SITE DESCRIPTION Bridge on -Y22: (Mailard Creek Road) over tributary to Stone Creek GROUND WTR (ft) BORING NO. B-30 \$TATION 15-84 OFFSET 12 ft.1 ALIGNMENT -Y22: 0 HR. 0.6 COLLAR ELEV: 0943 81 TOTAL DEPTH 10.8 ft NORTHING 179.970 EASTING 45.0377 24 HR. 1.7 DRILL MACHINE Diedrich D-50 DRILL METHOD 2-15/16" th-cone with rotary wash HAMMER TYPE Automatic DRILLER Duggins, W. T. START DATE 0.300/10 COMP. DATE 0.300/10 SUBFACE WATER DEPTH N/A ELEV DPIL BLOW SOUNT BLOWS PER FOOT SAMP L C 065 0 0.58 0.58 0 75 100 NO C GROUND SUFFACE 0.00 080 0 0.58 0.75 100 SS-16 M EUV CMV
IDENTION ON. B-30 STATION 15+84 OFFSET 12 ft.LT ALIGNMENT -V22- LASTING 450.377 0.HR 0.68 COLLAR ELEV. 694.9 ft TOTAL DEPTH 10.8 ft NORTHING 179.970 EASTING 450.377 24 HR 1.7 DRILL MACHINE Dideficit D-30 DRILL METHOD 2-15/16" tri-cone with rotary wash HAMMER TYPE Automatic HAMMER TYPE Automatic DRILL METHOR Dideficit D-3004/10 SURFACE watter DEPTH N/A SURFACE watter DEPTH N/A ELEV. (b) DEPTH. (BLOW SOUNT (BLOW SPER POOT (B)) SOIL AND ROCK DESCRIPTION (B) OUR AND ROCK DESCRIPTION (B) 695 0.61 1 3.8 17 18 0.51 <
COLLAR ELEV. 694.9 ft TOTAL DEPTH 10.8 ft NORTHING 179.970 EASTING 450,377 24 HR. 1.7 DRILLER MACHINE Diedrich D-50 DRILL METHOD 2-15/16* th-cone with rotary wash HAMMER TYPE Automatic DRILLER Duggins, W. T. START DATE 03/04/10 SURFACE WATER DEPTH N/A ELEV PERV Deprint ELCOV COUNT ELCOV SPERFOOT SOIL AND ROCK DESCRIPTION DEPTH(III) 04/10 SURFACE WATER DEPTH N/A 695 041 3.8 17 18 18 04/10 SS-16 0 25 50 75 100 N/A 04/4 0/A
DRILL MACHINE Diedrich D-50 DRILL METHOD 2-15/16" th-cone with rotary wash HAMMER TYPE Automatic DRILLER Duggins, W. T. START DATE 03/04/10 COMP. DATE 03/04/10 SURFACE WATER DEPTH N/A ELEV DEPNH BLOWS PER FOOT 03/04/10 SAMP. V/A C SOL AND ROCK DESCRIPTION DEPTH(R) 098 0.01 0.01 0.01 0.01 0.01 0.01 C GROUND SURFACE 0.01 098 0.01
DRILLER Duggins. W. T. START DATE 03/04/10 COMP. DATE 03/04/10 SURFACE WATER DEPTH N/A ELEV DEPTH BLOW COUNT BLOW SPER FOOT SAMP. I <tdi< td=""></tdi<>
ELEV DEVICE (ft) DEVICE (ft) DEVICE (ft) DEVICE (ft) BLOWS PER FOOT SAMP. L SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft) 695 - <t< td=""></t<>
695 691.1 3.8 17 18 18 18 18 18 18 1000.5 10000.5 1000.5 1000.5
695 691 1 3.8 17 18 18 1.1
Bit I 3.8 17 18 18 Tas & Gray Hard Files Sandy SLT (A-4), Saprolitic 690 661.1 3.8 17 18 18 306 1000 58-16 M S8-16 M S8-79 WEATHERED ROCK 70 1000 58-17 M S8-18 Boring Terminated by Tri-cone Refusal at Elevation 68.1 ft on Crystalline Rock: Gray Metamorphosed Rock 10.4 Boring Terminated by Tri-cone Refusal at Elevation 68.1 ft on Crystalline Rock: Gray Metamorphosed Rock 10.4 10.4 Boring Terminated by Tri-cone Refusal at Elevation 68.1 ft on Crystalline Rock: Gray Metamorphosed Rock 10.7 10.7 10.7 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.7 10.7 10.7 10.7 10.7 10.4 10.4 10.4 10.4 10.4 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7
690 691.1 3.8 17 18 10 10 10 10
680 17 18 18
685 686.1 8.8 1000.5
686 1 8.8
684.2 10.7 10.8 10.8 684.1 10.8 680 600.1 600.1 600.1 600.1 10.8 Elevation 684.1 ft on Crystalline Rock: Gray Metamorphosed Rock 680 1 10.8 10.8 10.8 10.8 10.8 Elevation 684.1 ft on Crystalline Rock: Gray Metamorphosed Rock 10.8
680 - 675 - 665 - 666 - 655 - 650 - 650 -
000 1) Station and offset are in METRIC 675 2) Advanced a 2-15/16" th-cone to a depth of 10.7 feet. 676 3) Set HW casing to 3.0 feet below the existing ground. 670 4) Used swamp water as drilling fluid. 665 665 666 665 660 665
675 -
073

PROJECT NO. 34410.1.25 ID. 1	R-2248E COUNTY Mecklenburg	GEOLOGIST Nash, A. A.
SITE DESCRIPTION Bridge on -Y22- (Mi	Mallard Creek Road) over tributary to Stone Creek	GROUND WTR (ft)
BORING NO. B-31 STAT	ATION 16+20 OFFSET 11 ft LT	ALIGNMENT -Y22- 0 HR. 0.4
COLLAR ELEV. 689.9 ft TOTA	FAL DEPTH 26.6 ft NORTHING 179,993 1	EASTING 450,396 24 HR. 0.0
DRILL MACHINE Diedrich D-50 DRIL	LL METHOD 2-15/16" tri-cone with rotary wash	HAMMER TYPE Automatic
DRILLER Duggins, W. T. STAF	ART DATE 03/03/10 COMP. DATE 03/04/10	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUNT (ft) (ft) (ft) 0.5ft 0.5ft 0.5ft 0	BLOWS PER FOOT 0 25 50 75 100 NO ANOL C F	SOIL AND ROCK DESCRIPTION
690		89.9 GROUND SURFACE 0.0
689.9 0.0 WOH 2 4	∳6 · · · · · · · · · · · · · · · · · · ·	ALLUVIAL Brown & Grav Medium Stiff Fine Sandy Silty
686.4 3.5		CLAY (A-7-5), with Trace Organic Matter
	•5 SS-13 W	Gray Loose Clayey Fine Sand (A-2-6) with
		WEATHERED ROCK
681.4 8.5 680 680.3 9.6 63 37/0.1		80.3 (Gray Metamorphosed Rock) 9.6
60/0	60/01 SS-15	Gray, Fresh to Very Slightly Weathered, Hard
		to Very Hard, Moderately Close to Closely Fractured Spacing, Very Thickly Bedded,
		Metamorphosed Rock
		REC = 94% RQD =91%
670		
		63.3 26.6 Boring Terminated at Elevation 663.3 ft in
660		Crystalline Rock: Gray Metamorphosed Rock
	I I F	 Station and offset are in METRIC Advanced a 2-15/16" tri-cone to a depth of
		9.6 feet. 3) Set HW casing to 4.0 feet below the
		exisiting ground. 4) Set NW casing to 9.5 feet below the
		existing ground. 5) Advanced a NO2 core barrel between 9 7
650		to 26.6 feet.
	I I F	of used swamp water as drining huid.
	4	
	4	
	1 	

PRO	JECT NO). 344	410.1.2	25	ID.	R-224	8E			со	UNTY Mecklenburg	GEOLOGIST	Nash, A. A.		
SITE	DESCR	IPTION	Brid	lge on -Y2	22- (M	allard	Creek Ro	oad) ov	ver trik	outar	y to Stone Creek	•		GROUND W	TR (ft)
BOR	ING NO.	B-31			STA	ΓΙΟΝ	16+20			OF	FSET 11 ft LT	ALIGNMENT	-Y22-	0 HR.	0.4
COL	LAR ELE	V. 68	39.9 ft		тот	AL DE	PTH 26	.6 ft		NO	RTHING 179,993	EASTING 4	50,396	24 HR.	0.0
DRIL	L MACH	INE D	Diedric	h D-50	DRIL	L MET	HOD 2-	-15/16	" tri-co	ne v	vith rotary wash		HAMMER TYPE	Automatic	
DRIL	LER D	uggins	, W. Т	-	STAF	RT DA	TE 03/0	3/10		со	MP. DATE 03/04/10	SURFACE W	ATER DEPTH N/	A	
COR	E SIZE	NQ			тоти	AL RUI	N 17.0 f	t				I			
FI FV	RUN	DEPTH	RUN	DRILL	RI		SAMP	STR		L	_				
(ft)	ELEV (ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G G	D ELEV. (ft)	ESCRIPTION AN	ID REMARKS	D	EPTH (ft)
680.3												Beain Corina	@ 9.6 ft		
	680.3 - 678.3 -	- 9.6 - 11.6	2.0	7:36/1.0 7:36/1.0	(1.5)	(0.8)	SS-15	(16.0)	(15.5)	R	680.3	CRYSTALLI	NE ROCK	Moderately	9.6
	-	-	5.0	N=60/0 14:33/1.0	(5.0)	(5.0)		5470	0170		Close to Closely Frac	tured Spacing, Ve	ery Thickly Bedded, M	etamorphosed	
675	-	L		8:31/1.0	100%	100%					-	RUC	к		
	673.3 -	16.6	50	6:40/1.0		(5.0)					-				
	-		5.0	9:40/1.0 8:29/1.0	100%	(5.0) 100%					-				
670				5:47/1.0 5:31/1.0							_				
	668.3	21.0	5.0	6:40/1.0 6:33/1.0	(4.5)	(4.5)					_				
665	-	-		7:06/1.0 5:57/1.0	90%	90%					-				
	663.3 -	- 26.6		5:07/1.0 5:31/1.0							- 663.3				26.6
	-	-									Boring Terminate	ed at Elevation 66 Metamorpho	63.3 ft in Crystalline Ro bsed Rock	ock: Gray	
660	-	-									- 	Station and offse	et are in METRIC		
	-	-									2) Advance	ed a 2-15/16" tri-c	one to a depth of 9.6 t	feet.	
GEE	-											casing to 9.5 feet	below the existing gro	bund.	
000	-	-									5) Advanced 6)	a NQ2 core barr Used swamp wat	el between 9.7 to 26.6 er as drilling fluid.	o feet.	
	-										-				
650	-	_									-				
	-	_									-				
	-	_									-				
645	_										_				
	-	-									_				
640	-	-									-				
	-	F									-				
	-	-									-				
635	-	-									-				
	-	-									-				
620	-	-									-				
030	-	-									-				
	-	-									-				
625	-	-									-				
6	-	F									-				
3/16/	-	Ł									-				
620	-	F									_				
DT.O	-	-									-				
0 Z 615	-	F									-				
R	-	F									-				
045.(-	F									-				
610	-	È.									-				
GLE	-	-									-				
	-	È									-				
3005	-	F									-				
DT (-	Ł									-				
NCE	-	\vdash									-				

DEC	1507		40.1	25	.	~	D 0040E		M - 1 ·	- In .				
PRO	JECT NO	J. 344	10.1.2	25		ן. ייי	R-2248E		Meckler	nburg		GEOLOGIST Nash, A. A.	000111-1-	
SITE	DESCR	IPTION	Bric	lge on	-Y22-	- (ľ	Mallard Creek Road) over ti	ibutary to Stor	ne Creel	k			GROUND WT	R (ft)
BOR	ING NO.	B-32			S	T/	ATION 16+40	OFFSET 1	1 ft LT			ALIGNMENT -Y22-	0 HR.	0.5
COL	LAR ELE	EV. 68	89.3 ft		T	0	TAL DEPTH 12.4 ft	NORTHING	180,0	07		EASTING 450,411	24 HR.	0.0
DRIL	L MACH		Diedric	h D-50) D	RI	ILL METHOD 2-15/16" tri-	cone with rotar	y wash			HAMMER TYPE	Automatic	
DRIL	LER D	uggins	, W. Т		S	T/	ART DATE 03/02/10	COMP. DAT	FE 03/	03/10	• • •	SURFACE WATER DEPTH N/	A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0W CO	UNT 0.5ft		BLOWS PER FOO 0 25 50)T 75 100	SAMP. NO.	моі	L O G	SOIL AND ROCK DESC		PTH (ft)
690	689.3	- 0.0										-689.3 GROUND SURFA	ACE	0.0
685	- 	3.4	WOH	WOH	1		1	· · · · · · · · · · · · · · · · · · ·	SS-8 SS-9	⊢ŵ− w		ALLUVIAL <u>687.3</u> Brown & Gray Very Soft Sligt Sitty CLAY (A-7-5), with L Matter	ntly Fine Sandy ittle Organic	2.0
680	- - 680.9 -	- - - 8.4	100/0.5	5				· · · · · · · · · · · · · · · · · · ·	<u>(SS-10</u>			Gray, Brown, & Orange Mec 681.9 Fine Sandy CLAY (WEATHERED RC (Gray Metamorphose	dium Stiff Silty A-7-5) DCK d Rock)	7.4
675	676.9	12.4	60/0						SS-11			676.9 Boring Terminated by Tri-cc	one Refusal at	12.4
075	-	- - -										 Elevation 676.9 ft on Crystall Metamorphosed F 1) Station and affect are 	ine Rock: Gray Rock	
670	-											2) Advanced a 2-15/16" tri-co 2.4 feet. 3) Set HW casing to 4.0 fee	ne to a depth of	
665	-	-										- 4) Used swamp water as	ı. drilling fluid.	
660	-	- - -										- - - -		
655	-	-										- - - -		
	-	-										-		
650	-	-										-		
645	-											- 		
640	-											- - - -		
635	-	-										-		
2 2 2 3 630	-	+ - -										- - - -		
		-										-		
625	-	-										-		
620	-	-										- - -		
615	-											-		
	-													

PRO	JECT N	0 . 344	410.1.2	25	ID).	R-2248	ЗE				C	OUNT	1	Meckler	nburg		GEOLOGIS	T Nash, A. A.		
SITE	DESCR		Bric	lge on	-Y22-	(M	lallard (Cree	ek Roa	ad) c	over tri	ibuta	ry to S	ton	e Creel	k		1		GROUND V	VTR (ft)
BOR	ING NO.	. B-33			S	TA	TION	16+	·70			O	FFSET	ˈ 1	1 ft LT			ALIGNMEN	r -Y22-	0 HR.	N/A
COL		EV. 68	38.6 ft		т	от	AL DEF	νтн	31.7	′ ft		N	ORTHI	NG	180,0	26		EASTING 4	450,434	24 HR.	N/A
DRIL	L MACH	INE D	Diedric	h D-50) D	RIL	L MET	но	D 2-1	5/16	6" tri-c	one	with ro	tar	y wash			1	HAMMER TYPE	Automatic	
DRIL	LER D	uggins	, W. T	-	S	TA		ΓE	03/01	/10		C	OMP. D	DAT	E 03/0	02/10		SURFACE V	VATER DEPTH 0.	Oft	
ELEV (ft)	DRIVE ELEV	DEPTH (ft)	BLC		JNT		n	25	BLOW	S PE	R FOO	T 75	1	20	SAMP.		L O	Ę	SOIL AND ROCK DES	CRIPTION	
690	 		0.51	0.51	0.51			- <u>-</u>	· · · ·	·		:			S-5_/	<u>— W</u> —	G	ELEV. (ft) - 688.6 - 687.1 Prov	WATER SURFACE ((ALLUVIAL	03/01/10)	0.0 0.0
<u>685</u> 680	685.0 	3.6	5	8	14		· · · ·	• • • • •	· · · ·		· · · ·		· · · ·		SS-6	w		- C Tan \ 682.2 Tra	LAY (A-7-5), Moderat RESIDUAL /ery Stiff Fine Sandy S ce Coarse Sand & Roo WEATHERED R (Gray Metamorphose	BILT (A-4), with ck Fragments DCK ed Rock)	<u>6.4</u>
675		+ + + + + +	60/0.2				· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	- - - -	· · · · · · · · · · · · · · · · · · ·	- - - - - -	60/0	2	<u>SS-7</u>			Gray, F to Ve Frac	CRYSTALLINE R Fresh to Very Slightly V ry Hard, Moderately C tured Spacing, Very T Metamorphosed REC = 91% RQI	OCK Veathered, Har lose to Closely hickly Bedded, Rock D =69%	
670 665		+ + + + +					· · · ·	- - - -	· · · ·	- - - -	· · · ·	- - - - -	· · · ·	· - - - - -				- - - - -			
660	- - - - -	+ + + + + +					· · · · · · · · · · · · · · · · · · ·		· · · ·	- - - -	· · · ·	- - - - -	· · · ·	· · · ·		No		- - - - - 			31.7
655								•		•	<u></u>	•		• •		Return		Borir Crysta	ig Terminated at Eleva lline Rock: Gray Metar Station and offset are	ition 656.9 ft in norphosed Roc in METRIC	k
650	- - - - -	+ + + + + +																- 2) Adv - 3) s - 4) s - 5) Adv	anced a 2-15/16" tri-cc 9.7 feet. Set HW casing to 4.0 f exisiting groun Set NW casing to 8.0 f existing groun vanced a NQ2 core ba	one to a depth o eet below the d. eet below the d. rrel between 9.7	of 7
640		+ + + + + + + + + + +																6) 	to 31.7 feet. Used swamp water as	drilling fluid.	
635	-																	-			
630	- - - -																	- - - -			
625		+ + + +																- 			
620		+ + + +																			
610		+ + +																-			

PROJECT NO. 34410.1.25 ID. R-2248E CC										UNTY Mecklenburg	GEOLOGIST	Nash, A. A.			
SITE	E DESCRIPTION Bridge on -Y22- (Mallard Creek Road) c									outar	y to Stone Creek	•		GROUND W	/TR (ft)
BOR	ING NO.	B-33			STAT	ΓΙΟΝ	16+70			OF	FSET 11 ft LT	ALIGNMENT	-Y22-	0 HR.	N/A
COLI	LAR ELI	EV. 68	88.6 ft		тот	AL DE	PTH 31.	7 ft		NO	RTHING 180,026	EASTING 4	50,434	24 HR.	N/A
DRIL	L MACH	IINE D	Diedric	h D-50	DRIL	L MET	HOD 2-	15/16	" tri-co	ne v	vith rotary wash	1	HAMMER TYPE	Automatic	
DRIL	LER D	uggins	, W. T		STAF	RT DA	TE 03/0	1/10		со	MP. DATE 03/02/10	SURFACE W	ATER DEPTH 0.0	Oft	
COR	E SIZE	NQ			тоти	AL RUI	N 22.0 f	t							
ELEV	RUN	DEPTH	RUN		REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L					
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G	ELEV. (ft))EPTH (ft)
678.9	070.0											Begin Coring	@ 9.7 ft		
	0/0.9	9.7	3.5	3:14/1.0 9:13/1.0	(1.8) 51%	(0.0) 0%					- Gray, Fresh to Very	CRYSTALL Slightly Weathe	Ted, Hard to Very Hard	l, Moderately	
675	675.4	13.2	50	12:53/1.0	(4.8)	(4.0)					 Close to Closely Frac 	tured Spacing, V Rock <i>(co</i> i	ery Thickly Bedded, M ntinued)	etamorphosed	
	-	ŧ		5:55/1.0 6:48/1.0 6:26/1.0	96%	80%					-				
670	670.4 ·	- 18.2		6:20/1.0							-				
670	-		5.0	7:02/1.0	(5.0)	(3.0)					-				
	-	ł		6:06/1.0		0070					-				
665	665.4	23.2	50	<u>6:31/1.0</u> 5:38/1.0	(5.0)	(47)					-				
	-	ł		4:15/1.0	100%	94%					-				
000	- 660.4 -	- 28.2		4:45/1.0							-				
660	-		3.5	6:45/1.0	(3.5)	(3.5)					-				
	656.9	31.7		4:36/1.0	100 /0	100 /0				Ń	656.9				31.7
655	-	Ļ		0.04/0.0							Boring Terminat	ed at Elevation 6 Metamorph	56.9 ft in Crystalline Ro osed Rock	ock: Gray	
	-	÷									- - 1)	Station and offs	et are in METRIC		
											- 2) Advance - 3) Set HW (ed a 2-15/16" tri- casing to 4.0 feet	one to a depth of 9.7 f	feet. ound.	
650	-	F									- 4) Set NW (casing to 8.0 feet	below the existing gro	ound. I feet	
	-	Ļ									- 6)	Used swamp wa	er as drilling fluid.		
645	-	L									-				
	-	Ļ									-				
0.40	-	L.									-				
640	-	-									-				
	-	ł									-				
635	-	Ļ									-				
	-	ł									-				
620	-	ł									-				
630	-	F F									-				
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625		‡									-				
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PRO	JECT N	O . 344	10.1.2	25	IC) .	R-2248E	COUNTY I	Meckler	nburg		GEOLOGIST Nash, A. A.		
SITE	DESCR		Brid	lge on	-Y22-	(Mallard Creek Road) over trib	outary to Stor	e Creel	k			GROUND W	VTR (ft)
BOR	ING NO.	. B-34			S	T/	ATION 16+97	OFFSET 1	1 ft LT			ALIGNMENT -Y22-	0 HR.	N/A
COL	LAR ELI	EV. 68	38.4 ft		Т	0	TAL DEPTH 9.9 ft	NORTHING	180,0)44		EASTING 450,454	24 HR.	N/A
DRIL	L MACH	IINE [Diedric	h D-50) D	RI	ILL METHOD 2-15/16" tri-co	ne with rotar	y wash			HAMMER TYPE	Automatic	
DRIL	LER D	uggins	, W. Т	-	S	T/	ART DATE 03/01/10	COMP. DAT	E 03/	01/10		SURFACE WATER DEPTH 0.4	4ft	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO	JNT 0.5ft		BLOWS PER FOOT 0 25 50	75 100	SAMP. NO.		L O G		CRIPTION	
690		- - -					· · · · · · · · · · · · ·	· · · · · · ·	<u>S-1</u>		<u> </u>	- 688.4. WATER SURFACE (C - 687.4 ALLUVIAL - 687.4 Brown & Gray Very Soft Fir	03/01/10)	
685	684.5 - 679.5 - 678.5 -	3.9 	3 60	7 40/0.3	20			100/0.8	SS-2 SS-3	-		CLAY (A-7-5), Moderate RESIDUAL Tan Very Stiff Fine Sandy S 682.2 Trace Coarse Sand & Roo WEATHERED RC (Gray Metamorphose 678.5 Boring Terminated by Trico	ely Organic ILT (A-4), with kk Fragments DCK ed Rock)] <u>6.2</u>
675	-	-	60/0					60/0	55-4			Elevation 678.5 ft on Crystall Metamorphosed F 1) Station and offset are	line Rock: Gray Rock	
670	- - -											2) Advanced a 2-15/16 tri-co 9.9 feet. 3) Set HW casing to 3.0 fe exisitng ground 4) Used swamp water as	eet below the d. drilling fluid.	T
665	-											-		
660	-	+ + +										- - - -		
655	-											- - - -		
650	-	+ + +										- - - - -		
645	-	- - -										- - - -		
640	-											-		
635	-											- - - -		
630	- - -											- - - -		
625	- - -											- - - -		
620	- - -											- - - -		
615	- - -											-		
610	-	ŧ										-		

STEE ESSCRIPTION Endogen TOTAL DEPTH OFFSET ALLGAMENT CRCUNAN 0HR COLLAR ELEX. 701.7 ft TOTAL DEPTH 12.8 NORTHING 19.954 EASTING 40.931 24 HR DRILL MACHINE Decision DOTAT DECISION TOTAL DEPTH 12.3 ft NORTHING 19.954 EASTING 40.931 24 HR DRILL MACHINE Decision DOTA Decision TOTAL DEPTH 12.9 ft Incommon Strengen Strenge Strengen Strengen Strengen Strengen Str	PRO	PROJECT NO. 34410.1.25 ID. R-2248E										COU	NTY	Meckler	nburg		GEOLOGIST Nash, A. A.		
DORUMO DO. B-35 STATUON 15:63 OFFSET 9 R RT ALIGNMENT -V22- EASTING 450.381 0 HR. 24 HR COLLAR ELEV. 7017 ft DRILLMCANNE Diedrich D.2 TOTAL DEPTH 12.3 ft MAMER TYPE AUDMAIN NORTHING 179.954 EASTING 450.381 24 HR DRILLMCANNE Diedrich D.2 DIAL METHOD 215/15" tricone with rotary wash HAMMER TYPE AUDMAIN DRILLMCANNE Diedrich D.2 STATUDATE 0305/10 COMP. DATE 0305/10 SURFACE WATER DEPTH 1.NA LEV PROF. 001 0 01 01 01 01 01 01 01 01 01 01 01 0	SITE	DESCR		Brid	lge on	-Y22-	· (I	Mallard Cr	eek Roa	ad) o	over trib	utary	to Sto	ne Creel	k			GROUND V	VTR (ft)
COLLAR LIEV. TOTAL DEPTH 12.3 ft NORTHING F179.054 EASTING 40.301 24 HR. DRILL MACHINE Deditable D-20 DRILL METHOD 2.16/16* thicknew throtary wash HAMMER TYPE Automatic DRILLE Duggins. W. T. START DATE 0005/10 COMP. DATE 0005/10 SURFACE WATER DEPTH NA DV Drift 0.0	BOR	NG NO.	B-35			S	T/	ATION 15	5+83			OFF	SET 9	9 ft RT			ALIGNMENT -Y22-	0 HR.	1.6
DRILLER Daggins, W. T. START DATE 0.8005/10 COMP. DATE 0.3005/10 SURFACE WAREN TYPE Automatic DRILLER Doggins, W. T. START DATE 0.8005/10 COMP. DATE 0.3005/10 SURFACE WAREN TYPE Automatic EV EUX Dogment, W. T. START DATE 0.8005/10 COMP. DATE 0.3005/10 SURFACE WAREN TYPE Automatic 700 EUX EUX EUX Data SOIL AND ROCK DESCRIPTION D 700 EUX	COLI	AR ELE	EV . 70)1.7 ft		Т	01	TAL DEPT	H 12.3	ß ft		NOR	THING	3 179,9	954		EASTING 450,381	24 HR.	N/A
DRILLER Dugens W.T. START DATE 03005/10 COMP DATE 03005/10 SURFACE WATER DEPTH N/A ELEV DEFIN BLOW COLUMI BLOWS FER FOOT No. Soil AND ROCK DESCRIPTION Soil AND ROCK DESCRIPTION 705	DRIL	L MACH	IINE D	Diedric	h D-50	D	RI	ILL METHO	OD 2-1	5/16	6" tri-co	ne wit	h rota	ry wash			HAMMER TYPE	Automatic	
ELCU PENT Deprint (1) MOM OUNT BLOWS PER FOOT SAME Visit SOL AND ROCK DESCRIPTION 700	DRIL	LER D	uggins,	, W. Т.		S	T/	ART DATE	03/05	/10		CON	IP. DA	TE 03/	05/10		SURFACE WATER DEPTH N/	۹	
100 0.01 0.02 0.02 0.01 25 50 75 100 NO. MOI G ELC.00. D 700	ELEV	DRIVE ELEV	DEPTH	BLC	W CO				BLOWS	S PEI	R FOOT			SAMP.	▼∕	L	SOIL AND ROCK DESC	RIPTION	
705 701 CROUND SUPFACE 700 1 <td>(11)</td> <td>(ft)</td> <td>(11)</td> <td>0.5ft</td> <td>0.5ft</td> <td>0.5ft</td> <td></td> <td>0 2</td> <td>5</td> <td>50</td> <td></td> <td>/5</td> <td>100</td> <td>NO.</td> <td>Имо</td> <td>G</td> <td>ELEV. (ft)</td> <td></td> <td>DEPTH (ft)</td>	(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft		0 2	5	50		/5	100	NO.	Имо	G	ELEV. (ft)		DEPTH (ft)
700 200 15 26 31 15 26 30 15 16 15 16 <	705	-	-														 701.7 GROUND SURFA	CE	0.0
	700	-	-				Γ			•	1				\Box		- RESIDUAL		
885 10 20 00 85.10 M 85.10 M 85.20 M 96.0 <td></td> <td>698.6 -</td> <td>3.1</td> <td>45</td> <td>-05</td> <td></td> <td>- Saprolitic</td> <td>y SILT (A-4),</td> <td></td>		698.6 -	3.1	45	-05												- Saprolitic	y SILT (A-4),	
685 81 31 68 35.20 M 484.0 680 12.2 600.0 10.1 10.1 10.1 10.1 880 12.2 600.0 10.2 10.1 10.1 10.1 880 12.2 600.0 10.2 10.1 10.1 10.1 880 12.2 600.0 10.2 10.1 10.1 10.1 880 12.2 600.0 10.2 10.1 10.1 10.1 880 12.2 600.0 10.2 10.1 10.1 10.1 890 12.2 600.0 10.2 10.2 10.1 10.1 10.0 10.2 10.2 10.1 10.2 10.1 10.2 10.0 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10.0 10.2		-	ŧ	15	25	30				:	♦55 · ·			SS-19	М		-		
683.6 8.1 01 68 0 000 000.1	695	-	ŧ							•	ļ	· ·					- 694.0		7 7
690 690 122 600.1 122 600.1 122 600.1 135.21 136.4 Boing Terminated by The one Relaxed at the memoryholder Rock. Gray Metamorphices Rock. Gr		693.6 -	8.1	31	69	-		· · · · ·	· · ·	:	L	+-:		SS-20	м	T	WEATHERED RO	СК	1.1
199 890.5 12.2 600.1 Boing Terminated by Theore Refusal at Elevation 684.1 for Crystalline Reck: Cray Metanorphotographic Refusal at Size 1 885 1		-	ŧ						· · ·	:	· · · ·				1		_ (Gray Metamorphosed	l Rock)	
865	690	689.5	12.2	60/0 1						-			60/0 1	00 01	<u> </u>		-689.4	no Define-1-1	12.3
685 1) Station and offset are in METRIC 680 2) Advanced a 2-15/1° Hor. one to a depth of signature to a deph of signature tot a depth of signature to a		-	ł	00/0.1									00.011	00-21			Elevation 689.4 ft on Crystalli Metamorphosed R	ne Rock: Gray ock	/
880 2) Advanced 2.15/16" throate to a depth of 2.2 feat. 880 3) Set HW casing 4.0 feet below the existing ground. 875 3) Set HW casing to 4.0 feet below the existing ground. 876 4) Used evemp water as during fluid. 877 4) Used evemp water as during fluid. 878 4) Used evemp water as during fluid. 879 4) Used evemp water as during fluid. 870 4) Used evemp water as during fluid. 875 4 865 4 865 4 865 4 866 4 867 4 868 4 869 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 849 4 <td>685</td> <td>-</td> <td>ŧ</td> <td></td> <td>- 1) Station and offset are</td> <td>in METRIC</td> <td></td>	685	-	ŧ														- 1) Station and offset are	in METRIC	
880 3) Set HW casing a CA 1 feet below the existing ground. 675 4) Used swamp water as drilling fluid. 676 4) Used swamp water as drilling fluid. 677 4 688 4 689 4 689 4 680 4 681 4 685 4 686 4 686 4 687 4 688 4 689 4 680 4 681 4 682 4 683 4 684 4 685 4 686 4 687 4 688 4 689 4 680 4 681 4 682 4 683 4 684 4 685 4 686 4 687 4 688 4 688 <t< td=""><td></td><td>-</td><td>ŧ</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2) Advanced a 2-15/16" tri-cor</td><td>ne to a depth o</td><td>of</td></t<>		-	ŧ														2) Advanced a 2-15/16" tri-cor	ne to a depth o	of
100 - - 4) Used swamp weller as drilling fluid. 675 - - - 676 - - - 666 - - - 666 - - - 666 - - - 666 - - - 666 - - - 666 - - - 666 - - - 666 - - - 666 - - - 667 - - - 668 - - - 669 - - - 640 - - - 635 - - - 636 - - - 637 - - - 638 - - - 639 - - - 630 - - -	600																3) Set HW casing to 4.0 fe	et below the	
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	675	-	Ŧ														-		
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PRO	JECT NO). 344	10.1.2	25	ID).	R-2	248E	-				С	OUN	ITY	Meckler	nburg		GEOLOGIST	Nash & Skeen		
SITE	DESCR	IPTION	l Brid	lge on	-Y22-	(N	lalla	rd Cr	eek	Road	l) ov	er tr	ibuta	ary to	o Stor	ne Creel	k					VTR (ft)
BOR	ING NO.	B-36			S	TA	TIO	N 16	6+30)			0	FFS	ET 🤅	ft RT			ALIGNMENT	-Y22-	0 HR.	0.6
COL	LAR ELE	EV. 68	39.2 ft		т	ОΤ	AL C	DEPT	н :	32.0 f	ft		N	ORT	HING	i 179,9	85		EASTING 45	50,381	24 HR.	0.2
DRIL	L MACH	IINE D	Diedric	h D-50) D	RIL	L M	ETH	OD	2-15	6/16"	tri-c	one	with	rotar	y wash				HAMMER TYPE	Automatic	
DRIL	LER D	uggins,	, W. Т		S	ТΑ	RT [DATE	03	3/09/1	10		С	OMF	P. DA	FE 03/	10/10		SURFACE W	ATER DEPTH N	/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO	UNT 0.5ft)	2	BL 25	ows	PER 50	FOO	от 75		100	SAMP. NO.	мо	L O I G	SC	DIL AND ROCK DES	CRIPTION	DEPTH (ft)
690	685.6 -	- 3.6						· · ·	-	 	-	· · · · · · · · · · · · · · · · · · ·	· · ·	 	 				<u> </u>	GROUND SURF/ ALLUVIAL Tan Stiff Silty Fine Plastic CLAY (A-	ACE Sandy Highly 7-6)	0.0
680	- - - 680.6 -	- 8.6	2	4	5		 	· · ·				· · ·	- - - -		· · · · · · · · I	SS-30	M		 683.2 Tan V	RESIDUAL ery Dense Silty Fine	SAND (A-2-4)	6.0
675	677.0	- 12.2 -	60/0.1				· · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	- - - -	· · · ·	- - - - -	· · · · · · · · · · · · · · · · · · ·	- - - -	· · ·	50/0_1	\ <u>SS-32</u> /	No Rec		677.0 (677.0 (Gray, Fr to Very Fractu	WEATHERED RC (Gray Metamorphose CRYSTALLINE R esh to Very Slightly V / Hard, Moderately C red Spacing, Very Th	DCK ed Rock) OCK Veathered, Har lose to Closely nickly Bedded,	10.5 12.2
670	- - -						· · ·	· · ·		· · · ·		· · ·		· · ·	· · ·				- - - -	Metamorphosed F REC = 98% RQE	Rock) =70%	
665	- - - -						· · ·	· · ·	· ·	· · · · · · · ·	· ·	· · ·	• • •	· · ·	· · ·				- - - -			
660	- - -	+				-	· · ·	· ·		· · · ·	· ·	· · ·	•	· · ·	· · ·				-			00.0
655		-																<u>ز المين</u>	Boring Crystallir	Terminated at Eleva ne Rock: Gray Metan	tion 657.2 ft in norphosed Roc	<u>32.0</u> k
650	-																		2) Advar 3) Set H	nced a 2-15/16" tri-co 12.2 feet. W casing to 3 feet be ground.	one to a depth o elow the exisitn	of g
645	-																		5) Advar - 5) U:	existing ground nced a NQ2 core barr to 32 feet. sed swamp water as	d. rel between 12. drilling fluid.	3
640	- - -																		- - - -			
635	- - - -																		- - -			
630 630																						
625	- - - -	+ - -																	+ - - -			
19:6700-01 620	- - - -																		- - - -			
BOKE SINGLE		- - - -																	- - - - -			
610	-	+																	-			

	PRO	JECT N	O. 344	10.1.2	25	ID.	R-224	8E			со	UNTY Mecklenburg	GEOLOGIST	Nash & Skeen		
	SITE	DESCR		l Brid	lge on -Y	22- (M	allard	Creek Ro	oad) o	/er trib	outar	y to Stone Creek			GROUND W	TR (ft)
	BORI	NG NO.	B-36			STAT	ΓΙΟΝ	16+30			OF	FSET 9 ft RT	ALIGNMEN	Г -Y22-	0 HR.	0.6
ſ	COLL	AR ELI	EV. 68	9.2 ft		тот	AL DEI	PTH 32.	0 ft		NO	RTHING 179,985	EASTING 4	150,381	24 HR.	0.2
	DRIL	L MACH	IINE D	Diedric	h D-50	DRIL	L MET	HOD 2-	15/16	" tri-co	one v	vith rotary wash		HAMMER TYPE	Automatic	
	DRIL	LER D	uggins,	W. Т	-	STAF	rt da [.]	TE 03/0	9/10		со	MP. DATE 03/10/10	SURFACE V	VATER DEPTH N/	/A	
	COR	E SIZE	NQ			тоти	AL RU	N 19.8 f	t							
	ELEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L	D	ESCRIPTION A	ND REMARKS		
_	(π)	(ft)	(π)	(π)	(Min/ft)	(ft) %	(π) %	NO.	(π) %	(π) %	G	ELEV. (ft)		-	D	EPTH (ft)
-	677	677.0	12.2	4.8	12:45/1 0	(4.8)	(21)	55-32	(19.5)	(13.0)		677.0	Begin Coring	1 @ 12.2 ft		12.2
ŀ	675	-	ŧ		12:45/1.0 N=60/0.1	100%	44%	00.02	98%	70%		Gray, Fresh to Very	Slightly Weather	ered, Hard to Very Hard	d, Moderately	12.2
		- 672.2	17.0		5:21/1.0								Rc	ck	letamor priosed	
	670	-	-	5.0	3:55/0.8 7:43/1.0	(5.0) 100%	(2.8) 56%					-				
		-	Ŧ		6:26/1.0							-				
		667.2	22.0	5.0	<u>6:43/1.0</u> 7:10/1.0	(4.7)	(4.2)					-				
	665		F		7:55/1.0 7:05/1.0	94%	84%					-				
		662.2	27.0		6:22/1.0 5:48/1.0							-				
	660	-	F	5.0	7:42/1.0 7:10/1.0	(5.0)	(4.8) 96%					-				
			F		5:58/1.0 6:34/1.0							-				
		657.2	<u>32.0</u>		6:39/1.0							657.2 Boring Terminate	ed at Elevation 6	57.2 ft in Crystalline R	lock: Gray	32.0
	655	-	Ł									-	Metamorph	losed Rock		
		-	ł									2) Advance	Station and offs d a 2-15/16" tri-c	set are in METRIC cone to a depth of 12.2	feet.	
	650	-	Ł									3) Set HW 4) Set NW	casing to 3 feet casing to 12 fee	below the exisitng gro t below the existing gro	und. ound.	
		-	ŧ									_ 5) Advanced _ 6)	d a NQ2 core ba Used swamp wa	rrel between 12.3 to 32 ater as drilling fluid.	2 feet.	
	045	-	ł									-		Ū.		
-	645	-	ŧ									-				
		-	+									-				
_	640	-	÷									-				
		-	+									-				
	635	-	ŧ									-				
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20.	615	-	ŧ									-				
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PRO	JECT N					C	OUN	TY	Meckler	nburg		GEO	LOGIST	Nash, A. A.									
SITE	DESCR		Bric	lge on	-Y22-	· (I	Mallarc	l Cr	eek F	Road	l) ov	er tri	but	ary to	o Stor	ne Cree	k					GROUND W	/TR (ft)
BOR	ING NO.	B-37			S	T/	ATION	16	6+55				C	OFFS	ET 🤅	9 ft RT			ALIG	SNMENT	-Y22-	0 HR.	N/A
COL	LAR ELI	EV. 68	38.2 ft		Т	01	TAL DI	EPT	H 2	26.1 f	ť		N	IORT	HING	180,0	01		EAS	TING 4	50,435	24 HR.	N/A
DRIL	L MACH	IINE D	Diedric	h D-50	D	RI	ILL ME	TH	OD	2-15	/16"	tri-c	one	e with	rotar	y wash					HAMMER TYPE	Automatic	
DRIL	LER D	uggins	, W. T	-	S	T/	ART D/	ATE	03	/10/1	0		C	OMP	. DA	TE 03/	10/10)	SUR	FACE W	ATER DEPTH 0.	3ft	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO	UNT 0.5ft		0	2	BLC	JWS I	PER 50	FOO	T 75	5	100	SAMP.				S(OIL AND ROCK DES	CRIPTION	
690		-									<u> </u>								- 688 2	<u>()</u>	WATER SURFACE ((03/10/10)	0.0
685	- - - - 684 7 -	35					· · · ·	ľ ľ	· · ·	· · ·		· · · ·		· · ·	· · ·					Gay	ALLUVIAL & Tan Stiff Silty Fine (A-7-5)	Sandy CLAY	
			4	5	14	1	 	4 19				· ·	·	 		SS-33	w		683.7 683.0		RESIDUAL		4.5
680	681.6 -	6.6	60/0.1	-			· · · ·	•	· · ·	•••		· · · ·	•	6	 0/0.1	<u>SS-34</u>	No Rec		681.5	Tan I SAN	Medium Dense Silty C ND (A-2-4), with Rock Saprolitic	Coarse to Fine Fragments,	6.7
	-	÷						:		· · · ·		· · · ·	:	••• •••					- 678.6 -	(Grav	WEATHERED R	OCK phosed Rock)	9.6
675	-	ŧ					· · · · · ·			· · · ·		· · · ·	:	· · · ·	: :					Tan 8	CRYSTALLINE R	OCK	4
0.0	-	+									·								+	Wea	thered, Hard to Soft,	Close to Very	
	-	Ē						•	· ·	•••		· ·		•••	· ·				Ē		Bedded, Metamorphic	c Granite	
670	-	ł									+:								- -	Betv	veen 8.7 to 9.6 was V Weathered Sea	′ery Severely am	
	-	+								· · · ·		••• •••	·	· · · ·	· · · ·				4 4		REC = 72% RQ	D =0%	
665	-	ŧ						•	· ·		·	• •	•		• •				∲	Gray, Fi	CRYSTALLINE R resh to Very Slightly V	OCK Veathered, Hard	4
	-	ŧ						:	· · ·	· · · ·		· · · ·		· · · ·					662.1	to Ver Fracti	y Hard, Moderately C ured Spacing, Very T	lose to Closely hickly Bedded,	26.1
660		E																	E		Metamorphosed	Rock	
	-	ł																	F	Boring	REC = 98% RQE Terminated at Eleva	D =72% ation 662.1 ft in	J
655	-	+																	-	Crystalli	ne Rock: Gray Metar	norphosed Rock	(
000	-	+																	F	1) S 2) Adva	tation and offset are nced a 2-15/16" tri-co	e in METRIC one to a depth o	f
	-	Ē																	E	3) Set ⊦	6.6 feet. W casing to 3 feet b	elow the exisitng	,
650	_	F																	E	4) Se	ground. et NW casing to 6.5 f	eet below the	
	-	ł																	F	5) Adva	anced a NQ2 core bai	a. rrel between 6.6	
645	-	ł																	F	6) L	Ised swamp water as	drilling fluid.	
	-	ł																	F				
640	-	ŧ																	F				
		E																	E				
005	-	ł																	F				
635	-	÷																	F				
	-	ł																	F				
630	-	ŧ																	F				
	-	ŧ																	F				
625		Ł																	É				
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620	-	ŧ																	F				
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615		F																	E				
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610	-	╞																	-				

PRC	JECT N	0 . 344	410.1.2	25	ID.	R-224	8E			со	UNTY Mecklenburg	GEOLOGIST	Nash, A. A.		
SITE	DESCR		Brid	lge on -Y	22- (M	allard	Creek Rc	ad) o	ver trib	outar	y to Stone Creek	•		GROUND W	/TR (ft)
BOF	RING NO.	B-37			STAT	ΓΙΟΝ	16+55			OF	FSET 9 ft RT	ALIGNMENT	-Y22-	0 HR.	N/A
COL	LAR ELI	EV. 68	38.2 ft		тот	AL DE	PTH 26.	.1 ft		NO	RTHING 180,001	EASTING 4	50,435	24 HR.	N/A
DRI	L MACH	IINE [Diedric	h D-50;	DRIL	L MET	HOD 2-	·15/16	" tri-co	ne w	vith rotary wash		HAMMER TYPE	Automatic	
DRI	LER D	uggins	, W. T	-	STA	RT DA	TE 03/1	0/10		со	MP. DATE 03/10/10	SURFACE W	ATER DEPTH 0.3	3ft	
COF	RE SIZE	NQ			тот	AL RUI	N 19.4 f	t							
ELEV	RUN	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L	D	ESCRIPTION AN	ID REMARKS		
(π)	(ft)	(ft)	(ft)	(Min/ft)	(π) %	(π) %	NO.	(π) %	(ft) %	Ğ	ELEV. (ft)				DEPTH (ft)
681.5	681.5	6.7		9.20/1.0	(3.6)	(6.0)		(2.1)	(0,0)		- 681 5	Begin Coring	@ 6.7 ft		67
680	-	-		9:59/1.0	82%	136%		72%	0%		Tan & Gray, Moderate	ely to Very Severe	ely Weathered, Hard to	Soft, Close to	· 9.6
	677.1	11.1		5:40/1.0				(16.2)	(11.8)	R		CRYSTALLI	NE ROCK	iorphosed Rock	·
675		ł.	5.0	5:28/1.0	(5.0) 100%	(3.2) 64%		0070	1.2%	P	Gray, Fresh to Very Close to Closely Frac	Visightly Weather tured Spacing, Ve	ed, Hard to Very Hard ery Thickly Bedded, M	l, Moderately etamorphosed	
	070.4			5:28/1.0 6:00/1.0						R	-	Roc	k		
070	0/2.1	10.1	5.0	6:04/1.0	(5.0)	(3.7)				R	-				
670	-	+		6:39/1.0	100%	74%				R	-				
	667.1	21.1	50	6:48/1.0	(47)	(4.2)				R	-				
665		÷	5.0	5:25/1.0	94%	(4.3) 86%					-				
	662.1	26.1		6:58/1.0							- 662 1				26.1
660			1	0.45/1.0							Boring Terminat	ed at Elevation 66	62.1 ft in Crystalline R	ock: Gray	20.1
000	-	+									- 1)	Station and offer			
	-	ŧ									2) Advance	ed a 2-15/16" tri-o	one to a depth of 6.6 f	feet.	
655		ŧ									- 3) Set HW	casing to 6.5 feet	below the existing group	bund.	
	-	ŧ									- 5) Advance - 6)	Used swamp wat	er as drilling fluid.	ieet.	
650		ŧ									-				
] -	F									-				
		E													
645	-	Ł									-				
	-	ŧ									-				
640		ŧ									-				
		ł									-				
635	-	ŧ									-				
035	-	÷									-				
		+									-				
630		ŧ									-				
		Ŧ									-				
625		E									-				
01/01		ŧ									-				
ð		ŧ									-				
<u>5</u> 620	-	ŧ									-				
ک اد	-	ŧ									-				
615	-	ŧ									-				
040.0	-	ŧ									-				
610		ŧ									-				
	1 -	ŧ									-				
		ŧ									-				
5 605		ŧ									-				
	-	ŧ									-				

Project No.: 34410.1.25	I.D. No.: R-2248E	County: Mecklenburg	Geologist: A. A. Nash
Site Description: Bridge on	-Y22- (Mallard Creek Road)	over tributary to Stone Cr	eek
Boring No.: B-37	Station:	Offset:	Alignment: -Y22-
Total Depth: 26.1 feet	Collar Elev.: 688.2 ft	Start Date: 3/10/2010	Comp. Date: 3/10/2010
Driller: Willie Duggins	Core Size: NQ	Drill Ma	achine: Diedrich D-50
feet 0	0.5 1	1.5	2
21.1 ft			Case

PRO	JECT NO). 344	10.1.2	25	ID).	R-2248	E				co	UNTY	Meckler	burg		GEOLO	OGIST	Nash, A. A	۱.		
SITE	DESCR	IPTION	Brid	lge on	-Y22-	(Ma	allard C	reek	Road	d) ove	er trib	outary	to Sto	o Stone Creek						GROUND W	/TR (ft)	
BOR	ΤΑΊ	TION 1	6+8	0			OFF	FFSET 9 ft RT AL				ALIGN	MENT	-Y22-		0 HR.	N/A					
COL	LAR ELE	EV. 68	38.3 ft		т	оτ	AL DEP	тн	35.8	ft		NO	NORTHING 180,017				EASTIN	NG 4	50,454		24 HR.	N/A
DRIL	L MACH	IINE D	Diedric	h D-50) D	RIL	L METH	IOD	2-15	5/16"	tri-co	one w	ith rota	ry wash					HAMMER T	YPE	Automatic	
DRIL	LER D	uggins,	, W. T		S	TAF	RT DAT	E 0)3/08/ [,]	10		co	MP. DA	TE 03/0	09/10		SURFA	CE W	ATER DEPT	H 1.	2ft	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0W CO	JNT 0.5ft	0)	В 25	LOWS	PER 50	FOOT	- 75	100	SAMP. NO.	моі	L O G	ELEV. (ft)	so	DIL AND ROCK	(DES		DEPTH (ft)
690	688.3	-	WOH	WOH	WOH		· · · · ·							SS-26	V		- <u>688.3</u>	V	VATER SURF/ GROUND	ACE (C SURF/	03/08/ <u>10)</u> ACE	0.0
685	686.2	2.1	2	8	12 WO		/: <u>```</u>	20	· · ·	:	· · ·		· · · ·	SS-27	D		685.7	Gay	& Tan Very So Highly Plastic	oft Fine	e Sandy Silty (A-7-6)	2.6
680	681.2	- - - -	38	62/0.3			· · · · L		· · · ·		· · · ·		-100/0.8	SS-28	D		682.8 	Tan (Gray	Very Stiff Fine WEATHER & Orange Met	E Sandy ED RO tamorp	y SILT (A-4) DCK phosed Rock)	5.5
675	677.3 	 	60/0				· · · · ·	· ·	· · · · · · · ·	· · ·	· · · ·		· · · · · · · · · · · · · · · · · · ·	SS-29	No Rec		- 677.3 - - -	Gray t Weathe Close	CRYSTALL o Dark Gray, F ered, Hard to V to Very Closely	INE R Fresh to Yery Ha	OCK o Very Slightly ard, Moderately ured Spacing,	11.0
670	- - - -	- - - -					· · · · ·	· ·	· · · ·	· · ·	· · · ·	· · ·	· · · ·				- - - -	very m	REC = 96%	RQE) =51%	
665	-	- - - -					· · · · ·		· · · ·		· · · ·		· · · ·				-					
660	- - - -	- - - -					· · · · ·	- - -	· · · ·		· · · ·		· · · ·				- - -					
655		-					· · · · ·	· ·	· · · ·	· ·	· · · ·		· · · · · ·				- - - 652.5					35.8
650	-	-															- (Boring Crystalli	Terminated at ne Rock: Gray	Eleva Metan	tion 652.5 ft in norphosed Rock	
645		- - - - -															- 2 - 2 	1) Si 2) Advai 3) Se 4) Se	ation and offs need a 2-15/16 11.0 t HW casing to exisitng : NW casing to existing	set are " tri-co feet. 0 3.5 fe ground 13.0 f	in METRIC one to a depth of eet below the d. eet below the d.	F
640	- - - -	-															5 	i) Advar 6) U	nced a NQ2 con to 35.8 sed swamp wa	re barı 3 feet. iter as	rel between 11.0 drilling fluid.)
635	-	-															-					
630 630	- - -																- - 					
625	- - -	- - -															- - 					
	- - - -	-															-					
615		- - - -															- - - -					
610	-	-															-					

PROJECT NO. 34410.1.25 ID. R-2248E										COUNTY Mecklenburg GEOLOGIST Nash, A. A.						
SITE	SITE DESCRIPTION Bridge on -Y22- (Mallard Creek Road) over									ibutary to Stone Creek GROUND						
BORING NO. B-38 STATION 16+80										OF	FSET 9 ft RT	ALIGNMENT	-Y22-	0 HR.	N/A	
COLLAR ELEV. 688.3 ft TOTAL DEPTH 35.8 ft								.8 ft		NO	NORTHING 180,017 EASTING 450,454 24 HR.					
DRIL	L MACH	IINE D	Diedric	h D-50	DRIL	L MET	HOD 2	15/16	" tri-co	one w	ith rotary wash		HAMMER TYPE	Automatic		
DRIL	LER D	uggins,	W. T.		STAF	rt da	TE 03/0	8/10		со	MP. DATE 03/09/10	SURFACE W	ATER DEPTH 1.2	2ft		
COR	E SIZE	NQ			TOTA	AL RUI	N 24.8 f	t								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	REC. (ft) %	ATA RQD (ft) %	L O G	D ELEV. (ft)	ESCRIPTION A	ND REMARKS	C	EPTH (ft)	
677.3	677.3 -	- 11.0	1.0	5 54/4 0		(0.4)	00.00	(00.0)	(10.7)			Begin Coring	@ 11.0 ft			
675	672.5 -	- 11.0 - - - 15.8	4.8 5.0	5:51/1.0 5:51/1.0 <i>N=60/0</i> 6:20/1.0 5:19/1.0 5:47/1.0 4:40/0.8/	(4.6) 96%	(2.1) 44%	55-29	96%	(12.7) 51%		677.3 Gray to Dark Gray, F Moderately Close to V	Fresh to Very Slig Very Closely Frac Metamorph	INE ROCK ghtly Weathered, Hard ctured Spacing, Very T osed Rock	to Very Hard, hickly Bedded,	11.0	
670	- 	- - - 20.8	5.0	4:38/1.0 7:50/1.0 7:51/1.0 9:20/1.0 13:38/1.0 8:44/1.0	94% (4.8)	54% (4.0)					- 					
665	- - 662.5 -	- - 25.8		5:50/1.0 5:38/1.0 6:48/1.0 6:12/1.0	96%	80%					 					
660	-	- - -	5.0	7:31/1.0 7:38/1.0 7:02/1.0 5:58/1.0	(5.0) 100%	(0.4) 8%					- - -					
655	657.5 - - - - 652.5 -	- <u>30.8</u> - - - - 35.8	5.0	5:02/1.0 4:38/1.0 4:16/1.0 4:02/1.0 5:26/1.0 5:04/1.0	(4.8) 96%	(3.5) 70%					- - - - 652.5				35.8	
650	-	-									Boring Terminat	ed at Elevation 6 Metamorph	52.5 ft in Crystalline R	ock: Gray		
645	-	- - - -									– 1) 2) Advance 3) Set HW c 4) Set NW c	Station and offs d a 2-15/16" tri-c casing to 3.5 fee casing to 13.0 fee	set are in METRIC cone to a depth of 11.0 t below the exisitng gro t below the existing gro	feet. ound. ound.		
640	-	-									5) Advanced 6)	a NQ2 core barr Used swamp wa	el between 11.0 to 35. ter as drilling fluid.	8 feet.		
040	-	-														
635	-	-									- 					
630	-	-									- 					
625		-									 					
2 620	-	-									- 					
615	-	t -									-					
	-	F									-					
	-	F									-					
610		F									-					
500	-	F									-					
605	-	Ē									-					
		E									-					
	-	F									-					
600		-									_ - -					

Project No.: 34410.1.25	<i>I.D. No.</i> : R-2248E	County: Mecklenburg	Geologist: A. A. Nash		
Site Description: Bridge on	-Y22- (Mallard Creek Road)	over tributary to Stone Cre	eek		
Boring No.: B-38	Station:	Offset:	Alignment: -Y22-		
Total Depth: 35.8 feet	<i>Collar Elev.:</i> 688.3 ft	Start Date: 3/8/2010	Comp. Date: 3/9/2010		
Driller: Willie Duggins	Core Size: NQ	Drill Ma	achine: Diedrich D-50		
feet 0	0.5 1	1.5	2		
11.0 ft	15.8 ft		20.8 ft		
feet 0	0.5 1	1.5	2		
20.8 ft					

Project No.: 34410.1.25	I.D. No.: R-2248E	County: Mecklenburg	Geologist: A. A. Nash
Site Description: Bridge on	-Y22- (Mallard Creek Road)	over tributary to Stone Cr	eek
Boring No.: B-38	Station:	Offset:	Alignment: -Y22-
Total Depth: 35.8 feet	Collar Elev.: 688.3 ft	Start Date: 3/8/2010	Comp. Date: 3/9/2010
Driller: Willie Duggins	Core Size: NQ	Drill Ma	achine: Diedrich D-50
feet 0	0.5 1	1.5	2
			ASTA-
	and the second se		
30.8 ft			
		warmen and the second	a contraction of the second
P. A.			
(LESSENT)			35.8 ft
		mana separate	
	Sensity in the	MHH	.12 2010
and a statistical and the second	1		and the second se

PROJECT NO. 34410.1.25 ID. R-2248E C								COUNTY Mecklenburg GEOLOG					GEOLOGIST	Nash, A. A.							
SITE DESCRIPTION Bridge on -Y22- (Mallard Creek Road							k Road) ove	er tribu	utary	to Sto	ne Creel	k		•	I			TR (ft)		
BORING NO. B-39 STATION 16+97 OFFSET								OFFSET 9 ft RT ALIGNMENT -Y22-			0 HR.	N/A									
COL	AR ELE	V. 68	38.3 ft		Т	01	TAL DEP	тн	15.1 f	t		NOF	THING	3 180,0	28		EASTING 4	50,468		24 HR.	N/A
DRIL	L MACH	INE D	Diedric	h D-50) D	RI	LL METH) 2-15	/16" 1	tri-cor	ne wi	th rota	ry wash				HAMMER T	YPE	Automatic	
DRIL	LER D	uggins	, W. T		s	T/	ART DAT	Έ	03/05/1	0		CON	IP. DA	TE 03/0	05/10		SURFACE W		I 0.5	5ft	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO	JNT 0.5ft		0	ا 25	BLOWS	PER F 50	=00T	75	100	SAMP. NO.		LOG	S	OIL AND ROCK	DESC	RIPTION	
690		-					· · · ·		· · · ·										CE (0)	3/05/10)	· — · · 0.0
685	- 	- - <u>3.5</u> - - -	5	10	11			21	· · · · ·	· · ·	· · · ·		· · · ·	SS-23	w		685.3 Gray 680.5	CLAY (A-7-5), H RESID Very Stiff Silty H (A-7-6), with S	Highly UAL Highly I Sand S	Organic Plastic CLAY leams	<u>3.0</u> 7.8
675	<u>678.2</u>	<u>8.5</u> 10.1	71 60/0	29/0.3					· · · · ·		· · · ·	- - - -	100/0.8 • • 60/0 • • • •	<u>SS-24</u> SS-25	м		– <u>678.2</u> – Gray, F – Very – Very T	WEATHERI (Gray Metamor CRYSTALLI reshly Weathere Close to Closely hickly Bedded, N	ED RO phosed NE RO ed, Har Fractu Metamo	CK d Rock) DCK of to Very Hard, ured Spacing, orphosed Rock	10.1
670		- - - -								<u> </u>		<u> </u>					673.2 Boring Crystall	REC = 96% Terminated at ine Rock: Gray I	RQD Elevat Vetam	=60% ion 673.2 ft in orphosed Rock	15.1
665	- - - -	-															- 2) Adva - 3) S - 4) S	inced a 2-15/16" 10.1 f et HW casing to exisiting g let NW casing to	tri-coi eet. 3.5 fe ground 10 fe	et below the et below the	
660		-															5) Adva 6) U	existing g nced a NQ2 cor to 15.1 Jsed swamp wat	ground e barro feet. er as o	el between 10.1 drilling fluid.	
655		-															- - - -				
645		-																			
640	-	-															-				
635	- - - -	-															- - - - -				
630 09.10	-	-															- - - -				
625 625	- - - - - -	- - - - -															- - - - - -				
620 620		- - - -															- - - - -				
610		- - - -																			

	PROJECT NO. 34410.1.25 ID. R-2248E								COUNTY Mecklenburg GEOLOGIST Nash, A. A.								
:	SITE DESCRIPTION Bridge on -Y22- (Mallard Creek Road) over									ver trib	outar	y to Stone	Creek	•		GROUND W	/TR (ft)
I	BORING NO. B-39 STATION 16+97										OF	FSET 9 ft	RT	ALIGNMENT	-Y22-	0 HR.	N/A
COLLAR ELEV. 688.3 ft TOTAL DEPTH 15.1 ft									1 ft		NO	RTHING	180,028	50,468	24 HR.	N/A	
DRILL MACHINE Diedrich D-50 DRILL METHOD 2-15/16" tri-c									15/16	" tri-cc	ne w	/ith rotary v	vash	•	HAMMER TYPE	Automatic	
	DRIL	LER D	uggins	, W. T.		STAF	RT DA	TE 03/0	5/10		со	MP. DATE	03/05/10	SURFACE W	ATER DEPTH 0.	5ft	
	CORI	E SIZE	NQ			TOTA	L RUI	N 5.0 ft						•			
E	ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft) %	L O G	ELEV. (ft)	C	DESCRIPTION AN	ID REMARKS	[DEPTH (ft)
6	678.2													Begin Coring	@ 10.1 ft		
_	675	678.2 - - - 673.2 -	10.1 10.1	5.0	7:37/1.0 7:37/1.0 <i>N=60/0</i> 6:08/1.0 7:08/1.0 7:24/1.0	(4.8) 96%	(3.0) 60%	SS-25	(4.8) 96%	(3.0) 60%		678.2 673.2	Gray, Freshly We Fractured Spac	CRYSTALLI eathered, Hard to ing, Very Thickly	NE ROCK Very Hard, Very Close Bedded, Metamorphos	e to Closely sed Rock	10.1 15.1
	670	-	+		5.20/1.0/							-	Boring Terminat	Metamorpho	73.2 ft in Crystalline R osed Rock	ock: Gray	
	665	-	+									- - - - -	2) Advance 3) Set HW 4) Set NW 5) Advanced 6)	ad a 2-15/16" tri-co casing to 3.5 feet casing to 10 feet l a NQ2 core barre Used swamp wat	bone to a depth of 10.1 below the exisiting gro below the existing gro el between 10.1 to 15. er as drilling fluid.	feet. ound. und. 1 feet.	
_	660	-										- - -					
_	655	- - - -	+ + + + +									- - - -					
_	650	-	+ + + +									- - - -					
_	645	-										- - - -					
	640	-	-									- 					
_	635	-										- -					
_	630	-										- - - -					
_	625		+ + + +									- - 					
	620	- - - -	+ + + +									- - - -					
	615											- - - -					
10-00-01	610	-										- - 					
	605											- - 					
	600	-										- - 					

Project No.: 34410.1.25	<i>I.D. No.</i> : R-2248E	County: Mecklenburg	Geologist: A. A. Nash		
Site Description: Bridge on	-Y22- (Mallard Creek Road)	over tributary to Stone Cr	eek		
Boring No.: B-39	Station:	Offset:	Alignment: -Y22-		
Total Depth: 15.1 feet	Collar Elev.: 688.3 ft	Start Date: 3/5/2010	Comp. Date: 3/5/2010		
Driller: Willie Duggins	Core Size: NQ	Drill Ma	achine: Diedrich D-50		
feet 0	0.5 1		2		
10.1 ft			ts.1 ft		