

	PRC	JECT I	NFORMATION	DRILLING INFORMATION							
PROJEC		Harley Da		DRILLING CO			chelbergers				
SITE LO	CATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER:			ane Albert	AD.T.			
JOB NO.	.:	10012.26		RIG TYPE: DRILLING MI	ETHOD		eoprobe 782 SA. Geoprol		e Sampling		
LOGGEI	DBY:	R. Ulrich		DEVELOPME			12/15-2/13/1		a sampung		
DATES I	DRILLED:	12/2914-12	2/30/14, 2/915-2/10/15	LOCATION: South Property Boundary Area							
NOTES	S: Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE EL	EVATI	ON 41	3.78' AMSI				
			at 50'. 4 1/4 ID HSA advanced to 66'. well installed 2/11/15.	EASTING 2260208.866 NORTHING 238989.580							
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET		ELL RUCTION	WELL CONSTRUCTION DETAILS		
4						4					
						-					
						-					
2									6" Standpipe with locking cap		
						_			Locking compression		
-0			Very dark brown 10YR 2/2, Topsoil. Moist		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- 0			Concrete surface pad		
			Limestone GRAVEL fill. Moist.			_					
-2			10YR 5/4 yellowish brown, fine to coarse SAI Clayey Silt, trace fine Gravel. Moist.	ND, some		—2 –			#1 Sand pack (1.0'-2.0')		
			5YR 4/4 reddish brown, Clayey SILT, some fi Sand, trace fine Gravel. Moist.	ne to coarse		_					
-4						—4 –			8" HSA borehole (0-66')		
			Reddish yellow 7.5YR 6/6, SILT & CLAY, lit coarse Sand, little fine to coarse Gravel. Mois		:_T_: :::::::::::::::::::::::::::::::::	_					
-6			Light gray 5Y 7/2, coarse GRAVEL, trace fine Sand, trace Clayey Silt. Moist.	e to coarse	#:# 	 6 -					
-8	4.6/5.0	S1/1 to S11/1	Yellowish brown 10YR 5/4, fine to coarse SA Clayey Silt, little fine Gravel. Moist.	ND, some		- - 8			2" PVC riser, (0'-55.7')		
		<i>311</i> , 1	Yellowish brown 10YR 5/4, Clayey SILT, littl coarse Sand, little fine to coarse Gravel. Mois			-					
- 10			Yellowish brown 10YR 5/4, fine to coarse GR fine to coarse Sand, trace Clayey Silt. Moist.	AVEL, little		- 10			Portland/benseal grout		
			Yellowish red 5YR 5/6, Clayey SILT, little fir Sand, little fine to coarse Gravel. Moist. Gray organic material at 10.3'.			-			(2.0'-49.8')		
- 12	5.0/5.0	S1/2 to	Yellowish red 5YR 5/6, fine to coarse GRAVI Clayey Silt, little fine to coarse Sand. Moist.	EL, some		— 12 -					
- 14	3.0/3.0	S1/2 to S12/2	Reddish yellow 7.5YR 6/6, CLAY & SILT, so coarse Gravel, some fine to coarse Sand, trace Moist.		=::±::= =::± ====	- - 14					
14			Brownish yellow 10YR 6/6, SILT, little fine S	and. Moist.		- 1 4 -					
			Brownish yellow 10YR 6/6, SILT, some fine 0	Gravel, little	: <u>\``\`\</u>	-		11			



PROJECT: Harley Davidson

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DEPTH	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
FEET			n	# # # # # # # # # # #	FEET		DETAILS
- 16			fine to coarse Sand. Moist. Brownish yellow 10YR 6/6, fine to coarse subangular		-16		
			quartzite GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.				
- 18	5.0/5.0	S1/3 to S12/3	Brownish yellow 10YR 6/6, SILT & CLAY and fine to coarse Sand, trace fine to coarse subangular quartzite Gravel. Moist.	-::±::= -::±:= -::±:=	- 18		
- 20			Brownish yellow 10YR 6/6, SILT & CLAY, trace fine Sand. Moist.	<u> </u>	- 20		8" HSA borehole (0- 66')
			Brownish yellow 10YR 6/6, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel. Moist.				
- 22	5.0/5.0	S1/4 to S12/4	Brownish yellow 10YR 6/6, CLAY & SILT, some fine to coarse Sand, trace fine Gravel. Moist.	E: #: # #: #	- 22		
- 24		312/4	Brownish yellow 10YR 6/6, SILT & CLAY, some fine to coarse Gravel, little fine to coarse Sand. Moist.		- 24		
			Brownish yellow 10YR 6/6, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel. Moist.				2" PVC riser, (0'-55.7')
- 26			Light red 2.5YR 6/6, fine to coarse subangular to subrounded quartzite GRAVEL, some Silt & Clay, little fine to coarse Sand. Moist.		- 26		2 1 ve iisei, (0-55.7)
			Red 10R 5/6, CLAY & SILT, some fine to coarse Sand, little fine subangular to subrounded quartzite GRAVEL. Moist.				
- 28	5.0/5.0	S1/5 to S12/5		1===	- 28		
			Brownish yellow 10YR 6/8, Clayey SILT, some fine to coarse Sand, trace fine Gravel. Moist.				
- 30			Brownish yellow 10YR 6/8, fine to coarse subangular to subrounded quartzite GRAVEL, some Silt & Clay, little fine to coarse Sand. Moist.		-30		Portland/benseal grout (2.0'-49.8')
	3.4/2.5	\$1/6 to \$6/6	Reddish yellow 7.5YR 6/8, SILT & CLAY, little fine to coarse Sand, little fine to coarse Gravel. Moist. Mottled reddish brown.				(2.0 45.0)
- 32			Reddish yellow 7.5YR 6/8, CLAY & SILT, little fine to coarse Sand, trace fine Gravel. Moist. Mottled reddish brown.	=::±:= =::± =::±	- 32		
- 34	3.4/2.5	S1/7 to	Brownish yellow 10YR 6/8, SILT & CLAY, little fine to coarse Sand, trace fine Gravel. Moist.		-34		
	3.4/2.3	S6/7	Brownish yellow 10YR 6/8, SILT & CLAY, little fine to coarse Sand, little fine to coarse Gravel. Moist. Wet 35.4'-	F.: ±.: = ±.: ±.: = ±.: ±.: = ±.: ±.: = ±.: ±.: =			
-36	5.0/2.5	\$1/8 to	35.8' and 36.8'-37.0'.		-36		
		S6/8					
-38					-38		



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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
-40	3.3/2.5	S1/9 to S6/9		I	40		
-	4.4/2.5	S1/10 to	Brownish yellow 10YR 6/6, CLAY & SILT, little fine to coarse Sand, little fine Gravel. Moist.	T: T	10 - -		8" HSA borehole (0- 66')
-42		S6/10	Brownish yellow 10YR 6/6, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Moist.		- 42		
				#:#:# #:# #:#	- - -		2" PVC riser, (0'-55.7')
- 44	2.0/2.5	S1/11 to S4/11	No Recovery. Sample fell out of bottom of tube into borehole.	 			
- 46 -	5.0/2.5	S1/12 to S6/12	Brownish yellow 10YR 6/6, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Moist. Wet 43.3'-43.7'.		- 46 		Portland/benseal grout (2.0'-49.8')
48			Vollowish husers 10VD 5/4 CLAV 9, CHT little fine to	X X X X X X X X X X	48 		
-	3.6/2.5	N/A	Yellowish brown 10YR 5/6 CLAY & SILT, little fine to coarse Sand, trace fine Gravel. Very moist with wet pockets & seams, wet below 49.5'.		-		
- 50			Soil not sampled. The borehole was deepened with augers after macrocore refusal. The lower 15 feet of augers and cutter head were coated in Silt & Clay.		50 		Bentonite chip annular seal (49.8'-53')
- 52 -					— 52 —		
- 54 -					— 54 - -		#1 Sand pack (53'-66')
- 56 -				= : ± : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : : ± : ± :	— 56 - -		2" PVC 10-slot screen, (55.7'-65.7')
- 58 -	N/A	N/A		=: ±: ± =: ±: ± =: ±: ± =: ±: ±	<u>-</u> ∣		
- - 60 -					 60		
-62					62		

			TER SCIENCES CORPORATION Harley Davidson		C	GEOLOGIC LO	G: MW-161 Page 4 of 4
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- - - 64				± ; ± ; ± ; ± ; ± ; ± ; ± ; ± ; ± ; ±	- - 64		8" HSA borehole (0-66')
				T: T: T: T: T: T: T: T:	- - - 66		2" PVC 10-slot screen, (55.7'-65.7')



	PRC	JECT I	NFORMATION	DRILLING INFORMATION						
PROJEC		Harley Da		DRILLING CO	O.:		chelbergers,	Inc.		
SITE LO	CATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER: RIG TYPE:			iane Albert coprobe 7822	DIT		
JOB NO.	.:	10012.26		DRILLING M	ETHOD		eoprobe 782. SA, Geoprob		ne Sampling	
LOGGEI	DBY:	R. Ulrich		DEVELOPME			12/15-2/13/1		7 8	
DATES 1	DRILLED:	11/6/14, 12	2/29/14, 2/5/15-2/6/15	LOCATION: South Property Boundary Area						
NOTES	S: Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE EL	EVATI	ON 41	3.37' AMSL	,		
			at 56.9'. 4 1/4 ID HSA advanced to 57'.	EASTING			260012.338			
	2" PVC 1	monitoring	well installed 2/6/15.	NORTHING	1 7)	23	88996.758 I		WELL	
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WE CONSTR		WELL CONSTRUCTION DETAILS	
-4						4			1	
						-				
					-	-				
						-]	9	C'' Stondaine 'd	
2						- -2			6" Standpipe with locking cap	
						_				
						_			Locking compression cap	
0					8,8,4	-0	7777			
			Yellowish brown (10YR 5/4), Topsoil. Dry.	/		_			Concrete surface pad	
			Yellowish brown (10YR 5/4), fine to coarse G Cobbles, , little fine to coarse Sand, little Clayer			-				
•			Cobbies, , inthe fine to coarse Sand, inthe Claye	zy Siit. Diy.		-			#1 Sand pack (1.0'-	
-2			Brownish yellow (10YR 6/6), Clayey SILT, lit	tle fine to		- 2			2.0')	
			coarse Sand, trace fine Gravel. Dry.			-				
			Yellowish red (5YR 5/6), Clayey SILT, little f	ine to coarse		_				
-4			Sand, little fine Gravel. Moist.	me to course		-4			8" HSA borehole (0-	
						_		И	57')	
			Red (2.5YR 4/6), Clayey SILT, little fine to co	arse Sand,		_		И		
-6			little fine Gravel. Moist.	•		- 6				
O						-				
	3.6/4.0	S1/1 to				-			2" PVC riser, (0'-43')	
	3.0/4.0	S8/1	Strong brown (7.5YR 5/6), fine to coarse SAN to coarse subangular Gravel, some Silt & Clay			-			2 1 ve fisci, (0-43)	
-8			,			-8				
						-				
						_				
- 10						- 10		И	Devided 1/1	
					<u> </u>	_		И	Portland/benseal group (2.0'-37')	
	4.0/4.0	S1/2 to	Red (2.5R 5/8), SILT & CLAY, little fine to consubangular to subrounded Gravel, trace fine to		X:X	_		И		
		S8/2	Moist.		工:工	-				
- 12					Ξ: Ξ:Ξ Ξ:Ξ	- 12				
					エ:エ	-				
			Red (2.5R 5/8), SILT & CLAY, some fine to c		######################################	-				
- 14			subangular to subrounded quartzite Gravel, tra coarse Sand. Moist.	ce fine to	E: X: X	 14				
					工:工:	-		И		
	3.3/4.0	S1/3 to			王王	_	ГИ	И		



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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
16		S8/3	Reddish yellow (5YR 6/6), CLAY & SILT, some fine to		- 16		
			coarse Sand, trace fine Gravel. Moist. Brownish yellow (10YR 6/6), CLAY & SILT, little fine to	=: = ::	_		
18			coarse quartzite Gravel, trace fine to coarse Sand. Moist. Reddish brown & white mottles.	X	— 18 —		
20	3.9/4.0	S1/4 to S8/4		I	_ 20		8" HSA borehole (0-
22			Brownish yellow (10YR 6/8), SILT & CLAY, little fine to medium Sand. Moist. Mottled white.	T: T			57')
22	3.2/4.0	S1/5 to		±:±: =:±: =:±: =:±:	— 22 –		
24		S7/5		X	— 24 –		
26			Brownish yellow (10YR 6/8), CLAY & SILT, trace fine to coarse Sand, trace fine Gravel. Moist. Mottled white & reddish brown.		- - - 26		2" PVC riser, (0'-43')
	4.0/4.0	S1/6 to S8/6		T: T	-		
28					— 28 - -		
30				T: T T: T	- 30 		Portland/benseal group (2.0'-37')
22	4.0/4.0	S1/7 to S8/7	Reddish yellow (7.5YR 6/8), CLAY & SILT, little fine to medium Sand. Moist.		-		
32			Reddish yellow (5YR 6/8), CLAY & SILT, little fine to coarse Sand, little fine to coarse Gravel. Moist.	#:# #:# #:#	- 32 -		
34			Brownish yellow (10YR 6/6), SILT & CLAY, some fine to coarse Gravel, little fine to coarse Sand. Moist.	T: T	- 34		
	4.0/4.0	S1/8 to	Brownish yellow (10YR 6/6), fine to coarse subangular to subrounded quartzite GRAVEL, some Silt & Clay, little fine to coarse Sand. Moist.		 - -		
36		S8/8	Red (2.5YR 5/6), fine to coarse subangular to subrounded quartzite GRAVEL, little Silt & Clay, little fine to coarse Sand. Moist.		- 36 -		
			Brownish yellow (10YR 6/6), SILT & CLAY, some fine to coarse Gravel, little fine to coarse Sand. Moist.		_		Bentonite chip annul
38			Brownish yellow (10YR 6/6), SILT & CLAY, little fine to coarse Sand, trace fine Gravel. Moist.	/=::=::= =::=::= :::=::=	—38 -		seal (37'-41')



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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 40	4.0/4.0	\$1/9 to \$8/9	Brownish yellow (10YR 6/6), CLAY & SILT, little fine to coarse Sand, trace fine to coarse Gravel. Moist. Coarse quartzite Gravel 39.0'-39.2'.		40 		Bentonite chip annular seal (37'-41')
- 42	1.6/4.0	S1/10 to	No recovery.		- -42 -		2" PVC riser, (0'-43')
44 44		S4/10	Brownish yellow (10YR 6/6), SILT & CLAY, little fine to coarse Sand, little fine to coarse Gravel. Moist. Coarse Gravel 43.9'-44.1'.	#:# #:# #:# #:#	— 44 —		#1 Cond on all (41) 540
- 46					46 		#1 Sand pack (41'-54')
-48	4.2/5.0	S1/11 to S10/11	Yellowish brown (10YR 5/6), CLAY & SILT, little fine to coarse Sand, little fine to coarse Gravel. Moist. Reddish brown mottles. Yellowish brown (10YR 5/6), CLAY & SILT, trace fine Sand. Moist.		Γ Ι		2" PVC 10-slot screen, (43'-53')
- 50			Light yellowish brown (10YR 6/4), CLAY & SILT, some fine to coarse Sand, little fine Gravel. Moist.		50 		8" HSA borehole (0-57')
- 52	5.0/4.2	S1/12 to S10/12	Light yellowish brown (10YR 6/4), CLAY & SILT, some fine to coarse Sand. Moist.		52 		
- 54			Light yellowish brown (10YR 6/4), fine to coarse subangular to subrounded quartzite GRAVEL, some fine to coarse Sand, some Silt & Clay. Moist.		54		
	4.2/2.7	S1/13 to	Yellowish brown (10YR 5/4), SILT & CLAY,some fine to coarse Sand, some fine to coarse Gravel. Moist. Wet seam of Sand at 55.6'.		-		Bentonite chip annular seal (54'-55.5')
- 56		S6/13	Yellowish brown (10YR 5/6), CLAY & SILT, trace fine to coarse Sand, trace fine Gravel. Moist. Reddish brown mottles.	H: H H: H	— 56 —		Collapsed formation (55.5'-57')
			Yellowish brown (10YR 5/6), SILT & CLAY, trace fine to coarse Sand, trace fine Gravel. Moist. Reddish brown mottles.				
			Reddish brown (5YR 5/4), fine to coarse SAND, some Silt & Clay. Wet.				



	PRC	JECT I	NFORMATION	DRILLING INFORMATION						
PROJEC		Harley Da		DRILLING CO			chelbergers,			
SITE LO	CATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER:			ane Albert			
JOB NO.	:	10012.26		RIG TYPE: DRILLING M	FTHOL		eoprobe 782. SA Geoprof		e Sampling, Air Rotary	
LOGGEI	DBY:	R. Ulrich		DEVELOPMENT DATE: 2/12/15					e Sumpung, An Rotary	
DATES	ORILLED:	11/4/14, 1/	/30/15, 2/2/15-2/4/15	LOCATION: South Property Boundary Area						
NOTES	Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE EL	EVATI	ON 41	6.97' AMSI	,		
	advanced	l to refusal	at 32.5'. 6 1/4 ID HSA overdrilled to 32.5.	EASTING		22	259838.321			
	5" hamm	er bit adva	nced to 57' with air rotary. Well constructed 2/4/	NORTHING		23	88999.212			
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WE CONSTR	LLL UCTION	WELL CONSTRUCTION DETAILS	
4						4				
-						-				
-						-				
-						-] 🖪	4 [
2						2			6" Standpipe with locking cap	
-						_				
-						_			Locking compression cap	
-0					2 2	-0			Сар	
-			Very pale brown (10YR 7/4), Topsoil. Moist.			-			Concrete surface pad	
-					<u> </u>	_				
-			Brownish yellow (10YR 6/6), Clayey SILT, lit coarse Sand, little fine to coarse Gravel. Moist	tle fine to	\equiv	-			#1 Sand pack (1.0'-	
-2			, , , , , , , , , , , , , , , , , , , ,		\equiv	-2		-1:	2.0')	
-					\equiv	-				
-					\equiv	-				
-4										
- 4 -					\equiv	- 4 -			10" HSA borehole (0-32.5')	
-						_			32.3)	
-			Strong brown (7.5YR 5/6), Clayey SILT, little Sand, trace fine Gravel. Moist.	fine to coarse		_				
- 6						 6				
- I			Red (2.5YR 5/6), SILT & CLAY, little fine to trace fine to coarse Gravel. Moist.	coarse Sand,	T:T	-				
-	4.0/4.0	S1/1 to			H:H	-			2" PVC riser, (0'-35')	
- _		S10/1	Red (2.5YR 5/6), fine to coarse GRAVEL, little coarse Sand, trace Clayey Silt. Moist. Gravel		=:	-				
-8			quartzite.			8				
			Red (2.5YR 5/6), SILT & CLAY, little fine to	coarse Sand,	=	_				
_			trace fine to coarse Gravel. Moist.		===	_				
-10			Red (2.5YR 5/6), SILT & CLAY, some fine to trace fine Gravel. Moist.	coarse Sand,		 10			Dortland/hamaa-1	
-						_			Portland/benseal grout (2.0'-28.5')	
-	4.0/4.0	S1/2 to	Reddish brown (5YR 5/4), Clayey SILT, trace Sand, trace fine Gravel. Moist.	fine to coarse		-				
-	110, 110	S10/2				-				
- 12			Red (2.5YR 5/6), Clayey SILT, some fine to me trace fine Gravel. Moist. Gravelly seams at 9.			 12				
-			D 1/10D 1/0 G 177 2 G =	g ;	<u> </u>	-				
-			Red (10R 4/6), CLAY & SILT, trace fine to co trace fine to coarse Gravel. Moist.	arse Sand,	::::::::::::::::::::::::::::::::::::::	_				
- 14			Red (10R 4/6), CLAY & SILT, some fine to co	narse Gravel	#:# #:#	- 14				
- '			trace fine to coarse Sand. Moist.	ourse Graver,	Ξ:Ξ	-				
-	4.0/4.0	S1/3 to			=:	_				
I	1 4.0/4.0	51/510			1		ı Vİ	V	1	



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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
16		S10/3	Red (2.5YR 5/6), CLAY & SILT, trace fine to medium Sand. Moist.		- 16 		
18			Red (2.5YR 5/6), CLAY & SILT, some fine to coarse Gravel, trace fine to coarse Sand. Moist. Gravel is quartzite.	H:H	18 18		
20	4.0/4.0	S1/4 to S10/4	Reddish yellow (5YR 6/6), Clayey SILT, some fine to coarse Sand, trace fine Gravel. Moist.		- - - 20		10" HSA borehole (0-32.5')
22	4.0/4.0	\$1/5 to	Yellowish red (5YR 5/6), SILT & CLAY, little fine to coarse Sand, little fine to coarse Gravel. Moist.	T: T	- - 22 -		2" PVC riser, (0'-35')
24		S10/5	Brownish yellow (10YR 6/6), Clayey SILT, little fine to medium Sand, trace fine Gravel. Moist.		24 		
26			Yellowish red (5YR 5/6), Clayey SILT, some fine to coarse Gravel, little fine to coarse Sand. Moist. May be sluff?		- - 26		Portland/benseal grou
28	4.0/4.0	\$1/6 to \$10/6	Reddish yellow (7.5 YR 6/8), CLAY & SILT, little fine to coarse Gravel, trace fine to coarse Sand. Moist. Brownish yellow (10YR 6/8), subrounded to rounded fine to coarse Gravel, some fine to coarse Sand, trace Silt. Wet. Brownish yellow (10YR 6/8), fine SAND, little Silt. Wet.	= : = : = : = : = : = : = : = : = : = :	- - - - 28		(2.0'-28.5')
30			Reddish yellow (5YR 6/6), subrounded to rounded fine to coarse GRAVEL, little fine to coarse Sand, little Clayey Silt. Wet.		- - - 30		Bentonite chip annula seal (28.5'-32.8')
	3.6/3.5	S1/7 to S10/7	Brownish yellow (10YR 6/6), subrounded to rounded fine to coarse GRAVEL, little fine to coarse Sand, little Silt & Clay. Wet.		-		
32		510//	Brownish yellow (10YR 6/8), CLAY & SILT, some fine to coarse Sand, trace fine Gravel. Coarse Sandstone Gravel 32.2-32.4. Limestone shards in toe of macrocore at 32.5'. Moist.	=:::::	-32		
34			Refusal at 32.5'. Hard, slightly weathered, gray (N5/) LIMESTONE. Dry. Thin calcite veins present.		- - 34 -		5" air rotary borehole (32.5'-57')
36			Void filled with Sand and Gravel from 35.5'-37', Silt & Clay from 37'-39'.	0:::(0::::(0::::(0::::(0::::(- -36 -		#1 Sand pack (32.8'-56')
-38				70:-:.7 0:::.7 70:::.7	- -38		2" PVC 10-slot screet (35'-55')



Page 3 of 3

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
			Solution features evident.			: <u> </u> :	
40			No returns. No sound from the hammer bit, downward resistance indicates sediment is present, presumably Silt & Clay. From 49'-51' hammer bit produces soft thuds, suggesting more resistant material such as gravel or weathered bedrock.		40 		
42					— 42 - -		5" air rotary borehold (32.5'-57')
44					- 44 - -		
46					- 46 		#1 Sand pack (32.8'- 56')
48					- 48 		
50							2" PVC 10-slot scree (35'-55')
52			No returns. Hammer bit sounds as if in competent rock. Limestone dust on hammer bit when removed from borehole.		- 52 		
54					- 54 		
56					- - 56	0:: 0:: 0::	Collapsed formation (56'-57')



	PRC)JECT I	NFORMATION	DRILLING INFORMATION							
PROJEC		Harley Da		DRILLING C			chelbergers, I				
SITE LO	CATION:		ork Naval Ordnance Plant, York, PA	DRILLER:		SI	ane Albert				
JOB NO.		10012.26	, ,	RIG TYPE:	ETHOL		eoprobe 7822L				
LOGGE		R. Ulrich		DRILLING M DEVELOPME			SA, Air Rotary 12/15	V			
	DRILLED:		20/15	LOCATION: South Property Boundary Area							
				SURFACE ELEVATION 422.48' AMSL							
NOTES			to 5'. 6 1/4 HSA advanced to refusal at 10.3'. need using air rotary to 53'.	EASTING 2259623.933							
			well installed 1/30/15.	NORTHING			38954.174				
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WEL CONSTRU		WELL CONSTRUCTION DETAILS		
 						 4					
+						-					
г						_					
- 2 						- 2 			6" Standpipe with locking cap		
-						-			Locking compression cap		
0 - -			Yellowish brown (10YR 5/6), fine to coarse G fine to coarse Sand, little Clayey Silt. Moist.	RAVEL, little		0 - -			Concrete surface pad		
-						_			#1 Sand pack (1.0'-		
-2 -			Light brown (5YR 5/6), weathered sandstone (Cobbles &		- 2			3.0')		
-			Gravel, little fine to coarse Sand, little Clayey	Siit. Moist.		-					
-4						-4			10" HSA borehole (0-		
-						-			10.3')		
- 6			No returns. Augers are chattery as if in Cobble	es & Gravel.		- 6					
-						_			2" PVC riser, (0'-43')		
-	No		No returns. Slow progress with augers, grinding weathered bedrock.	ng as if in		-					
-8 -	recovery					 8					
-						<u>-</u>			Portland/benseal grout (3'-37')		
- 10						 10					
- -			Soft to very soft, highly weathered, brown (10 light yellowish brown (10YR 6/4), fine-grainer SANDSTONE. Locally recrystallized to Quar	d		- -			5" air rotary borehole (10.3'-53')		
12 	air rotary cuttings					— 12 –					
- 14						- 14					
-						_					
<u> </u>					:•:•:	-	і ИА	1			



GEOLOGIC LOG: MW-164

PROJECT: Harley Davidson

		ECI: H	tariey Daviason				T
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 16					- 16 -		
- - - 18					- - 18		
-20	air rotary cuttings				- 20 -		5" air rotary borehole (10.3'-53')
- 22 - 22					- - 22 -		
- - 24 -					- - 24 -		2" PVC riser, (0'-43')
- 26					- 26 		
- 28			Medium hard to soft, moderately weathered, very pale brown (10YR 7/3), QUARTZITE.		- - - 28 -		Portland/benseal grout (3'-37')
-30					- - 30 -		
- 32					- - -32		
- 34					- - - 34 -		
- 36					- - - 36 -		
- 38					- - -38		Bentonite chip annular seal (37'-40')



GEOLOGIC LOG: MW-164

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	PROJ	JECT: H	darley Davidson				Page 3 of 3
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
-40					- - -40		Bentonite chip annular seal (37'-40')
	air rotary cuttings				- -		2" PVC riser, (0'-43')
42					— 42 —		#1 Sand pack (40'-53')
- 44 -					- 44 		2" PVC 10-slot screen, (43'-53')
- - 46 -			Wet fracture at 46.5'.		- 46 		5" air rotary borehole (10.3'-53')
-48 -			Soft zone 47.5'-48'.		- 48 		
- 50					_ 50		
- - -52					- - 52		



PROJECT: SITE LOCATION JOB NO.: LOGGED BY: DATES DRILLEI NOTES: Vacuu 5" ham	Harley Da I: Former Yo 10012.26 R. Ulrich D: 11/4/14, 2/ m excavation mmer bit advan C monitoring	ork Naval Ordnance Plant, York, PA	DRILLING CO DRILLER: RIG TYPE: DRILLING M DEVELOPME LOCATION: SURFACE EL EASTING NORTHING	O.: ETHOD ENT DA	Ei Sh Go: H. TE: 2// So ON 41	ING INFORMA chelbergers, Inc. chane Albert coprobe 7822DT SA, Air Rotary 20/15 chth Property Boundary 8.74' AMSL 259411.882 88842.029 WELL CONSTRUCTION	
SITE LOCATION JOB NO.: LOGGED BY: DATES DRILLEI NOTES: Vacuu- 5" ham 2" PVO DEPTH FEET RECOVER	I: Former You 10012.26 R. Ulrich D: 11/4/14, 2/ m excavation namer bit advant C monitoring	virk Naval Ordnance Plant, York, PA //12/15 to 4.5'. 6 1/4 ID HSA advanced to refusal at 4.5' need using air rotary to 72.5'. well installed 2/13/15 & 2/18/15.	DRILLER: RIG TYPE: DRILLING M DEVELOPME LOCATION: SURFACE EL EASTING	ETHODENT DA	Sh GG	nane Albert eoprobe 7822DT SA, Air Rotary 20/15 outh Property Boundary 8.74' AMSL 259411.882 88842.029 WELL	WELL CONSTRUCTION
JOB NO.: LOGGED BY: DATES DRILLEI NOTES: Vacuu. 5" harr 2" PVC DEPTH FEET RECOVER 4	10012.26 R. Ulrich D: 11/4/14, 2/ m excavation mer bit advan C monitoring	to 4.5'. 6 1/4 ID HSA advanced to refusal at 4.5' need using air rotary to 72.5'. well installed 2/13/15 & 2/18/15.	DRILLING M DEVELOPME LOCATION: SURFACE EL EASTING	ENT DA	DEPTH	SA, Air Rotary 20/15 outh Property Boundary 8.74' AMSL 259411.882 88842.029 WELL	WELL CONSTRUCTION
DATES DRILLEI NOTES: Vacuu 5" ham 2" PVC DEPTH FEET RECOVER	R. Ulrich D: 11/4/14, 2/ m excavation mer bit advar C monitoring	to 4.5'. 6 1/4 ID HSA advanced to refusal at 4.5' need using air rotary to 72.5'. well installed 2/13/15 & 2/18/15.	DEVELOPME LOCATION: SURFACE EL EASTING	ENT DA	TE: 2/. S6 ON 41 22 23 DEPTH	20/15 outh Property Boundary 8.74' AMSL 259411.882 8842.029 WELL	WELL CONSTRUCTION
DATES DRILLEI NOTES: Vacuu 5" harr 2" PVC DEPTH FEET 4	m excavation nmer bit advar C monitoring	to 4.5'. 6 1/4 ID HSA advanced to refusal at 4.5' need using air rotary to 72.5'. well installed 2/13/15 & 2/18/15.	LOCATION: SURFACE EL EASTING	LEVATI:	ON 41 22 23 DEPTH	8.74' AMSL 259411.882 88842.029	WELL CONSTRUCTION
NOTES: Vacuus 5" ham 2" PVC DEPTH FEET RECOVER 4	m excavation nmer bit advan C monitoring	to 4.5'. 6 1/4 ID HSA advanced to refusal at 4.5' need using air rotary to 72.5'. well installed 2/13/15 & 2/18/15.	EASTING		22 23 DEPTH	259411.882 88842.029 WELL	CONSTRUCTION
5" harr 2" PVC DEPTH FEET RECOVER	nmer bit advan	nced using air rotary to 72.5'. well installed 2/13/15 & 2/18/15.	EASTING		22 23 DEPTH	259411.882 88842.029 WELL	CONSTRUCTION
DEPTH RECOVER -42			NORTHING	GRAPHIC	DEPTH	WELL	CONSTRUCTION
FEET RECOVER	SAMPLE SAMPLE	SOIL DESCRIPTION		GRAPHIC			CONSTRUCTION
2							1
					4		1
air rotary cuttings		Yellowish brown (10YR 5/6), Clayey SILT, lit coarse Sand, little fine to coarse GRAVEL. M Light reddish brown (5YR 6/3), weathered san Cobbles & Gravel, trace fine to coarse Sand, tr Silt. Moist. Moderately hard to medium hard, moderately volive brown (2.5Y 4/3), fine-grained SANDST Moderately hard to soft, moderately to highly volight yellowish brown (10YR 6/4), fine-grained SANDSTONE.	dstone ace Clayey weathered, ONE.				6" Standpipe with locking cap Locking compression cap Concrete surface pad #1 Sand pack (1.0'-2.0') 10" HSA borehole (0-4.5') 5" air rotary borehole (4.5'-72.5')
- 12 - 14		Hard to moderately hard, moderately weathered yellowish brown (10YR 6/4), fine-grained SAN	d, light NDSTONE.		- - - - 12 - - - - 14		Portland/benseal grout (2'-42.5')



PROJECT: Harley Davidson

GEOLOGIC LOG: MW-165

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 16					- 16 		
- 18					- - 18		
- 20	air				- - 20		5" air rotary borehole
- 22	rotary cuttings				- - - 22		(4.5'-72.5')
- 24			Medium to very soft, highly weathered, dark yellowish brown (10YR 4/4), fine-grained SANDSTONE.		- - - - 24		
- 26					- - - -26		2" PVC riser, (0'-50.5')
-28					- - - 28		
- 20			Hard, slightly weathered, gray (N5/ to N6/), DOLOSTONE.		- 20 - -		
-30							Portland/benseal grout (2'-42.5')
- 32			Moderately hard, moderately weathered, grayish brown (10YR 5/2), fine-grained SANDSTONE.		— 32 –		
- 34					— 34 —		
-36					- 36		
-38			Moderately hard, moderately weathered, grayish brown (10YR 5/2), fine-grained SANDSTONE; with interbedded		- - -38		



GEOLOGIC LOG: MW-165

PROJECT: Harley Davidson

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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 40 -	air rotary cuttings		hard, slightly weathered, gray (N5/ to N6/), DOLOSTONE.		- - 40 -		Portland/benseal grout (2'-42.5')
- -42 -					- 42 -		2" PVC riser, (0'-50.5')
- 44 -					_ 44 		Bentonite chip annular seal (42.5'-47.5')
- - 46 -					46 4		
- -48 -					48 	\$\frac{\beta}{4}\$ \frac{\beta}{1}\$	#1 Sand pack (47.5'-72.1')
- - 50			Hard, slightly weathered, gray (N5/ to N6/), DOLOSTONE. Texture is sugary.		- 50		
52 			Moderately hard, moderately weathered, grayish brown (10YR 5/2), fine-grained SANDSTONE.		52		2" PVC 10-slot screen, (50.5'-70.5')
- 54 54					54 		5" air rotary borehole (4.5'-72.5')
- - 56 -			Hard, slightly weathered, gray (N5/ to N6/), DOLOSTONE with sugary texture; with interbedded moderately hard, moderately weathered, grayish brown (10YR 5/2), finegrained SANDSTONE.				
- -58 -					— 58 —		
- - 60 -					- 60 -		
62					62		

			TER SCIENCES CORPORATION Harley Davidson		(GEOLOGIC LO	G: MW-165 Page 4 of 4
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 64					- - - 64		2" PVC 10-slot screen, (50.5'-70.5')
- - 66 -	air rotary cuttings				- - - 66 - -		#1 Sand pack (47.5'-72.1')
- 68 - - - 70					— 68 - - - - - 70		5" air rotary borehole (4.5'-72.5')

Collapsed formation (72-1'-72.5')



	PRC	JECT I	INFORMATION		Г	RILL	ING IN	FORMA	TION	
JOB NO	CATION: .: D BY:	10012.26 KB Flemin	ork Naval Ordnance Plant, York, PA	DRILLING CO.: Eichelbergers, Inc. DRILLER: Shane Albert RIG TYPE: Geoprobe 7822DT DRILLING METHOD: Geoprobe Dual-tube sampling DEVELOPMENT DATE: 1/7/15, 1/9/15, 1/15/15-1/16/15 LOCATION: Northeast Canterbury Lane						
	DRILLED:									
NOTES	advanced	l to 60'. 4 1	to 5'. 3" dia dual-tube direct push macrocore 1/4 ID HSA overdrilled to 60'. well installed 12/9/14.	EASTING NORTHING						
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WE	LUCTION	WELL CONSTRUCTION DETAILS	
-0 -			Asphalt and gravel base.						Flushmount manhole completion and	
- -2 - - - -			Brown (7.5 YR 4/4) Sub-angular to sub-round coarse GRAVEL, little fine to coarse sand, litt moist.			- -2 - - - - -4			concrete pad Locking compression cap #1 Sand pack (1.0'- 2.5') 8" HSA borehole (0- 60')	
- -6 - - - -8	4.0/4.0	S1/1 to S10/1	Brownish yellow (10 YR 6/6) CLAY and SILT coarse Gravel, little fine to coarse Sand, moist quartzite cobbles 7.5'-7.8'.			- -6 - - - - -8			2" PVC riser, (0'- 41')	
- 10 - 10 12	4.0/4.0	S1/2 to S10/2	Brownish yellow (10 YR 6/8) SILT, some fine sub-rounded quartzite Gravel, moist. Red (2.5 YR 4/8) SILT and CLAY, little fine t trace fine Gravel, moist. Brownish yellow (10 YR 6/8) SILT & CLAY, medium Sand, trace fine Gravel, moist.	o coarseSand,		- - 10 - - - - 12			Portland/benseal grout (2.5'-36')	
- - - - 14 -	4.0/4.0	S1/3 to	Brownish yellow (10 YR 6/8) CLAYEY SILT Sand, trace sub-angular quartzite Gravel, large cobbles 13.7'-13.8', moist. Brownish yellow (10 YR 6/8) CLAYEY SILT coarse GRAVEL, gravel is cobble to pebble si	quartzite and fine to		- - - 14 -				
- 16 -		S10/3	trace fine Sand, moist. Brownish yellow (10 YR 6/8) grading to red (2 CLAYEY SILT, little fine-medium Sand, trace moist.			- 16 				
- 18 	4.0/4.0	S1/4 to	Yellowish Red (5 YR 5/8) CLAYEY SILT and sub-angular to sub-rounded GRAVEL,, trace c moist. Sub-angular quartzite GRAVEL and medium to SAND, some Silt, trace fine Sand, moist.	coarse Sand,		- 18 				



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PROJECT: Harley Davidson

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
20		S10/4	(5 YR 5/8) to (2.5 YR 4/8) CLAY & SILT, some fine to medium Sand, moist.	H: H H: H H: H H: H	- 20 -		8" HSA borehole (0-60')
			Gray, Coarse SAND and fine GRAVEL quartzite, moist.	\ 	- -		
22			Brownish yellow (10 YR 6/8) SILTY CLAY, trace fine Sand, moist.		— 22 –		
4	4.0/4.0	S1/5 to S10/5	(2.5 YR 4/8) CLAYEY SILT and coarse sub-angular to sunrounded quartzite GRAVEL, trace fine Sand, trace coarse Sand, moist.		- 24 -		
6	4.0/4.0	\$1/6 to	Yellowish Red (5 YR 5/8) SILT & CLAY, some fine to medium Sand, trace fine Gravel, moist.		- - 26 -		2" PVC riser, (0'- 41
28		\$10/6			28 		
30			Yellowish Red (5 YR 5/8) CLAYEY SILT, little fine to medium Sand,m trace coarse Sand, moist.		— 30 –		Portland/benseal gro (2.5'-36')
32	4.0/4.0	\$1/7 to \$10/7	Yellowish Red (5 YR 5/8) fine to coarse SAND and Clay & Silt, some fine to coarse quartzite Gravel, moist.		- - -32		
			Brownish yellow (10 YR 6/8) CLAY and SILT, little coarse Sand, trace fine Gravel, moist.	 	-		
4			Brownish yellow (10 YR 6/8) CLAYEY SILT, some medium to coarse Sand, trace fine Sand, trace fine Gravel, moist.		- 34		
	4.0/4.0	S1/8 to	Brownish yellow (10 YR 6/8) CLAYEY SILT, some coarse Sand, little fine Gravel, trace coarse Gravel, moist.		-		
6		S10/8	Brownish yellow (10 YR 6/8) CLAYEY SILT, some medium to coarse Sand, trace fine Sand, trace fine Gravel, moist.		36 		
8	4.0/4.0	\$1/9 to	Brownish yellow (10 YR 6/8) CLAYEY SILTand fine to coarse Sand, trace fine to coarse Gravel, trace fine, moist. trace black streaking.		- 38 -		Bentonite chip annu seal (36'-39')
40		S10/9	Brownish yellow (10 YR 6/8) CLAY & SILT, some fine to coarse Sand, little fine to coarse Gravel, moist. some black		- 40 		#1 Sand pack (39'-52
12			streaking, coarse Sub-rounded to sub-angular quartzite Gravel 40.6'-40.7', 42.4'-42.5', 43', 43.5', 45', 45.5'. 50'-53'. Wet at 53'.		- - 42		2" PVC 10-slot scree (41'-51')



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PROJECT: Harley Davidson

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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 44	4.0/4.0	\$1/10 to \$10/10			— 44		2" PVC 10-slot screen, (41'-51')
- 46 - 48	4.0/4.0	\$1/11 to \$8/11					#1 Sand pack (39'-52')
- 50 - 52	4.0/4.0	\$1/12 to \$8/12	Brownish yellow (10 YR 6/8) to Yellowish Red (5 YR 5/8) fine to medium SAND and fine GRAVEL, some Clayey Silt,		- 50 - 50 52		8" HSA borehole (0-60')
- 54	2.0/2.0	S1/13 to S4/13	wet. Brownish yellow (10 YR 6/8) to Yellowish Red (5 YR 5/8) CLAYEY SILT and fine to medium SAND, little coarse Sand, trace fine Gravel, wet.	500	54 		
- 56 - 58	5.2/5.0	\$1/14 to \$10/14	Brownish yellow (10 YR 6/8) fine to coarse SAND and fine GRAVEL, some Clayey Silt, wet. Brownish yellow (10 YR 6/8) fine to medium SAND and CLAYEY SILT, trace coarse Gravel, wet. Brownish yellow (10 YR 6/8) CLAYEY SILT, some medium to coarse Sand, trace fine Sand, trace coarse Gravel, wet.		- -56 - - - - -58		Bentonite chip annular seal (52'-60')



	PRC	JECT I	NFORMATION		Г	RILL	ING INFORMA	TION	
PROJEC		Harley Da		DRILLING CO		Ei	ichelbergers, Inc.		
SITE LO	CATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER:			nane Albert eoprobe 7822DT		
JOB NO.	:	10012.26		RIG TYPE: DRILLING M	e sampling				
LOGGEI	OBY:	R. Ulrich		DEVELOPME			9/15, 1/15/15-1/16/15		
DATES 1	DRILLED:	11/24/14, 1	12/4/14	LOCATION: North central Canterbury Lane					
NOTES	: Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE EL	EVATI	ON 39	99.55' AMSL		
			/4 ID HSA overdrilled to 60'.	EASTING			260043.563		
	2" PVC 1	monitoring	well installed 12/4/14-12/5/14.	NORTHING	1 1	23	38861.218	T	
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS	
-0			Asphalt & gravel base.			_0 -		Flushmount manhole completion and	
			Yellowish red 5YR 5/6, Clayey SILT, little fin	e to coarse		-		concrete pad	
			Sand, little fine to coarse Gravel. Moist.			-		Locking compression cap	
-2						-2		#1 Sand pack (1.0'-	
						_		2.5')	
						_			
4						-4		8" HSA borehole (0-	
						_		60')	
			Daddish vallary 10VD 6/6 CH T & CL AV 1:	la fina ta		-			
			Reddish yellow 10YR 6/6, SILT & CLAY, litt coarse Sand, little fine to coarse Gravel. Moist	t.		-			
-6					 	 6	I ИИ		
					王:王 ::エ:	_	ΙИИ		
					:::: : :::	_		2" PVC riser, (0'- 41')	
-8	3.8/5.0	S1/1 to S10/1			ニ: エ: I エ: エ	-8			
			Reddish yellow 7.5YR 6/8, SILT & CLAY, so	me fine to		_			
			medium Sand, trace fine Gravel. Moist.			_			
						_			
- 10						 10	ΙИИ	Portland/benseal grout	
						_	ΙИИ	(2.5'-36')	
			Yellowish red 5YR 5/6, Clayey SILT, some fire	na to coarsa	==	_			
- 12			Sand, little fine to coarse Gravel. Moist.	ic to coarse		- 12			
	5.0/5.0	S1/2 to	Red 2.5YR 5/8, fine to coarse subrounded quar	rtzite		_			
	3.0/3.0	S1/2 to S12/2	GRAVEL, little fine to coarse Sand, little Silt of Moist.			_			
				/	1	_			
14			Red 2.5YR 5/6, SILT & CLAY and fine to coa fine subangular to subrounded quartzite GRAN			 14	І ИИ		
			Grand			_			
						_			
- 16						- 16			
10						-			
						-			
- 18	5.0/5.0	S1/3 to S12/3	Reddish yellow 5YR 6/6, Clayey SILT, some	fine Sand.	\	- 18			
10		312/3	Moist.			- 10			
			Yellowish red 5YR 4/6, Clayey SILT, some fire	ne to coarse		_			
	I	l	Sand, little fine Gravel. Moist.		1:::-::::		1 1/1//	I	



GEOLOGIC LOG: MW-167

	PRO	JECT: H	larley Davidson				Page 2 of 3
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- 20			Red 10R 4/6, SILT & CLAY, little fine to coarse Sand, trace		- 20		8" HSA borehole (0-60')
- 22	5.0/5.0	C1/44-	fine Gravel. Moist. Reddish yellow 5YR 6/8, CLAY & SILT, trace fine Sand. Moist.	H::H::H::H::H::H::H::H::H::H::H::H::H::	- - 22		
- 24	5.0/5.0	S1/4 to S12/4	Red 2.5YR 5/6, fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.		- - 24		
-26			Yellowish red 5YR 5/6, fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand, trace Clayey Silt. Moist.) H::::::::::::::::::::::::::::::::::::	- - 26		2" PVC riser, (0'- 41')
	5.0/5.0	S1/5 to	Red 10R 5/8, SILT & CLAY, little fine Sand. Moist.	H: H	- -		
-28		S12/5		-: ± .: ± .: ± .: ± .: ± .: ± .: ± .: ±	— 28 - - -		
- 30				H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:	30 		Portland/benseal grout (2.5'-36')
-32	5.0/5.0	S1/6 to S12/6		H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:	- -32 -		
-34		2-2-2		H: H	- 34 -		
-36				H: H	- 36 -		
-38	5.0/5.0	S1/7 to S12/7	Red 2.5YR 5/8, SILT & CLAY, little fine to medium Sand. Moist.	H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:	- - - 38		Bentonite chip annular seal (36'-39')
- 40				H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:	- - 40		#1 Sand pack (39'-52')
- 42					- - 42		2" PVC 10-slot screen,
	5.0/5.0	S1/8 to	Red 2.5YR 5/8, SILT & CLAY, little fine to coarse Sand, little fine to coarse subrounded to rounded Gravel. Moist.	H.H.	-		(41'-51')



GEOLOGIC LOG: MW-167

PROJECT: Harley Davidson

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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- - 44 -		S12/8	Brownish yellow 10YR 6/6, CLAY & SILT, little fine to coarse Sand, little fine to coarse Gravel. Moist.	T	- - 44		2" PVC 10-slot screen, (41'-51')
- - 46 -			Reddish yellow 7.5YR 6/6, CLAY & SILT, trace fine to coarse Sand, trace fine Gravel. Moist. Yellowish red 5YR 5/6, SILT & CLAY, little fine to coarse Sand, little fine to coarse Gravel. Moist.	T: T	- 46		
- 48 -	5.0/5.0	\$1/9 to \$12/9	Red 5YR 5/6, SILT & CLAY, little fine to coarse Sand, little fine to coarse Gravel. Moist.		— 48 —		#1 Sand pack (39'-52')
- -50 -			Light yellowish brown 2.5Y 6/4, SILT & CLAY, some fine to coarse Sand, trace fine Gravel. Moist.		- 50 		
-52 -	4.3/4.0	S1/10 to S10/10	Gravelly seam 52.5'-52.8'.				8" HSA borehole (0-60')
- 54 - - - 56					54 56		Bentonite chip annular seal (52'-60')
-58	4.7/4.0	S1/11 to S10/11			- - - - - - - - 58		
60	4.0/2.0	N/A	Dark yellowish brown 10YR 4/4, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Wet.	T: T	60		



	PRC	JECT I	NFORMATION	DRILLING INFORMATION						
PROJEC	Γ:	Harley Da	vidson	DRILLING CO		Ei	ichelbergers, nane Albert			
			ork Naval Ordnance Plant, York, PA	RIG TYPE:		G_{ϵ}	eoprobe 7822			
JOB NO.		10012.26 R. Ulrich		DRILLING M. DEVELOPME			eoprobe Dua 7/15, 1/15/15	•	ling	
			2/3/14, 12/11/14	LOCATION:	INI DA		7/13, 1/13/13 orthwest Car		ne	
			·	SURFACE EL	EXACT		96.05' AMSL			
NOTES	advanced	d to 57'. 4 1	to 5'. 3" dia dual-tube direct push macrocore 1/4 ID HSA overdrilled to 57'. well installed 12/11/14-12/12/14.	EASTING 2259872.680 NORTHING 238861.827						
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	I	GRAPHIC	DEPTH FEET	WE CONSTR		WELL CONSTRUCTION DETAILS	
-0			Asphalt road & gravel base			 			Flushmount manhole completion and	
-2 2 4			Reddish yellow 5YR 6/6, SILT & CLAY, little Sand, little fine to coarse Gravel. Moist.	e fine to coarse		- -2 - - - -			concrete pad Locking compression cap #1 Sand pack (1.0'- 2.0') 8" HSA borehole (0-	
_			No Recovery		T: ±	- -			57')	
-6 - -	3.2/5.0	S1/1 to	Brownish yellow 10YR 6/8, fine to coarse subsquartzite GRAVEL, little fine to coarse Sand, l Silt. Moist.			6 - -			2" PVC riser, (0'-31')	
- 8		S8/1	Light brown 7.5 YR 6/4, CLAY & SILT, little medium Sand. Moist.	fine to	H:H: H:H:H:	- 8				
- 10			Reddish yellow 7.5YR 6/8, fine to coarse suba subrounded quartzite GRAVEL, little fine to co little Clayey Silt. Moist.		H.H.	- 10			Portland/benseal grout	
_			Reddish yellow 7.5YR 6/6, Clayey SILT, little Sand, little fine to coarse Gravel. Moist.	fine to coarse		-			(2.0'-25.4')	
-12			Reddish yellow 7.5YR 6/6, SILT & CLAY, lit coarse Sand, little fine to coarse Gravel. Moist		 	— 12				
_	5.0/5.0	S1/2 to S12/2	Reddish yellow 7.5YR 6/6, SILT & CLAY, so coarse Gravel, little fine to coarse Sand. Moist		H:H: H:H:H	-				
<u>-</u> 14			Reddish yellow 10YR 6/8, CLAY & SILT, litt Moist.	le fine Sand.	H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:H:	— 14 -				
- - 16 -	5.0/5.0	\$1/3 to	Yellowish brown 10YR 6/4, SILT & CLAY, li coarse Sand, trace fine Gravel. Moist.	ttle fine to		- 16 - -				
- 18 -		S12/3	Yellow 10YR 7/6, fine to coarse GRAVEL, so coarse Sand, little Silt & Clay. Moist.	me fine to	H:H	— 18 –				



PROJECT: Harley Davidson

GEOLOGIC LOG: MW-168

				2		WELL	WELL
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	7	DEPTH FEET	CONSTRUCTION	CONSTRUCTION DETAILS
- 20			Yellow 10YR 7/6, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Moist.	 	20		2" PVC riser, (0'-31')
			Yellow 10YR 7/6, SILT & CLAY, some fine to coarse Gravel, little fine to coarse Sand. Moist.	±:±- =:±:- ±:±			
- 22	5.0/5.0	S1/4 to	Yellowish red 5YR 5/6, CLAY & SILT, and fine to coarse Sand, trace fine Gravel. Moist.		- 22		
- 24		S12/4	Yellowish red 5YR 5/6, fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand, trace Clayey Silt. Moist.		· 24		Portland/benseal grout (2.0'-25.4')
- 26			Brown 5YR 5/4, fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand, trace Clayey Silt. Moist.		· 26		Bentonite chip annular seal (25.4'-28.5')
	5.0/5.0	Q1/5 ·	Very pale brown 10YR 7/3, fine to coarse SAND, some fine to coarse Gravel, little Clayey Silt. Moist.				
-28	5.0/5.0	\$1/5 to \$12/5	Reddish yellow 5YR 7/6, fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand, little to trace Silt & Clay. Moist.		28		W1 G 1 1 (20.5)
- 30					30		#1 Sand pack (28.5'-42')
-32	5.0/5.0	S1/6 to S12/6	Very pale brown 10YR 7/4, fine to coarse SAND, and Silt & Clay, trace fine Gravel. Moist.		32		2" PVC 10-slot screen, (31'-41')
- 34 - 34					· 34		
-36			Reddish yellow 5YR 6/6, fine to coarse subrounded GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.		· 36		8" HSA borehole (0-57')
-38	5.0/5.0	S1/7 to S12/7			-38		
			Reddish yellow 5YR 6/6, CLAY & SILT, some fine to coarse Sand, little fine to coarse subrounded GRAVEL. Moist.		40		
- 40			Reddish yellow 7.5YR 6/8, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Dark gray laminae 40.5'-40.9'. Wet 40'-40.4', moist below.	=::±::= =::±:= =::±:= =::±:=	40		
- 42 -	5.0/5.0	S1/8 to		F:: #:: =	42		Bentonite chip annular seal (42'-57')



GEOLOGIC LOG: MW-168

PROJECT: Harley Davidson

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DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- - - 44		S12/8	Reddish yellow 7.5YR 6/8, SILT & CLAY, some fine to coarse Gravel, little fine to coarse Sand. Moist.	:: <u> </u>	- - - 44		
-			Pale yellow 2.5Y, SILT & CLAY, little fine Sand, trace fine Gravel. Moist. Dark gray laminae 44.5'-44.7', wet.		-		
-46			Light brown 7.5YR 6/4, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Moist, except wet 46.6'-46.8'.		46 		8" HSA borehole (0-57')
- 48 -	5.0/4.0	\$1/9 to \$10/9			- 48		
-50 -52	5.0/4.0	S1/10 to S10/10	Pale brown 10YR 6/3, SILT & CLAY, little fine to coarse Sand, little fine to coarse subrounded Gravel. Moist, except Wet 49.0'-49.3' and 53.0'-53.3'.		-50 -50 52		Bentonite chip annular seal (42'-57')
- 54 - 54 56	5.0/4.0	S1/11 to S9/11	Pale brown 10YR 6/3, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel. Moist, except Wet 54.9'-57.0'. Dark gray laminae 56.5'-56.9'.		- - - - - - - - - - - - - - -		



	PRC	JECT I	NFORMATION	DRILLING INFORMATION						
JOB NO. LOGGEI	CATION: : D BY:	10012.26 R. Ulrich	vidson ork Naval Ordnance Plant, York, PA 2/23/15-2/25/15	DRILLING CO.: Eichelbergers, Inc. DRILLER: Shane Albert RIG TYPE: Geoprobe 7822DT DRILLING METHOD: Geoprobe Dual-tube sampling DEVELOPMENT DATE: 3/3/15 LOCATION: Southeast Canterbury Lane						
	Vacuum	excavation I to 40'. 6 1	to 5'. 3" dia dual-tube direct push macrocore /4 ID HSA overdrilled to 30'., 4 1/4 augers to 47 well installed 2/25/15.	SURFACE EL EASTING NORTHING	EVATI	22	89.87 AMSL 260197.951 38579.721			
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WELL		WELL CONSTRUCTION DETAILS	
-0			Asphalt Road & gravel base Reddish yellow 7.5YR 6/6, fine to coarse subasubrounded GRAVEL, little fine to coarse San	ngular to d, little Silt &		—0 - -			Flushmount manhole completion and concrete pad Locking compression cap	
2 4			Clay. Moist.			2 4 			#1 Sand pack (1.0'-2.0') 10" HSA borehole (0-30')	
-6 -8	2.0/5.0	S1/1 to S6/1	Red 2.5 YR 5/8, fine to coarse subangular quar GRAVEL, little fine to coarse Sand, little Silt &	tzite & Clay. Wet.		- -6 - - - - -8			2" PVC riser, (0'-37')	
- 10 - 12			Reddish yellow 5YR 6/8, fine to coarse (predo SAND, little Clayey Silt, trace fine Gravel. Meddish yellow 5YR 6/6, SILT & CLAY, and Sand, trace fine Gravel. Moist.	oist.		- - - - - - - -			Portland/benseal grout (2.0'-31.9')	
- 14	3.2/5.0	\$1/2 to \$8/2	No Recovery.							
- 16 - 16 18	4.9/5.0	S1/3 to S12/3	Reddish yellow 5YR 6/8, fine SAND, some Cl Moist. Reddish yellow 5YR 6/8, SILT & CLAY, som Moist. Reddish yellow 5YR 6/8, SILT & CLAY, som Seam of fine to coarse Sand, little Silt 18.3-18.	e fine Sand.		- - - - - - - - 18				



PROJECT: Harley Davidson

GEOLOGIC LOG: MW-169

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
20			Reddish yellow 5YR 6/8, fine SAND, little Clayey Silt. Wet.		- - 20 - -		10" HSA borehole (0-30')
22	4.8/5.0	S1/4 to S12/4	Light yellowish brown 10YR 6/4, SILT & CLAY, little fine Sand. Moist. Light yellowish brown 10YR 6/4, Clayey SILT, little fine Sand. Moist. Light yellowish brown 10YR 6/4, SILT & CLAY, trace fine Sand. Moist.		- 22 - - - - - 24		2" PVC riser, (0'-37')
26 28	5.0/5.0	S1/5 to S12/5	Light yellowish brown 10YR 6/4, SILT & CLAY, little fine Sand. Moist.	H:H:H:H:H:H:H:H:H:H	- - 26 - - - 		Portland/benseal grou
30			Yellow 10YR 7/6, SILT & CLAY, and fine to coarse Sand, little fine Gravel. Moist. Reddish yellow 7.5 YR 6/8, SILT & CLAY, little fine Sand. Moist. Reddish yellow 7.5YR 6/8, Clayey SILT, little fine Sand. Wet. Coarse Gravel at 31.6'.		- - - - 30		(2.0'-31.9')
32 34	5.0/5.0	S1/6 to S12/6	Reddish yellow 5YR 6/6, fine to coarse GRAVEL, some fine to coarse Sand, little Clayey Silt. Moist, except wet below 35'.	0.00000 0.0000000000000000000000000000	- 32 34		8" HSA borehole (3047') Bentonite chip annu
36	4.8/5.0	S1/7 to		00000000000000000000000000000000000000	- - - -36 - -		seal (31.9'-35.2') #1 Sand pack (35.2'-47')
38 40	4.0/3.0	\$12/7	Reddish yellow 5YR 6/6, fine to coarse GRAVEL, some fine to coarse Sand, trace Silt. Wet. Borehole deepened, soil was not sampled.	00000000000000000000000000000000000000	- 38 - - - - 40		2" PVC 10-slot scree (37'-47')
42					- - - 42		(31-41)

			TER SCIENCES CORPORATION Tarley Davidson		C	GEOLOGIC LO	G: MW-169 Page 3 of 3
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- - - 44	N/A	N/A			- 44		8" HSA borehole (30'-47')
-46					- - 46		#1 Sand pack (35.2'-47') 2" PVC 10-slot screen, (37'-47')



								Page 1 of 2	
	PRC	DJECT I	INFORMATION		Ι	DRILI	LING INFORMA	ATION	
PROJEC	CT:	Harley Da	vidson	DRILLING CO	O.:		Eichelbergers, Inc.		
SITE LO	OCATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER: RIG TYPE:			hane Albert Geoprobe 7822DT		
JOB NO	.:	10012.26		DRILLING M	ETHOL		неоргове 7822D1 Geoprobe Dual-tube samp	oling	
LOGGE	D BY:	R. Ulrich		DEVELOPMENT DATE: 1/14/15, 1/16/15					
DATES	DRILLED:	12/16/14,	12/19/14	LOCATION:		S	outh central Canterbury	Lane	
NOTES	S: Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE EL	EVATI		885.96' AMSL		
			1/4 ID HSA overdrilled to 40'.	EASTING NORTHING			2259962.593 238575.643		
	2" PVC.	Monitoring	Well Constructed 12/19/14.	NORTHING	T 0			WELL	
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	CONSTRUCTION DETAILS	
-0			Asphalt road & gravel base.			_0		Flushmount manhole completion and concrete pad	
			Reddish yellow 7.5YR 6/8, SILT & CLAY, lit coarse subangular to subrounded Gravel, little Sand. Moist.		 	-		Locking compression cap	
-2 - -					E: X:	2 - -		#1 Sand pack (1.0'-2.5')	
-4					F.: X.: E.: X.: X.: X.: X.: X.: X.: X.: X.: X.: X	- 4		8" HSA borehole (0-	
					II	- -		40')	
			No Recovery.			_			
-6						 6			
-	2.6/5.0	S1/1 to	Yellowish brown 10YR 5/4, fine to coarse sub quartzite GRAVEL, some fine to coarse Sand, Silt. Moist.	angular trace Clayey		-		2" PVC riser, (0'-21.3')	
-8	2.0/3.0	S6/1	Brownish yellow 10YR 6/6, SILT & CLAY, a coarse Sand, trace fine Gravel. Moist.	nd fine to		—8 -			
			Brownish yellow 10YR 6/6, SILT & CLAY, s medium Sand, trace fine Gravel. Moist.	ome fine to		-			
- 10						— 10 - -		Portland/benseal grout (2.5'-16.2')	
						_			
- 12 ·	27/50	Q1/2+-				— 12 -			
-	3.7/5.0	S1/2 to S10/2	Light yellowish brown 10YR 6/4, Clayey SILT medium Sand. Moist.	Γ, trace fine to		_			
- - 14			medidii Sand. Woist.			- 14			
<u>-</u>						_			
-			Light yellowish brown 10YR 6/4, SILT & CL. to medium Sand. Moist. Mottled reddish brown			_			
-16			gray.		=: ±:=	 16			
-					 	_			
					= : <u> </u>	_		Bentonite chip annular	
- - 18	5.0/5.0	S1/3 to S12/3			#:#: #:#	- 18		seal (16.2'-19.2')	
-		912/3			E: =:=	-			
-					±:± ;::±::=	_			



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PROJECT: Harley Davidson Page 2 of 2

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
-20			Light yellowish brown 10YR 6/4, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel. Moist.	<u>+ : +</u> ± : ±	20		W1 S 1 1 (10 2)
- 22			Reddish yellow 5YR 6/6, SILT & CLAY, little fine Sand. Moist.	T:T	- - - - 22		#1 Sand pack (19.2'-32.3')
- 24	5.0/5.0	S1/4 to S12/4	Reddish yellow 5YR 6/6, SILT & CLAY, little fine subrounded quartzite Gravel, trace fine Sand. Moist.	T: T			
- 24 -			Light brown 7.5YR 6/4, fine to coarse quartzite GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.		24		2" PVC 10-slot screen, (21.3'-31.3')
-26	5.0/5.0	\$1/5 to	Light brown 7.5YR 6/4, fine to coarse quartzite GRAVEL, little fine to coarse Sand, trace Clayey Silt. Moist.		— 26 —		
- 28 - - - 30		S12/5	Yellow 10YR 7/6, SILT & CLAY, some fine to medium Sand, trace fine Gravel. Moist.		- 28 - - - - - 30		8" HSA borehole (0- 40')
-32	5.0/5.0	\$1/6 to \$12/6	Pale brown 10YR 6/3, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel. Wet.				Bentonite chip annular seal (32.3'-40')
-34			Pale brown 10YR 6/3, SILT & CLAY, little fine to coarse Gravel, trace fine to coarse Sand. Wet.	# # # # # # # # # # # # # # # # # # #	_		Sea (32.3 40)
- 36 	5.0/5.0	\$1/7 to \$8/7	Light yellowish brown 10YR 6/4, SILT & CLAY, little fine to coarse Sand, little fine to coarse quartzite Gravel. Wet.		-36 38 38		
_40				士:士 =:士: 士:士	40		



	PRC	JECT I	NFORMATION	DRILLING INFORMATION						
PROJEC		Harley Da		DRILLING CO.: Eichelbergers, Inc.						
SITE LO	CATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER:			hane Albert			
JOB NO.	:	10012.26		RIG TYPE: DRILLING M	ETHOL		eoprobe 7822. 1/4'' ID HSA		Air Rotary to 45.5'	
LOGGEI	DBY:	R. Ulrich		DEVELOPME			13/15		20 2000 9 10 10 10	
DATES I	ORILLED:	12/17/14, 1	1/16/15, 1/20/15-1/21/15	LOCATION: Southwest Canterbury Lane						
NOTES			to 5'. 3" dia dual-tube direct push macrocore	SURFACE ELEVATION 387.01' AMSL						
			5 1/4 ID HSA overdrilled to 35'. 5" hammer bit stary to 45.5'. Well constructed 1/21/15-1/22/15.	EASTING NORTHING			259762.499 38616.679			
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WEI CONSTRU		WELL CONSTRUCTION DETAILS	
-0			Asphalt road & gravel base.			—0 -			Flushmount manhole completion and	
-2			Light yellowish brown 10YR 6/4, fine to coars GRAVEL, little fine to coarse Sand, trace Clay Moist.			- - -2 - -			Locking compression cap #1 Sand pack (1.0'- 2.5')	
-4 -						—4 –			10" HSA borehole (0- 35')	
- -6 -			No Recovery.			- 6 -			2" PVC riser, (0'-32.8')	
-8	2.5/5.0	\$1/1 to \$6/1	Light yellowish brown 10YR 6/4, SILT & CLA to coarse Sand, trace fine Gravel. Moist.	AY, trace fine	H:H:	- 8 -				
_			Brownish yellow 10YR 6/8, SILT & CLAY, so medium Sand. Moist.			-				
- 10 -			Brownish yellow 10YR 6/6, fine to coarse subsubrounded quartzite GRAVEL, little fine to colittle Clayey Silt. Moist.			— 10 – –			Portland/benseal grout (2'-26')	
- 12 -	5.0/5.0	S1/2 to S12/2	Brownish yellow 10YR 6/6, SILT & CLAY, a coarse Sand, trace fine Gravel. Moist.	nd fine to		— 12 - -				
- 14 - 14						- 14 				
_ _ 16 _						- 16 				
- 18 18	5.0/5.0	\$1/3 to \$12/3	Yellowish brown 10YR 5/6, fine to coarse subquartzite GRAVEL, little fine to coarse Sand, l Clay. Moist.			- - 18 				



GEOLOGIC LOG: MW-171

PROJECT: Harley Davidson

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
20			Grayish brown 10YR 5/2, SILT & CLAY, some fine to coarse Sand, trace fine Gravel. Moist. Mottled brownish yellow.		- 20 -		10" HSA borehole (0-35')
22	5.0/5.0	S1/4 to	Grayish brown 10YR 5/2, fine to coarse subrounded GRAVEL, some Silt & Clay, little fine to coarse Sand. Moist.		- 22 -		
24	3.0/3.0	S12/4	Grayish brown 10YR 5/2, SILT & CLAY, little fine to medium Sand, trace fine Gravel. Moist to 22.5'. Wet 22.5'-23.8'. Gravelly at base.	T T	- - 24		Portland/benseal grou (2'-26')
24			Yellowish brown 10YR 5/6, fine to coarse subrounded quartzite GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.		-		
26			Yellowish brown 10YR 5/6, SILT & CLAY, trace fine to medium Sand. Moist.	#:# #:#	- 26 		Bentonite chip annul seal (26'-30.8')
28	5.0/5.0	S1/5 to S12/5	Mottled light & dark brown, light & dark gray, and orange, Clayey SILT, little fine to medium Sand. Wet.		- - - 28		
30			Light yellowish brown 10YR 6/4, fine to coarse subrounded quartzite GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.		- - - -30		2" PVC riser, (0'-32.
50			Brownish yellow 10YR 6/6, CLAY & SILT. Moist.	T:T	-		
			Brownish yellow 10YR 6/6, fine to coarse subrounded GRAVEL, some fine to coarse Sand, little Silt & Clay. Wet.		- -		
32	5.0/5.0	S1/6 to S12/6	Mottled as 26.5'-28.5', CLAY & SILT, trace fine Sand. Wet.	T: T	- 32 -		#1 Sand pack (30.8'-43.5')
34					- 34 -		2" PVC 10-slot scree (32.8'-42.8')
36			No Recovery.		- - -36		
38	No Recovery	N/A			- - - 38		17" dia. annular opening from air lift (35'-40')
40			Hard to moderately hard, fresh, N5/ gray, LIMESTONE. Wet.		- 40 -		
42					- - 42		5" air rotary borehole (40'-45.5')

			TER SCIENCES CORPORATION Sarley Davidson		(GEOLOGIC LO	G: MW-171 Page 3 of 3
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
- - 44					- - 44		5" air rotary borehole (40'-45.5') Bentonite chip annular
_					_		seal (43.5'-45.5')



	PRC	JECT I	NFORMATION	DRILLING INFORMATION						
PROJEC		Harley Da		DRILLING CC		Ei	ichelbergers, Inc.			
SITE LO	CATION:	Former Yo	ork Naval Ordnance Plant, York, PA	DRILLER: RIG TYPE:			nane Albert			
JOB NO.	:	10012.26		RIG TYPE: Geoprobe 7822DT DRILLING METHOD: Geoprobe Dual-tube sampling						
LOGGEI	OBY:	R. Ulrich		DEVELOPMENT DATE: 1/14/15-1/16/15						
DATES I	DRILLED:	11/25/14, 1	12/8/14	LOCATION: East Old Arsenal Road						
NOTES	: Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE ELI	EVATI	ON 38	35.48' AMSL			
			./4 ID HSA overdrilled to 40'.	EASTING NORTHING			260196.735 38253.888			
	2 PVC1	nonitoring	well installed 12/8/14.	NORTHING	ا ن		I		WELL	
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WELL CONSTRUCTI	ON	CONSTRUCTION DETAILS	
_0			Asphalt road & gravel base.			-0 -			Flushmount manhole completion and concrete pad	
- 2			Cobbles & boulders.			- 2			Locking compression cap #1 Sand pack (1.0'-	
- - 			Brownish yellow 10YR 6/6, Clayey SILT, som coarse Sand, little fine to coarse Gravel. Moist			-			2.0')	
- 4 -						- 4 -			8" HSA borehole (0-40')	
- - -			Reddish yellow 5YR 6/8, fine to coarse subang GRAVEL, little fine to coarse Sand, little Clay			-			40)	
-6 -			Moist. 6.8'-7.0' seam of Silt, trace fine Sand.	.,		 6 -				
- 8	4.0/5.0	S1/1 to S10/1				- 8			2" PVC riser, (0'-27.5')	
- -			Brownish yellow 10YR 6/6, SILT, little fine Sa	and. Moist.		- -				
10 			Yellowish red 5YR 5/6, fine to coarse SAND, Clay, trace fine to coarse subangular Gravel. N		 	— 10 - -			Portland/benseal grout (2'-20.9')	
- 12			Yellowish red 5YR 5/6, Clayey SILT, little fin Moist.	e Sand.		- 12				
-	4.4/5.0	S 1/2 to S12/2	Reddish yellow 5YR 6/8, SILT & CLAY, little Sand, trace fine Gravel. Moist.	e fine to coarse	=: 土: =	-				
- 14 					H:H: H:H: H:H: H:H:	- 14 				
- - 16 -			Reddish yellow 5YR 6/8, SILT & CLAY, trace medium Sand. Moist.	e fine to		- - 16 -				
- - 18	5.0/5.0	S1/3 to S12/3	Brownish yellow 10YR 6/8, SILT & CLAY, li medium Sand. Some fine to medium Sand 18.		H:H: H:H: H:H: H:H: H:H:	- - - 18				



GEOLOGIC LOG: MW-172

PROJECT: Harley Davidson

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
-20				T: T	- - 20 -		Portland/benseal grout (2'-20.9')
-22	4.6/5.0	S 1/4 to S 12/4	Light yellowish brown 10YR 6/4, fine to coarse SAND, and Silt & Clay, some fine to coarse subangular quartzite Gravel. Moist.		- 22 		Bentonite chip annular seal (20.9'-23.9')
- 24 -					24 		2" PVC riser, (0'- 27.5')
- 26 -			Light yellowish brown 10YR 6/4, fine to coarse subangular quartzite GRAVEL, little fine to coarse Sand, trace Silt.		_ 26		#1 Sand pack (23.9'-
-28	4.4/5.0	S 1/5 to S 11/5	Moist. Light yellowish brown 10YR 6/4, fine to coarse SAND and Silt & Clay, some fine subangular quartzite Gravel. Moist.		28 		38.5')
30					30		2" PVC 10-slot screen, (27.5'-37.5')
- -32	5.0/5.0	S 1/6 to S 12/6	Yellow 10YR 7/6, SILT & CLAY, little fine Gravel, little fine to coarse Sand. Moist.		- -32		
- - 34 -			Yellowish brown 10YR 5/6, SILT & CLAY, trace fine to coarse Sand. Moist.		34 		8" HSA borehole (0-40')
- - 36			Yellowish brown 10YR 5/4, CLAY & SILT, trace fine to coarse Sand, trace fine Gravel. Wet. Yellowish brown 10YR 5/4, fine to coarse subangular Gravel, little fine to coarse Sand, little Clayey Silt. Wet.		36		
- - -38	5.0/5.0	S 1/7 to S 12/7	Yellowish brown 10YR 5/4, SILT & CLAY, little fine to coarse Sand, trace fine Gravel. Wet.	/ =: ±::	- - - -38		
40			Yellowish brown 10YR 5/4, Clayey SILT, little fine to coarse Sand, little fine to coarse Gravel. Wet.		40		Bentonite chip annular seal (38.5'-40')



	PRC	JECT I	NFORMATION		Г	RILL	ING INFORMA	TION	
PROJEC SITE LO	CT:	Harley Da		DRILLING CO DRILLER: RIG TYPE:		Ei SI	ichelbergers, Inc. nane Albert eoprobe 7822DT		
JOB NO	. :	10012.26		DRILLING M	ETHOD		eoprobe 7822D1 eoprobe Dual-tube samp	oling	
LOGGE	D BY:	R. Ulrich		DEVELOPME	ENT DA		9/15, 1/13/15, 1/15/15		
DATES	DRILLED:	2/10/14	LOCATION: East central Old Arsenal Road at Canterbury I						
NOTES	advanced	d to 40'. 4 1	to 5'. 3" dia dual-tube direct push macrocore /4 ID HSA overdrilled to 40'. well installed 12/10/14.	SURFACE EI EASTING NORTHING	LEVATI	22	32.07' AMSL 259945.012 38249.237		
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS	
_0			Asphalt road & gravel base.					Flushmount manhole completion and concrete pad	
- - 2			Cobbles & gravel.			- - 2		Locking compression cap	
- -			Pale brown 10YR 6/3, subangular to subround coarse GRAVEL, little fine to coarse Sand, litt Moist.	ed fine to le Clayey Silt.		- - -		#1 Sand pack (1.0'-3.0')	
-4 -						4 		8" HSA borehole (0-40')	
- 6 -			Reddish yellow 7.5 YR 6/6, fine to coarse subsubrounded GRAVEL, little fine to coarse San Clayey Silt. Moist.	angular to d, little		- 6 -			
- 8 -	3.3/5.0	S1/1 to S9/1				- 8 		2" PVC riser, (0'- 21.6')	
- 10 -			Brown 7.5 YR 5/4, SILT & CLAY and fine to trace fine subangular to subrounded Gravel. M			- 10 		Portland/benseal grout (3'-15.5')	
- 12	4.5/5.0	S 1/2 to				- - 12 			
- 14 		S12/2				- - 14 -			
_			Reddish yellow 7.5YR 6/6, Clayey SILT, little Sand, trace fine Gravel. Moist.	fine to coarse		_			
- 16 -			Reddish yellow 7.5YR 6/6, SILT & CLAY, tra Moist.	ace fine Sand.	 	16 		Bentonite chip annular seal (15.5'-18.7')	
- - 18	4.9/5.0	S1/3 to S12/3	Yellowish brown 10YR 5/4, SILT & CLAY, li coarse Sand, trace fine Gravel. Moist.	ttle fine to	#: # #: # #: # #: #	- 18 			



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PROJECT: Harley Davidson

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
-20			Yellowish brown 10YR 5/4, fine to coarse SAND, little fine to coarse Gravel, little Silt & Clay. Moist.	#:# #:#	- 20 		#1 Sand pack (18.7'-32.8')
- - 22	5.0/5.0	S 1/4 to S 12/4	Brownish yellow 10YR 6/6, SILT & CLAY, little fine to medium Sand. Moist.		- - 22		
- - 24		3 12/4	Brownish yellow 10YR 6/6, SILT & CLAY, little fine to coarse Sand, trace fine Gravel. Moist.	T: T	— 24 —		2" PVC 10-slot screen, (21.6'-31.6')
			Brownish yellow 10YR 6/6, SILT & CLAY, some fine to coarse Sand, trace fine Gravel. Moist.	T: T	-		
-26			Brownish yellow 10YR 6/6, SILT & CLAY, little fine to coarse Sand, trace fine Gravel. Moist.	T: T T: T T: T	- 26 - -		
-28	5.0/5.0	S 1/5 to S 11/5	Brownish yellow 10YR 6/6, SILT & CLAY, some fine to coarse Sand, trace fine Gravel. Moist.		— 28 —		8" HSA borehole (0-40')
-30 -			Brownish yellow 10YR 5/6, SILT & CLAY, some fine to coarse Sand, trace fine Gravel. Moist.		— 30 - -		
-32 -34	5.0/5.0	S 1/6 to S 12/6	Light yellowish brown 10YR 6/4, fine to coarse subangular quartzite GRAVEL, little fine to coarse Sand, little Clayey Silt. Moist.		- 32 - - - - 34		
-36 -	5.0/5.0	S 1/7 to	Light yellowish brown 2.5Y 6/4, fine to coarse SAND, little Clayey Silt, little fine to coarse Gravel. Wet.	Na.	-36 -		Bentonite chip annular seal (32.8'-40')
- 38 - - - - 40		S 12/7	Light yellowish brown 10YR 6/4, fine to coarse GRAVEL, little fine to coarse Sand, little Silt & Clay. Moist.		38		



	PRC	INFORMATION	DRILLING INFORMATION									
	SITE LOCATION: Former York Naval Ordnance Plant, York, PA					DRILLING CO.: Eichelbergers, Inc. DRILLER: Shane Albert RIG TYPE: Geoprobe 7822DT						
JOB NO	JOB NO.: 10012.26						eoprobe 78221 eoprobe Dual-		ling			
LOGGEI	DBY:		DEVELOPME LOCATION:	ENT DA		13/15, 1/15/15						
DATES	DRILLED:	12/1/14, 12	2/15/14				est central Ol	a Arsenai I	Koaa			
NOTES	advanced	l to 35'. 4 1	to 5'. 3" dia dual-tube direct push macrocore 1/4 ID HSA overdrilled to 35'. well installed 12/15/14.	SURFACE EL EASTING NORTHING	EVATI	22	79.01' AMSL 259640.885 38247.838					
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET	WEL CONSTRU		WELL CONSTRUCTION DETAILS			
_0 -			Asphalt & gravel base.			0 			Flushmount manhole completion and			
- - -2			Cobbles & boulders.			- - -2			concrete pad Locking compression cap			
- - -			Brownish yellow 10YR 6/8, SILT & CLAY, s coarse Sand, little fine Gravel. Moist.	ome fine to		- -			#1 Sand pack (1.0'-2.0')			
- 4						- 4			8" HSA borehole (0-			
_ _ _			Reddish yellow 5 YR 6/6, fine to coarse subar			= =			35')			
- 6			GRAVEL, little fine to coarse Sand, little Clay Moist.	ey Siit.		 6						
- - -8	4.6/5.0	S 1/1 to S 12/1	Light yellowish brown 10YR 6/4, SILT & CL to coarse Sand, trace fine Gravel. Moist.	AY, some fine		- - 8			2" PVC riser, (0'- 21')			
-		5 12/1				-						
- 10						- 10			Portland/benseal grout			
-			Strong brown 7.5YR 5/6, CLAY & SILT, son	ne fine to		_			(3'-15.9')			
- 12 -	5.0/5.0	S 1/2 to	coarse subangular quartzite GRAVEL, some f Sand. Moist.	ine to coarse		— 12 –						
-	3.6/3.0	S 12/2				-						
14 						— 14 - -						
- - 16						- - 16			Doutonity -kin			
-				<u> </u>		-			Bentonite chip annular seal (15.9'-18.9')			
- - 18	4.7/5.0	S 1/3 to S 12/3	Reddish yellow 7.5YR 6/8, Clayey SILT, little Sand, little fine to coarse Gravel. Moist.			- 18						
-			Reddish yellow 7.5YR 6/8, Clayey SILT, som coarse Gravel, little fine to coarse Sand. Mois		7	-						



GEOLOGIC LOG: MW-174

PROJECT: Harley Davidson

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
-20			Reddish yellow 7.5YR 6/8, fine to coarse subangular to subrounded GRAVEL, some Clayey Silt, little fine to coarse Sand. Moist.	○ 0 <	20		#1 Sand pack (18.9'-
- 22 24	5.0/5.0	S 1/4 to S 12/4	Brownish yellow 10YR 6/6, CLAY & SILT, little fine to coarse Sand, trace fine Gravel. Moist.				2" PVC 10-slot screen, (21'-31')
- 26 28	5.0/5.0	S 1/5 to S 11/5	Reddish yellow 7.5YR 6/6, SILT & CLAY, some fine to coarse Sand, little fine Gravel. Moist. Reddish yellow 7.5YR 6/6, SILT & CLAY, little fine to coarse Sand, trace fine to coarse subrounded quartzite Gravel. Moist.		- 26 - 28 28		8" HSA borehole (0-35')
- 30 - - - 32	4.3/5.0	S 1/6 to S 12/6	Reddish yellow 7.5YR 6/6, SILT & CLAY, little fine to coarse Sand, little fine Gravel. Wet. Reddish yellow 7.5YR 6/6, SILT & CLAY, some fine to	T: T	- 32		
- -34		3 12/0	coarse Sand, trace fine Gravel. Wet. Soil sample not recovered.		-		Bentonite chip annular seal (31.8'-35')



	PRC	DRILLING INFORMATION							
			DRILLING CO.: Eichelbergers, Inc.						
BILE LOCATION: Former York Navai Oranance Fiani, York, FA			DRILLER: John Peters RIG TYPE: Geoprobe 7822DT						
IOB NO. LOGGEI		10012.26 R. Ulrich		DRILLING M			eoprobe Dud 13/15-1/14/1	_	ling
	DRILLED:	DEVELOPMENT DATE: 1/13/15-1/14/15 LOCATION: West Old Arsenal Road at cul-de-sac					cul-de-sac		
NOTES	: Vacuum	excavation	to 5'. 3" dia dual-tube direct push macrocore	SURFACE EI	LEVATI	ON 3	76.49' AMSI	<u> </u>	
			/4 ID HSA overdrilled to 37'. well installed 1/7/15.	EASTING NORTHING			259407.100 38248.740		
DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION		GRAPHIC	DEPTH FEET		ELL RUCTION	WELL CONSTRUCTION DETAILS
0			Asphalt road & gravel base.			0 			Flushmount manhole completion and concrete pad
2			Gravel & cobbles.			- - -2			Locking compression cap #1 Sand pack (1.0'-
			Light yellowish brown 10YR 6/4, subangular to GRAVEL, little fine to coarse Sand, trace Clay			-			2.0')
4			Moist.			4 4			8" HSA borehole (0- 37')
			No Recovery.		Nar.s	_			
6			Brownish yellow 10YR 6/6, fine to coarse sub quartzite GRAVEL, little fine to coarse Sand, Silt. Moist.			 6			
8	4.2/5.0	S 1/1 to S 10/1	Brownish yellow 10YR 6/6, CLAY & SILT, a coarse Sand, some fine to coarse subangular que Gravel. Moist.			- - -8			2" PVC riser, (0'-18.8')
						_			
10						- 10 			Portland/benseal grout (2'-12.2')
12			Very pale brown 10YR 7/3, fine to coarse subaquartzite GRAVEL, little fine to coarse Sand, Clay. Moist.			- - 12			
12	4.5/5.0	S 1/2 to S 12/2	Light gray 2.5Y 7/2, fine to coarse SAND, trace trace Silt. Moist.	ce fine Gravel,		-			
14			Pale yellow 2.5Y 7/3, fine to coarse SAND, so coarse Gravel, trace Silt. Moist.	ome fine to		- 14			Bentonite chip annular seal (12.2'-16.6')
			Pale yellow 2.5Y 7/3, fine to coarse SAND, so Gravel, some Silt & Clay. Moist.	ome fine	<u> </u>	_			sear (12.2-10.0)
16			No Recovery.		, , , , , , , , , , , , , , , , , , ,	 16			
			Grayish brown 10YR 6/2, fine to coarse suban GRAVEL, little fine to coarse Sand, trace Clay Moist.			- -			#1 Sand pack (16.6'-
18	3.9/5.0	S 1/3 to S 10/3	White quartzite cobble.			- 18			29.8')
			White fine to coarse GRAVEL, trace fine to coarse Clayey Silt. Moist.	parse Sand,		-			2" PVC 10-slot screen, (18.8'-28.8')



PROJECT: Harley Davidson

GEOLOGIC LOG: MW-175

DEPTH FEET	RECOVERY	SAMPLE	SOIL DESCRIPTION	GRAPHIC	DEPTH FEET	WELL CONSTRUCTION	WELL CONSTRUCTION DETAILS
20			Brownish yellow 10YR 6/6, fine to coarse SAND, some Clay & Silt, little fine Gravel. Moist.		20		2" PVC 10-slot screer
			Brownish yellow 10YR 6/6, fine to coarse SAND, some Clayey Silt, trace fine Gravel. Moist.		_		(18.8'-28.8')
- 22			Yellow 10YR 7/6, fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand, little Clayey Silt. Moist.				
	5.0/5.0	S 1/4 to S 12/4	Reddish yellow 7.5YR 6/6, CLAY & SILT, some fine to coarse Sand, trace fine Gravel. Moist.		- - -		
- 24			Brown 7.5YR 6/4, fine to coarse SAND, some Clay & Silt, some fine to coarse subangular to subrounded GRAVEL. Moist.		<u></u> 24		#1 Sand pack (16.6'-29.8')
- 26			Brown 7.5YR 5/4, Clayey SILT, some fine to coarse Gravel, little fine to coarse Sand, Wet. Dark gray silty seams.				
			Brown 7.5YR 6/4, fine to coarse GRAVEL, little fine to coarse Sand, little Clayey Silt. Moist.				
-28	5.0/5.0	S 1/5 to S 11/5	Brownish yellow 10YR 6/6, SILT & CLAY and fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand. Moist.				8" HSA borehole (0-37')
			Brownish yellow 10YR 6/6, Clayey SILT, little fine to medium Sand. Wet. 1" sandy, gravelly seam at 29.7'.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u></u>		
30			Brownish yellow 10YR 6/6, SILT & CLAY, some fine to coarse subangular to subrounded quartzite GRAVEL, little fine to coarse Sand. Moist.		- 30 -		
32	5.0/5.0	S 1/6 to S 10/6	Brownish yellow 10YR 6/6, fine to coarse subrounded GRAVEL, some fine to coarse Sand, little Clayey Silt. Moist to 32.3'. Wet below 32.3'.		32		Bentonite chip annul
34			Brownish yellow 10YR 6/6, fine to coarse subrounded GRAVEL and fine to coarse Sand, little Clayey Silt. Wet.		34		seal (29.8'-37')
			Brownish yellow 10YR 6/6, fine to coarse subrounded GRAVEL and fine to coarse Sand, trace Clayey Silt. Wet.	0000	_		
36	1.9/2.0	N/A	Brownish yellow 10YR 6/6, fine to coarse subrounded GRAVEL and fine to coarse Sand, little Clayey Silt. Wet.	000000	_ 36		
			Yellowish brown 10YR 5/6, SILT & CLAY, little fine to coarse Sand, trace fine Gravel. Wet.	====	Ī		