BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

ANNEX C

HAT CREEK PROJECT WATER SUPPLY AND ASH RETENTION DAMS SITE INVESTIGATION DATA

by

KLOHN LEONOFF CONSULTANTS LTD

Our File: VA 2321

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,

March 1978

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APPENDIX VII Graphic Drill Hole and Test Pit Logs Plate Nos. C1 to C16

1

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LEGEND AND ABBREVIATIONS

ON DRILL HOLE AND TEST PIT LOGS

Penetration Resistance for 5t in. dia. Becker Drill	SYMBOL	DESCRIPTION	UNIT
HW Heavy Walled Shelby Tube Sample, driven C Drill Cuttings from air or water return Standard Penetration Resistance (N Value) -140 lb. Hammer, 30 in. drop Penetration Resistance for 34 in. dia. Becker Drill blows/30 on C Netural Water Content Plastic and Liquid Limits percent 3/4 in. dla. PVC standpipe Sand-cement grout Pea gravel Sand & Gravel III Sand & Gravel Sand & Gravel Silt Clay Silt Sand & Gravel Silt Silt Clay Silt		Split Spoon Sample (SPT) driven	
C Drill Cuttings from air or water return. Standard Penetration Resistance (N Value) biows/30 cm - 140 ib. Hammer, 30 in. drop Penetration Resistance for 54 in. dia. Becker Drill c Natural Water Content Plastic and Liquid Limits percent 3/4 in. dia. PVC standpipe Sand-coment grout Sand-coment grout Pea gravel Bentonite clay seal Hif Silice Sand If in. dia. slotted PVC pipe It in. dia. slotted PVC pipe X Water level in standpipe at date shown K Location of failing heed permeability test) Sand & Gravel Silit Sand & Gravel Silit Sand & Gravel Silit Silit Silit Silit Clay Silit Silit Silit Silit Silit Clay Silit Silit Silit Silit <			
Standard Penetration Resistence (N Value) - 140 lb. Hammer, 30 lb. drop blows/30 cm Penetration Resistence for 54 in. dia. Becker Drill casing driven open ended with 8000 ft-1b delsel hammer blows/30 cm • Netural Water Content Plastic and Liquid Limits percent • Netural Water Content Plastic and Liquid Limits percent • Stand-coment grout percent • Stand-coment grout percent • Bentonite clay seal fi6 Silice Sand • Hi n. dia. slotted PVC pipe vert • Water level in standpipe at date shown Location of falling head permeability test • Location of pressure (packer permeability test) sand & Gravei • Silit Cley • Silit cley • Bedrock bdrk bdrk Bedrock boulder(s) • Cley true • Cley true • Stand & Gravei sand & Gravei • Subder(s) cley • Cley true • Sand & Gravei sand & Gravei <tr< td=""><td></td><td></td><td></td></tr<>			
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3III (3 / 3 / 3 / 3 / 3 / 3 / 3 / 3 / 3 / 3			1
wx Weathered bedrock			

Г								g Identification						
	Ha.je	er Nylsi	Lense	Group Symbols	Typical Rame	(Statuting p	dentification Pro articles larger t restions on estim	ben 3 inches	Information Inquired for Describing Soils				Laboratory Classification Criteria	
1	1		1	3	4		5		6				7	
	ļ	1	1	~	Dell-gradut gravels, gravel-and mixtures, little or no fine.	Wide range in g emparts of al	rais since and su l intermediate pa	estential- rticle sizes,	For updisturned soils add information on stratification, degree of compart-		į8.,	Y	$C_{ij} = \frac{D_{60}}{D_{10}}$ Greater that 6	
İ	,		(1111) (1111)	a7	Foorly-graded gravale, gravel-send mixtures, little or no fines.	Productmently of ecus intermed	on sine or a reap inte sines minoin	e of eigee with 6.	name, commutation, molature conditions and drainage characteristics.		n etter and the local		$G_{0} = \frac{(D_{30})^{-1}}{D_{10} \times D_{60}}$ introduce on a	al) Lirenants for QV
		l i	1,1,1	a 4	Silty gravels, gravel-send-silt mixtures.		or fines with bontion procedures		- Give typical name; indicate aggrentinate		od from grain-eise tion sealler then classified as fol		Attaiturg limits below "A" line or FI less than "	Above "A" line with Fi between b and T are <u>boydarling</u> enses
	411 -		f fr	ec	Clayey growals, growal-sund-clay externo.	Figstic fines (ass CL inlow)	for identificatio	n prozedures	phromphages of annat and gravel, mux. eise; engularity, surface condition, and bardwase of the coarse graine; lossil or graving to man and other	ettm.		00, 03, 100, 03, 100, 00, 00, 00, 00, 00, 00, 00, 00, 00,	Attervery limits index "A" lime with Fi greater than 7	requiring use of deal symbols.
					Whilegradue sames, growally evalue, little or an fines.		rais sian and and mists particle s		pertinent descriptive information; and symbol in parentheses.	14milti	af final of final start of		$C_{ij} = \frac{h_{60}}{h_{10}}$ Greater than b	
	dial and		1 <u>5</u> 1	17	Fnorly-graded sends, gravelly sends, little or no flows,	Freiominently of with some into	ne sise or a range ermediate sises m	e of sises iseing.	Tromple:	1 U 1	atterner Arrende Contracter	× P	$C_{0} = \frac{(D_{33})^{4}}{D_{10} \times D_{60}}$ Solvean one as Not meeting all gradation requ	
			111	-	Silty mands, same-silt mixtures.	Homplastic fina (for identifi	e or fince with L obtion procedures	ow plasticity nes HL below).	<u>Bilty peed</u> , gravely: blout 20% hard, mentage gravel pertiches 1/2-in. waines size; reached and entemplar eased grains course to fine; should 30% somplastic fines with haw dry strength;			1933 113	Atterning lights below "A" line of FI loss that t	Limits plotting in baished some with FI between 5 and 7
1			1493	BC	Clayey sands, sand-elay sixtures.	Plastic fines (any CL below)	for immtifientio	n procedures	well compacted and moist in place; al- lovial mind; (B4).			₩ĒĒ.	Attorney lights shows "A" line with 72 granter time 7	are parterling uses requiring use of sail symbols.
	1					on Fraction : Dry Strength	Dilatency	O Sinve Size Toughness		5				
1	3					(Crushing characteristics)	(Reaction to shaking)	(Consistency near FL)		Į.				
	Į	1	SR ST ST	¥.	Increments alls and vary fine sames, rock flowr, ulity or eleger fine mands or clayer pilts with elight planticity.	Name to slight	Quink to slaw	Rate	Give typical news, indicate degree and character of plasticity, encent and maximum size of course grains, color in wer conditions, oder if muy, lowal or	Ĩ	60 50	Translation	g feile at Bass. Ligstd Limit ee und Dry Manughh Zaerman Invreasing Floringth Zaerman	
H	8	Line	33 1	et.	Theregenic slays of low to moliton plasticity, gravely slays, namely ulays, sikty clays, lamm clays,	Hedium to high	jiamo ta very slav	Heitian	sologic news, and other particult descriptive information; and symbol in parantheses.		24 B			
	ā.			œ	Organic silts and organic silty clays of low plasticity.	Slight to modium	8 low	Slight	For undisturbed soils edi information	In-start	19 19 19			
		ł	Я 1	•	Independs silte, missecos or distancesous fine anody or silty soils, elastic silts.	Slight to motion	Slow to none	Slight to modium	on structure, structification, com- sistency is undisturbed and re- noladi states, mointure and drain- men conditions.	1	N MART			
ľ		1	# 1	æ	Incommis alors of high plasticity, fit alors.	Eigh to very high	Bine	Xigh	-		ور ۲ 4			
Li		4		•	Organic slave of medium to high planticity, organic silis,	Holium to high	Hone to very slow	Blight to goldine	Emergin: <u>Clever silt</u> , brown, slightly plastin, small persontage of fine seni,		°		20 30 40 50 60	70 80 90 100
	Habby	y Organia	- Soile	•	Past and other highly organic soils.	Readily identific frequently by 1	ed by color, odor, fibrous beathure,	, spongy feel and	numprous westion! root boles, firm and dry in place, loss, (ML).			:	FARMOUT CHART	grainet soils
	(1)	Jend i	er elemític	time: R	ils presenting elementaristics of two groups ar	· designated by o	antinations of gr	oup symbols. For	amaple 06-00, will-graded gravel-sund mixt	480 V	th elay	Mader. (2) All sinve since on this chart are	Q. B. etembert.

FIRED INSTITUTION PROCESSING FOR FIRE-GALAND SOLA OF FIRE-GALAND SOLAS OF FRANCHING as pressinger are to be performed on the minum in. To size six particles, aggregimently 1/6 in. For field electification purph as pressinger are to be performed at the minum in the best be attracted at the best with the determinant of the

Cheeting (Reeting to staking)

- we resurring particles larger than So. to stars giving an a pat manufa well with a whene of stars con-half weigh last. Add manufa to be post in the open pain of one hand and when between 197, withing velocity equations the other hand several these. A positive selection section of the approximate of their on the starthour of the path within sections of the approximate of their one that sametons of the path selects sections of the setting sections of their one of the path
- angle is squared interven the fingure, the water and gives disappear from the corflass, the pair rightness and finally it excise or coupling the coupling of appearance of varies during shally it of its sizeparameters for any appearance of the intering shall be exerciser of the
- Ney first claim same give the actionst and much distinct reaction whereas a plastic clay his no reaction. Darganic silts, such as a typical real

Dry Firmgth (Crushing characteristics

- Arter reserving particless langur than Bo. No stowe site, and a pain of well to be remained on putty, adding eather if messawary. Allow the pat to fary completely by own, sut, commiling theorem has fragment, Thirdrey by the land makes of the character and quantity of the colloidal fraction combined the soil. The dry strongch increases with increasing plasticity. Migh dry strongch is characteristic for clays of the CR groups
- A system increase an estillar processor only one sight dry strength. Silly fine makes and sills have about the new slight dry strength, but can be distinguished by the feel when postering the dried speciess. Fine each feels gritty whereas a trained will be at he manuch fool of finer.

Conditions (Consistency near plastic limit)

- Ther reserving particles larger has the No. No stere size, a specime of sell shant men-tail into one is die; is mailed to the considerant of puty, I too fry, when must be added and if with, the effective denoid be special one in a bin layer and allowed to late some between the puts into a thread how conciderable laid. A share the allowed is been folded and recalled repeatedly. During this manipulation the mainter, The Market is then folded and recalled repeatedly. During this manipulation the mainter economy is gradually related and the specime strings, finally done is by hardward in them to lists to receased.
- he longing the thread more the plantic limit and the effort the long when it finally evenbles, the more potent is to use collociant ling furnition is the scale. Nonlinewood the thread of the plantic limit and quick loss of othermose of the long below the plantic limit indicase either incompute elege of the planticity, or materials work as headin-type stage and arguing elege which sever below the A-lima, (jub) compute elege to be a stage work and peopy field the the plantic limit.

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apiel by Deepe of Regimeers and Research of Reclamation, Jennery 1952

Ref: Corps of Engineers, U.S. Army, Technical Memorandum No. 3 - 357

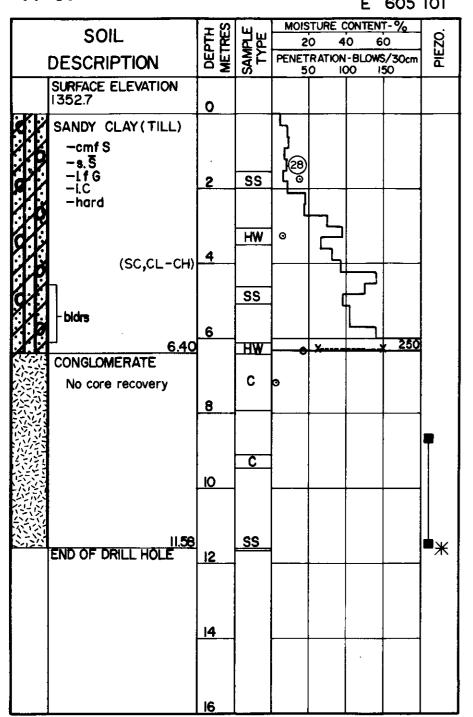
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	Written	Symbol	Written	Symbol		As Written	Symbol	
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Component	SILT	5			50 or more	coarse medium to fine	cnnf	but the medium com-
	CLAY	С						ponent predominates
						coarse to medium	сл	less than 10≸ fine
	Gravel	G	and	а.	35 to 50			
Minor	Sand	S	some	s.	20 to 35	medium to fine	mf	less than 10\$ coarse
Componen†	STIT	5	little	۱.	10 to 20			
	СГау	с	trace	t.	1 to 10	medium.	m	less than 10% coarse and fine
						fine	f	iess than 10\$ coarse and medium

modified from Burmister, D.M. (1964) "Suggested Methods of Test for Identification of Soils", ASTM Procedures for Testing Soils, 4th Ed.



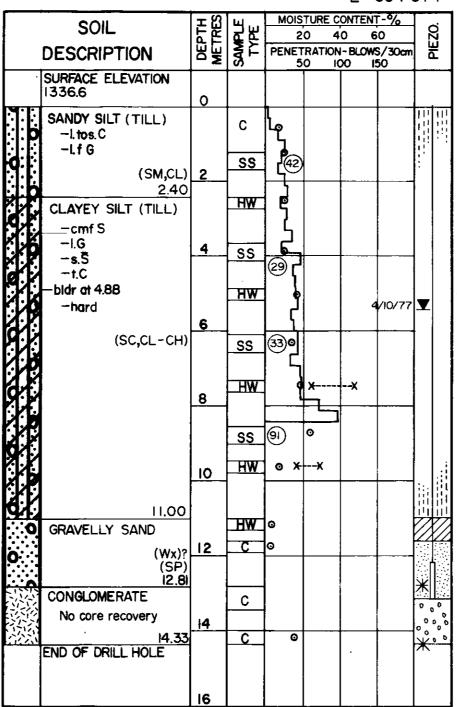
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N 5626 362 E 605 101





N 5626 275 E 604 974





SOIL

DESCRIPTION

1341.1

FILL

SURFACE ELEVATION

SANDY CLAY (TILL)

-cmf S

-s.\$

−l,f C

-hard

SILTY SAND (Wx) -I.fG (SM)

CONGLOMERATE

No core recovery

END OF DRILL HOLE

-1. C

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N 5626 198 E 604 900

DEPTH METRES SAMPLE TYPE

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(SM,CL-CH)

(SM) 6.10

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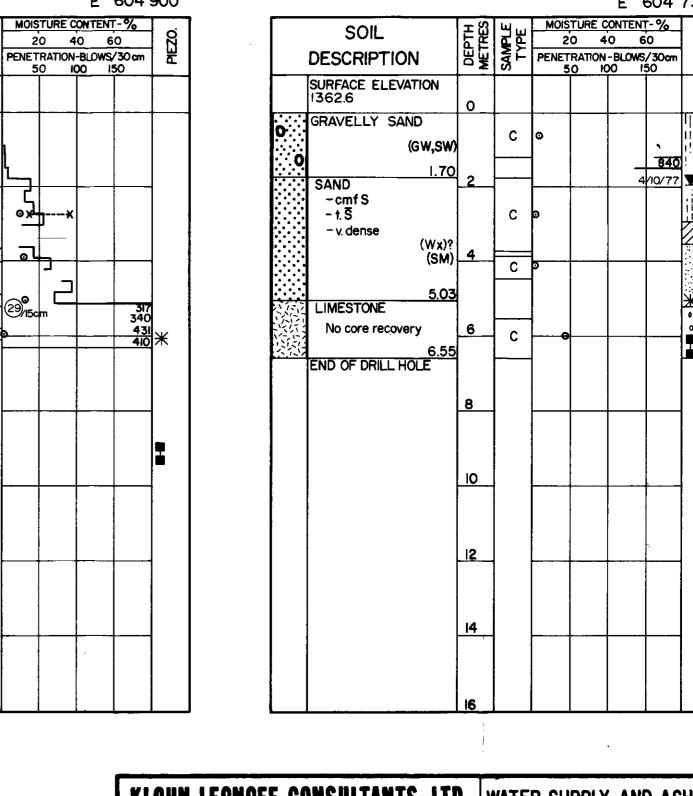
<u>SS</u> 29/15cm

P77-34

N 5626 057 E 604 737

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KLOHN LEONOFF CONSULTANTS LTD. PERCUSSION DRILL HOLES

APPROVED Harmen

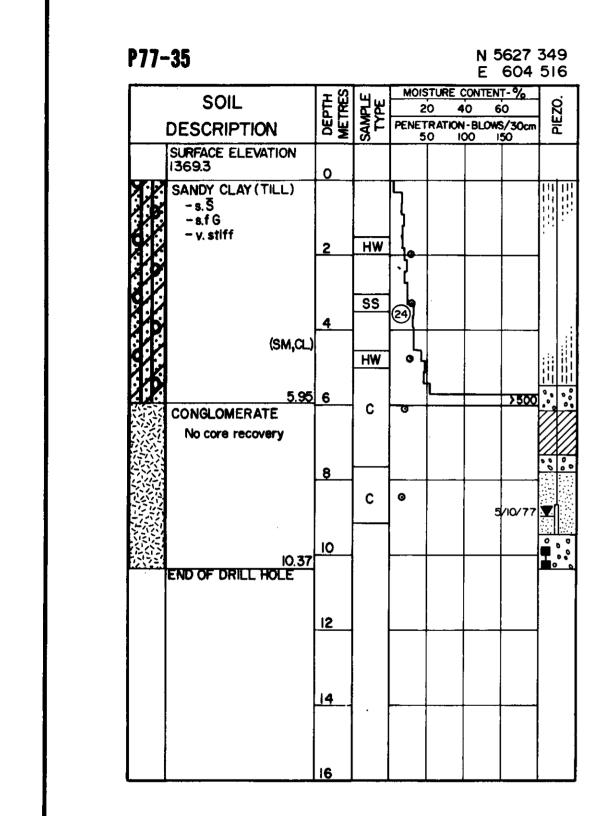
B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

WATER SUPPLY AND ASH RETENTION DAMS

P77-31 to P77-34

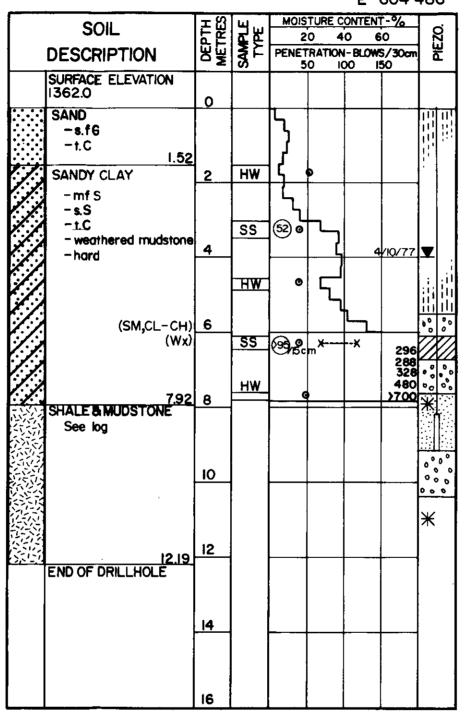
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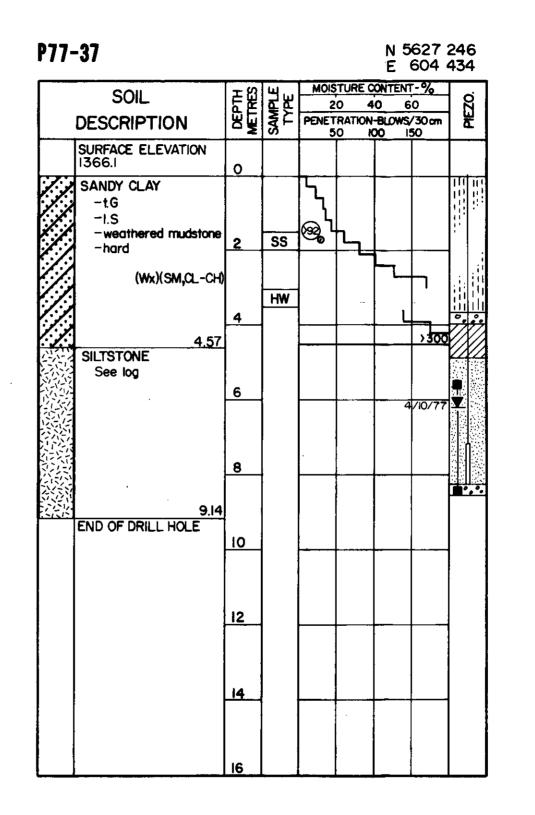
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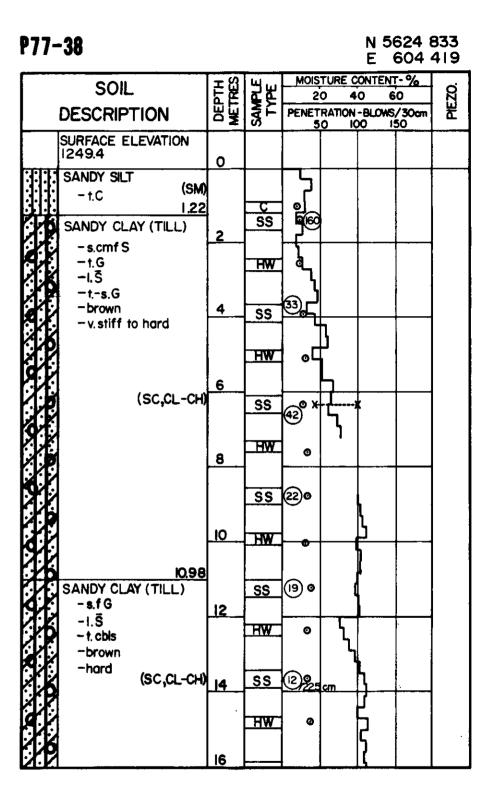


P77-36

N 5627 301 E 604 486







KLOHN LEONOFF CONSULTANTS LTD.WATER SUPPLY AND ASH RETENTION DAMSB.C. INTORO AND POWER AUTHORITY
HAT CREEK PROJECTPERCUSSION DRILL HOLES
P77-35 to P77-38APPROVED
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HUSTIMENPROJECT NO.
VA 2321

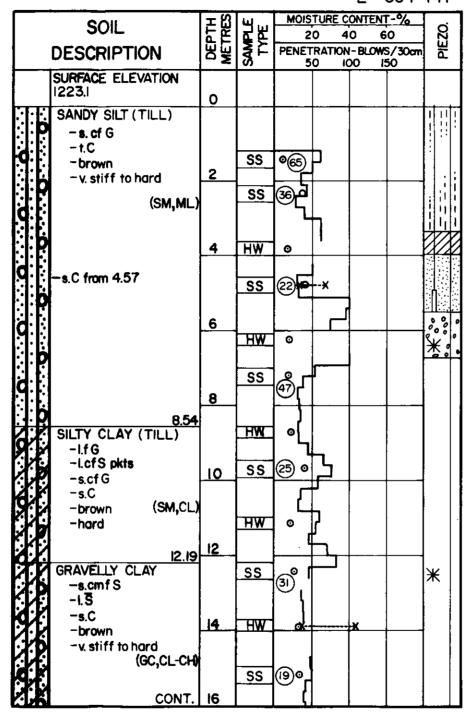
Р77-38 сонт.

	– 8	ω	MOIS	TURE	CONTEN	л-%	
SOIL		토문	2			50	PIEZO.
DESCRIPTION	8 ¥	SAMPLE TYPE	PENET	RATION 0 II	1-810% 00	15 /30 cm	Ē
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(CL-CH)		HW	0				
	18						
		SS	୲ୄୢ୶୵୵	5 c m	1		*
SILTY GRAVEL PKT		c				Į	*
(Wx)? 200	20	SS	47				
END OF DRILL HOLE							
	22						
	24						
					1		
	26						
	28						
	30					1	
	32						

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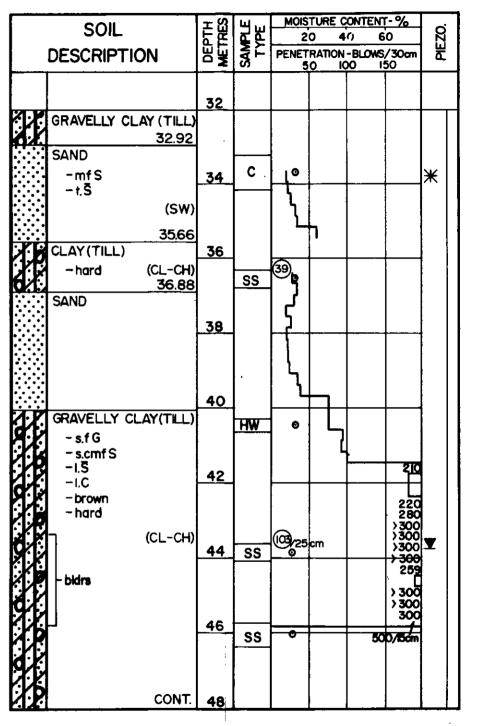
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Р77-39 сонт.

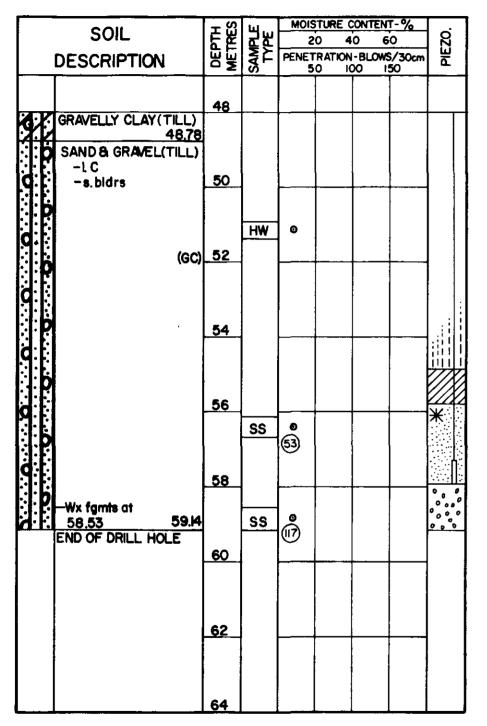
SOIL	王怒	щμ		TURE O		,	ø
DESCRIPTION	DEPTH	SAMPLE TYPE	20 PENET	RATION	BLOWS	0 /30cm	PIEZO.
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GRAVELLY CLAY (TILL)			Ľ	_			
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Р77-39 сонт.



KLONN LEONOFF CONSULTANTS LTD.WATER SUPPLY AND ASH RETENTION DAMSB.C. MYDRO AND POWER AUTHORITY
HAT CREEK PROJECTPERCUSSION DRILL HOLES
P77-38 to P77-39AT CREEK PROJECTPROJECT NO.
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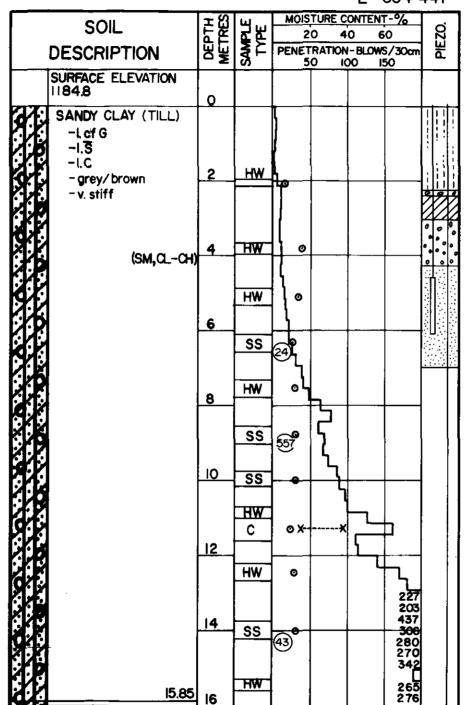
P77-39 CONT.



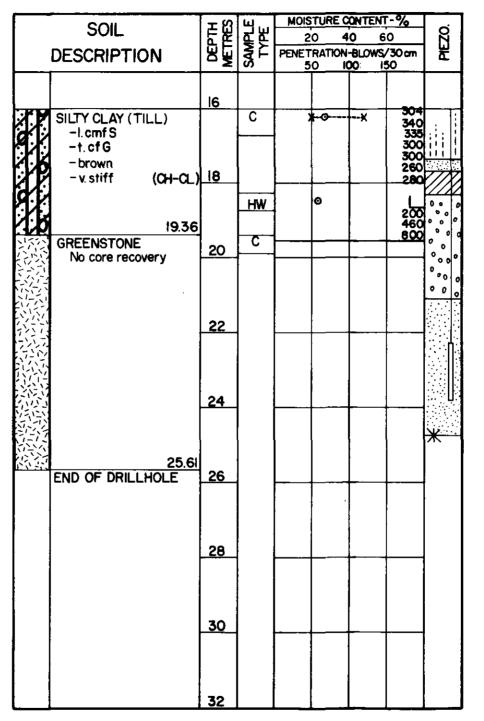
P77-40 & 40A

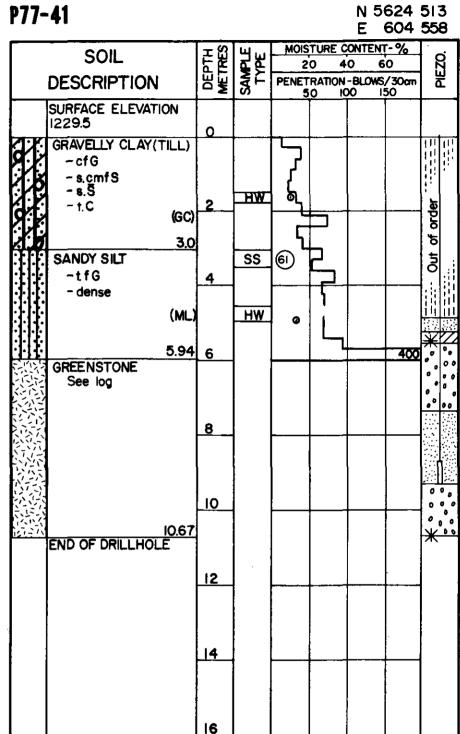
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E 604 441

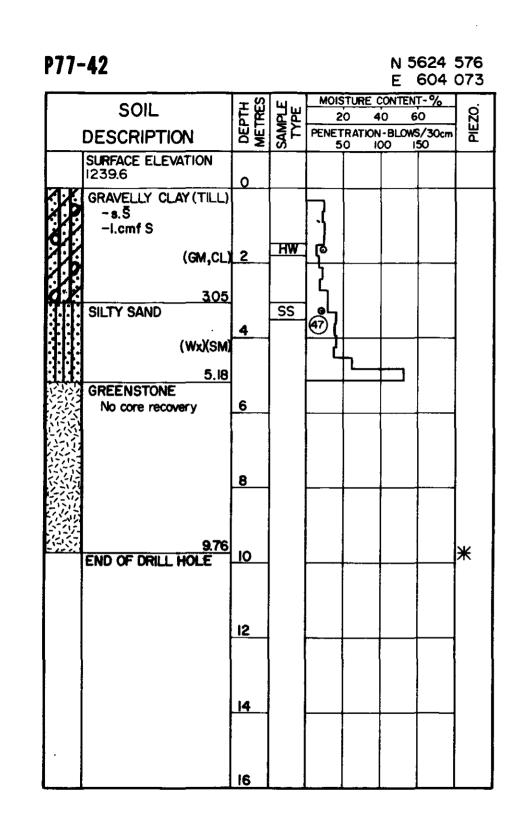


P77-40 & 40A cont.





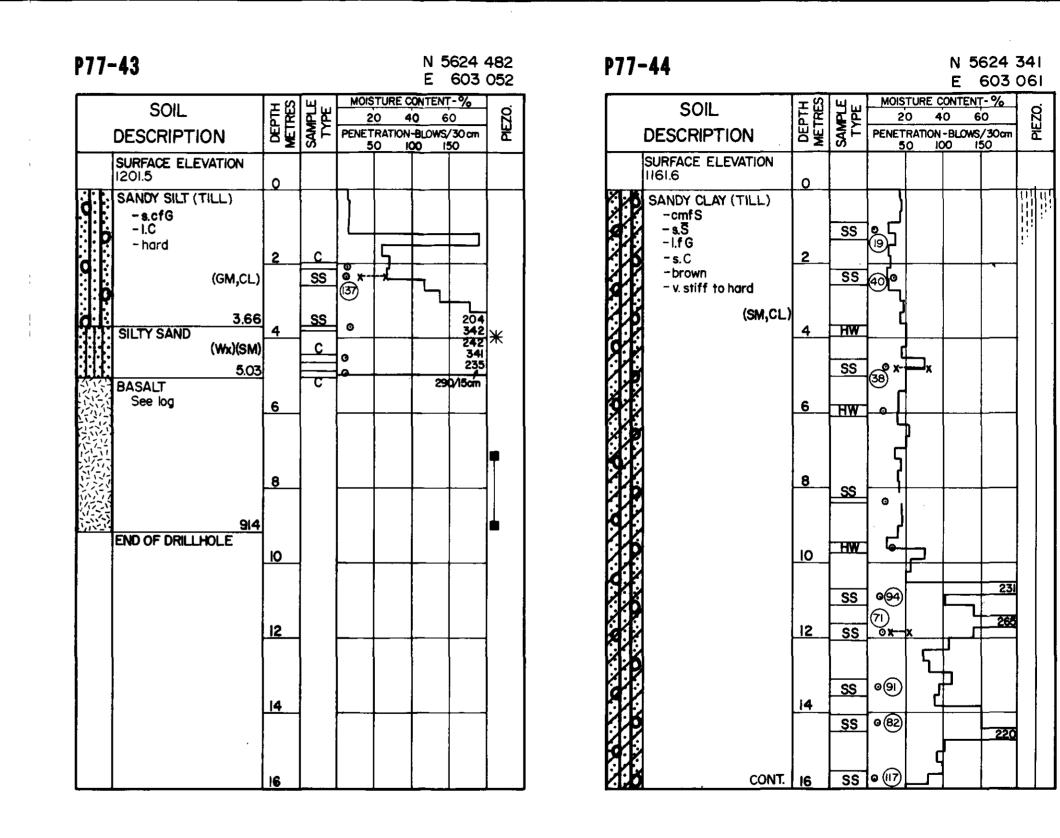
KLOHN LEONOFF CONSULTANTS LTD. WATER SUPPLY AND ASH RETENTION DAMS PERCUSSION DRILL HOLES B.C. HYDRO AND POWER AUTHORITY P77-39 to P77-41 HAT CREEK PROJECT APPROVED HUGStonan DATE JAN, 1978 PLATE C4 PROJECT NO. VA 2321



P77-42A

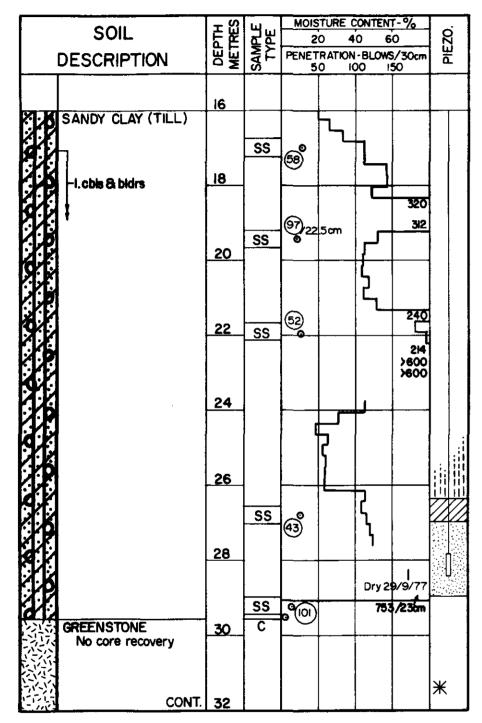
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	SOIL	ΞŨ	SAMPLE	MOIS		ONTEN		o l
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1	DESCRIPTION	lä₩	₹⊢		RATION	I-BLOW: DO II	S /30cm 50	Ē
	SURFACE ELEVATION		•/	<u>*</u>				
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	SILTY SAND	- V	_					·
	(Wx)(SM)			1				
		ļ						
	2.13	2	C					
歌歌	GREENSTONE							
《公议	No core recovery		С					
					-			
		4		L	L			
	5.18							
فدنك	END OF DRILL HOLE							⋇
		6						
				—				
		8		~				
				l				
		10		L				
		12						
		14						
		1-4		ļ				
		16						



KLOHN LEONOFF CONSULTANTS LTD.WATER SUPPLY AND ASH RETENTION DAMSB.C. HYDRO AND POWER AUTHORITY
HAT CREEK PROJECTPERCUSSION DRILL HOLES
P77-42 to P77-44APPROVED
HUGHLANDPROJECT NO.
VA 2321AML 1978
PLATE

P77-44 CONT.

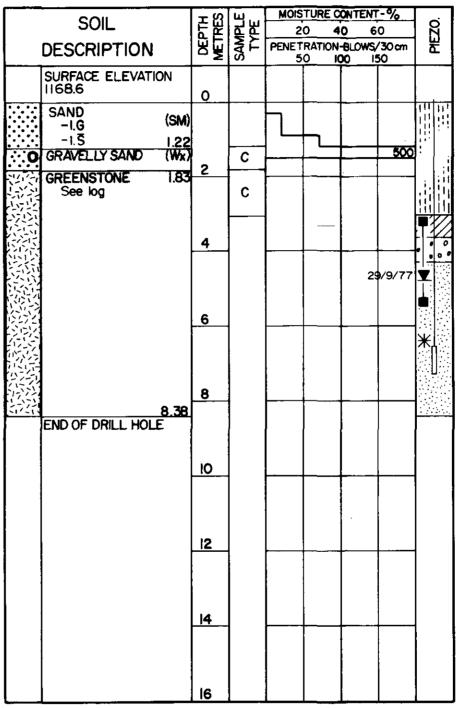


P77-44 CONT.

	SOIL	ΞΞ	SAMPLE TYPE	MOIS	TURE C 0 4		-% 0	<u>ö</u>
I	DESCRIPTION		S₽	PENET	RATION			PIEZO.
		ΩΣ	<u>8</u>	5	0 10		50	<u>u</u>
		32						
15	GREENSTONE							
					1			
5.57		34						
		36						
刻			1					
	37.50 END OF DRILL HOLE	2						-
	END OF DRILL HULE	38	ł					-
		40						
[1	Í	ĺ	[Í		
}		42						
1		42	1					
		4 4						
		1						
		46						
			1	 				
I		48	1	i	1	Í		

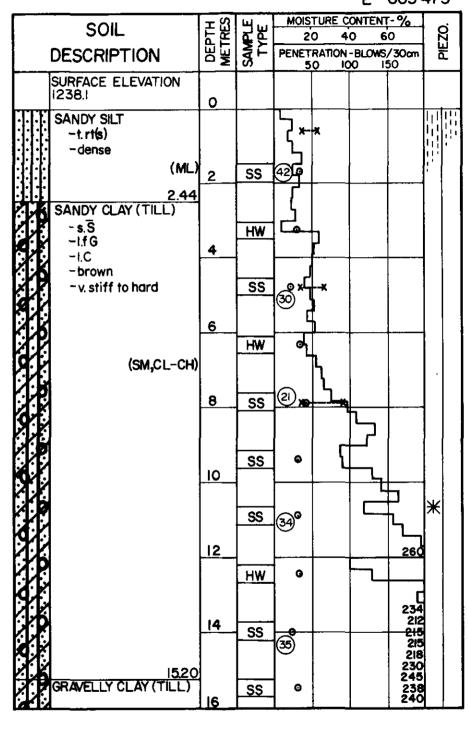


N 5624 046 E 603 119





N 5625 137 E 605 475



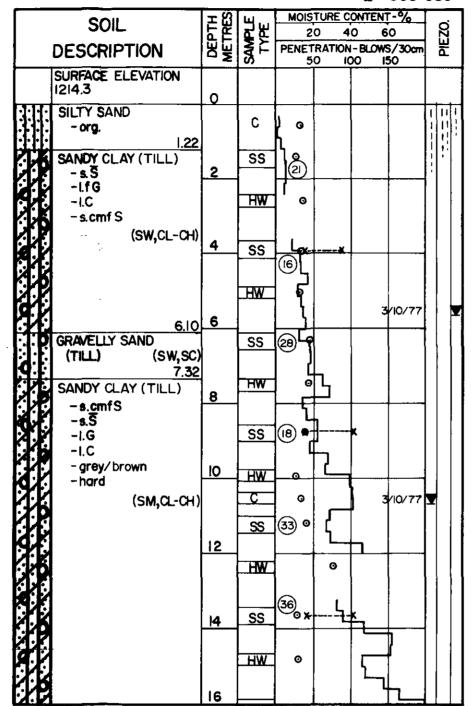
KLOHN LEONOFF CONSULTANTS LTD.WATER SUPPLY AND ASH RETENTION DAMSB.C. HYDRO AND POWER AUTHORITY
HAT CREEK PROJECTPERCUSSION DRILL HOLES
P77-44 to P77-46AT CREEK PROJECTPROJECT NO.MAT CREEK PROJECTPROJECT NO.MAT CREEK PROJECTPROJECT NO.MAT CREEK PROJECTPROJECT NO.

P77-46 CONT.

	<u> </u>	ΞΩ	ω.	MOIS	TURE	ONTEN	T-%	
	SOIL		LE E				0	PIEZO.
	DESCRIPTION	DEPTH	SAMPLE	PENET 5			S/30cm 50	Ē
		16						
K.K.	GRAVELLY CLAY (TILL)						263 270	
KV?	−s.cmf S −hard						242 233 230	
KK				1			230	
ИX	(GC,CL-CH)	18		 		<u> </u>	240 250	
Иľ			SS	34 ^{0X-}	x	3/10/	77250	
M K				34			217 300	0 00
NK		20					320 290	///
ИK		20					- 340 375	XXX
μX	20.7						430	0000
	SAND -tfg (Wx)(SM)			o			550	0,000
	21.95	22	SS	õ			1000	ា
	SANDSTONE No core recovery		С	o				
	NO COLE LECONELY							° ° ° ° ° °
			С	0				
影響		24		<u> </u>		ļ	-	
	24.69							*
	24.69 END OF DRILL HOLE							
		26						
		20						
		28						
			-					
			-					
		30						
		32						

P77-47

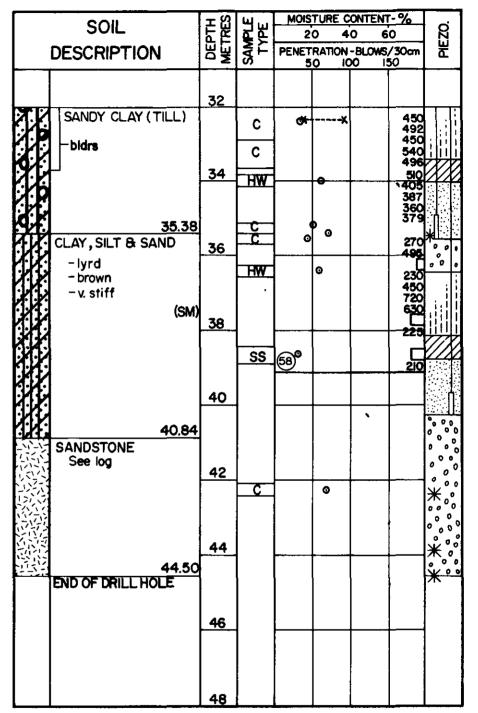
N 5624 883 E 605 559



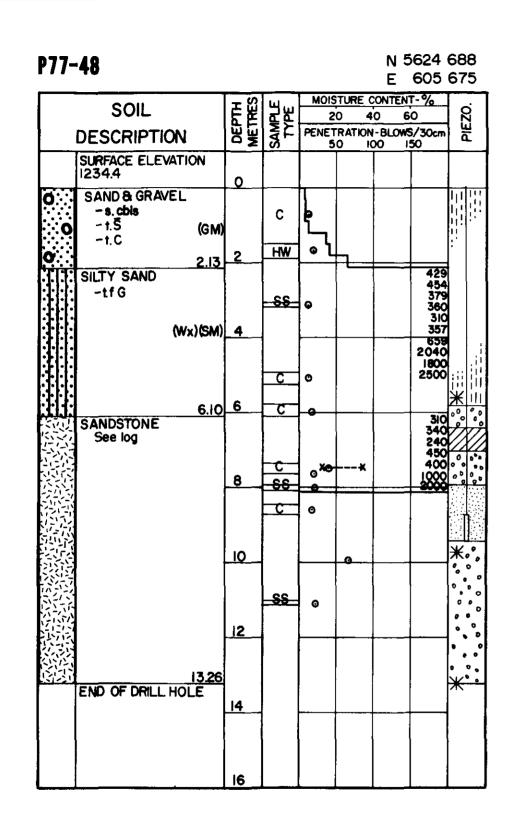
P77-47 CONT.

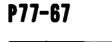
SOIL H H H MOISTURE CONTE DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION	60 VS/30 cm
	VS/30cm デー
	150
SANDY CLAY (TILL)	┼╶┟┐╷┨
	238
	265
18	205
	238 225 265 235 205 205 215 225 230 335 230
	230
20 55 260	230
	230 230 230
	230
	230
22 HW 0	230 230 226 228
	4
	205 240 221 453
24	453
SS (27)®	\ []]
	240 2 <u>55</u>
	5
28	
SS SP	240 360
30 SS 50°	<u>375</u> 360
	375 450
	450
	495

Р77-47 сонт.

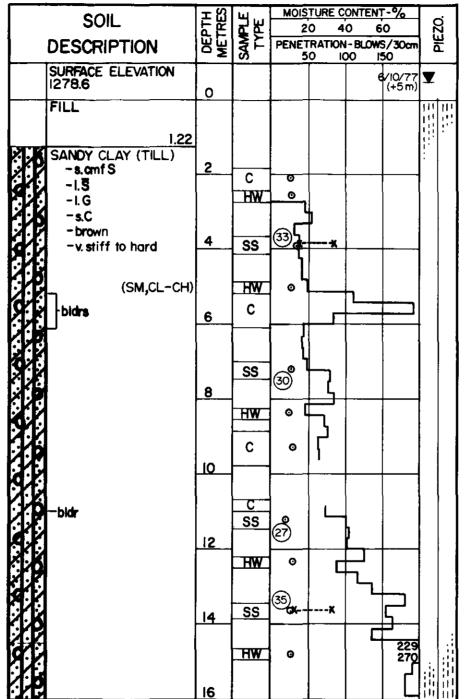


KLOHN LEONOFF CONSULTANTS LTD. WATER SUPPLY AND ASH RETENTION DAMS PERCUSSION DRILL HOLES B.C. HYDRO AND POWER AUTHORITY P77-46 to P77-47 HAT CREEK PROJECT APPROVED DATE JAN, 1978 PLATE C7 ROJECT NO. VA 2321



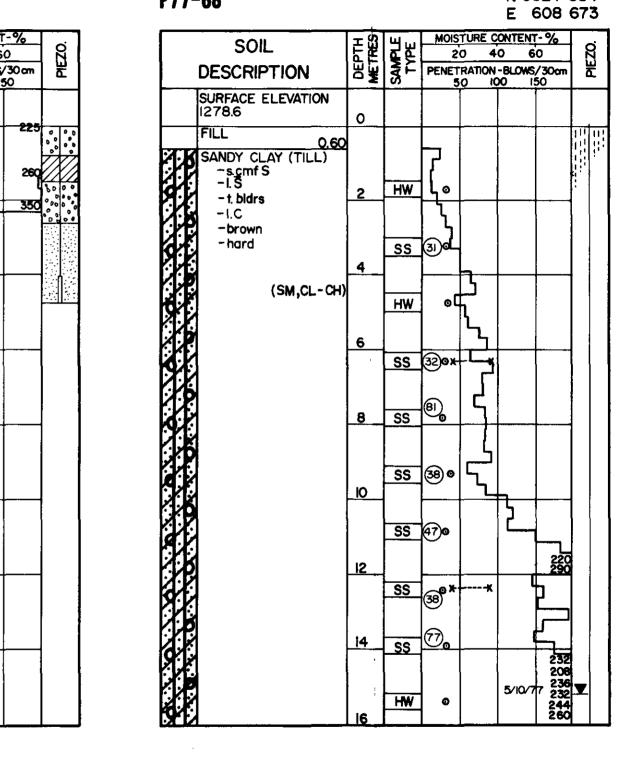


N 5624 864 E 608 429



Р77-67 сонт.

MOISTURE CONTENT - % SOIL 20 40 60 DENETRATION-BLOWS/30 cm DESCRIPTION 16 AK GRAVELLY CLAY(TILL) SS 820 18 18.9Q SANDY SILT - t, f G 0¥--С (Wx)(SM) 20 C G 20.73 END OF DRILL HOLE C ĿЫ 22 24 26 28 30 32



KLOHN LEONOFF CONSULTANTS LTD. WATER SUPPLY AND ASH RETENTION DAMS PERCUSSION DRILL HOLES B.C. HYDRO AND POWER AUTHORITY P77-48 to P77-68 HAT CREEK PROJECT APPROVED Following ROJECT NO. VA 2321 DATE JAN., 1978 PLATE C8

P77-68

N 5624 884

P77-68 CONT.

	+ <i>S</i>	Lu	MOIS	STURE (ONTEN	T-%	
SOIL	ĒĔ	56				0	PIEZO.
DESCRIPTION	DEPTH	SAMPLE	PENET	RATION 0 I	BLOW	5/30cm	E
						Ĩ	
	16			,			
SANDY CLAY (TILL)						268 252 292	
						292	
		:				256	
	18					240	出前
		SS	0			262	000
18.90		00	@r22	5.00			ж.,
BRECCIA See log			722	Jun			° 0 0
27792 27702	20					L	
							000
教授							0000
1116 1211							ູ່
	22						0 0
1323							
							Î
	24					-	
彩 絵							, °
							៓៰៓
秋 辺	~				:		، ۹
<u>线彩</u>	26						^ ••
							• • •
2743							•°•*
END OF DRILL HOLE	~						<u>,,,</u>
	28						
]							
	30						
	32						

SOIL	Ξü	щ.,,	MOISTURE CONTENT-%		Ċ.		
	Le É	l ≣ Ĕ	2			50	PIEZO.
DESCRIPTION	la ₹	SAMPLE TYPE	PENET		1-BLOW 20 1	S /30cm 50	∎
SURFACE ELEVATION					[
	1						
	<u> </u>					ļ	
			<u> </u>		<u> </u>		
					ĺ		
		ł					

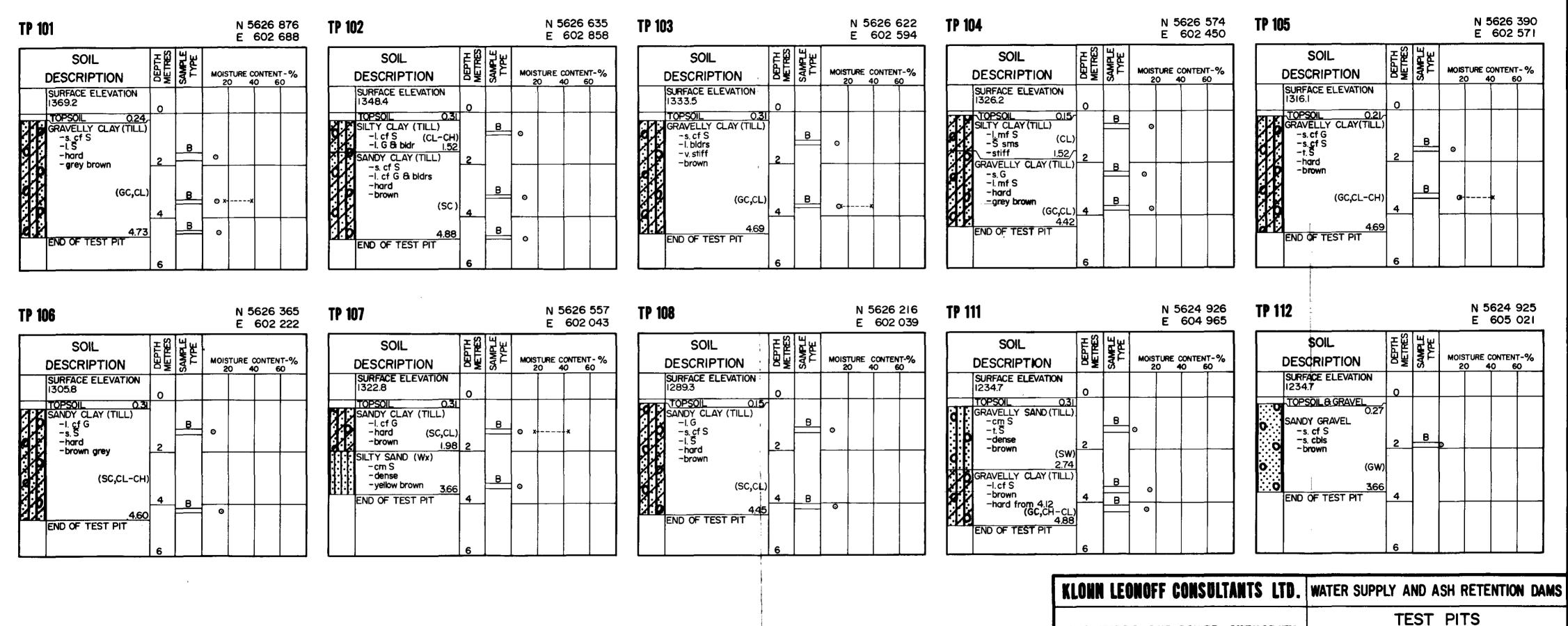
SOIL DESCRIPTION	DEPTH	SAMPLE TYPE	2	TURE C 0 4 RATION 0 IC	06	0	PIEZO.		S DESC
SURFACE ELEVATION									SURFAC
				_					
			·· =,						
						:			

<u> </u>	- 0	<u>.</u>	MOIS	TURE C	ONTEN	- %	
SOIL	Г Г Ж	22	2	0 4	06	0	N N
DESCRIPTION	μÜΨ	SAMPLE TYPE			-BLOWS	/30am	PIEZO.
	- 2	S	5	0 10	XO 1	50	
SURFACE ELEVATION							
				1			
							:
	ł						
	5			[
				1			
1	1						

KLOHN LEONOFF CONSULTANTS LTD. WATER SUPPLY AND ASH RETENTION DAMS

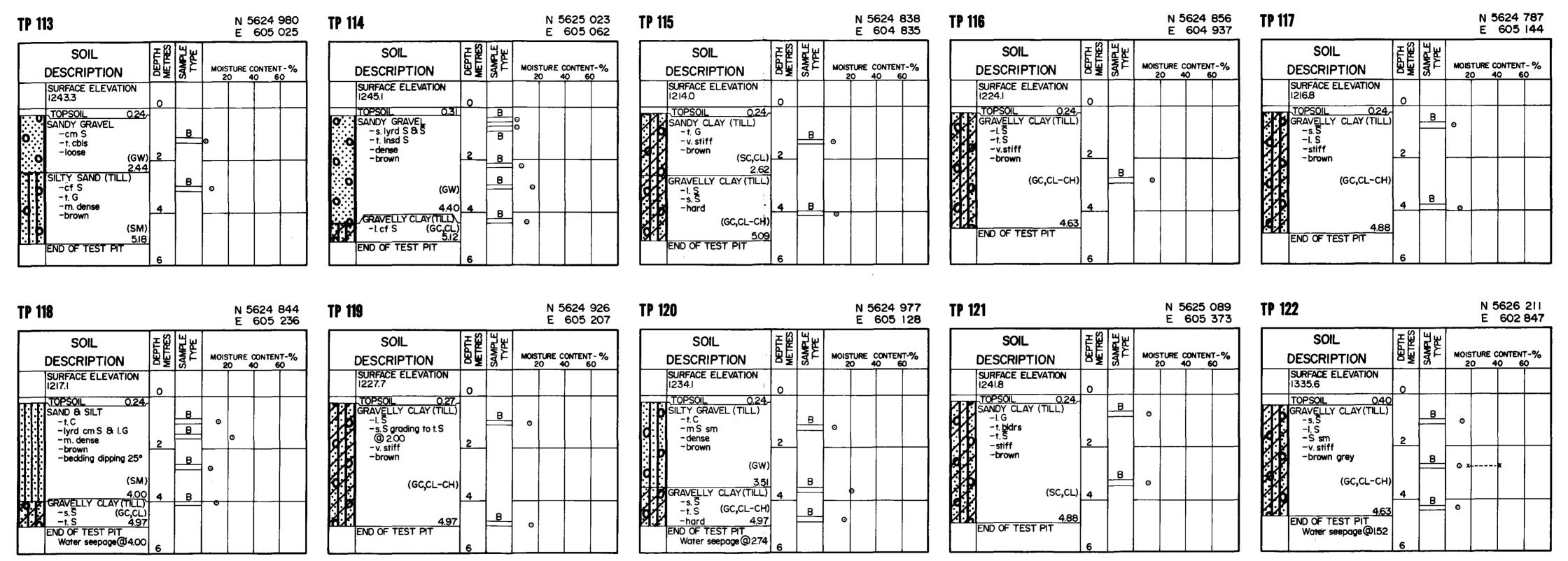
B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

PERCUS	SION DRIL	L HOLES
	P77-68	
APPROVED	PROJECT NO.	DATE JAN., 1978
APPROVED	VA 2321	PLATE C9



B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

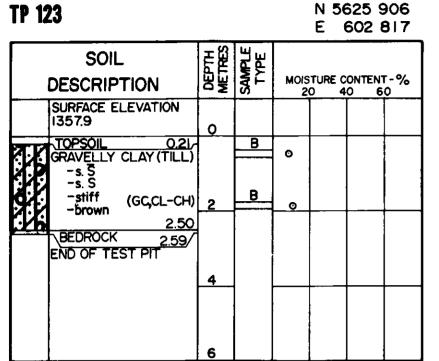
TP IOI to TP II2 APPROVED Helightman ROJECT NO. DATE JAN., 1978 VA 2321 PLATE CIO

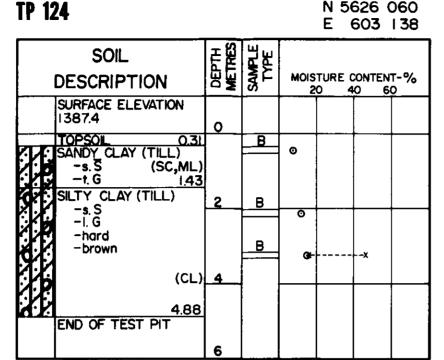


KLOHN LEONOFF CONSULTANTS LTD. WATER SUPPLY AND ASH RETENTION DAMS TEST PITS B.C. HYDRO AND POWER AUTHORITY

HAT CREEK PROJECT

TP 113 to TP 122 APPROVED DATE JAN., 1978 PROJECT NO. VA 2321 PLATE CII

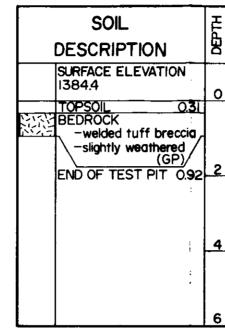




TP 125

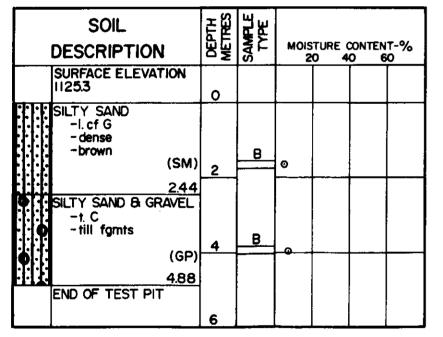
N 5626 060

N 5620 374

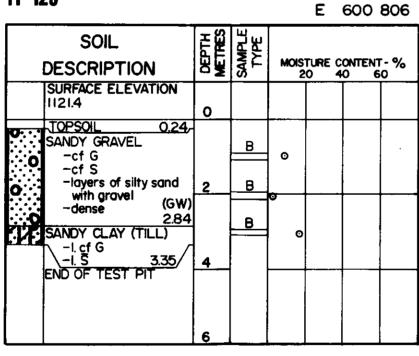




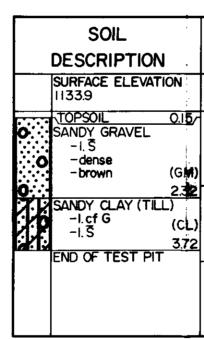
N 5620 395 E 600 804

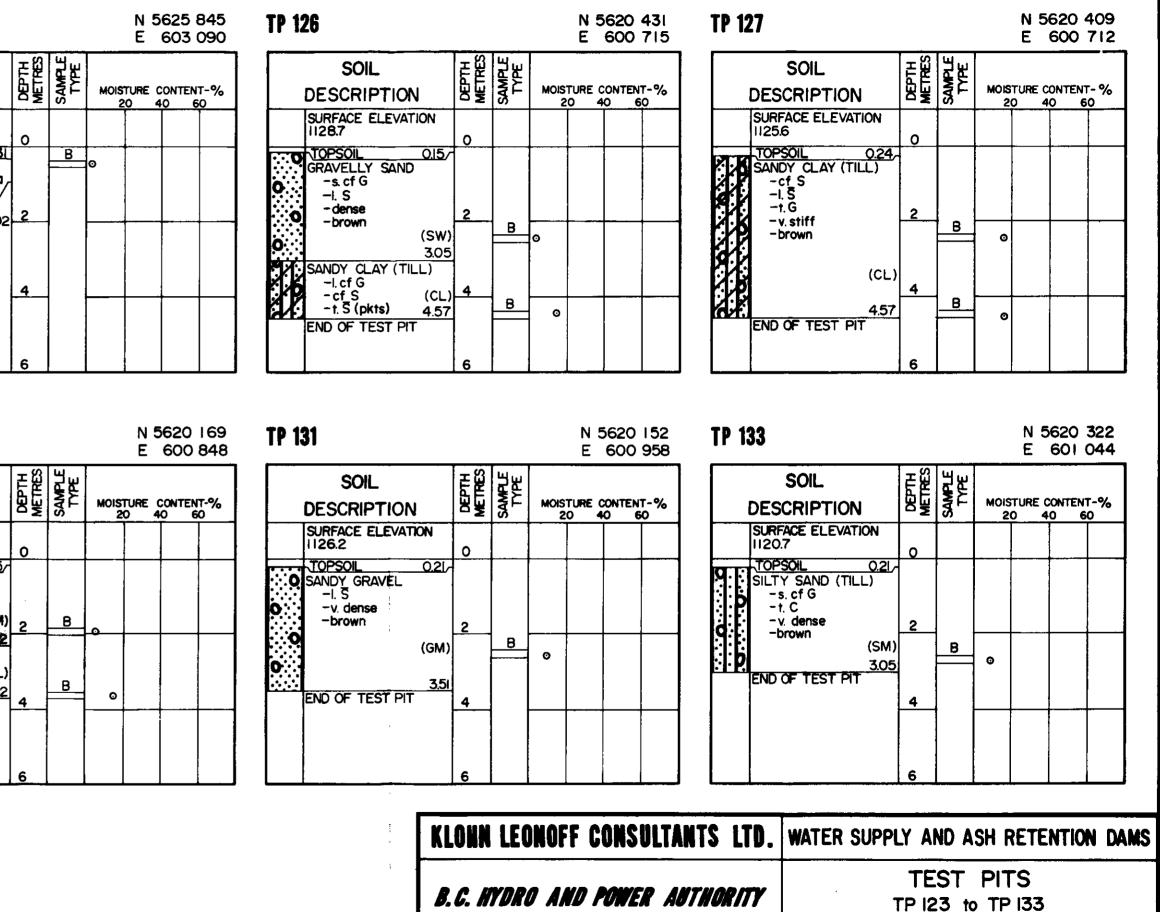






TP 130



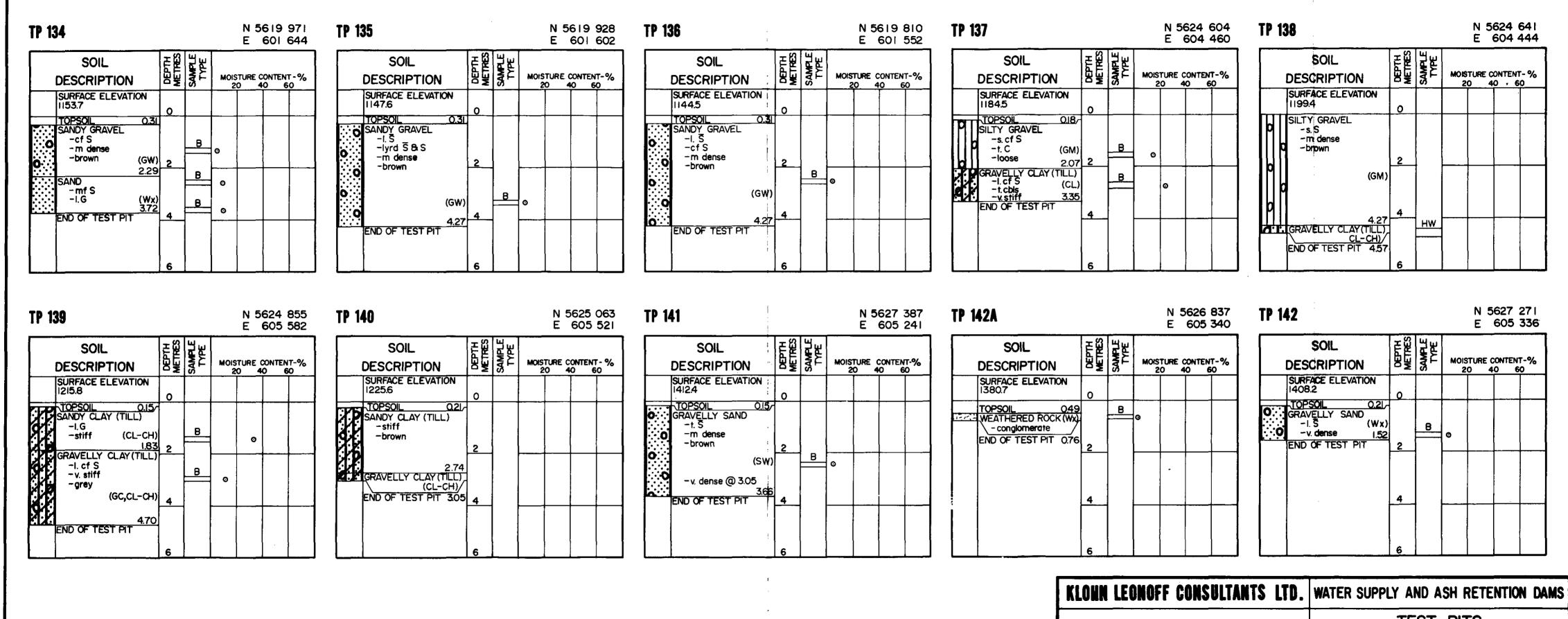


HAT CREEK PROJECT

APPROVED Hurtoman ROJECT NO. VA 2321

DATE JAN., 1978

PLATE CI2



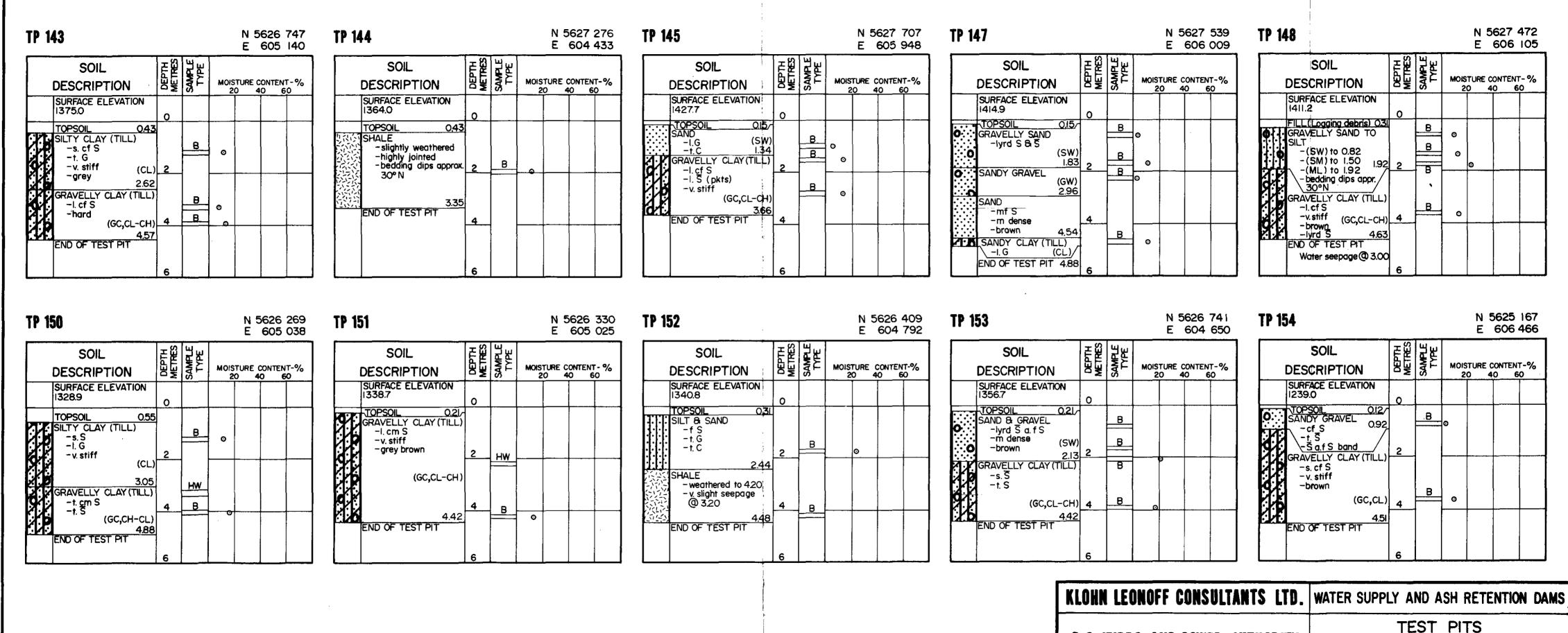
B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

TEST PITS TP 134 to TP 142

ROJECT NO.

APPROVED HUGh brinn

DATE JAN., 1978 VA 2321 PLATE CI3

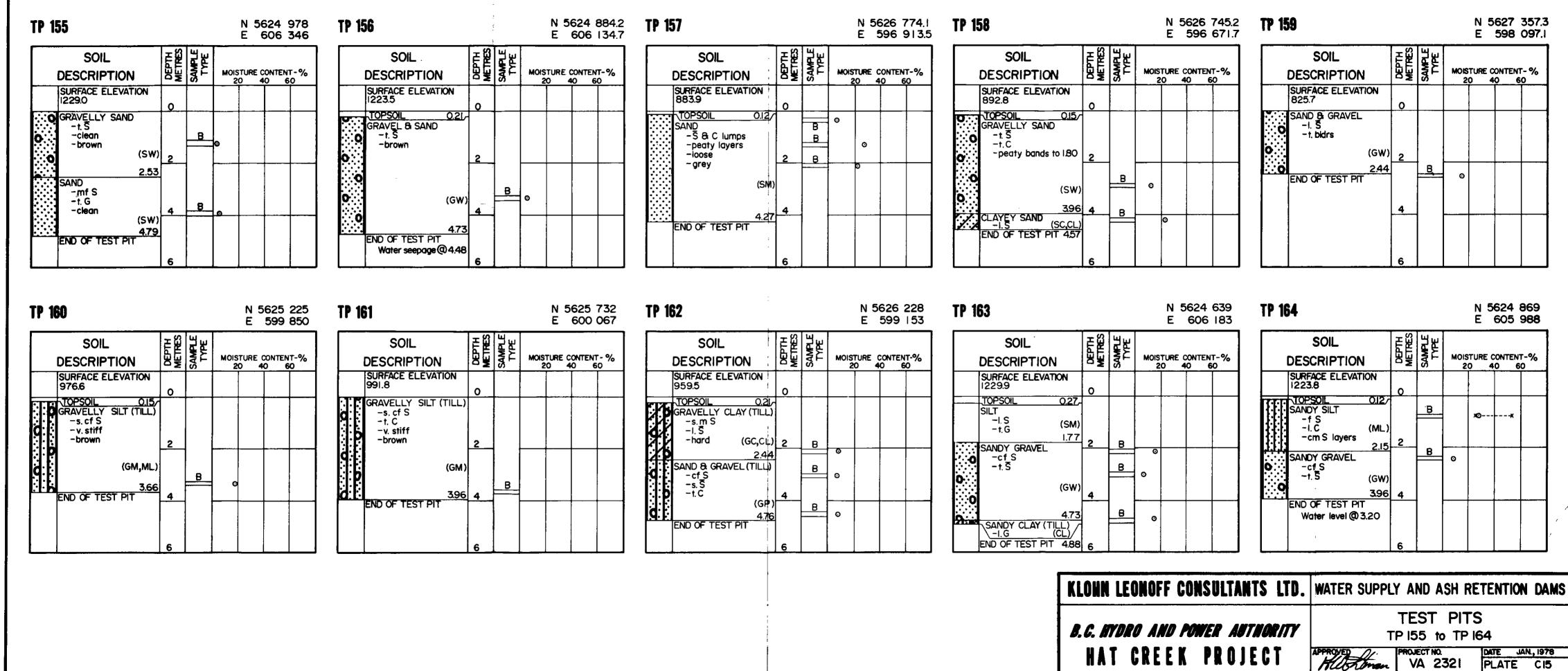


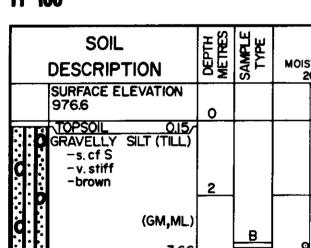
B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

APPROVED AL ROJECT NO. VA 2321

TP I43 to TP I54

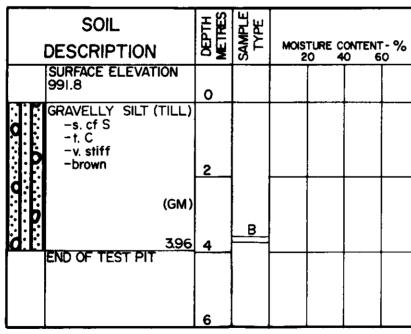
DATE JAN., 1978 PLATE CH4



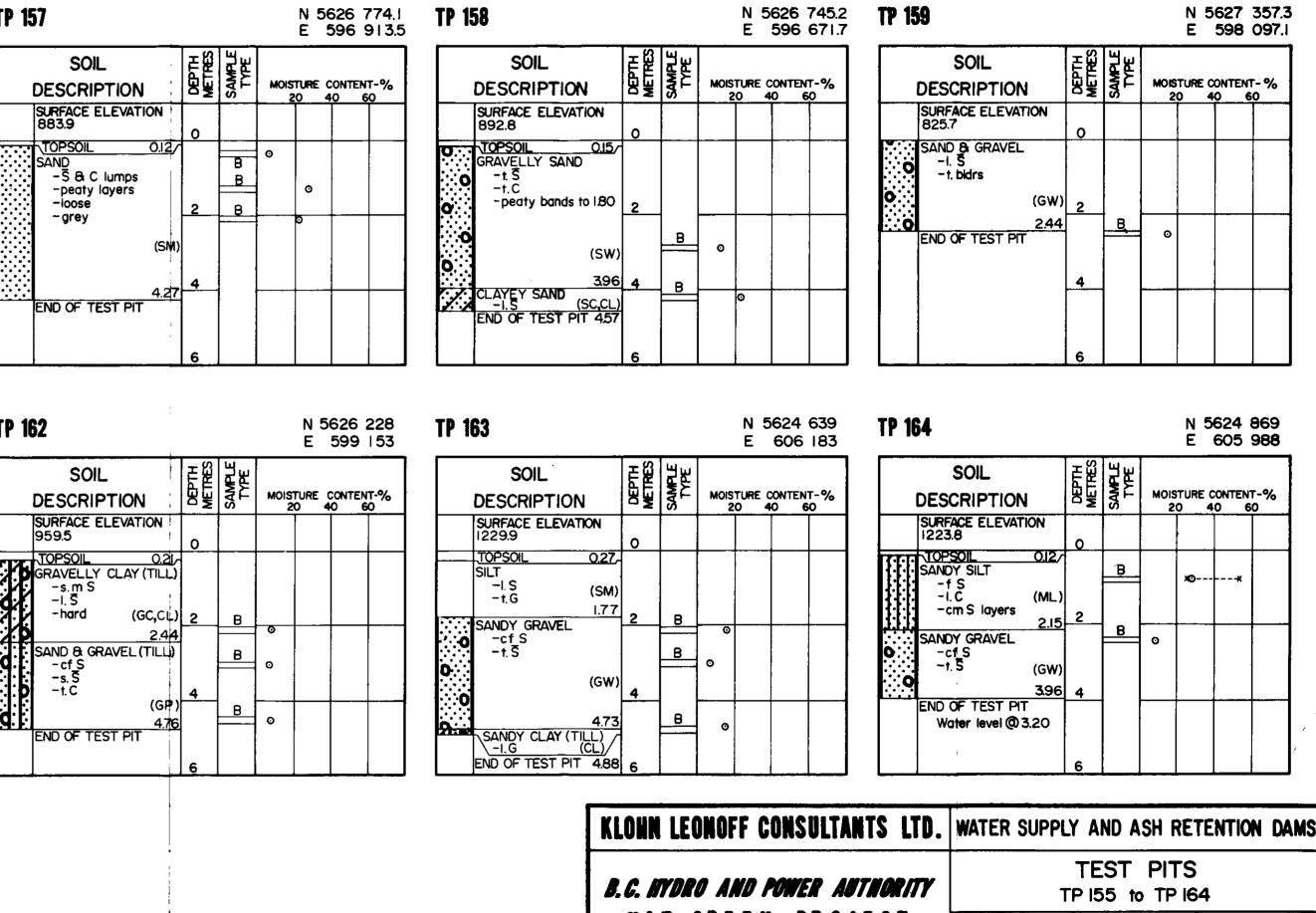






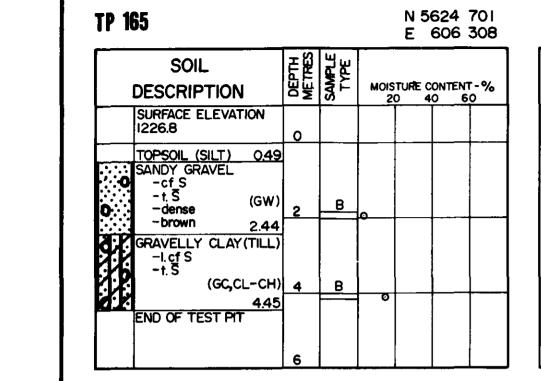






VA 2321

PLATE CI5



١.

SOIL DESCRIPTION	DEPTH	SAMPLE TYPE	MOIS 2		CONTEN	
SURFACE ELEVATION	0					
	2			-		
	4					
	6					

SOIL DESCRIPTION	DEPTH METRES	SAMPLE TYPE		CONTENT-%	-	SOIL DESCRIPTION	DEPTH METRES	SAMPLE TYPE	MOIST 20	URE CONT	ENT-%	SOIL DESCRIPT		DEPTH	SAMPLE	MOISTURE	CONTENT	% 0
SURFACE ELEVATION	0					SURFACE ELEVATION	0					SURFACE EL	EVATION	0				
i	2						2							2				
	4						4							4				
	6						6							6				
SOIL	±₩	۲. ۱			[SOIL	۲ü	Land				SOIL		포۵	Щw			
DESCRIPTION	DEPTH METRES	SAMP	MOISTURE	CONTENT-%		DESCRIPTION	DEPTH METRES	SAMPI TYP	MOIST 20	URE CONT	ENT-%	DESCRIP		METH	SAMPLE TYPE	MOISTURE	CONTENT	r-9
						SURFACE ELEVATION	1											

SOIL DESCRIPTION	DEPTH	SAMPLE TYPE		1T-% 50
SURFACE ELEVATION	0			
	2			
	4		-	
	6			

SOIL DESCRIPTION	DEPTH	SAMPLE TYPE	MOIS 2	TURE C 0 4	ONTENT O 6	r - %
SURFACE ELEVATION	0					
	2					
	4					
	6					

SOIL DESCRIPTION	DEPTH	SAMPLE TYPE	TURE O	CONTEN	1 7-%
SURFACE ELEVATION	0				
	2				
	4				
	6				

SOIL DESCRIPTION	DEPTH	SAMPLE	MOIS 2	TURE (XONTEN KO E	т-% Ю	D
SURFACE ELEVATION	0						S
	2						
-	4						
	<u> </u>						
	6						

SOIL DESCRIPTION	DEPTH METRES	SAMPLE. TYPE	MOISTURE CONTENT-% 20 40 60
SURFACE ELEVATION	0		
····			
	2		
	4		
	6		

KLOHN LEONOFF CONSULTANTS LTD. WATER SUPPLY AND ASH RETENTION DAMS

B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

TP 165 APPROVED PROJECT NO. Hughman VA 2321

TEST PITS

DATE JAN, 1978 PLATE C 16 <u>APPENDIX VIII</u> Written Geologic Drill Hole Logs Plate No. C17

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		GEOLOGIC DRILL HOLE LOG			-	-
CLIENT				No		
PROJEC	HAT CREEK		HOLE	No	P-77-	-3
SITE	Axis of Sad	dle Dam		T No		
	ACTOR: <u>Becker</u>		<u>pt. 1</u> -+ 2		. 19]	<u>77</u> רד
METHO	D SOIL Ha	mmer Drilling CASING DIA.	<u> 140 </u>	mm		
OF		amond Coring CASING DEPTH CORE DIA.	7.92	m		
		•				
LOCATIO	DEPARTURE BEARING		CE			
		ROCK SURFACE BOTTOM OF HOL WATER TABLE				
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	4
0.0						t
7.92					<u> </u>	Ŧ
			+		<u> </u>	
7.92	Shale &	Shale and Mudstone 7.92 - 8.53. Shale,		1.22	0	t
9.14	Mudstone	dark. flat grey. poorly to moderately fissile.		<u> </u>		+
\square						1
	/	Some small pieces of core show fine laminations. In general, core splits		 	<u> </u>	╀
		normal to c/a along smooth, irregular				t
		to conchoidal fractures.			<u> </u>	╀
<u> </u>		Very slightly calcareous.				t
		Come multiply from noweder to 1 inch size			<u> </u>	╞
		Core rubbly from poweder to 1 inch size One or two discs of core about 5 mm	•			t
+		thick. Some fracture surfaces show a				1
	<u>.</u>	very slight sheen (probably mica). Medium hard. 8.53 - 9.14, mudstone	- <u>†</u>			t
		powdery with a few fragments up to 5				Ŧ
	· · · · · · · · · · · · · · · · · · ·	mm. Crumbles under fine pressure.				╞
9.14	Mudstone	Mudstone, same as 8.53 - 9.14. Medium		1.52	0	╀
0.66		to dark grey, slight to moderately calcareous.				ŧ
						t
		Core has been softened by drill water			 	ļ
		1 1 1 1 1 1 Le Le	- I -	1.	L	1
		but tends to split into disc - like pieces along surfaces ±80 to core axes.				١,
						╞

		Klohn Leonoff Consultants Ltd.				
		CIVIL & GEOTECHNICAL ENGINEERS				
		GEOLOGIC DRILL HOLE LOG				
CLIENT	B.C. Hydro			No		
PROJECT	HAT CREEK		HOLE	No	P-77-	-36
SITE	Axis of Sad			T No		
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	% CORI REC
10.66	·····	Mudstone, same as 9.14 to 10.66. Sandy		1.52	0	17
12.19		Mudstone, same as 9.14 to 10.66. Sandy to gravelly near top of run, softened by drill water throughout.				
12.19		End of Drillhole				
	·····					
			- 			
	<u>.</u>					
	· · · · · · · · · · · · · · · · · · ·					1
				· · · ·		
			1			
	· · · · · ·					
			-			1
	· · · · · · · · · · · · · · · · · · ·					
	<u></u>					ļ
			<u> </u>			<u> </u>
						ļ
			+			
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		Klohn Leonoff Consultants Ltd.				-
CUENT				No	VA 27	521
	,					
PROJEC						
SITE	Axis of Sa	ddle Dam	SHEE	「 No, _	10	<u> 2</u>
ſ		FINISHEDM	<u> </u>		. 17	
OF	CIVIL B GEOTECHNICAL ENGINEERS GEOLOGIC DRILL HOLE LOG INT B.C. Hydro JOB No. VA 2321 HAT CREEK Axis of Saddle Dam SHEET No. 1_ OF 2 Axis of Saddle Dam SHEET NO. 1_ OF 2 Axis of Saddle Dam SHEET NO. 1_ OF 2 Axis of Saddle Dam SHEET NO. 1_ OF 2 INTRACTOR: Becker SOIL Hammer. Orilling CASING DEPTH CASING DEPTH ASTION: LATITUDE DEFARTURE BATING GROUND SUFFACE BATING GROUND SUFFACE BATING GROUND SUFFACE BATING GROUND SUFFACE BATING BATING	<u>.</u>				
LOCATI						
DEPTH	ROCK TYPE	DESCRIPTION	PRESS.	٩O	*	% CORE REC.
0.0					-	
4 57	Siltatona	Siltstone medium to dark grey massive		1 52	- 0	40
4.57				1.52		40
) 			
		2				
	··			<u> </u>		
		Core breaks in discs normal to c/a from				
 	······································		1			<u> </u>
	······································	a smooth, flat surface. The irregularity				
		surfaces are flat, smooth and apparently				
	······					<u> </u>
		the naked eye. In some pieces, com-				
			ļ			
		minerals, up to 5 mm long can be				ļ
		opserved. These are probably amphiboles or fragments of volcanic electa.				<u> </u>
T						
 †						├───
LOGGE	D BYR. Lopez	DATE 27/09/77				

		Kiohn Leonoff Consultants Ltd.				
CLIENT	B.C. Hydro HAT CREEK	GEOLOGIC DRILL HOLE LOG		No. <u> </u>		
PROJECT SITE		Axis of Saddle Dam			2 OF	
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST		% RGD	T
		It appears as if this rock is derived				t
		directly from a volcanic source and				t
		represents an underwater deposit of				Ι
		volcanic ash.				
						1
		Weathering:				╀
		4.57 - 5.33 - Moderately weathered. 5.33 - 6.10 - Slightly weathered.	 			╀
		1				╉
		Very_mildly calcareous_(slight reaction_	+ ⊂			t
 		HCL.	10	<u> </u>	<u> </u>	t
						t
						I
	Siltstone	Finely grained sandstone	l	1.52	0	╀
7.62		7.32 - 7.62 changing gradually to mudstor	re 			ļ
		· · · · · · · · · · · · · · · · · · ·				╀
7.62 M	ludstone	Mudstone. Colour and appearance same	<u> </u>	1.52	0	╀
9.14		as previous runs but apparently some		1.72	<u> </u>	t
		clay content in this section.	1			t
						T
		Core breaks into pieces of up to 50 mm	1			Τ
		length with rounded-off edges probably				
		washed by drill water.	ļ			Ļ
			ļ			╀
	<u></u>	Core is soft and can be easily indented	 	l		╀
		with fingernail.	<u> </u>			╀
	· · · · · · · · · · · · · · · · · · ·	Rock mass has minor to moderate amounts		<u> </u>	<u> </u>	t
		of disseminated calcite.		<u> </u>	1	t
						t
9.14		End of Drillhole				Ļ
				ļ		∔
 			 	 		╀
_	<u> </u>		 	<u> </u>		╉
	····			<u> </u>		t
			1			t
						T
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			L			Ļ
			<u> </u>	 		1
						╀
			<u> </u> '	<u> </u>		╀
			 			╋

		CIVIL & GEOTECHNICAL ENGI					
	B.C. Hydro	GEOLOGIC DRILL HOLE			No	VA 27	321
PROJECT	HAT CREEK Axis of Ash	Dam No 3			No		
SITE			<u>_</u> _	SHEET	「 No	<u></u> 0ł	:
CONTRA	CTOR: Becker	STARTED FINISHED	<u></u> . <u>M. Aug.</u>	24 24		. 197 <u>7</u> 19 7	י <u>-</u> די
METHOD	SOIL Har	nmer Drilling CASH CASH	NG DIA.	140 i	mm		
OF DRILLING	3: ROCK Dia	amond Coring COR	E DIA.	BW	<u> </u>		
LOCATIO	DEPARTURE BEARING INITIAL DIP	GROL ROCK BOTT	PLATFORM				
DEPTH	ROCK TYPE	DESCRIPTION		WATER PRESS. TEST	LENGTH OF RUN	% RQD	% CO RE
).0).5							
2.94	Greenstone	Greenstone. (Altered intermedi			1.37	0	3
7.32	(altered	basic Volcanics), altered and h	īghly				F
	volcanics)	weathered, greenish grey on free faces, rusty on fracture surface					
		Core fragments from fine grave					F
		bound by irregular rusty surface					
		There is a very poorly develope	ed				
		foliation subparallel to core w				1	-
- I		to control fracturing. Rock re	eacts				L
<u> </u>		weakly to acid due to finely d	eacts isseminated	1			╞
		weakly to acid due to finely d calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or	eacts isseminated lcite veins ne sub-	1			
		weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo	eacts isseminated lcite veins ne sub-	1			
		weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core.	eacts isseminated lcite veins ne sub- out 20 mm				
		weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core.	eacts isseminated lcite veins ne sub- out 20 mm				
		weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo	eacts isseminated lcite veins ne sub- out 20 mm				
7.32	Greenstone	weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core. This core appears to have been by tectonic action and recement calcite-rich solutions.	eacts isseminated lcite veins ne sub- out 20 mm brecciated ted by		1.10	0	
3.41 (altered	weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core. This core appears to have been by tectonic action and recement	eacts isseminated lcite veins ne sub- out 20 mm brecciated ted by		1.10	0	
3.41 (weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core. This core appears to have been by tectonic action and recement calcite-rich solutions. Greenstone. Recovered only 2 of	eacts isseminated lcite veins ne sub- out 20 mm brecciated ted by		1.10	0	
3.41 (altered	weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core. This core appears to have been by tectonic action and recement calcite-rich solutions. Greenstone. Recovered only 2 of	eacts isseminated lcite veins ne sub- out 20 mm brecciated ted by		1.10	0	
3.41 (altered	weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core. This core appears to have been by tectonic action and recement calcite-rich solutions. Greenstone. Recovered only 2 of	eacts isseminated lcite veins ne sub- out 20 mm brecciated ted by		1.10	0	
3.41 (altered	weakly to acid due to finely di calcite in rock mass. Some ca from hairline to 2 or 3 mm. Or rounded fragment of calcite abo mixed with core. This core appears to have been by tectonic action and recement calcite-rich solutions. Greenstone. Recovered only 2 of	eacts isseminated lcite veins ne sub- out 20 mm brecciated ted by		1.10	0	

		Kiohn Leonoff Consultants Ltd.			
		GEOLOGIC DRILL HOLE LOG			
CLIENT	B.C. Hydro			No	
PROJECT	HAT CREEK		HOLE	No	P-
	Axis of Ash	Dam No 3		T No. 2	
SITE			SHEE	1 No	<u> </u>
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	7 R G
	Greenstone	Greenstone. Approximately upper 173 of		0.79	
9.20		recovered portion, same as 5,94 to 7.32			
		m. Below the rock is thoroughly			
		weathered and pulverized to finely broke	<u>h</u>		L
		(coarse sand to fine gravel_size).	<u> </u>		
		Colour is rusty brown with only			
	<u> </u>	occasional speckles of greenish grey.		· · · · · · · · · · · · · · · · · · ·	_
		Upper one third of core has a waxy			
		appearance as if the rock has been			
		altered to talc or chlorite.			
		Throughout the core, in fresh pieces			
	······································	and surfaces, the rock appears as	<u> </u>	<u> </u> -	<u> </u>
		finely crystalline but not quite			
		aphanitic (individual crystals may be			
		picked up with IOX lens). <u>Composition</u> appears to be mainly Ca-feldspar, with			
		appears to be mainly Ca-feldspar, with			
		significant amounts of quartz (±10%)		 _	
		and amphiboles dominating as the Fe-			<u> </u>
		Mg minerals. Some rare large phenocryst	5		
		of epidote can also be seen.	 		
		This rock is probably the greenstone	f		
		member of the Cache Creek group.			
9.20		End of Drillhole			
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		CIVIL & GEOTECHNICAL ENGINEERS				
		GEOLOGIC DRILL HOLE LOG		. V	A 070	
CLIENT	B.C. Hydro			No. <u>V</u>		
PROJECT	HAT CREEK			No. P		_
SITE	Axis of Ash	Dam No 1A	SHEE	「 No	<u>1</u> 0	F <u>2</u>
CONTRA	CTOR: Becker	STARTEDM. Aug	. 23		19 7	<u>7</u>
OF		FINISHED .m. Aug mer Drilling CASING DIA.	140	mm		
		CASING DEPTH mond Coring CORE DIA.	5.0 BW	<u>3 m</u>		
LOCATIO		ELEVATIONS: DATUM				
	DEPARTURE	DRILL PLATFORM				
	INITIAL DIP	GROUND SURFACE	<u> </u>			
	OTHEP DIPS	BOTTOM OF HOLE WATER TABLE				
ДЕРТН	ROCK TYPE	DESCRIPTION	PRESS.		% RGD	% co
0.0			TEST	RUN		RE
5.03						
5.03	Basalt	Basalt		1.52	0	40
5.55		Dark green to greenish grey, yellow to rusty along fracture surfaces.				┣
		Core is composed of fragments rounded to				
	······································	subangular, from 6 mm to 40 mm.	<u> </u>			
		Recovered fragments are moderately				
		weathered but they probably represent the fragmental portion of a deeply				
		weathered saprolitic profile with the	İ			
	· · · · · · · · · · · · · · · · · · ·	deeply weathered products having been washed out by drill water.				
		Structure is dense and massive with no	╅───			
		finely crystalline to slightly porphyrit	ic.			
		Mild reaction to HCl due to thin calcite				┣─
		coatings on surfaces. Thin (hairline)				
		calcite - filled irregular cracks criss- crossing the rock mass. Rock appears				
		to have been brecciated and recemented	<u> </u>		<u></u>	}──
		by calcite.				
						<u> </u>
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1			1			<u> </u>
			 			

CLIENT	B.C. Hydro	GEOLOGIC DRILL HOLE LOG	JOB 1	No. VA	232	1
PROJEC	HAT CREEK		HOLE	No. P-	77-4	3
SITE	Axis of Ast	Dam No 1 A	SHEET	2 1 No. –	OF	2
DEPTH	ROCK TYPE	DESCRIPTION	PRESS.	LENGTH OF RUN	7	co RE
6.55	Basalt	Basalt. Same as 5.03 to 6.55.		1.52	0	50
8.08		Core pieces increase in size up to 60 -				
		90 mm.				┣—
	····					┢──
8.08	Basalt	Basalt Same as 7.77 to 8.08.		1.07	0	73
9.14	<u></u>	One half core piece 10 cm long with a	 			
<u> </u>	·····	6 to 12 mm thick calcite vein. Vein dips at 10 with core axis. One side of	┫			┫
		the vein appears slickensided but the				┢─
	······································	surface is guite weathered and weathering				
	·	is masking the striations.				
		One subhorizontal calcite vein ± 20 mm			.	┢
	· · · · · · ·	thick near bottom of run and several				┢
		irregular calcite veins around. It				┢──
		appears as if the rock has been brecciate	d			
		and recemented by calcite-rich solutions.				┣
		Mild to moderate reaction to HCL due to				┢──
		increased abundance of calcite-filled				†
		hairline cracks. The degree of weatherin	9			
	······································	is slowly decreasing with depth.	 			_
						┢──
9.14		End of Drillhole				<u> </u>
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	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	┟──┤			┣—
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		Klohn Leonoff Consultants Ltd.				
		GEOLOGIC DRILL HOLE LOG				
CLIENT	B.C. Hydro			No		
PROJECT	HAT CREEK		HOLE	No	P-77-	45
SITE	Axis of Ash	Dam No IA	SHEET	No	1_0	: <u>2</u>
CONTRACT	TOR:Becker	STARTED 2:30p.m. Aug.	20	<u>. </u>	. 19 _	77
METHOD OF DRILLING:		FINISHED .M. Aug. mer Drilling CASING DIA. 14 CASING DEPTH 1. CASING DEPTH 1. mond CORE DIA. BW	<u>u mm</u>			
LOCATION	DEPARTURE BEARING INITIAL DIP	ELEVATIONS: DATUM DRILL PLATFORM GROUND SURFACE ROCK SURFACE BOTTOM OF HOLE WATER TABLE				
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	% CORE REC.
0.0						
3.66 ()	reenstone altered olcanics)	Greenstone. Altered intermediate or basic volcanics representing the green- stone member of the Cache Creek group.		0.61	0	100
	instal	Dark greenish grey to grey, hard (cannot be scratched with knife)				
		Rock minerals partly altered to chlorite and/or epidote.				
		Slightly to moderately weathered. Rust stained along joint surfaces.				
		Rock mass has been subjected to shearing and exhibits a moderately developed schistosity (phyllitic structure). Some crudely developed mineral segregation with contorted dark bands	· · · · · · · · · · · · · · · · · · ·			
		(probably biotite). Core splits in places along these bands, with the split surface exhibiting a silky lustre and some slickensiding.				
		Very slight reaction to ^{HCI} caused by thin calcite coatings on joint and foliation surfaces.				
LOGGED B	Y R. Lope	DATE 28/09/77				

		Klohn Leonoff Consultants Ltd.				
		CIVIL B GEOTECHNICAL ENGINEERS GEOLOGIC DRILL HOLE LOG				
CLIENT	B.C. Hydro		JOB 1	No	/A 23	21
	HAT CREEK			No		
		n Dam No 1 A		 ۲ No. 4		
SITE	AXIS OF ASI		SHEET	[No. 4	OF	
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	% COR REC
3.66	Greenstone	Same as 3.05 to 3.66, moderately weathered		1.31	<u>`</u> a	8
4.97	<u>(altered</u>	3.96 - 4.27 contored foliation, slickens	ded			
	volcanics)	surfaces.				
4.97	Greenstone	Greenstone. Same as 3.05 to 3.66. High	V V	1.43	0	7
6.40	(phyllitic	contorted foliation throughout this run				
	structure)		 			
5.40	Greenstone	Greenstone. Same as 4.97 to 6.40		0.61	0	5
7.01	(phyllitic	moderately to strongly weathered in parts		ļ		
	structure)	Recovered only fragments up to 50 mm.				
		Some of these fragments indicate that the				
	·····	rock has been crushed and recrystallized				
7.01	Greenstone	Greenstone. Recovered only a few pebbles		1.37	0	0
8.38	(phyllitic	Rest of core probably lost in hole.				
	structure)	Same as 6.40 to 7.01				ŀ
		The entire core shows strong evidence of	1			
		being a fault zone.				
3.38		End of Drillhole				
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		Klohn Leonoff Consultants Ltd.				
CLIENT	B.C. Hydro		JOB 1	No	VA 23	<u>521</u>
	HAT CREEK		HOLE	No.	P77-	·47
SITE	CIVIL & GEOTECHNICAL ENGINEERS GEOLOGIC DRILL HOLE LOG JOB No. VA 2321 HAT CREEK P-77-47 HAT CREEK P-77-47 Axis of Ash Dam No 4 SHEET No. 1 OF 2 Itractor: Becker STARTED .M. Aug. 25 19 77 HOD SOIL Hammer Drijung CASING DIA. 140 mm LING: Rock Diamond Coring & Rotary CORE DIA. BW Ation: LATIUDE ELEVATIONS: Datum DEPARTURE BEARING ORCK SURFACE Matter Lenom Matter Lenom Mole No. VA 2321 Matter Lenom Matter Lenom Matter Lenom Matter Able Description Matter Lenom Matter Lenom Matter Lenom Matter Able Description Matter Lenom Matter Lenom Matter Lenom Matter Able Description Matter Lenom Matter Lenom Matter Lenom Matter Able Description Matter Lenom Matter Lenom Matter Lenom Matter Able Description Matter Lenom Matter Lenom Matter Lenom					
CONTR	ACTOR: Becker	STARTEDM. Aug.	25		. 19_	
METHO	SOIL H	ammer Drilling Casing Dia.	14(0 mm		
OF DRILLI		CASING DEPTH				
LOCATI	DEPARTURE BEARING INITIAL DIP	DRILL PLATFORM DRIUL PLATFORM GROUND SURFACE ROCK SURFACE BOTTOM OF HOLE				
DEPTH	ROCK TYPE	DESCRIPTION	PRESS.	OF	%	CORE
0.0						
40.84				1.52	0	17
42.37	• •					
[]						
	· · · · · · · · · · · · · · · · · · ·	Medium grey, Medium dense	TECHNICAL ENGINEERS DRILL HOLE LOG JOB No. VA 232 HOLE NO. P-77-4 HOLE NO. SHEET No. CASING DEPTH 40,84 m. SRotary CASING DEPTH 40,84 m. Brotary CASING DEPTH 40,84 m. Brotary CORE DIA. BOTION SURFACE BOTTOM OF HOLE WATER TABLE DESCRIPTION Yandesite on basand			
		Moderately weathered.				
		Bedding not noticeable. Rock is quite				
						<u> </u>
—					•••••	<u> </u>
	·····	quartz, calcic feldspar and some dark				
}{		minerals.	<u> </u>			<u> </u>
						
						<u> </u>
		surface.				
		This rock is probably a reworked tuff				
		or ash deposit, and probably should be defined as a greywacke.				
<u>├</u>	·					
LOGGE	D BYR. Lope:	DATE28/09/77				·

	B.C. Hydro	Kiohn Leonoff Consultants Ltd. CIVIL & GEOTECHNICAL ENGINEERS GEOLOGIC DRILL HOLE LOG		No. <u>V</u>	A 232	21
	HAT CREEK			No. 5		
PROJEC			HOLE	: No		*/
SITE	<u>Axis of As</u>	SHEE	T No. 2	OF	_2	
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST			co RE
and the second se	Sandstone	Same as 40.84 to 42.37. Core is		1.52	0	
43.89	(possiby	relatively intact with pieces from 25				
	greywacke)	to 100 mm long.				Ļ
		At top of core, one joint at 45° with	+			
†		core axis.				f
	······	At 43.43 one joint at 45° with c/a.				ļ
		Joint surface shows laminations	+	<u> </u>		
		(bedding) less than 1 mm thick, showing graded bedding.	+		┝	
			1			\mathbf{t}
		Laminations are subvertical indicating				
		that rock may have been upset tectonical	¥•	ļ		
	······	From 43.43 to 43.89 the core is split		<u> </u>		_
		along a vertical fracture, which is	+	<u> </u>	<u> </u>	
		probably a lamination surface. One	+	†		┢
		half of core is broken up; the other				
		half is relatively intact.				
		Deals in medium model durate t	+		<u> </u>	┣
		Rock is medium grey, medium dense, and moderately weathered in this run.	+		<u> </u>	┢─
						\mathbf{t}
43.89		End of Drillhole				
·	, , , , , , , , , , , , , , , , , , , 		<u> </u>			
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	· · · · · · · · · · · · · · · · · · ·		+	 i		┢
			<u> </u>	 	<u> </u>	<u>†</u>
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		Klohn Leonoff Consultants Ltd.				
		CIVIL & GEOTECHNICAL ENGINEERS				
CLIENT	B.C. Hydro	GEOLOGIC DRILL HOLE LOG	JOB I	No	VA 23	21
PROJEC	HAT CREEK		HOLE	No	P-77	-48
SITE	Axis of Ash			T No		
CONTR		STARTEDmAu	<u>19.2</u>	8	. 19 _	77
METHO OF	D SOIL Hamm	er Drilling CASING DIA. CASING DEPTH	140			
DRILLIN	NG: ROCK Diam	ond Coring CORE DIA.	BW			
LOCATI	DEPARTURE BEARING INITIAL DIP	ELEVATIONS: DATUM DRILL PLATFORM GROUND SURFACE ROCK SURFACE BOTTOM OF HOLE WATER TABLE				
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST		% RQD	C C RI
0.0						
6.10						
6.10	Sandstone	Fine to medium grained, uniform (well		1.37	0	6
7.48	and silty sandstone	sorted). Moderately cemented (can be broken with strong finger pressure and				-
	Sands Tone	grains rub off easily)				┢
		6.10 - 6.40. Moderately weathered.				
		Core consists of rounded pebbles up				
		to 25 mm. 6.40 - 7.48. Slightly to moderately	+	<u> </u>		┢╌
		weathered.intact core pieces up to	1			┢
		100 mm long.				
		7.31 - 7.41 Same as 6.10 to 6.40.		ļ		
		Colour medium to dark yellowish orange to yellowish brown.				-
		Generally medium dense and massive with				
		no apparent bedding or fracturing.				
		This run is thoroughly oxidized but not deeply weathered. Composition seems to				┝
		be mainly quartz with some accessory K-				
		spar and Na-spar.				
		This rock probably represents reworked	<u> </u>			┡
		<u>deposits of volcanic ash and tuff. Very</u> slight calcareous reaction.	+			┢
7.48	Clayey	Similar colour as 6.10 to 7.48 but core		0.46	0	9
7.92	sandstone	consists of irregular pieces of clayey sandstone softened by drill water.				⊢
		Sundstone softened by utilit water.				t
7.92	Pebbles	Pebbles of sandstone (similar to 6.10		1.83	0	
9.75		to 7.48) and greenstone (Cache Creek				
		Group) Only 4 round pebbles ±12 mm	1			┣
 -		recovered. Probably a poorly cemented				

		Klohn Leonoff Consultants Ltd.				
		CIVIL & GEOTECHNICAL ENGINEERS				
		GEOLOGIC DRILL HOLE LOG				
CLIENT	B.C. Hydro		JOB 1	No. X	A 232	21_
	HAT CREEK			Р	-77-4	48
PROJECT				No		
SITE	Axis of Ash		SHEET	[No		2
·		r	1			T
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	C (R
		conglomeratic layer			- ·· ·	_
9.75	Silty clayey	Silty-clayey_sandstone (recovered only		0.31	0	
10.06	sandstone	loose material), probably soft and poorly			¥	
	· · · · · · · · · · · · · · · · · · ·	<u>cemented, dark greenish grey, containing</u>				Ľ
		pebbles of dark greenish grey volcanics				Γ
		of (probably) Cache Creek greenstone.				
		Mildly calcareous.				
			ļ			ſ
10.06	Clayey	Clayey sandstone, recovered only 2 or 3				Ĺ
10.97	<u>sandstone</u>	pieces of core about 25 mm long which				
		are well indurated. Rest is loose sand	 			┨
		and softened core representing probably	 	I		┞
		clayey zones and zones of poor cementatio	p			
·····	<u> </u>	Eveball composition is 60% quartz and				╞
		40% Na-Ca feldspar and dark minerals or fragments of dark aphanitic volcanic	┣───┤			╋
		or tragments of dark appanitic volcanic				╋
	·····	rocks.		0 01	~	╂─
	<u></u>	Most fragments are subrounded and some are angular indicating only relatively	i	0.91	0	-
		short transport of the material. Medium	 			┢
		greenish grey, very slightly calcareous.				+-
_		ground group yor straining curculadus.	1			+
10.97	Clayey	Clayey sandstone. Same as 10.06 - 10.97.		2.29	0	T
13.26	sandstone	1 pebble rounded about 12mm size of hard			- v	\uparrow
		cemented volcanic tuff consiting of 3	<u> </u>			t
	·····	to 6 mm fragments of dark apparitie				t
		volcanic rock in a cherty groundmass.				t
		There are other sparse, rounded 6 to				
		12 mm size pebbles of chert and volcanics				Γ
		Slightly calcareous				Γ
13.26		End of drillhole				Ĺ
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	<u></u>	Kiohn Leonoff Consultants Ltd.				
		GEOLOGIC DRILL HOLE LOG				
CLIENT	B.C. Hydro		JOB 1	No	VA 23	21
PROJE	CTHAT_CREEK		HOLE	No	P -77 -	68
SITE	<u>Divide</u>		SHEET	「 No	10	F <u>3</u>
	RACTOR: Becker	STARTEDM	ept.	5	. 19 _	77
METHO		FINISHED MSe mmer_Drilling CASING DIA, CASING DEPTH	14(18) mm .90 m		<u>.</u>
LOCAT	ION: LATITUDE DEPARTURE BEARING INITIAL DIP	amond Coring CORE DIA.				
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	% CORE REC.
0.0 19.81						
19.81 20.42	Breccia	Fragments of volcanic rock, acidic to intermediate, (rhvolite-andesite), in a well cemented, fine grained matrix. Fragments are angular, ranging in size		0.61	0	80
		from medium sand to ±20 mm.				
		Rock is hard - moderately to highly weathered (1 core piece 25 mm long the rest is rubbly up to 25 mm).				
		Colour reddish brown with yellowish				<u> </u>
		mottling, Slight HCl reaction,				<u> </u>
20.42 21.95	Breccia	Same as 19.81 to 20.42. Reddish brown from 20.42 to 20.57, greenish grey below.		1.52	50	84
		Hard, moderately to slightly weathered				
		Intact core pieces up to 20 cm long.				
		Irregular fracturing. Strongly				
		weathered along fractures.				
	······	Slight HCL reaction caused by disseminated carbonate in rock mass.				
LOGGE	D BYR. Lope	DATE 28/09/77		<u> </u>		

		Kiohn Leonoff Consultants Ltd.				
CLIENT	B.C. Hydro		JOB 1	No. ¥	A_23	21
CLIENT	•	24-11-11-11-11-11-11-11-11-11-11-11-11-11				
PROJEC	HAT CREEK		HOLE	No	- / / - (
	Divide	ţ.	eucc	T No. 2		3
SITE			JHEE	/ NO. =	0F	
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	% CORE REC.
		Some calcite filling along joints.				
	· · ·					
21.95		Same as 20.42 to 21.95. Greenish grey		1.68	0	59
23.62	Breccia	with rust or reddish brown coloured				
		sections.		ļ	 	<u> </u>
				<u> </u>		<u> </u>
		Rock mass moderately weathered, strongly weathered along joints. Hard. 3 core	╂	<u> </u>		
		pieces 75 mm long. Rest is rubbly from				
		fine gravel to 40 mm.	†			
t			<u> </u>			<u>+</u>
			<u> </u>			
23.62		Same as 21.95 to 23.62		1.52	0	96
24.80	Breccia					
		24.38 - 24.80 strongly weathered to a	 			ļ
		porous friable mass. This section	ļ	 		
		exhibits slightly rounded pebbles and	 			
	· · · · · · · · · · · · · · · · · · ·	may represent a section having under gone some reworking and sorting by	<u> </u>			
		running water.	<u> </u>	<u> </u>		
			f			
		Rest of core is moderately to strongly	t			
		weathered. 7 relatively intact core				
Ì		pieces from 25 to 75 mm long. Rest of	1			
		core is rubbly from coarse sand to 25				
		to 40 mm fragments.				
			 	 		
	······	Come an 07 (0) to 04 00	 	h 01		05
24,80	Breccia	Same as 23,62 to 24.80 24,80 - 25.15 mudstone. Medium hard.	├ ───	D.91	0	95
<u>~)•/0</u>	DIECCIA	Appears to have been softened and	<u> </u>	├ ───		<u> </u>
-+		leached by drill water. Strongly				
		weathered greyish red.				
		25.15 - 25.76 conglomerate to breccia				
		texture. Tightly packed angular fragmen	ts	ļ		ļ
		from coarse sand to 75-100 mm in a dark				1
		greenish grey, well cemented matrix.			 	
		Pook mace of testing to moderate the second				
		Rock mass slightly to moderately weather joints moderately weathered. Very	ea			
		irregular fracturing. About 80% of core				
		consists of intact pieces 25 to 75 mm	<u> </u>			
		long. Rest is rubbly in the 3mm to 6 mm				
		· · · · · · · · · · · · · · · · · · ·	 			
			L	Ļ	L	L

		Kiohn Leonoff Consultants Ltd.				
	B.C. Hydro HAT CREEK	GEOLOGIC DRILL HOLE LOG	-		<u>A 232</u> 2-77-6	
PROJECT SITE	Divide				5_0F	
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST		% RQD	% CORE REC.
	· · · · · · · · · · · · · · · · · · ·	range.				
						
25.76	· · · · · · · · · · · · · · · · · · ·	Same as 24.80 to 25.76. 25.76-26.06		0.76	0	73
	Breccia	slightly weathered, intact core pieces 12 to 75 mm long.				
						— —
		26.06 - 26.53. Rubbly. Angular to sub- rounded fragments from 6 to 25 mm.				╂
		Strongly to moderately weathered.				
						┨────
						<u> </u>
26.52	· · ·	Breccia. Dark greenish grey.		0.91	0	33
<u></u>	Breccia	Moderately weathered.				──
		Recovered only rounded pebbles up to 40				
		mm size. Clasts seem to consist mainly				
·		of Permian greenstone types.				┟───
	·····					
						F
27.43		End of Drillhole.				╆
						<u></u>
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		<u> </u>				╆───
						
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		Kiohn Leonoff Consultants Ltd.		-		
CLIENT	B.C. Hydro	GEOLOGIC DRILL HOLE LOG	IOB	No. <u>V</u>	A 232	21
	CT HAT CREEK A	SH STORAGE DAMS		No DD		
SITE	Medicine Cr	1		T No		
CONTI		Drilling STARTED 8:00 P.M. FINISHED			_ 19 _	
METHO	DD SOIL <u>HQ</u> Mùd	Coring CASING DIA. circulation CASING DEPTH	_HQ			
DRILLI	I NG: ROCK <u>HQ</u> Wat	Coring Core DIA.	HQ			
LOCAT	TION: LATITUDE DEPARTURE BEARING INITIAL DIP	ELEVATIONS: DATUM ELEVATIONS: DATUM DRILL PLATFORM GROUND SURFACE ROCK SURFACE BOTTOM OF HOLE WATER TABLE		• [•] •		,
depth m	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST		% RQD	% CORI REC
0.0	Overburden	Drilled casing		1.52	N/A	_0.
	· · · · · · · · · · · · · · · · · · ·					
1.52 3.35	Overburden	1.52 - 2.44 Organic soil, dark brown		1.83	N/A	30
	· · · · · · · · · · · · · · · · · · ·	2.44 - 3.35 Rounded pebbles				
		l core piece 50 mm long (boulder)				
3.35	Overburden	Recovered core piece 75 mm		1.52	N/A	5
4.88		long (boulder) - material_is				
		medium grained arkose or sandstone of the coldwater deposits				
4.88	Overburden	Angular to subrounded pebbles		1.22	NZA	31
6.10		in matrix of medium chocolate brown, soft, medium plastic clay -				-
		200 mm long core piece at bottom of	1			
		row - sedimentary conglomerate of the coldwater beds.		 		
<u>6.10</u> 6.40	Overburden	Lost casing shoe in soft clay material - sample inside a casing		N/A	N/A	N/Ă
V. TV		tap is clay, sandy, medium chocolate	†			
		brown, medium to high plasticity, soft to medium stiff.				
	Overburden	CLAY, sandy to gravelly, medium chocolat	е	1.83	N/A	28
6.40 8.23	Overburden		÷	1.83	N/A	28
	Overburden	CLAY, sandy to gravelly, medium chocolat brown, medium stiff to stiff, medium	2	1.83	N/A	28

		Klohn Leonoff Consultants Ltd.				
		GEOLOGIC DRILL HOLE LOG				
•	D				7271	
CLIENT	BRITISH CO	DLUMBIA HYDRO	JOB 1	No. V <u>A</u>	2521	
PROJE	CT HAT CREEK	-ASH STORAGE DAMS	HOLE	No. D	DH-77	-50
	MEDICINE	CREEK DIVIDE	euce:	r No.2	05	8
SITE			JHEE	1 110	0F	<u> </u>
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	% COR REC
8.23	Overburden	Lost core		1.22	N/A	0
9.45					··	<u> </u>
9.45	Overburden	Lost core.		1.83	N/A	0
11.28						Ē
11 20	Quarburdez	Last core		1 22	N/A	0
<u> .28</u> 2.50	Overburden	Lost core.	+	1.22	N/ A	\vdash
	······································					
12.50	Overburden	CLAY, sandy to gravelly, medium		1.52	N/A	50
14.02		chocolate brown, softened by circulation, medium plasticity.			ļ	
						t
14,02	Overburden	Same as 12.50 to 14.02. Medium		1.52	N/A	13
15.54		stiff to stiff.				
15.54	Overburden	Same as 14.02 to 15.54	+	1.52	N/A	6
17.07						
17 07	Overburden	Same as 15.54 to 17.07 - large		1 57	N/A	13
18.59		(up to 38 mm) angular fragments of	+	1.72	117 M	
		rock.				
18 50	Overburden	Same as 17.07 to 18.59	+	52	N.A	15
20.12	Overburgen		+	1.74	<u>11.7</u>	
						Ļ
20.12 21.64	Overburden &	<u>20.12 - 21.24 - same as 18.59 - 20.12</u> 21.24 - 21.64	+	1.52	15	28
	ROCK	Conglomerate (sedimentary), well				
		cemented, hard, medium grey -				
		clasts appear to be mainly dark				
{		coloured basic volcanic rocks. Probably a boulder overlying bedrock -	+			
	······································					
		BEDROCK AT 21.64 m				<u> </u>
21.64	SILTSTONE	SILTSTONE, dark grey, dense, fissile		.61	30	90
22.25		core breaks easily along randomly	1			<u> </u>
	````	oriented planar surfaces				
22.25	SILTSTONE	same as 21.64 - 22.25		.61	90	100
22.86				01		
22.05						
	SILTSTONE &	same as 22.25 - 22.86. Crumbles easily	┥	1.52	30	100
0, 10		23.47 - 24.38 - Clayey, mudstone	┨───┤		_	<u> </u>
			1 1	I		

		GEOLOGIC DRILL HOLE LOG				
CLIENT	BRITISH CO	LUMBIA HYDRO	JOB N	No. <u>V</u>	A 232	<u>:1</u>
PROJE	CT HAT CREEK-	ASH STORAGE DAMS	HOLE	No. D	DH-77	/-50
SITE		REEK DIVIDE		No		
DEPTH	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	*	% CORI REC
	Mudstone	MUDSTONE - same as 23.47 - 24.38		1.52	50	65
25.91			<b>I</b>			ļ
25.91	SILTSTONE	SILTSTONE, dark grey, dense,	+	1.52	35	100
27.43		fissile, core breaks easily,			_	
		laminated	<b>_</b>			
27.43	SILTSTONE	SILTSTONE, dark brownish grey,	<u> </u>	1.52	60	100
28.96		dense, medium hard to	+			ļ
		hard towards bottom of run,				
		laminated. Core breaks easily	┇			<u> </u>
		along two sets of planes, one @80 degrees w.c.a. and the	+			┣──
	······································	other parallel to c.a.				
20.06				Т Е Л	50	
28.96	SILTSTONE	SILTSTONE, colour changing to dark greyish brown, very dense,		1.52	50	100
<u>JU.40</u>		hard, from 28.96 - 29.41 core				
		splits same as described for				
		<u>27.43 - 28.96 - Massive from 29.41 to</u> 30.48				<u> </u>
		29.41 - Sandy, calcareous zone				
		moderate reaction to HC!				
		29.41 - 30.48 - Clayey, mudstone-like	<b> </b>			<b>├</b>
	·	30.18 - Calcareous seam about				<u> </u>
	· · · · · · · · · · · · · · · · · · ·	13 mm thick, normal to c.a.				
		irregular, soft, strong reaction to				
		HCI - calcareous seams between 30.18 and 30.48	┣───			—
						┢──
	SILTSTONE	SILTSTONE, Medium to dark greenish grey, dense, medium hard.		1.52	90	100
32.00		grey, dense, medium hard.				ļ
		30.48 - 30.78 - Sandy zone, core breaks				
	<u> </u>		<u> </u>			┣──
			<u>+</u>			<u> </u>
			┣			<u> </u>
			+			├
	· · · · · · · · · · · · · · · · · · ·		+			<b> </b>
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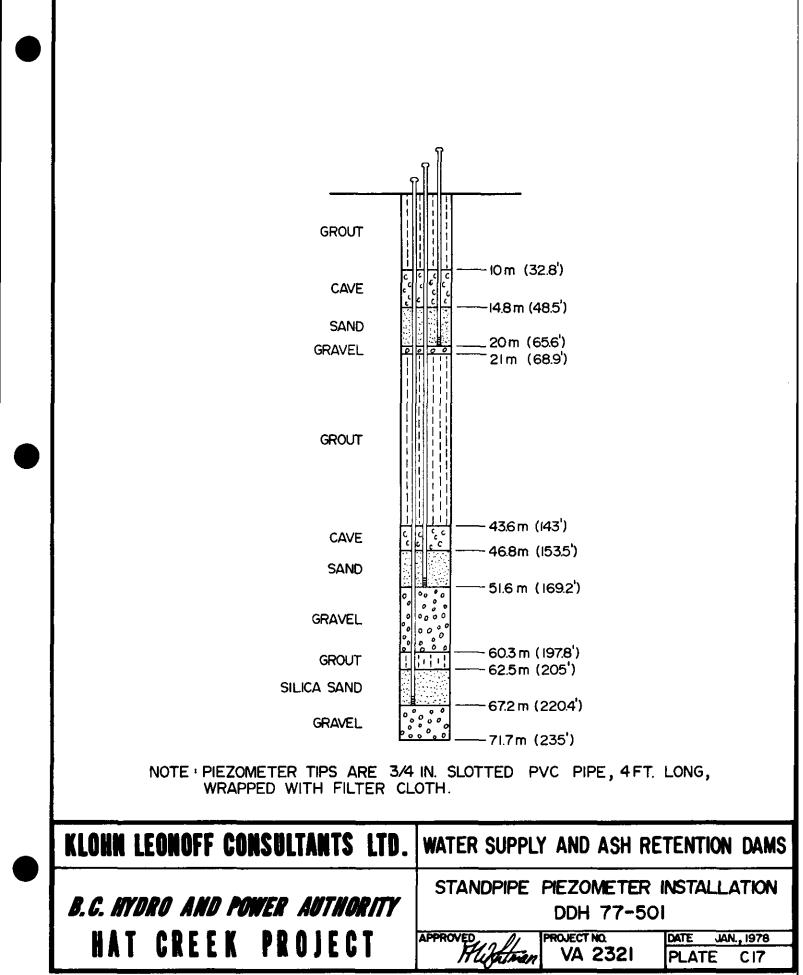
CLIENT       BRITISH COLUMBIA HYDRO       JOB No. VA 2321         PROJECT       HAT CREEK-ASH STORAGE DAMS       HOLE No.DDH-77-         SITE       MEDICINE CREEK DIVIDE       SHEET No.4_OF         DEPTH       ROCK TYPE       DESCRIPTION			CIVIL & GEOTECHNICAL ENGINEERS				
PROJECT       HAT CREEK-ASH STORAGE DAMS       HOLE No.DDH-77-         SITE       MEDICINE CREEK DIVIDE       SHEET No.4 OF         DEFINE       SHEET No.4 OF       OF         DEFINE       ROCK TYPE       DESCRIPTION       WATSH MOOTH WATSH br>WATSH MOOTH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH WATSH W			GEOLOGIC DRILL HOLE LOG			~~~	
SHTE       MEDICINE CREEK DIVIDE       SHEET No.4 OF         DEFTM       RECK TYPE       DESCRIPTION       WATEST NOTE % TEST NOTE % SOLVER SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF THE SALESS OF	CLIENT	BRITISH C	OLUMBIA HYDRO	JOB I	No. V <u>A</u>	252	<u> </u>
DEFTH         DESCRIPTION         WATER ENORM TEST         ENORM TEST           m         easily dark grey         20.78 - 31.39. Thin hairline laminations         8           g         10° W.C.A., probably calcareous         6         10° W.C.A., probably calcareous         6           g         10.39 - 32.00. Clayey(mudstone         10°         10°         10°           31.39 - 32.00. Clayey(mudstone         10°         10°         10°         10°           32.00 SILTSTONE         SILTSTONE, dense, massive, medium         1.52         30°           32.00 SILTSTONE         SILTSTONE, dense, massive, medium         1.52         30°           33.53         hard.         10°         1.52         30°           32.00 SILTSTONE         SILTSTONE, dense, massive, medium         1.52         30°           33.53         32.00 - 32.16. Fragments of volcanic         10°         10°           40°         32.7733.53. Clayey massive (mud-         10°         10°           33.53         SILTSTONE         SILTSTONE, dense, massive, soft to         1.52         80°           35.05         medium hard. medium to dark greyish         1.52         80°         15°         15°         15°         15°         15°         15°         15°         <	PROJECT	HAT CREEK	-ASH_STORAGE_DAMS	HOLE	No.DD	<u>H-77</u> -	-5
DEFTH m         ROCK TYPE         DESCRIPTION         WATES ENOTY TEST BUN TEST BUN BUNCAL PROBLEM BUNCAL	SITE	MEDICINE	CREEK DIVIDE	SHEE	T No.4	OF	: <u>8</u>
DESTIN         PESCRIPTION         PESS OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST         OF TEST <thof TEST         OF TEST         OF TEST</thof 							_
30,78 - 31.39. Thin hairline laminations         # 10° W.C.A., probably calcareous         (rock mass does not react to HCl)         31.39 - 32.00. Clayey(mudstone         structure, massive). Trace of sand.         32.00 SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE		ROCK TYPE	DESCRIPTION	PRESS.	OF	<b>%</b>	ŀ
8 10 ⁰ W.C.A., probably calcareous							╇
(rock mass does not react to HQI)         31.39 - 32.00. Clayey(mudstone         structure, massive). Trace of sand.         32.00 SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SI				<u>IS</u>			╇
31.39 - 32.00. Clayey(mudstone         structure, massive). Trace of sand.         32.00 SILTSTONE         31.53 hard.         33.53 hard.         32.00 - 32.16. Fragments of volcanic         tuff (probably andesite tuff, or         breccia)         32.16 - 32.77. Medium greenish grey.         changing to greyish brown, trace of         sand.         32.77 - 33.53. Clayey massive (mud-         stone like)         stone like)         35.05 medium hard, medium to dark greyish         brown.         34.29 - 35.05. Gradually sandier         colour changing to greenish grey.         gradual transition to volcanic         brown.         and sandstone near bottom of run.         brown.         and sandstone near bottom of run.         brown.         and sandstone near bottom of run.         colour changing to volcanic origin         jz.05 BRECCIA         BRECCIA, Possibly of volcanic origin         jz.05 BRECCIA         BRECCIA         groundmass, greyish green. Most of the         fragments seem to be of weathered         cach Creek greenstone. Massive.         hard.         36.04 ad 36.58. open, irregular joints							╈
structure, massive). Trace of sand.         32.00 SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SIL							t
32.00       SILTSTONE       SILTSTONE, dense, massive, medium       1.52       30         33.53       hard.       1.52       30         33.53       32.00 - 32.16, Fragments of volcanic       1.52       30         32.00 - 32.16, Fragments of volcanic       1.52       30         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11       1.11         1.11       1.11       1.11       1.11       1.11       1.11							T
33.53       hard.         32.00 - 32.16. Fragments of volcanic       tuff (probably andesite tuff. or         breccia)       32.16 - 32.77. Medium greenish grey.         32.16 - 32.77. Medium greenish grey.       changing to greyish brown, trace of         32.16 - 32.77. Jas.53. Clayay massive (mud-stone like)       32.77 - 33.53. Clayay massive (mud-stone like)         33.53 SILTSTONE       SILTSTONE, dense, massive, soff to       1.52 80         35.05       medium hard, medium to dark greyish       50.05         brown.       34.29 - 35.05. Gradually sandier       50.05         gradual transition to volcanic       preccia. interbedded sandy siltstone       51.05         breccia. interbedded sandy siltstone       1.52 60       36.58       0r deposited very near a volcanic         35.05 BRECCIA       BRECCIA, Possibly of volcanic origin       1.52 60         36.58       or deposited very near a volcanic       50.05         groundmass, greyish green. Most of the       66.04 and 36.58. open, irregular joints         at 20 W.C.A.       36.04 and 36.58. open, irregular joints       37.03 - 38.10. Highly weathered. Very         destroyed when extruded from sleeve.       37.64 - 37.80. Layer of siltstone,       37.64 - 37.80. Layer of siltstone,         37.64 - 37.80. Layer of siltstone,       37.64 - 37.80. Layer of siltstone,       37.64 - 37.80. Layer of siltstone			structure, massive). Trace of sand.				
33.53       hard.         32.00 - 32.16. Fragments of volcanic       tuff (probably andesite tuff. or         breccia)       32.16 - 32.77. Medium greenish grey.         32.16 - 32.77. Medium greenish grey.       changing to greyish brown, trace of         32.16 - 32.77. Jas.53. Clayay massive (mud-stone like)       32.77 - 33.53. Clayay massive (mud-stone like)         33.53 SILTSTONE       SILTSTONE, dense, massive, soff to       1.52 80         35.05       medium hard, medium to dark greyish       50.05         brown.       34.29 - 35.05. Gradually sandier       50.05         gradual transition to volcanic       preccia. interbedded sandy siltstone       51.05         breccia. interbedded sandy siltstone       1.52 60       36.58       0r deposited very near a volcanic         35.05 BRECCIA       BRECCIA, Possibly of volcanic origin       1.52 60         36.58       or deposited very near a volcanic       50.05         groundmass, greyish green. Most of the       66.04 and 36.58. open, irregular joints         at 20 W.C.A.       36.04 and 36.58. open, irregular joints       37.03 - 38.10. Highly weathered. Very         destroyed when extruded from sleeve.       37.64 - 37.80. Layer of siltstone,       37.64 - 37.80. Layer of siltstone,         37.64 - 37.80. Layer of siltstone,       37.64 - 37.80. Layer of siltstone,       37.64 - 37.80. Layer of siltstone	70.00			ļ	1 52	70-	+
32.00 - 32.16. Fragments of volcanic         tuff (probably andesite tuff, or         breecia)         32.16 - 32.77. Medium greenish grey,         changing to greyish brown, trace of         sand.         32.77 - 33.53. Clayey massive (mud-         stone lika)         35.05         medium hard, medium to dark greyish         brown.         34.29 - 35.05. Gradually sandler         colour changing to greenish grey.         gradual transition to volcanic         brown.         gradual transition to volcanic         brown.         stone ear bottom of run.         and sandstone near bottom of run.         35.05         BRECCIA         BRECCIA         BRECCIA         gradual transition to volcanic origin         1.52 60         source - irregular fragments up to         25 mm in cemented and welded sandy         gradual 36.58. open, irregular joints         at 20 W.C.A.         at 20 W.C.A.         36.58         11.52 70.51. Gradually weathered.         Yery         Yery         Stone deposited very near a volcanic         yery         source - irregular fragments up		STLISIONE		<u> </u>	1.92	- 00	+
interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfection       interfection         interfectin       interfection				<u> </u>			╈
breccia)       32.16 - 32.77. Medium greenish grey,         changing to greyish brown, trace of         sand.         32.7733.53. Clayey massive (mud-         stone like)         33.53 SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         Gradual transition to volcanic         Gradual transition to volcanic         Social and stone						<u> </u>	t
changing to greyish brown, trace of         32.77 - 33.53. Clayey massive (mud-         32.77 - 33.53. Clayey massive (mud-         stone Like)         33.53 SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         Gradual transition to volcanic         gradual transition to volcanic origin         1.52 60         or deposited very near a volcanic<			breccia)				Ţ
sand.       32.77 - 33.53. Clayey massive (mud-         32.77 - 33.53. Clayey massive (mud-       stone like)         33.53 SILTSTONE       SILTSTONE, dense, massive, soft to       1.52 80         35.05       medium hard, medium to dark greyish       1         35.05       medium hard, medium to dark greyish       1         35.05       medium hard, medium to dark greyish       1         35.05       gradual transition to volcanic       1         gradual transition to volcanic       1       1         gradual transition to volcanic       1       1         35.05       BRECCIA       BRECCIA. Possibly of volcanic origin       1.52 60         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1       1         36.58       or deposited very near a volcanic       1	<u> </u>					ļ	+
32.77 - 33.53. Clayey massive (mud- stone like)         33.53 SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         Gradual transition to valcanic         Gradual transition to valcanic         Source - irregular fragments up to         Source - irregular fragments up to <t< td=""><td></td><td></td><td></td><td><u> </u></td><td> </td><td> </td><td>+</td></t<>				<u> </u>			+
stone Lika)         33.53 SILTSTONE       SILTSTONE, dense, massive, soft to         35.05       medium hard, medium to dark greyish         brown.       34.29 - 35.05. Gradually sandier         colour changing to greenish grey.       gradual transition to volcanic         gradual transition to volcanic       gradual transition to volcanic         breccia. interbedded sandy siltstone       and sandstone near bottom of run.         35.05       BRECCIA         BRECCIA       BRECCIA. Possibly of volcanic origin         1.52       60         36.58       or deposited very near a volcanic         groundmass, greyish green. Most of the         groundmass, greyish green. Most of the         fragments seem to be of weathered         cache Creek greenstone. Massive.         hard.         36.04 and 36.58. open, irregular joints         at 20 W.C.A.         36.58       1.52 35         38.10       37.03 - 38.10. Highly weathered. Very         friable. Core almost completely       1         destroyed when extruded from sleeve.       37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.       37.34. Open irregular joint at					<b>.</b>		╉
33.53       SILTSTONE       SILTSTONE, dense, massive, soft to       1.52       80         35.05       medium hard. medium to dark greyish				t			$\dagger$
35.05       medium hard. medium to dark grevish         brown.       34.29 - 35.05. Gradually sandier         colour changing to greenish grev.       gradual transition to volcanic.         gradual transition to volcanic.       breecia. interbedded sandy siltstone         and sandstone near bottom of run.       and sandstone near bottom of run.         35.05 BRECCIA       BRECCIA. Possibly of volcanic origin         1.52 60       or deposited very near a volcanic         source - irregular fragments up to       25 mm in cemented and welded sandy         groundmass, greyish green. Most of the       fragments seem to be of weathered         cache Creek greenstone. Massive.       bard.         36.58 BRECCIA       BRECCIA - same as 35.05 - 36.58       1.52 35         38.10       37.03 - 38.10. Highly weathered. Very       1         friable. Core almost completely       destroyed when extruded from sleeve.       37.64 - 37.80. Layer of siltstone,         37.34. Open irregular joint at       37.44 - 37.44.       37.44 - 37.80.		·····					İ
brown.       34.29 - 35.05. Gradually sandier         colour changing to greenish grey.       gradual transition to volcanic         breccia. interbedded sandy siltstone       and sandstone near bottom of run.         35.05 BRECCIA       BRECCIA. Possibly of volcanic origin       1.52 60         36.58       or deposited very near a volcanic       and sandstone near bottom of run.         35.05 BRECCIA       BRECCIA. Possibly of volcanic origin       1.52 60         36.58       or deposited very near a volcanic       and sandstone near bottom of run.         35.05 BRECCIA       BRECCIA. Possibly of volcanic origin       1.52 60         36.58       or deposited very near a volcanic       and context for the source - irregular fragments up to         25 mm in cemented and welded sandy       at 20 mm in cemented and welded sandy       at 20 mm in cemented and welded sandy         at 20 W.C.A.       at 20 W.C.A.       at 20 W.C.A.       at 20 W.C.A.         36.58 BRECCIA       BRECCIA - same as 35.05 - 36.58       1.52 35         38.10       37.03 - 38.10. Highly weathered. Very       at 20 W.C.A.       at 20 W.C.A.         36.58 BRECCIA       BRECCIA - same as 35.05 - 36.58       1.52 35         38.10       37.03 - 38.10. Highly weathered. Very       at 20 W.C.A.       at 20 W.C.A.         37.64 - 37.80. Layer of siltstone, <t< td=""><td></td><td>SILTSTONE</td><td></td><td></td><td>1.52</td><td>80</td><td>Ţ</td></t<>		SILTSTONE			1.52	80	Ţ
34.29 - 35.05. Gradually sandier         colour changing to greenish grey.         gradual transition to volcanic         breccia. interbedded sandy siltstone         and sandstone near bottom of run.         35.05 BRECCIA         BRECCIA.         Gragments seem to be of weathered         Cache Creek greenstone.         Mard.         Ach         Ach         BRECCIA         BRECCIA.         BRECCIA. <td>35.05</td> <td><u> </u></td> <td></td> <td><b> </b></td> <td> </td> <td></td> <td>+</td>	35.05	<u> </u>		<b> </b>			+
colour changing to greenish grey.         gradual transition to volcanic.         breccia, interbedded sandy slitstone         and sandstone near bottom of run,         35.05 BRECCIA         BRECCIA, Possibly of volcanic origin         1.52 60         36.58         or deposited very near a volcanic         groundmass, greyish green. Most of the         groundmass, greyish green. Most of the         fragments seem to be of weathered         bard.         at 20 W.C.A.         36.58 BRECCIA         BRECCIA         BRECCIA         groundmass, greyish green. Most of the         fragments seem to be of weathered         bard.         at 20 W.C.A.         36.58 BRECCIA         BRECCIA         BRECCIA         BRECCIA         bard.         at 20 W.C.A.         at 20 W.C.A.         bard.         at 20 W.C.A.         bard.         colour strengt and strengt completely         destroyed when extruded from sleeve,         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at				<u> </u>			╉
gradual transition to volcanic         breccia, interbedded sandy siltstone         and sandstone near bottom of run,         35.05 BRECCIA         BRECCIA, Possibly of volcanic origin         1.52 60         36.56         or deposited very near a volcanic         25 mm in cemented and welded sandy         groundmass, greyish green. Most of the         fragments seem to be of weathered         Cache Creek greenstone. Massive.         hard.         36.58 BRECCIA         BRECCIA         BRECCIA         Groundmass, greyish green. Most of the         fragments seem to be of weathered         cache Creek greenstone. Massive.         hard.         36.04 and 36.58. open, irregular joints         at 20 W.C.A.         36.10 37.03 - 38.10. Highly weathered. Very         friable. Core almost completely         destroyed when extruded from sleeve.         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at				<u> </u>		<u> </u>	$\dagger$
breccia. interbedded sandy siltstone         and sandstone near bottom of run.         35.05 BRECCIA         BRECCIA. Possibly of volcanic origin         1.52 60         36.58         or deposited very near a volcanic         source - irregular fragments up to         25 mm in cemented and welded sandy         groundmass, greyish green. Most of the         fragments seem to be of weathered         Cache Creek greenstone. Massive.         hard.         36.58 BRECCIA         BRECCIA - same as 35.05 - 36.58         11.52 35         38.10         37.03 - 38.10. Highly weathered. Very         destroyed when extruded from sleeve.         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at							t
35.05       BRECCIA       BRECCIA. Possibly of volcanic origin       1.52       60         36.58       or deposited very near a volcanic       1.52       60         36.58       or deposited very near a volcanic       1.52       60         36.58       or deposited very near a volcanic       1.52       60         36.58       or deposited very near a volcanic       1.52       60         25       mm in cemented and welded sandy       1.52       1.52         9       groundmass, greyish green. Most of the       1.52       1.52         9       fragments seem to be of weathered       1.52       1.52         9       hard.       1.52       1.52       1.52         9       at 20       W.C.A.       1.52       35         36.58       BRECCIA       BRECCIA - same as 35.05 - 36.58       1.52       35         38.10       37.03 - 38.10. Highly weathered. Very       1.52       35         38.10       friable. Core almost completely       1.52       35         37.64 - 37.80. Layer of siltstone,       1.52       37.34. Open irregular joint at       37.34.			breccia, interbedded sandy siltstone				Ţ
36,58       or deposited very near a volcanic         source - irregular fragments up to         25 mm in cemented and welded sandy         groundmass, greyish green. Most of the         fragments seem to be of weathered         Cache Creek greenstone. Massive.         hard.         36.58 BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA         BRECCIA			and sandstone near bottom of run.				1
36.58       or deposited very near a volcanic         source - irregular fragments up to         25 mm in cemented and welded sandy         groundmass, greyish green. Most of the         fragments seem to be of weathered         Cache Creek greenstone. Massive.         hard.         36.58 BRECCIA         BRECCIA         BRECCIA         BRECCIA         Stroyed when extruded from sleeve.         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at	75 00 1		BRECCIA Possibly of volgenia origin		1 52	60	╀
source - irregular fragments up to         25 mm in cemented and welded sandy         groundmass, greyish green. Most of the         fragments seem to be of weathered         Cache Creek greenstone. Massive.         hard.         36.04 and 36.58. open, irregular joints         at 20 W.C.A.         36.58 BRECCIA         BRECCIA - same as 35.05 - 36.58         1.52 35         38.10         37.03 - 38.10. Highly weathered. Very         friable. Core almost completely         destroyed when extruded from sleeve.         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at				<u> </u>	<u> </u>	<u> </u>	+
25 mm       in cemented and welded sandy         groundmass, greyish green.       Most of the         fragments seem to be of weathered       Image: Cache Creek greenstone.         Mard.       Massive.         bard.       Image: Cache Creek greenstone.         Mard.       Image: Cache Creek greenstone.         Image: Cache Creek greenstone.       Image: Cache Creek greenstone.         Mard.       Image: Cache Creek greenstone.         Image: Cache Creek greenstone.       Image:							Ţ
fragments seem to be of weathered			25 mm in cemented and welded sandy				Ţ
Cache Creek greenstone. Massive.					<b> </b>	ļ	4
hard.       36.04 and 36.58. open, irregular joints         36.04 and 36.58. open, irregular joints       at 20 W.C.A.         36.58 BRECCIA       BRECCIA - same as 35.05 - 36.58       1.52 35         38.10       37.03 - 38.10. Highly weathered. Very       1         friable. Core almost completely       1         destroyed when extruded from sleeve.       1         37.64 - 37.80. Layer of siltstone,       1         medium brown, very friable, dense.       37.34. Open irregular joint at					<b> </b>	┣──	╉
36.04 and 36.58. open, irregular joints         at 20 W.C.A.         36.58 BRECCIA         BRECCIA         BRECCIA         37.03 - 38.10.         Highly weathered.         Very         friable.         Core almost completely         destroyed when extruded from sleeve.         37.64 - 37.80.         Layer of siltstone,         medium brown, very friable, dense.         37.34.				<u> </u>	<u> </u>	├	╉
at 20 W.C.A.         36.58 BRECCIA       BRECCIA - same as 35.05 - 36.58       1.52 35         38.10       37.03 - 38.10. Highly weathered. Very       1         friable.       Core almost completely       1         destroyed when extruded from sleeve.       37.64 - 37.80. Layer of siltstone,       1         medium brown, very friable, dense.       37.34. Open irregular joint at       1							╋
38.10       37.03 - 38.10. Highly weathered. Very         friable. Core almost completely         destroyed when extruded from sleeve.         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at			at 20 W.C.A.				I
38.10       37.03 - 38.10. Highly weathered. Very         friable. Core almost completely         destroyed when extruded from sleeve.         37.64 - 37.80. Layer of siltstone,         medium brown, very friable, dense.         37.34. Open irregular joint at						7.	1
friable. Core almost completely destroyed when extruded from sleeve. 37.64 - 37.80. Layer of siltstone, medium brown, very friable, dense. 37.34. Open irregular joint at		SKEUUTA		ļ	1.52	<u>ככ</u>	╇
destroyed when extruded from sleeve. 37.64 - 37.80. Layer of siltstone, medium brown, very friable, dense. 37.34. Open irregular joint at	20.14		friable. Core almost completely				╋
37.64 - 37.80. Layer of siltstone, medium brown, very friable, dense. 37.34. Open irregular joint at							t
37.34. Open irregular joint at			37.64 - 37.80. Layer of siltstone,				Ţ
37.34. Open irregular joint at			medium brown, very friable, dense.				I
			<u>37.34. Open irregular joint at</u>			L	1

m       SILTSTONE       SILTSTONE, medium to dark brown, dense,       1.22       25         39.32       medium hard, frlable,       1.22       25         39.32       38,56 - 38,80 - Breccia layer, same as       1.22       25         31.05       36,55 - 36,58       - One 50 mm chert pebble at top of run			CIVIL & GEOTECHNICAL ENGINEERS				
CLIENT       BRITISH COLUMBIA HYDRO       JOB No. VA 232         PROJECT       HAT CREEK-ASH STORAGE DAMS       HOLE No.0DH-77         SITE       MEDICINE CREEK DIVIDE       SHEET No.5_O         DEFIN       RESCRIPTION       WATERLENOTH RESS FOR NO.5_O         B.O       SILTSTONE       SILTSTONE, medium to dark brown, dense, 35.05 - 36.58       1.22 25         39.32       medium hard, friable.       1.22 25         39.32       38.65 - 38.80 - Breccia layer, same as 0 no 50 mm chert pebble at top of run (may have failen from above)       .         39.32       SLITSTONE, medium to dark brown, very 38.65 - 38.80 - open joints at 30° W.C.A       .         39.32       SLITSTONE, medium to dark brown, very 39.33       .         39.32       Gense, massive, medium hard. Intact       .         39.33       Gense, massive, medium hard. Intact       .         39.34       Gore piece 450 mm long.       .       .         39.35       JOB A.G.B. from 40.39 - 40.64       .       .         MIDTONE       39.32 - 39.33       .       .       .         39.35       Gore piece 450 mm long.       .       .       .         39.35       Gore piece 450 mm long.       .       .       .       .         39.35       JOB OBAR B			GEOLOGIC DRILL HOLE LOG				
PROJECT       HAT CREEK-ASH STORAGE DAMS       HOLE No ^{DDH-77} SITE       MEDICINE CREEK DIVIDE       SHEET No. ⁵ O         DEFIN       ROCK TYPE       DESCRIPTION       Writes worr Writes or Writes worr Writes or Writes worr Writes or Writes worr Writes or Writes worr Writes worr W				100		2321	
SHEET No.5_0           MEDICINE CREEK DIVIDE           DESCRIPTION         WATER ENGOME TEST         NATER ENGOME TEST          NATER ENGOME TEST <td>CLIENT</td> <td>DKITISH C</td> <td></td> <td>JOBI</td> <td>NO. 10</td> <td></td> <td></td>	CLIENT	DKITISH C		JOBI	NO. 10		
DEFTH         ROCK TYPE         DESCRIPTION         WATER ENOTE TEST         PUN         ROD           38,10         SILTSTONE         SILTSTONE, medium hard, friable.         1.22         25           39,22         38,56 - 38,80 - Breccla layer, same as         1.22         25           39,22         38,56 - 38,80 - Breccla layer, same as         1         1           0ne 50,mm chert pebble at top. of run.         1         1         1           (may have fallen from above)         38,65 - 38,86 - open joints at 30° W.C.A         1           39,32         SILTSTONE         SILTSTONE, medium hard. Intact         1           (core plece 450 mm long.         1         1         1           39,93         dense. massive. medium hard. Intact         1         1           (core plece 450 mm long.         1         1         1         1           39,93         SILTSTONE         39,93 - 40-08, silfstone, same as         1         1           39,93         SILTSTONE         39,93 - 40-08, silfstone, same as         1         1           41.45         BRECCIA         39,32 - 30-36,58, from 40,39 - 40,84         1         1           41.45         BRECCIA         30,35,5 - 36,58, from 40,39 - 40,84         1         1	PROJE	CTHAT_CREEK	-ASH STORAGE DAMS	HOLE	No.DD	<u>H-77-</u>	-50
DEFINI         RECK TYPE         DESCRIPTION         PRESS of TEST         OF RESS         OF RESS <thof RESS         OF RESS         OF RESS</thof 	SITE	MEDICINE	CREEK DIVIDE	SHEE	T No.5	OF	8
38.10       SILTSTONE       SILTSTONE, medium to dark brown, dense, inclusion medium hard, friable.       1.22         39.32       medium hard, friable.       1.22         38.56       -38.80       Breccia layer, same as inclusion medium hard, friable.       1.22         35.05       -36.58       0.80       Breccia layer, same as inclusion medium hard.       1.22         36.65       -38.86       - Breccia layer, same as inclusion medium hard.       1.22       25         39.32       SILTSTONE       SILTSTONE, medium to dark brown, very inclusion medium hard.       61       75         39.32       SILTSTONE       SILTSTONE, medium to dark brown, very inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium inclusion medium incl	DEPTH	ROCK TYPE	DESCRIPTION	PRESS.	OF	%	C C R I
38,56 - 38,80 - Breccia layer, same as         35,05 - 36,58         One 50 mm chert pebble at top of run         (may have fallen from above)         38,65 - 38,86 - open joints at 30° W.C.A         39,32         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         SILTSTONE         39,93         dense, massive, medium hard. Intact         core piece 450 mm long.         39,93         SANDSTONE         40,08 - 40,08, breccia, same as         highly weathered to a plastic, probably         montmorillonite - rich clay, soft         40,39 - open joint at 30° W.C.A.         40,39 - open joint at 30° W.C.A.         40,39 - open joint at 30° W.C.A.         41,45         BRECCIA and         BRECCIA probably of sedimentary origin-         41,45         BRECCIA and         BRECCIA and         BRECCIA and         BRECCIA probably of sedimentary origin-         41,45         BRECCIA probably of sedimentary origin-         41,45         BRECCIA and         BRECCIA and genetic, wave wall cemented, uneathered, geney to greanish grey.         <	38,10	SILTSTONE	SILTSTONE, medium to dark brown, dense,				10
35.05 - 36.58         One 50 mm chert pebble at top of run         (may have fallen from above)         38.65 - 38.86 - open joints at 30° W.C.A         39.32       SILTSTONE         SILTSTONE       SILTSTONE, medium to dark brown, very         .6175         39.32       SILTSTONE         SILTSTONE       SILTSTONE, medium hard. Intact         .6175         39.93       dense. massive, medium hard. Intact         .775       39.93         .775       SILTSTONE         39.93       SILTSTONE         .797       SILTSTONE         .798       SILTSTONE         .799       SILTSTONE         .775       SANDSTONE         .775       .775         .775       SANDSTONE         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775         .775       .775							
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41.54, 41.82, 42.06 and 42.82. Open         fractures normal to c/a.         42.98         BRECCIA and         Same as 41.45 - 42.98. Sandstone from         44.50         SANDSTONE         44.07 - 44.50.         Partially weathered,         medium hard, friable.         44.38. Seam of soft, plastic clay         (probably weathering product of breccia         material).         44.50         SANDSTONE and         SANDSTONE ANDSTONE, similar composition and				┨	<u> </u>		┢
42.98       BRECCIA and       Same as 41.45 - 42.98.       Sandstone from       1.52 80         44.50       SANDSTONE       43.46 - 44.07.       Image: Constraint of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second			well cemented.				┢
42.98       BRECCIA and       Same as 41.45 - 42.98.       Sandstone from       1.52 80         44.50       SANDSTONE       43.46 - 44.07.       Image: Constraint of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second			41.54, 41.82, 42.06 and 42.82. Open	<u>├</u> ───			╋
42.98       BRECCIA and       Same as 41.45 - 42.98. Sandstone from       1.52 80         44.50       SANDSTONE       43.46 - 44.07.       1.52         44.07 - 44.50.       Partially weathered.       1.52         medium hard, friable.       1.52       1.52         44.38.       Seam of soft. plastic clay       1.52         (probably weathering product of breccia       1.52         44.50       SANDSTONE and       SANDSTONE, similar composition and					<u>+</u>	<b>-</b>	╈
44.50       SANDSTONE       43.46 - 44.07.         44.07 - 44.50.       Partially weathered,         medium hard, friable.       44.38.         44.38.       Seam of soft, plastic clay         (probably weathering product of breccia       1         material).       1.52         44.50       SANDSTONE and       SANDSTONE, similar composition and				<b> </b>	1	<u> </u>	1-
44.50       SANDSTONE       43.46 - 44.07.         44.07 - 44.50.       Partially weathered,         medium hard, friable.       44.38. Seam of soft, plastic clay         44.38.       Seam of soft, plastic clay         (probably weathering product of breccia         material).         44.50         SANDSTONE and         SANDSTONE and	42.98	BRECCIA and	Same as 41.45 - 42.98. Sandstone from		1.52	80	10
medium hard, friable.       44.38. Seam of soft, plastic clay         44.38. Seam of soft, plastic clay       9         (probably weathering product of breccia       9         44.50       SANDSTONE and       1.52	44.50	SANDSTONE	43.46 - 44.07.				
44.38. Seam of soft, plastic clay       (probably weathering product of breccia         (probably weathering product of breccia       (and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s							
(probably weathering product of breccia           material).           44.50         SANDSTONE and         SANDSTONE, similar composition and         1.52         98			medium hard, friable.	ļ	ļ	<b> </b>	ļ
material).     44.50     SANDSTONE and     SANDSTONE, similar composition and     1.52     98			44.38. Seam of soft, plastic clay		<b> </b>	<u> </u>	┨
44.50 SANDSTONE and SANDSTONE, similar composition and 1.52 98				<u>}</u> -	<u> </u>	}	┨
					<u> </u>		╀╌
	14,50	SANDSTONE and	SANDSTONE, similar composition and	1	1.52	98	To
40.VZ L DKEUVIA I COLOUR AS THE DRECCIA DUT TIME TO I I I		BRECCIA	colour as the breccia but fine to			<u> </u>	f
medium sand grain size dominating, with						<u> </u>	<b>†</b>

		CIVIL & GEOTECHNICAL ENGINEERS				
		GEOLOGIC DRILL HOLE LOG				
		COLUMBIA HYDRO		No. V.	A 232	21
CLIENT	DRITISH		JORI	NO		
PROJE	CT HAT CREE	K-ASH STORAGE DAMS	HOLE	No,DD	H77- <u>5</u>	01
SITE	MEDICINE	CREEK DIVIDE	SHEE	t No	<u>6</u> of	_8
DEPTH M	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	c c R I
		volcanic rock, dense, massive, hard				
		unweathered.				
		44,40 - 44,65 and 45.11 - 45.41				
		Breccia, hard, massive, unweathered.	ļ			
16 00				1 50	100	
46.02 47.55	BRECCIA	BRECCIA. same as 45.11 - 45.41		1.52		<u>1'''</u>
						L
	BRECCIA and	47.55 - 47.85, same as 46.02 - 47.55	ļ	1.68	90	10
49,23	SANDSTONE	47.55, open joint at 30 W.C.A.	┣────			
		47.85 - 49.23, sandstone, same as	┥────			╞
		<u> </u>	<u> </u>			+-
49.23	SANDSTONE	49.23 - 50.47, sandstone same as		1.52	95	10
50.75		44.50 - 46.02				
		50.47 - 50.75, breccia, same as				Γ
		45.11 - 45.41, finer grains near 50.47				
		grading into coarser grains.	<b> </b> -		ļ	<b> </b>
50 75	BRECCIA and	Interbeddings of medium grained	<b> </b> -	1.52	95	$\frac{1}{10}$
	SANDSTONE	sandstone at 50.90, 51.36, open joint		1.52		ľ
22,21	<u>ornibo rone</u>	at 52.12 30 W.C.A.	1			<u> </u>
		Breccia characteristically fine				$\vdash$
		grained beneath sandstone beds.				
FO 07					05	
	BRECCIA	BRECCIA, hard unweathered, massive		1.37	22	10
<u>53,64</u>		53.19 open fracture @ 90°W.C.A. 53.49 - 150 mm sandstone layer.				┢
		brownish red. medium grained.				┢╴
						Γ
	BRECCIA	BRECCIA, same as 52.27 - 53.64		1.52	95	95
55.17		53.80 - one open joint and one conjugate				
		calcite healed joint at 45° W.C.A.				┣
		54.56 - open, irregular joint at 20				┢
		W.C.A.				┢
55.17	BRECCIA	BRECCIA, same as 52.27 - 53.64 very	†			┢
56.69		coarse grained.				
FC F0			ļ			
	BRECCIA	BRECCIA, moderately weathered, soft	<u> </u>	1.52	40	80
58.22		and brecciated beginning at 56.69 m. Some portions of the rock are fragmented				╂
		or weathered to gravel size pebbles and				$\vdash$
		show advanced kaolinization - kaolinized				⊢
		zones appear to correspond with zones of	_			┢
		pumice clasts. Numerous slickensided				$\vdash$
		joints exhibiting advance weathering of				
-		the joint surface. Secondary Pyrite	1			

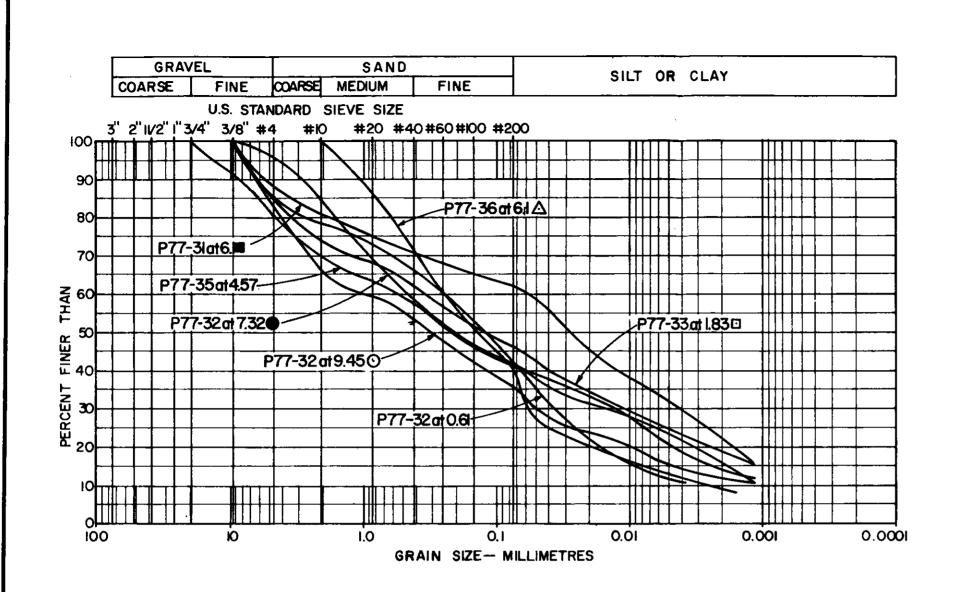
		GEOLOGIC DRILL HOLE LOG				
CLIENT	BRITISH	COLUMBIA HYDRO	JOB N	10. V <u>A</u>	2321	
PROJE	CTHAT_CREE	K-ASH STORAGE DAMS	HOLE	NoDD	<u>+-77-</u>	-5(
SITE	MEDICINE	CREEK DIVIDE	SHEET	г _{No} .7_	OF	_
DEPTH M	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST		% RQD	c 8
		deposits along joint suffaces. Hole				
		was flowing about   g.p.m. between				
		56.69 and 58.22.				┞
		57.45 - broken up core, advanced	- · · ·			┝
		kaolinization. 57.61, slickensided joint at 20° W.C.A.	<u></u>			╉
		slickenside traces at app. 20				$\mathbf{t}$
	<u></u>	w/horizontal.				t
		58.06, slickenside joint @ 10° W.C.A.				T
		56.69 is the beginning of a fault zone.				
						Γ
	BRECCIA	Highly weathered, rubbly, mainly sand		.61	0	10
58 <b>.8</b> 3		and gravel sizes. Lost core probably				Ļ
	·····	represents kaolinized material.				╞
50.07						
	BRECCIA	58.83 - 59.13, same as 58.22 - 58.83	<u> </u>	<u>.92</u>	15	μ(
59.74		59.13 - 59.74, alightly to moderately	}			╀
		weathered, relatively intact core pieces.	<b> </b>			+
	<u></u>	59.13 - 59.44., broken core, rust				+
		stained along fractures 6 mm thick cale	ita 1			t
		stained along fractures. 6 mm thick calc or dolomite vein at 80° W.C.A. at 59.28.				Γ
	BRECCIA	59.75 - 60.50, same as 59.13 - 59.74		1.52	15	Ē
61.26		60.50 - 61.26. highly weathered and				
		kaolinized core.				-
						┞
		60.05, iron stained joint at 20 W.C.A.				┝
		Calcite or dolomite-coated joint at				┢
		<u></u>				╞
61.26	BRECCIA	Same as 59.74 - 60.50, secondary Pyrite	†			†
62.79		on fractures. 62.33 - 62.48.			·····	t
		Fragmented, kaolinized.				
	BRECCIA	Slightly to moderately weathered.		1.37	40	10
64.16		Highly fractured, numerous clasts of				
		pumice with little or no kaolinization.		<u> </u>		
	····· •·••••••	63.70 - 64.01. Open joint @ 30° W.C.A.	<b> </b>			╞
		64.01. End of fault zone.				┢
		USANTA EIN OF FAULT ZORE.				+
64.16	BRECCIA	Unweathered, hard, dense.		1.52	90	10
65.68		64.31 - small fractured zone				Ë
		64.77 - open joint at 40 W.C.A.				t
1						
	······································					
	·······	64.77 - 65.68, core rust stained. 65.53 - 100 mm zone moderately				

		Kiohn Leonoff Consultants Ltd.				
		GEOLOGIC DRILL HOLE LOG				
CLIENT	BRITISH	COLUMBIA HYDRO	JOB 1	40. V <u>A</u>	2321	
00015		K-ASH STORAGE DAMS		No.DD	H <b>-</b> 77-	-50
PROJE						
SITE		CREEK DIVIDE	SHEET	1 No.8	OF	_8
DEPTH M	ROCK TYPE	DESCRIPTION	WATER PRESS. TEST	LENGTH OF RUN	% RQD	9 CC RE
	BRECCIA	Breccia, hard, dense, massive		1.52	90	10
67.21		unweathered, rust-stained core alternation	ng			
<u> </u>		fine and coarse grained layers. 65.99 - slickensided joint @ 20° W.C.A.				
		65.99 - slickensided joint @ 20 W.C.A.	<u>                                     </u>			Ļ
	}	Slickensides dipping 20° with horizontal				┨──
	<u> </u>	Joint surface weathered, rust-stained.	<u> </u>			-
67.21	BRECCIA	Same as 65.68 - 67.21		.92	60	10
68.12		Somewhat more fractured.	t			ť
00.14	1	67.21 - 67.51, fractured. Fracture	1			1
	†	surfaces polished or slickensided.	1			1
68,12	BRECCIA	68.12 - 69.04, Breccia, same as		1.52	95	10
69.65		67.21 - 68.12				
		68.88 - irregular open joint @ 10	ļ			<u> </u>
<u></u>	<b>-</b>	W.C.A	<b> </b>			
<u> </u>		69.04 - 69.65 - sandstone -	<u> </u>			┥──
		dense, massive, unweathered, dark				+
		greenish brown. 3 to 6 mm thick.	-			+
		69.65 - END OF HOLE				
, <u>,</u>			<u> </u>			+-
		NOTES:	<b>↓</b>	<b>}</b>		+
	<u> </u>	1. All depths from drill platform,	┨────	<u> </u>	ļ	+
		380 mm above ground.				
			<u> </u>			
		2. Drill hole located halfway between	<u> </u>	<b>├</b>		+
		sta. 15 and sta. 16 of Seismic Line.		<b> </b>		+
			<del> </del>	t		╂──
			1	<u> </u>		1
			<u>t</u>			
			L			
				L		
				ļ		╂
			<b> </b>	<b> </b>	ļ	_
			┣			┢
			<del> </del>			┢
				<b> </b>		╉──
			<u> </u>	<u> </u>	<u> </u>	+
	· · · · · · · · · · · · · · · · · · ·		<u>†</u>	<b> </b>		
			<u>†                                    </u>	1	·	†

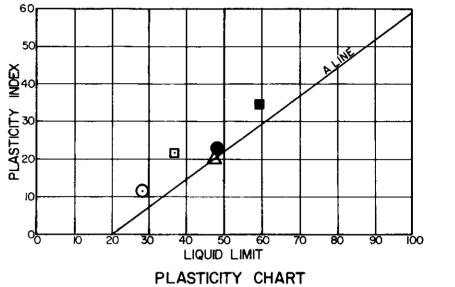


APPENDIX IX

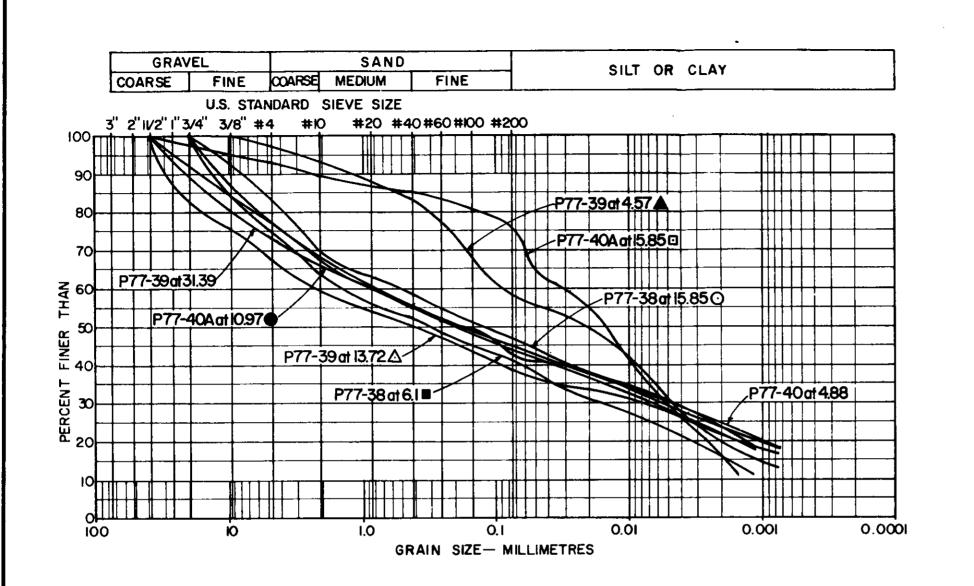
Grain Size and Atterberg Limit Test Data Plate Nos. C18 to C22



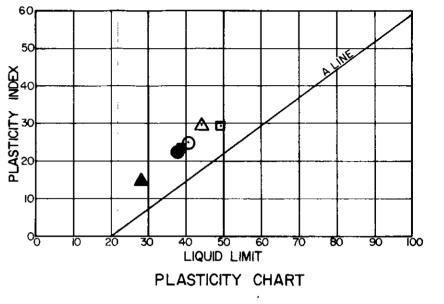
KLOHN LEONOFF CONSULTA B.C. HYDRO AND POWER AD HAT CREEK PROJ



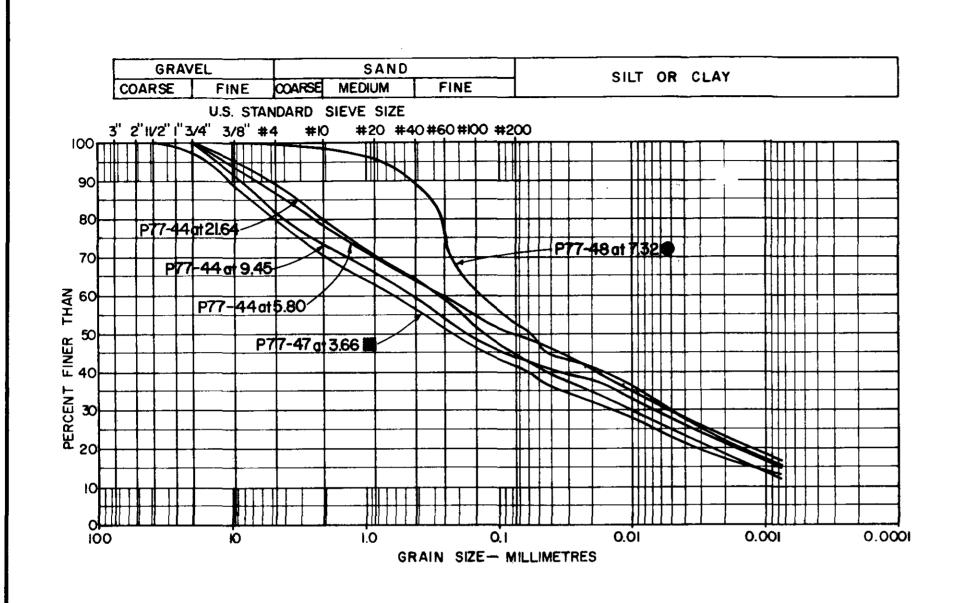
LTANTS LTD.	WATER SUPPLY	( AND ASH RE	TENTION DAMS
AUTHORITY		ex test d Er supply	
OJECT	APPROVED HUrman	PROJECT NO. VA 2321	DATE JAN, 1978 PLATE C18



KLOHN LEONOFF CONSULTA B.C. MYDRO AND POWER AND HAT CREEK PROJ

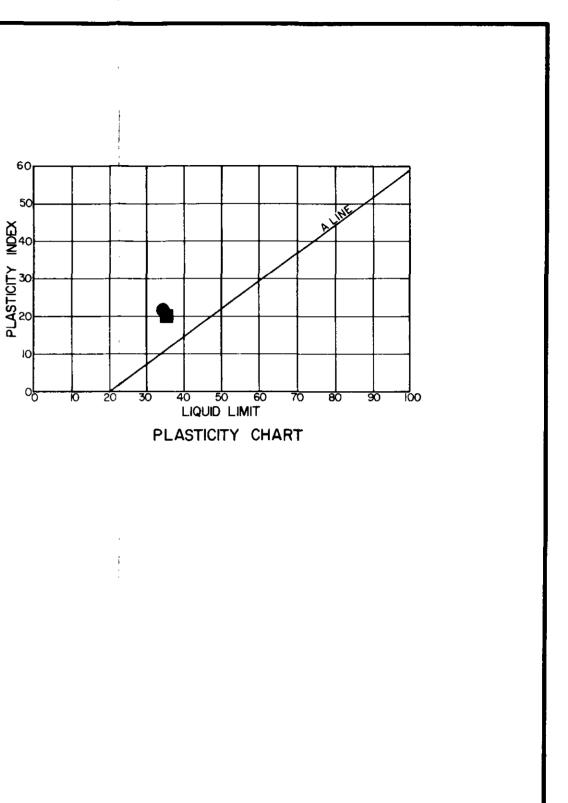


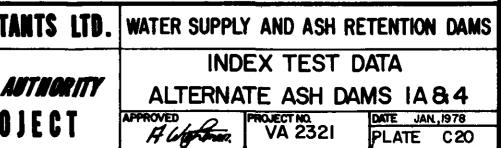
LTANTS LTD	. WATER SUPPLY	Y AND ASH RE	TENTION DAMS		
AUTHOR/TY	-	INDEX TEST DATA ASH RETENTION DAM			
OJECT	APPROVED A Las Ama	PROJECT NO.	DATE JAN, 1978 PLATE C 19		

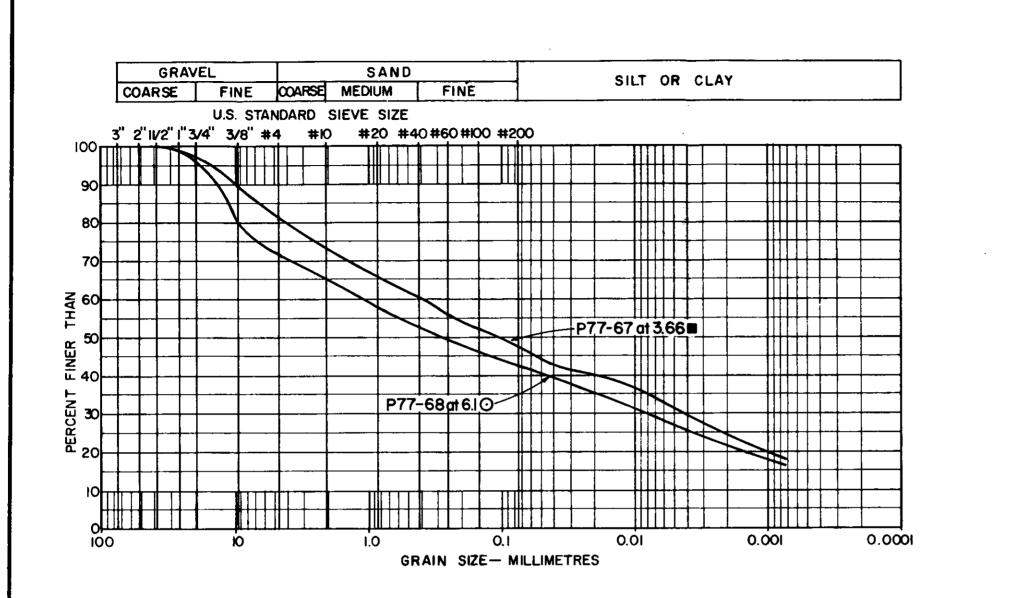


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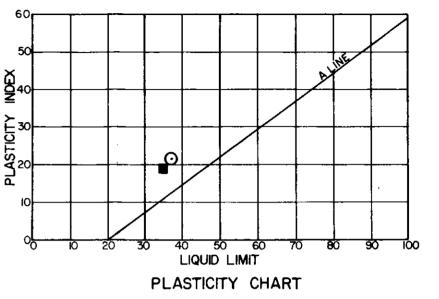
KLOHN LEONOFF CONSULTANTS LTD. B.C. MYDRO AND POWER AUTHORITY NAT CREEK PROJECT



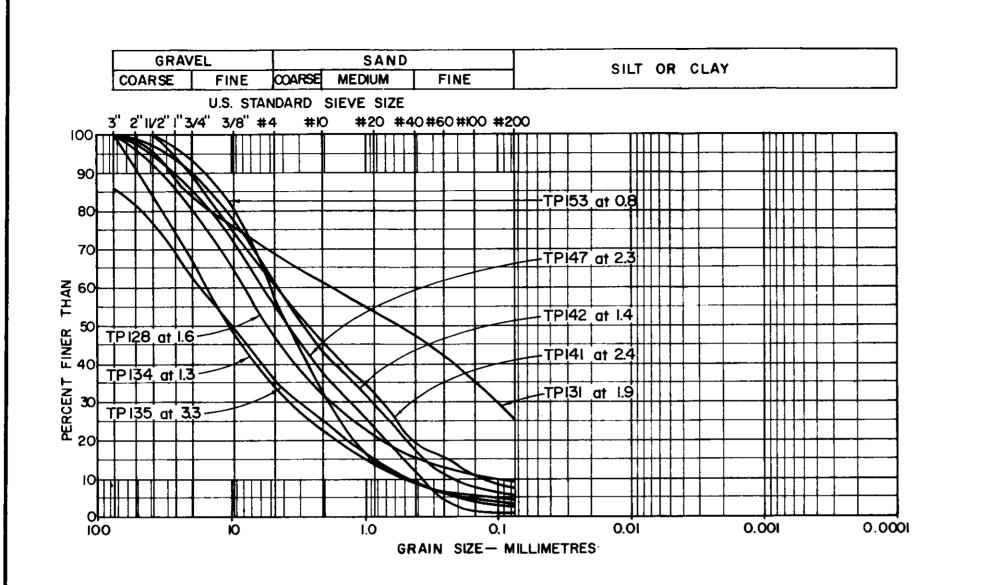




KLOHN LEONOFF CONSULTA B.C. Hydro and Power Ad Hat creek proj



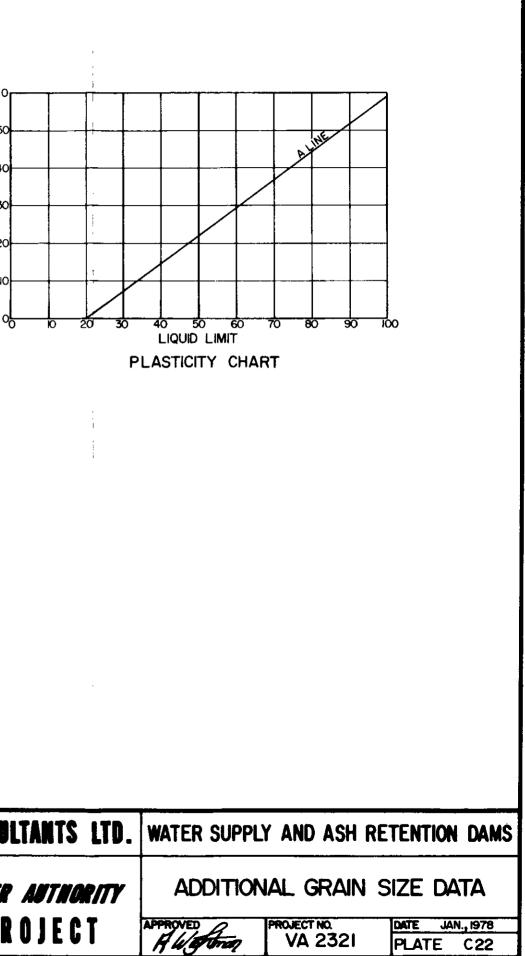
TANTS LTD.	WATER SUPPLY	( AND ASH RE	TENTION DAMS
AUTHORITY	MEDICI	ex test d Ne creek	DIVIDE
OJECT	APPROVED A Wyntmae	PROJECTINO. VA 2321	DATE JAN, 1978 PLATE C21



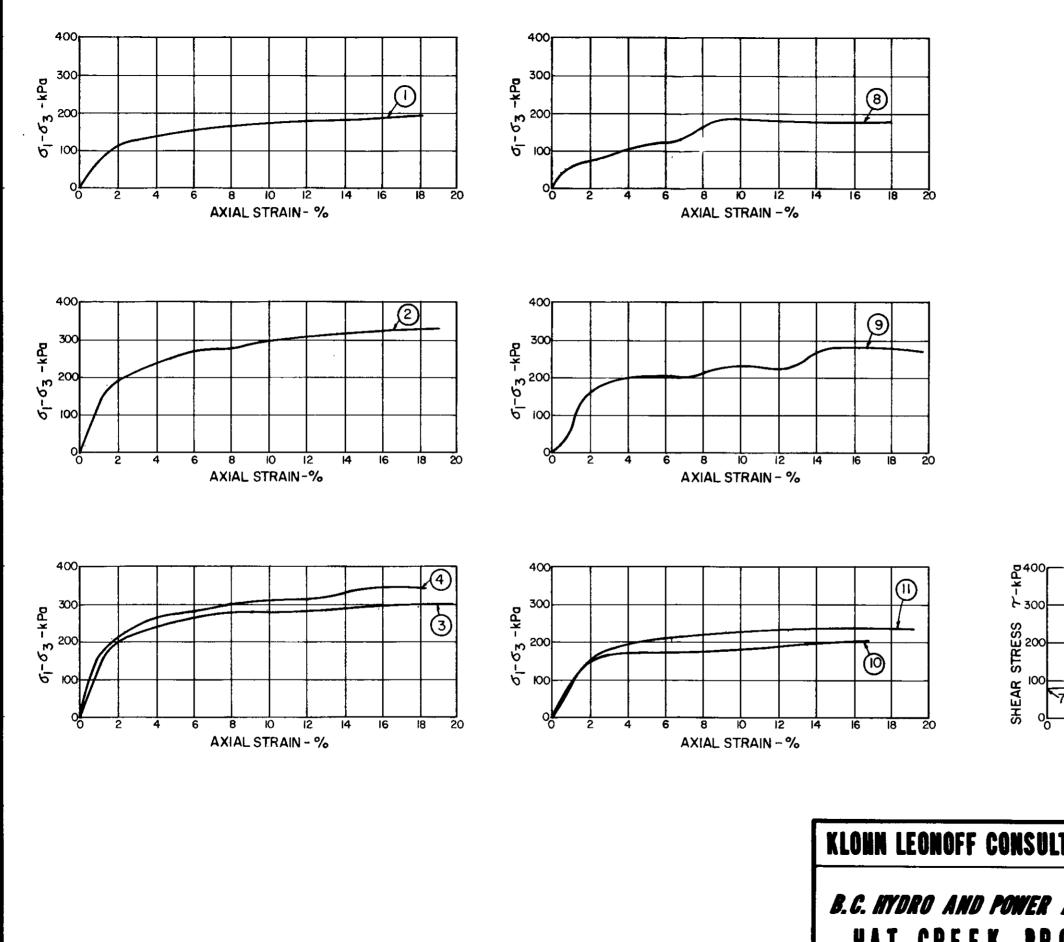
KLONN LEONOFF CONSULTANTS LTD. B.C. HYDRO AND POWER AUTHORITY HAT CREEK PROJECT

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<u>APPENDIX X</u> Triaxial Test Results Plate Nos. C23 and C24

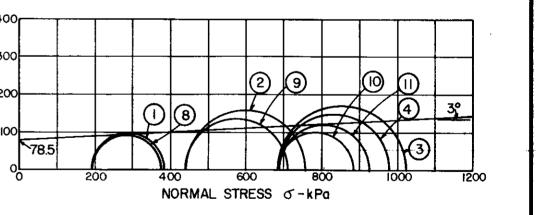


HAT CREEK PRO

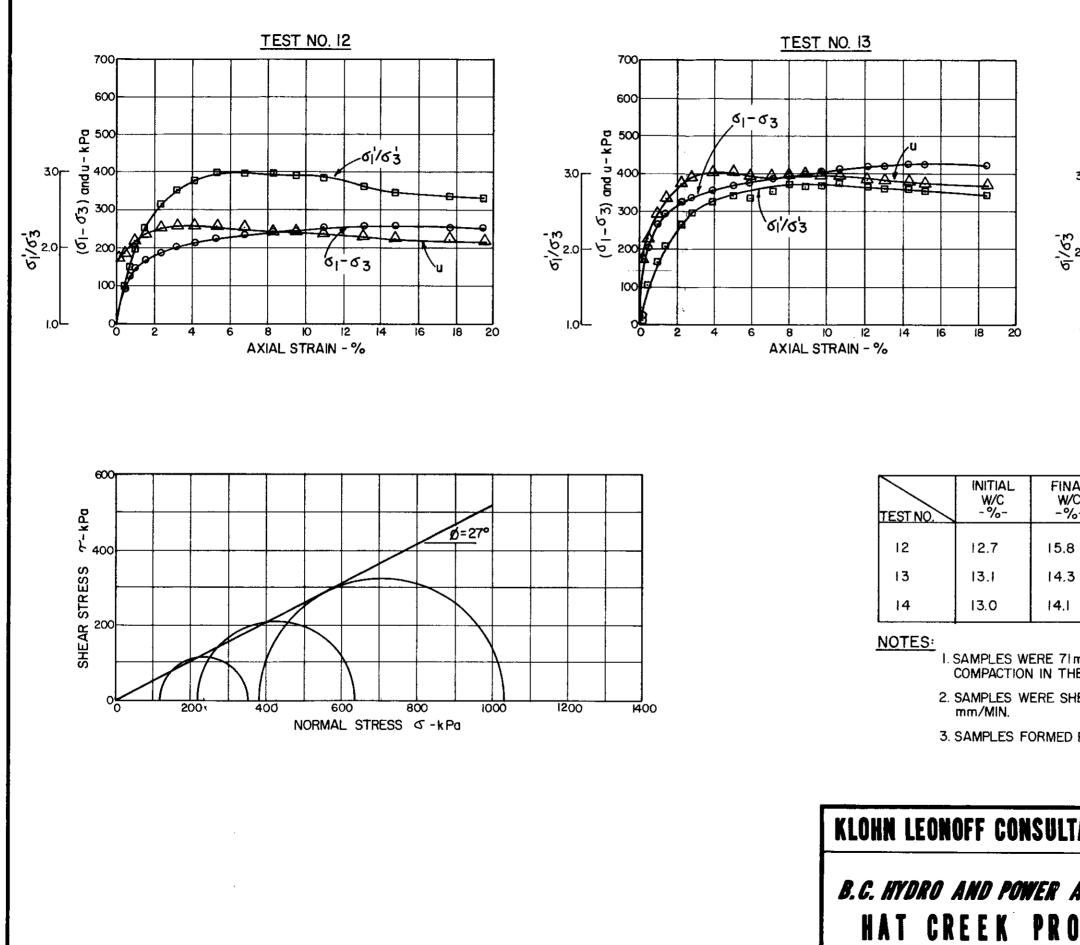
TEST NO	INITIAL W/C - %-	∦d t∕m ³	CELL PRESSURE kPa
	13.7	1.88	196
2	14.0	1.89	441
3	14.0	l.89	686
4	14.0	1.90	686
8	15.0	1.86	196
9	15.0	1.88	441
10	15.3	1.88	686
11	15.0	1.86	686

### NOTES:

- I.SAMPLES WERE 71mm LONG BY 33mm DIA.FORMED BY COMPACTION IN MINITURE HARVARD APPARATUS.
- 2. SAMPLES WERE SHEARED AT A STRAIN RATE OF 0.033mm/MIN.
- 3 SAMPLE FORMED FROM COMPOSITE SAMPLE FROM TEST PITS 115, 116, 117,119 & 120.



TANTS LTD.	WATER SUPPLY	AND ASH RE	TENTION DAMS
AUTHORITY		ATED UNDRAI	
OJECT	APPROVED		date jan.,1978 PLATE C23



	:								
			TEST	NO. I	<u>4</u>				
	700	51-03				<b></b>	-0		-•
	500	600	A A A						
3.0 ₁	d 300 d y - 7 400								4
0,0	50 40 00 00 00 00 00 00 00 00 00 00 00 00							-	-6
10 2.0		F	01/03						
ō				•					
1.0									
	0	2 4	6 8 AXIAL S			14	16	18	<b>20</b>
		•							
NAL V/C %-	8 d t∕m ³	CELL PRESSURE kPa	BACK PRESSURE kPa						
.8	1.89	372.6	176.5						
.3	1.89	617.8	173.5						
.I	1.89	870.8	173.5						
THE MIN	ONG BY 33m NIATURE HA ED AT A STR	RVARD APP	ARATUS.						

3. SAMPLES FORMED FROM MATERIAL FROM TEST PIT 105.

TANTS LTD.	WATER SUPPLY AND ASH RETENTION DAMS
AUTHORITY	CONSOLIDATED DRAINED TRIAXIAL TESTS WITH PORE PRESSURE MEASUREMENT ON IMPERVIOUS FILL MATERIAL
OJECT	APPROVED PROJECT NO. DATE JAN., 1978 H Wightman VA 2321 PLATE C24

APPENDIX XI Pin Hole Test Results

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#### PIN HOLE TESTS

### TEST DESCRIPTION

Three samples of Clay Till were tested for erodibility (dispersibility) in accordance with the procedure outlined by Sherard et al. (1976). Samples I and 2 were obtained from a combined sample from Test Pits I15, 116, 117, 119, and 120, and were air-dried prior to testing. Sample 3 was a grab sample from Test Pit 102 at a depth of 3.26m stored at its natural moisture content (11.6%). Since samples I and 2 were previously air-dried and it is not certain how the dispersive nature of the clay is affected by drying and rewetting (Sherard et al, 1976), sample three was tested at its natural water content to confirm that the clay is truly nondispersive.

All samples were screened through a #10 sieve and water was added to bring the water content of the sample to approximately that of its plastic limit prior to compaction with the Harvard miniature compactor.

Distilled water was passed through a 1.1 mm diameter pinhole punched in the 30 mm long specimen. Initially the water was caused to flow under a hydraulic head of 50 mm for 5 minutes. The hydraulic head was then progressively raised to 180, 380 and 1020 mm incrementally for 5 minute durations at each head. The dispersive nature of the soil was classified depending on the measured flow rates at each head and by the colour of the water emerging from the pinhole.

#### RESULTS AND DISCUSSIONS

All three samples were found to be nondispersive (classification NDI) according to the three criteria set forth by Sherard et al. (1976).

For the samples tested,

- the water emitted from the pinholes was clear at all hydraulic heads.
- the flow rate was constant at each head and was less than 40 ml/sec at the maximum head tested (1020 mm). Table XI-I summarizes the flow rate data.
- 3) negligible enlargement of the pinhole resulted from the flow.

# TABLE XI-I

HEAD	FLC	W RATE (ml,	ml/sec)		
-mm-	Sample #I	#2	#3		
50 mm	0.38	0.23	0.24		
180 mm	0.81	0.62	0.60		
380 mm	1.44	1.22	1.04		
1020 mm	2.71	2.34	2.23		

# FLOW RATE SUMMARY