SUBSURFACE INVESTIGATION

OF

DISTURBED GLACIAL DEPOSITS

ON

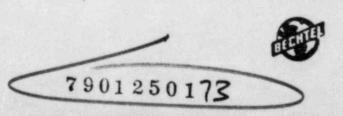
LAKE CAVANAUGH ROAD

SKAGIT NUCLEAR POWER PROJECT

ESTURN TO REACTOR DOCKET

STW 50-522/523 Ltr 1-11-79 7901250170

BECHTEL, INC. 29 DECEMBER 1978



A

TABLE OF CONTENTS

1.0 INTRODUCTION

- 1.1 Location of Study Area
- 1.2 Purpose of Present Study
- 1.3 Previous Investigation
- 1.4 Scope of Present Study
- 1.5 Conclusions

2.0 DISCUSSION

- 2.1 Description of Local Surface Geology
- 2.2 Auger Drilling Program
- 2.3 Results of Drilling

FIGURES

Figure 1 Location Map - Lake Cavanaugh Road Investigation

Figure 2 Lake Cavanaugh Road Auger Drilling-Plan and Section

1.0 INTRODUCTION

1.1 Location of Study Area

The auger-drilling program described herein was conducted along Lake Cavanaugh Road in Skagit County, Washington. The drill site, located about 13-1/2 miles southeast of the Skagit Site, is in the southeast one-quarter of Section 17, T33N, R6E, about 2 miles west of Lake Cavanaugh, as shown on Figure 1.

1.2 Purpose of the Present Study

Field mapping by the US Geological Survey noted deformation within glacial deposits in the area described above. This deformation is near the southeast projection of a lineation, visible on 1:62500 sidelooking airborne radar imagery, in a portion of Gilligan Creek. Because Dr. John Whetten has postulated a fault in Gilligan Creek, the U.S. Geological Survey drilled six auger holes adjacent to these disturbed glacial deposits. As a result of this drilling, the USGS interpreted a 20-ft vertical offset of a till horizon below the exposure in question (Maynard, oral communication, 1978). The USGS reported these deformations to the geology staff of the Nuclear Regulatory Commission, together with several possible origins for them, one of which is tectonic faulting; other possible causes suggested by the USGS to the NRC included ice contact, sediment loading or gravity slumping (Pess1, oral communication, 1978). No question was directed to the Applicant by the NRC as a result of the USGS information; however a series of newspaper articles and television news reports, based on press releases at about the same

time the NRC was notified, implied that active faulting could be considered the most likely cause of the deformation in the glacial deposits. Therefore, this possibility was further investigated by Bechtel.

The purpose of the auger drilling program conducted by Bechtel was to obtain direct evidence regarding the configuration of marker horizons at depth across the observed deformation, specifically, the continuity or lack thereof, of the till surface reported by the USGS. The drilling was done with a large, heavy auger rig, and holes spaced closer than those drilled by the USGS.

1.3 Previous Investigations

The deformation in the exposures of glacial deposits noted by the USGS had been previously mapped during Bechtel field studies. At and near the locality studied, deformation features occur in both lacustrine clays and silts, and in silts, sands and gravels of deltaic and outwash deposits which overlie the lacustrine strata. These features include variously oriented but predominantly northeast striking fractures with and without offset in all the units, and synform and antiform warping in the lacustrine beds. Previous examination had concluded that the deformation observed in the glacial deposits had probably resulted from a combination of gravity slumping and response of saturated sediments to loading. (If the lacustrine sediments were deposited on stagnating ice, subsequent melting of the ice would also cause slumping in the overlying materials.) Similar deformation in glacial deposits are not unusual and are due solely to glacial processes, or to later slumping or sliding.

1.4 Scope of Present Study

The current program consisted of: 1) an examination of available exposures of glacial deposits in the immediate area, and 2) twenty-six 8-in. hollow-stem auger holes. Split spoon samples were taken periodically during drilling. Remote sensing imagery for this project was also reviewed for the study area. The auger drilling required seven days.

1.5 Conclusions

The principal conclusions of the Lake Cavanaugh Road study are that:

1) within the interval investigated, a hard till occurs at a depth of approximately 40 ft below local road surface; and 2) there is no evidence from the auger holes that the till surface is offset; on the contrary, the surface of the till is remarkably uniform over the interval examined.

2.0 DISCUSSION

2.1 Description of local surface geology

Bedrock is exposed in the immediate area of this study. The closest bedrock outcrops are exposures of greenstone metavolcanics about three-quarters of a mile north and south of Lake Cavanaugh Road.

Several glacial stratigraphic units are exposed along Lake Cavanaugh Road and in nearby Pilchuck Creek. The lowermost unit topographically, and stratigraphically, is a gray, very hard, pebble-cobble till which is exposed locally in Pilchuck Creek and nearby drainages. This till is interpreted to correlate with the lowermost unit encountered in the auger holes. Easterbrook (personal communication, 1978) observes that this lowermost till "appears to represent Vashon till." Another till is exposed along Lake Cavanaugh Road, and forms a low, roughly north-south aligned ridge. The apparent configuration of this deposit suggests that it is a remnant of a moraine.

Road cuts, several hundred feet in length along Lake Cavanaugh Road, expose an interval of blue-gray, thinly-bedded (though locally massively bedded) very fine sands, silts and clays. These materials are lake-bed deposits of probable Vashon recessional age. The strata vary from clean sand and silt to highly plastic clay. Irregularly shaped pods of very fine-grained sand occasionally occur within the unit. The lacustrine deposits apparently occur only to the east of the till-ridge described above. This suggests that the ridge represents, at least in part, the dam which caused the lake wherein the fine sediments

were deposited. Because the lake deposits occur to slightly higher elevations than the crest of the ridge along Lake Cavanaugh Road, the ice mass apparently constituted the bulk of the dam; the till ridge is probably on ice-marginal feature.

Overlying the lacustrine strata along Lake Cavanaugh Road are outwash sediments. They include silt, very fine to medium-grained sand and minor pea-gravel. Locally, graded bedding is discernable.

The uppermost unit in the section at this locality is not exposed in the Lake Cavanaugh Road cut but it is exposed in a pit on a side-road several hundred feet to the north-northeast. This uppermost unit consists of sand and gravel exposed in topset and foreset deltaic beds.

No deformation structures, such as simple fracturing, were observed in any of the till exposures around the drill site. Several features do occur in the overlying stratigraphic units, and are especially well-exposed in a relatively high roadcut on Lake Cavanaugh Road. In this roadcut, the blue-gray lacustrine deposits comprise the most distinctive stratigraphic member. The most notable structural feature here occurs within this unit and consists of a relatively abrupt, synformal warping of the strata within an otherwise horizontal interval. The axis of this downwarp is aligned approximately north-south. Fluting and flame-structures (plumes of sediments squeezed into the overlying layer) occur within bedding, particularly well exposed in the east limb of the warp,

but these features are interpreted as soft-sediment deformation due to flowage and sediment loading and are not related to subsequent deformation of the section. Five prominent fractures occur on the west limb of the downwarp. These fractures average in strike about N70°E; most dip steeply to the south. Normal offset on these fractures ranges from 1/2 ft. to 4 ft.; cummulative displacement on these five fractures is about 9 ft. The strike of the lineation coincident with portions of Gilligan Creek is approximately N25°W; thus the prominent fractures are essentially perpendicular in strike to the projection of this lineation. Less prominent fractures of various orientation occur elsewhere in the lake beds along the road cut. Weakly developed anticlines are evident in the lake sediments at two localities on either side of Lake Cavanaugh Road adjacent to the drill site.

The sand and silt beds overlying the lacustrine sequence contain random fractures with up to about 18 in. maximum normal offset. This fracturing appears to be concentrated over the downslumping in the underlying silt and clay beds but does not extend into them.

Minor fracturing also occurs in the foreset beds of the deltaic deposits at the top of the local section. Normal offsets along N50°E fractures dip generally southward, similar to but not parallel to the dip of the foreset beds.

2.2 Auger Drilling Program

The auger drilling program along Lake Cavanaugh Road consisted of 26 auger holes. The holes were located along the north side of the road immediately adjacent to the large roadcut wherein the deformation

described previously is exposed. Twenty holes were drilled at 10-foot spacing. They span the disturbed interval, and all but the easternmost one of the six USGS drill holes. An additional five-holes were augered at 40-foot intervals east of the first group. One hole was drilled 120 ft west of the close-spaced series. The distance between the easternmost and westernmost auger holes is 510 ft. The layout for all twenty six auger holes relative to the roadcut is shown on Figure 2.

Drilling was performed using a mobile (B-75) hydraulic drill rig and 3-3/8 in. ID hollow-stem auger rods which cut an 8 in. diameter hole. All holes were drilled to the till surface. Interception of the till surface was determined during drilling by extreme rig noise (chatter) and substantial jumping of the rig on its stabilizer stands. The till is very dense and is therefore difficult to drill. Maximum penetration into the till was 6-1/2 ft. A geologist observed the drilling operation full time to observe cuttings and drill action as well as log the samples.

2.3 Results of Drilling

Drilling generally defined an irregular wedge-shaped lens of coarse sediments 1 ft. to 9 ft. thick at a depth of about 20 ft. in the close-spaced holes, LCAG 7 through LCAG 20. Materials in this wedge included silty sand with significant amounts of gravel, cobbles and occasional small boulders; minor amounts of clay, occurring as interstitial matrix and as blebs in the unsorted material, are also present. The coarse sediment wedge thickens notably in an easterly direction reaching maximum thickness around LCAG 19.

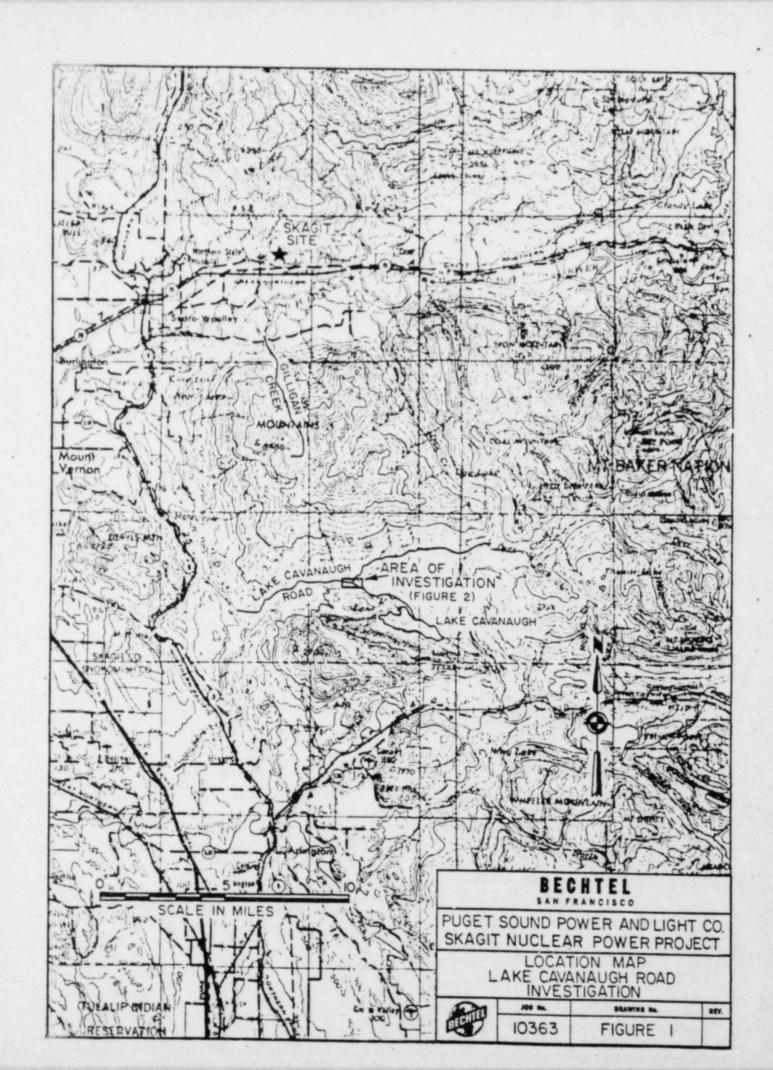
See Figure 2. Drilling through these coarse materials was characterized by rig noise and jumping similar to that encountered while penetrating the till horizon at 40 ft., but drilling through the upper zone was often more difficult due to the presence of greenstone and argillite boulders. The composition, generally unsorted condition and presence of interstitial clavs suggest this zone might well be a till horizon. However, the variable cohesiveness. variable amount of matrix clay, locally saturated nature of the material, and lack of lateral extent also suggest the zone could be a reworked till or local ablation product such as an ice float deposit. Dr. Easterbrook considers this zone to be a second or upper till, possibly correlative to the till in the moraine ridge west of the dril? site. He notes that the upper surface of this layer is parallel to the lower till surface, is not offset vertically beneath the Lake Cavanaugh Road cut and is not involved in the synclinal deformation (personal communication, 1978).

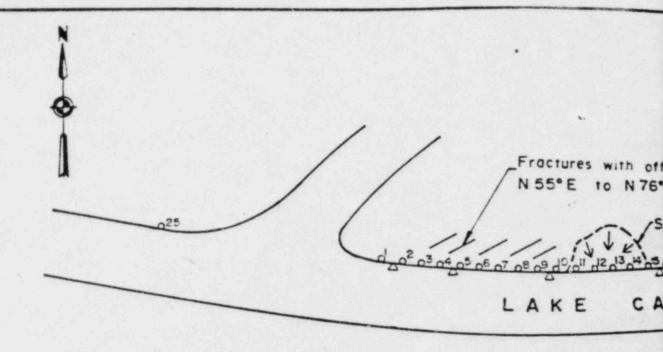
Minor gravels occur throughout the column above the till but are more prevalent in the western half of the section. Silty clays encountered were generally restricted to the upper column above the coarse wedge with silty sands and sands predominant in the lower column. A clean sand was found to overlie the till in most holes, with small gravel at the contact.

The lowest stratigraphic unit throughout the explored interval along Lake Cavanaugh Road is a hard till which was encountered

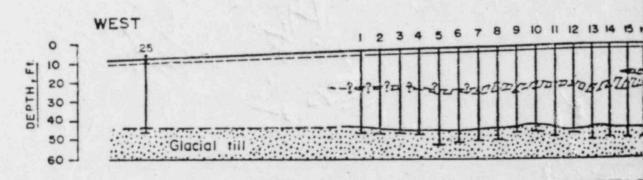
in all of the auger holes at depths of 37 to 45 feet (the variation is due mostly to differences in elevation of ground surface at the auger holes).

Sampling indicated the till is a blue-grey, dense diamicton (poorly sorted or non-sorted terrigenous sediment with a wide range of particle sizes) composed of coarse sands, gravels and cobbles in a clayey matrix. Coarse fraction constitutents include sandstone, greenstone, argillite, coal, phyllite and greenschist. The closely-spaced auger holes demonstrated that the till surface under the deformed sediments in the road cut is unusually uniform considering that the surfaces of till layers are often quite irregular. It was concluded that there is no evidence from the auger holes that the till layer is offset.





PLAN VIE



SECTIO

SCALE IN F

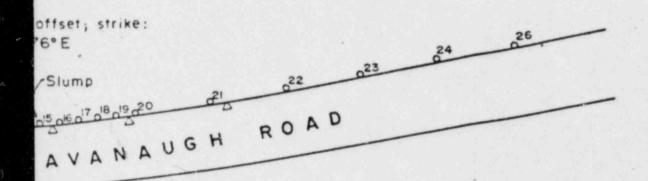
NO VERTICAL EX

NOTES:

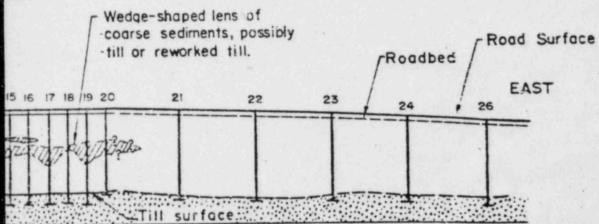
- Section reflects relative elevations of drill holes.
- USGS auger hole locations are estimated from spoils on ground surface.

o

0







ION

100

FEET

EXAGGERATION

EXPLANATION

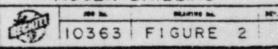
Auger hole by Bechtel.

Estimated location of USGS auger hole (See NOTE 3).

BECHTEL

FUGET SOUND POWER AND LIGHT CO. SKAGIT NUCLEAR POWER PROJECT

LAKE CAVANAUGH ROAD AUGER DRILLING





GEO	LOGI	CD	RIL	LL	06	Skag	it N	uclear Pov	ver Proje		1-1	LACG 1
LAKE	CAVANAL	IGH RO	DAD		T33		REF	SEC. 17	S.F. 1/4	***	900	
	COMPLE	***								0v===v====		
and the second second	78 10/2				and the second second		-	/8" Auger	8"		BEFTH/81 707	44.5'
				9				893'				
	LBS/SPT		64	91/48 E8	77 11 404	4: DIA./		100000	orge Mart	inez		
18,3	16:512		WATE			_	П	1	rge narc	IIIEZ	1	
AND DIAMETER	# # # # # # # # # # # # # # # # # # #	***************************************	TENT		BLEVATH	. !	******	•***	RIPTION AND CL	ASSIFICATION	MO WA WA C'N D-7	TES ON: TER LEVELS, TER BETWEN, ARACTER OF ILLING, ETC.
Н					746			0-2.5' R	oadbed:	brown, sar		3-3/8" hol
5 18	18 2-2	-3]]]	grave	& cobb I	es.		ing an 8"
Н				LA		3.	0			d: blue-q	ray, dry 1	nole.
5 18	18 2-3	-3				10-		nodera	te to we contain	II-sorted, s thin len	ses Grave	1 horizon
Н						10.	1///	of si	lty clay	and fine s	and no',	1 foot
5 18	18 3-3	-5	1			15.	14/40	11-14' 5	ilty Clay	· hlue-		-rig chatt duration
н		:1-	1						loose.	. 5100	but 1	
\$ 18	18 2-6	5-6			His .	20	1	14-16 5'	Silty Sa	nd: blue-	Scatt	ered grav
н						20		gray,	well-sort	ted, loose	e1 @	20' rig
55 18	18 4-6	-14	e k			25	0	densit	y. Sand: o	ray, well	chatt	er and rig jump
Н						25		sorted	, loose.	-5,	ing	1 19 Jump
\$ 18	18 5-6	-9				30		19-24' S	ilty Sand	: blue-gr	av.	
Н		119		12		30	14	moder	ate to we	11- sorted		
22 18	183-6	-10	1			35	***	loose	to mediu	m density.		
Н			1			33	0 0	24-29' S	and: gra	y, well-		e gravel
5 18	18 1-4	-7				40		Sorted	, medium	density.		, less the
8	11		117			40	190			: blue-gr	ay, chatt	er loud
5 10	10 25-	4074				45	700			n density,		some jump- on stands
						45	3	conta	ins a coa	rse gravel		
							3	roriza	on and fil	ne gravel		@ 39.5'- surface w
	1	4	. 2				=			ray, well-	copp	les at con
1			1				3	sorte	d, loose.		- The Control of the	of fine and till-
				1			3			blue-gray	rig	chatter
							=	diami		nse to ver		with sub-
1		0	1.	1	1		3				jump	ing on
		1					3	Bottom o	f hole @	44.5	stand	ds.
			20	16			1					
							1					
					are a			AUGH ROAD			LCA	



LAKE CAVANAUGH ROAD T33N R6E SEC. 17 S.E. 1/4 90° 44.5' 893' 140 LBS/SPT 0 Jorge Martinez 0-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. H 20 Small gravel & 19'- zone—thick-loud rig chatter with minimal jumping on stands. 39-41.5' Sand: gray, fine, well sorted, loose. 41.5-44.5' Till: blue-gray Thin gravel horizon at 34 minor rig chatter with minimal jumping on stands.		E O	LO	GI	C	DF	IIL	LL	06	Account to the second second	Nuclear Powe	r Projec] 00]	LCAG 2
Add LBS/SPT O Jorge Martinez O-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. The sand lenses but not define in cuttings Small gravel & 10-25-25-25-25-25-25-25-25-25-25-25-25-25-		LAKE	E CA	AVAI	NAU	GH R	OAD				SEC 17	S.F. 1			*******
140 LBS/SPT O Jorge Martinez O-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. Is all 182-4-9 S 18 18 2-4-9 Jorge Martinez O-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. S 3-39' Variable drilling rate indicates this silty clay an sand lenses but not define in cuttings Small gravel & 19' — zone — thick-loud rig chatter with minimal jumping on stands. 35 18 18 2-4-9 Jorge Martinez O-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. Thin gravel horizon at 34 minor rig chatter with minimal jumping on stands.		411	60		780	DRILL	**				MARE AND MODEL	MOTE BIES	Ov. **********		
Jorge Martinez Jorge Martinez O-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. Solution of the state o												Married States of the Owner of			
Jorge Martinez Jorge Martinez Jorge	**	MECO		for 4.7	*1	60*		2	# # TOP	0. C. 1.W.		m/ac. 6400m			
U-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. 3-39' Variable drilling 8" dry hole sand lenses but not define in cuttings Small gravel & loose. Thin gravel horizon at 34 minor rig chaminor rigi						ALL	CA	-		DIA./LENGT	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUM				
0-3' Roadbed: brown, sand gravel & cobbles. 5-3-39' Silty Sand: blue-gray moderate to well sorted, loose. 10-39' Nove that auge drilling 8" dry hole 3-39' variable drilling rate indicates this silty clay an sand lenses but not define in cuttings Small gravel 8 le 19'— zone = thick-loud rig chatter with minimal jumping on stands. 35-38 18 18 2-4-9 40-31 Roadbed: brown, sand gravel blue-gray moderate to well sorted, loose. Thin gravel horizon at 34 minor rig chat minor rig chat stands.		140	LBS	/SF	T				0		Jorg	e Marti	nez		
H 10 10-3' Roadbed: brown, sand gravel & cobbles. 3-39' Silty Sand: blue-gray moderate to well sorted, loose. 3-39' variable drilling rate indicates this silty clay an sand lenses but not define in cuttings Small gravel @ 19'—zone = thick-loud rig chatter with minimal jumping on stands. 35 39-41.5' Sand: gray, fine, well sorted, loose. Thin gravel horizon at 34 minor rig chat		CORE BUT					TEST	RE	BLEVATIO	# 14 PER 18	*******	TION AND CL	ASSIPICATION	***	ES ON: PER LEVELS, PER RETURN,
H 10 3-39' Silty Sand: blue-gray moderate to well sorted, loose. 3-39' Solty Sand: blue-gray moderate to well sorted, loose. 3-39' variable drilling rate indicates this silty clay and sand lenses but not define in cuttings Small gravel en 19'—zone—thick-loud rig chatter with minimal jumping on stands. 39-41.5' Sand: gray, fine, well sorted, loose. Thin gravel horizon at 34 minor rig cha	-	LOWBYN		-				T. M. S.		9 4				•••	LLING, ETC.
S 18 18 7-35-43 Jumping on	55	18	18	2-4	-9					10- 15- 20- 25- 30- 35-	gravel 3-39' Silt moderat loose.	s cobble y Sand: e to we	blue-grail sorted,	low s drill y dry h 3-39' drill indic silty sand but n in cu Small 0 19' thick rig c with jumpi stand Thin horiz minor ter a	tem augering 8" ole variable ing rate ates this clay and lenses ot define ttings gravel —zone = -loud hatter minimal ng on s. gravel on at 34 rig cha and sligh
					1901			March 1971		LAKE C	VANAUGH ROAD)		LCAC	



C	FO	10	GIC	np	111	1 1	nc	Page 1			alexa Davis	Dwadaa	+ 30		***	er NO.	HOLER	
u	r O	LU	ulu	חע	IL	_	COOMD		III	Nu	clear Power	Projec	£ 110	363			LCAG	3
			VANAU				T33		6E		SEC. 17 S.I	HOLE SIZE	0venau*	- DEN (F)		00	TOTALD	
				B Pac	cifi			Labs	3-3	3/8	" Auger	8"					44.5	
0 8 6	****		[FY./%]	con	cx	E S BAM		P OF CAS	ING		8931	EL SROUNG	-		DEPTH	#L. TOP	OF ROCK	
A M P				FALL	CA	SING L	EFT IN HO	E: DIA./L	E NO 7	*	LOSSED BY:					-		
_	140	LB	S/SPT		VATE			0		-	Jorg	ge Mart	inez					_
	2 4 2 5		10 × 10 × 10 × 10 × 10 × 10 × 10 × 10 ×	PE	ESSU	RE		1.	100							NO WA	TER OM:	
SAMPLER	TH CO		"N". "N". "N". "N". "N". "N". "N". "N".	:.:			ELEVATI	ON I	GRAPHIC LOS	BAMPLE	DESCRIPTI	ON AND CL	SEIFICAT	TION		CH DR	TER RETU ARACTER ILLING, ET	# N.
4 4 0	LENGTH		1 15:	1008 110	****													
H	18	18	7-8-38					5 - 10 - 15 - 20 - 25 - 30 - 40 - 45 - 45 - 45	<i>8/96</i>		0-3'Roadbed: & cobbles 3-42.5' Sill moderate loose. 42.5-44.5' diamicto - Bottom o	ty Sand to well	blue-	ue-gray	y,	hollo auger 8" dr 3-42. Varia drilli indic proba clay lense defir cutti Small horiz less thick ter minor on st Thin grave @ 35' rig c slight	ow ster drill ry hole 5' - ble ling ra cates ble st and sa es but ned in	line. ate iltind no el 'chand w/ging izonor win et, w/
	00		POON; ST				oits.	LAKE	CAN	VAN	AUGH ROAD					LCA(



HACE IS

G	EO	LO	GIC	DE	RIL	LI	LOG	Sk		. 1	uclear Power Project 10363 1	OF 7 1 CAC A
178							COORD				ANGLE FR	1 LCAG 4
***			AVANAU				T3.	3N	ROE	M.A	EC.17 S.E. 1/4 9	O FOTAL DEPT
0/2	26/7	781)/26/7	8 Pa	cifi	c T	esting				Auger 8"	44.5'
0**	****		(**/*)	con		-		0 P OF CAS	ING	6 11	894 1 DEFTH/EL	TEL. TOP OF BOCK
AMI	LE HA				CA	-	EFT IS HO!	LE: DIA./I	LENGT	H .	L000000 0Y:	
	140	LE	S/SPT					0			Jorge Martinez	
:	N C		1 11.	PR	WATE	RE				Γ		
	LENGTH CORE		"N"		TESTS		BLEVAT	ON I	BRAPHIC LOG		SESCRIPTION AND CLASSIFICATION	WATER RETURN
0	***								1			DRILLING, ETC.
::		3 00	: "	* *	1.	*			•			200
H	18	18	7-6-28					10- 15- 20- 25- 30- 35- 40- 45-		, A		"H"= 3-3/8" hollow stem auger drilling rate probably thin silty clay units at 5-10' but auger cutting inconclusive. Gravel horized 20'— approx 1' thick, rigin chatter loud w/minor jumpi on stand. Gravel horized 35' - thin, less than 1', rigin chatter minor w/very slight jumpir on stand.
												unit, rig jumped sub- stantially w/ loud chatter.
		LIT 81			V TUB	E;	- FY R	LAVE	-		AUGH ROAD	LCAG 4



G	En	LO	GIC	DI	RIL	LI	OG	Ska		N	iclear Power Proje	ect 10363	OF	LACG 5
7.						-	C00#01			- 11		ANG	900	
			VANAU				T3		R6E	MA	SEC.17 S.E.	OVERBURDEN(FT.	AND DESCRIPTION OF THE PARTY OF	TOTAL DEPT
	-		And the last of th	-				-	Description of the last of the	_	' Auger 8"			49.5'
	****	v	(**./*)	cor	E BOX	E 5 SAMP	E . TO	POP CASI	ING		394	DWATER	DEPTH/EL. TOP	OF MOCK
A M P			-	FALL	C.	SING L	EFT IN HOL	E DIA./L			LOGGED BY:			
_	140	LB	S/SPT		WATE			0	_		Jorge Ma	ertinez		
	SAMPLES ADVANC LENGTH CORE BU	COME RECOVER	PERCENT COM	-	TEST	RE	*LEVATIO			84891.8	DESCRIPTION AND CO	ASSIFICATION	WA WA CM DR	TES ON: TER LEVELS, TER RETURN, ARACTER OF ILLING, ETC.
H SS H	18	18	3-5-7					5 -		NA IA	0-2.5' Roadbed: gravel & cobbl 2.5-11.5' Silty C gray, loose to density, inter	es. lay: blue medium bedded wit	holl auger 8" di	= 3-3/8" ow stem r drillin ry hole. elly zone
7.1	18	18	5-7-17					15-		(B)	thin silty san		slig	- 25', ht rig ter and
H S	18	18	7-9-12					20		C	gray, moderate sorted, loose density, inter	to well to medium	mino on s	r jumpin tands.
H	18	18	8-12-1	15				25	000	101	thin silty cla 31.5-43.0' Sand:	y lenses.	Grav @ 38	elly zon
H	18	18	5-9-3					30-		[w]	sorted, medium		chat	ter and r jumpin tands.
H	18	18	6-8-1					35		14			Till	@ 43' -
	18	18	5-7-7					40	000	G	42.0.40.51. 7/11	.,	chat	loud ri ter and tantial
H	18	18	3-14-	5				45	6/9	H	43.0-49.5' <u>Till</u> : diamicton, med dense.		W I	ing on
H 55	18	18	22-33	55				50	5/0/	ŽĮ.	- Bottom of.Hole	@ 49.5' -		
1	0	-	POON; 51		. 0 - 0	**:	e/78	LA	1 KE	CA	ANAUGH ROAD		LCA	



-	EO	L(IGI	C	DR	IIL	LL	0 G	_		N	uclear Power	Proje	and the second second	53 1	٥٠]	LCAG 6
178	AKE	E C	AVAN	AUG	H R	OAD		T3:		R68		SEC.17	S.E	. 1/4	9	0 +0*12.	BEARING
***		1	3/10				. T.		Labo			NE AND MODEL	811	0.54804051	(FT.) #OC	x (FT.)	49.5
	-	-	1/19					8 1 1 1 70				3" Auger		-	DEPTH	/&L. TOP 0	-
							10					894'					
					ALL	CA		FT IN HOL	#: DIA./	LENGT		LC BORD BY	ge Mar				وأرسان
	5,5	LD	S/SP			VATE				T	П	Jor	ge mar	THEZ			
		******		100		TEST		ELEVATH	2	100		DEACRIPTI		ASSIFICATION		WAT	ER LEVELS,
AND DIAMETE			N. N.						DN F	BRAPHIC LOS	BAMPLE					CHA	HACTER OF
2014			1		* *	1.	i										Sauta St.
Н	: 1				H					1		0 2 51 0004			and	10110 3	2 /0"
	18	18	6-6-	14					5	##	4A	0-2.5' Road gravel &				"H"= 3	w stem
н						1.5			1	1//							drillin
C	18	18	4-6-	18					10	1///	R	2.5-4' Silt medium					dry hol
н									10	344	4	interbed				Small	gravel
	18	18	4-5-	8		-		16.9	15	# 1	C	lenses.					below slight
									15	HE	_	4-6.5' Silt	y Sand	blue-	gray,	chatte	er w/
H	18	18	8-10	1-1	3	E				3(1)	n	medium d			hin		jumping
	10	10	0 10						20	111	Ĭ	lenses o	TSIIL	y Clay.		on st	ands.
H	10	10	11-1	1-1	5					all,		6.5-11.5' <u>S</u>					@ 44' -
20,7	10	10	111-1	-	5				25	-17	1	gray, me thin sil				unit	compact - rio
H SS	10	12	6-12	2-1							1		0, 50,			chatt	er loud
33	10	10	0-12		5				30	-00	F	11.5-31.5' gray, we	Silty S	Sand: b	lue-	on st	jumping
H	10	10	8-12		-					-000		sorted,	loose 1	to mediu	ım		derable.
22	10	18	10-12	-	5				35	000	2	density, interbed					
Н										-00	0	clay.	ded lei	1562 01	Silty		
SS	18	18	8-12	2-	4				40	- 0	H	23 5 261 6-					
Н						1				-	0	31.5-36' Sa sorted,					
SS	18	18	5-40)-	54				45	19%	II						
Н										1//	9	36-38.5' Si moderate				1	
SS	18	18	10-3	33-	40	-		13-33	50	772	4	density.		ocu, mec			
										=		20 E 141 Ca	nd: a		1		
										3		38.5-44' <u>Sa</u> sorted,					
										1							
										=		44-49.5' Ti diamicto					
			1							3							
										=		- Bottom o	f Hole	(0 49.5			
										3							
										1							
:	5	PLIT	POON;	er .	-	9 7 7 0		HTE.	IAV	e c1	W	NAUGH ROAD				LCAG	6
10.	F 19								DAK	LUF	WF	MAUGH RUAD				Lond	



G	En	10	GIC	n	R	11	LI	06	Ska		N.	clear Power	Dende	10363		0F 1	HOLE NO.
178	- 0		, 410		**	-	-	_	IMATES	git	IN	iclear Power	Proje	Ct 10363	-	OM NOR12.	LCAG 7
L			VANAU		ROA			T	33N			SEC.17 S	.E. 1/		90		TOTAL DEPTH
0/	20/	781	0/20/	78 F	ac	ifi	. Te	sting	Labs	3-3	3/8	3" Auger	8"				49.5
0 8	***	0 v * *	v (FT./%)	c	088	****	10	E 2L 7	0 P OF CA	1 NG	G = 0	UND EL. DEPTH	EL		D @ P T +	# / EL. TOP	0F #0CH
LA M	LE M/		. WEIGHT	/FALL	_	CA	SING LE	FT IN HO	LE DIA.	LENGT	*	894'					
	140	DLE	BS/SP	Τ					0				Jorg	e Martine	z		the State
::	ANCE		: :		PRE	ATE	RE	1									
	A 0 0				Ť	ESTS		ELEVAT	ION I	2	8748	DESCRIPTI	ON 4ND CL	ASSIFICATION		WA	
-	1 0 M			0,1						BAPHIC						D#1	LLING, ETC.
	113	100		-	4	:	,			ļ.	Н					-	
Н					1					100		0-2' Roadb	ed: b	rown, sand	1.	"H"=3	3-3/8"
SS	18	18	7-9-1	1					5	1777	A	gravels	& cobb	les.		ho110	w stem
Н	100									3///	1	2-3.5' 511	tu San	t hlue-	arav	auger	drillin
55	18	18	3-4-8					144	10	3///	图	well-sor	ted, me	edium der	sity		
Н								M		1///	11	3.5-19' Si	1+v C1:	av. blue			boulder - rig
SS	18	18	5-7-1	1					15	3///	垣	gray, To	ose - I	medium		jumpe	
Н									1.5	1///	11	density,			th		w/very
55	18	18	3-4-1	3					20	##	包	very thi	n Siit,	y sand		Toud	chatter.
Н		В							20	34		101 001 01					1 @ 38.5
20.0	18	18	6-15-	7	4				25	-	E	19'-23' Si	ne, we	na: blue	-gra	loud	chatter.
ш				П	1				25	- 4		slightl	y plas	tic, medi	um	some	jumping
H	18	18	2-6-9	+	-1					3	-	density				on st	and.
-	1	1			1				30	1/4		23'-25.5'	Silty !	Sand: bl	ue-	Till	@ 43' -
H	18	18	6-9-1	0						311	Ä	gray, p	oorly :	sorted wi	th		ct,rig
	10	10	0-5-1	Ĭ					35					vel and ns in a s			ed sub-
H	10	10	6.10	7,	-							clayey	matrix			very	loud
22	18	18	6-10-	1					40	-	1	25.5'-31.5'	Sand	gray,	very	chatt	er.
Н										7.5/		medium,	with '	thin lens	ses	H.	
55	18	18	40-50	45"					45	3//	a I	of silt	y sand				
Н								18.2		197		31.5'-36.5'	Silt	y Sand:			
22	18	18	30-35	35			100		50	10/9	9	blue-gr	ay, mod	derately			
				-			1 34			1				n density lenses o		-	
										3				gravel.			
										1		26 5 421 6	and.				
										1		36.5-43' <u>S</u> moderat		gray, rted, med	dium		
			100							3		density					
										=		43-49.5' T	111.	hlue-oras	,		
										7				ery dense		1	
										3		- Bottom o	f Hole	@ 49.5	-		
		-	POON: #	T - SH	***	* ***	a:	ire.		-						HOLE NO	
	F 19	MNIS	ON; *	-		0 - 0			LAKE	CA	VAI	AUGH ROAD				LCAG	7



G	E O	L	GI	C	DI	RIL	Ll	.0G			N	iclear Power	Proje		1	er no.	LCAG 8
Δ i	CF (rav	ANAU	CH	POA	n		T33		D	6E	SEC 17	S.E.		90) HONIE.	PEARING
	i Pe	c		**	-		-	-				SEC.17	HOLE SIZE	OVERBURDEN			TOTAL DEPTH
_		_					-		-	-	-	3" Auger	8"		1	/EL. TOP 0	49.5'
0#8	***	0488	* (**)*	*1	con		10	1 8 70	P OF CAS	ING	-	895'				/ 12. 10.	
					ALL	CA	-	# T IN HOL	E: DIA./		H	L00080 87					
	140	LB	S/SP	T				()	_	_	Jo	rge Ma	rtinez			
	CORE RUE			BECOVERY BECOVERY	-	WATE PESSU TESTS	RE	ELEVATION	- 1	#IC 100	***	D# 9C#1PT1		ASSIFICATION		NOT WAT WAT	ES ON: ER LEVELS, ER RETURN, RACTER OF
2024	SAMPLE.		*****	28.6	9 1				ō	SHANNE	**					DAI	LING, ETC.
Н				1						-		0-2.5' Roa			and &		
SS	18	18	3-14		В				5	HE	A	gravel w	ith co	bbles.		holl	ow auger
н	- 1									1//	7	2.5'-5.5'	Silty	Sand: bl	ue-	drill	ing 8"
	18	18	9-12	2-1	4				10	1//	压	gray, we density.	11 sor	ted, medi	um	dry h	ole.
Н									10	1//	1						cobbles
7.7	18	18	4-9-	5					15	1//	10	5.5'-16.5'			lue-		11 bould
Н									15	14	4	gray, me density			d		- rig
	18	18	3-18	3-2	,		N.	1		-	D	silty sa	nds (v	ery thin)		Stand	S ,
		1.4							20	10	0	and sand	y silt	S.			me jumpi hatter.
H	10	3.0	0 2	7 4	7					-60	N E	16.5'-19.0'	Silt	y Sand:	blue-		nacter.
22	10	18	8-17	-3	/				25	-	-	gray, we				Grave	
Н						1.5		H		3		density.				30' -	rig d w/loud
SS	18	18	5-20	-2	7				30	- 00	F	19.0'-24'	Silty	Sand: bl	ue-	chatt	er - not
Н										111		gray, mo				extre	me.
55	18	18	5-11	-1	1	11			35	3	G	with sca cobbles,				Fine	sand ove
Н						1			33			gravel b				till	@ 43'
25/75	18	18	5-14	-1	0				40	1	H	24'-29.5'	Sand.	arav		with	gravel at
Н									40	3		moderate	-		ium	Conca	
	18	18	24-2	5-	26					7/9	71	to dense					@ 43'-
	10	10					1		45	14/9	-	@ base.				ctant	umped su ially w/
H	פו	10	18-3	20	12					300	9	29.5'-32.5' gray, we			blue		chatter.
, 0	10	10	10-5		-				50	-	-	gray, we					
	7					1				=		lenses,	medium	to dense	€.		
	1									-		32.5-43' S	and:	grav.		1 887	
						1				=		moderate	Ty sor	ted, medi			
										=	1	density, @ 40'-41	grave	1 horizon	1		
						1				=		43-49.5' Ti					
						1				3		diamicto	n, me	dium dens	se.		
										-		- Bottom	of Ho	le @ 49.5	5' -		
-		PLIT	POON:	. 78	-			977E	AVE	CAVI	2 81	UGH ROAD				LCAG	



GEO	LO	GIC	0	R	ILI	Γ	L	16	Ska		N	uclear Power	r Proje	ct 1036		er #0.	LCAG 9
74				_		_	-	C00 *01	****				rioje			OM HORIZ.	Name and Address of the Owner, where the Owner, which is the Owner, which
LAKE	7000	ANAUG		200		-		T331	N RE			EC. 17		0ve******	900	K (FY.)	TOTAL DEPTH
0/20/7	18	0/20/78									-	B" Auger	8"				44.5
** ***		(*L+4	E		****		10	1 - 10	OF CA		***		/&L	-		/#L. 70P	PROCK
MPLS NO			/F AL		CA	****			8: DIA./			895'					
140	LB	S/SPT						0			-	Jorge	Martin	ez			
AND DIAMETER SAMPLES ADVANCE LENDTH CORE RUE	COME RECOVERY	SAMPLE BLOWS	*****	-	ESTS	ME		LEVATIO		********	-	DESCRIPT		8 8 8 1 P 1 C A T 1 O H		MOT WAT CHA	ES ON: TER LEVELS, TER RETURN, TRACTER OF LLING, ETC.
4				T			1			1	T	0-2.5' Road	The second second		and,		3-3/8"
	18	12-14	1-18	3						10.55	Ā	gravel 8	cobb1	es.			ow stem
1									5	111	201	2.5-4' Sil					y hole.
	18	3-4-6	5							-	R	rounded	, mediu	m densi	ty.	1	1 1 1 1
				-					10	1//	1						
5 18	18	2-4-7	7							341	7	4-6.5' Si'very fir	lty San	d: blue-	gray,		el @ 20
	1.7								15		×			m, thin			ed with
5 18	18	5-9-	10							1//	10	lenses				loud	chatter
		4-19-2							20	100	1					0000	cobbles intered.
										-30	0	6.5-9' <u>Sand</u>	i: gray	, well-s	orted	1	
	18	5-9-	10						25	-30	E	9-11.5' 2 Si	1tv Clav	· hlue-	orav		@ 42.5'
										1,	ī	16.5-20) 10	oose, i	nterbedo	ded,	subst	tantiall
S 18	18	3-6-8	3						30	4	G	with fir				with	
										3	-	11.5-16.5'	Silty	Sand: b	lue-	Chat	Ler.
S 18	18	1-5-6	2						35	1	H	gray, we density				1	
										3	L	of silty					
\$ 18	18	4-8-11	0						40	3	- 1	20-24.5' S			e-gray		
1										-	27.	poorly s density			le		
5 18	18	3-12-2	23						45	3	ÄJ	with cot		-			
									45	3		clayey	enses.				
						1				=		24.5-26.5' gray, we					
			1	-						3		with th					
							1			1		clay. 26.5-42.5'	Sand.	arav w	-11-		
										7	-	sorted,	loose	with th	in		
			1							3		silty c					
							1			=		42.5-44.5' diamicto					
			1			-	1			=	1	-Bottom of			is rey.		
										-		DOCCOM OT	nore @	44.5 -			
	PLIT	POON: 0			¥ 108		100		. L	1	1	1011 8048				HOLE NO	
		on; * * 1	PITCH	**;		***	•	LA	IKE C	AVA	NA	JGH ROAD				LCA	G 9



u		LU	GIC	-	D R	IL	L	.0G	Ska	git	Nuc	lear Power	Proje	ct 10363	1 07 1	LCAG 10
	LAK		AVANA						33N			SEC. 17		1/4	90°	
0/2		100	V20/7				c Te	stina				3" Auger	8"	-	.) ROCH (FT.)	44.5'
			(FT./%)					288 84 70			*00	D &L	/#L. ##DUN	-	DEFTH/EL. TO	the state of the s
	F1.8 WA			17.0		TEA	4	EFT IN HOL	#: DIA./	E NO 7 H	-	15'				
			/SPT					0				J	lorge M	artinez		
****	RMSTH CORE RUM		PRECOVERY	1107	PR	ESTS	RE	RLEVATI	0 M Z	98APHIC LOS	*******	DESCRIPY	ION AND C	ASSIFICATION		DYES ON: ATER LEVELS, ATER RETURN, HARACTER OF RILLING, ETC.
H SS H SS	18	18	5-18-3 5-5-8 3-7-8						10· 15· 20 25 30 35 40 45	* ***********************************	2 2 B 3 3 3 I D 4	silty sa 0-22.5' Spoorly service throughor matrix. 2.5-30' Service at ly so scattere service	lty Clark fine and: with the ses.	ay: blue- e lenses of and: blue- medium es and se gravel nor clays gray, mode loose with gravel enses. ay: blue- ith thin nses. gray, well hin coarse blue-gray ium densit	holl auge gray.8" d bf Grav bles gray.jump stan w/lo in Till comp jump on s very chat gray,	ow stem r drillin ry hole. el & cob- @ 20'-rig ed sub- tially ud chatte @ 41' - act, rig ing extre tands w/ loud
-	** - *		PRON; F					9/78		1					HOLE	
	0 - 01		ON; > . F	PITC	ME#;	•	****		LA	KE (CAV	NAUGH ROA	D		LC	AG 10



H&CF 19-1

G	E O	LO	G	IC	DR	IL	L	OG	Skag		clear Power	Projec	t 10363] 07]	LCAG 11
78	LAK	E C	AVA	NAU	GH R	OAD		T33		R6E	SEC.17		1/4	900	
0/					8 P		fic 1	estino			/8" Auger	8"	-	T.) #0C# (PT.)	44.5
-	***	_			-	_		# 8 EL TO				/8L. 680VH	-	DEPTH/ SL. TOP	DF ROCK
A 160 P	LE MA	-		16 HT/	PALL	CA	1 4	IFT IN HOLI	E DIA./I	ENSTH	896'				
	14	0 L	BS/	SPT	_			()		Joi	rge Mar	tinez		
	CORR BUT				PR	ESSU	RE	BLEVATIO		1010	DESCRIPT		ASSIFICATION		TES ON: TER LEVELS, LTER RETURN,
AMD DIAM	LENGTH CORR	CONE RECOVE		PRECENT CON	9 :		1 1 1 N 1 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1								ILLING, ETC.
+									5		0-2.5' Roa gravel & 2.5-8' Sil loose de 8-15.5' Sil loose, w silty sa	ty Cla nsity. ty Cla ith th	es. y: brown,	holl auge an 8	= 3-3/8" ow stem r drilling dry hole
SS	18	18	6-1	8-8					15		15.5-23' Si well to silty cl	poorly	nd: blue-g sorted, n ses, loose	minora 16	1 thin
_	18	18	6-	10-1	5				20	000	23 42' Sil	ty San	d: blue-gi	mining, Cobb	mal chatte les and els from
Н									30				m density es of sil	ty 20'-	23'; rig consider chatter.
SS	18	18	4-	6-8					35						
Н									40		42-44' Sar	nd: ar	y, well s	orted.	
									45	147	100se - 44-49.5 Ti	medium	ue-gray, ium densi	ty. Till	0 44'- act; rig
SS	18	18	12	2-18	30				50	7.75	- Bottom of	f hole	@ 49.5' -	ly o very	ed extrem n stands loud ter.
		PLIT	******	m: e7		. TU			LAKE	CAVA	AUGH ROAD			LC	AG 11



G	EO	LO	GIC	DR	IL	LLC	G s	kag		clear Power	Project		1 00]	LCAG	12
**	-	-	VANAUG	-	-		T33N		R6E	SEC. 17 S	.E. 1/4		90°	IL. BEARING	
***	-		MPLETED							E AND MODEL] **** (FY.)	707AL 08	
							ing La	Mari-	-	" Auger	8"		DEPTH/EL. TO	45.5	, '
0 * *	MECO	****	(-1-4)	CORI		5	8 L TOP 0	CAB		896'	EL	2788	DEPTH/BL. TO	P OF NOCK	
AMP	LE MA		# # 10 HT/	ALL	CA		IN HOLE:	DIA./L	E MOTH	LOSSED BY:					
1	40 1	LBS,	/SPT				0			Jorge M	artinez				
	CORE RUE		WTE BLOWS	**	ESSU TESTS	RE	LEVATION	*****	***	DE SC#1PT1	OR AND CLAS	81F1CATION		OTES ON: PATER LEVEL PATER RETUR	
			WENCENT PROCOUR			1 1 2 1		•						PRILLING, ETC	
								5-	7//	0-2.5' Road gravel & 2.5-8' Silt loose to	y Clay:	brown,	ho au an	" = 3-3/ llow ste ger dril 8" dry le.	em 11i
Н								10-		with thi lenses. 8-20' Silty	n blue s	ilty cl	Gr.	avel @ 2 arse - r atter ve	rig
								15-	3///	loose to	medium	density	lo	ud with antial mping on	su
SS	18	18	9-21-7	6				20	FIGA.	poorly s cobbles	orted, s	cattered	d st	ands.	
Н								25		out, wit near bas 22-27.5' Si with thi	1ty Clay	: blue-	gray, ha	rd, compa g chatte	ect
								30		of fine 27.5-34.5'	Silty S	and: blu	ie- su	ud with bstantia mping on	
SS. H	18	18	2-8-9					35		grey, we 34.5-39.5'	Sand: g		st.	ands.	
	18	18	4-12-	6					3 7	sorted,					
			3-17-7	1				40	7///	39.5-41' S	ilty Cla	y: blue			
Н					1				1	grey, me					
SS	18	18	24-24	38				45	V//	41-44' Sand medium d		well-so	rtea,		
										44-45.5' T diamicto					
				1						- Bottom o	f Hole @	45.5'			
									1						
									111111						
		PLIT	FOON: 81	- 947		• E; Of	TAVE	CA	I E	GH ROAD			MOLE	mo. CAG 12	



140 LBS/SPT	acific Testing L	abs 3-3/8" Auger	17 S.E. 1/4 90	the same of the sa
140 LBS/SPT	acific Testing L	abs 3-3/8" Auger	DEPTH/EL. GROUND WATER DEPTH	
140 LBS/SPT	CASING LEFT IN HOLE	OF CASING GROUND EL. 896"	DEPTH/EL. SROUND WATER DEPTH	43.0
140 LBS/SPT	0 WATER	DIA./LENSTH LOSSED		/ EL. TOP OF ROCK
140 LBS/SPT	0 WATER		a v :	
			lorge Martinez	
AND DIAM AND	PRESSURE TESTS ELEVATION	2 APRIC 1.06	SCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACYER OF DRILLING, ETC.
1		grav 2.5-7' 100s 10-11-12' 8 sort 12-23' 100s clay 25-26' poor grav scat clay 26-32' 100s silt 45-27-100s sand 45-27-100s sand	Roadbed: brown, sand, el & small cobbles. Silty Clay: brown, e. Silty Sand: brown, welled, medium density. Silty Clay: blue-gray e, with brown silty and fine sand lenses. Silty Sand: blue-gray ly sorted, with cobbles el, and small boulders tered throughout, minor in matrix. Silty Clay: blue-gray e, with thin brown y clay lenses. Silty Sand: blue-gray e, with thin coarse lenses. Sand: gray, welled, medium density.	hollow stem auger drillin an 8" dry hol Gravels @ 23' very coarse & rig chatter very loud with substantial jumping on stands, SPT on small boulder 100/3' Till @ 43' - rig chatter very loud with substantial jumping on stands.



6	E O	LO	GIC	1	DR	IIL	L	L	-	5ka		Nu	lear Power Project 10363 1	3F]	LCAG 14
			CAVAN				AD			33N	R61		SEC.17 S.E. 1/4 90	0	Marin
0/			0/23/7				fic	Te	stir	ng La	The contract of	7	8/8" Auger 8"	× (=7.)	49.5'
-	_	_	(FT/4)										UND EL. DEPTHIEL, GROUND WATER DEPT	/ EL. TOP (and the state of t
A 10 1				FAL		CA	-	3	T IN MO	LE: DIA	/68 987		8961		
	140	LBS	S/SPT	_						0		_	Jorge Martinez		
**	ABVANCE CORE RUE			L	-	TEST!	RE		ELEVAT	108	9070	***	DESCRIPTION AND CLASSIFICATION	#01 WA1	ES ON:
AND DIAMET	SAMPLER C		OT AND MAN	1011		F. B. C.	Trees	MINUTES			SHAPHIC LOS	BYAMPS		04/	HACTER OF
Н 55	18	18	24-15	-1	3					11 2 2 3	5 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	A	2.5-13' Silty Clay: brown, loose -medium density, with thin lenses of brown silty clay. 13-20' Silty Clay: blue-gray loose-medium density, with thin lenses of brown silty clay. 20-23' Silty Sand: blue-gray clay. 20-23' Silty Sand: blue-gray, poorly sorted, medium density, with silty clay to coarse gravel and small cobbles scattered throughout.	hollo auger 8" hole. Grave coars chatt loud subst jumpi stand	e, rig e, rig er very with antial ng on
35	18	18	2-5-1	P						3	5	00	23-42.5' <u>Silty Sand</u> : blue-gray, medium density, contains thin lenses of silty clay. 42.5-45' <u>Sand</u> : gray, fine, well sorted, <u>loose</u> .		
	18	18	12-40	5	0					5		17.15.6	45-49.5' Till: blue-gray, diamicton, very dense. - Bottom of Hole @ 49.5' -	rig o	@ 45'- chatter loud wit cantial ng on ds.
	-	A 200 K 120	POON; 87	000				. "	" LA	KE C	E AVANA	LUC	H ROAD	LCA(



	E O	LO	610	;	DR	ILI	L	.06	_		git	N	clear Power	Proje			or]	LCAG 15
L	AKE	CAV	ANAU	IGH	ROA	AD		T3	3N		R6E		SEC. 17	S.E. 1		90°	W HO#12.	
			w P 1, E 7 E				_			г		-	E AND MODEL	Total Control	0VERBURDEN (**	T.) *OC*	(FT.)	TOTAL DEPTH
			¥23/					sting					8" Auger	8"		DEPTH	8L. 707 0	49.5'
			6.1341				1	1					896'					
	-		-			CA	51NG L	EFT IN HO	LE: D1	4./6	2 46 7	H	LOSSED BY:					
_	140	LBS	/SPT	_	-	ATE		0	-	_	-		Jorg	e Mart	inez	_		
			MPLE BLOSS		PR	ESSU	RE	ELEVAT	ION	****	10 100	2740	DESCRIPT	OR AND CL	ASSIFICATION		WAT	E
				****			T			:							B#11	LIME, ETC.
н									1	5 -			of fine 15-16' <u>Sil</u>	lty Cl ontain silty ty San	es. ay: brows thin lessand. d: blue-	n, nses gray	hollo auger 8" dr Grave @ 15' very	3-3/8" w stem drillir y hole. lly zone and 19' coarse
SS	18	18	7-24-	-19					2	20 -	43	14	density. 16-19.5' Sorted,	and: medium ded wi	density, th very t	1-	small rig c very	-
Н										30			density, coarse g	orly s silty ravels	orted, me	dium	rig c loud some on st	hatter with jumping ands.
2.5	10	10	5-10-	7	,								23.5-36' S		ted, medi		Till	hard, ri
	10	10	5-10-	-16				1		40	- 13	-0	density.		,		chatt	er very
H		2.5	0					Ho.			1		36-39' Sil	+4 5	d. blue	arau	loud	
55	18	18	2-4-	10						45	19/19	C			ith poor!			ng on
Н											17/	1	sorted s	ilty s	and and		stand	
SS	18	18	10-24	4-4	9					50	1/4	AD.	gravelly	sand	lenses.			
													39-41.5' sorted, density.	loose	gray, wel to medium			
		-	Bott	om	of	Hol	e @	49.5	-				41.5-43' <u>St</u> gray, we		nd: blue ted, loos			
													43-44' Sar sorted,		ay, moder density.		4	
											3	-	44-49.5']	ill:	blue-gray	,	1.71	
-									.		1	1	diamicto	on, den	se to ver	y de	se.	He wisi
	** - *				-	. 701		-		AVE		W	NAUGH ROAD				LCAG	



HACF 17.

LAKE CAVANAUGH ROAD T33N R6E SEC17 S.E. 1/4 90° 149.5' 149.5' 140 LBS/SPT 150 LBS/SPT 150 LBS/SPT 150 LBS/SPT 160 LBS/SPT 170 LBS/SPT
A
Jorge Martinez D-2.5' Roadbed: brown, sand, gravel & cobbles. D-2.5' Roadbed: brown, sand, moderately plastic, loose to medium density, thin lenses of blue silty clay. SS 18 18 5-1-8 D-2.5' Roadbed: brown, sand, moderately plastic, loose to medium density, thin lenses of blue silty clay. D-2.5' Roadbed: brown, sand, hollow stem auger drilling an 8" dry hollow stem auger dri
H O Jorge Martinez D-2.5' Roadbed: brown, sand, gravel & cobbles. 10 Partial State of the sta
D-2.5 Roadbed: brown, sand, gravel & cobbles. 2.5-15' Silty Clay: brown, moderately plastic, loose to medium density, thin lenses of blue silty clay. SS 18 18 5-1-8 SS 18 18 5-1-8 D-2.5 Roadbed: brown, sand, mollow stem auger drilling an 8" dry hour moderately plastic, loose to medium density, thin lenses of blue silty clay. SS 18 18 5-1-8 D-2.5 Roadbed: brown, sand, hollow stem auger drilling an 8" dry hour moderately plastic, loose to medium density, thin lenses of blue silty clay. SS 18 18 5-1-8 D-2.5 Roadbed: brown, sand, hollow stem auger drilling an 8" dry hour moderately plastic, loose to medium density with heavy gray, poorly sorted, with scattered cobbles and coarse gravels, and blue silty clay lens 18'-20'. SS 18 18 5-1-8 H
H D-2.5' Roadbed: brown, sand, gravel & cobbles. D-2.5' Silty Clay: brown, auger drilli an 8" dry how moderately plastic, loose to medium density, thin lenses of blue silty clay. D-2.5' Roadbed: brown, sand, gravel & cobbles. D-2.5' Silty Clay: brown, auger drilli an 8" dry how moderately plastic, loose to medium density, thin lenses of blue silty clay. D-2.5' Roadbed: brown, sand, hollow stem auger drilli an 8" dry how moderately plastic, loose to medium density very coarse, rig chatter gray, poorly sorted, with socattered cobbles and coarse gravels, and blue silty clay lens 18'-20'. D-2.5' Roadbed: brown, sand, hollow stem auger drilli an 8" dry how moderately plastic, loose to medium density very coarse, rig chatter was very lou with heavy jumping on stands. D-2.5' Roadbed: brown, sand, hollow stem auger drillian 8" dry how moderately plastic, loose to medium density very coarse, rig chatter was very lou with heavy jumping on stands. D-2.5' Silty Sand blue-gray, poorly sorted, with scattered cobbles and coarse gravels, and blue silty clay lens 18'-20'. D-2.5' Silty Sand blue-gray, poorly sorted, with scattered cobbles and coarse gravels, and blue silty clay lens 18'-20'. D-2.5' Silty Sand blue-gray planting on stands. D-2.5' Silty Sand blue-gray planting on stands.
H D-2.5' Roadbed: brown, sand, gravel & cobbles. D-2.5' Roadbed: brown, sand, hollow stem auger drilling an 8" dry hollow st
40- 44-49.5' <u>Till</u> : blue-gray diamicton, very dense. 50- 50- 50- 50- 50- 50- 50- 50- 50- 50-



0/	4=	781	0/2:	3/7	ROA Pa	cif	ic Te	T33N	Labs		MA*	SEC.1	HOLE SIZE	0.22502027		(FT.)	49.5
								2		ulte	_	396'					-,41-21
-	40 1		-		***		SING L	0	DIA./		_		rge Mart	inez			
	NA BUT		****			WATE PESSU TEST	RE			*07						NOT	
AND DIAM	LENGTH COM!			2 0		****	*****	BLEVATIO		SEAPHIC LOS	1484	DESCRI	PTION AND CL	ASSIPICATION		CHA DRI	MACTER OF
Н	18								5 · 10 · 15 · 20 · 25 · 30 · 35 · 40 · 45 · 50	6000	3 17 A	& small -13' Sili with blu loose to 3-20* Sill loose. 0-30' Sill medium is scattere cobbles clay ler 30-41.5' gray, 1e density 41.5-44' ately so 44-49.5' diamict	cobbles ty Clay: de-gray medium Ity Clay Ity Sand to poor sed grave with fin nses. Silty S. cose to in Till: on, medi	brown, lenses, density. blue-g blue-g blue-g sorting, ls and sm ne silty and: blue medium gray, mod oose.	ray, iray iall ie-	hollo auger an 8 hole. Grave cobbl 30'-r moder extre subst jumpi stand Till hard, chatt loud subst	els & es @ 20' rig chatt to eme with antial ing on er very with antial ing on
	••••	PLIT	POON		- 9#8	LBY TU	••:	DITE	KE C	1	Ш						AG 17



GEOLOGIC	DRILL		agit Nuc	lear Power F	Project 1036	3 1 00	1 LCAG 18
LAKE CAVANAUGH		T33N	R6E		S.E. 7/4	90°	
0/24/78 10/24/7		Testina	Decree of the control		8"	PT.] #0C# [PT.]	49.5
ORE RECOVERY (** 7%)						BEPTH/81. 7	07 07 NOCK
	ALL CASING	0	A./LEMOTH	896'			
140 LBS/SPT		0		Jorg	e Martinez		
PARTOLNE SECONS SELECTION OF SE	WATER PRESSURE TESTS	ELEVATION		DESCRIPTIO	N AND CLASSIFICATION		MOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF BRILLING, EYC.
H SS 8 18 18 18 18 18 18			5	gravel & co 2.5-4' Sand: moderately 4-14.5' Silty loose, with sand and fi 14.5-45' Silt well-sorted fine sand thick, thir clay, and a at 20'-21.5	gray, loose, sorted. Clay: blue-on very thin some sand lenses ty Sand: blue-on, with interbed lenses 1.5'-2 on lenses of sing gravel horizon.	gray, Grailty hors. 14 med charged cha	rizons at ' & 20-22', dium to arse, rig
88 * SPLIT SPOOK; ST .	-	arra					E HO.
0 - BECHISON; P - PIT		LAK	E CAVANA	AUGH ROAD		L	CAG 18



-	E O	LO	G	IC	DI	RIL	L	LO	G	Skag	70.0	Nu	clear 1	Power	Projec	10	363	1 .	- 1	LCAG 19
L	AKE	CAV	AN	AUGH	H RC	AD			T33N	RE	5E	S	EC17	S.E.				90°		
**	7.1							_					A AND MOS		811	OVERSUR	B & N (PT.)	moc # (m.)	49.5'
4	24/	811 (1/2	4/78	Pa	C11	10	Tes	ting L	abs	no		8" Aug		/8L. ***			****/*	L. TOP 0	
				10 HT/F		-		2	IN HOLE	A14 (1			896'							
	140								0						e Mart	inez				
	CORE NUM			NT CORE	•	WATE RESS! TEST			LEVATION	***	*****	3740		8 SCRIPTI	ION AND CI	ASSIPICAT	10%		WAT	. ON: . LEVELS.
AND DIAMET			SAMPLE		91		*****			:									-	LING, BYC.
Н										10-			grav 2.5-17 loos lens 17-28 well	els 8 ' Sil e, wi es. Silt sort	ty Cla th sil y Sand ed, wi 5' and	es. y: bl ty san : blu th sil	ue-grad	ray h	in 8" ole.	l zone @ ig noise ately with
SS	18	18	2-7	7-73						20	000	A	medi sand	um gr s, mi	avels nor cl	in sil ay.	ty	j	tand	ng on
4	*									30- 35- 40-	8 6 6		well	-sort	ty Sand ed, To nsity.	ose to	e-gr	i s	hatte oud i ubst	antial ng on
22	18	18	7-	17-	23					45		THE PERSON IN			11: b			у.		
										50		2	- Bot	tom c	of Hole	@ 49.	5' -			
	****	PLIT :	POOI	*: #*	- sme	LOY 7:			LAK	E CA	AVAN	AL	GH ROA	D					LCAG	19



MACF 19-1

LAKE	E (AV	ANA	UGH	RO/	AD		1.00	33N		E S	EC.17	S.	E. 1/4	4		90	0	
0/2/	4/7				0 D		i	Torti	na l	4		/OU A		8		*******	(PT.) =0	CR (PT.)	44.5
0/2		-								-		/8" Au	W	TH/81. 00	_		000	TH/ 84. TOP	
	4						4	1				8961			P. 1.1				
14			5/5		ALL	CA	\$1W6	LEFT IM	Hore	DIA./L		Lee	lorg	e Mari	tinez				
5	3					WATE		\top					0019	ic riar	CINCL			1	
		8 A O C				TEST	-				100	:		PYION AND				NO.	TER LEVELS.
4 4 0 0 0 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	LENGTH C					*****	**			48.0		1						CH.	TER RETURN, ARACTER OF ILLING, ETC.
H SS T H SS T H	8	18	2-	7-1	24					10- 15- 20- 25- 30- 40- 45- 50-		2.5-1 10 16 15-24 we be c1 15-24 so me 1e 34.5- C 1e 34.5- C 1e 34.5- di	avel 5' Si ose, nses ' Sil 11-so dium dded ay5' S rted, ay, 1 nses nd. 44.5' amict	with of sill ty Sar rted, grave fine s	nall lay: very lty s nd: with lensand gray uty, w lty c vity ry fi bl nediu	blue- thin and. blue- small ses, it and si , well nsity, ith th lay. y: bl thin ne sil ue-gra m dens	gray to nter lty in ue- ty	hollo auger ,an 8" Grave rig c loud minor on st Thin horiz minor hatt Till rig c extre subst jumps stand	gravel on @ 34. or rig er. @ 43.5' hatter me w/ antial ng on
		.17 81	-0011			. TUI	:	arre .	LAK	E CA	VAIN	AUGH RO	AD					HOLE NO	G 20



-	OL	0	GIC	D	RIL	L		5		it !	Vuc	lear Power	Projec	The second secon	1	ar 1	LCAG 21
LAKE	CA	VA	NAUGH	RO	AD		C 0 0 R	T33	ν.	R6E		SEC.17	S.E.	1/4	90	0	. EARING
0/24			1241			ic T	netic	0.1	- 1			B" Auger	8"		PT.) **OC*	(=7.)	45.5
0/24				E 0	ac11	1 C 1	62 C1U	70,00	EAS	,		HO EL DEFTH	/EL. ****			/ EL. TOP 0	
			W C 16 HT		1.		9					896'					
			S/SP					0					e Marti	nez		and se	
W W			: ::.		RESS	JRE					П			Tile:			
1 0 V	000	*02	PRECENT CON		TEST			T10H	ŀ	20	87.6	DESCRIPT		ASSIFICATION		WAY	
			1	9 5					ě	1	1						LLING, BYC.
H :	3 1	0		-	1	+-	-	-		1	1	-2.5' Road	hade h	cown sa	nd	"H" -	3-3/8"
	8 1	8	8-6-8							1	A	gravei &			,	h0110	w stem
Н									5.	- 11.	1	.5-6.5' Si	1+v Sar	nd: hlue-	arav		drillfr
	8 1	8	2-2-5							1///	B	well-sorte	ed, 100	se, with		Land .	
Н				1					10-	1///	11	interbeddiclay.	ing len	ses of si	ity		gravel ons @ 13
SS 18	8 1	8	4-2-3							10000	过	.5-21.5' 5				minor	rig
Н	T								15-	1///		with thir fine silt				chatt	er.
SS 18	8 1	8	1-2-2			1	1		00	}///E	包	.5-31.5' \$			10-		gravel on @ 28
Н									20	////	11	gray, well	-sorte	d, loose,		minor	rig
55 18	8 1	8	2-3-5			1			0.5	1	E	with inter			edium	chatt	er.
Н									25	111					. U		@ 44'-
SS 18	8 1	8	2-4-5						30	- 112	F	.5-38.5' sorted, me			1-		hatter loud wit
Н	1								30	-						subst	antial
\$5 18	8 1	8	2-7-1	1					35		G	gray, well	-sorte	d, loose,		stand	ng on
Н											Ц	with very fine sand		enses of			
-	8 1	8	2-4-9						40	311	出	Time Sana					
Н	1				-					11:	1	4-45.5' I	ill: t	lue-gray			
55 18	8 1	8	6-21-	30					45	1/2/	ZΙ	diamicton	, dense				
					1					1							
					1			H	50	H	1						
						-	17			=						1	
				-						=							
	1			138				i		1	1	Bottom of	Hole	@ 45.5' -			
										-							
	1								Τ,	=							
										=							
										1							
** -	5PL	7 0	-00H; 81	- 946	LOY 71	***	erre L	AKE	CA	VANA	AUG	H ROAD				HOLE HO	21
HACFI																LCAG	- 21



LA	KE	CAV	ANAUGH	ROA	D	-	C00 #81N		3N	R	SEC. 17 S.E. 1/4	••
0/	25/	781	0/25/7	8 Pa	cif	ic Te	sting			-	MODEL MOLE SIZE OVERSUNDEN PT.) SOCK (PT.) TOTS:	4.5
			(PT/4)				# 1 EL 101			4200		
				ALL	EA	9	FT IN HOLE	DIA./			LOGGED BY	
	140	LB	S/SPT		VATE		()	-	_	Jorge Martinez	_
			100	PR	ESSU	ME			07		MOTES ON WATER LE	
	** **		PERCENT CO		****	*****	BLEVATIO	1	-	848/71	DESCRIPTION AND CLASSIFICATION WATER RECHARACTED BRILLING.	# OF
4 8 8 8		3 400	: 15.	3	1				:			
1				-					-	0	2.5 Roadbed brown, sand, "H" = 3-3	
1	18	18	3-5-5				17.5	5.	94,9	A	gravel & small cobbles. hollow st	
	3.0	3.0	2 0 0	4.			1		3///	2	5-24 Silty Clay: blue-gray, an 8" ho loose, interbedded with fine	le.
	18	18	1-2-3	H			7	10	1///	2	silty sand and thin fine to Thin, sma	
SS	18	18	1-1-3			15	15		1//	40	medium sand lenses. gravel zo	
4	10	10	, , , ,				1	15	3///	2	-36.5 Silty Sand: Well chatter.	
	18	18	2-4-7				14		1///	TO	sorted, loose, with thin lenses of fine sand. Thin grav	
1				156				20	₹///	1 3	.5-39 Sand: gray, well & 34'-min	
55	18	18	2-5-7						77	TE TE	sorted, loose.	
1			T.P.					25	111	\prod_3	-41.5 Silty Sand: blue- Till @ 43	.5'-
55	18	18	4-5-7					20	-	E	gray, well sorted, loose. very loud chatter w	
Н								30	311	4	.5-43.5 Sand: gray, moder- substanti	al
	18	18	2-6-7					35	-	G	ately sorted, medium jumping of density.	n
Н								00	41	┨,		
55	18	18	3-6-8					40	-31	1	diamicton, dense.	
H	10	10	15 75	24					7			
22	18	18	16-35	34				45	-	ET		
									1			
							248		=		- Bottom of Hole @ 44.5' -	
									3		- BOCCOM OF HOTE @ 44.5 -	
				14.	13		1		=			
			120						=			
									E			
			1						1			
									3			
		Phir	POON; ST	- 245		••:	e/78		1	Ш	HOLE NO.	
			ON; P - P				CHI.	LAKE	CA	VAN	JGH ROAD LCAG 22	ar u



H&CF 19-1

G	EO	LO	GI	C	DR	ILI				it Nu	clear Power	Project		1 00		AG 23
L	AKE	CAN	ANA	AUGH	H RO	AD			33N	R6E	SEC.17	S.E.		900	108/1. BEAR	
		-									KE AND MODEL	8"	0v2800808%[P	7.) ROCK (F		.51
			0/25		Pa	cifi	C T	estin	g Labs	3-3	/3" Auger	1/EL		08PTH/8L	. 100 OF NO	
								9			895'					
			5/5/		ALL	CA		# T IN M	0	E 78 TH	Jorg	e Marti	nez			
::	5 5	:	:	:		VATE		T							Table 1	
***********						*			**************************************	10 10	DESCRIPT	TION AND CL	ASSIFICATION		WATER D	EVELS.
	LENGTH CONT			RECENT	9 2			2		4					DRIFFING	
**	1	100	,		•	1		i		1.						
Н										1777	0-2.5' Road gravel &				H'' = 3-	
SS	18	18	2-3	3-5					5.	\$///A	gravei a	Silia I I	coppres.	0.00	uger dr	
Н	4	113								\$///_	2.5-17.5	Silty C	lay: blu	e- 8'	" dry h	ole.
SS	18	18	1-7	2-3					10-	\$///B	gray, lo		silty san	d and Gr	ravel 1	ens @
Н							H			1///	very fine			39	9', min	or ri
22	18	18	1-	1-3					15	3///E	17.5-31.5	Silty Sa	and: blu		hatter.	
Н										1//	gray, we	11-sorte	ed, loose	, T	ill @ 4	
55	18	18	2-	2-3					20	3	with this				hatter oud wit	
Н								1	-	43 11					tantial	
22	18	18	1-	5-4					25	3116	31.5-41.5' gray, loc	Silty	Clay: bl	ue- ju	umping tands.	on
Н									25		0 0		e of unit		canus.	
55	18	18	3-	5-2		1			30	排						
Н								1	30							
SS	18	18	1-	3-3					35	1///13						
Н									35	3///						
55	18	18	1-	3-7				1. 1		- Last						
Н									40	377/A	41.5-43' S	and: g	ray, moder	ately		
	18	18	2-	25-	40					**	sorted,	loose.				
			1					1	45	1	43-44.5' <u>T</u>					
							-			3	diamict					
							1			1	- Bottom o	T Hole	@ 44.5' -			
						10	1			3	THE STATE OF					
						١.	1	10.4		-						
										3						
										=						
				100				1		1						
										-						
		-								1						
	** - :	PLIT	. POON	: 87		TUI		DITE.	1 445	CAVA	NUON DOLD				DLE 80.	
			ON; F		-		****		LAKE	CAVAN	AUGH ROAD				LCAG 2	3



	01	. 0	GI	C	DR	IIL	L	LOG		-	Nu	clear Power	Projec) or]	LCAG 24
LAKE	C	AV	ANAL	JGH	ROA	D		T3	3N	R	6E	SEC.17	,	S.E.1/4	900	
ROUN		co		*0	-	**	_						HOLE SIZE	OVERBURDEN (PT.)	* * CH (FY.)	TOTAL BEPTH
/25/					Pac	111	CIC	esting	Labs	3	3/	8" Auger	8"	WATER	DEPTH/ EL. TO!	44.5
								9				892'				
3.40					ALL	ca	-	LEFT IN H		L # # 6 T	н	LOGGED SY:	Manti			
140	51:	82	/SP1		-	VATE	R	1 0		_	Т	Jorge	Marti	nez		
AND DIAMETER	LENGTH CORE &	CORR RECOVER		BRCOVERV		ESSU TEST!	0.00	S ELEVA	TION I	SHAPHIC LOS	BAMBER	DESCRIPTI	ON AND CLA	SEIPICATION		THE ON! ATER LEVELS, ATER SETURN, IARACTER OF HILLIME, ETC.
н	T									=	Ī	0-2.5' Road	bed: t	rown, san		3-3/8"
5 18	T	8	2-2-	-5					5	¥///	A	gravel &	cobble	S.		w stem
Н		1							"	3///E	1	2.5-24' Sil	ty Clay	: blue-g		
S 18	1	8	1-2-	- 3					10	109.4	B	loose, wi	th thi	n lenses o	f	
Н									10	3///		tians gra	y sand	, also con sand @ 18	5'27'-	elly zone
S 18	ì	8	1-1-	-3						1///	E	and fine	sand @	21.5".	rig (chatter.
н									15	7///	1	24-29.5' Si	1+v Sar	d: blue		little or umping.
5 18	1	8	1-2-	-2						1///	4			ed, loose.		mp mg.
Н	T								20	1///	1	20 5 26 21				@ 42'
5 18	1	Q	11.	R						1//	1	29.5-36.3' sorted, 1		gray, well-		ter very
H	+	0		-					25	-11	-	30. 300,			subst	tantial
	-	0	1 0		-					0	_	36.3-39' Si	lty Cla	y: blue-	jump	ing on
S 18	+	8	1-3-	-6					30	- 1015		gray, 100	se.		Scan	us.
Н										-		39-42' Silt	y Sand:	blue-gr	ay	
S 18	1	8	2-7-	-9					35	10.00	G	loose, we		ted, with		
Н	1								35	1///						
S 18	1	8	1-1-	- 5					40	144	41	42-44.5' Ti				
Н									40	111		u raiii re cor	, ver	y delise.		
5 18	1	8	7-10	00						- 905h	I					
T	T			7						-	T					
										3						
								No.		3		- Bottom of	f Hole	@ 44.5' -		
										=						
										=						
										3						
			£							=						
	-									7	-					
										3						
										1	-					
	1									=						
0 - 0						0 . 0		L/	KE CA	VANA	UC	SH ROAD			LCAG	
ACF 19	9-1	-		-			-			-	-				LONG	



H&CF 19-1

GEOLOGIC	DRILL	106	PROJECT	+ N/-	iclass Bours	Droin	700 HO.		EET NO.	LCAC 25		
T &		COORD	-		uclear Power					LCAG 25		
LAKE CAVANAU		T3.			SEC. 17	S.E. 1	/4	90		TOTAL BEPTH		
0/26/7810/26/	3-3	/8" Auger	8"				39.5'					
ONE RECOVERY (FT.)*)	CORE BOXES	8	P OF CASING		3881	EL	-	DEPT	H/EL, TOP (PROCH		
			E: DIA./LEN	-	LOSGED BY:							
L40 LBS/SPT	WATER	-	0	_	Jorge	Marti	nez					
SECOLUSION MECOLUSION SECOLUSION	PRESSURE	ELEVATE	ON I		DESCRIPTION	MOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.						
\$15 \$10		+	++	-	0-2.5' Roa	dhad:	hyoun	cand	""" -	3-3/8"		
SS 18 18 4-8-1	2			A A				Sand	hollo	w stem		
H 1	5-2/2 2.5-4' Silty Sand: brown,									auger drilling 8" dry hole.		
SS 18 18 2-2-3			1/	/AB	moderate							
			10 7		density.				Small	gravel		
SS 18 18 3-4-5			1. 3		4-12' Silt				, 15' -	minor		
			15 -	-	loose, w				w/lit	er in ri tle		
S 18 18 2-5-6			3/		silty sa	nd sca			jumpi			
4			20 1/2	14	througho	ut.			Small	gravel		
SS 18 18 3-7-1	2		1 3	E	12-16.5' S				at 32	' - rig		
H			25		sorted, thin sil				chatt	er, e rig		
SS 18 18 2-4-6			3	E	sand.				jumpi			
н			30 =	2	16.5-21.5'	Silty	Clay:	blue	Till	@ 37' -		
SS 18 18 2-4-7			70	of G	gray, lo thin len	ose, w	ith ver	4	hard	surface,		
н			35 -	20	silt'.	562 01	Claye,	,	rig j subst	antially		
SS 18 18 8-10-	30		2	/AH	21.5-26.5	Cand:	anav	wo11	very	loud		
			40 =		sorted,				- chatt	er.		
			1 4		with thi sand and			ilty				
			1 3		Salla alla	SIILY	ciay.					
					26.5-34.5' gray, we							
			1111		34.5-37' <u>S</u> sorted,			e11				
					37-39.5' I diamicto							
					- Bottom o	f Hole	@ 39.5					
56 - SPLIT SPOON; 51			LAKE	CAV	ANAUGH ROAD				LCAG			



GI	E O	LO	GIC	D	RIL	L	L	0 G	Ska		N	uclear Power	Proje	ct 10:	200) or]	LCAG 26
***		-	VANAUG					COORDIN		R6	-		S.E.		-	0	BEARING
80 W	Nr.	ce	MP. ETEO	DAI						-		RE AND MODEL		01889180			TOTAL DEPTH
-	and in the		1/26/78	-				sting		_	-	B" Auger	8"			TH/ EL. TOP	44.5'
			1-1341			***	9	12 101			-	891'				10,00.	
			* WEIGHT/			A 819		T IN HOLE	DIA./4		91	LOSSED BY:	at the	July 1			
-	8.5	FR:	S/SPT	_	WAT	ER			0	_	_	Jorge	Marti	nez		_	
			N	'	PRESSURE					*07					NOT	HOTES ON:	
AND DIAMETE	# P CO			:.			. 1	BLEVATIO	"	SRAPHIC LO	14 m F.	DESCRIPTION AND CLASSIFICATION		CHA	RACTER OF		
1 2		CONB	1 1	9 =		1	MINCT			1	ľ						
н		•			+	$^{+}$				-	†	0-2.5' Roa	dhed:	hrown	sand		3-3/8"
	18	18	1-2-3							1999	A	gravel &			, suite	1110110	w stem drillin
н									5 -	1//	1	2 5 2 5 1 5	11+4 0	and.	1110-		y hole.
55	18	18	1-2-2			1				1//	TE	2.5-3.5' S gray, we					gravels
									10-	1//	1						-36.5' -
H SS	10	10	1-3-4							1///	1	3.5-16.5' gray, lo					ade slig er with
	10	10	1-3-4						15-	1///	广	layers o	ffine	to ver	y fin	e littl	e jump-
H	10	3.0	2 4 5							10	6	sand and	silty	sand.		ing o	n stand.
22	18	18	2-4-5				-		20-		-	16.5-36.5'	Silty	Sand:	blue	- Till	@ 40' -
Н										File	0	gray, we				rig j	umped on
SS	18	18	3-6-4						25	0	E	contains silty cla		ienses	ОТ	100	antially
H						1					0						d chatte
SS	18	18	2-6-8						30-		E	36.5-40' S					
н									30	0	4	contains	lens	of silt			
SS	18	18	3-5-8			1			35-		G	clay 38.5	-39.5	5'.			
н									35	Yo.							
SS	18	18	3-5-9						40	7//	T	40 44 EL T					
Н					1	1			40-	1/4	2	40-44.5' Todamictor					
SS	18	18	9-24-2	6		1	- 1				I	d i alli i C coi	i, meu	rum der	is ity.		
						1			45		T						
					to	ľ				3		- Bottom o	f Hole	@ 44.5	5' -		
						1				1	l						
			in., 1						1								
										-							
			25								1						
										-							
										1							
										-							
						1				1							
100		LIT .	POON: 81				-	**									