	<u>U</u>						8		page of
Proje	ect And	rsen Al	n in			Total De	oth 575 feet		START
Loca	tion N20	923 E22	23516 G	538.5		Borehole	Dia 10.75 inch	nes e	Date 2/18/87 :
Geol	logic Log	by N.	Shafer			Depth to	Fluid 514.6 fee	nt bgl	Time 1655 1
Drille	er <u>· Heri</u>	mas Dr	illing	(Rig _ c			* * *
Geor	hysics b	у н.	Shafer		11		75 inch Percusa	ion Hammer	How Left Open
1	ther PILL				7		sh water with f		
-	Pene.			7	mple				casing and lock
Depti	Rate	lation		38	mple		Geologic	and Hydrologic	Description
	(FPM)	(gpm)	(ppm)	*	Inter				22
		1	₹ =	1	x	20.72	0.0'-5.0':		100
	11		şi	 	X		舅		52
		TI TI		21	x		10.0'-15.0':		ngs from 1 to <2
			47	40	X			send, grain	med, grained size subangular to s
. 25 .	1. 16	5			X		3	e rown cond, cu	teings mad
	New Day	2/19/B	2		X			por., white	orly cat., mod. v N9 except for 5-
			- 1		1 (2)			carrings mod	· red orange 1076
2.6		- 2			×		20.0'-30.0':		ove except cutti
	 				Y		9 T	<u><</u> 18∞.	·
- 50 -	2.74		1 8		X		35.0'~40.0':	Same as above	except pred. med.
					X			sharp frag <1	bengular, occ. o:
					<u> </u>		45.0'-60.0':	_	5.00
le:					X		"	course sand,	except 75% medium very crumbly, su
	0.68	. N	- 8		×			rounces, 2	5% sharp frac concoid fracture
75	0.00				<u> </u>			304 porous	LS Green
		(t) t			X.		ε	moderatefA it	iable.
12			90		x		70.0'-75.0':		except 50% frag
			(1.34)	10	×		4 .	50% perous cu	
	0.83	E2	0		x		80.0'-105.0':		except 75% poro
100		-			×			line LS < 3mm,	15mm, 25% crysta. blocky, hard.
=		5 n	-34 gr	8	×		110.0'-115.0':		except 85% very his
	, a ¹ =				·			boresith' fig	ce of fossil our
11	S4 (8)		n G	7.3	×		9	tings from 1 :	o 15mm, moderatel
125	0.81	5	101		×		120.01-150 01-		
			8		X		130.0	decreased poro	except 50% wit sity, very unifor
10		Ξ		79	<u> </u>			in size (2mm)	, 50% sharp frag
⊕ 8		y .		12	X .			<u>-</u>	
		25	(Z)		X		133.01-160.01:	Very homogeneou	18, moderate to 1
50	. 66		S		×			moderate hard,	ty, 1 to 10mm subengular, WH NS
				0.	x E		165 01-170 01		•
	-	9 (4)			× =		143.0 -170.01	Same as above moderate vis. p	except 50% "Lt
	8			15	× =		ig.		F)
		- -					175.01:	Same as above of to 18mm.	except cuttings u;
75 <u>l</u> a	74	400			0		- G	25	

page	2	of	4	
		01		

	<u> </u>	Dage 01		
Project Andersen AFS IN	Total Depth 575 feet	START FINISH		
Location N201923 E223516 @ 538.	5 Borehole Dia 10.75 inches	Date 2/18/87 2/22/8		
Geologic Log by H. Shafer	Depth to Fluid 514.6 feet bgl	Time 1655 1425		
Driller Harianas Drilling	Rig CP 650W	How Left Open hole with surface casing and lock box.		
Geophysics by H. Shafer	Bit(s) 10.75 inch Percussion Hammer			
Weather Prtly cldy, brz, w 92 de	g P Fluid Fresh water with foam/air			
	ample Geologic and Hydrologi			
Depth Rate Istion OVA		NA THE RESERVE TO THE		

	Pene.	lation	1	Sa	mple		Geologic a	nd Hydrologic Description
Depti	Rate (FPM)	0	OVA	*	Inter-	Lith.		
175		(gpin)	+		val	Symbol		
-	New Da	2/20/	7		×		3 180.0'-190.0'	: LS - 20% high vis. porosity.
	 	 			X			<pre><17mm, mod. hard, WH N9, 80% Crystalline LS, very poor vis.</pre>
-	+				X			porosity, angular cuces age
-					X			hard to very hard, between white and very pale orange 10YR8/2.
200 -	0.66	5	0		×			
 					X .		193.01-210.01	: Same as above except 50% WH N9. 50% very pale crange.
					×			
 					×		215.0'-220.0'	: Same as above except 75% grayish orange, _ mod. to high win
		F1			X			porosity, mod, to high formal
225 _	0.83				_ ×	1		cuttings from 2 to 12mm, some
					×		*	sharp frags with no vis.
					x		225.0'-255.0':	(A) (A)
					x		243.0 - 255.0 -	Same as above except grayish orange, and pale orange, staining
					x			variable.
250	0.93	5	0		X		255.0'-260.0'.	Same as above except 100% very
					x P			pele orange, from poor to mad
		85			×			Vis. porosity, round outsing an
					x E			sharp frags, from 2-23mm.
					X		265.0'-270.0':	The same of the same
- 275 -	0.69				<u> </u>			fossil frags, trace orange staining.
					· ·		275.01:	in a
	9	j.	()		T E		2,3.0 .	Same as above except trace prange stain, very high vis. porosity.
				_			300 01 000 01	-
		- 2		-+	× 2		260.0 - 265.0 :	Same as above except trace orange frage, sharp, no porosity, con-
	0.74	5			<u> </u>			
- 300 +					<u> </u>		**	fossil.
	Drill				<u> </u>		290.0'-300.0':	Tri-colored appearance of cut-
	Breek				× 5			tings becoming more apparent in
	DEXTI				<u> </u>			N9 5%, very pale orange 10YR8/2 95%, pale yellow orange 10YR8/6.
	Break				<u>×</u> _E		305 01-330 01-	1
- 343 -	0.69		0		× 3		303.0 -320.0 1	Same as above exc. 100% very pale orng., varies in por., from 1 to
	New Day	2/21/17			x E			20mm.
					<u>. </u>		325.0':	Same as shown and
					x E			Same as above exc. trace frags with light brown stain 5YR5/6.
		*			, =			15.
350 🚣	42				,			_

Log of Borehole

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	نينيت	_						page
	ect And					Total Dep	th 575 feet	START
Locar	tion N20)1923 E2	23516 Œ	: 538.5]		Dia 10.75 inches	Date 2/18/87
Geoir	ogic Log	by H.	Shafer				Fluid 514.6 feet bgl	
	r Har					Ria 🗢		
			Shafer			·		How Left Ope
			, brz. o s		-	Bit(\$) 10.	75 inch Percussion H	ammer hole with surf
West			20 2 25	92 4-7		Fluid Free	sh water with form/a	ir casing and loc
Depth	Pene.	lation		Sai	mple		Geologic and H	lydrologic Description
		(gpm)	(ppm)		Inte			
350 -	 	(gpm)	<u> </u>		val	Symbol		
					x		330.0'-370.0': P/	
					x		a 330.0 -370.0 , ye	ale yellow-orange staining reases to 335.0' then dim
	↓ /				X		4	ry pale orange st
					x		≅ ~	JIM CARE.
375	0.31	5					375.0'-395.0': Le	et circulation (of cu
		0					0.0	my) due to cavity at 370.0
							400.0'-425.0': LS	- 750 pale valley or m
							Ų ΨΩ.	., poor to good wis
				-			·50	ra, occas, frible. cut
400	0.71	5	0		x		eut	EGLIGE, ITOM 1 PA . 1Amm
•••		46			-		and	ow fossil frags.
			22	-		多多	430.0': Sam	se as above exc. from 1 to.
				$\neg +$	×			se as above with 50% whit
					- -		PAL	re Astron-orands and mink
425	0. 22	5	$\overline{}$	\rightarrow			362	uning.
423		70.0		-+	×		450.0'-455.0': Pre	dom. IS - 40% white, 20%
			\rightarrow	-+			Aer	. Orng., 20% mink mean /re
	7 7		\rightarrow	-+	<u> </u>		oli	ve grn. vell -
		-+	+		<u> </u>		cutt	tings, from 1 to 12mm or
	0.39	-+		+	×		brel	k & qtz. mn. incl., le., por. vis. por. or
450 +	0.35	$\overline{}$			X		ligt	ht brn. cuttings 5YR5/6.
	-+	-+	\rightarrow		x			tom Formation as picked
-	-+	-	\rightarrow		×	Sec	Bore	shole Natural Games Log.
-		-+		_	×	4		
-		_			×		lt.	(25%) & Sltstn. (75%), p olive gray, abun. dark
75	0.71	5	\rightarrow		x	3 5.55	TueT	BOG III. shrndad .
	-+	-+			X	表。	poor	vis. por., trace br e (lt. olive gray).
-		-+-			X		_	
-					x	S-3-4	_ ,	15%) & Sltstn. (85%).
+	-+-				×		475.0': LS	(10%), Sltstn (80%),
·∘ ∤°	.54				X Z		(104)	
+	-+-				×	E	180.0'-490.0': Slter	tn. (50%)-olive gray, fro
+	-				X		CO 30	■ , BOd. hard, b=+++ .
+					×		(40%)	qtz. & dark min. in), Shale (10%), light ol
-					x E	1	gray,	ship to shinded m
25 🚣	8	5			x F		***************************************	

Project Anderson AFS IN	Total Depth 575 feet	START -FINISP		
Location N201923 E223516 @ 538.5	Borehole Dia 10.75 inches			
Geologic Log by N. Shafer	Depth to Fluid 514.6 feet bg1	Time 1655 1425		
Driller Marianas Drilling	Rig © 650W	How Left Open hole with surface casing and lock box.		
Geophysics by N. Shafer	Bit(s) 10.75 inch Percussion Hammer			
Weather Prtly cldy, brz. w 92 deg P	Fluid Fresh water with foam/air			
Pene. Circu-	le Geologic and Hydrologi	c Description		
	nas I tak			

Danet	Pene. Rate (FPM)	Circu- lation		Sample		Geologic and Hydrologic Description			
		A 8	OVA (ppm)	*	inter- val	Lith. Symbol	<u>.</u> 1 m.,		
					x	365	405 04 500 04		
					X		493.01-500.01:	Wethrd. Vol. (75%), olive gra 5Y3/2, from 1 to 8mm, hard dan	
					x		, ,	que. min. incl. shruded. Shall	
					x			(15%), LS (10%).	
550					×		505.0'-510.0':	LS (25%), Shale (50%), gray1: olive 1074/2, from 2 to 8000, no:	
					×			soft, flat platy., weathered, wo:	
-+					×	4.5	(4) (4)	Sitstn. (25%).	
\dashv					×		515.0':	Shale (75%), pale yellow hrm	
\dashv					X			10YR6/2 & lt. olive gray, yer platy., sbrnded., soft, occas	
575		5	-		_×_			lg. cuttings 18mm, LS (25%).	
#							550.0'-560.0';	Same as above exc. Shale (195%) from 1 to 10mm. Same as above exc. Shale (100%) pale yel. brn., lt. olive gray dusky yel. grn., LS.	
							565.0':	Same as above exc. Shale (95%) Clay (5%), soft, wet.	
1						nt M	570.0'-575.0':	Same as above exc. Clay (75%) olive gray 5Y3/2, soft, wet. sticky, Shale (25%).	
								· " "	
				-					
-								B 24	
+							V a		
+	-							E	
						= 1			
-		-+		160				-	
\dashv	\dashv								
+		-+	-+			=	*		
				-		60			
+	$\neg \vdash$	_		-					
							S**		