FORM No. H.E. 443

DRILLING RECORD

SCHEME:- GREAT LAKE POWER DEVELOPMENT

LOCATION:- Access Shaft to Power Station.

POSITION PLOTTED ON DRAWING No.:

DATES: (a) DRILLED: 29-5-59 (b) WATER TABLE:

METHOD USED: Diamond Drill DIAMETER: NX

SITE REMARKS: Cleared area at foot of Western Tiers - soil covered and gently sloping.

POSITION — CO-ORDINATES: E. 483/1374 N. 851/0391

ON LINE: BEARING: AT CH:

FROM STN. X61 BEARING 0°48' DIST. 112·4'

LEVEL — SURFACE: 1190·0 FORMATION: (Permian) Dabool to Quamby WATER TABLE:

INCL. — HOLE DRILLED: DEPRESSION ANG.: INCL. BEARING:

VERT/

HOLE No. 5104

FILE No.

SHEET 1 OF 6 SHEETS

STANDARD LEVEL	DEPTH	CORE DRAWN	RECOVERY 0·2 0·4 0·6 0·8 1·0	GRAPHIC LOG	JOINTS	WATER	REMARKS	Drilling & Other Notes
1190	0							
	5'							
1180	10'							
	15'							
1170	20'						**Meander Formation (17'-212')** Composed of alternating units of — 1. Fairly massive, well jointed, light grey med. hard to hard, tough, gritty, rock fragment mudstone. 2. Thinner units of softer, more laminated mudstone which frets on exposure.	
	25'							
1160	30'							
	35'						35·3'-35·5" Fine pebble band with fossils (leached)	
					2" fretting	87°	37' leached calcite 88°.	← Core marked incorrect (going way round)
1150	40'					87°	38' leached calcite.	
						80°	40'10 slightly leached calcite.	
	45'				2" fretting	87°	43'. Open. No calcite.	
							No calcite.	
					2" fretting		Tight. Slight calcite.	
1140	50'						1/2" calcite slightly leached. horizontally stratified.	
					3" fretting	85°	48°. Slightly leached calcite. hair line.	
	55'				4" fretting	85°	52'3": 1/32" tight calcite.	
					3" fretting		54' 1/32 calcite (slightly leached.)	
					1" pebble	85°	57' Slightly weathered. No calcite.	
1130	60'					85°	58'3" Limonite stain No calcite.	
					1" fretting	85°	60'3" Slight calcite & limonite	
					5" fretting			
	65'				4" fretting	86°	65'8" Slightly weathered.	
						80°	67' 1/32 calcite weathered.	
					3" fretting			
1120	70'						70'5" 1/32" calcite.	
					7" fretting			
					8" fretting		74'3" Slightly weathered. No calcite	
	75'							
						75°	1/16" calcite. (irregular)	← Core wrong way round.
1110	80'				7" fretting		81'10" (irregular) hairline Ca.	
					10" fretting	83°	83': irregular no calcite (weathered)	
	85'				2" fretting	86°	3/32" calcite.	
					6" fretting	87°	1/2" calcite. No calcite.	
1100	90'						Open joints weathered calcite	
					1" pebble			
					Pebbles	80°	93'6" 1/2" calcite.	This box more gritty and pebbly than that above. Slight traces plant fossils.
	95'				1" fretting	82°	Open joint. No calcite Lining Pyrite	
1090	100'							

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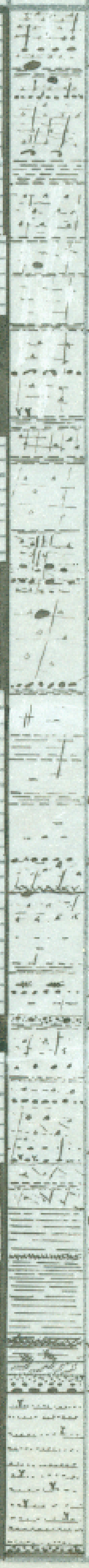
DRILLING RECORD

SCHEME:– GREAT LAKE POWER DEVELOPMENT	POSITION: CO-ORDINATES: E	N:		HOLE No. 5104
LOCATION:– Access Shaft to Power Station.	ON LINE:	BEARING:	AT CH:	
POSITION PLOTTED ON DRAWING No:	FROM STN:	BEARING:	DIST:	FILE No.
DATES: (a) DRILLED: (b) WATER TABLE:	LEVEL: SURFACE:	FORMATION:	WATER TABLE:	
METHOD USED: DIAMETER:				
SITE REMARKS:	INCL: HOLE DRILLED:	DEPRESSION ANG.:	INCL. BEARING:	SHEET 2 OF 6 SHEETS
	VERT/~~HORIZ~~:			



STANDARD LEVEL	DEPTH	JOINTS	REMARKS	Drilling & Other Notes.
1090	100'			
		4" cobble		
	105'	3" cobble.	104'5" $\frac{1}{32}$" calcite. Loose.	
		80°	107'6" $\frac{1}{16}$" calcite.	
1080	110'	86°	109' $\frac{1}{32}$" calcite.	
		1½" fretting		
	115'	3" fretting. 2" cobble 2" fretting		
		88°	118' $\frac{1}{32}$" calcite	Less gritty than previous box. Frets slightly.
1070	120'	5" fretting.		
	125'	plant remains? 8" fretting		
		86° 5" fretting	128' $\frac{1}{32}$" calcite.	
1060	130'	82°	129'6" $\frac{1}{32}$" calcite	
		78°	132'5" tight, slight calcite.	
	135'	fretting. 85°	133'9" open joint. 2ndary pyrite.	Very gritty zone.
			134'5" open joints, 2ndary pyrite.	Very gritty zone.
		2" pebble 70° ½" maximum	$\frac{1}{32}$" calcite.	Very gritty zone.
1050	140'	3" cobble		
		75°	141'9" tight. slight calcite	
	145'	½" max. 3" fretting		
		86°	$\frac{1}{32}$" calcite	No joints really tight.
		17" fretting 86°	$\frac{1}{32}$" calcite.	
1040	150'	8" fretting (severe)		
	155'	½" max. 35° 88°	154'5" $\frac{1}{32}$" calcite.	
		Tae	157' calcite mesh. 2ndary.	
1030	160'	9" fretting 80°	161'5" slightly open. no calcite.	Becoming softer and shaly from 160'.
		½" maximum	$\frac{1}{32}$" calcite.	
	165'	2" fretting 65°	165'–165'2" Thin pebbly quartzite.	166–177'6" Dark grey, fairly soft gritty mudstone.
		86°	$\frac{1}{32}$" calcite.	
1020	170'	½" max. 3" fretting		
			$\frac{1}{32}$" calcite.	
	175'	½" max. ½" max. 5" fretting	174'5" plant remains SAMPLE TO U ol Loisville	
		70°	X $\frac{1}{32}$" calcite.	
		88° 88°	$\frac{1}{32}$" calcite } open joints with calcite crystals.	177'6"–187'5" Dark grey, barren shaly mudstone.
1010	180'	Whole shales fretting.	180'3" calcite mesh.	Very weak on bedding planes. Core frets on exposure.
	185'			
		calcite mesh	186'–186'5" calcite mesh.	
		87°	188'6" $\frac{1}{32}$" calcite.	187'5"–188'3" Wormcast sandstone } Tough & stable
		2" maximum		188'3"–189'3" Ortho-quartzite } Tough & stable
				Core in box wrong way round & incorrectly marked.
1000	190'			189'3"–195'2" Fine grained laminated sandstone with numerous shale partings. Shale laminae fret.
	195'			
				195'2"–199'7" Thin pebbly quartzite.
990	200'			

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LOCATION:- Access Shaft to Power Station

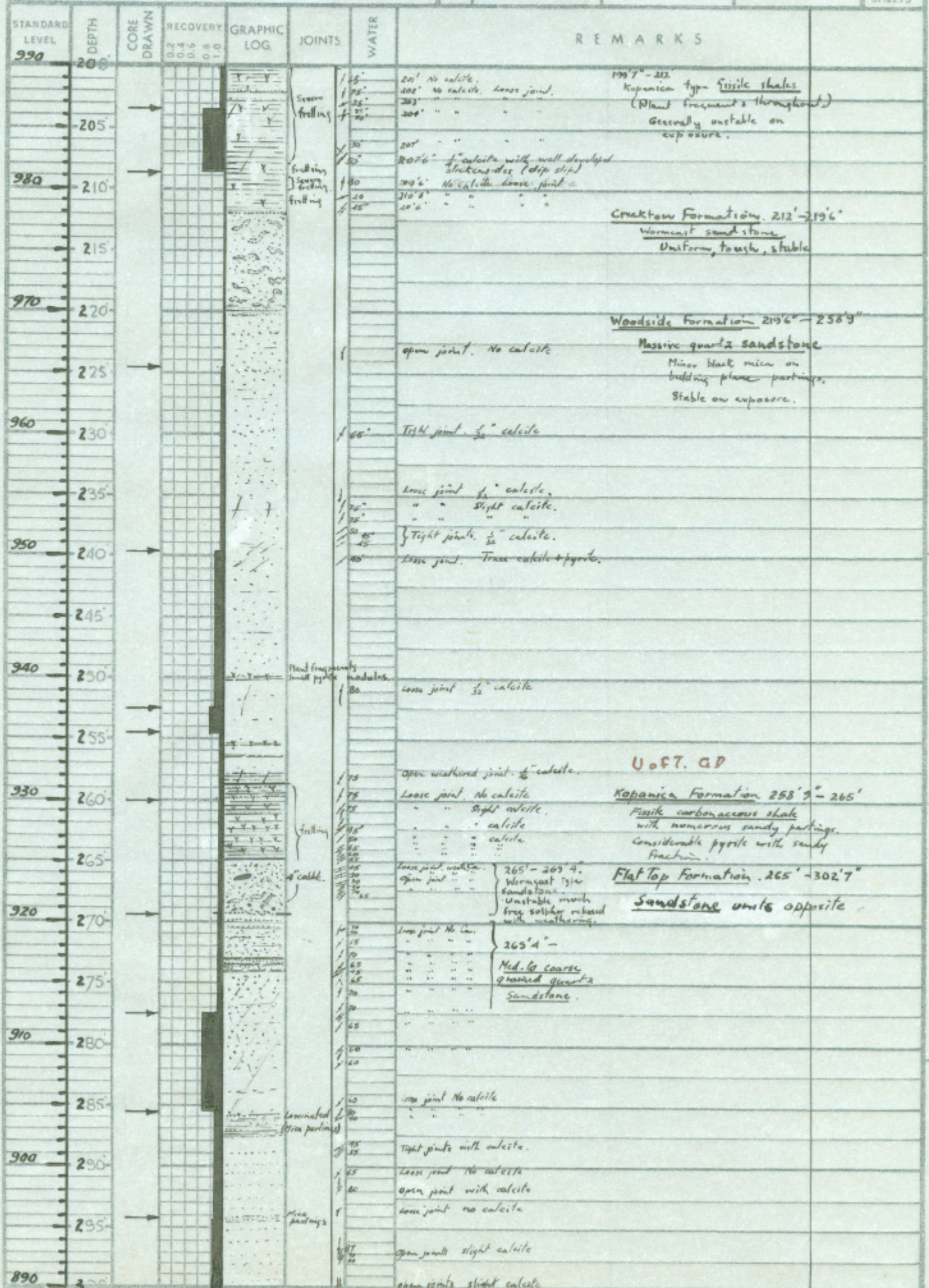
POSITION PLOTTED ON DRAWING No.:

DATES: (a) DRILLED: (b) WATER TABLE:

METHOD USED: DIAMETER:

SITE REMARKS:

POSITION			
CO-ORDINATES:	E.	N:	HOLE No. 5104
ON LINE:	BEARING:	AT CH:	
FROM STN.:	BEARING:	DIST.:	FILE No.
LEVEL: SURFACE:	FORMATION:	WATER TABLE:	
			SHEET 3 OF 6 SHEETS
INCL: HOLE DRILLED:	DEPRESSION ANG.:	INCL. BEARING:	
VERT ~~HOR INC~~			



FORM No H.E 443

DRILLING RECORD

SCHEME:- GREAT LAKE POWER DEVELOPMENT

LOCATION:- Access Shaft to Power Station

POSITION PLOTTED ON DRAWING No.

DATES: (a) DRILLED: (b) WATER TABLE:

METHOD USED: DIAMETER:

SITE REMARKS:

POSITION			
CO-ORDINATES	E.	N.	HOLE No 5104
ON LINE	BEARING	AT CH.	
FROM STN.	BEARING	DIST.	FILE No
LEVEL: SURFACE	FORMATION:	WATER TABLE:	
INCL: HOLE DRILLED	DEPRESSION ANG.	INCL. BEARING:	SHEET 1 OF 6 SHEETS
VERT.			

STANDARD LEVEL	DEPTH	CORE DRAWN	RECOVERY 0.2 0.4 0.6 0.8 1.0	GRAPHIC LOG	JOINTS	WATER	REMARKS
890	30				1/65 1/70 1/60		Loose joints with calcite.
	305						Softish, Light grey, unstable gritty siltstone with much fine and coarse pyrite. Some slickensiding.
							305' Soft pyritic limestone concretion? with hard limestone kernel. Unstable surround, strong smell SO_2
880	310				1/32 Calcite joints.		310' Quartzite pebble.
					60		Grey, massive quartz mica siltstone with fact fragments and few isolated cobbles and stringers of pebbles.
	315				314'2" 314'11" Loose joints with fine pyrite.		
					316'3" Open joint. Coarse xl calcite. 1/16		
870	320						Phases of light grey gritty siltstone and smooth dark grey siltstone. All with indistinct bedding and wispy disturbed and slumped fractions.
					Fine joints		323'2" Secondary calcite. Partly concretion.
	325						
				Fault Zone			326'-333' Fault zone sheared and crushed into pieces about 1" size with some clay gouge. (Slickensides show some transverse movement.)
860	330						
							333'-338' Broken zone - poor recovery (probably fault)
	335						
							338'-339'4" Lacework of hard secondary calcite associated with fault above.
850	340				75 1/1 80		
					65 1/1 70 1/1 80		339'6" 340'4" 341'3" 342'6" 343'3" Tight joints, 1/64" calcite.
	345				40 1/32		345'6", 346'6", 347'. Open joints - sparse calcite
					1" 1/4"		
840	350				1/16 1/16		340'3", 349'3" Tight joints - calcite.
				Fault ?	75 1/16		350'-352'3". Fault, slickensides at 75° Pocket of sand in core box - possibly from fault.
	355				1/4"		
					30 1/20		358'6" Tight joint. 359' Several tight joints. 352'6"-360' Hard, lenticular limestone with fenestella and spirifer.
830	360				45 1/32 1/16		361' Tight - slight slickenside. 361'6" Tight - 1/32 Calcite.
					70 1/64		364' Tight - 1/64 Calcite.
	365				80 1/64		364' Slight calcite - slickenside. 365' slickenside.
					80 1/64		366' Open joint, coarse calcite and pyrite.
820	370						Uniform, medium hard, massive, compact siltstone and gritty siltstone with varying amounts rock fragment. In places parts on bedding planes pheonitic sub-isotropic.
	375						
810	380						Soft, unstable. No distinct bedding generally breaking with conchoidal fracture.
							383'-384'6". Dense, hard limestone lense or concretion.
	385			Bottom Sandstone.			386'6" 1/32" Calcite. Tight joint.
800	390			1" Pebbles & sandstone.			385'6". Joint slight calcite.
				Clay sandstone.	70 1/1		396' About 2" of dark grey plastic clay at end of run suggesting sub-horizontal shear. However, no sign of slickensides and may be associated with drilling.
790	395						
	4 00						

McRae Formation

302'7" - 421'. See opposite for descriptions.

Much of the Mc breaks down o exposure to t weather.

Rods caught in hole at 300'.

Lost water at 37

396' Rods stuck in hole.

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POSITION PLOTTED ON DRAWING No.

DATES: (a) DRILLED (b) WATER TABLE

METHOD USED: DIAMETER

SITE REMARKS:

POSITION			
CO-ORDINATES	E	N	
ON LINE	BEARING	AT CH.	
FROM STN.	BEARING	DIST.	

LEVEL		
SURFACE	FORMATION	WATER TABLE

INCL		
HOLE DRILLED	DEPRESSION ANG.	INCL. BEARING
VERT/~~[illegible]~~		

HOLE No. 5104

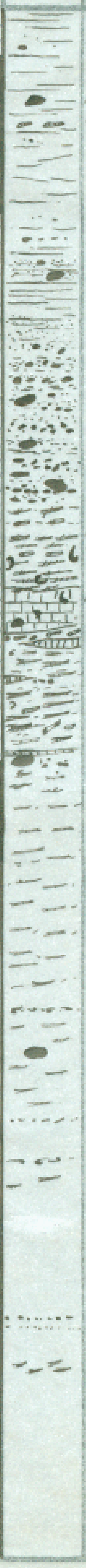
FILE No.

SHEET 5 OF 6 SHEETS

STANDARD LEVEL	DEPTH	CORE DRAWN	RECOVERY	GRAPHIC LOG	JOINTS	WATER	REMARKS

STANDARD LEVEL: 790, 780, 770, 760, 750, 740, CROWN, 730, 720, 710, 700, 690

DEPTH: 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500



JOINTS: 1/2" · 2" quartzite · Stenopora · 1/4" · 3" · 1" · 6" · 1" · 1" · 1" · 6" · 1" · 3" · 2" · 4" · 1" · Fenestella & minor Stenopora · Hard limestone · 18° ca. · Stenopora in [illegible] · 3" · 10° · 2" · 60° · V. thin pebble bands

416'–417'6" Gritty horizon, rock fragments.

<u>Billop Formation</u> 421'–431'6"

<u>Conglomeratic mudstone.</u> (Light grey)

Rounded & faceted boulders, cobbles and pebbles (of mainly quartzite) in matrix of calcareous mudstone – the matrix is rich in rock fragments. The boulders – pebbles range in size from 6" – ... averaging about 3/4". The material is very compact med. hard to hard and poorly stratified and is gradational to unit above.

<u>Bromby Formation</u> 431'6" – 476' <u>Calcareous, fossiliferous compaction mudstone</u>

<u>Upper 431'6" – 448'</u> Very compact, bedded, grey to dark grey, very calcareous mudstone rich in fossils. Fenestella – fernlike
Stenopora – tubular colonies.
Various other. spirifids eurydesma.
6" – 1/8" bedding units interstratified with very hard, dense limestone lenses.

<u>Lower. 448' – 476'</u>

As for upper but fewer fossils & laminations
Grades into non-fossiliferous Quamby mudstone below.
The material is compact, med. hard – fairly weak on bedding planes, but exertion necessary to break NX core when fresh.
Bedding planes not smooth, they are defined by fossil layering. i.e. reasonably high shear resistance.

465'1" Healing ca.

Tensile & shear strengths high on other planes.

467'5" "

Quamby Formation. 476' — 501'6"+

<u>Grey, massive compaction mudstone</u>

Med. hard, strong with occasional bedding planes.
Few zones slightly calcareous.
Pebble bands common in lower part of formation. (These bands contain pebbles, fossils and occasionally cobbles & boulders quartzite, schist, gneiss, limestone etc.

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DRILLING RECORD

SCHEME:- *GREAT LAKE POWER DEVELOPMENT*	POSITION: CO-ORDINATES E:	N:	HOLE No. *5104*
LOCATION:- *Access Shaft to Power Station*	ON LINE	BEARING:	AT CH.
POSITION PLOTTED ON DRAWING No.	FROM STN.	BEARING:	DIST.	FILE No.
DATES: (a) DRILLED (b) WATER TABLE	LEVEL: SURFACE	FORMATION	WATER TABLE
METHOD USED DIAMETER			
SITE REMARKS:	INCL: HOLE DRILLED VERT/~~HORIZ~~	DEPRESSION ANG.	INCL. BEARING	SHEET *6* OF *6* SHEETS

STANDARD LEVEL	DEPTH	CORE DRAWN	RECOVERY 0.2 0.4 0.6 0.8 1.0	GRAPHIC LOG	JOINTS	WATER	REMARKS
690	500'	→	■	- - - - -	*Pebbles.*		*Quartzite pebbles to ½" Very hard.*
							Hole complete 501'6"
	505'						*Hole logged E.A. Clothier.*
680	510'						
	15'						
	20'						
	25'						
	30'						
	35'						
	40'						
	45'						
	50'						
	55'						
	60'						
	65'						
	70'						
	75'						
	80'						
	85'						
	90'						
	95'						
	00'						

Classification of joints in diamond drill core

Hairline — very fine, tight joint

Tight — any joint which doesn't open when tapped with hammer

Loose — any joint which falls open when tapped with hammer.

Open — any joint showing weathering or obviously offering little resistance to circulating fluids. In original position cementing material would contain numerous voids.