL: 668.91	κ REMARKS						
	DESCRIPTION	nscs						
R-1 (8%) 2.0 2.3 32 - R-2 (20%) 34 -	Cobbles - 100% cobbles, 8" max elongated, sub rounded, hard, high dry strength, nonplastic, no dilatancy, low toughness, grayish red (10R 4/2), light gray (N7) and medium dark gray (N4), no odor, no reaction to HCl, wet. Cobbles and Gravel- About 60% cobbles, 40% coarse gravel, 10" max elongated, subrounded to rounded, hard, high dry strength, nonplastic, no dilatancy, low toughness, light olive gray (5Y 6/1), brownish gray (5 YR 4/1), medium light gray (N6), very light gray (N2) and dark gray (N3), no odor, no reaction to HCl, wet. Cobbles and Gravel- About 60% cobbles, 40% gravel, 6" max elongated, subrounded, hard, high dry strength, nonplastic, low toughness, light olive gray (5Y 6/1), brownish gray (5 YR 4/1), medium light gray (N4) and very light gray (N2), no odor, no reaction to HCl, wet.	cb cb						
42	GWL: DEPTH: NA DATE/TIME: NA GWL: DEPTH: NA DATE/TIME: NA DRILLING METHOD: SPT/Tricone/ NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation						
CHECKED BY: EVZ APPROVED BY: RJB DRILLER: Craig VanVactor HELPER: Terry Duncan RIG: CME 75 Truck DRILLING CO.: Terracon								



	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-330		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 ⊩E	COORDINATES N 339200.551 E 2405916.031	SYMBOL				
EVA.	ОЕРТН (FEET)	MPLI	2W/6 R % I 8 (RC	OVE	PROFILE	SURFACE EL: 668.91	SS S	REMARKS			
		& Q	BLC	REC		DESCRIPTION	nscs				
617.4	44 —	R-5	88% (24%)	4.4'		Cobbles and Gravel- About 60% cobbles, 40% coarse gravel, 6" max elongated, subrounded to rounded, hard, high dry strength, nonplastic, light olive gray (5Y 6/1), brownish gray (5 YR 4/1), medium light gray (N4) and very light gray(N8), no odor, no reaction to HCl, wet. 51.5' Shale- Dark gray (N3) to grayish black (N2), medium soft, fresh to		51.5-51.7' Highly fractured			
616.2	52 — –					slight weathering, thinly laminated, highly fractured. 52.7' Sandstone- Light brownish gray (5YR 6/1) and brownish gray (5YR 4/1), fine .grain, well rounded.					
615.2	54 	R-6	84% (58%)	4.2'		Shale- Dark gray (N3) to grayish black (N2), medium soft, fresh to slight weathering, thinly laminated, calcite healed fracture, vertical beds in bottom face.					
612.9 612.4	56 — — — 58 —					Sandstone- Coarse grained 56.5' Shale- Highly fractured					
DATE (STARTED COMPLE GEOLOG KED BY:	ΓED: 8/ IST: JI	/20/07 /29/07 _O VZ		GWL:	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRILL	.ER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck			



	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-330		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	HE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339200.551 E 2405916.031	SYMBOL				
EVA'	DEPTH (FEET)	MPLE	N//6' R % F R (RC	OVE	PROFILE	SURFACE EL: 668.91	S SY	REMARKS			
E F		SA	BLC	REC	<u> </u>	DESCRIPTION	nscs				
	60 — 62 — 64 —	R-7	30% (0%) 94% (64%)	1.5' 4.7'		61.0-61.5' bedding vertical to core, thinly laminated. Shale- Dark gray (N3), slightly fractured, vertical bedding, slightly calcareous, weak reaction to HCI.					
	66 —		100%			Shale- Dark gray (N3), slightly fractured vertical bedding, veins of pyrite from 66.6'-67.7', noncalcareous, medium hard, thinly bedded, no reaction to HCI.					
	- -	R-9	(100%)	3.5'		68.5 slight color change medium dark gray (N4) to grayish black (N2).					
598.9	70 — - - - 72 —					BOTTOM OF BORING 70'					
DATE (STARTED COMPLET GEOLOG KED BY:	TED: 8/			GWL	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core	TON	FES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck			



N 339872.651 E 2406407.009 SURFACE EL: 683.70 DESCRIPTION DESCRIPTION Sand, soft, 0.04" max, low plasticity, slow dilatancy, low toughness, low dry strength, moderate yellowish brown (10YR 5/4) and light gray (N7), dry, no reaction to HCL, stiff.	D-11 D	Bell Bend NPP PROJECT NO. 07-3891									
Sandy Leon Ciby (21) - 40% sand, 10% sill, 10% cibidity, 20% cibidity, 20% cibidity and cibidity cibidity cibidity. Sandy Leon Ciby (21) - 40% sand, 10% sill, 10% cibidity, 20% cibidi	Bell Be	ena NPP					LOG OF BORING NO. B-331		PROJECT NO. 07-3891		
Sandy Leon Ciby (21) - 40% sand, 10% sill, 10% cibidity, 20% cibidity, 20% cibidity and cibidity cibidity cibidity. Sandy Leon Ciby (21) - 40% sand, 10% sill, 10% cibidity, 20% cibidi	TION MSL)	тн :T)	E NO.	" & (N) REC. 2D)	.RY (ft.)	:ILE		MBOL			
Sandy Leon Ciby (21) - 40% sand, 10% sill, 10% cibidity, 20% cibidity, 20% cibidity and cibidity cibidity cibidity. Sandy Leon Ciby (21) - 40% sand, 10% sill, 10% cibidity, 20% cibidi	EET	DEP (FEE	MPL RUI	DW/6 R % I & (R(OVE	 30	SURFACE EL: 683.70	SSS.	REMARKS		
Sand, soft, 0.4" max, low plasticity, slow dilatancy, low toughness, low ystrength, moderate yellowish brown (10YR 5/4) and light gray (NT), dry, no reaction to HCL, stiff. S-1	EI (F		SA OF	BLC	REC		DESCRIPTION	osn			
APPROVED BY: RJB DRILLER: Craig VanVactor HELPER: Terry Duncan RIG: CME 75 Truck	DATE (FIELD	2 — 2 — 4 — 6 — 10 — 12 — 14 — STARTEL COMPLE	ST-1 S-2 S-3 S-4	8-10 10 (20) 8-12 12 (24) 8-10 13 (23)	1.3	GWL:	sand, soft, 0.04" max, low plasticity, slow dilatancy, low toughness, low dry strength, moderate yellowish brown (10YR 5/4) and light gray (N7), dry, no reaction to HCL, stiff. 7.5' Silty Sand (SM) - 80% sand, 20% silt, fine to medium, rounded to subrounded sand, soft, 0.04" max, low plasticity, slow dilatancy, low toughness, low dry strength, dark yellowish orange (10YR 6/6) to moderate brown (10YR 5/4), light olive gray (5Y 6/1), grayish black (N2), and moderate brown (5 YR 4/4), moist to wet, no reaction to HCl, medium dense.	SM	Shelby Tube 5.0-7.0 Down Pressure 550 psi TES: Bedrock Part of the		
						חפוויו	ED: Craig VanVactor HELDED: Torny Duncan	BIC.	: CME 75 Truck		
						DKILL	TELFER. Telly Dulicall	NIC	J. GIVIL 13 TIUCK		



	Pall Pand NPP										
Bell B	end NPP					LOG OF BORING NO. B-331		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	F (SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RY (ft.)	 -	COORDINATES N 339872.651 E 2406407.009	SYMBOL				
EVAT	DEPTH (FEET)	MPLE	7%/6" 7% F 8 (RG	RECOVERY	PROFILE	SURFACE EL: 683.70	S SY	REMARKS			
13) 13		SA	BLC OF S	REC		DESCRIPTION	sosn				
	_							Shelby Tube 15.0-17.0			
	_										
	16 —	ST-2									
	_										
	_										
	18 —		7-27			Silty Sand (sm)- 80% sand, 15% silt, 5% gravel, fine to coarse elongated and flat, subangular gravel, fine to coarse, subrounded to angular sand, medium hard, 1" max, low plasticity, slow dilatancy, low					
	_	S-5	13 (40)	1.0		toughness, low dry strength, Brownish gray (5YR 4/1), wet, no reaction to HCl, dense.					
	_										
	_					20.0'					
663.7	20 —				0 80	Well Graded Sand with Gravel (sw) - 5% cobbles, 30% gravel, 60% sand, 5% silt, fine to coarse, subangular, elongated and flat gravel,	sw				
	_	S-6	5-15 22 (37)	0.7	900 9. 900 9.	fine to coarse, subangular sand, 0.75" max size, hard, nonplastic, dark gray (N3) and grayish black (N2), wet, no reaction to HCL,					
	_		(0.7		9 00	dense.					
	22 —				900						
661.2	_				100	22.5' Clayey Sand with Gravel (sc) - 15% gravel, 70% sand, 15% clay, fine	sc				
	_	S-7	5-7 10	0.6		to coarse, subangular, elongated and flat gravel, hard, low plasticity, high dilatancy, low dry strength, high toughness, dark gray (N3) and					
	_		(17)	0.0		grayish black (N2), wet, no reaction to HCl, medium dense.					
	24 —										
658.7	_					25.0'					
	_		11-20		000 B	Well Graded Sand with Gravel (sw) - 20% cobbles, 20% gravel, 60% sand, hard, fine to coarse, angular, elongated and flat cobbles and gravel, fine to coarse, subrounded to angular sand, 2" max size,	SW				
	26 —	S-8	16 (36)	0.5	9 00	nonplastic, dark gray (N3) and grayish black (N2), wet, no reaction to HCI, medium dense.					
	_				8 9 0	noi, median donos.					
	_					27.5'					
656.2	_				700	Well Graded Gravel with Sand (gw) - 60% gravel, 40% sand, hard, fine to coarse, angular, elongated and flat gravel, fine to coarse,	gw				
	28 —	S-9	9-16 10 (26)	0.6		subangular to angular sand, 2" max size, nonplastic, moderate red (5R 4/6) to dark reddish brown (10R 3/4) moderate yellowish brown					
	_					(10YR 5/4), wet, no reaction to HCl, medium dense.					
DATE	STARTEI	D: 9/	<u> </u> /19/07		GWL	: DEPTH: NA DATE/TIME: NA	NO	ITES: Bedrock Part of the			
	COMPLE					: DEPTH: NA DATE/TIME: NA		Mahantango Formation			
	GEOLOG KED BY:		₋O VZ		DRIL	LING METHOD: SPT/Tricone/ NQ Rock Core					
	OVED BY				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck			
DRILL	NG CO.:	Terraco	n			-					



Bell Be	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ilu NPP					LOG OF BORING NO. B-331		PROJECT NO. 07-3091			
ELEVATION (FEET MSL)	DЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339872.651 E 2406407.009 SURFACE EL: 683.70	SS SYMBOL	REMARKS			
		S. AS	BLO	REC		DESCRIPTION	nscs				
653.7	30 —	S-10	12-17 13 (30)	0.8	0 000 00 00 00 00 00 00 00 00 00 00 00	30.0' Well Graded Sand with Gravel (sw) - 30% gravel, 60% sand, fine to coarse, angular, elongated and flat gravel fine to coarse, angular to subangular, 2" max size, hard, nonplastic, moderate red (5R 4/6) to dark reddish brown (10R 3/4) and moderate yellowish brown (10YR 5/4), wet, no reaction to HCI, medium dense.	sw				
651.2	32 —	S-11	9-17 19 (36)	0.6		Well Graded Gravel (gw) - 60% cobbles, 30% gravel, 10% sand, fine to coarse, subangular, elongated and flat gravel, fine to coarse, subangular sand, 4" max size, hard, nonplastic, moderate red (5R 4/6) to dark reddish brown (10R 3/4) moderate yellowish brown (10YR 5/4), wet, no reaction to HCl, dense.	gw				
647.2	36 —	S-12	13-14 17 (31)	0.9		Well Graded Gravel with Sand (gw) - 40% cobbles, 30% gravel, 30% sand, hard, fine to coarse, subangular, elongated and flat gravel, medium to coarse, subangular sand, 2" max size, nonplastic, moderate red (5R 4/6) to dark reddish brown (10R 3/4) moderate yellowish brown (10YR 5/4) wet, no reaction to HCL, dense. Cobbles- About 80% cobbles, 20% gravel, hard, fine to coarse, sub angular, elongated and flat, 6" max size, nonplastic, no dilatancy, low dry strength, no toughness, moderate reddish orange (10R 6/6) olive gray (5Y 6/1), light gray (N7), medium gray (N5), wet, no reaction to HCl.					
643.7	40 —		(0%)			Cobbles- About 95% cobbles, 5% gravel, hard, fine to coarse, subangular, elongated and flat, 4" max size, nonplastic, no dilatancy, low dry strength, no toughness, brownish gray (5YR 4/1), light gray (N7), medium gray (N5) wet, no reaction to HCl.					
DATE S	42 — - - - STARTED	R-2	60% (30%)	3.0	GWI ·	DEPTH: NA DATE/TIME: NA	NOT	ES: Bedrock Part of the			
DATE C	COMPLET GEOLOG KED BY:	TED: 9/	/20/07		GWL:	DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation			
APPRO	OVED BY: NG CO.:				DRILL	ER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck			



Ball B	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	ena NPP					LOG OF BORING NO. B-331		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	H.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339872.651 E 2406407.009	SYMBOL			
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 683.70	SS S	REMARKS		
EL (F		SA	BLC	REC		DESCRIPTION	nscs			
638.7	44 — 46 — 48 — 50 — 52 — 54 — 558 — 58 —	R-3	100% (100%)	5.0		Shale- Grayish black (N2), noncalcareous, slightly fractured, medium hardness, thinly bedded, fracture zone at 48.2' and 48.6', no reaction to HCl. Shale- Dark gray (N3), noncalcareous, medium hardness, slightly fractured, slightly weathered, thinly bedded, fracture zone at 50.4', 50.8' and 54.7', no reaction to HCl. Shale- Dark gray (N3), calcareous, medium hardness, slightly fractured, slightly weathered, thinly bedded, fracture zone at 59.5, healed fracture at 55.5' and 59.5', reaction to HCl.				
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 9/	_0		GWL:	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation		
CHECKED BY: EVZ APPROVED BY: RJB DRILLER: Craig VanVactor HELPER: Terry Duncan RIG: CME 75 Truck DRILLING CO.: Terracon										



Ball Bana	Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend	a NPP					LOG OF BORING NO. B-331		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	E (f.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339872.651 E 2406407.009	SYMBOL			
EVA:	DEPTH (FEET)	MPLI	2W/6 R % F 8 (RC	OVE	PROFILE	SURFACE EL: 683.70	\S S:	REMARKS		
		SA	BLC	REC		DESCRIPTION	nscs			
	60 — 62 — 64 — 66 — 70 —	R-6	100% (80%)	4.9		Shale- Dark gray (N3), noncalcareous, medium hardness, slightly fractured, thinly bedded, fractures partially healed by calcite, fracture zone at 64.6' to 66.4', no reaction to HCI. Shale- Dark gray (N3), calcareous, medium hardness, slightly fractured, thinly bedded, calcite healed fracture at 69.5', veins of calcite and pyrite, reaction to HCI.				
DATE STA	MPLETE	ED: 9/			GWL:	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation		
CHECKED BY: EVZ						LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck		



B. II B.	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-332		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339907.334 E 2406874.307	SYMBOL				
EVA EET	DEPTH (FEET)	MPL RUI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 691.55	S S	REMARKS			
교底		SA	BLC	REC		DESCRIPTION	nscs				
	0 - - 2					Poorly Graded Sand with Gravel and Silt (sp-sm) - 20% gravel, 70% sand, 10% silt, fine to coarse, subangular to angular gravel, elongated and flat, fine to coarse, subangular to angular sand, 0.4" max size, hard, nonplastic, moderate brown (5YR 4/4), dry, no reaction to HCl, loose.	sp- sm				
	4 —	S-1	2-3 2 (5)	1.2							
	6 —	S-2	3-4 5 (9)	1.0	4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 -						
684.1	8 	S-3	4-4 5 (9)	1.3	2 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7.5' Silty Sand (SM)- 80% sand, 10% silt, 5% clay, 5% gravel, fine sand, fine gravel, nonplastic, moderate brown (5YR 4/4), dry, no reaction to HCL, loose.	SM				
681.6	- 10 — - -	S-4	2-4 5 (9)	1.5	20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Poorly Graded Sand with Gravel (sp) - 15% gravel, 80% sand, 5% silt, fine to coarse, angular, elongate and flat gravel, hard, fine, rounded sand, soft, nonplastic, pale yellowish brown (10YR 6/2), dry, no reaction to HCL, loose.	sp				
679.1	12 — - - - 14 —	S-5	4-4 5 (9)	0.9		Silty Sand (sm) - 85% sand, 15% silt, fine to coarse subangular to rounded sand, hard, 0.04" max size, nonplastic, dark yellowish brown (10YR 4/2) to grayish brown (5YR 3/2), wet, no reaction to HCl, loose to medium dense.	sm	Sample slid out of sampler- reconstructed as best as possible- wet due to helper rinsing off sample that fell on ground			
DATE C FIELD C CHECK	STARTED COMPLET GEOLOG KED BY:	TED: 9/ IST: JI E	_O VZ		GWL: DRILL	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/NQ Rock Core		TES: Bedrock Part of the Mahantango Formation			
	VED BY: NG CO.:				DRILL	ER: Craig VanVactor HELPER: Terry Duncan	RIG	i: CME 75 Truck			



Dall D	end NPP							DDO IECT NO. 07 2004
Bell Be	ena NPP					LOG OF BORING NO. B-332		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)]_E	COORDINATES N 339907.334 E 2406874.307	SYMBOL	
EVA:	ОЕРТН (FEET)	MPLI R RUI	OW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 691.55	SS S	REMARKS
<u>п</u> н		S O	BLC	REC		DESCRIPTION	nscs	
	_							
	16 	S-6	4-5 5 (10)	1.3				
	18 	S-7	6-6 7 (13)	1.1				
671.6	20 —	S-8	2-3 3 (6)	1.1		Sandy Silt (ML) - 50% silt, 40% sand, 5% clay, 5% gravel, fine to coarse, angular, elongate and flat gravel, medium hard, fine to coarse, subangular to subrounded sand, 0.7" max size, nonplastic, grayish brown (5YR 3/2), wet, no reaction to HCL, medium stiff.	ML	
669.1	22 	S-9	3-15	0.8		22.5' Poorly Graded Sand with Silt and Gravel (sp-sm) - 10% cobbles, 20% gravel, 60% sand, 10% silt, coarse, subangular, elongated and flat gravel, hard, fine to medium, subrounded to angular sand, 1" max	sp- sm	
	24 	5-9	33 (48)	0.8	0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	size, nonplastic, moderate yellowish brown (10YR 5/4) to dusky yellow brown (10YR 2/2), wet, no reaction to HCl, dense.		
666.6	26 	S-10	15-34 50/5 (84)	1.0		Well Graded Gravel (gw) - 100% gravel, subangular, elongated and flat, hard, nonplastic, moderate yellowish brown (10YR 5/4), wet, no reaction to HCl, very-dense.	gw	
	28 	S-11	50/6 (50)	0.1				
DATE	OTADTE:		22/07		CVA	Cobbles - About 90% cobbles, 5% gravel 5% sand, fine to coarse,	NOT!	CC. Dodwook Dowl of the
DATE FIELD	STARTED COMPLE ^T GEOLOG KED BY:	TED: 9/ IST: JL	23/07 24/07 -O VZ		GWL	: DEPTH: NA DATE/TIME: NA : DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/NQ Rock Core	NOIT	ES: Bedrock Part of the Mahantango Formation
APPRO	NED BY: OVED BY: ING CO.:	RJI	В		DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck



Bell Re	ell Bend NPP PROJECT NO. 07-3891								
Bell B	ciid ivi i					LOG OF BORING NO. B-332		1 NOULO 1 NO. 07-3031	
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339907.334 E 2406874.307	SYMBOL	REMARKS	
LEV, FEET	DEI (FE	AMP R RL	OW/ S % R (R	COV	PRO	SURFACE EL: 691.55	uscs s	INLIVIAINIO	
ш=		ος O	BE	A.		DESCRIPTION	SN		
652.6	30 — 32 — 34 — 36 — 38 — 38 — 3	R-1	50% (0%)	2.5		4.0" max size, subangular, nonplastic, low toughness, no dilatancy, low dry strength, dark gray (N3), no odor, no reaction to HCl, verydense, wet. 39.0' No Recovery	ח		
DATE (FIELD CHECK	40 — 42 — STARTED COMPLET GEOLOG KED BY:	ΓED: 9, IST: JI E	LO VZ	0.0	GWL:	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/NQ Rock Core FR: Craig VanVactor HELPER: Terry Duncan		FES: Bedrock Part of the Mahantango Formation	
DATE (FIELD CHECK APPRO	COMPLE ^T GEOLOG	ΓED: 9, IST: JI E RJ	/24/07 LO VZ B		GWL:	DEPTH: NA DATE/TIME: NA			



D.II.D.	I NDD							DDO 1507 NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-332		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339907.334 E 2406874.307 SURFACE EL: 691.55	SYMBOL	REMARKS
ELE) FEE	E)	SAMF OR R	LOW OR 9	00=	P.R.		nscs	
			В	8	2-2	DESCRIPTION	ő	
646.6	44 — - - 46 —					Cobbles - About 90% cobbles, 5% gravel 5% sand, fine to coarse, 4.0" max size, subangular, nonplastic, low toughness, no dilatancy, low dry strength, dark gray (N3), no odor, no reaction to HCl, verydense, wet. No Recovery		
	48 —	R-4	0% (0%)	0.0		49.0'		
642.6	50 —		100%			Shale - Dark gray (N3), soft, moderately weathered, intensely fractured due to coring activity, noncalcareous, moderately bedded, pyrite lenses between fractures, calcite veins parallel to bedding plane (approximately 30°-40° angle to core).		
	52 -	R-5	(36%)	5.0				
	54 — - - - 56 —					Pyrite lenses in between bedding planes at break Calcite veins- becoming more parallel to bedding plane (approximately 30-40° angle to core) Shale - Dark gray (N3), moderately hard, fresh, slightly to moderately fractured, slightly calcareous, contains few calcite veins, thickly bedded, very thinly laminated and microfractured calcite layers, thin lenses of pyrite throughout. Very thinly laminated calcite and shale layers - horizontal, microfractures present Thin lens of pyrite sand - horizontal, all breaks mechanical		
	- - - 58 -	R-6	100% (98%)	5.0		Slight reaction to HCI		
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 9	/23/07 /24/07 LO		GWL	DEPTH: NA DATE/TIME: NA DEPTH: NA DATE/TIME: NA LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation
I	OVED BY: ING CO.:				DRIL	LER: Craig VanVactor HELPER: Terry Duncan	RIG:	CME 75 Truck



Ball Ba	end NPP							DDO IECT NO. 07 2004
Bell Be	and NPP					LOG OF BORING NO. B-332		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339907.334 E 2406874.307	SYMBOL	
EVA'	DEPTH (FEET)	MPLE	DW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 691.55	S S	REMARKS
EI (F		SA	BLC	REC		DESCRIPTION	nscs	
	60 —	R-7	92% (78%)	4.6		Shale - Dark gray (N3), moderately hard, fresh, slightly to moderately fractured, slightly calcareous, thickly bedded calcite layers parallel to bedding at 59.1', 59.4' and 61.2', bedding planes visible at breaks, slight reaction to HCI. Shale - Dark gray (N3), moderately hard, fresh, slightly to moderately fractured, slightly calcareous, thickly bedded.		
	66 —	R-8	100% (98%)	4.5		66.0'-67.3' Breccia-like zone of calcite and shale, slight reaction to HCI. 66.0-67.3' Breccia-like zone of calcite and shale		
621.6	70 — - - -	R-9	100% (93%)	1.5		Shale - Dark gray (N3), moderately hard, fresh, slightly to moderately fractured, slightly calcareous, thickly bedded, very few, thin calcite veins throughout, Breccia-like zone at 69.0', slight reaction to HCI. 69.0 Breccia-like zone BOTTOM OF BORING 70'		
1	72 — - STARTED COMPLET		/23/07 /24/07		1	: DEPTH: NA DATE/TIME: NA : DEPTH: NA DATE/TIME: NA	NOT	FES: Bedrock Part of the Mahantango Formation
CHECK APPRO	GEOLOG KED BY: DVED BY: NG CO.:	E RJ	VZ B			LING METHOD: SPT/Tricone/NQ Rock Core LER: Craig VanVactor HELPER: Terry Duncan	RIG	: CME 75 Truck



Boll Br	Sell Bend NPP PROJECT NO. 07-3891								
Dell De	ena NPP					LOG OF BORING NO. B-333		PROJECT NO. 07-3091	
ELEVATION (FEET MSL)	TH (T	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339667.255 E 2406421.421	SYMBOL		
EVA:	DEPTH (FEET)	MPLE	7W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 678.29	SSS	REMARKS	
EL (F		S O	BLC	REC		DESCRIPTION	SOSN		
675.8 673.3	0	S-1	5-4 4 (8)	1.5		2.5' Clayey Sand (sc) - 70% sand, 25% clay, 5% silt, soft, fine, rounded, spherical sand, 0.04" max size, low plasticity, no dilatancy, high toughness, low dry strength, moderate yellowish brown (10 YR 5/4) and pale yellowish brown (10 YR 6/2), moist, no reaction to HCI, loose 5.0' Silty Sand (SM) - 80 % sand, 10% silt, 10% clay, subrounded, fine sand, soft, 0.04" max size, nonplastic, moderate yellowish brown (10	sc	PP=1.0 tsf	
668.3	6 — 8 — - 10 —	S-2 S-3	7-8 6 (14)	1.5		YR 5/4) and dark yellowish brown (10 YR 6/6), moist, no reaction to HCI, medium-dense.			
665.8	- - 12 —	S-4	6-14 13 (27)	1.5		Silty Sand with Gravel (sm)- 15% cobbles, 10% gravel, 60% sand, 15% silt, fine to coarse, subrounded, flat and elongated, gravel, fine to coarse, subrounded sand, 1" max size, hard, very hard sandstone cobbles, nonplastic, dark yellowish brown (10 YR 6/6) to moderate brown (5YR 3/4), wet to moist, no reaction to HCl, medium-dense.	sm		
	14 —	S-5	11-13 9 (22)	1.0		Poorly Graded Gravel with Silt and Sand (GP-GM)- 65% gravel, 30% sand, 5% silt, fine gravel, medium to coarse sand, nonplastic, dark yellowish brown (10YR 6/6) to moderate brown (5YR 3/4), moist, no reaction to HCL, medium dense.	GP- GM	TEO. Badash Bada 6th	
DATE (STARTED COMPLE ^T GEOLOG KED BY:	TED: 9/ IST: Jl	/20/07 /21/07 _O VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO [*]	TES: Bedrock Part of the Mahantango Formation	
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig Van Vactor HELPER: T. Duncan, J. Boulton	RIG	S: CME 75 truck	



Bell B	end NPP					LOG OF BORING NO. B-333		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	//6" & (N) % REC. (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339667.255 E 2406421.421	SYMBOL	REMARKS
LEV/	DEF (FE	4MPI R RL	BLOW/6" OR % R & (RQI	COVI	PRO	SURFACE EL: 678.29		REMARKS
J) (F		/S	BL	RE		DESCRIPTION	nscs	
663.3	_				7. II.	15.0' Well Graded Gravel with Silt and Sand (gw-gm)- 15% cobbles, 55%	gw-	
	16 	S-6	10-9 9 (18)	0.8		gravel, 20% sand, 10% silt, fine, flat and elongated, subangular, gravel, fine to coarse subangular sand, 1" max size, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCl, medium dense.	gm	
	18 —	S-7	25-48 20 (68)	0.6		Well Graded Gravel with Silt and Sand (gw-gm)- 20% cobbles, 50% gravel, 20% sand, 10% silt, fine to coarse, subangular flat and elongated gravel, fine to coarse, subrounded to subangular sand, 1.5" max size, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCl, very dense.		
658.3	20 —					20.0' Well Graded Gravel with Sand (gw)- 20% cobbles, 65% gravel, 10% sand, 5% silt, fine to coarse subangular to subrounded flat and	gw	
	- -	S-8	9-7 7 (14)	0.8		elongated, gravel, fine to coarse subangular to subrounded hat and elongated, gravel, fine to coarse, subangular to subrounded sand, 1.5" max size, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCl, medium-dense.		
	22 —					99.51		
655.8	- -	S-9	7-13 15 (28)	0.9		Well Graded Gravel with Sand (gw) - 25% cobbles, 50% gravel, 20% sand, 5% silt, fine to coarse, angular to subrounded elongated, gravel, fine to coarse, subangular to subrounded sand, 1.5" max size, nonplastic, moderate brown (5YR 3/4), moist, no reaction to HCl, medium-dense.	gw	
653.3	24 					25.0'		
000.0	26 	S-10	10-11 38 (49)	0.8		Poorly Graded Gravel and Sand (gp) - 20% cobbles, 50% gravel, 20% sand, 5% silt, fine to coarse, subangular, flat and elongated gravel, fine to coarse, subangular sand, 1.5" max size, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCl, dense.	gp	
650.8	_					27.5' Well Graded Sand with Silt and Gravel (SW-SM) - 48% sand, 42% gravel, 6% silt, 4% clay, fine to coarse, subangular, flat and elongated	SW-	
	28 —	S-11	15-12 12 (24)	1.0	51/36 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	gravel, 6% slit, 4% day, life to coarse, subangular, liat and elongated gravel, fine to coarse, subangular sand, 1.5" max size, nonplastic, moderate brown (5YR 3/4) to medium dark gray (N4), wet, no reaction to HCl, medium dense to dense.		
DATE	STARTE): 9/	<u> </u> /20/07			DEPTH: N/A DATE/TIME: N/A	NOTE	S: Bedrock Part of the
	COMPLE					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
	GEOLOG		_0		DRILL	ING METHOD: SPT/Tricone/ NQ Rock Core		
	KED BY: OVED BY		VZ B		DRILL	LER: Craig Van Vactor HELPER: T. Duncan, J. Boulton	RIG:	CME 75 truck
DRILL	NG CO.:	Terraco	n					



D !! D	Bell Bend NPP PROJECT NO. 07-3891								
Bell Ben	nd NPP					LOG OF BORING NO. B-333		PROJECT NO. 07-3891	
ELEVATION (FEET MSL)	E E	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 	COORDINATES N 339667.255 E 2406421.421	SYMBOL		
EVA	DEPTH (FEET)	MPLI R RUI	2W/6 R % I & (R(OVE	PROFILE	SURFACE EL: 678.29	35.53	REMARKS	
<u> </u>		SA	BLC	REC		DESCRIPTION	nscs		
642.8			8-12 15 (27) 13-18 19 (37) 83% (67%)			Poorly Graded Gravel with Sand (gp)- 10% cobbles, 75% gravel, 10% sand, 5% silt, fine to coarse, flat and elongated, 35.5' max size, soft shale gravel and cobbles, nonplastic, medium dark gray (N4), wet, no reaction to HCI, very dense. Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, slightly fractured, thinly bedded with structure only visible at mechanical and natural breaks, large calcareous vein 35.8'-36.5'. Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, slightly fractured, thinly bedded with structure only visible at mechanical and natural breaks, no reaction to HCI. Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, slightly fractured, thinly bedded with structure only visible at mechanical and natural breaks, no reaction to HCI.		ES: Bedrock Part of the Mahantango Formation	
FIELD GI					DRILI	ING METHOD: SPT/Tricone/ NQ Rock Core			
CHECKED BY: EVZ APPROVED BY: RJB DRILLER: Craig Van Vactor HELPER: T. Duncan, J. Boulton RIG: CME 75 truck DRILLING CO.: Terracon							CME 75 truck		



Bell Be	end NPP					LOG OF BORING NO. B-333		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339667.255 E 2406421.421	SYMBOL	
EVA:	ОЕРТН (FEET)	MPLE	3 % F 3 % F 3 (RG	OVE	PROFILE	SURFACE EL: 678.29	SS)	REMARKS
		SAI	BLC OF	REC		DESCRIPTION	nscs	
EI (F	44 — 46 — 48 — 50 — 52 — 54 — 56 — — — — — — — — — — — — — — — — —	R-3	100% (100%)	5.0 5.0		Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, thinly bedded with structure only visible at mechanical and natural breaks, very slightly fractured, no reaction to HCl. Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, thinly bedded with structure only visible at mechanical and natural breaks, very slightly fractured, fossiliferous, zone of calcite infilled cast from 60.9'- 62.3', no reaction to HCl.	OSO	Natural break at 48.8'- all others are mechanical.
	58 — STARTED		(20/07		1	structure only visible at mechanical and natural breaks, moderately to slightly fractured, foliated calcite layer with pyrite at 64.5', slight reaction to HCl. DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the
FIELD	COMPLE ⁻ GEOLOG KED BY:	IST: JI				DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig Van Vactor HELPER: T. Duncan, J. Boulton	RIG	: CME 75 truck
					•			



Dall Barrel MBB							DDO 1507 NO. 07 2004
Bell Bend NPP					LOG OF BORING NO. B-333		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339667.255 E 2406421.421	SYMBOL	
EVATIO EET MS DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 678.29	SS S)	REMARKS
<u> </u>	S, O	BL(REC		DESCRIPTION	nscs	
60 — 62 — 64 — 66 — 68 — 70 — 608.0	R-6	100% (96%) 96% (90%)	5.0		Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, thinly bedded with structure only visible at mechanical and natural breaks, no reaction to HCl. Shale- Dark gray (N3) to grayish black (N2), noncalcareous, mostly fresh to slightly weathered, moderately hard, thinly bedded with structure only visible at mechanical and natural breaks, very slightly fractured, no reaction to HCl.		
72 — DATE STARTED DATE COMPLE FIELD GEOLOG	TED: 9	//20/07 //21/07 LO		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation
CHECKED BY: APPROVED BY: DRILLING CO.:	: RJ			DRILI	LER: Craig Van Vactor HELPER: T. Duncan, J. Boulton	RIG:	: CME 75 truck



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-334		
ELEVATION (FEET MSL)	Ŧ£	N N O	BLOW/6" & (N) OR % REC. & (RQD)	RY (ft.)	ILE	COORDINATES N 339700.596 E 2406888.488	SYMBOL	
EVA.	DEPTH (FEET)	SAMPLE NO OR RUN NO	2W/6 R % F & (RC	RECOVERY	PROFILE	SURFACE EL: 671.21		REMARKS
□ F)		δρ	BLC	REC		DESCRIPTION	nscs	
	0							
669.7	2 —	S-1	2-17 50/2 (67)	0.8		1.5' Clayey Sand with Gravel (sc) - 20% gravel, 60% sand, 20% clayey silt, coarse, subangular, elongated and flat gravel, subrounded to rounded fine to coarse sand, 2.0" max size, hard, low plasticity, high toughness, high dry strength, low dilatancy, moderate brown (5 YR 5/	sc	PP= 1.0 tsf
668.2	_					4) and grayish red (5 YR 4/2), moist, no reaction to HCl, very dense. 3.0'		
000.2	4 —	S-2	24-18 16 (34)	1.1		Well Graded Gravel with Sand (gw) - 80% sandstone cobbles, 20% sand, subangular, elongated and flat gravel, medium to coarse, subangular to angular sand, 2.0" max size, hard, nonplastic, moderate red (SR 5/4) and light gray (N7), dry, no reaction to HCI,	gw	
666.7	- -	S-3	6-20 28 (48)	1.0		dense. 4.5' Silty Clayey Sand with Gravel (SC-SM) - 45% sand, 45% gravel, 5% silt, 5% clay, fine to coarse, subangular, elongated and flat gravel, fine to coarse, subangular sand, 1.0" max size, hard, nonplastic, moderate brown (5 YR 4/4) to moderate red (5 R 5/4) and light gray	SC- SM	
	6 —		12-30			(N7), dry, no reaction to HCI, dense to very dense.		
	_	S-4	45 (75)	1.1				
	8 —	S-5	8-31 28 (59)	1.1				
662.2	_	S-6	11-40 50	1.1		9.0' Well graded Gravel with Sand (gw) - 45% cobbles, 15% gravel, 40% sand, fine to coarse, angular, elongated and flat gravel, medium to coarse, subangular sand, 2.0" max size, hard, nonplastic, moderate	gw	
660.7	10 —		(90)			brown (5 YR 5/4), light gray (N7), moderate red (5R 4/4), dry, no reaction to HCl, very dense.	CVA	
	-	S-7	29-35 32 (67)	1.4		Well Graded Sand with Silt and Gravel (SW-SM) - 50% sand, 40% gravel, 5% silt, 5% clay, fine to coarse, angular, elongated and flat gravel, medium to coarse, subangular sand, 2.0" max size, hard, nonplastic, moderate brown (5 YR 5/4), light gray (N7), moderate red (5R 4/4), dry, no reaction to HCl, very dense.	SW- SM	
659.2	12 	S-8	50/5" (50+)	0.4		Well Graded Gravel with Sand (gw) - 60% cobbles, 20% sand, 20% gravel, fine to coarse, subangular to angular, elongated, gravel, fine to coarse, subangular to angular sand, 0.75" max size, hard, nonplastic, dark gray (N3), wet, no reaction to HCl, very dense.	gw	
657.7	14 —	S-9	10-20 50 (70)	1.2		13.5' Well Graded Gravel with Silt and Sand (gw-gm) - 10% cobbles, 60% gravel, 20% sand, 10% silt, fine to coarse, angular, flat gravel, fine to coarse, subangular to angular sand, 0.75" max size, hard, nonplastic, moderate brown (5 YR 4/4), wet, no reaction to HCl, very dense.	gw- gm	
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 9/ BIST: JI	/22/07 /23/07 _O VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY NG CO.:	: RJI	В		DRIL	LER: Craig Van Vactor HELPER: T. Duncan	RIG	6: CME 75 truck



Dall B	and NDD							DDO IECT NO. 07 2004
Bell D	end NPP					LOG OF BORING NO. B-334		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	тн ЕТ)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339700.596 E 2406888.488	SYMBOL	SEMANICO
LEVA FEET	DEPTH (FEET)	AMPL R RU	OW/6	COVE	PRO	SURFACE EL: 671.21	S S	REMARKS
<u> </u>		% Ō	BL	RE		DESCRIPTION	nscs	
656.2 654.7	16 —	S-10	16-26 18 (44)	0.8		Clayey Gravel with Sand (gc) - 10% cobbles, 45% gravel, 25% sand, 20% fat clay, hard, fine to coarse, subrounded, elongated and flat gravel, fine to coarse, subrounded to subangular sand ,low plasticity, high toughness, no dilatancy, high dry strength, dark gray (N3), wet, no reaction to HCl, dense.	gc	
054.7		S-11	23-23 22 (45)	1.0		Well Graded Gravel with Sand (gw) - 60% cobbles, 20% sand, 15% gravel, 5% silt, fine to coarse, subangular to subrounded, elongated and flat gravel, fine to coarse, subangular to subrounded sand, 2.0" max size, hard, nonplastic, medium gray (N4) to moderate red (5R 5/4), wet. no reaction to HCI, dense.	gw	
	18 	S-12	22-50/5 (50+)	0.6		Well Graded Gravel with Sand (gw) - 80% cobbles, 10% gravel, 10% sand, fine to coarse, subangular, elongated and flat gravel, fine to coarse, subangular sand, 2.0" max size, hard, nonplastic, dark gray (N3) and moderate red (5 YR 5/4), wet, no reaction to HCl, dense to very dense.		
GEO O	20 —	S-13	7-15 23 (38)	0.6		21.0'		Switched to NQ coring at 21.0' due to poor recovery in split spoons.
650.2	22 —					Well Graded Gravel with Sand (gw) - 80% gravel, 20% sand, fine to coarse, subrounded to subangular, elongated and flat gravel, fine to coarse, subrounded to subangular sand,3.0" max size, hard, nonplastic, light bluish gray (5B 7/1) and greenish gray (5GY 6/1), wet, no reaction to HCl.	gw	
	24 —	R-1	60%	2.7				
	26 —					Cobbles with Gravel- About 85% cobbles, 15% gravel, 12" max size, hard, sub rounded, elongated and flat, fine to coarse, nonplastic, no toughness, no dilatancy, high dry strength, light bluish gray (5B 7/1), greenish gray (5GY 6/1), and medium bluish gray (5B 5/1), no odor, no reaction to HCl, wet.		
	28 	R-2	56% (0%)	2.8				
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 9/	/22/07 /23/07 _O VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY	RJ	В		DRILL	.ER: Craig Van Vactor HELPER: T. Duncan	RIG	6: CME 75 truck
DRILLI	NG CO.:	I erraco	n					



Bell Bend NPP		PROJECT NO. 07-3891
	LOG OF BORING NO. B-334	
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. OR RUN NO. RLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339700.596 E 2406888.488 SURFACE EL: 671.21	OBWAS REMARKS
LEVATIO TEET MS DEPTH (FEET) AMPLE N R RUN N R RUN N R RUN N R RUN N R REG R ROD)	SURFACE EL: 671.21	κεMARKS
AS OID SEC	DESCRIPTION	nscs
30 — R-3 48% (0%) 2.4 34 — 36 — 38 — R-4 46% (0%) 2.3	Cobbles with Gravel- About 75% cobbles, 25% gravel, hard, sub rounded to round, elongated and flat, fine to coarse, nonplastic, no toughness, no dilatancy, high dry strength, greenish gray (5GY 6/1), dusky red (5 R 3/4), medium gray (N5), very light gray (N8), no odor, no reaction to HCl, wet. Cobbles with Gravel- About 95% cobbles, 5% gravel, 6.0" max size, hard, sub angular to angular, elongated and flat, fine to coarse, nonplastic, no toughness, no dilatancy, high dry strength, dusky red (5R 3/4), medium dark gray (N4), no odor, no reaction to HCl, wet.	
A0 — 42 — 28% 1.4 — R-5 (0%) 1.4 DATE STARTED: 9/22/07 DATE COMPLETED: 9/23/07 FIELD GEOLOGIST: JLO	Cobbles with Gravel- About 85% cobbles, 15% gravel, 3.0" max size, hard, sub rounded to rounded, elongated and flat, fine to coarse, nonplastic, no toughness, no dilatancy, high dry strength, medium dark gray (N4) and light gray (N6), no odor, no reaction to HCI, wet. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/ NQ Rock Core	No water returns from approximately 43' to 70.5' NOTES: Bedrock Part of the Mahantango Formation
CHECKED BY: EVZ APPROVED BY: RJB	DRILLER: Craig Van Vactor HELPER: T. Duncan	RIG: CME 75 truck
DRILLING CO.: Terracon		



	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	end NPP					LOG OF BORING NO. B-334		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	TH TT)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339700.596 E 2406888.488	SYMBOL			
EVA EET	DEPTH (FEET)	MPL R RU	DW/6 R % & (R(COVE	PROFILE	SURFACE EL: 671.21	.S S.	REMARKS		
		% <u>Q</u>	BLO	REC		DESCRIPTION	nscs			
625.7	44 — 46 — 48 — 50 — 52 — 54 — 56 — 56 —	გ-6	82% (66%)	4.1		Shale- Dark gray (N3), noncalcareous to slightly calcareous, mostly fresh to slightly weathered, moderately hard, slightly fractured, thinly bedded with structure only visible at mechanical and natural breaks, no reaction to to weak reaction to HCI. 46.0'-46.6' intensely fractured. 47.9' iron staining. 48.3'-49.4' large calcite vein. Shale- Dark gray (N3), noncalcareous to slightly calcareous, mostly fresh to slightly weathered, moderately hard, slightly fractured, thinly bedded with structure only visible at mechanical and natural breaks, slightly fossiliferous, no reaction to weak reaction to HCI. 51.1'-51.2' calcareous vein with pyrite, perpendicular to bedding. 51.0'-56.6' zone of calcite veins mostly parallel to bedding.	NSI			
DATE	58 —	R-8	98% (98%)	4.9	CIAII	55.5'-55.9' calcite vein with breccia appearance. DEPTH: N/A DATE/TIME: N/A	NOT	ES: Bedrock Part of the		
DATE STARTED: 9/22/07 DATE COMPLETED: 9/23/07 FIELD GEOLOGIST: JLO CHECKED BY: EVZ					GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core	INOT	Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRILL	.ER: Craig Van Vactor HELPER: T. Duncan	RIG:	CME 75 truck		



Bell Be	end NPP					LOG OF BORING NO. B-334		PROJECT NO. 07-3891
ION (ISI)	IC	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	l l	COORDINATES N 339700.596 E 2406888.488	USCS SYMBOL	
ELEVATION (FEET MSL)	DEPTH (FEET)	APLE RUN	W/6" (RQ	OVEF	PROFILE	SURFACE EL: 671.21	SSY	REMARKS
HE		SAN	BLO OF 8	REC		DESCRIPTION	USC	
600.7	60 — 62 — 64 — 66 — 70 — 72 — STARTED		100% (100%)	4.8	GWL	Shale- Dark gray (N3), noncalcareous to slightly calcareous, mostly fresh to slightly weathered, moderately hard, slightly fractured, thinly bedded with structure only visible at mechanical and natural breaks, fractures healed with calcite with a few brachiopods fossils cast near bottom, no reaction to weak reaction to HCl. BOTTOM OF BORING 70.5'	NO	Special care sample taken at 63.7'-65.5'. TES: Bedrock Part of the
DATE COMPLETED: 9/23/07 FIELD GEOLOGIST: JLO					GWL:	: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/ NQ Rock Core		Mahantango Formation
CHEC	KED BY:	Е	VZ					
	OVED BY: ING CO.:				DRILI	LER: Craig Van Vactor HELPER: T. Duncan	RIG	: CME 75 truck
DIVILLI	140 00	i c iiaco	11					



Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-335		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	표(:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 340767.344 E 2405475.557	SYMBOL			
EET	DEPTH (FEET)	MPL R RU	2W/6 R % 8 (R(OVE	PROFILE	SURFACE EL: 793.71	SS S	REMARKS		
E F		S O	BLC	REC		DESCRIPTION	sosn			
790.7	2 —		4-5		्र _क - अ	3.0' Silt with Gravel (ml) - 20% gravel, 60% silt, 20% clay, fine to coarse, angular, shale gravel, low plasticity, low strength, slow dilatancy, medium toughness, dark yellowish orange (10YR 6/6), moist, no	ml	PPT = 1.5 TSF		
	4 — - - 6 — - -	S-1	10 (15)	1.1	10	medium toughness, dark yellowish orange (10YR 6/6), moist, no reaction to HCl, stiff.				
785.7	8 — - 10 — - 12 —	S-2	8-13 14 (27)	0.9		Clayey Gravel (gc) - 55% gravel, 10% sand, 35% fat clay, fine to coarse, flat and elongated, angular gravel, fine to coarse subangular sand, low plasticity, low dry strength, no dilatancy, low toughness, dark yellowish orange (10YR 6/6), moist, no reaction to HCl, medium dense, weak cementation.	gc			
780.7	- 14 	S-3	11-10 12 (22)	1.0		Clayey Gravel (gc) - 55% gravel, 5% sand, 40% clay, fine to coarse, angular to rounded, flat gravel, fine to coarse, rounded sand, low plasticity, low dry strength, low dilatancy, low toughness, yellowish orange (10YR 6/6), moist, no reaction to HCI, medium dense.	gc			
	STARTED		1/11/2007			DEPTH: 8.62 DATE/TIME: 11/11/2007, 15:30	NO	TES: Bedrock Part of the Mahantango Formation		
l	COMPLE ^T GEOLOG		1/11/2007 FW	,		DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Manantango i Omiation		
	KED BY:		VZ							
	OVED BY:				DRILL	LER: Sam Silverman HELPER: Mike Steinbach	RIG	3: CME 55 truck		
DRILLI	NG CO.:	l erraco	n							



Bell Bend	d NPP					LOG OF BORING NO. B-335		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	Ξ£	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340767.344 E 2405475.557	SYMBOL				
EVA'	DEPTH (FEET)	MPLE	OW/6' R % F & (RG	OVE	PROFILE	SURFACE EL: 793.71	SSSY	REMARKS			
<u>п</u> н		S O	BLC	REC		DESCRIPTION	nscs				
	_ _ 16 — _ _										
775.7	18 —	S-4	50/5" (50+)	.4		18.0' Silty Gravel with Sand (gm) - 55% gravel, 15% sand, 20% silt, 10% clay, fine to coarse, angular, flat and elongated gravel, moderate hardness, fine to coarse, angular sand, soft, low plasticity, low dry	gm				
774.7	20 —	R-1	50%	1.0		strength, low dilatancy, moderate toughness, yellowish orange (10)/ (6/6), wet, no reaction to HCl, very dense. Shale- Calcareous, medium gray (N4), medium hardness, fractures at 45° to rock core, thinnly bedded, reaction to HCl.		Begin Coring at 19.0-ft			
772.7	22 —					21.0' Silty Shale- Medium gray (N4), very little to slightly fractured, medium hardness, fractures at 45° from rock core, 1.0' to 2.0' fracture spacing, vertical bedding planes, laminated thickness, reaction to HCl, calcareous.	-				
:	_ 24 — _ _ _	R-2	100% (88%)	5.0							
	26 — - - - 28 —					Siltstone- medium gray (N4), medium hardness, slightly to very slightly fracture, fractures at 45° to rock core, approximately 1.0' to 1.5' fracture spacing, reaction to HCl, thickly bedded, calcareous.					
DATE ST.			100% (92%) 1/11/2007 1/11/2007			DEPTH: 8.62 DATE/TIME: 11/11/2007, 15:30 DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the Mahantango Formation			
FIELD GE	EOLOG	IST: P	FW			LING METHOD: SPT/Tricone/NQ Rock Core					
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon					DRILL	ER: Sam Silverman HELPER: Mike Steinbach	RIG	S: CME 55 truck			



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP		LOG OF BORING NO. B-335		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)		COORDINATES N 340767.344 E 2405475.557	SYMBOL							
LEVATIO EET MS DEPTH (FEET) (MPLE N R R R R R R R R R R R C R C R C R C R C	PROFILE	SURFACE EL: 793.71	SS	REMARKS						
SA SA OR OR OR OR OR		DESCRIPTION	nscs							
30 — 32 — R-4 100% (90%) 5.00		Siltstone- Dark gray (N3), medium hardness, very slightly to slightly fractured, fracture spacing 1.0' to 1.5', fractures 45° to rock core, slightly weathered on fractures, thickly bedded, calcareous. 36.0' Shale- Dark gray (N3), medium hardness, very slightly fractured, fresh, thickly bedded, highly calcareous.								
752.7 - R-6 100% 5.00		41.0' Siltstone- Dark gray (N3), medium to hard, fossiliferous, very slightly fractured at 45° to rock core, calcareous, pyrite and calcite inclusions.								
DATE STARTED: 11/11/2007 DATE COMPLETED: 11/11/2007 FIELD GEOLOGIST: PFW	GWL GWL	DEPTH: 8.62 DATE/TIME: 11/11/2007, 15:30 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOTE	ES: Bedrock Part of the Mahantango Formation						
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Sam Silverman HELPER: Mike Steinbach	RIG:	CME 55 truck						



Bell Bend NPP	LOG OF BORING NO. B-335		PROJECT NO. 07-3891	
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	СООRDINATES N 340767.344 E 2405475.557	USCS SYMBOL		
DEPTH (FEET) (MPLE N R RUN N R RUN N R REGE) (MR R R REGE) (MR R R R R R R R R R R R R R R R R R R	N 340767.344 E 2405475.557 SURFACE EL: 793.71	SSY	REMARKS	
SAI OR OF	DESCRIPTION	nsc		
747.7 46 —	Shale- Dark gray (N3), medium to hard, fossiliferous, calcite inclusions, very slightly fractured, calcareous. Shale- Dark gray (N3), medium to hard, no fractures, fossiliferous, pyrite and calcite inclusions, calcareous.			
54 — 56 — 58 — 100% DATE STARTED: 11/11/2007 DATE COMPLETED: 11/11/2007 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	Shale- Dark gray (N3), medium to hard, no fractures, fossiliferous, pyrite inclusions, calcareous. GWL: DEPTH: 8.62 DATE/TIME: 11/11/2007, 15:30 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core		S: Bedrock Part of the Mahantango Formation	
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbach	RIG: (CME 55 truck	



Bell Bend NPP PROJECT NO. 07-3891											
Bell Bend NPP	LOG OF BORING NO. B-335	PROJECT NO. 07-3891									
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES ⊔ N 340767.344 E 2405475.557	REMARKS SOSO									
DEPTH (FEET) MMPLE N R RUN N R RUN N R REG	N 340767.344 E 2405475.557	κ REMARKS									
1 1 1 1 1	DESCRIPTION	osn									
R-9 (100%) 5.0	Siltstone- Dark gray (N3), highly fossiliferous, medium to hard, pyritic zones with inclusions of calcite and quartz, very slightly fractured, weathering on fracture face, fracture dipping at 45° to core, calcareous. Sittstone- Dark gray (N3), medium to hard, no fractures, slightly fossiliferous, calcareous, pyritic zone at 68'.										
723.7 70 —	BOTTOM OF BORING 70'										
DATE STARTED: 11/11/2007 DATE COMPLETED: 11/11/2007 FIELD GEOLOGIST: PFW	GWL: DEPTH: 8.62 DATE/TIME: 11/11/2007, 15:30 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation									
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbach	RIG: CME 55 truck									



Bell Be	Bell Bend NPP PROJECT NO. 07-3891											
						LOG OF BORING NO. B-336		11002011101010101				
ELEVATION (FEET MSL)	H.(.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	 - -	COORDINATES N 340492.179 E 2405516.324	SYMBOL					
EVA:	DEPTH (FEET)	MPLI RUI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 803.79	SS)	REMARKS				
E (F		S A	BLC	REC	"	DESCRIPTION	nscs					
	0	S-1	5-5 6 (11)	1.0		Silty Sand with Gravel (sm)- 30% gravel, 40% sand, 30% silt, fine to medium, rounded sand, low plasticity, low dry strength, low dilatancy, no toughness, light brown (5YR 6/4), dry, no reaction to HCl, medium dense.	sm	PP=0.0 TSF				
801.3	2 —				333	2.5' Poorly Graded Gravel (gp)- 100% gravel, coarse grained, subrounded, hard, nonplastic, dusky red (5R 4/6), dry, no reaction to	gp					
	4 —	S-2	13-16 20 (36)	0.1		HCl, dense.						
798.8	6 —	S-3	24-20 23 (43)	1.3		Silty Sand with Gravel (sm)- 15% gravel, 65% sand, 20% silt, fine to coarse, angular gravel, fine to coarse, subrounded sand, low plasticity, low dry strength, low dilatency, no toughness, dusky red (5 R 4/6), dry to moist, no reaction to HCl, dense to very dense.	sm					
	8 —	S-4	40-35 31 (66)	1.3								
793.8	10 —	S-5	26-40	0.4		Well Graded Gravel with Sand and Silt (gw-gm)- 60% gravel 30% sand, 10% silt, fine to coarse, subrounded to subangular gravel, fine	gw- gm					
	- 12 		(90)			to coarse, subrounded sand, nonplastic, dusky red (5R 4/6), moist, no reaction to HCl. very dense, weak cementation,. 12.5'						
791.3	14 —	S-6	19-17 18 (35)	1.1	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Well Graded Sand with Gravel and silt (sw) - 20% gravel, 70% sand, 10% silt, fine to coarse, subrounded to subangular sand, hard, nonplastic, dusky red (5R 4/6), moist, no reaction to HCl, dense, weak cementation.	sw					
DATE (STARTED COMPLE GEOLOG KED BY:	TED: 1 IST: P	 1/14/07 1/15/07 FW VZ	<u> </u>	GWL:	DEPTH: 38.90 DATE/TIME: 11/15/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	L TES: Bedrock Part of the Mahantango Formation				
APPRO	OVED BY:	RJ	В		DRILL	ER: Sam Silverman HELPER: Mike Steinbrook	RIG	:: CME 55 Track				



Bell Bend NPP PROJECT NO. 07-3891										
Dell De	ena NPP					LOG OF BORING NO. B-336		PROJECT NO. 07-3091		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 340492.179 E 2405516.324 SURFACE EL: 803.79	SYMBOL	REMARKS		
ELE (FE	□ ()	SAN	BLOV OR &	RECC		DESCRIPTION	nscs			
				Т.		15.0'	-			
788.8	16 	S-7	17-9 7 (16)	0.4		Sandy Fat Clay with Gravel (ch), 15% gravel, 30% sand, 55% clay, coarse, subangular gravel, hard, fineto coarse, subrounded, hard sand, medium plasticity, medium dry strenght, slow dilatency, low toughness, moderate yellow brown (10YR 5/4), wet, to reaction to HCL, very stiff.	ch			
786.3	_					17.5'	اما			
	18 	S-8	4-8 6 (14)	1.0		Lean Clay with gravel (cl)- 15% gravel, 5% sand, 20% silt, 60% clay, fine to coarse, subangular gravel, fine to coarse subangular to subrounded sand, high plasticity, medium dry strength, medium dilatancy, medium toughness, soft, light brown (5 YR 6/4), moist, no reaction to HCl, stiff.	cl	PP=0.25 TSF		
	_									
783.8	20 —	S-9	10-14 10 (24)	1.0		Well Graded Gravel with Sand (gw) - 80% gravel, 15% sand 5% silt, fine to coarse, spherical, subrounded gravel, hard, fine to coarse, rounded sand, nonplastic, yellowish brown (10 YR 5/4), wet, no reaction to HCl, medium-dense to very dense.	gw			
	 22 	S-10	19-17 50/4" (67)	1.1						
779.3 778.8	24 —	R-1	50% (0%)	0.3		24.5' Cobbles - About 100% sandstone cobbles, fine to medium grained, yellowish brown (5R 4/6), noncalcareous, no 25.0'	-1			
776.6	26 — - - - 28 — -	R-2	66% (0%)	3.3		\reaction to HCl. Lean Clay (cl)- About 60% clay, 30% silt, 10% siltstone gravel, high plasticity, medium toughness, medium dilatancy, medium dry strength, greenish gray (5 GY 6/1), hard, subangular, no reaction to HCl, medium gray (N5).	cl			
DATE STARTED: 11/14/07 DATE COMPLETED: 11/15/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					GWL:	DEPTH: 38.90 DATE/TIME: 11/15/07 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO	TES: Bedrock Part of the Mahantango Formation		
APPRO	KED BY: OVED BY: NG CO.:	RJ	В		DRILL	LER: Sam Silverman HELPER: Mike Steinbrook	RIG	6: CME 55 Track		



Dall B	and NDD			Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-336		PROJECT NO. 07-3891						
ELEVATION (FEET MSL)	ТН (Т:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 340492.179 E 2405516.324	SYMBOL							
EVA'	DEPTH (FEET)	MPLE	2W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 803.79	\S S	REMARKS						
] H		SA	BLC	REC		DESCRIPTION	nscs							
	_					30.0'								
773.8	30 —				YYXY	Shale- Medium gray (N5), highly fractured, healed with medium green (10 Y 4/2) clay, fractured, oxidized with yellow brown staining, no								
	_					reaction to HCl.								
			4000/											
	32 —	R-3	100%	3.5										
	-													
	_													
	_					Shale- Medium gray (N5), highly fractured, healed with medium green								
	34 —	5 4	100%			(10 Y 4/2) clay, oxidized, no reaction to HCl.								
	_	R-4	(0%)	1.5										
	_					Shale- Medium gray (N5), highly fractured, slightly healed, fractures								
	_					at 45° and 0° to rock core, oxidized on weathered face, medium hard, thinly bedded, no reaction to HCl.								
	36 —													
	_													
	_		84%											
	_	R-5	(16%)	4.2										
	38 —													
	_													
	40 —					Chala Madium anno (NE) bioble for trued backed with madium anno								
	-					Shale- Medium gray (N5), highly fractured, healed with medium green (10 Y 4/2) fatty clay, fractures at 45° and 0° to rock core, oxidized on weathered face, medium hard, thinly bedded, no reaction to HCl.								
	_					weathered race, medium hard, thirty bedded, no reaction to not.								
	_													
	42 —													
	_	R-6	100%	5.0										
	_		(=170)											
	_													
DATE STARTED: 11/14/07						DEPTH: 38.90 DATE/TIME: 11/15/07	NOT	ES: Bedrock Part of the						
	COMPLET GEOLOG					DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation						
CHEC	KED BY:	Е	VZ											
	OVED BY:				DRILI	LER: Sam Silverman HELPER: Mike Steinbrook	RIG:	CME 55 Track						
DIVILLI	10 00	. 0.1400			1									



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bena NPP	LOG OF BORING NO. B-336	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 340492.179 E 2405516.324	USCS SYMBOL REMARKS								
LEVATIO EET MSI DEPTH (FEET) (MPLE N R RUN N R REG R R REG R R REG	N 340492.179 E 2405516.324 O SURFACE EL: 803.79	တ် REMARKS								
SA OF	DESCRIPTION	osn osn								
44										
DATE STARTED: 11/14/07 DATE COMPLETED: 11/15/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	GWL: DEPTH: 38.90 DATE/TIME: 11/15/07 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Sam Silverman HELPER: Mike Steinbrook	RIG: CME 55 Track								



Description Description	Poll Pop	4 NDD							PROJECT NO. 07-3891
743.8 60 R-10 100% (90%) 5.0 Sillstone-Medium gray (NS), very slightly fractured, contains pyritic zones, fossill-ferous, medium to hard hardness, thinly bedded. Sillstone-Medium gray (NS), very slightly fractured, contains pyritic zones, fossill-ferous, medium to hard hardness, thinly bedded. Sillstone-Medium gray (NS), very slightly fractured, contains pyritic zones, fossill-ferous, medium to hard hardness, thinly bedded. 733.8 70 BOTTOM OF BORING 70' BOTTOM OF BORING 70' BOTTOM OF BORING 70' DATE STARTED: 11/14/07 GWL. DEPTH: 38.90 DATE/TIME: 11/15/07 Mediant progray (NS), very slightly fractured, contains pyritic zones, fossill-ferous, medium to hard hardness, thinly bedded.	Bell Dell	a NFF					LOG OF BORING NO. B-336		PROJECT NO. 07-3031
743.8 60 — R-10 (100%) 5.0 Sillstone-Medium gray (NS), very slighty fractured, contains pyritic cones, fosailiferous, medium to hard hardness, thinly bedded. 80 — R-11 (100%) (100%) 5.0 Sillstone-Medium gray (NS), very slighty fractured, contains pyritic cones, fosailiferous, medium to hard hardness, thinly bedded. 733.8 70 — BOTTOM OF BORING 70' BOTTOM OF BORING 70' BOTTOM OF BORING 70' BOTTOM OF BORING 70' NOTES: Bedrock Part of the Mehantango Formation NOTES: Bedrock Part of the Mehantango Formation	TION MSL)	ΕŒ.	. ON NO .	' & (N) REC. 2D)	RY (ft.)	ILE		MBOL	
743.8 60 — R-10 10105, (60%) 5.0 Silbstone-Medium gray (NS), very slightly fractured, contains pyritic zones, fossiliferous, medium to hard hardness, thinly bedded. 80 — R-11 1005, (60%) 5.0 Silbstone-Medium gray (NS), very slightly fractured, contains pyritic zones, fossiliferous, medium to hard hardness, thinly bedded. 733.8 70 — BOTTOM OF BORING 70' NOTES: Bedrock Part of the Mehantango Formation NOTES: Bedrock Part of the Mehantango Formation NOTES: Bedrock Part of the Mehantango Formation	EVA ⁻	DEP (FEE	MPLE	3W/6' R % F & (RC	OVE	,ROF	SURFACE EL: 803.79	S SY	REMARKS
A			SA	BLC	REC	ш	DESCRIPTION	osn	
DATE STARTED: 11/14/07 DATE COMPLETED: 11/15/07 FIELD GEOLOGIST: PFW BOTTOM OF BORING 70 BOTTOM OF BORING 70 NOTES: Bedrock Part of the Mahantango Formation NOTES: Bedrock Part of the Mahantango Formation DRILLING METHOD: SPT/Tricone/NQ Rock Core		62 — 64 —		(90%)			Siltstone- Medium gray (N5), very slighty fractured, contains pyritic zones, fossiliferous, medium to hard hardness, thinly bedded. Siltstone- Medium gray (N5), very slighty fractured, contains pyritic		
DATE COMPLETED: 11/15/07 GWL: DEPTH: N/A DATE/TIME: N/A Mahantango Formation FIELD GEOLOGIST: PFW DRILLING METHOD: SPT/Tricone/NQ Rock Core		- - -					BOTTOM OF BORING 70'		
APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Mike Steinbrook RIG: CME 55 Track	DATE CO FIELD GE CHECKE	DATE COMPLETED: 11/15/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ				GWL:	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation



Bell Bend NPP PROJECT NO. 07-3891										
Bell B	ena NPP					LOG OF BORING NO. B-337		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	TH (TE	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 340239.458 E 2405528.135	SYMBOL			
EVA EET	DEPTH (FEET)	MPL R RUI	2W/6 R % 8 (R(OVE	PROFILE	SURFACE EL: 793.04	S S	REMARKS		
		SA OF	BLC	REC		DESCRIPTION	nscs			
790.0	0	S-1	50/1" (50)	0.0		3.0' Well Graded Gravel (gw) - 100% cobbles, elongated, subangular, 3.0" max size, hard, nonplastic, moderate brown (5 YR 4/4), dry, no reaction to HCl, very dense.	gw			
785.0	8 — — — — — — — — — — — — — — — — — — —	S-2	14-16 15 (31)	1.2		Well Graded Gravel with Sand and Silt (gw-gm) - 60% gravel, 30% sand, 10% silt, fine to coarse, rounded sand, fine to coarse, subangular, elongated and flat gravel, nonplastic, moderate brown (5 YR 4/4), moist, no reaction to HCl, dense, weak cementation.	gw- gm			
780.0	14 —	S-3	6-6 8 (14)	1.2		Clayey Gravel with Sand (gc) - 50% gravel, 15% sand, 10% silt, 25% clay, fine to coarse, subangular, elongated and flat gravel, fine to coarse, well rounded, elongated and flat sand, low plasticity, low dry strength, no dilatancy, low toughness, greenish gray (5 GY 6/1), moist, no reaction to HCI, medium dense, weak cementation.	gc			
DATE FIELD	STARTED COMPLET GEOLOG	ΓED: 1 IST: P	FW		GWL:	DEPTH: 74.62 DATE/TIME: 11/13/07, 1345 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation		
	KED BY: OVED BY:		VZ B		DRILL	.ER: Sam Silverman HELPER: Michael Steinbrook	BIC.	CME 55 Track		
	ING CO.:				DIVILL	LET LIV. WIGHER STEINBOOK	MO.	SME 00 Huok		



Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend NPP		LOG OF BORING NO. B-337		PROJECT NO. 07-3891					
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 340239.458 E 2405528.135	SYMBOL						
DEPTH (FEET)	8 (R(N 340239.458 E 2405528.135 SURFACE EL: 793.04	\ \(\cdot \) \(\	REMARKS					
SAS OF S	BLC O	DESCRIPTION	nscs						
775.0 18 — S-4 774.0 — R-1 22 — —	50/4" 0.3 (50+) 0.3	Well Graded Gravel with Sand (gw) - 80% gravel, 15% sand, 5% silt, fine to coarse, angular, elongated and flat gravel, fine to medium, we rounded sand, nonplastic, medium gray (N3), wet, no reaction to HCl very dense, weak cementation, homogeneous consistency. Siltstone- Medium gray (N5), medium hard, slightly weathered, medium brown staining along fracture faces medium brown, thinly bedded, moderately fractured, 45° and 0° to rock core, fossiliferous, no reaction to HCI.	gw						
26 — R-3 — R-3 — — — — — — — — — — — — — — — — — — —	W	vertical bedding, no reaction to HCI. Siltstone- Medium gray (N5), medium hard, highly weathered, and highly fractured, noncalcareous, thinly vertical bedding, staining on bedding planes, fractures vertical and at 45° of rock core, no reaction to HCI. GWL: DEPTH: 74.62 DATE/TIME: 11/13/07, 1345 GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: I	Bedrock Part of the Mahantango Formation					
APPROVED BY: RJB DRILLING CO.: Terracon		DRILLER: Sam Silverman HELPER: Michael Steinbrook	RIG: CME	E 55 Track					



Dall B	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-337		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 340239.458 E 2405528.135	SYMBOL				
EVA:	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 793.04	S S	REMARKS			
E		SA	BLC	REC	"	DESCRIPTION	nscs (
763.5	=					29.5' Shale- Medium gray (N5), medium hard, highly weathered and					
	30 —					fractured, noncalcareous, fractures 45° and 90° to rock core, vertical bedding planes, no reaction to HCl.					
	_										
	-	5.4	90%								
	32 —	R-4	(0%)	4							
	_										
	34 —										
	_					Shale- Dark gray (N3), medium hard, moderately to highly fractured, vertical fractures and 45° to rock core, slightly weathered,					
	_					noncalcareous.					
	_										
	36 —										
	_										
	_	R-5	100%	5.0							
	_		(==,0,								
	38 —										
	_										
	_										
	_					Shale- Medium gray (N5), medium hard, highly fractured, vertical and					
	40 —					45° to rock core, weathered, noncalcareous.					
	_										
	42 —	R-6	100%	5.0							
	44	11-0	(10%)	5.0							
	_										
1	STARTED		1/12/07		1	DEPTH: 74.62 DATE/TIME: 11/13/07, 1345	NOT	FES: Bedrock Part of the Mahantango Formation			
1	COMPLET GEOLOG				1	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		ivianantanyo Fumation			
	KED BY:		VZ		DIVIE	ENGINETITOD. OF ITTIOUTERING NOON COTE					
	OVED BY:				DRIL	LER: Sam Silverman HELPER: Michael Steinbrook	RIG:	: CME 55 Track			
DRILLI	DRILLING CO.: Terracon										



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP	LO	G OF BORING NO. B-337		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	ILE ILE	COORDINATES N 340239.458 E 2405528.135	USCS SYMBOL							
LEVATIO EET MS DEPTH (FEET) (MPLE N R RUN N R REC R REC R REC	PROFILE	SURFACE EL: 793.04	SSS	REMARKS						
SA SA OF SA	ш	DESCRIPTION	OSC							
44 —	Shale- Med 45° to rock HCI.	iium gray (N5), medium hard, highly fractured vertical and core, highly weathered, noncalcareous, no reaction to								
50 — 52 — R-8 100% 5.0	Shale- Med 45° to rock HCI.	lium gray (N5), medium hard, highly fractured vertical and core, highly weathered, noncalcareous, no reaction to								
54 — 56 — 56 —	Shale- Med 45° to rock HCI.	lium gray (N5), medium hard, highly fractured vertical and core, slightly weathered, noncalcareous, no reaction to								
R-9 100% (30%) 5.0 DATE STARTED: 11/12/07	GWL: DEPTH:	74.62 DATE/TIME: 11/13/07, 1345	NOTE	S: Bedrock Part of the						
DATE COMPLETED: 11/13/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	GWL: DEPTH: DRILLING METHO	N/A DATE/TIME: N/A DD: SPT/Tricone/NQ Rock Core		Mahantango Formation						
APPROVED BY: RJB DRILLING CO.: Terracon	ORILLER: Sam S	ilverman HELPER: Michael Steinbrook	RIG:	CME 55 Track						



Roll Rond NDD										
Bell Bend NPP	LOG OF BORING NO. B-337	PROJECT NO. 07-3891								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 340239.458 E 2405528.135 SURFACE EL: 793.04	Og WAS REMARKS								
LEVATIO EEET MSI DEPTH (FEET) MMPLE N R RUN N S RUN N S REG R (RQD)	SURFACE EL: 793.04	κ REMARKS								
SA OR OR OR OR	DESCRIPTION	nscs								
60 — R-10 100% (0%) 5.0 5.0 64 — R-11 100% (60%) 5.0 68 — R-12 70 — R-12 94% (62%) 4.7	Shale- Medium gray (N5), medium hard, highly fractured vertical and 45° to rock core, highly weathered, noncalcareous, no reaction to HCI, medium yellowish brown (5 YR 4/1) staining on fracture face. Siltstone- Medium gray (N5), slightly to moderately fractured, fractures located horizontal to rock core, weathered faces of yellowish brown (5YR 4/1), staining on the face, spacing 0.3'-0.5', trace amount of vertical fractures, thinly bedded. Siltstone- Medium gray (N5), medium to high hardness, medium fractures. fracture faces weathered with reddish brown staining, fractures at horizontal, 45° and 90° to rock core, clay located at approximately 72.0' within fractures, noncalcareous, no reaction to HCI.									
DATE COMPLETED: 11/12/07	GWL: DEPTH: 74.62 DATE/TIME: 11/13/07, 1345	NOTES: Bedrock Part of the Mahantango Formation								
DATE COMPLETED: 11/13/07 FIELD GEOLOGIST: PFW	GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	Manantango i omiation								
CHECKED BY: EVZ										
APPROVED BY: RJB DRILLER: Sam Silverman HELPER: Michael Steinbrook RIG: CME 55 Track										
DRILLING CO.: Terracon										



Dall B	Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	ena NPP					LOG OF BORING NO. B-337		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340239.458 E 2405528.135	SYMBOL				
EVA	DEPTH (FEET)	MPLI RUI	3W/6 7 % 1 8 (RC	OVE	PROFILE	SURFACE EL: 793.04	S S	REMARKS			
급단		SA	BLC	REC		DESCRIPTION	nscs				
	74 — - -					Siltstone- Medium gray (N5), medium to high hardness, medium fractures. fracture faces weathered with reddish brown staining, fractures at horizontal, 45° and 90° to rock core, noncalcareous, no reaction to HCl.					
	76 — — — 78 —	R-13	100% (20%)	5.0							
	80 —					Siltstone- Medium gray (N5), medium to hard, slightly to very slightly fractured, healed fractures with quartz inclusions, no reaction to HCI, fractures at 45° shows reddish brown staining.					
	82 — - - - 84 —	R-14	100% (92%)	5.0							
	86 —					Siltstone- Medium gray (N5), medium hard to hard, slightly to medium fractures, 45° angle and horizontal angle to rock core, healed with quartz inclusions, noncalcareous, reddish brown staining along fractures, no reaction to HCI.					
	_	R-15	90% (60%)	4.5							
DATE (FIELD	STARTED COMPLE ^T GEOLOG KED BY:	TED: 1			GWL:	DEPTH: 74.62 DATE/TIME: 11/13/07, 1345 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:				DRILI	LER: Sam Silverman HELPER: Michael Steinbrook	RIG:	CME 55 Track			



Dall D	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	end NPP					LOG OF BORING NO. B-337		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340239.458 E 2405528.135	SYMBOL			
EET	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 793.04	SS S	REMARKS		
EI (F		SA	BLC	REC		DESCRIPTION	nscs			
698.5	96 —	R-16	98% (75%)	5.0		Siltstone- Medium gray (N5), medium hard to hard, slightly to moderate fractures, healed with quartz, no reaction to HCl, fractures having reddish brown (10YR 5/4) staining on fracture face, fractures at 45° and 90° direction of rock core. 94.5' Shale- Medium gray (N5), medium hard to hard, slightly to moderate fractures, healed with quartz, no reaction to HCl, reddish brown (10YR 5/4) staining on fracture face, fractures at 45° and 90° to direction of rock core.				
DATE FIELD	DATE STARTED: 11/12/07 DATE COMPLETED: 11/13/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					DEPTH: 74.62 DATE/TIME: 11/13/07, 1345 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	TON	FES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRILI	LER: Sam Silverman HELPER: Michael Steinbrook	RIG	: CME 55 Track		



Bell Bend NPP PROJECT NO. 07-3891											
Bell Be	end NPP					LOG OF BORING NO. B-338		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	Ε <u>Έ</u>	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	.⊩E	COORDINATES N 340738.303 E 2406234.464	SYMBOL				
EVA.	DEPTH (FEET)	MPLI R RUI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 720.08	SSS)	REMARKS			
日币		S O	BLC	REC		DESCRIPTION	nscs				
717.3	0	S-1	3-3 2 (5)		# 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Poorly Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine to medium grained, angular to round, spherical sand, nonplastic silt, moderate yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2), moist to wet, no reaction to HCL, very-loose to loose.	SN မှာ အ				
707.3	- 14 	S-3	6-4 3 (7)	1.2		Silty Sand (sm), 80 % sand, 20 % silt, fine sand, low plasticity slit, medium dry strength, no dilatancy, low toughness, moderate yellowish brown (10YR 5/4) to light brown (5YR 5/6), moist to wet, no reaction to HCL, loose.	sm				
	STARTED COMPLE		0/23/07 0/23/07			DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the Mahantango Formation			
	GEOLOG		.O			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core					
	CHECKED BY: EVZ										
	OVED BY:				DRILI	LER: Craig VanVactor HELPER: Logan Shipman	RIG	: CME 75 Truck			
PINIEL	DRILLING CO.: Terracon										



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bena NFF	LOG OF BORING NO. B-338	PRUJEUT NO. 07-3031								
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 340738.303 E 2406234.464	TOBWARKS REMARKS								
DEPTH (FEET) MMPLE N R RUN N R % REC (RCD)	의 N 340738.303 E 2406234.464	တ် REMARKS								
SA OF OF OF	DESCRIPTION	nscs								
702.3	Clayey Sand with Gravel (sc), 50% sand, 20% clay, 20% gravel, 10% silt, 0.25" max size, elongated and flat, subangular to round, hard sand, nonplastic, dark gray (N4) to medium gray (N5), wet, no reaction to HCL, medium dense.	SC								
697.7 697.3	Shale- Grayish black (N2), intensely weathered to degraded, fissile, thinly bedded, medium soft, noncalcareous. Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCI.									
26 —	Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, calcite fossils at 28.8'-30.6'.									
DATE STARTED: 10/23/07 DATE COMPLETED: 10/23/07 FIELD GEOLOGIST: JLO CHECKED BY: EVZ	GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core	NOTES: Bedrock Part of the Mahantango Formation								
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: Logan Shipman	RIG: CME 75 Truck								



Ball B	Bell Bend NPP PROJECT NO. 07-3891										
Dell B	eliu NFF			1	1	LOG OF BORING NO. B-338	, ,	FROSECT NO. 07-3091			
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 340738.303 E 2406234.464	SYMBOL				
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I 8 (RC	OVE	PROFILE	SURFACE EL: 720.08	\S S.	REMARKS			
FL (F)		SA	BLC OI	REC	<u> </u>	DESCRIPTION	nscs				
	30 — - -					Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive					
	32 —	R-3	100%	5.0		bedding, no bedding planes visible, no reaction to HCl, abundant fossils, calcite, and pyrite veins from 30.6'-38.0'.					
	34 — - - 36 — - -					Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCl, decreasing amount of pyrite below 38.0'.					
	38 — - - 40 — - -	R-4	100%	5.0		Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCI.					
DATE	42 — - STARTED COMPLET GEOLOG	ΓED: 1		5.0	GWL	: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	ES: Bedrock Part of the Mahantango Formation			
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRIL	LER: Craig VanVactor HELPER: Logan Shipman	RIG:	CME 75 Truck			



LOG OF BORING NO. B-338 COORDINATES COORDINATES SURFACE Et. 720.08 DESCRIPTION A44 A6 -		Bell Bend NPP PROJECT NO. 07-3891										
Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained. fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCI. Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained. fresh to unfractured, massive bedding planes visible, no reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh to unfractured, no reaction to slight reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh to unfractured, no reaction to HCI, slightly fossiliferous (calcite filled), massive bedding. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh to unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding.	Bell Be	and NPP					LOG OF BORING NO. B-338		PROJECT NO. 07-3891			
Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCI. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, slightly fossiliferous (calcite filled), massive bedding R-7 (190%) 5.0 Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to slight reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding.	TION MSL)	F.E.	. N N O. O. O.	'& (N) REC. 2D)	.RY (ft.)			MBOL				
Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCI. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, slightly fossiliferous (calcite filled), massive bedding R-7 (190%) 5.0 Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to slight reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding.	EVA ⁻	DEPT (FEE	MPLE	X % F R % F R (RC	OVE		SURFACE EL: 720.08	S SY	REMARKS			
Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh to slightly weathered, slightly to unfractured, massive bedding, no bedding planes visible, no reaction to HCI. Shale- Dark gray (N3) to grayish black (N2), medium hard, fine grained, fresh, unfractured, no reaction to slight reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to slight reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding.	 		SA	BLC Of	REC		DESCRIPTION	nsc				
Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to slight reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, slightly fossiliferous (calcite filled), massive bedding Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding.		- - -					grained, fresh to slightly weathered, slightly to unfractured, massive					
Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCI, fossiliferous (calcite filled), massive bedding. DATE STARTED: 10/23/07 GWL: DEPTH: N/A DATE/TIME: N/A NOTES: Bedrock Part of the		50 —	R-6		5.0		unfractured, no reaction to slight reaction to HCI, slightly fossiliferous					
DATE STARTED: 10/23/07 GWL: DEPTH: N/A DATE/TIME: N/A NOTES: Bedrock Part of the		- - -	R-7		5.0		unfractured, no reaction to HCI, fossiliferous (calcite filled), massive					
		STARTED): 1((100%)	5.0	1		NOT				
FIELD GEOLOGIST: JLO CHECKED BY: EVZ APPROVED BY: RJB DRILLING VanVactor HELPER: Logan Shipman RIG: CME 75 Truck RIG: CME 75 Truck	CHECK APPRO	KED BY: OVED BY:	E RJ	VZ B				RIG:	: CME 75 Truck			



Dall B	Bell Bend NPP PROJECT NO. 07-3891									
Bell Be	ena NPP					LOG OF BORING NO. B-338		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	HT. (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 340738.303 E 2406234.464	SYMBOL			
EVA EET	DEPTH (FEET)	MPL	2W/6 R % I & (R(OVE	PROFILE	SURFACE EL: 720.08	S S	REMARKS		
E F		SA	BLC	REC		DESCRIPTION	nscs			
649.5	60 — 62 — 64 — 66 — 70 — 72 —	R-9	100% (100%)	5.0		Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCl, slightly fossiliferous (calcite filled), thinly bedded. Shale- Dark gray (N3) to grayish black (N2), medium hard, fresh, unfractured, no reaction to HCl, fossiliferous (calcite filled), massive bedding. BOTTOM OF BORING 70.6'				
DATE STARTED: 10/23/07 DATE COMPLETED: 10/23/07 FIELD GEOLOGIST: JLO CHECKED BY: EVZ					GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NO ⁻	TES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: Logan Shipman	RIG	: CME 75 Truck		



Date Started: 102407 Start	Bell Bend NPP PROJECT NO. 07-3891										
708.7 2— S-1 2 3-14 (1.5 5 6 6 6 7) S-2 7 0.8 3 1.5 7	Bell Be	end NPP					LOG OF BORING NO. B-339		PROJECT NO. 07-3891		
708.7 2— S-1 2-1 3-14 1.5 TSF Fat Clay with Sand (ch), 60% clay, 20% silt, 20% sand, fine grained sand, madium plasticity fines, high dry strength, rapid dilatancy, reduction to HCL, hard. Fat Clay with Sand (ch), 60% clay, 20% silt, 20% sand, fine grained sand, madium plasticity fines, high dry strength, rapid dilatancy, reduction to HCL, hard. Footy Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine to some coories, rounded, hard sand, nonplastic silt, dark yellowish brown (dYR 4/2), wet. no reaction to HCL, medium dense. 10— 12— S-3 7/(14) 1.0 (1978 4/2), wet. no reaction to HCL, medium dense. 110— 12— S-3 8/(11) 1.0 (1978 4/2), wet. no reaction to HCL, medium dense. 12— S-3 8/(11) 1.0 (1978 4/2), wet. no reaction to HCL, medium dense. 13— S-4 9/(14) 1.5 (1978 4/2), wet. no reaction to HCL, medium dense. 14— 15— 16— 17— 18— 18— 19— 18— 19— 19— 19— 19— 19— 19— 19— 19— 19— 19	TION MSL)	H. (F.	NO.	" & (N) REC. 2D)	RY (ft.)	ורב		MBOL			
708.7 2— S-1 2-1 3-14 1.5 TSF Fat Clay with Sand (ch), 60% clay, 20% silt, 20% sand, fine grained sand, madium plasticity fines, high dry strength, rapid dilatancy, reduction to HCL, hard. Fat Clay with Sand (ch), 60% clay, 20% silt, 20% sand, fine grained sand, madium plasticity fines, high dry strength, rapid dilatancy, reduction to HCL, hard. Footy Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine to some coories, rounded, hard sand, nonplastic silt, dark yellowish brown (dYR 4/2), wet. no reaction to HCL, medium dense. 10— 12— S-3 7/(14) 1.0 (1978 4/2), wet. no reaction to HCL, medium dense. 110— 12— S-3 8/(11) 1.0 (1978 4/2), wet. no reaction to HCL, medium dense. 12— S-3 8/(11) 1.0 (1978 4/2), wet. no reaction to HCL, medium dense. 13— S-4 9/(14) 1.5 (1978 4/2), wet. no reaction to HCL, medium dense. 14— 15— 16— 17— 18— 18— 19— 18— 19— 19— 19— 19— 19— 19— 19— 19— 19— 19	EVA.	DEP.	MPLI RUI	2W/6 R % I 8 (RC	OVE	ROF	SURFACE EL: 710.66	SS.	REMARKS		
708.7 2 — S-1 3.14 1.5 Fat Clay with Sand (ch), 60% clay, 20% silt, 20% sand, fine grained sand, medium plasticity fines, high dry strength, rapid diletancy, medium bughness, light brown (6YR 6/4), wet, no reaction to HOL. 704.2 S-2 77	EL (F)		SA OF	BLC	REC		DESCRIPTION	OSC			
704.2 S-2 77	708.7	2 —	S-1	26	1.5		Fat Clay with Sand (ch), 60% clay, 20% silt, 20% sand, fine grained sand, medium plasticity fines, high dry strength, rapid dilatancy, medium toughness, light brown (5YR 6/4), wet, no reaction to HCL,	ch	pp=1.5 TSF		
10	704.2	- - -	S-2	7-7 7 (14)	0.8		Poorly Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine to coarse, rounded, hard sand, nonplastic silt, dark yellowish brown				
S-3 5 (11) 1.0 CHINT CHINT		- - -			•••••						
FIELD GEOLOGIST: PFW DRILLING METHOD: SPT/Tricone/NQ Rock Core CHECKED BY: EVZ		_ _ _ 14 — _ STARTED): 1 ₍	5 (11)	1.0	(1911) (1911) (1911) (1911) (1911) (1911) (1911) (1911) (1911) (1911) (1911)		NO			
I ADDITIONAL DEVICE DELLE DELL	FIELD CHEC	GEOLOG KED BY:	IST: P	FW VZ		DRILI	LING METHOD: SPT/Tricone/NQ Rock Core	D : 5			
APPROVED BY: RJB DRILLER: Craig VanVactor HELPER: Russel Whitaker RIG: CME 75 Truck RIG: CME 75 Truck	_					DRIL	LER: Craig VanVactor HELPER: Russel Whitaker	RIG	3: CME 75 Truck		



Bell Be	end NPP							PROJECT NO. 07-3891
						LOG OF BORING NO. B-339		
ELEVATION (FEET MSL)	TH T)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340479.984 E 2406149.449	SYMBOL	
EVA'	DEPTH (FEET)	MPLE	OW/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 710.66	S SY	REMARKS
日日		SA	BLC	REC	"	DESCRIPTION	nscs	
694.2	- 16 — -		12-14 52	0.8		16.5' Poorly Graded Gravel with Sand (gp), 75% gravel, 25% sand, trace fines, fine to coarse, subangular, hard gravel, fine to coarse, subangular sand, 1.0" max size gravel, 1/16" max size sand, medium	gp	
692.7	- 18 -	S-4	52 (66)			brown (10 Y/R 5/4), fragments of shale, elongated and flat, hard, wet, no reaction HCL, very dense. Shale- Dark gray (N3), slightly to little fractured, medium to hard, fresh, laminated bedding, not healed, vertical bedding planes, no reaction to HCl.		
	20 —	R-1	(33%)	3.0		Shale- Dark gray (N3), little to some fracturing at 30°-45° to rock core, light brown staining on fracture face, slightly weathered, not healed, medium hardness, no reaction to HCl, vertical thin bedding planes, spacing between fractures 0.6'-1.0'.		
	24 — - - - - 26 —	R-2	100% (66%)	5.0		Shale- Dark gray (N3), very little to slightly fractured, not healed,		
DATE :	28 — - - - - STARTEC	R-3 0: 10	100% (60%) D/24/07	5.0	GWL	fresh, medium to hard, fractures at 30°-45° to rock core, 0.6'-0.8' fracture spacing, thin, vertical bedding. DEPTH: 5.02 DATE/TIME: 10/24/07, 12:00	NOT	ES: Bedrock Part of the
FIELD	COMPLE ⁻ GEOLOG KED BY:	IST: P	0/24/07 FW VZ			DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
	OVED BY: NG CO.:				DRILI	LER: Craig VanVactor HELPER: Russel Whitaker	RIG:	CME 75 Truck



Ball B	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	ena NPP					LOG OF BORING NO. B-339		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 340479.984 E 2406149.449	USCS SYMBOL				
EVA:	DEPTH (FEET)	MPLI	DW/6 R % F & (RC	OVE	PROFILE	SURFACE EL: 710.66	SS S)	REMARKS			
□ 		δ. Q. Q.	BL(REC		DESCRIPTION	OSC				
	30 — 32 — 34 — 36 — 40 — 42 —	R-4	100% (96%)	5.0		Shale- Dark gray (N3), very little to slightly fractured, not healed, fresh, fracture spacing of 1.0°-1.5°, medium to hard, fractures at 30°-45° to rock core, no reaction to HCl. Shale- Dark gray (N3), medium hard, no fractures, vertical bedding, thinly laminated, no reaction to HCl.	n				
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	ΓED: 10 IST: P	(98%) 0/24/07 0/24/07 FW VZ		GWL:	DEPTH: 5.02 DATE/TIME: 10/24/07, 12:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	FES: Bedrock Part of the Mahantango Formation			
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: Russel Whitaker	RIG:	: CME 75 Truck			



Poll Pand NDD										
Bell Bend NPP		LOG OF BORING NO. B-339		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)		COORDINATES N 340479.984 E 2406149.449	USCS SYMBOL							
LEVATIO EET MS DEPTH (FEET) MMPLE N R RUN N R RUN N R REC R RQD)	PROFILE	SURFACE EL: 710.66	SS S	REMARKS						
SA OF		DESCRIPTION	OSC							
44 — 48 — R-7 100% 5.0 5	GWL	Shale- Dark gray (N3), medium hard, no fractures, vertical bedding plane, thinly laminated, no reaction to HCl. Shale- Dark gray (N3), medium hard, vertical fractures, slightly fractured, healed with calcite, veins are slightly healed with calcite, slight reaction to HCl, periodic pyrite veins.	NOT	TES: Bedrock Part of the						
DATE COMPLETED: 10/24/07 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	GWL	: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation						
APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Craig VanVactor HELPER: Russel Whitaker	RIG:	: CME 75 Truck						



Boll Br	Bell Bend NPP PROJECT NO. 07-3891									
Dell De	enu NPP					LOG OF BORING NO. B-339		PROJECT NO. 07-3091		
ELEVATION (FEET MSL)	HE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340479.984 E 2406149.449	USCS SYMBOL			
EVA:	DEPTH (FEET)	MPLE	2W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 710.66	S S	REMARKS		
EL (F						DESCRIPTION	OSC			
640.7	60 — 62 — 64 — 66 — 70 —	R-9 R-10	100% (100%)	5.0		Shale- Dark gray (N3), medium hard, no fractures, vertical bedding, thinly laminated, no reaction to HCl. Shale- Dark gray (N3), medium hard, no fractures, nonfossiliferous, thinly laminated bedding planes, no reaction to HCl. BOTTOM OF BORING 70'				
DATE (72 — TARTED COMPLET GEOLOG	ΓED: 1	0/24/07 0/24/07 FW		GWL:	DEPTH: 5.02 DATE/TIME: 10/24/07, 12:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	FES: Bedrock Part of the Mahantango Formation		
APPRO	KED BY: OVED BY: NG CO.:	RJ			DRILI	LER: Craig VanVactor HELPER: Russel Whitaker	RIG	: CME 75 Truck		



Bell Be	end NPP					LOG OF BORING NO. B-340		PROJECT NO. 07-3891	
ELEVATION (FEET MSL)	HI.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340298.177 E 2406433.929	SYMBOL		
EVA'	ОЕРТН (FEET)	MPLE	7W/6' R % F & (RC	OVE	PROFILE	SURFACE EL: 702.37	SSY	REMARKS	
E F		SA OF	BLC OII	REC	ш	DESCRIPTION	nscs		
700.0	0 - - 2 - - -	S-1	6-7 8 (15)	1.0'		Silty Sand (sm), 70% sand, 30% Silt, fine, rounded sand, low plasticity silt, medium dry strength, slow dilatancy, medium toughness, light brown (5Y 5/6), moist, no reaction to HCL, medium dense.	sm		
	4 — — — — — — — — — — — — — — — — — — —	S-2	12-13 11 (24)	1.1'					
690.9 689.9	- 12 -	S-3	9-55 (55)	0.5'		Clayey Gravel (gc), 60% gravel, 20% clay, 10% silt, 10% sand, fine to coarse, angular shale gravel, fine to coarse, subangular, flat, medium gray (N5) sand, medium plasticity fines, medium dry strength, rapid dilatancy, medium toughness, moderate 12.5' yellowish brown (10YR 5/4), moist, no reaction to HCL, very dense.	gc		
	- - 14 	R-1	88% (0%)	2.2		Shale - Dark gray (N3), highly fractured, fractures dipping 45° to rock core, light brown (5YR 6/4) weathering in fracture, highly fractured, medium hardness, fracture spacing 0.2' to 0.3'			
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 10	I 0/25/2007 0/30/2007 FW VZ		GWL:	DEPTH: 5.05 DATE/TIME: 10/25/07 at 16:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ core	NO ⁻	TES: Bedrock Part of the Mahantango Formation	
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 truck	



Bell Bend NPP PROJECT NO. 07-3891										
Deli Delia NPP		LOG OF BORING NO. B-340		PROJECT NO. 07-3091						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	:ILE	COORDINATES N 340298.177 E 2406433.929	USCS SYMBOL							
DEPTH (FEET) (MPLE N R RUN N R R REC R R REC SOVERY	PROFILE	SURFACE EL: 702.37	SSS	REMARKS						
SA SA OF		DESCRIPTION	OSC							
16 — R-2 80% 4.0		Shale - Dark gray (N3), highly fractured, fractures dipping 45° to rock core, slightly weathered with light brown (5YR 6/4) staining on fracture face, highly fractured, medium hardness, fracture spacing 0.3' to 0.4'.								
20 —		Shale - Dark gray (N3), highly fractured, fractures dipping 45° to rock core, slightly weathered, highly fractured, medium hardness, fracture spacing 0.2' to 0.3'.								
24—		Shale - Dark gray (N3), highly fractured, slightly weathered, medium hardness, fracture spacing 0.3' to 0.4'.								
26 —										
DATE STARTED: 10/25/2007 DATE COMPLETED: 10/30/2007	GWL:	DEPTH: 5.05 DATE/TIME: 10/25/07 at 16:00 DEPTH: N/A DATE/TIME: N/A	NOT	FES: Bedrock Part of the Mahantango Formation						
FIELD GEOLOGIST: PFW CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon		LING METHOD: SPT/Tricone/NQ core LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 truck						



Bell Bend NPP PROJECT NO. 07-3891										
Bell Be	end NPP					LOG OF BORING NO. B-340		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340298.177 E 2406433.929	USCS SYMBOL			
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 702.37	SS S	REMARKS		
EL (F		SA	BLC	REC	ш	DESCRIPTION	OSC			
	30 — 30 — 32 — 34 — 36 — 40 — 42 —	R-5	40% (16%)	2.0		Shale - Dark gray (N3), slightly to highly fractured, slightly weathered, medium hardness, fracture spacing 0.3' to 0.4'. Shale - Dark gray (N3), slightly fractured, medium hardness, fracture dipping 45° to rock core, slightly weathered.				
DATE (DATE STARTED: 10/25/2007 DATE COMPLETED: 10/30/2007 FIELD GEOLOGIST: PFW CHECKED BY: EVZ					DEPTH: 5.05 DATE/TIME: 10/25/07 at 16:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ core	NOT	TES: Bedrock Part of the Mahantango Formation		
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: L. Shipman	RIG:	: CME 75 truck		



Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend NPP		LOG OF BORING NO. B-340		PROJECT NO. 07-3891					
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	il E	COORDINATES N 340298.177 E 2406433.929	SYMBOL						
LEVATIO EET MS DEPTH (FEET) AMPLE N R RUN N R RUN N R R REG R (RQD)	PROFILE	SURFACE EL: 702.37	(S S)	REMARKS					
SA SA OR		DESCRIPTION	nscs						
44 — 46 — 48 — R-8 (52%) 5.0 — 50 — 50 — 6		Shale - Dark gray (N3), highly fractured, fracture spacing 0.2' to 0.3', medium hardness, slightly weathered with light brown (5YR 6/4) staining on fracture face, thinly bedded, fracture dipping 45° to rock core. Shale - Dark gray (N3), slightly to very slightly fractured, fractures at 45° and 90° to rock core, vertical fractures are discontinuous, slightly weathered, medium to hard.	30						
52 — R-9 100% 5.0		Shale - Dark gray (N3), slightly to very slightly fractured, fractures 45° to rock core, no weathering, no healing, medium to hard, no reaction to HCl.							
DATE STARTED: 10/25/2007 DATE COMPLETED: 10/30/2007 FIELD GEOLOGIST: PFW CHECKED BY: EVZ APPROVED BY: RJB	GWL DRIL	: DEPTH: 5.05 DATE/TIME: 10/25/07 at 16:00 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ core		TES: Bedrock Part of the Mahantango Formation					
APPROVED BY: RJB DRILLING CO.: Terracon	DKIL	LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 truck					



	Bell Bend NPP PROJECT NO. 07-3891										
Bell B	end NPP					LOG OF BORING NO. B-340		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	TH (F:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 340298.177 E 2406433.929	USCS SYMBOL				
EVA:	DEPTH (FEET)	MPLE	3.00/6 7.00 8.00 1.00 1.00 1.00 1.00 1.00 1.00 1	OVE	PROFILE	SURFACE EL: 702.37	S S	REMARKS			
 - - -		SA	BLC	REC		DESCRIPTION	nsc				
DATE	60 — 62 — 64 — 66 — 70 — 72 — STARTED COMPLET GEOLOG	ΓED: 10	92% (92%) 94% (46%) 94% (46%)		GWL:	Shale - Dark gray (N3), highly to moderately fractured, fractures 45° and 90° to rock core, slightly weathered, no healing, medium hardness, no reaction to HCI. Shale - Dark gray (N3), slightly fractured, moderately hard, no reaction to HCI. Fracture at 70.0' to 70.2' - weathered, unhealed Fracture at 74.0' - fresh, moist, unhealed DEPTH: 5.05 DATE/TIME: 10/25/07 at 16:00 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ core	NOT	ΓΕS: Bedrock Part of the Mahantango Formation			
CHECKED BY: EVZ											
	OVED BY: ING CO.:				DRILI	LER: Craig VanVactor HELPER: L. Shipman	RIG:	: CME 75 truck			
					-						



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP		LOG OF BORING NO. B-340		PROJECT NO. 07-3891						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	_ - -	COORDINATES N 340298.177 E 2406433.929	USCS SYMBOL							
LEVATIO EET MS DEPTH (FEET) AMPLE N R RUN N R RUN N R RCD)	PROFILE	SURFACE EL: 702.37	S S	REMARKS						
SA OFF		DESCRIPTION	OSC							
74—		Shale - Dark gray (N3), very slightly fractured, moderately hard, no HCl reaction, unhealed, fresh.								
76 — - - - - - - - - - - - - -										
82 — 84 — 86 — 86 — - - - - - - - - - - - - -		BOTTOM OF BORING 80'								
DATE STARTED: 10/25/2007 DATE COMPLETED: 10/30/2007 FIELD GEOLOGIST: PFW CHECKED BY: EVZ	GWL	: DEPTH: 5.05 DATE/TIME: 10/25/07 at 16:00 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ core	NO	TES: Bedrock Part of the Mahantango Formation						
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Craig VanVactor HELPER: L. Shipman	RIG	: CME 75 truck						



Bell Bend NPP PROJECT NO. 07-3891										
Bell Bend NPP		LOG OF BORING NO. B-341		PRUJECT NO. 07-3091						
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	PROFILE	COORDINATES N 339825.649 E 2406458.827	SYMBOL							
LEVATION DEPTH (FEET) MPLE N N N R RUN N N N R REG R R R R R R R R R R R R R R R R R	PROFILE	SURFACE EL: 680.71	S SY	REMARKS						
SA OR OR		DESCRIPTION	nscs							
0 _ _ S-1	3'	Sandy Silt (ml), 70% silt, 30% sand, fine grained, low plasticity, low dry strength, no dilatancy, low toughness, moderate yellowish brown (10YR 5/4), moist, no reaction to HCL, soft.	ml							
2 — S-2 2-4 12 1.4 —	5'	Same as Above except 60% silt, 40% sand								
675.7 — S-3 8-13 14 (27)	1'	5.0' Silty Sand (sm), 80% sand, 15% silt, 5% gravel, fine to medium grained, hard sand, coarse, subrounded, hard gravel, nonplastic silt, yellowish brown (10YR 4/2), moist, no reaction to HCL, medium dense.	sm							
8 — S-4 9-10 13 1.	0, 1,53,53	7.5' Poorly Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine to medium grained, hard sand, nonplastic silt, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, medium dense.	sp- sm							
10 — S-5 6-11 12 (23) 1.	1'									
12 — S-6 9-12 13 14 — S-6 15 15 15 15 15 15 15 1	6.69 961 1.09 973 6.69 961 0.69 961 0.69 961									
DATE STARTED: 11/01/2007 DATE COMPLETED: 11/03/2007 FIELD GEOLOGIST: JTM CHECKED BY: EVZ	GWL GWL	.: DEPTH: 5.7 DATE/TIME: 11/03/07 0945 .: DEPTH: N/A DATE/TIME: N/A .LING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing	NOT	ES: Bedrock Part of the Mahantango Formation						
APPROVED BY: RJB DRILLING CO.: Terracon	DRIL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	CME 75						



Bell Bend NPP		PROJECT NO. 07-3891
	LOG OF BORING NO. B-341	. 1.33231 113. 07-3001
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339825.649 E 2406458.827 SURFACE EL: 680.71	TO NO REMARKS
ELEY (FEE (FEE (FEE OR R SAMIS OR R OR 8	DESCRIPTION	- RSCS
	[0.03.000]	5.0'
665.7 S-7 8-7 12 (19) 0	Poorly Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine to medium grained, hard sand, nonplastic silt, dusky brown (5YR 2/2	sp-
663.2	[元] 元	7.5' ed sp
18 — S-8 6-8 11 1 1 1 1 1 1 1 1	sand, hard sand, nonplastic silt, dusky brown (5YR 2/2), wet, no F	
660.7 20 — S-9 5-7 (14)	Silty Sand (sm), 60% sand, 40% silt, fine grained sand, nonplastic silt, low dry strength, slow dilatancy, low toughness, moderate	
22 —	Sandy Silt (ml), 65% silt, 30% sand, 5% gravel, fine grained sand	2.5' ml
S-10 6-11 16 12 12 14 15 15 15 15 15 15 15	fine to coarse grained, angular gravel, low plasticity silt, medium of	
655.7	Poorly Sorted Sand with Gravel (sw), 75% sand, 20% gravel, 5%	
26 — S-11 12-11 13 C	fine to coarse grained, subrounded to subangular, hard sand, fine angular gravel, nonplastic silt, dark reddish brown (10R 3/4), wet, HCL reaction, medium dense.	
653.2	Well Graded Sand with Gravel and Silt (sw-sm), 60% sand, 30%	7.5' sw-
S-12 9-14 11 (25) 0	in the state of th	
DATE STARTED: 11/01/2007	GWL: DEPTH: 5.7 DATE/TIME: 11/03/07 0945	NOTES: Bedrock Part of the
DATE COMPLETED: 11/03/2007	GWL: DEPTH: N/A DATE/TIME: N/A	Mahantango Formation
FIELD GEOLOGIST: JTM	DRILLING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing	
CHECKED BY: EVZ APPROVED BY: RJB	DRILLER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG: CME 75
DRILLING CO.: Terracon	- Inchinate the second of the	



Dall Barr	Bell Bend NPP PROJECT NO. 07-3891										
Bell Ben	nd NPP					LOG OF BORING NO. B-341		PROJECT NO. 07-3891			
ELEVATION (FEET MSL)	H (F.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339825.649 E 2406458.827	SYMBOL				
EVA EET	DEPTH (FEET)	MPL R RUI	2W/6 R % I & (R(OVE	PROFILE	SURFACE EL: 680.71	S S	REMARKS			
H E		S O	BLC	REC		DESCRIPTION	nscs				
	30 —	S-13	20-14 17 (31)	0.6'							
648.2	32 —	S-14	16-28 24 (52)	0.2'		Well Graded Gravel (gw), 70% cobbles, 30% gravel, very hard, medium bluish gray (5B 5/1), unweathered cobbles, coarse grained, angular to subangular, hard gravel, dark reddish brown (10R 3/4), wet, no reaction to HCL, very dense.	gw				
645.7	36 —	S-15	7-16 10 (26)	0.5'		35.0' Well Graded Gravel (gw), 100% cobbles, very hard, very light gray (N8), fresh quartz-rich sandstone cobbles, soft, dark gray (N3), fresh shale fragments, wet, no reaction to HCL, medium dense to dense.	gw				
641.7	38 —	S-16	17-24 25 (49)	1.0		39.0' Cobbles- 100% cobbles, sandstone, pale reddish brown (10R 5/4), very hard, quartz rich, no reaction to HCI, sandstone grayish orange pink (5YR 7/2), very hard, quartz rich.					
DATE ST DATE CO FIELD G CHECKE APPROV	OMPLET GEOLOGI ED BY: VED BY:	ED: 11 ST: JT E' RJI	1/01/2007 1/03/2007 FM VZ B		GWL: DRILI	DEPTH: 5.7 DATE/TIME: 11/03/07 0945 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin		TES: Bedrock Part of the Mahantango Formation :: CME 75			



Bell Bend NPP					LOG OF BORING NO. B-341		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339825.649 E 2406458.827	USCS SYMBOL	
EET MS EET MS DEPTH (FEET)	MPLE	3W/6' 3 % F \$ (RC	OVE	PROFILE	SURFACE EL: 680.71	SS)	REMARKS
	SAI	BLC OF	REC	<u> </u>	DESCRIPTION	nsc	
632.2	R-2	36% (0%)	1.8		Shale- Dark gray (N3), soft, intensely fractured, fractures closely spaced, staining, partly healed with calcite, thinly bedded, no reaction to HCI. Shale- Dark gray (N3), soft, intensely fractured, fractures closely spaced, partly to completely healed with calcite (reaction to HCI), thinly bedded, brecciated zones throughout run, no reaction to HCI.		
DATE STARTED: DATE COMPLETEI FIELD GEOLOGIST CHECKED BY:	D: 11	М		GWL:	DEPTH: 5.7 DATE/TIME: 11/03/07 0945 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing	NOT	FES: Bedrock Part of the Mahantango Formation
APPROVED BY: DRILLING CO.: Te	RJE	3		DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	: CME 75



D. II D	! NDD							DDO 1507 NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-341		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339825.649 E 2406458.827	SYMBOL	
EVA:	DEPTH (FEET)	MPLI R RUI	DW/6 R % I & (RC	COVE	PROFILE	SURFACE EL: 680.71	SS S)	REMARKS
		S O	BL(REC		DESCRIPTION	nscs	
	- - 60 —					Shale- Dark gray (N3), soft, intensely to moderately fractured, fractures closely spaced, unhealed to completely healed fractures with calcite (reacts to HCI), thinly bedded, no reaction to HCI.		
	- -	R-5	100%	5.0		60.5', breccia zone. 61.1', breccia zone.		
	62 		(0=70)			61.5'-61.9', large vertical fracture, completely healed with calcite, moderately thick.		
	64 					Shale- Dark gray (N3), soft, moderately to slightly fractured, fractures closely spaced, completely healed with calcite (reacts to HCI), thinly bedded, no reaction to HCI. 63.7'-64.1', breccia zone		
	66 — - -	R-6	100% (96%)	5.0				
	68 — - - - 70 —					Shale- Dark gray (N3), soft, unfractured, thinly bedded, no reaction to HCl, small breccia zones through run filled with calcite (reacts to HCl).		
	- - -	R-7	100% (100%)	5.0				
	72 — – –							
DATE (STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: J	1/01/2007 1/03/2007 TM VZ		GWL	DEPTH: 5.7 DATE/TIME: 11/03/07 0945 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing	NOT	ES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	CME 75



D. II D	! NDD							DDO 1507 NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-341		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ГН (Т.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339825.649 E 2406458.827	SYMBOL	
EVA:	DEPTH (FEET)	MPLE RUN	3.W/6 7.% F 8. (RG	OVE	PROFILE	SURFACE EL: 680.71	S S	REMARKS
日 (F		SA	BLC	REC		DESCRIPTION	nscs	
	- 74 -					Shale- Dark gray (N3), soft, moderately to very slightly fractured, fractures closely spaced, completely healed with calcite (reaction to HCI), thinly bedded, no reaction to HCI.		
	76 -	R-8	94% (86%)	4.7				
	78 —					77.6'-77.9', breccia zone filled with calcite and small pyrite nodules		
	- -					Shale- Dark gray (N3), soft, very slightly fractured, fractures very closely spaced, unhealed to completely healed with calcite (reacts to HCI), no reaction to HCI.		
	80 —		100%					
	- -	R-9	(93%)	4.0		80.2' calcite filled fracture.		
	82 — - -					Shale- Dark gray (N3), soft, unfractured, moderately thick bedding, fresh, some calcite filled nodules throughout, no reaction to HCl.		
	84 — - -	R-10	100% (100%)	4.0				
	86 —					85.6' foliated calcite lens.		
	- - -					Shale- Dark gray (N3), moderately hard, unfractured, moderately thick bedding, fresh, no reaction to HCL, few calcite nodules throughout.		
			100%					
DATE FIELD	STARTED COMPLET GEOLOG KED BY:	TED: 1 ^r IST: J	1/01/2007 1/03/2007 TM VZ		GWL:	DEPTH: 5.7 DATE/TIME: 11/03/07 0945 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing	NOTI	ES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	CME 75



Ball B	end NPP							PPO IECT NO. 07-3801
Dell B	enu NFF					LOG OF BORING NO. B-341		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339825.649 E 2406458.827	SYMBOL	
EVA EET	DEPTH (FEET)	MPL R RUI	DW/6 R % R(R(COVE	PROFILE	SURFACE EL: 680.71	S S	REMARKS
EI (F						DESCRIPTION	SOSN	
580.7	88 — 90 — 92 — 94 — 96 — 100 — 102 —	R-12 R-13	98% (98%) 100% (100%)	3.0 4.9 5.0		Shale- Dark gray (N3), moderately hard, unfractured, moderately thick bedding, fresh, no reaction to HCI, few calcite nodules throughout. Shale- Dark gray (N3), moderately hard, unfractured, moderately thick bedding, fresh, no reaction to HCI, few calcite nodules throughout. BOTTOM OF BORING 100'		
DATE FIELD CHEC	STARTED COMPLET GEOLOG KED BY:	ΓED: 1 IST: J ⁻ E	TM VZ		GWL DRIL	DEPTH: 5.7 DATE/TIME: 11/03/07 0945 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/Casing advancer 4" temporary steel casing		rES: Bedrock Part of the Mahantango Formation
	OVED BY: ING CO.:				DRIL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	: CME 75



Bell Be	nd NPP							PROJECT NO. 07-3891
Dell De						LOG OF BORING NO. B-342		1 100E31 110. 07-3031
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	" & (N) REC. 2D)	.RY (ft.)	 	COORDINATES N 339721.501 E 2406467.455	SYMBOL	
EET	DEPTH (FEET)	MPL RUI	BLOW/6" & (OR % REC & (RQD)	RECOVERY	PROFILE	SURFACE EL: 678.15		REMARKS
		SA	BLC	REC	"	DESCRIPTION	USCS	
	0	S-1	3-4 6 (10)	1.5'		Silt with Sand (ml), 50% silt, 30% clay, 20% fine sand, medium plasticity fines, low dry strength, no dilatancy, low toughness, moderate yellowish brown (10YR 5/4), dry, no reaction to HCL, medium stiff to hard.	Ē	
	2 —	S-2	4-14 19 (33)	1.5'		2.01		
675.2	4 —	S-3	11-13 12 (25)	1.1'		3.0' Silty Sand (sm), 70% sand, 20% silt, 10% gravel, fine to medium sand, medium to coarse hard gravel, nonplastic silt, moderate yellowish brown (10YR 5/4), wet, no reaction to HCL, medium dense.	sm	
070.0	-	S-4	7-10 11 (21)	1.0'		6.0'		
672.2	6 —	S-5	7-9 11 (20)	1.1'		Poorly Graded Sand (sp), 90% sand, 10% silt, fine to medium grained sand, nonplastic silt, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, medium dense. 7.5'	sp	
670.7	8 —	S-6	8-10 10 (20)	1.0'	6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Poorly Graded Sand with Silt (sp-sm), 80% sand, 10% silt, 10% cobbles, fine to medium grained, angular to subangular sand, hard, dark gray (N3) cobbles, nonplastic silt, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, medium dense.	sp- sm	
667.7	10 —	S-7	8-12 11 (23)	1.0'	Figure 1990 First of the second of the seco	10.5'		
		S-8	7-15 32 (47)	1.0'		Poorly Graded Sand (sp), 90% sand, 5% gravel, 5% silt, fine to coarse grained, angular to subangular, very hard sand, medium to coarse grained, angular, hard gravel, angular hard gravel, nonplastic silt, dusky yellowish brown (10YR 2/2), wet, no reaction to HCL, dense.	sp	
666.2	12 	S-9	19-22 19 (41)	0.9'		Well Graded Gravel (gw), 60% gravel, 30% sand, 10% silt, medium to coarse, angular to subangular, hard gravel, fine to medium grained, angular to subangular sand, nonplastic silt, dusky yellowish brown (10YR 2/2), wet, no reaction to HCL, dense.	gw	
664.7	- 14 	S-10	6-15 23 (38)	0.7'	<u>ta</u>	Well Graded Sand (sw), 60% sand, 40% gravel, fine to medium grained angular to subangular sand, medium to coarse grained angular to subangular, hard gravel, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, dense to very dense.	sw	
DATE C	STARTED COMPLE GEOLOG (FD BY:	TED: 1°	0/31/2007 1/01/2007 ГМ VZ		GWL	: DEPTH: 20.3 DATE/TIME: 11/01/07 1450 : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/NQ Rock Core	NO ⁻	TES: Bedrock Part of the Mahantango Formation
APPRO	VED BY:	: RJI	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	: CME 75 truck



Boll Bo	Bell Bend NPP PROJECT NO. 07-3891										
Dell De	ilu NFF					LOG OF BORING NO. B-342		PROJECT NO. 07-3091			
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339721.501 E 2406467.455	SYMBOL				
EVA.	DEPTH (FEET)	MPLI	2W/6 R % I R (RC	OVE	PROFILE	SURFACE EL: 678.15	\S S.	REMARKS			
E E		S P	BLC	REC		DESCRIPTION	nscs				
	_					No Recovery					
	_ 16 —	S-11	15-29 25 (54)	0				Loose water circulation at			
661.7	_	S-12	9-13 7 (20)	0.6'		Well Graded Gravel (gw), 90% gravel, 10% sand, fine to coarse, angular, hard gravel, coarse, hard sand, moderate brown (5YR 4/4), wet, no reaction to HCL, medium dense.	gw	approximately 16'			
	18 	S-13	4-6 8	0		No recovery					
658.7	20 —	S-14	8-18 50/4 (68)	0.6'		19.5' Well Graded Gravel (gw), 70% gravel, 30% sand, medium to coarse, angular to subangular, hard gravel, fine to medium grained, angular to subangular sand, pale brown (5YR 5/2), wet, no reaction to HCL, very dense.	gw				
657.2	_	S-15	19-38 28 (66)	0.6'		21.0' Well Graded Gravel (gw), 100% sandstone cobble, hard, medium gray (N5) to light gray (N7), wet, no reaction to HCL, very dense, very intensely fractured.	gw				
655.7	22 —		(00)			22.5'					
655.7		S-16	12-10 10 (20)	0.8'		Well Graded Gravel with Cobbles (gw), 60% gravel, 40% cobble, medium to coarse grained, angular to subangular, hard gravel, hard, light gray (N7) fractured sandstone cobble, light brown (5YR 5/6) gravel, wet, no reaction to HCL, medium dense.	gw				
654.2	24 —	S-17	13-13 16 (29)	0.7'		Poorly Graded Gravel with Sand and Cobbles (gp), 50% gravel, 25% sand, 25% cobble, medium to coarse grained, angular to subangular, hard gravel, fine to medium grained sand, fine grained, very hard, very slightly fractured sandstone cobble, dark yellowish (10GY 4/4) to	gp	Regain water circulation at			
652.7	26 —	S-18	18-40 45 (85)	0.5'		moderate yellowish brown (10YR 5/4), wet, no reaction to HCL, medium dense. 25.5' Poorly Graded Gravel with Sand (gp), 70% gravel, 30% sand, medium to coarse grained, angular to subangular, hard gravel, fine to medium grained, subangular sand, moderate yellowish brown (10 GY 5/4), wet, no reaction to HCL, very dense.	gp	approximately 25.0'			
651.2	_					27.0' Poorly Graded Gravel (gp), 60% gravel, 30% sand, 10% silt, medium	gp				
	28 —	S-19	21-13 8 (21)	0.6'		to coarse grained, angular to subangular, hard gravel, fine to medium grained, subangular sand, nonplastic silt, pale yellowish brown (10YR 6/2), wet, no reaction to HCL, medium dense.					
	_		24-14								
1	STARTED		0/31/2007			DEPTH: 20.3 DATE/TIME: 11/01/07 1450	NO	TES: Bedrock Part of the Mahantango Formation			
FIELD	DATE COMPLETED: 11/01/2007 FIELD GEOLOGIST: JTM CHECKED BY: EVZ					DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/NQ Rock Core		Mananango i omianon			
APPRO	OVED BY: NG CO.:	RJI	В		DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	G: CME 75 truck			



Dall Ba	Bell Bend NPP PROJECT NO. 07-3891										
Bell De	ena NPF		-			LOG OF BORING NO. B-342	•	PKUJECI NU. U7-3031			
ELEVATION (FEET MSL)	тн ЕТ)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ile	COORDINATES N 339721.501 E 2406467.455	SYMBOL				
EET	ОЕРТН (FEET)	MPL R RU	DW/6 R % & (R(OVE	PROFILE	SURFACE EL: 678.15	SSS	REMARKS			
□ 						DESCRIPTION	nscs				
	_	S-20	9 (23)	0.5'		30.0'					
648.2	30 —					Well Graded Sand (sw), 100% sand, fine to coarse grained, subangular, very hard grains, very dusky red (10R 2/2), wet, no	sw				
	_	S-21	4-9 15 (24)	1.4'		reaction to HCL, medium dense.					
	_					No recovery					
	32 —	S-22	11-11 10 (21)	0							
645.2	_				777	Well Graded Sand with Clay and Gravel (sw-sc), 60% sand, 30%	sw-				
	34 —	S-23	11-11 10 (21)	0.7'		gravel, 5% silt, 5% clay, fine to coarse, subangular sand, fine to coarse, angular gravel, low plasticity fines, low dry strength, slow dilatancy, low toughness, brownish gray (5YR 4/1) to dark gray (N3), wet, no reaction to HCL, loose to medium dense.	sc				
	_										
	_	S-24	3-5 4 (9)	0.7'		36.0'					
642.2	36 — – –	S-25	5-10 18 (28)	0.6'	2222	Poorly Graded Gravel with Cobbles (gp), 50% gravel, 40% cobbles, 10% sand, trace silt and clay, fine to coarse, subangular, hard gravel, dark gray (N3) to very light gray (N8), moderately to very hard, slightly fractured cobbles, fine grained, very dusky red (10R 2/2) sand, wet, no reaction to HCL, medium dense.	gp				
640.7 640.2	38 —	S-26	50/6" (50+)	0.5	*	37.5' SHALE, dark gray (N3), soft, very intensely fractures, no weathering, no reaction to HCL 38.0' Shale- Dark gray (N3), moderately soft, no reaction to HCl, slightly		Begin rock coring at 38.0'			
	_	R-1	100%	2.5		fractured, fresh, unhealed, thinly bedded.					
	_		(100%)								
	40 —										
						Shale- Dark gray (N3), moderately soft, no reaction to HCl, slightly fractured, fresh, unhealed, thinly bedded, calcite vein at 41.2'.					
	42 —										
	· -										
	_	R-2	84% (82%)	4.2							
	_		(02%)								
DATE	STARTE	D: 1	0/31/2007	7	GWL:	DEPTH: 20.3 DATE/TIME: 11/01/07 1450	NO	TES: Bedrock Part of the			
	DATE COMPLETED: 11/01/2007 FIELD GEOLOGIST: JTM			7		DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/NQ Rock Core		Mahantango Formation			
	GEOLOG KED BY:		VZ		DKILL	LING MILTHOD. SET/THECOHE/NO ROCK CORE					
	OVED BY				DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	6: CME 75 truck			
DRILLING CO.: Terracon							<u> </u>				



D !! D				DD0 1507 NO 07 0004
Bell Bend NPP		LOG OF BORING NO. B-342		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	 	COORDINATES N 339721.501 E 2406467.455	USCS SYMBOL	
LEVATIO EET MS DEPTH (FEET) (MPLE N R RUN N R REC R REC R REC	PROFILE	SURFACE EL: 678.15	S S	REMARKS
SA OF	ш	DESCRIPTION	nsc	
44 — 46 — 48 — R-3 100% (96%) 5.0 5.		Shale- Dark gray (N3), moderately soft, no reaction to HCl, unfractured, fresh, thinly bedded, calcite filled nodules throughout. Shale- Dark gray (N3), moderately soft, no reaction to HCl, very slightly fractured, fresh, unhealed, thinly bedded, small calcite nodules throughout. DEPTH: 20.3 DATE/TIME: 11/01/07 1450 DEPTH: N/A DATE/TIME: N/A		TES: Bedrock Part of the Mahantango Formation
FIELD GEOLOGIST: JTM		LING METHOD: SPT/Tri-cone/NQ Rock Core		
CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon	DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	: CME 75 truck



Dall B	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-342		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339721.501 E 2406467.455	SYMBOL	
EVA:	DEPTH (FEET)	MPLE RUN	3.0%/6' 7.% F 8. (RG	OVE	PROFILE	SURFACE EL: 678.15	S S	REMARKS
		SA	BLC	REC		DESCRIPTION	nscs	
	60 —	R-6	100%	5.0		Shale- Dark gray (N3), moderately soft, no reaction to HCl, unfractured, fresh, thinly bedded.		
	64 —	R-7	100%	5.0		Shale- Dark gray (N3), moderately soft, no reaction to HCl, very slightly fractured, thinly bedded, very closely spaced fractures, calcite filled nodules throughout, fossiliferous, 67.5' fracture completely healed in calcite.		
	70 — 72 — - STARTED		100%		1	Shale- Dark gray (N3), moderately soft, no reaction to HCl, very slightly fractured, moderately bedded, calcite nodules throughout, fossiliferous, very closely spaced fracture, vertical fracture from 73.3' to 74.3' completely healed fracture.	NOT	FES: Bedrock Part of the
FIELD	COMPLE ⁻ GEOLOG KED BY:	IST: J	1/01/2007 TM VZ	7	1	DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/NQ Rock Core		Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	: CME 75 truck



Bell Bend NPP				DDO IECT NO. 07 2904
Bell Bend NPP		LOG OF BORING NO. B-342		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	ורב	COORDINATES N 339721.501 E 2406467.455	SYMBOL	
DEPTH (FEET) MMPLE N R RUN N R RUN N R REGE ROD) SOVERY	PROFILE	SURFACE EL: 678.15	S S	REMARKS
_		DESCRIPTION	nscs (
74 —				
76 —		Shale- Dark gray (N3), moderately hard, no reaction to HCl, ufractured, moderately bedded, calcite filled nodules throughout, fossiliferous.		
78 — R-9 96% 4.8		Shale- Dark gray (N3), moderately hard, no reaction to HCl, very slightly fractured, moderately bedded. 81.0' fracture completely healed with calcite.		
84 — (100%) 86 — (100%) DATE STARTED: 10/31/2007 DATE COMPLETED: 11/01/2007	GWL:	Shale- Dark gray (N3), moderately hard, no reaction to HCI, unfractured, moderately bedded. DEPTH: 20.3 DATE/TIME: 11/01/07 1450 DEPTH: N/A DATE/TIME: N/A	NOT	ΓES: Bedrock Part of the Mahantango Formation
FIELD GEOLOGIST: JTM CHECKED BY: EVZ APPROVED BY: RJB DRILLING CO.: Terracon		LING METHOD: SPT/Tri-cone/NQ Rock Core LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	: CME 75 truck



Ball Ba	end NPP							PROJECT NO. 07-3891
Bell De	ena NFF					LOG OF BORING NO. B-342		PRUJECT NO. 07-3031
ELEVATION (FEET MSL)	ŦE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339721.501 E 2406467.455	USCS SYMBOL	
EET	DEPTH (FEET)	MPLI R RUI	DW/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 678.15	SS S	REMARKS
		SA		REC		DESCRIPTION	OSC	
577.7	88 — 90 — 92 — 94 — 96 — 100 — 102 —	R-12	96% (96%)	5.0		Shale- Dark gray (N3), moderately hard, no reaction to HCl, slightly fractured, moderately bedded. BOTTOM OF BORING 100.5'		
DATE C	STARTED COMPLET GEOLOG (ED BY:	ΓED: 1 ⁻ IST: J ⁻			GWL:	DEPTH: 20.3 DATE/TIME: 11/01/07 1450 DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tri-cone/NQ Rock Core	NOT	FES: Bedrock Part of the Mahantango Formation
	OVED BY: NG CO.:				DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	: CME 75 truck



Dall Bar								DDO IFCT NO. 07 2004
Bell Ben	10 NPP		- <u>-</u>			LOG OF BORING NO. B-343		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HE.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339772.487 E 2406401.475	SYMBOL	
EVA ⁻	DEPTH (FEET)	MPLF R RUI	3W/6' R % F 8 (RC	OVE	PROFILE	SURFACE EL: 681.17	S SY	REMARKS
		SA	BLC	REC	"	DESCRIPTION	nscs	
	0	S-1	4-3 4 (7)	1.3		Sandy Lean Clay (cl), 50% clay, 30% sand, 20% silt, fine to medium grained, rounded sand, medium plasticity fines, high dry strength, no dilatency, high toughness, moderate yellowish brown (10YR 5/4), moist to dry, no reaction to HCl, medium stiff to very stiff.	cl	
	2 	· · · · · · · · · · · · · · · · · · ·						
	4 —	S-2	8-12 15 (27)	1.5				
676.2	- -					5.0' Silty Sand (sm), 80% sand, 20% silt, fine to medium grained, hard	sm	
	6 —	S-3	7-9 10 (19)	1.1		sand, nonplastic silt, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, medium dense.		
673.7	-					7.5' Poorly Graded Sand (sp), 95% sand, 5% silt, fine to medium grained, hard sand, nonplastic silt, dark yellowish brown (10YR 4/2), moist, no	sp	
	8 —	S-4	8-11 12 (23)	1.1		reaction to HCl. medium dense.		
	10 —							
	_	S-5	7-9 10 (19)	1.0				
	12 —	·						
	14 —	S-6	9-13 14 (27)	0.9				
DATE S1	TARTER)· 1·	1/03/2007	,	CWI:	DEPTH: N/A DATE/TIME: N/A	NOI	FES: Bedrock Part of the
DATE CO FIELD G	OMPLET GEOLOG	TED: 11	1/04/2007 ГМ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel casing	INUT	Mahantango Formation
CHECKE APPROV DRILLIN		RJI			DRILL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	: CME 75 truck



D. II D	I NDD							DD0 1507 NO 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-343		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	ОЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339772.487 E 2406401.475 SURFACE EL: 681.17	SS SYMBOL	REMARKS
日 日 子		SA	BLC	REC	"	DESCRIPTION	nscs	
666.2						15.0'	sm	
	16 	S-7	9-13 12 (25)	0.9		Silty Sand (sm), 70% sand, 30% silt, fine to medium grained, hard sand, low plasticity silt, low dry strength, slow dilatancy, medium toughness, moderate yellowish brown (10YR 5/4), wet, no reaction to HCI, medium dense.	3111	
	- 18 -	S-8	8-11 11 (22)	0.4				
661.2	20 —	S-9	6-9 16 (25)	1.3		20.0' Sandy Silt (ml), 60% silt, 40% sand, fine grained, rounded sand, medium plasticity silt, high dry strength, no dilatancy, medium toughness, dark yellowish orange (10YR 6/6), wet, no reaction to HCl, medium dense.	ml	
658.7	22 —				1:129:104: 1:129:104: 1:106:1:12	22.5' Well-Graded Sand with Silt and Gravel (sw-sm), 80% sand, 15% gravel, 5% silt, fine to coarse grained, subrounded to subangular	sw- sm	
	24 —	S-10	12-9 9 (18)	0.7		sand, fine to coarse, angular, hard gravel, nonplastic silt, dusky brown (5YR 2/2), wet, no reaction to HCl, medium dense.		
	26 —	S-11	6-9 9 (18)	0.7	10000000000000000000000000000000000000			
	28 —	S-12	8-7 6 (13)	0.8				
	_				ří (1911) 11 k (1911) 12 (1911) 13 (1911)			
DATE	STARTE): 1 [·]	1/03/2007	7		: DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the
FIELD	COMPLE GEOLOG KED BY:	IST: J	1/04/2007 ГМ VZ	7		: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel casing		Mahantango Formation
APPRO	OVED BY:	: RJI	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	CME 75 truck



Ball B	end NPP							DDO IECT NO. 07 2004
Bell B	ena NPP					LOG OF BORING NO. B-343		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE IILE	COORDINATES N 339772.487 E 2406401.475	SYMBOL	
EVA.	ОЕРТН (FEET)	MPLI	2W/6 R % I & (RC	OVE	PROFILE	SURFACE EL: 681.17	S S	REMARKS
<u> </u>		SA	BLC	REC		DESCRIPTION	SOSN	
	30 —							
	_	S-13	10-12 13 (25)	1.1				
648.7	32 —					32.5'		
040.7	_	S-14	10-33 16 (49)	0.7		Well Graded Gravel (gw), 60% gravel, 30% cobble, 10% sand, fine to coarse, angular to subangular, hard gravel, fine grained, very hard, medium gray (N5) sandstone cobble, fine grained sand, dark reddish brown (10R 3/4), wet, no reaction to HCI, dense.	gw	
646.0	34 —					35.0'		
646.2	36 —	S-15	13-33 22 (55)	0.6		Poorly Graded Sand (sp), 90% sand, 10% gravel, trace silt, fine to coarse sand, coarse, hard, angular gravel, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCl, very dense.	sp	
	_					37.5'		
643.7	38 —	S-16	6-7 8 (15)	0.8		Well Graded Gravel (gw), 70% cobbles, 30% gravel, fine to coarse, angular to subangular, hard gravel, moderate yellowish brown (10YR 5/4), wet, no reaction to HCl, medium dense.	gw	
	_					40.0'		
641.2	40 — _ _	S-17	13-13 9 (22)	0.9		Well-Graded Sand with Gravel (sw), 80% sand, 20% gravel, medium to coarse grained, rounded to subrounded sand, fine to coarse, angular to subangular, hard gravel, moderately yellowish brown (10YR 5/4), wet, no reaction to HCl, medium dense.	sw	
	- 42 —							
638.7	- - -	S-18	12-25 16 (41)	0.4		Well-Graded Gravel with Sand (gw), 50% gravel, 40% sand, 10% sandstone cobbles, fine to coarse, angular to sub angular, hard gravel, fine grained sand, very hard sandstone cobbles, dark yellowish brown (10YR 4/2), wet, no reaction to HCl, dense.	gw	
DATE	STARTED): 1 ⁻	I 1/03/2007	 7	GWL:	DEPTH: N/A DATE/TIME: N/A	NOTE	ES: Bedrock Part of the
	COMPLE					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
1	GEOLOG		ГМ		DRILI	LING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel casing		
1	KED BY: OVED BY:		VZ B		DRILI	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	CME 75 truck
DRILL	ING CO.:	Terraco	n					



Dall Da	end NPP							PROJECT NO. 07-3891
Bell Be	ena NPP					LOG OF BORING NO. B-343		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339772.487 E 2406401.475	SYMBOL	
EVA.	DEPTH (FEET)	MPL R RUI	DW/6 R % I & (R(OVE	PROFILE	SURFACE EL: 681.17	SS S	REMARKS
EL (F		SA	BLC	REC		DESCRIPTION	nscs	
	44 —				袋			
000 0					鉄	45.0'		
636.2	46 —	S-19	6-10 19 (29)	1.1		Well-Graded Sand (sw), 95% sand, 5% gravel, fine to coarse grained, subrounded to subangular, hard sand, fine to coarse grained, subrounded to sub angular, hard gravel, very dusky red (10R 2/2), wet, no reaction to HCl, medium dense.	sw	
634.7	_					46.5'		
	_	S-20	18-50/5" (50+)	0.3		SHALE, dark gray (N3), very soft, moderately bedded, unweathered, very intensely fractured, no reaction to HCL.		
633.7	_					47.5' 57% medium light gray (N6) sandstone, very hard, thickly bedded,		Rock at 48.0'
	48 —					unfractured, highly weathered at edges, 43% dark gray (N3) shale, moderately soft, slightly fractured, fresh, thinly bedded, no reaction to HCl.		Nock at 40.0
		R-1	84% (68%)	2.1		Tio.		
			(0070)					
631.2	50 —					Small Calcite Filled Nodule at 49.8'. 50.0'		
031.2	50 —					Shale- Dark gray (N3), moderately soft, thinly bedded, no reaction to HCl, fresh, slightly fractured.		
	50							
	52 —		100%					
	_	R-2	(100%)	5.0				
	_							
	_							
	54 —							
						Shala Dark grov (N2) madarataly acti thinks headed from		
						Shale- Dark gray (N3), moderately soft, thinly bedded, fresh, unfractured, no reaction to HCl, many very thin calcite fractures		
	F0					completely healed throughout.		
	56 —							
	_							
	-		40001					
	-	R-3	100% (100%)	5.0				
	58 —		(10070)					
DATE	STARTED); 1 [,]	<u> </u> 1/03/2007		GWI ·	DEPTH: N/A DATE/TIME: N/A	NO	Lagrand Lagran
	COMPLE					DEPTH: N/A DATE/TIME: N/A	```	Mahantango Formation
	GEOLOG		ΤМ		DRILL	ING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel		
	KED BY:		VZ			casing		OME 75 1
	OVED BY:				I DRILL	.ER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG	: CME 75 truck
DIVILLI		1011000						



Bell Bend NPP	LOG OF BORING NO. B-343	PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD) RECOVERY (ft.)	COORDINATES N 339772.487 E 2406401.475 O SURFACE EL: 681.17	TOBWAS REMARKS
LEVATIO LEET MSI DEPTH (FEET) MMPLE N R RUN N R R REG 8 (RQD)	SURFACE EL: 681.17	κ REMARKS
S & OF	DESCRIPTION	USCS
	58.5'- foliated calcite layer, moderately thin, completely healed, fresh.	
60 — - - - 62 — - - - - - - - - - - - - - - - - - - -	60.0'-60.6', highly fractured, partially healed breccia zone, well developed calcite crystals, open area in the fracture at 60.4' with prismatic quartz crystals and few pyrite flakes, hole goes completely through core. Shale- Dark gray (N3), moderately soft, thinly bedded, fresh, very slightly fractured, no reaction to HCl, many very thin calcite fractures completely healed throughout.	
64 — - - - - - - - - - - - - -	Shale- Dark gray (N3), moderately soft, thinly bedded, fresh, unfractured, no reaction to HCl.	
68 —	Shale- Dark gray (N3), moderately soft, moderately bedded, fresh, very slightly fractured, unhealed, clean and very closely spaced, no reaction to HCl, few calcite nodules throughout.	
DATE STARTED: 11/03/2007 DATE COMPLETED: 11/04/2007 FIELD GEOLOGIST: JTM CHECKED BY: EVZ	GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel casing	NOTES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG: CME 75 truck



Bell B	end NPP					LOG OF BORING NO. B-343		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	H.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339772.487 E 2406401.475	USCS SYMBOL	
EVA'	DEPTH (FEET)	MPLE RUN	3.W/6' 7.% F 8.(RG	OVE	PROFILE	SURFACE EL: 681.17	SSY	REMARKS
- III (H)		SA	BLC	REC		DESCRIPTION	OSC	
	74 —							
	- -					Shale- Dark gray (N3), moderately soft, moderately bedded, fresh,		
	_					unfractured, no reaction to HCl.		
	76 —							
	_							
			100%					
		R-7	(100%)	5.2				
	78 —							
	80 —							
	_							
	_							
	_							
	82 —							
	_	R-8	98% (98%)	4.9				
	_		(5070)					
	_							
	84 —							
	_							
						Shale- Dark gray (N3), moderately soft, moderately bedded, fresh, unfractured, no reaction to HCl.		
						annaction, no reaction to Hot.		
	86 —							
		R-9	100%	5.0				
DATE	STARTED		(100%) 1/03/2007		GWI	DEPTH: N/A DATE/TIME: N/A	NOT	ES: Bedrock Part of the
DATE	COMPLE	ΓED: 1	1/04/2007		GWL:	DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
	GEOLOG KED BY:		ΓM VZ		DRIL	LING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel casing		
APPRO	OVED BY:	RJI	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	CME 75 truck
DRILL	ING CO.:	Terraco	n					



Bell Be	end NPP					LOG OF BORING NO. B-343		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	E E	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339772.487 E 2406401.475	USCS SYMBOL	
EVA'	DEPTH (FEET)	MPLE	1W/6 7 % F 8 (RC	OVE	PROFILE	SURFACE EL: 681.17	SSY	REMARKS
] F	-	SAI	BLO OF	REC		DESCRIPTION	nsc	
581.2	88 — 90 — 92 — 94 — 96 — 100 — 102 — STARTED	R-10	100% (100%)	5.0	GWI	Shale- Dark gray (N3), moderately soft, moderately bedded, fresh, unfractured, no reaction to HCl. 93.7', fossiliferous zone with calcite filled nodules Shale- Dark gray (N3), moderately soft, moderately bedded, fresh, unfractured, no reaction to HCl, few calcite nodules throughout. BOTTOM OF BORING 100'	NOT	ES: Bedrock Part of the
DATE (COMPLET GEOLOG	TED: 1	1/04/2007 TM		GWL:	: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/ Tricone/ NQ Rock Core 4" temporary steel	110.	Mahantango Formation
APPRO	KED BY: OVED BY: ING CO.:	: RJ			DRILI	casing LER: Craig VanVactor HELPER: L. Shipman/ K.Goodin	RIG:	: CME 75 truck



Boll B	end NPP							PPO IECT NO. 07-3801
Bell B	ena NFF					LOG OF BORING NO. B-344		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	БЕРТН (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339761.983 E 2406301.534 SURFACE EL: 683.12	USCS SYMBOL	REMARKS
		<i>ω</i> 0	BI	RE		DESCRIPTION	-	
	0 -	S-1	3-2 2 (4)	1.3		Sandy Silt (ml), 70% silt, 30% sand, fine, subrounded to subangular sand, low plasticity, medium dry strength, no dilatancy, medium toughness, dark yellowish orange (10YR 6/6), organic odor, dry, no reaction to HCL, very loose.	ml	
680.6	2 —					2.5' Silty Sand (sm), 80% sand, 20% silt, fine to medium grained angular	sm	
	- - 4 	S-2	6-6 14 (20)	1.5		sand, nonplastic, dark yellowish brown (10YR 4/2), moist to wet, no reaction to HCL, loose to medium dense.		
	- -							
	6 —	S-3	3-4 4 (8)	1.0				
	- 8 		5-6					
	_	S-4	8 (14)	1.0				
	10 —		6-8					
	_	S-5	7 (15)	1.1				
	12 							
	- 14 —	S-6	5-7 8 (15)	1.2				
B.==			1/00/055	7		DEDTH NA DATE THE ANY	1	FF0 P + 12 : ("
DATE FIELD	STARTED COMPLE ^T GEOLOG KED BY:	TED: 1	1/06/2007 1/07/2007 ГМ VZ		GWL	: DEPTH: N/A DATE/TIME: N/A : DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	I NOT	FES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY: ING CO.:	RJ	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker	RIG	: CME 75 truck



Bell Be	end NPP							PROJECT NO. 07-3891
				1		LOG OF BORING NO. B-344		
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339761.983 E 2406301.534 SURFACE EL: 683.12	SSYMBOL	REMARKS
ELE (FE)	SAN	BLO' OR &	RECO	=	DESCRIPTION	nscs	
668.1	_					15.0'	sm	
	- 16 	S-7	8-13 11 (24)	1.2		Silty Sand with Gravel (sm), 50% sand, 30% gravel, 20% silt, fine sand, fine to medium grained gravel, subrounded to subangular sand, angular, hard gravel, nonplastic, moderate brown (5YR 3/4), wet, no reaction to HCL, medium dense.	3111	
665.6						17.5'		
003.0	18 	S-8	10-23 36 (59)	0.9		Poorly Graded Gravel with Sand (gp), 60% gravel, 20% sand, 20% cobbles, fine to coarse gravel, fine to medium sand, angular to subangular gravel, subrounded to subangular sand, subrounded to subangular cobbles, hard gravel, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, very dense.	gp	
663.1	20 —					20.0'		
003.1	20 — _ _	S-9	9-18 19 (37)	1.0		Poorly Graded Gravel with Sand (gp), 60% gravel, 30% cobbles, 10% sand with trace silt, fine to coarse gravel, medium grained sand, angular to subangular hard gravel, subrounded to subangular sand, dark yellowish brown (10YR 4/2), wet, no reaction to HCL, dense.	gp	
660.6	22 					22.5' Poorly Graded Gravel with Sand (gp), 50% gravel, 40% cobbles, 10%	gp	
	- 24 	S-10	19-34 50/6 (84)	0.9		sand with trace silt, fine to coarse gravel, medium grained sand, angular to subangular hard gravel, very hard light gray (N7) sandstone cobbles, subrounded to subangular sand, dark reddish brown (10R 3/4), wet, no reaction to HCL, very dense.		
658.1	_	S-11	50/6 (50+)	0.5		25.0' Silty Gravel (gm), 60% gravel, 20% silt, 20% cobbles, fine to coarse, angular to subangular hard gravel, low plasticity silt, medium dry strength, slow dilatancy, medium toughness, moderate yellowish brown (10YR 5/4), wet, no reaction to HCL, very dense.	gm	
656.6	26 —					26.5'		
030.0	_	S-12	32-40 31 (71)	1.3		Poorly Graded Gravel with Silt (gp-gm), 90% gravel, 10% silt, fine to coarse, angular to subangular, soft to hard gravel, nonplastic silt, moderate yellowish brown (10YR 5/4), wet, no reaction to HCL, very dense.	gp- gm	
655.1	28 —	R-1	55%	1.1		28.0' Cobbles- 90% cobbles, 10% fine to coarse grained gravel, angular, moderately soft, dusky brown (5R 2/2), no odor, wet, no reaction to HCI.		Begin rock coring at 28.0'
DATE	STARTED		(0%) 1/06/2007		GWL	 DEPTH: N/A DATE/TIME: N/A	NO	I TES: Bedrock Part of the
DATE COMPLETED: 11/07/2007 FIELD GEOLOGIST: JTM CHECKED BY: EVZ						: DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core		Mahantango Formation
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker	RIG	6: CME 75 truck



Bell Bend NP	•				LOG OF BORING NO. B-344		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339761.983 E 2406301.534 SURFACE EL: 683.12 DESCRIPTION	USCS SYMBOL	REMARKS
653.1 30 – 651.9 32 – 34 –	R-2	88% (80%)	4.4	**	Shale- Dark gray (N3), soft, intensely fractured, weathered, staining along fractures, thinly bedded, no reaction to HCI. 31.2' Sandstone- Very hard, quartz rich, unfractured, staining at ends, moderately thick bedding, no HCL reaction, light bluish gray (5 B 7/1).		
647.3 36 -	R-3	50% (14%)	2.5		Cobbles- Angular to rounded, soft to very hard.		
641.1 42 –	R-4	84%	4.2		Cobbles- Soft to very hard, very intensely weathered, iron staining, rounded to angular. 42.0' Shale- Dark gray (N3), intensely fractured, some calcite healing, no reaction to HCl, thinly bedded, soft.		
DATE STARTE DATE COMPL FIELD GEOLO CHECKED BY APPROVED B DRILLING CO.	ETED: 1 GIST: J E Y: RJ	TM EVZ B		GWL: DRILI	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core LER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker		TES: Bedrock Part of the Mahantango Formation : CME 75 truck



Bell Bend NPP (FEET MSL) DEPTH (FEET)	0.0	<u> </u>			LOG OF BORING NO. B-344		PROJECT NO. 07-3891
ATION - MSL) - MSL	o. o.				LOG OF BORING NO. D-344		
. [≮]	ZZ	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339761.983 E 2406301.534	SYMBOL	
.EV, EET DEF (FE	SAMPLE NO. OR RUN NO.	3W/6' 7 % F 8 (RG	OVE	PROFILE	SURFACE EL: 683.12	S S	REMARKS
	SA	BLO	REC		DESCRIPTION	nscs	
44 — 46 — 48 — 50 — 52 —	R-5	100% (98%)	5.0		Shale- Dark gray (N3), soft, unweathered, slightly fractured, some fractures completely healed with calcite. 48.9', fracture, clean, unhealed Shale- Dark gray (N3), unfractured, soft, unweathered, moderately bedded. 51.9', foliated calcite layers		
54 — 56 — DATE STARTED: DATE COMPLETE FIELD GEOLOGIS CHECKED BY: APPROVED BY:	ED: 11 ST: JT	100% (100%) 1/06/2007 1/07/2007 IM		GWL: DRILI	Shale- Dark gray (N3), soft, unfractured, unweathered, moderately bedded, no reaction to HCI. DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core LER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker		ES: Bedrock Part of the Mahantango Formation



Dall Daniel NDD			DD0 IE07 NO 07 2004
Bell Bend NPP	LOG OF BORING NO. B-344		PROJECT NO. 07-3891
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. BLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339761.983 E 2406301.534	SYMBOL	
LEVATIO TEET MSI DEPTH (FEET) NMPLE N R RUN N R RUN N R R REG R R R R R R R R R R R R R R R R R R R	N 339761.983 E 2406301.534 O SURFACE EL: 683.12	S S	REMARKS
SA OF	DESCRIPTION	nscs	
60 — R-8 100% 5.0 64 — R-9 100% 100% 5.0 68 — R-10 100% 100% 5.0 DATE STARTED: 11/06/2007 11/07/2007 FIELD GEOLOGIST: JTM CHECKED BY: EVZ	Shale- Dark gray (N3), soft, unfractured, unweathered, moderately bedded, no reaction to HCl. GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rock Core		TES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker	RIG	: CME 75 truck



Dall B	and NDD							DDO 1507 NO. 07 2004
Bell B	end NPP					LOG OF BORING NO. B-344		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (F:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)		COORDINATES N 339761.983 E 2406301.534	SYMBOL	
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F R (RC	OVE	PROFILE	SURFACE EL: 683.12	S S	REMARKS
<u> </u>		SA	BLC	REC		DESCRIPTION	nscs	
	74 —							
	_							
	_					Shale- Dark gray (N3), soft, unfractured, unweathered, moderately		
	_					bedded, no reaction to HCl.		
	76							
	76 —							
	_							
	_							
		R-11	100%	5.0				
		17-11	(100%)	3.0				
	78 —							
	_							
	_							
	80 —							
	_							
	_							
	82 —		4000/					
	_	R-12	100% (100%)	5.0				
	_		(100%)					
	84 —							
	_							
	_					Shale Dark grow (N2) moderately seft unfreetuned university and		
						Shale- Dark gray (N3), moderately soft, unfractured, unweathered, moderately bedded, no reaction to HCl.		
						•		
	86 —							
	_							
		D 40	100%	ΕΛ				
		R-13	(100%)	5.0				
	STARTED		1/06/2007			DEPTH: N/A DATE/TIME: N/A	NO	TES: Bedrock Part of the
DATE COMPLETED: 11/07/2007 GWL: DEPTH: FIELD GEOLOGIST: JTM DRILLING METHO								Mahantango Formation
					DRIL	LING METHOD: SPT/Tricone/NQ Rock Core		
	KED BY: OVED BY:		VZ B		DRII	LER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker	BIC	: CME 75 truck
	ING CO.:				PKIL	LETT. Graig varivacioi TILLEEN. L. Shiphian N. Willaker	'''	. CIVIL 13 HUCK
							•	



								PPO 1507 NO. 07 0004
Bell B	end NPP					LOG OF BORING NO. B-344		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	TH (F:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	:ILE	COORDINATES N 339761.983 E 2406301.534	SYMBOL	
EVA EET	ОЕРТН (FEET)	MPL RUI	DW/6 R % I & (R(SOVE	PROFILE	SURFACE EL: 683.12	SS S	REMARKS
13 F)		& Q	BLC	REC		DESCRIPTION	nscs	
583.1	88 — 90 — 92 — 94 — 96 — 100 —	R-14	98% (98%)	4.9		Shale- Dark gray (N3), moderately hard, unfractured, unweathered, moderately bedded, no reaction to HCI, calcite filled nodules throughout, fossiliferous. 98.0', calcite and pyrite filled nodule BOTTOM OF BORING 100'		
DATE FIELD	DATE STARTED: 11/06/2007 DATE COMPLETED: 11/07/2007 FIELD GEOLOGIST: JTM					DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rock Core	NOT	TES: Bedrock Part of the Mahantango Formation
APPRO	KED BY: OVED BY: ING CO.:	RJ			DRIL	LER: Craig VanVactor HELPER: L. Shipman/ R. Whitaker	RIG	: CME 75 truck



Boll Bo	Bell Bend NPP PROJECT NO. 07-3891									
Bell De	ena NFF					LOG OF BORING NO. B-345		PROJECT NO. 07-3031		
ELEVATION (FEET MSL)	TH (Ti	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339746.442 E 2406203.704	SYMBOL			
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F 8 (RC	OVE	PROFILE	SURFACE EL: 688.02	SSS)	REMARKS		
		SA	BLC	REC		DESCRIPTION	nscs			
	0	S-1	2-2 3 (5)	1.2		Organic Soil with Sand (ol), 40% clay, 40% silt, 20% sand, fine grained, subrounded to subangular, low plasticity, low dry strength, no dilatancy, low toughness, moderate brown (5YR 4/4) and medium dark gray (N4), organic odor, dry, no reaction to HCL, soft to hard.	ol			
	2 									
	4 —	S-2	8-22 27 (49)	1.1						
683.0	_					5.0' Silty Sand (sm), 85% sand, 15% silt, fine to medium grained, subrounded to subangular, nonplastic, moderate yellowish brown	sm			
	6 	S-3	2-2 3 (5)	1.1		(10YR 5/4), moist, no reaction to HCL, loose.				
680.5	8 	S-4	1-2 3 (5)	1.1	6 64 60 6 0 6 6 6 6 6 7 6 7 6 7 6 7 6 7 6 7 6 8 6 7 6 7 6 6 6 9 6 7 6	7.5' Poorly Graded Sand with Silt (sp-sm), 90% sand, 10% silt, fine grained, subrounded to subangular, nonplastic, moderate yellowish brown (10YR 5/4), moist, no reaction to HCL, loose.	sp- sm			
678.0	10 —				1.000 trus (4.600	10.0' Well Graded Sand (sw), 95% sand, 5% silt, fine to medium grained,	sw			
	-	S-5	4-6 6 (12)	1.2		rounded, soft sand, nonplastic, dark yellowish brown (10YR 4/2), dry, no reaction to HCL, medium dense.				
675.5	12 					12.5' Well Graded Sand (sw), 100% sand, fine to medium grained, rounded, nonplastic, dark yellowish brown (10YR 4/2), dry, no	sw			
	14 —	S-6	4-5 6 (11)	1.2		reaction to HCL, medium dense.				
1	STARTED COMPLE		1/05/07 1/06/07			DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A	NOT	ES: Bedrock Part of the Mahantango Formation		
	GEOLOG KED BY:		ΓM VZ		DRILI	LING METHOD: SPT/Tricone/NQ Rockcore				
APPRO	OVED BY: NG CO.:	RJ	В		DRILI	LER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG:	: CME 75 Truck		
					•					



Ball Ba	and NDD							DDO IECT NO. 07 2004
Bell Be	end NPP					LOG OF BORING NO. B-345		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	DEPTH (FEET)	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	PROFILE	COORDINATES N 339746.442 E 2406203.704	SYMBOL	REMARKS
ILEV. FEET	DEI (FE	AMP R RU	OW/ S & (F	00	PRC	SURFACE EL: 688.02	uscs s	KLWAKKO
ш		ω O	B	R		DESCRIPTION	Sn	
673.0	- 16 - -	S-7	9-8 10 (18)	1.4		Silty Sand with Gravel (sm), 60% sand, 20% silt, 20% gravel, fine grained sand, fine grained gravel, subrounded to subangular sand, angular, hard gravel, low plasticity silt, medium dry strength, no dilatancy, low toughness, grayish brown (5YR 3/2), dry, no reaction to HCL, medium dense.	sm	
670.5	- 18 	S-8	8-12 14 (26)	1.3		Silty Sand with Gravel (sm), 50% sand, 30% silt, 20% gravel, fine grained sand, fine grained gravel, subrounded to subangular sand, angular, poorly sorted hard gravel, low plasticity silt, medium dry strength, no dilatancy, low toughness, moderate yellowish brown (10 YR 5/4), dry, no rection to HCL, medium dense.	sm	
668.0	20 —	S-9	12-8 7 (15)	1.2		Silty Gravel with Sand (gm), 50% gravel, 30% sand, 20% silt, fine grained gravel, fine to coarse grained sand, angular, soft gravel, subrounded to subangular sand, nonplastic, dark yellowish brown (10 YR 4/2), wet, no reaction to HCL, medium dense.	gm	
665.5	24 —	S-10 S-11	38-50/5" (50) ::::::::::::::::::::::::::::::::::::	0.6		Silty Gravel with Sand (gm), 60% gravel, 25% sand, 15% silt, fine grained gravel, fine to coarse grained sand, angular, soft gravel, subrounded to subangular sand, nonplastic, dark yellowish brown (10 YR 4/2) to medium gray (N5), wet, no reaction to HCL, very dense.	gm	
663.4	26 —	R-1	100%	0.4		Shale- Dark gray (N3), soft, very intensely to intensely fractured, clean, weathered, thinly bedded, no reaction to HCI. Shale- Dark gray (N3), soft, very intensely fractured to intensely fractured, clean, no reaction to HCI, moderately bedded, staining present on fractures.		
DATE	28 — 28 — STARTEE COMPLET GEOLOG	TED: 1	(6%) 1/05/07 1/06/07 TM	5.0	GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOT	ES: Bedrock Part of the Mahantango Formation
APPRO	KED BY: OVED BY: NG CO.:	RJ			DRILI	LER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG:	CME 75 Truck



Bell Bend NPP		PROJECT NO. 07-3891
Deli Deliu NFF	LOG OF BORING NO. B-345	PROJECT NO. 07-3091
ELEVATION (FEET MSL) DEPTH (FEET) SAMPLE NO. OR RUN NO. OR RUN NO. RLOW/6" & (N) OR % REC. & (RQD)	COORDINATES N 339746.442 E 2406203.704	TO BW REMARKS
LEVATIO EET MSI DEPTH (FEET) AMPLE N R RUN N R RUN N R R R R R R R R R R R R R R R R R R	N 339746.442 E 2406203.704 SURFACE EL: 688.02	σ REMARKS
SA SA OF OF OF	DESCRIPTION	nscs
30 — R-3 94% (24%) 4.7 34 — R-4 86% (32%) 4.3 38 — R-4 (32%) 4.3	Shale- Dark gray (N3), soft, very intensely fractured to intensely fractured, fractures clean, unweathered, shale unweathered, no reaction to HCl, moderately bedded. Shale- Dark gray (N3) soft, very intensely fractured to intensely fractured, fractured stain, fracture at 38.8' very thin with silty sand healing, no reaction to HCl, moderately bedded. Shale- Dark gray (N3) soft, intensely fractured, clean, no reaction to HCl, moderately bedded, exhibits staining, heavy weathering large vertical fracture from 41.6'-42.9', has horizontal fractures from 44.5'-44.8' containing quartz crystals and pyrite.	
DATE STARTED: 11/05/07 DATE COMPLETED: 11/06/07 FIELD GEOLOGIST: JTM CHECKED BY: EVZ	GWL: DEPTH: N/A DATE/TIME: N/A GWL: DEPTH: N/A DATE/TIME: N/A DRILLING METHOD: SPT/Tricone/NQ Rockcore	NOTES: Bedrock Part of the Mahantango Formation
APPROVED BY: RJB DRILLING CO.: Terracon	DRILLER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG: CME 75 Truck



Rall R	end NPP							PROJECT NO. 07-3891
Dell B	end NFF					LOG OF BORING NO. B-345		FROSECT NO. 07-3091
ELEVATION (FEET MSL)	H.F.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339746.442 E 2406203.704	SYMBOL	
EVA'	DEPTH (FEET)	MPLE	2W/6' R % F 8 (RG	OVE	PROFILE	SURFACE EL: 688.02	S S	REMARKS
EL (F		SA	BLC	REC		DESCRIPTION	nscs	
	44 — — — — — — — — — — — — — — — — — —	R-6	100% (82%)	5.0		Shale- Dark gray (N3), soft, intensely to moderately fractured, moderately bedded, no reaction to HCI, fractures very thin, unhealed, some calcite healed fractures throughout. Shale- Dark gray (N3), soft, intensely to moderately fractured, moderately bedded, no reaction to HCI, unhealed, clean from 50.0-51.3', partially healed fracture zone at 51.3' with calcite, quartz and pyrite flakes, foliated calcite zone at 53.2'. Shale- Dark gray (N3), soft, no reaction to HC, unfractured, moderately bedded, few fractures healed with calcite throughout, foliated calcite layers at 55.8', possible slickenside.		
DATE FIELD	DATE STARTED: 11/05/07 DATE COMPLETED: 11/06/07 FIELD GEOLOGIST: JTM CHECKED BY: EVZ					DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOT	ES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRIL	LER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG:	: CME 75 Truck



Pall Pand	Bell Bend NPP PROJECT NO. 07-3891									
Bell Bend	I NPP					LOG OF BORING NO. B-345		PROJECT NO. 07-3891		
ELEVATION (FEET MSL)	E.E.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ורב	COORDINATES N 339746.442 E 2406203.704	SYMBOL			
EVA.	DEPTH (FEET)	MPLI	2W/6 R % F RC	OVE	PROFILE	SURFACE EL: 688.02	S S	REMARKS		
		SA	BLC	REC		DESCRIPTION	nscs			
	60 —	R-9	100% (100%)	5.0		Shale- Dark gray (N3), soft, very slightly fractured, moderately bedded, no reaction to HCI, foliated calcite layer at 62.45', fracture at 63.1', unhealed, very thin.				
	64 —	R-10	100%	5.0		Shale- Dark gray (N3), moderately soft, very slightly fractured, moderately bedded, clean no healing, no reaction to HCI.				
7	68 — - 70 — - - 72 —	K-10	(100%)	5.0		Shale- Dark gray (N3), moderately hard, unfractured, moderately bedded, no reaction to HCl.				
	= 1	R-11	(100%)	5.0						
DATE STA	MPLETE EOLOGIS	ED: 11 ST: JT	1/05/07 1/06/07 FM VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOT	FES: Bedrock Part of the Mahantango Formation		
APPROVE DRILLING	ED BY:	RJI	В		DRILI	LER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG:	: CME 75 Truck		



Dall D	end NPP							DDO 1507 NO. 07 2004
Bell Be	ena NPP					LOG OF BORING NO. B-345		PROJECT NO. 07-3891
ELEVATION (FEET MSL)	HT.	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339746.442 E 2406203.704	USCS SYMBOL	
EVA'	ОЕРТН (FEET)	MPLE	2W/6' R % F R (RC	OVE	PROFILE	SURFACE EL: 688.02	SS SY	REMARKS
<u>п</u> .		S O	BLC	REC		DESCRIPTION	DSN	
	_							
	74 —							
	_							
	_					Shale- Dark gray (N3), moderately hard, unfractured, moderately		
	_					bedded, no reaction to HCI.		
	76 —							
	_							
	_							
			100%					
	_	R-12	(100%)	5.0				
	78 —							
	_							
	_							
	80 —							
	_							
	_							
	_							
	82 —							
		R-13	100%	5.0				
		K-13	(100%)	5.0				
	_							
	_							
	84 —							
	J .							
	_					Shale- Dark gray (N3), moderately hard, unfractured, moderately		
	_					bedded, no reaction to HCI.		
	86 —							
	_							
	_	R-14	100%	5.0				
DATE	STARTED); 1	1/05/07		GWL	DEPTH: N/A DATE/TIME: N/A	NOT	ΓES: Bedrock Part of the
1	DATE COMPLETED: 11/06/07					DEPTH: N/A DATE/TIME: N/A		Mahantango Formation
1	FIELD GEOLOGIST: JTM					LING METHOD: SPT/Tricone/NQ Rockcore		
	KED BY:		VZ				<u> </u>	
	OVED BY:				DRIL	LER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG	: CME 75 Truck
DRILLI	ING CO.:	Terraco	n					



Rell R	end NPP							PROJECT NO. 07-3891
Den D	ena m.					LOG OF BORING NO. B-345		FN00E01 NO. 07-0001
ELEVATION (FEET MSL)	ГН (T:	SAMPLE NO. OR RUN NO.	BLOW/6" & (N) OR % REC. & (RQD)	RECOVERY (ft.)	ILE	COORDINATES N 339746.442 E 2406203.704	USCS SYMBOL	
EVA-	ОЕРТН (FEET)	MPLE RUI	3.W/6' 7.% F 8. (RC	OVE	PROFILE	SURFACE EL: 688.02	S SY	REMARKS
크린		SA	BLC	REC		DESCRIPTION	nsc	
588.0	88 — 90 — 92 — 94 — 96 — 98 — 100 —	R-15	100% (100%)	5.0		Shale- Dark gray (N3), moderately hard, unfractured, moderately bedded, few calcite filled nodules throughout, fossiliferous, no reaction to HCI. Shale- Dark gray (N3), moderately hard, unfractured, moderately bedded, few calcite filled nodules throughout, fossiliferous, calcite and pyrite filled nodules at 99.5', no reaction to HCI.		
	102 —							
DATE (STARTED COMPLET GEOLOG KED BY:	TED: 1	1/05/07 1/06/07 TM VZ		GWL:	DEPTH: N/A DATE/TIME: N/A DEPTH: N/A DATE/TIME: N/A LING METHOD: SPT/Tricone/NQ Rockcore	NOT	TES: Bedrock Part of the Mahantango Formation
APPRO	OVED BY:	RJ	В		DRILI	LER: Craig VanVactor HELPER: L.Shipman/K.Goodin	RIG	: CME 75 Truck

Symbol Description

Strata symbols

Description not given for: "DY"

Well graded sand

Description not given for: "DB3"

Description not given for: "D=Y3"

Description not given for: "D3"

> Description not given for: "83ZS"

Description not given for: "83S"

Well graded gravel

Description not given for: "8ZS"

Description not given for: "8YB"

Shale

Siltstone

Symbol Description

Description not given for:

Description not given for:

Description not given for:

Description not given for:

"83B"

Poorly graded sand with silt

Silty sand

Description not given for: "830S"

Poorly graded gravel with clay

Poorly graded clayey silty sand

Description not given for: ": ZOY3"

Description not given for: "8S"

Notes:

Legend:

 Exploratory borings were drilled on 11/05/07 using a 4-inch diameter continuous flight power auger.

2. No free water was encountered at the time of drilling or when re-checked the following day.

Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

Results of tests conducted on samples recovered are reported on the logs.

Symbol Description

Strata symbols

Description not give

Description not given for: "D8"



Description not given for: "DRY3"



Description not given for: "83Y"



Description not given for: "O8S"



Description not given for: "ZO8S"



Description not given for: "ZD83"



Description not given for: "ZS"



Poorly graded gravel with silt



Description not given for: "D=8"



Description not given for: "DZ3"



Description not given for: "0Y3"



Silty sand and gravel



Description not given for: "DB"



Well graded gravel and sand



Description not given for:
":Y3"



Description not given for: "DY3"



Description not given for: "OB"

Symbol Description



Description not given for: ":Z8B"



Clayey gravel



Well graded gravel with clay



Description not given for:



Clayey sand



Cobbles



Silty gravel



Silty clayey gravel



Description not given for: "ZS3"



Poorly graded sand



Poorly graded silty fine sand



Well graded gravel with silt



Description not given for: "GB"



Silt



Description not given for:
"DO="



Description not given for: "03"



Description not given for: "GBS"



Description not given for: "DO3"

Legend:

Symbol Description

Strata symbols

Description not given for: "D8Z"

Well graded sand with silt



Description not given for: "ZY38S"



Description not given for: "DOY3"



Description not given for: "D=Z8"



Description not given for: "83YSB"



Description not given for: "83SB"



Description not given for: "B8"



Description not given for:



Description not given for: "00"



High plasticity clay



Description not given for: "83BSZ"



Description not given for: "OZS"



Poorly graded sand with clay



Description not given for: "CS"



Description not given for: "83SY"



Legend:

Description not given for: ">Z"

Symbol Description



Description not given for: "83YB"



Description not given for: ": ZO3"



Poorly graded gravel



Sandstone



Description not given for: "OSY3"



Description not given for: "DBY3"



Description not given for: "0BY3"



Description not given for:



Description not given for: "D=3"



Description not given for: "ZY3"



Description not given for: ">I"



Description not given for: "G8"



Description not given for:



Description not given for: "0Z3"



Description not given for: "O="



Description not given for: "83:"



Description not given for: "DR3"



Description not given for:

Symbol Description

Strata symbols



Description not given for: "N>"



Description not given for:

Legend: