ORKUSTOFNUN
NATIONAL ENERGY AUTHORITY

THORODDSEN AND PARTNERS

ÞÓRISVATN
GEOLOGICAL REPORT

Supplement to Volume II

THE VATNSFELL DIVERSION
NOTES ON GEOLOGY

by

Birgir Jónsson geologist NEA.

Prepared for

LANDSVIRKJUN
THE NATIONAL POWER COMPANY

September 1970

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Notes on Geology

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THE VATNSFELL DIVERSION

Notes on Geology.

Introduction.

These notes are on the geology of the canalsite west of Vatnsfell, the Vatnsfell Diversion, at the southern end of Lake Þórisvatn. They are based on information from the drilling done during the period March to September 1970 and are supplementary to "ÞÓRISVATN, GEOLOGICAL REPORT, Vol. I-III, The National Energy Authority, February 1970", which deals with all the previous investigations.

In the storage development at Lake Þórisvatn, four main routes for outlet works have been under consideration in the Vatnsfell area. These routes were numbered 1 to 4 (see chapter 3 in the above mentioned geological report).

Most of the exploration during the summer of 1969 was focused on routes 3 and 4, east of Vatnsfell, but early in 1970, route 1, west of Vatnsfell was chosen. Only the upper sections of 2 holes, 0-1 and 0-2 had then been drilled in this route, mostly with tricone bits and neither of them had, at that time, reached the main groundwater table, as we found out this year. Some borro soundings had also been done.

In the middle of March 1970, further investigations on route 1 were started, first by borro soundings through the ice on Lake Þórisvatn and, during the first half of April, borro soundings on land and core drilling began.

This route is dealt with on pages 3.13 and 3.14, Vol. II in the geol. report and the geological section of it (section A-A, Exh. 3.09) is based on the scarce information then available. Much of what is said there still holds true, but along with further information the present report also contains some corrections.

Canalsite Geology.

For classification and description of each member of the Vatnsfell formation and its units, see Vol. II of Þórisvatn, Geological Report, pp. 3.2 to 3.10.

a) At the Lake. See section F-F, in Exh. 4, and for location see Exh. 2.A and Exh. 1.

One of the core drillholes, 0-7 was drilled on the ice of Lake Þórisvatn, about 170 m from the shore. This hole along with hole 0-4, showed, that the bedrock at the lake, which had been found to have a high seismic velocity (about 3000 m/sec) and is interpreted as a dense móberg (V_1), in section A-A, Exh. 3.09 in the geological report, is in fact a pillow lava which belongs to the Grasatangi formation.

The Grasatangi formation is older than the Vatnsfell one (see the geol. report, vol. I, pp. 1.6-1.11) and can easily be distinguished from the latter because of the great number of feldspar phenocrysts the Grasatangi magma did contain. Also the colour of the basalt, which makes up the pillow lava in the Grasatangi formation is light grey, but that of the Vatnsfell formation is much darker.

The pillow lava is a very heterogeneous rock with occasional lenses of badly consolidated material, mostly sand made of basaltic glass. There are also basaltic injections in the pillow lava, consisting of cube jointed basalt, which represent late stages of the eruption, when most of the ordinary pillow lava had already solidified. These injections are usually very irregular in shape, and do not solidify as quickly as the ordinary pillow lava, and therefore contain much less glassy material, if any at all. The section F-F in Exh. 4 shows the stratigraphy of the part of the canal nearest to the lake and in the lake itself. As can be seen, the stratigraphy is very simple; the bedrock consisting of pillow lava and on top is a few meters thick layer of soft sediments, which are beach and lake deposits (L_3). The graphic logs of the borro soundings in this area are shown in Exh. 14 to 19.

b) At the control structures. See sections A-A up to E-E in Exh. 3, and for location see Exh. 2.B and Exh.1.

In the part of the canal, where the control structures are to be placed,many holes have been drilled. Eight of them are within, or in the immediate vicinity of, the construction site, and they are shown in the sections A-A to E-E.

The control structures will be placed where the canal route is highest. This is where a móberg ridge crosses the route (section A-A). This ridge belongs to the Vatnsfell formation and is made of the various types of móberg and pillow lava found in this formation. The ridge is most likely a crater rim, the crater being the depression between this rim and the mountain Vatnsfell itself. The drillhole 0-13, which is 45 m deep, is in the western part of this crater and does not reach the bedrock proper, but only extends down into the L_1 unit, which is defined as tuffaceous sand, formed subglacially, not penetrated by borro soundings.

This depression, and the one to the north of it, were once an inlet, or a small fjord, extending southwards from Lake Þórisvatn. Later a gravel bar was formed, which crossed the inlet and now makes up the present shore of the lake west of Vatnsfell. This changed the inlet into a closed lagoon, which subsequently drained out. We do not know how deep the lagoon was when it became dry, but the dry lake bottom is the boundary between the L_3 and L_2 units, as the L_3 is deposited in water, but the L_2 is mostly windblown. From an engineering point of view, this boundary should not be important, as both units have similar properties with regard to excavation.

In Þórisvatn, Geological Report the boundary between these two units was assumed at 570 m elevation (present level of Lake Þórisvatn is about 571 m). This means that the inlet or lagoon was almost filled with sediments before it became dry.

Another possibility is, that this boundary is about 10 m lower than assumed before, or at an elevation of about 558-560 m, where there is a dense horizontal layer in which most of the borro soundings stop (see the graphic logs of borro soundings: 1115V, 1112V, 1110, 1113H, 12125V, 12120V and 12115V in Exh. 21 and 22, and their locations in Exh. 13. This layer was also noticed in drillhole 0-13 (Exh.8) and borro sounding No. 1060 penetrated through it down to an elevation of 532 m, but at 558 m, the number of blows per half a meters run increased greatly, and further down the number decreased again (see Exh.20). This layer may represent the former lake bottom, which may have cemented into a hard crust when it became dry.

In the stratigraphy of the móberg ridge or the crater rim itself, the symbols V_1, V_2, F_2 etc. are used, but as this is the same formation, the stratigraphy is mostly based on how consolidated the material is, whether belonging to the same units as classified in the above mentioned report.

It became necessary to divide the V_2 and the F_2 units to form a new unit on the boundary between V_2 and F_2. The unit V_2, i.e. coarse móberg breccia was divided into well consolidated V_2 with good core recovery, which was classified along with V_1, and badly consolidated V_2 with a low core recovery, which was classified along with some of the F_2. The F_2 unit was also divided into F_2 with a lot of glassy sand between and inside the pillows, often a pillow breccia, which was classified along with V_2, and F_2 with less glassy sand, but more basalt, which was classified along with F_1.

This new unit V_2-F_2 then grades from badly consolidated V_2, i.e. móberg breccia, over to badly consolidated pillow breccia, which should be on the boundary between V_2 and F_2 over to

very sandy F_2, which is pillow lava, sand filled or with sand lenses. Generally the parts of this unit which are marked V_2 are a better rock than the F_2 part, as there some of the matrix is strong enough to withstand the erosion caused by the flush water during drilling.

Ground Water.

The permanent ground water table in the bedrock west of Vatnsfell is much lower than thought before, as the holes drilled last year did not reach deep enough. Therefore the northwestern part of the ground water map in the geol. report (Exh. 3.06, Vol. II) is incorrect. A renewed copy of this map, based on information from the drilling done this year accompanies the present report as Exh. 10.

The permanent ground water table beneath the above mentioned ridge is at an elevation of about 520 m, but during drilling some water was noticed at higher levels in many of the drillholes. For further information, see the graphic logs of the holes.

Hrauneyjafoss 10.09.70

Birgir Jónsson

TABLE 1

LOCATION AND DEPTH OF CORE BOREHOLES

WEST OF VATNSFELL

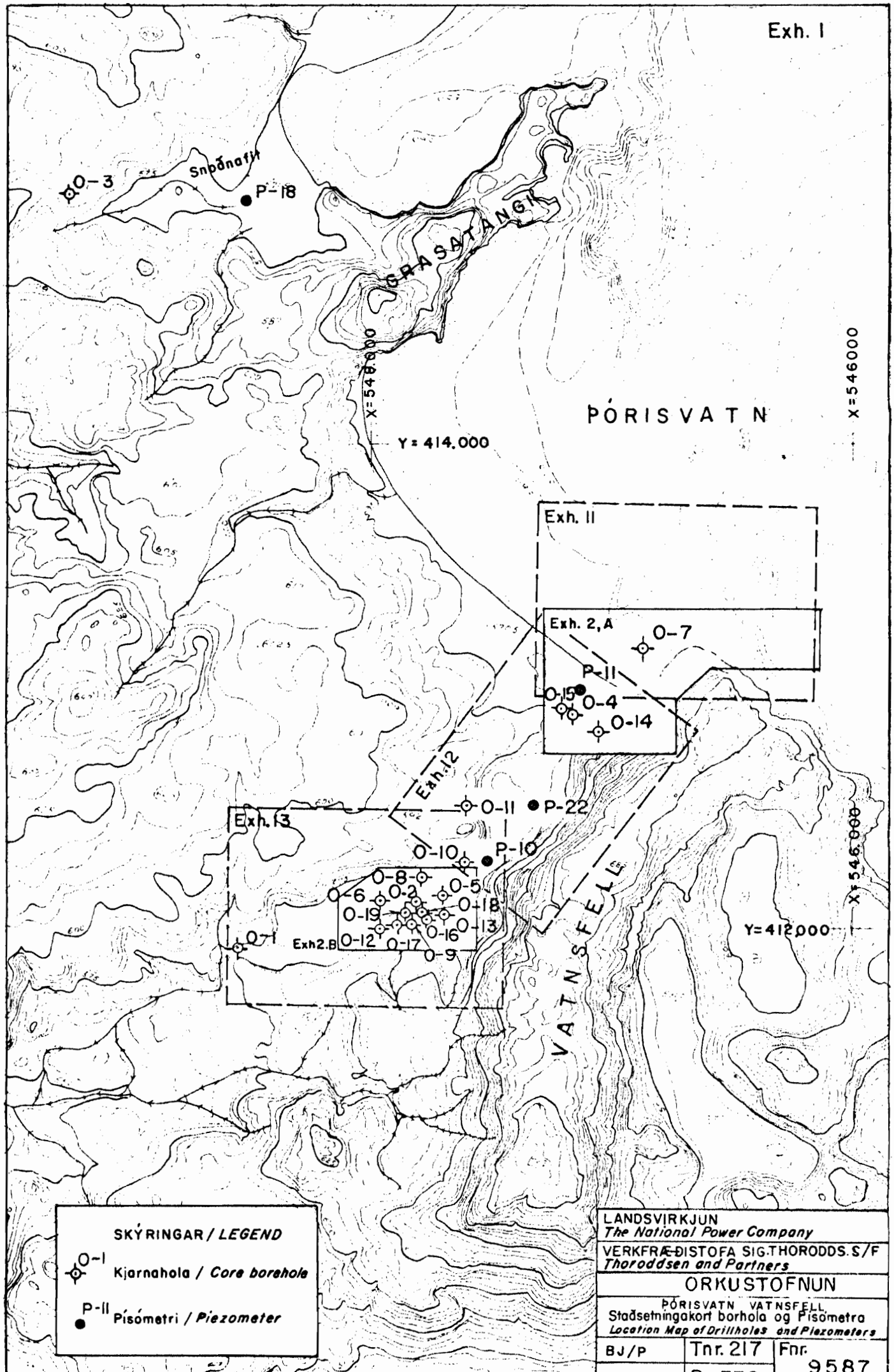
Hole Number	Coordinates		Top of Casing Elevation	Top of Piezometer Pipe (if present) Elevation	Depth	Bottom of Hole Elevation
	X	Y			m	
O-1	548.554	411.913	573.73		48,7	525.0
O-2	547.808	412.108	580.16	581,1	71,5	508.7
O-3	549.259	415.031	588.53		80,6	507.9
O-4	547.164	412.877	570.50		50,5	520.0
O-5	547.701	412.129	578.14		57,6	520.5
O-6	547.958	412.106	576.95	577,6	56,5	520.5
O-7	546.873	413.154	571.29	?	29,8	541.6
O-8	547.779	412.205	584.37	584,9	85,0	499.4
O-9	547.836	412.013	584.60		85,2	499.4
O-10	547.609	412.274	588.55		70,0	518.5
O-11	547.600	412.497	589.21		66,0	523.2
O-12	547.967	411.997	577.83		43,0	534.8
O-13	547.695	412.049	576.92		45,0	531.9
O-14	547.056	412.812	579.97		61,6	518.4
O-15	547.206	412.903	573.68		52,0	521.7
O-16	547.784	412.030	578.23		60,3	517.9
O-17	547.892	412.016	578.86		54,5	524.4
O-18	547.794	412.065	578.17		53,0	525.2
O-19	547.852	412.060	581.18		56,0	525.2

TABLE 2

LOCATION AND DEPTH OF PIEZOMETERS

WEST OF VATNSFELL

Hole Number	Co-ordinates		Surface Elevation	Top of Piezometer Pipe Elevation	Depth	Bottom of Hole Elevation
	X	Y			m	
P-10	547.555	412.212	573,0	573,74	16,3	556,8
P-11	547.094	413.002	573,1	573,87	7,9	565,2
P-18	548.460	414.978	572,3	573,36	21,6	550,7
P-22	547.324	412.507	568,1	569,22	37,5	530,6


Exh. I
O-3
Snpðnafjl
P-18
GRASATANGI
X=548.000
Y = 414.000
ÞÓRISVATN
X=546000
Exh. II
Exh. 2,A
O-7
P-11
O-15
O-4
O-14
Exh.12
O-11
P-22
Exh.13
O-10
P-10
O-8
O-6
O-2
O-5
O-19
O-18
O-13
O-16
O-12
O-17
O-9
O-1
Exh2.B
VATNSFELL
Y=412.000
X=546.000
SKÝRINGAR / LEGEND
O-1 Kjarnahola / Core borehole
P-11 Písómetri / Piezometer
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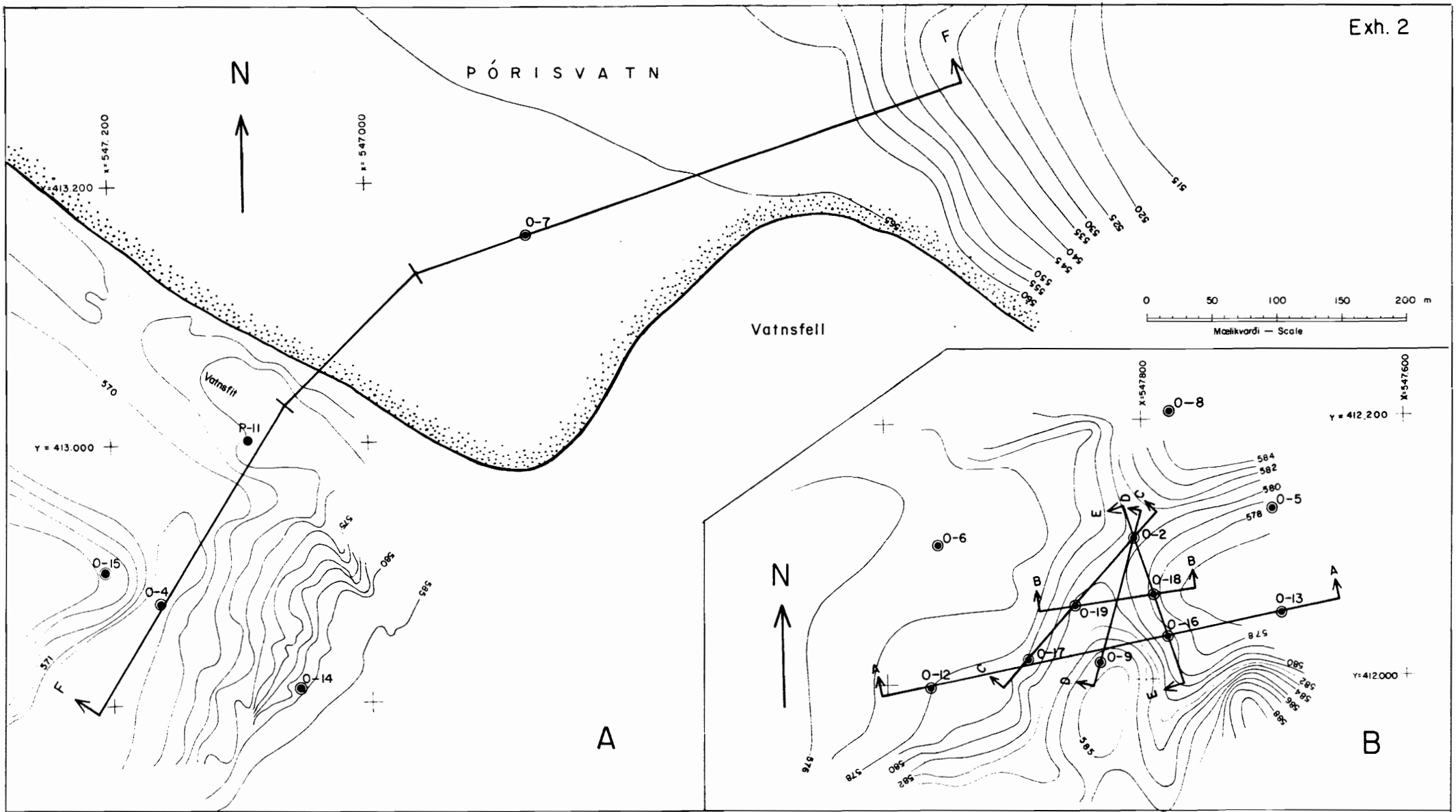
ÞÓRISVATN VATNSFELL
Staðsetningakort borhola og Písómetra
Location Map of Drillholes and Piezometers
BJ/P
Tnr. 217
B-332
Fnr.
9587

Exh. 2



Skýringar: *Legend*

Jarðlagasnið
Geological Section

0-2 Borhola
Drillhole

P-11 Písómetri
Piezometer

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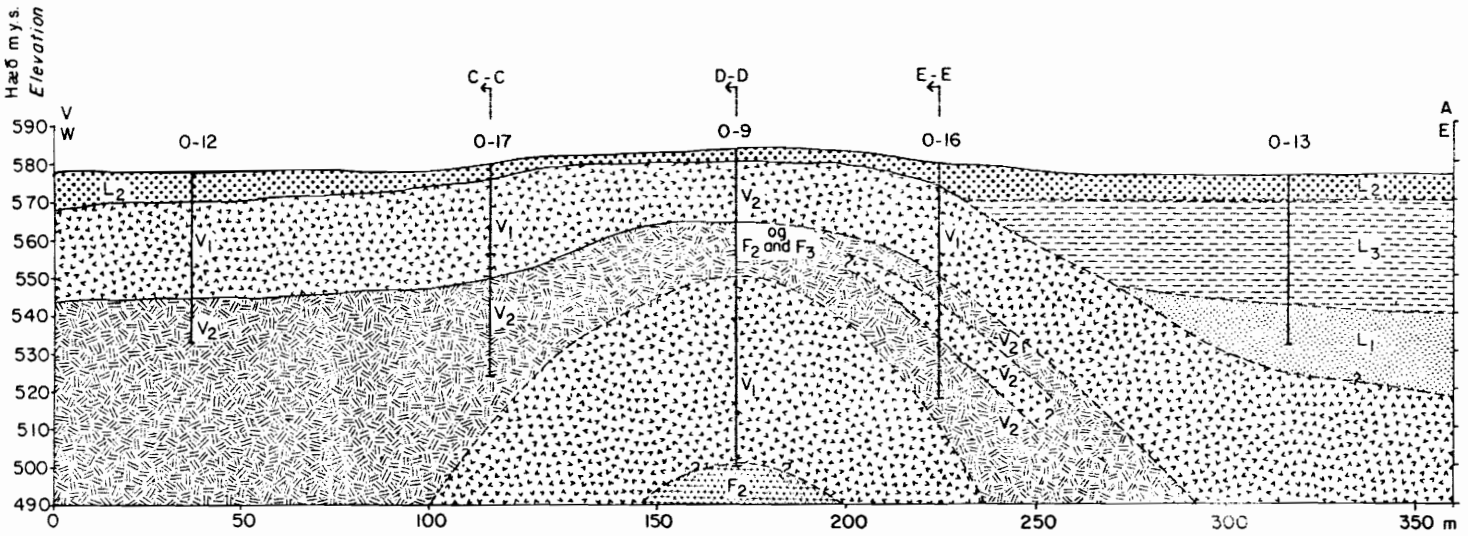
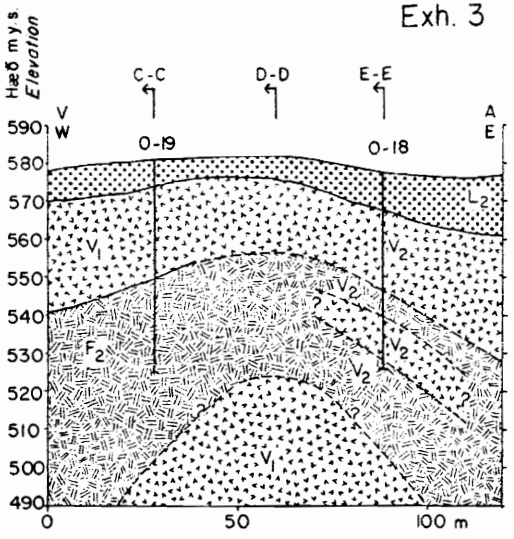
ORKUSTOFNUN		
ÞORISVATN VATNSFELL 1970 Staðsetningarkort borhola og sniða. *Location map of drillholes and sections.*		
4.9.70 BJ / P	Tnr. 207 B-332	Fnr. 9558

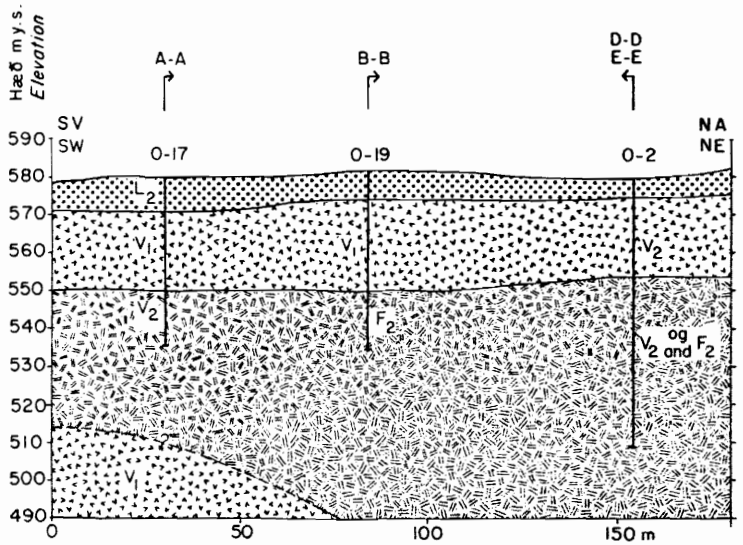
Exh. 3



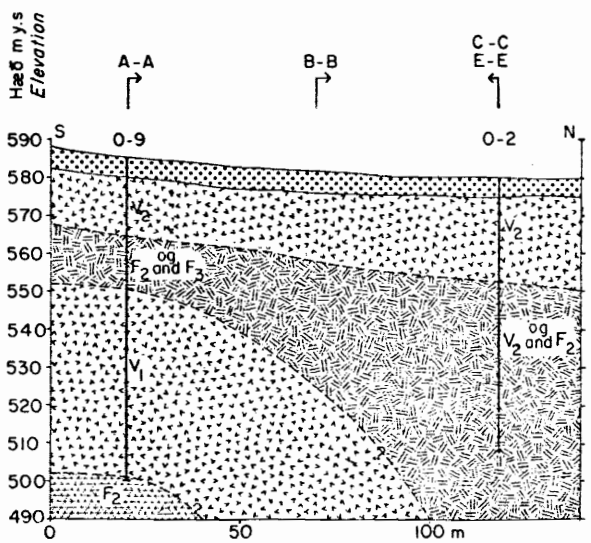
A - A



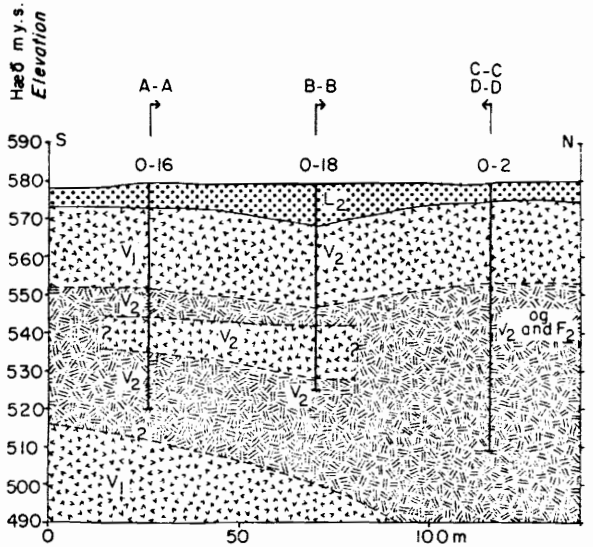
B - B



C - C



D - D



E - E

Staðsetning sjá
Location see Exh. 2,B

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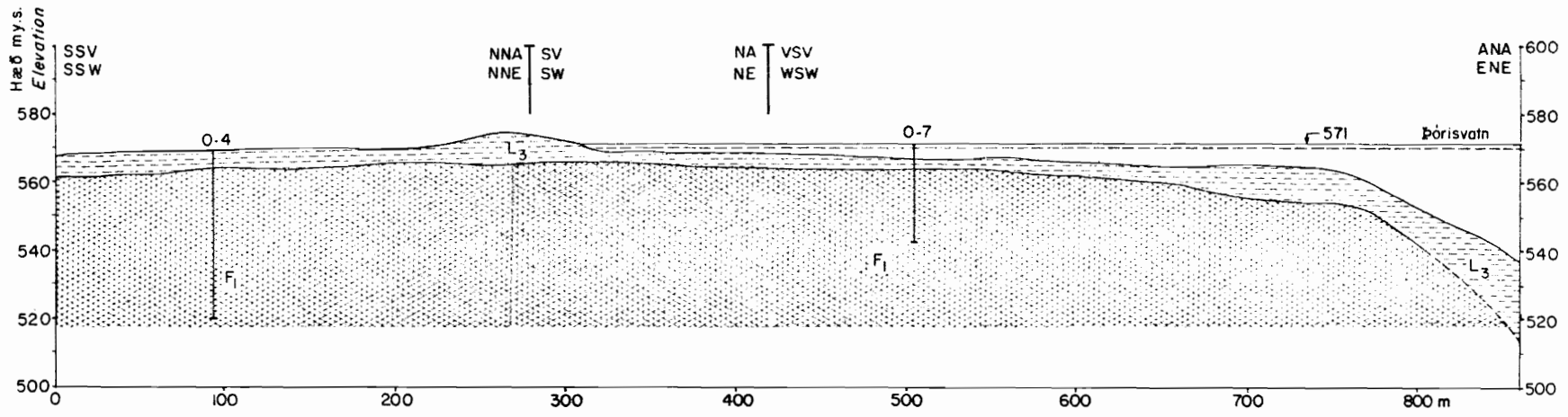
ÞORISVATN VATNSFELL 1970
JARÐLAGASNIÐ
Geological sections

7.9'70 BJ /ÓM	Tnr. 205	Fnr. 9556
Bl. 1 af 2	B-332	

Exh. 4



F — F

SKÝRINGAR — *LEGEND*

Staðsetning sjá *Location see* Exh. 2, A

L_1 Tuffsandur, vel pakkaður
Tuffaceous sand, well packed

L_2 Sandur, mest aðfokinn vikur og aska
Sand, mostly winddrifted tephra

L_3 Strand og vatnaset
Beach and lake deposits

V_1 og *and* V_2 Móberg, þétt og vel samlímt
Moberg, tight and well consolidated

V_2 og *and* F_2 Illa samlímd móbergsbreksía, sem greinist yfir í illa samlímda bólstrabreksíu eða sandfyllt bólstraberg
Badly consolidated móberg breccia, which grades into badly consolidated pillow breccia or sand filled pillow lava

F_1 og *and* F_2 Bólstraberg, F_2 er sandfyllt
Pillow lava, F_2 is sand filled

Borhola
Drillhole

Snið breytir stefnu
Section turns

A-A Þversnið
Section at right angles

Óviss jarðlagaskil
Uncertain rock contacts

Skilgreiningar á jarðlagamyndunum við Vatnsfell er að finna í Þórisvatn, Geological Report, Volume II, bls. 3.2 - 3.10

For definitions of each member of the Vatnsfell formation, see Þórisvatn, Geological Report, Volume II, pp. 3.2 - 3.10.

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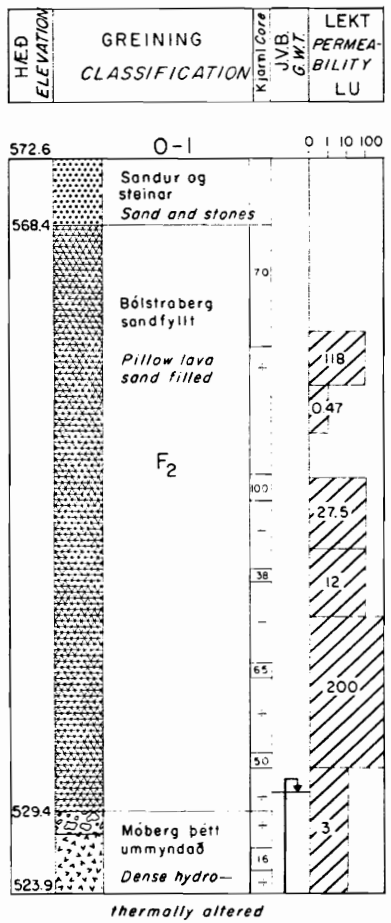
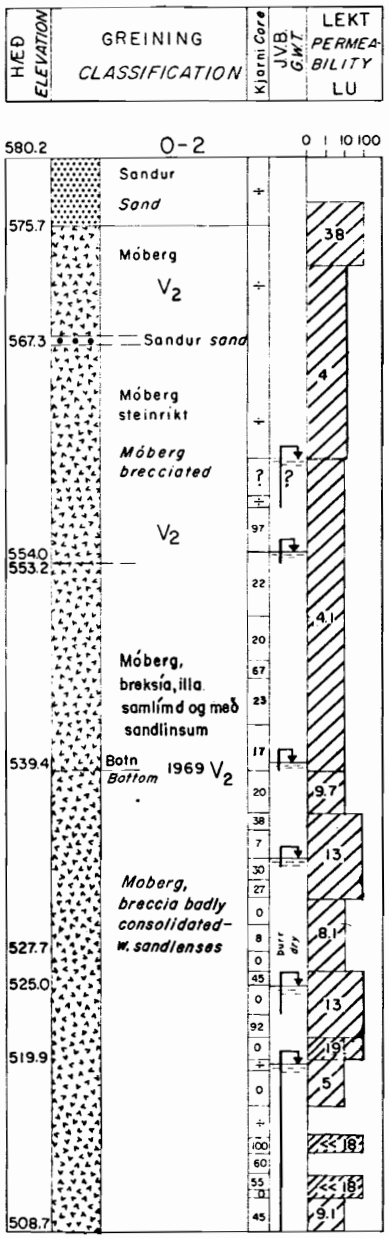
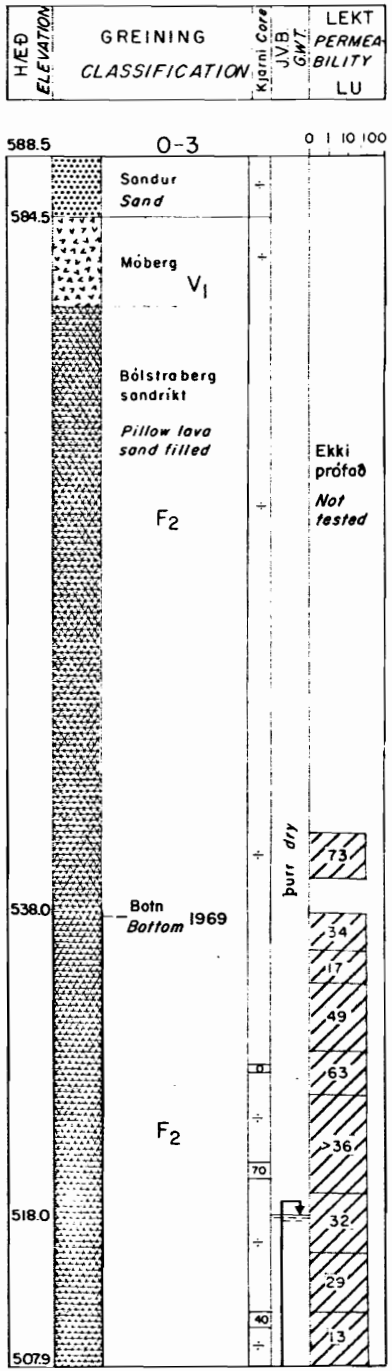
ÞÓRISVATN VATNSFELL 1970 JARÐLAGASNIÐ *Geological sections*	
7.9.'70 BJ./ÓM	Tnr. 206
Bl. 2 af 2	B-332
Fnr. 9557	

Exh. 5







DÝPI m DEPTH

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

Kjarni: Tölur sýna kjarnaheimtur í % ÷ kjarnataka ekki reynd

Core: Numbers indicate per cent core recovery ÷ core sampling not attempted

Abbreviations: Diat. diatomaceous; Tuff. tuffaceous; w. with

Staðsetning, sjá fylgiskjöl 1 og 2
Location, see Exhibit No. 1 and 2

SKÝRINGAR – *LEGEND*

- V_1 Móberg, þétt, fínkornótt — *dense, finegrained*
- V_2 Móberg, gropið, steinaríkt — *porous, brecciated*
- V_3 Móberg, gropið, sundurlaust — *porous, badly consolidated*
- F_1 Bólstraberg — *Pillow lava*
- F_2 Bólstraberg, sandfyllt — *Pillow lava, sand filled*
- F_3 Túffsandur með basalteitlum — *Tuffaceous sand with veins of basalt*
- L_1 Túffsandur — *Tuffaceous sand*
- L_2 Túffsandur og gosaska — *Tuffaceous sand and tephra*
- L_3 Vatnaset, sandur og kísilgúr — *Lake deposits, sand and diatomaceous earth*
- Jökulberg — *Tillite*
- TH Hraun — *Basaltic lava*
- Óhörðnuð yfirborðslög — *Overburden*

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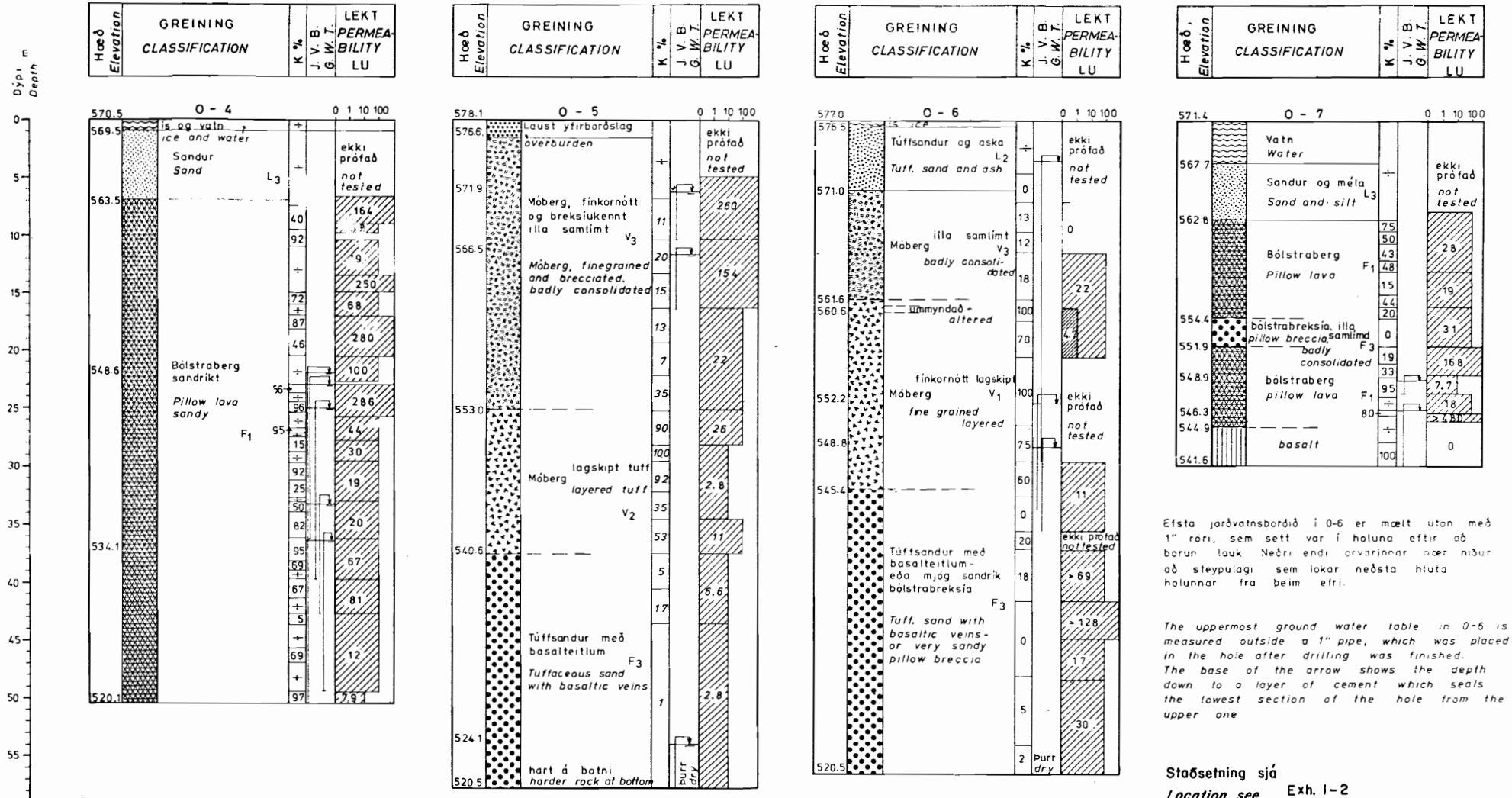
ÞÓRISVATN VATNSFELL .
SNIÐ AF BORHOLUM 0-1-0-3
GRAPHIC CORE LOGS

21.1.'70 EGV/IS Tnr. 127 | Fnr. 9292
Blað 1 af 7 | 8-332



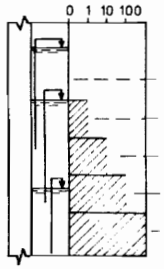
Efsta jarðvatnsborðið í O-6 er mælt utan með 1" röri, sem sett var í holuna eftir að borun lauk. Neðri endi örvarinnar nær niður að steypulagi sem lokar neðsta hluta holunnar frá þeim efri.

The uppermost ground water table in O-6 is measured outside a 1" pipe, which was placed in the hole after drilling was finished. The base of the arrow shows the depth down to a layer of cement which seals the lowest section of the hole from the upper one

Staðsetning sjá
Location see Exh. 1-2

K = Kjarnaheimtur
Core Recovery

LEKTAR- OG JARÐVATNSÚTSKÝRING
NOTE ON PERMEABILITY AND GROUND WATER



Jarðvatnsborð er sýnt með örvum. Neðri endi örvarinnar sýnir holudýpið þegar jarðvatnsborðið var mælt. Ef jarðvatn breytist ekkert í borun nær örin í botn

Ground water levels are shown by arrows. Base of the arrows indicates the hole depth when the water level was measured. If no change in level was observed the arrow reaches the hole bottom.

1 LU = Lugeon Unit = 1 l/mín/m í 76 mm ø holu við þrýsting 10 kg/cm 2

1 LU = Lugeon Unit = 1 l/min/m in 76 mm ø hole at pressure 10 kg/cm2

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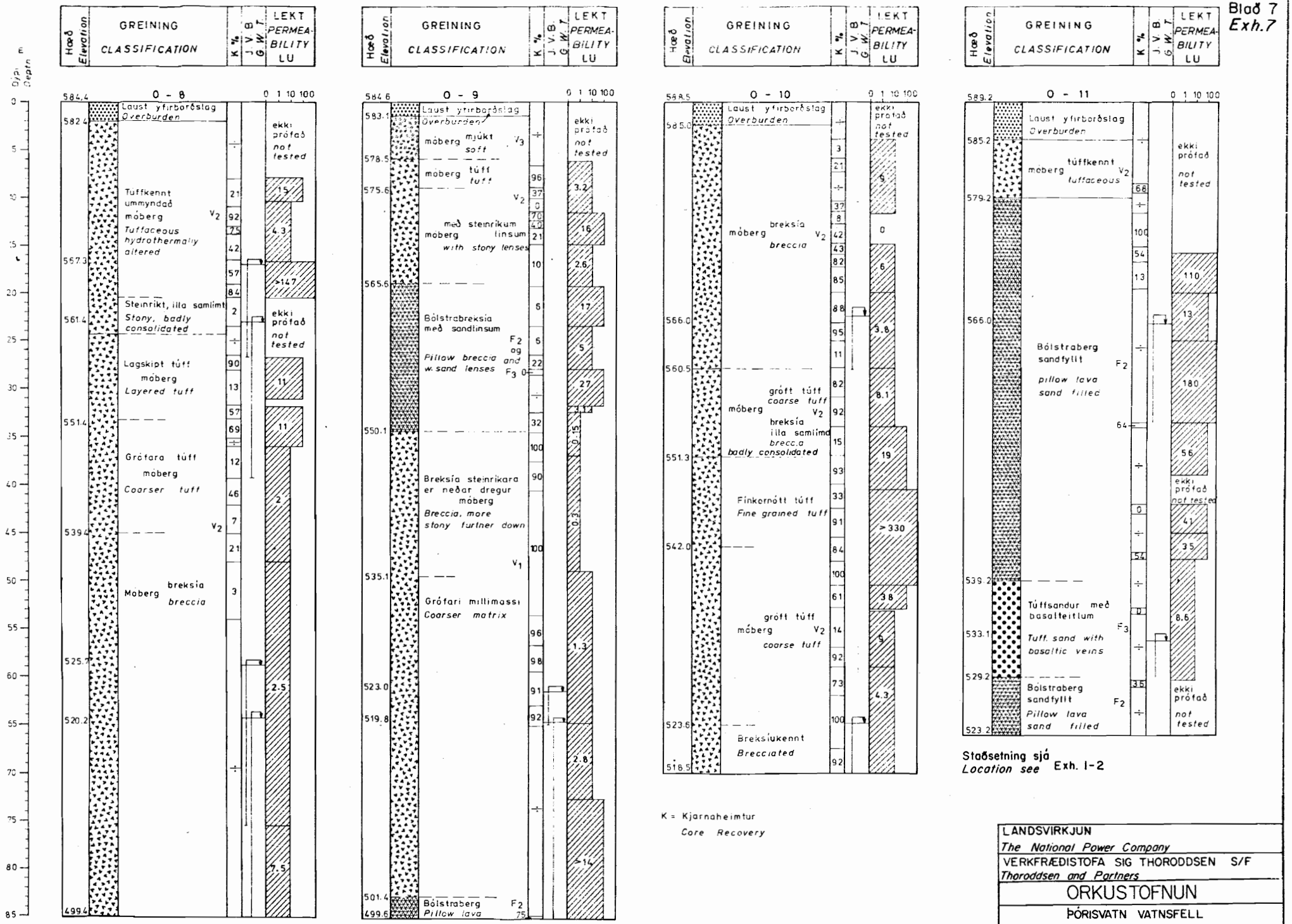
ÞÓRISVATN VATNSFELL
Snið af borholum O-4—O-7
Graphic core logs

25.9.70 BJ/SF/MH Tnr 223 Fnr 9593

Blað 7
Exh.7



Staðsetning sjá
Location see Exh. 1-2

K = Kjarnaheimtur
Core Recovery

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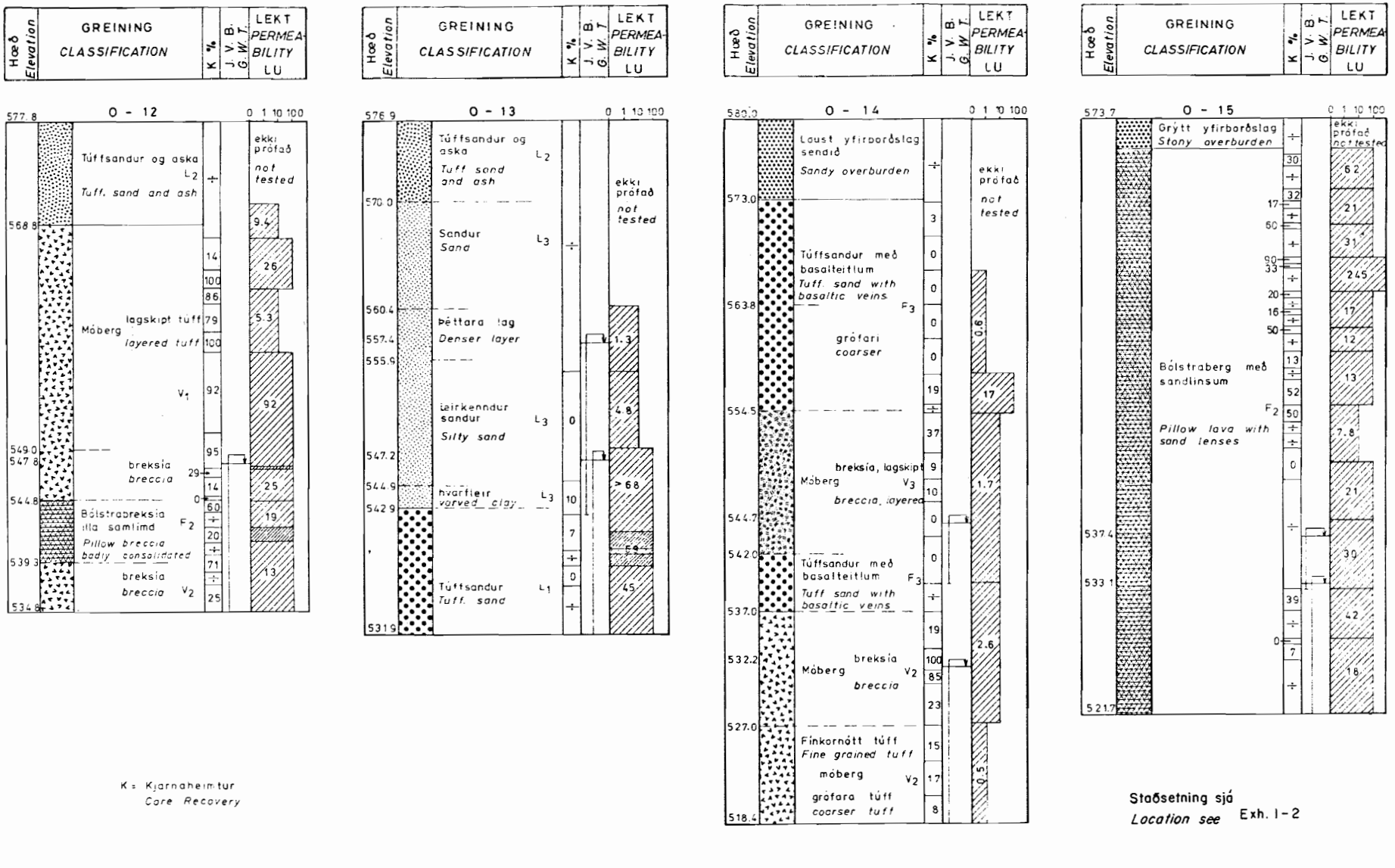
ÞÓRISVATN VATNSFELL
Snið af borholum 0-8 — 0-11
Graphic core logs " "

24970 BJ/SF/MH	Tnr. 220	Enr. 9590
	R-332	



K = Kjarnaheimtur
Core Recovery

Staðsetning sjá
Location see Exh. 1-2

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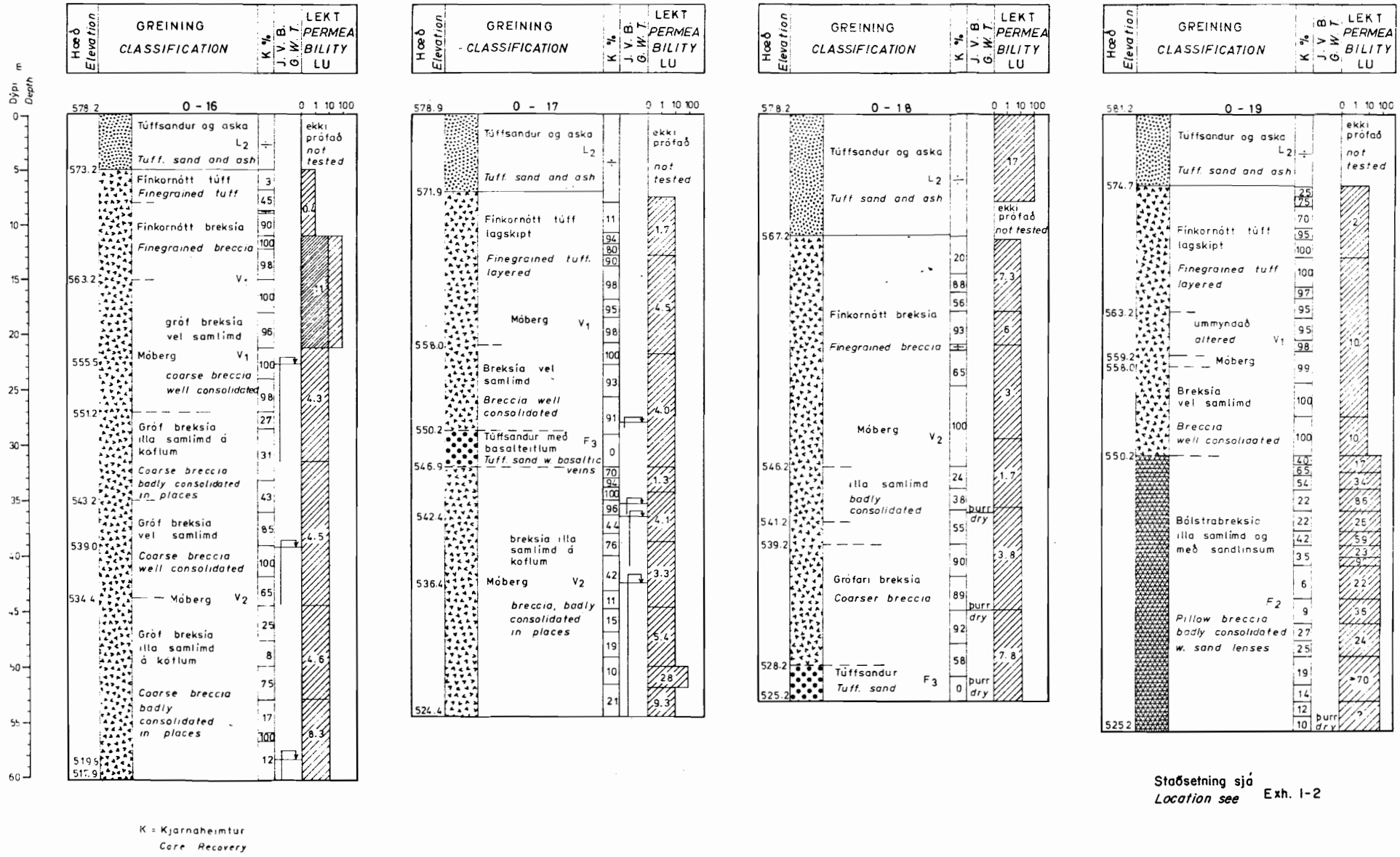
ÞÓRISVATN VATNSFELL
Snið af borholum O–12 — O–15
Graphic core logs " "

24.9.'70 BJ/SF/MH Tnr. 2.21
B-332

Fnr. 9591



K = Kjarnaheimtur
Core Recovery

Staðsetning sjá
Location see Exh. 1-2

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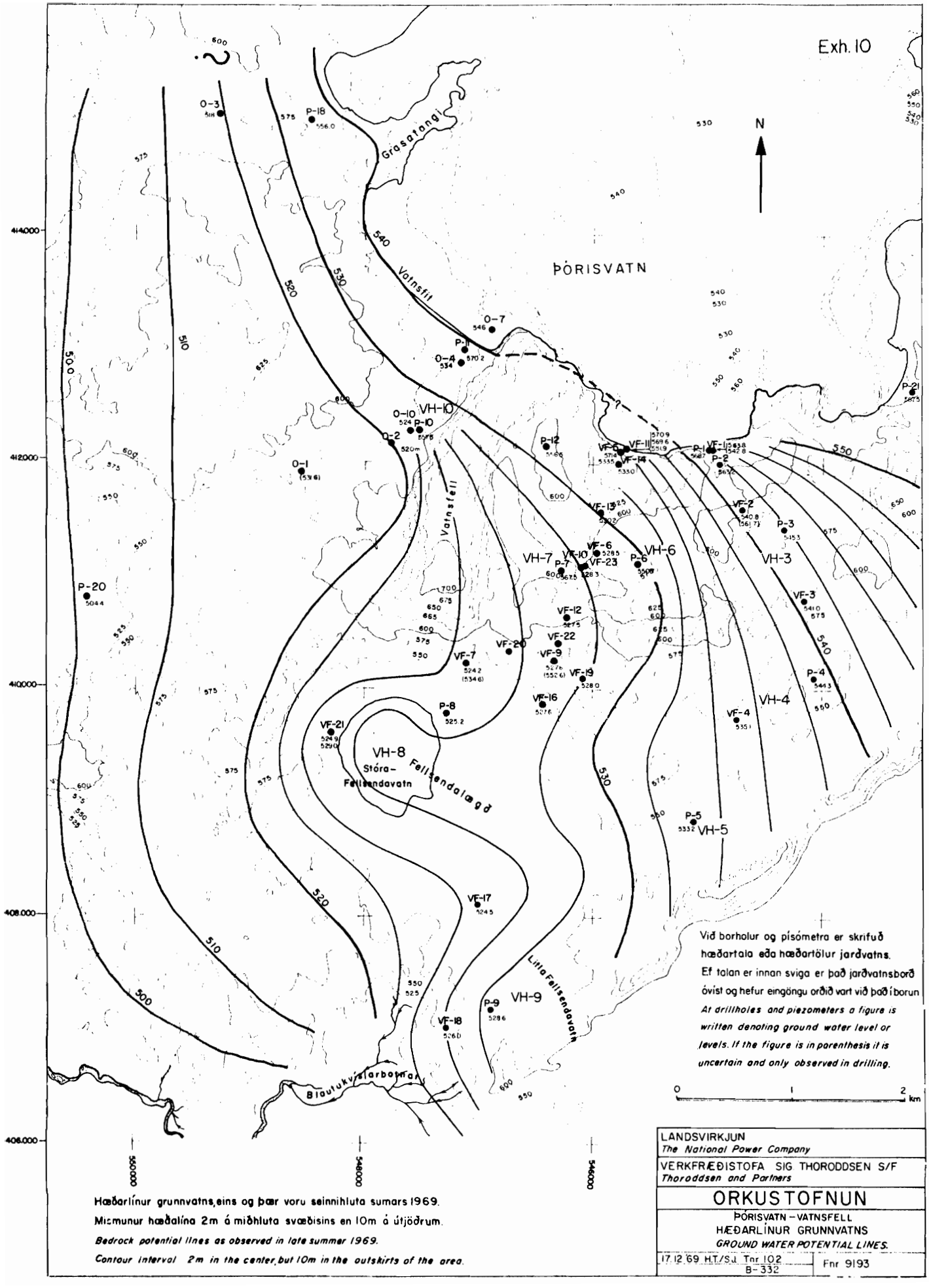
ÞÓRISVATN VATNSFELL
Snið af borholum O-16–O-19
Graphic core logs " "
24970BJ/SF/MH Tnr. 222
S 332
Fnr 9592



Hæðarlínur grunnvatns, eins og þær voru seinnihluta sumars 1969.
Mismunur hæðalína 2m á miðhluta svæðisins en 10m á útjöðrum.

Bedrock potential lines as observed in late summer 1969.
Contour interval 2m in the center, but 10m in the outskirts of the area.

Við borholur og písómetra er skrifuð hæðartala eða hæðartölur jarðvatns. Ef talan er innan sviga er það jarðvatnsborð óvíst og hefur eingöngu orðið vart við það í borun

At drillholes and piezometers a figure is written denoting ground water level or levels. If the figure is in parenthesis it is uncertain and only observed in drilling.

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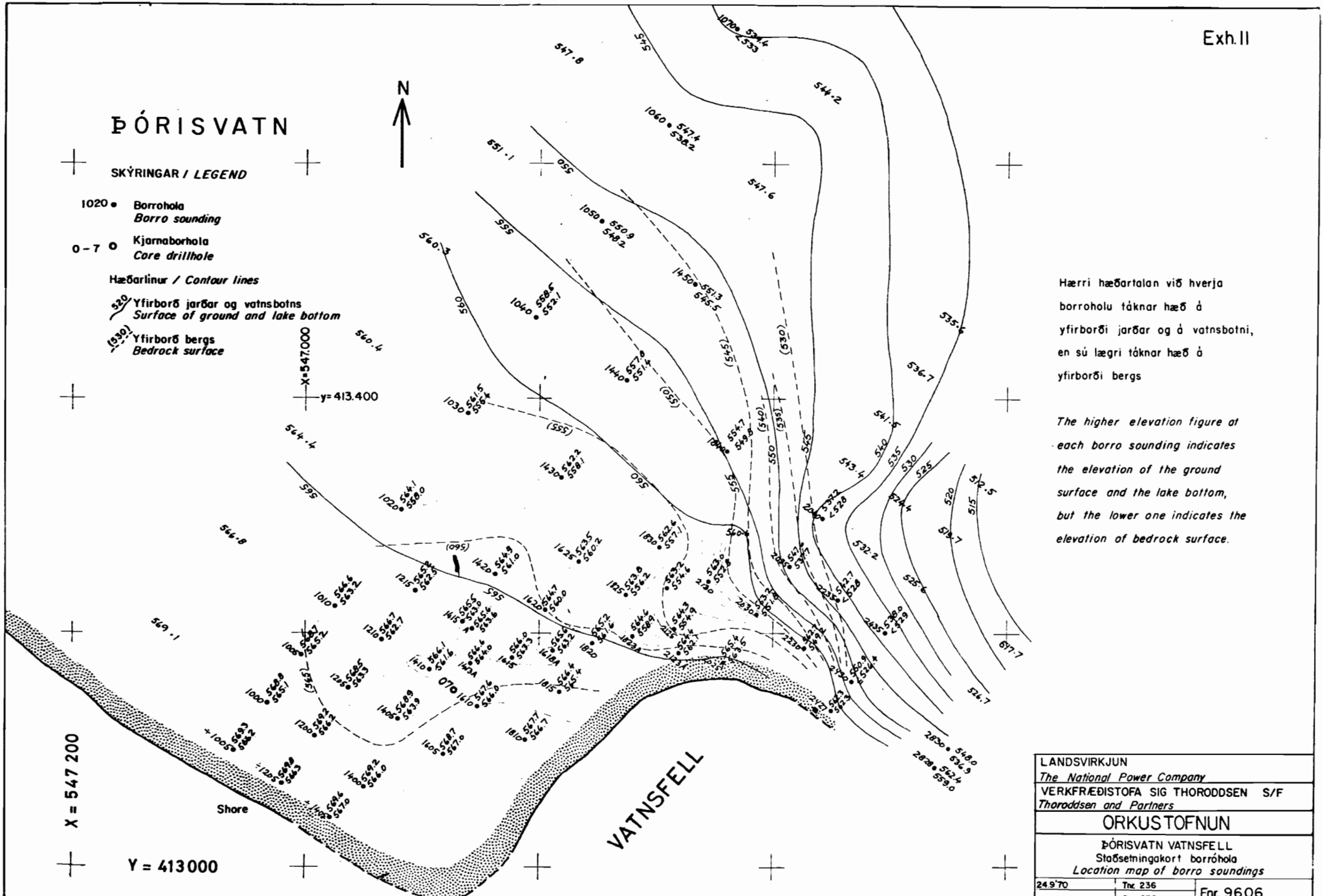
ÞORISVATN – VATNSFELL
HÆÐARLÍNUR GRUNNVATNS
GROUND WATER POTENTIAL LINES.

17.12.69 HT/SJ Tnr 102
B-332

Fnr 9193

Exh. II



Hærri hæðartalan við hverja borroholu táknar hæð á yfirborði jarðar og á vatnsbotni, en sú lægri táknar hæð á yfirborði bergs

The higher elevation figure at each borro sounding indicates the elevation of the ground surface and the lake bottom, but the lower one indicates the elevation of bedrock surface.

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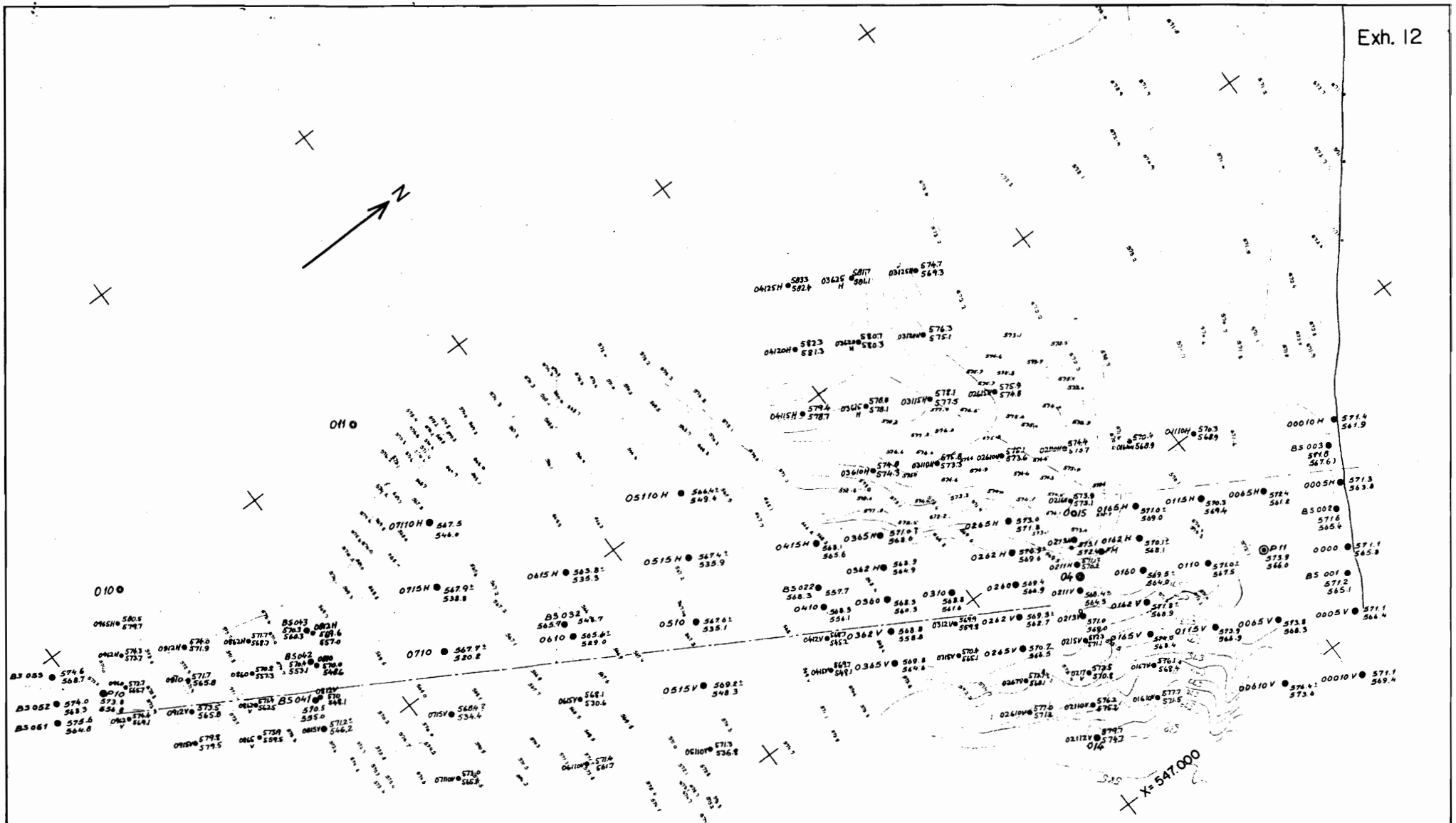
ORKUSTOFNUN	
ÞÓRISVATN VATNSFELL Staðsetningakort borróhola *Location map of borro soundings*	
24.9.'70	Tnr. 236 B—332
	Fnr. 9606

Exh. 12



Skýringar sjá Exh. 11
Legend see " "

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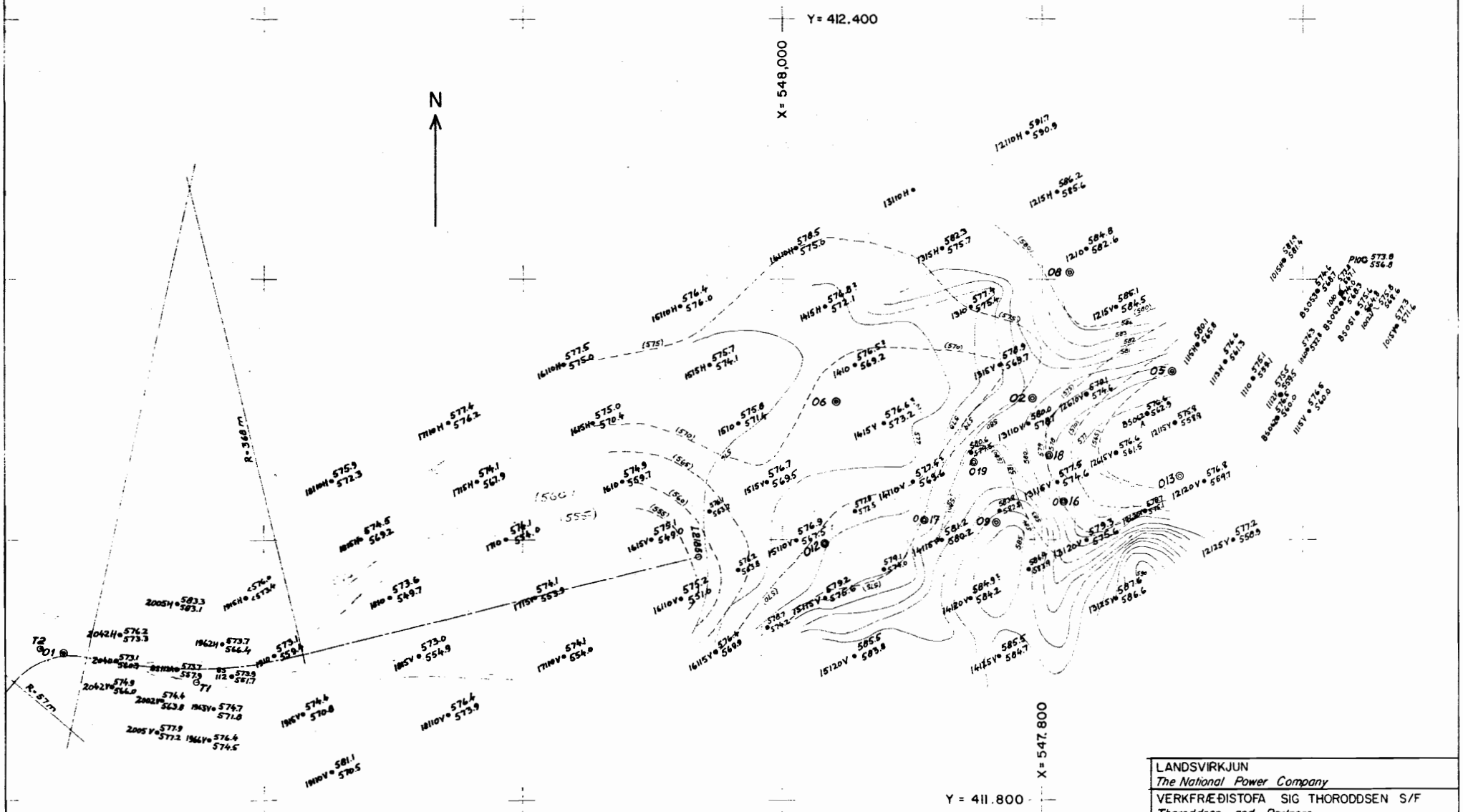
ÞÓRISVATN VATNSFELL
Staðsetningakort borrhola
Location map of borro soundings.

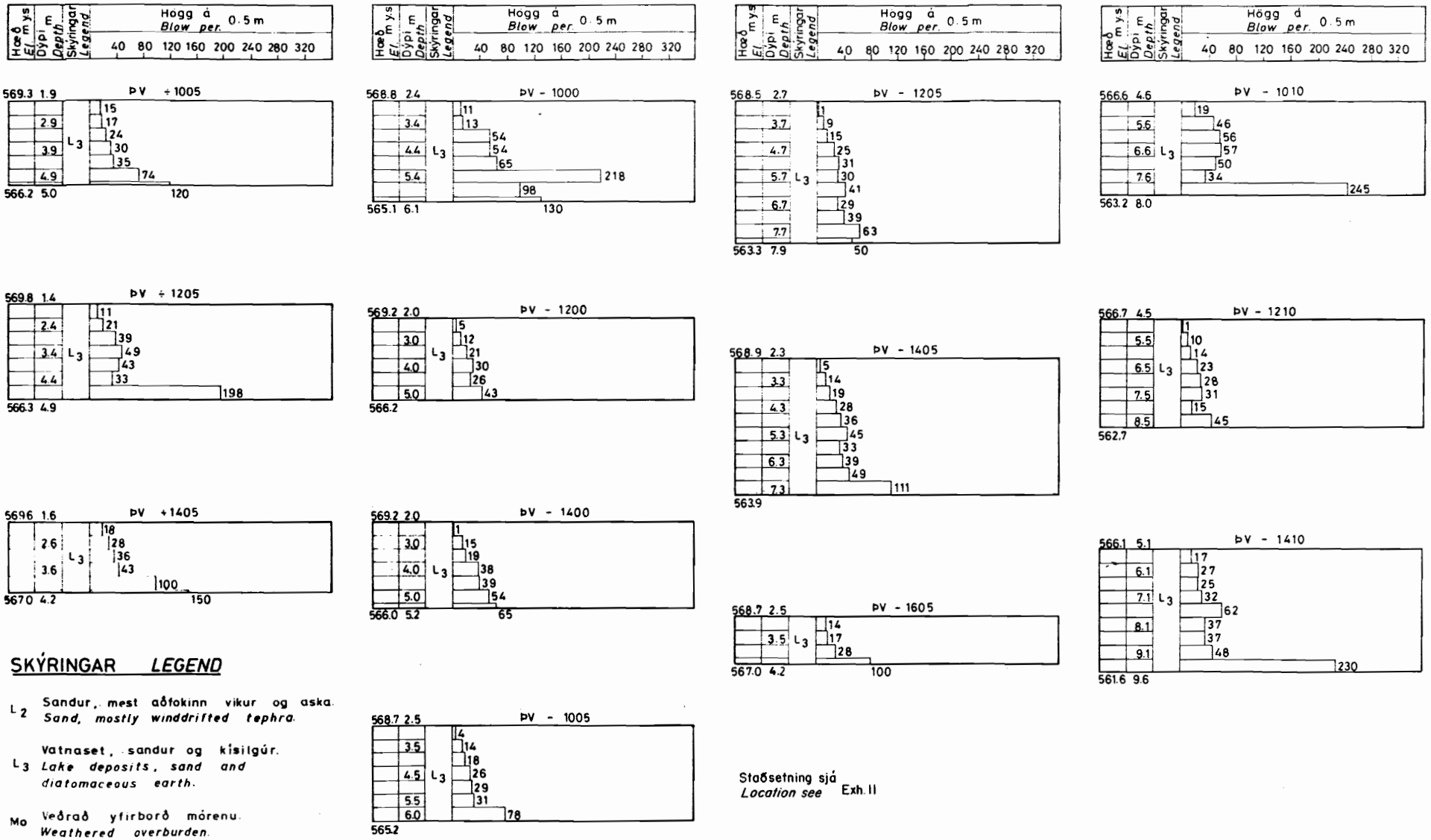
23.9.'70 BJ/SF/MH/H | Thr. 219 | B-332 | Fnr. 9589

Exh. 13



Skýringar sjá Exh. II
Legend see " "

LANDSVIRKJUN *The National Power Company*	
VERKFRÆÐISTOFA SIG THORODDSEN S/F *Thoroddsen and Partners*	
ORKUSTOFNUN	
ÞÓRISVATN VATNSFELL Staðsetningakort borróhola *Location map of borro soundings*	
22 9'70 BJ/SF/MH/M Tnr 218 B – 332	Tnr. 9588



SKÝRINGAR *LEGEND*

L_2 Sandur, mest aðfokinn vikur og aska.
Sand, mostly winddrifted tephra.

L_3 Vatnaset, sandur og kísilgúr.
Lake deposits, sand and diatomaceous earth.

Mo Veðrað yfirborð mórenu.
Weathered overburden.

Y Veðrað yfirborð móbergs, aðallega sandur.
Weathered overburden of móberg, mostly sand.

Staðsetning sjá
Location see Exh. II

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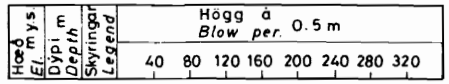
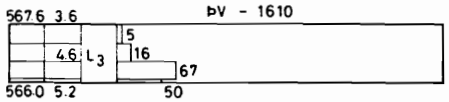
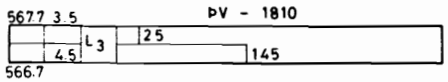
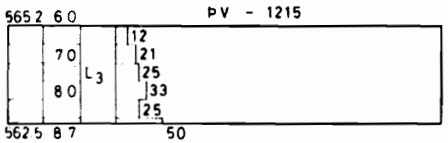
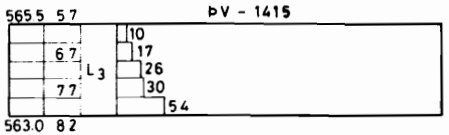
ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN.
Borró borholur í Þórisvatni.
Borro soundings in lake Thorisvatn.
25 9'70 BJ/SF/MH | Tnr. 224 | B-332 | Fnr. 9594

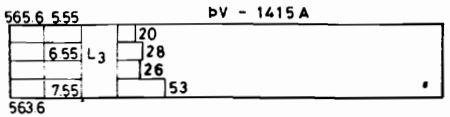


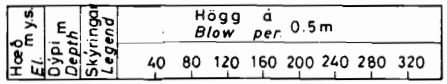


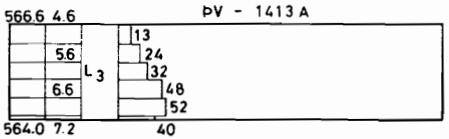


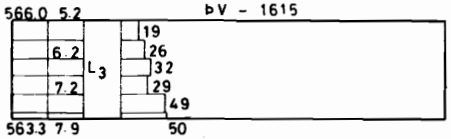


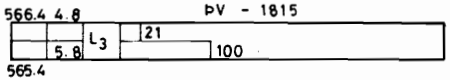


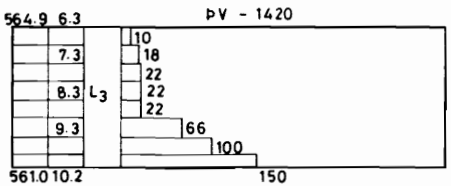




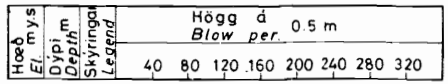


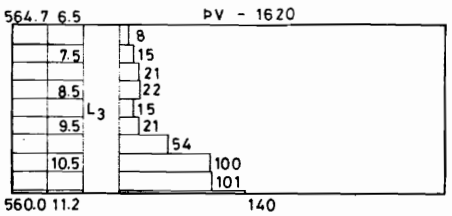


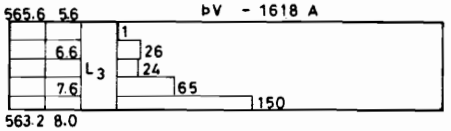


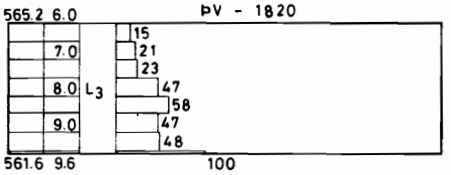


Skýringar sjá blað 14
Legend see Exh. 14

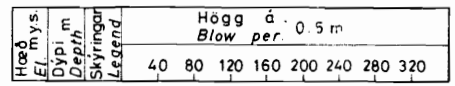


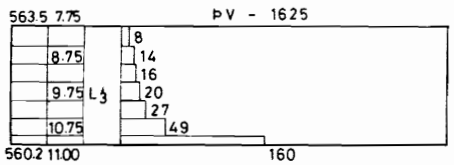


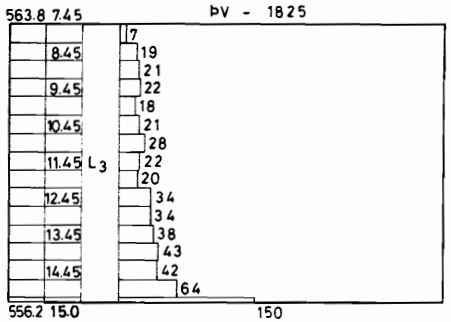


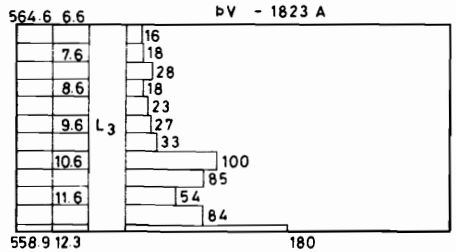


Staðsetning sjá
Location see Exh. II









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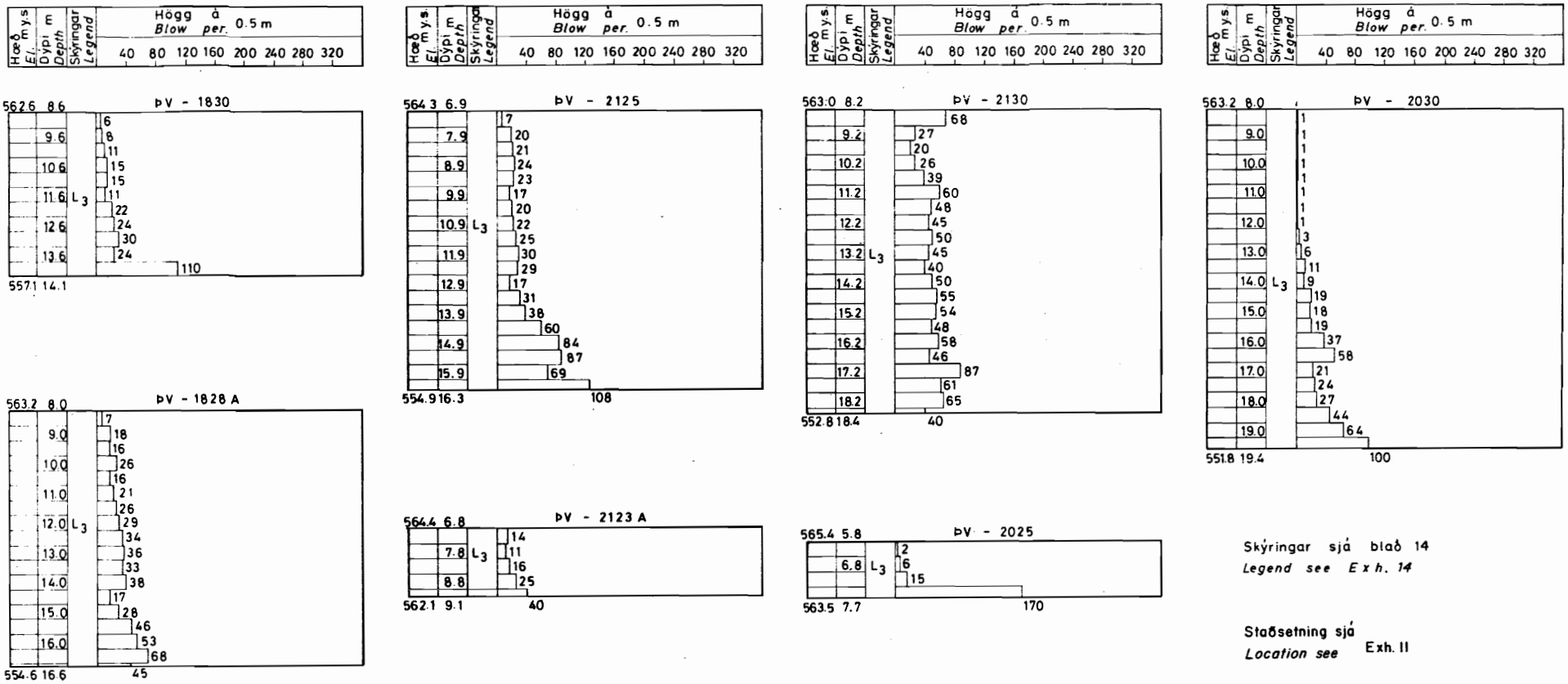
ORKUSTOFNUN

ÞÓRISVATN VATNSFELL, ÞÓRISVATNSMIÐLUN
Borro borholur í Þórisvatni
Borro soundings in lake Thorisvatn.

25.9.'70 BJ/SF/MH | Tnr 225 | B-332 | Fnr. 9595



Skýringar sjá blað 14
Legend see Exh. 14

Staðsetning sjá
Location see Exh. II

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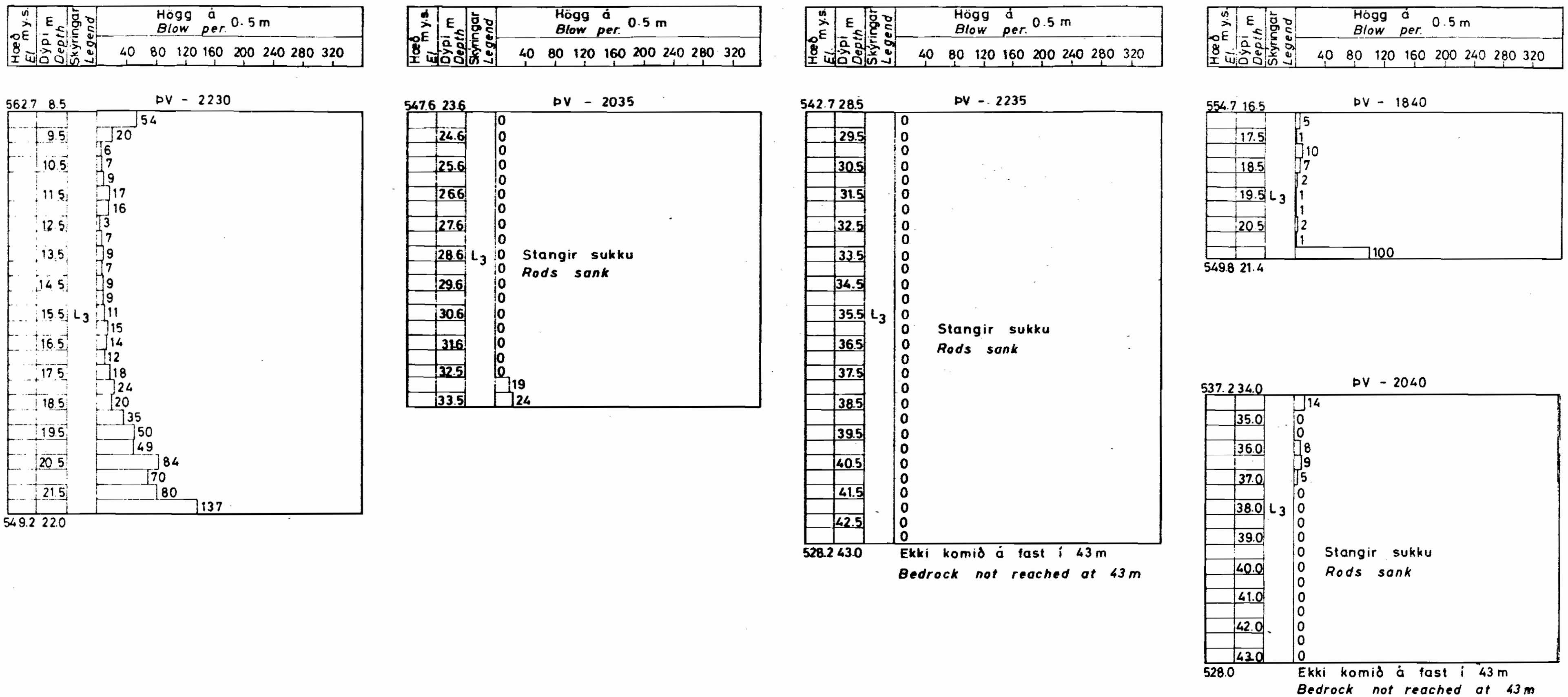
Thoroddsen and Partners
ORKUSTOFNUN
ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN
Borro borholur í Þórisvatni
Borro soundings in lake Thorisvatn.
25970 BJ/SF/MH | Tnr. 226 | B-332 | Fnr. 9596

Blað 17
Exh. 17



Skýringar sjá blað 14
Legend see Exh. 14

Staðsetning sjá Exh. II
Location see

LANDSVIRKJUN
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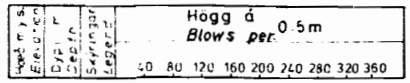
ÞÓRISVATN VATNSFELL ÞÓRISVATNSMIÐLUN
Borro borholur í vatni
Borro soundings in lake Thorisvatn

25970BJ/SF/MH/E Tnr. 227 B-332
Fnr. 9597



571.1 0.0 00010 V
1.0 L3 14 49 111
569.4 1.7 100

571.1 0.0 0005 V
1.0 2.0 3.0 4.0 L3 20 39 76 64 31 26 13 16 30
566.4 4.7 100

571.1 0.0 0000
1.0 2.0 3.0 4.0 5.0 L3 30 49 49 35 30 33 15 25 12 40
565.8 5.3 120

571.3 0.0 0005 H
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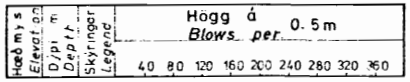
563.8 7.5

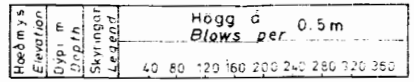


571.4 0.0 00010 H
1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 L3 67 42 44 59 46 27 26 62 79 41 33 24 19 13 18 21 28 26 100
561.9 9.5

576.4 0.0 00610 V
1.0 2.0 L2 19 21 35 34 106
573.6 2.8 115

573.8 0.0 0065 V
1.0 2.0 3.0 4.0 5.0 L3 36 21 21 16 23 32 46 33 22 23 85
568.3 5.5

Skýringar, sjá blað 14
Legend, see Exh. 14

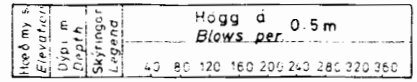


572.4 0.0 0065 H
1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 L3 46 63 71 43 21 15 11 15 14 19 16 22 21 21 28 32 44 28 35 19 19 25
561.2 11.2 45

573.9 0.0 0115 V
1.0 2.0 3.0 4.0 5.0 6.0 7.0 L3 36 38 21 25 24 42 39 44 59 73 55 48 40 97
566.9

571.0 0.0 0110
1.0 2.0 3.0 L3 43 13 9 12 14 18 46
567.5 3.5

Staðsetning sjá
Location see Exh. 12



570.3 0.0 0115 H
L3 25 70
569.4 0.9

570.3 0.0 01110 H
1.0 L3 34 67 128
568.9 1.4

577.7 0.0 01610 V
1.0 2.0 3.0 4.0 5.0 6.0 L2 33 16 16 23 34 51 57 96 100 90 110 128
571.5 6.2 150

576.1 0.0 0167 V
1.0 2.0 3.0 4.0 5.0 6.0 7.0 L2 L3 15 22 11 12 17 32 38 37 68 63 48 47 39 37 49
568.4 7.7 60

574.0 0.0 0165 V
1.0 2.0 3.0 4.0 5.0 L2 L3 58 93 32 18 24 22 35 56 37 34 49
568.4 5.6 60

Ath Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar, svo að hogga-fjoldi í efsta 1-1,5 m er allt of hár

NB: The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1 - 1,5 m is far too high.

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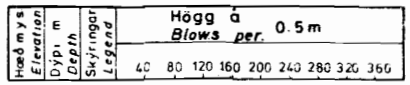
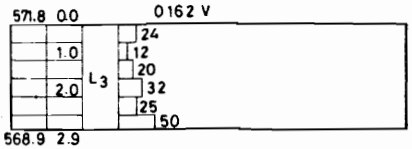
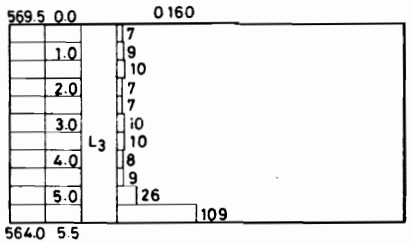
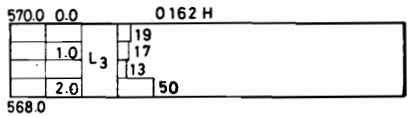
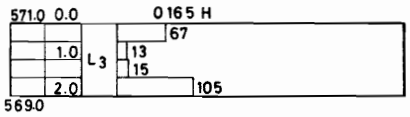
ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN.
Borro borholur nr. 00010V—0165V
Borro soundings no. " "
259'70 BJ/SF/MH | Tnr 228 | B-332
Fnr. 9598

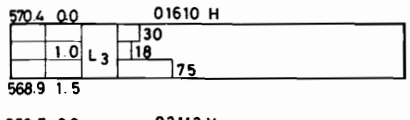


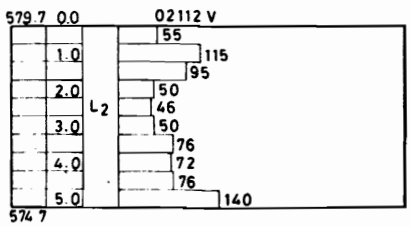


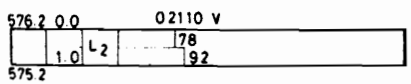


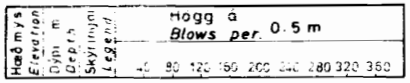


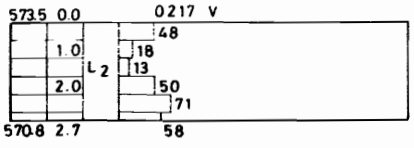


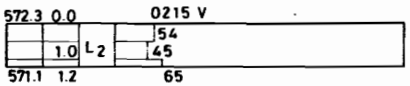


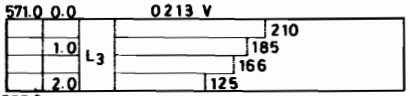


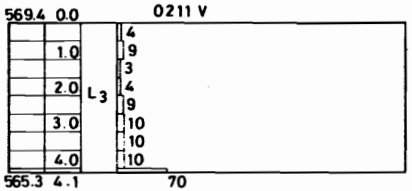


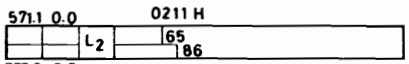


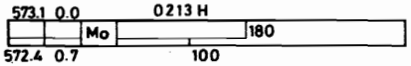


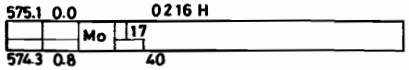


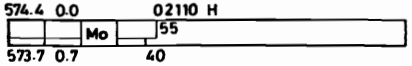


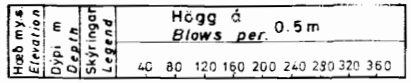


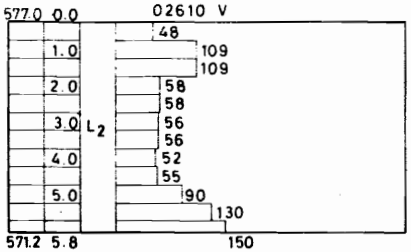


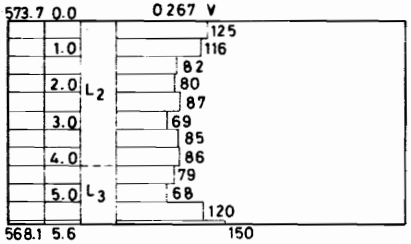


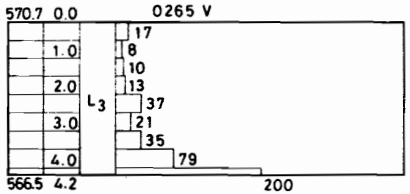


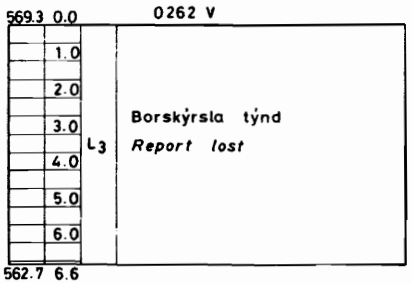


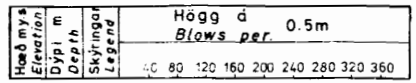


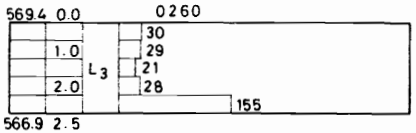


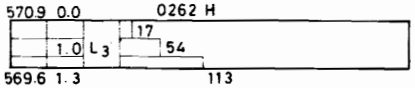


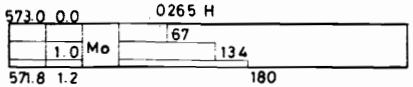


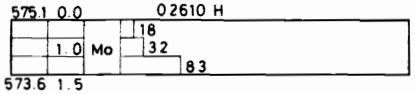


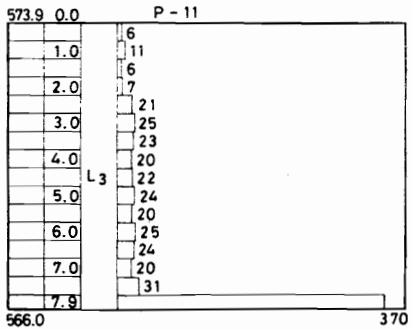












Staðsetning sjá
Location see Exh. 12

Skýringar, sjá blað 14

Legend, see Exh. 14

Ath: Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar, svo að höggafjöldi í efsta 1-1,5 m er allt of hár.

NB: The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1-1,5 m is far too high.

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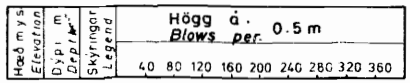
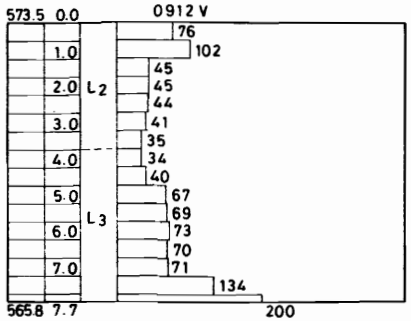
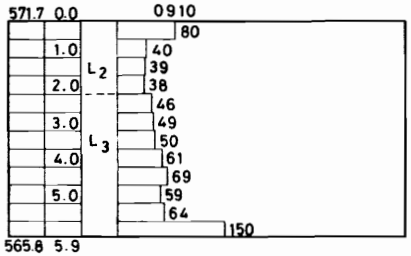
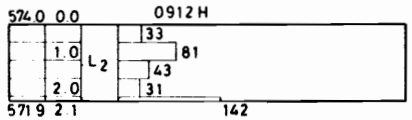
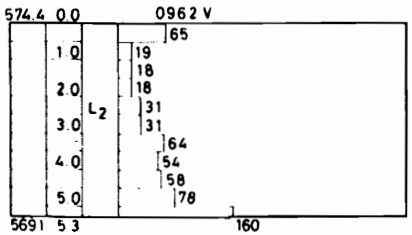
ORKUSTOFNUN
ÞORISVATN VATNSFELL ÞÓRISVATNSMIÐLUN
Borró borholur nr. 0162V–0261OH
Borro soundings no. " "
259 '70 BJ/SF/MH Tnr 229
B-332
Fnr. 9599

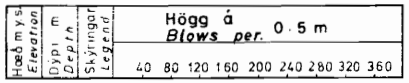


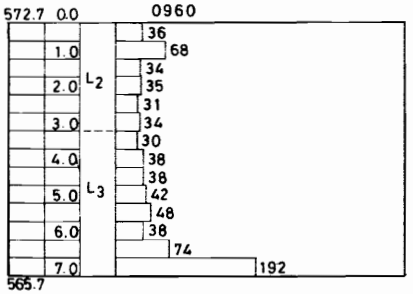


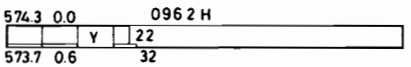


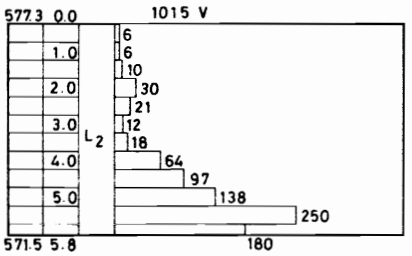


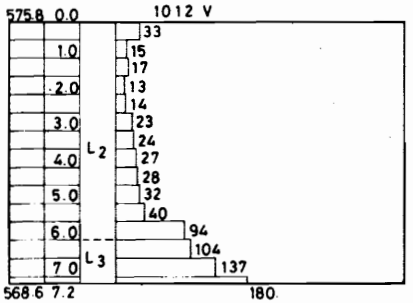






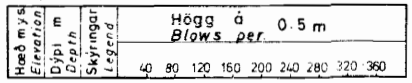


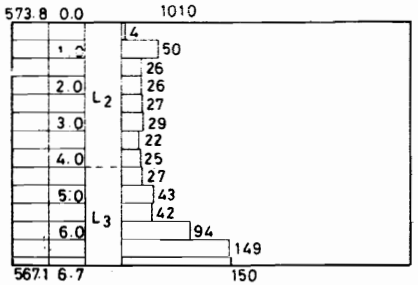


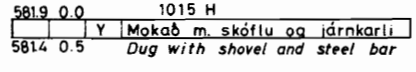


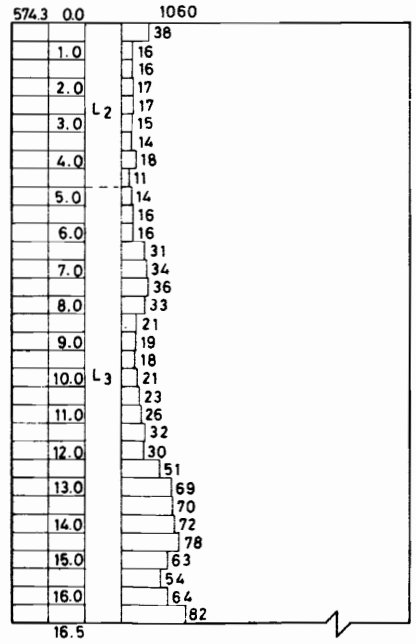
Skýringar, sjá blað 14

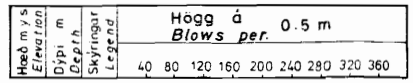
Legend, see Exh. 14

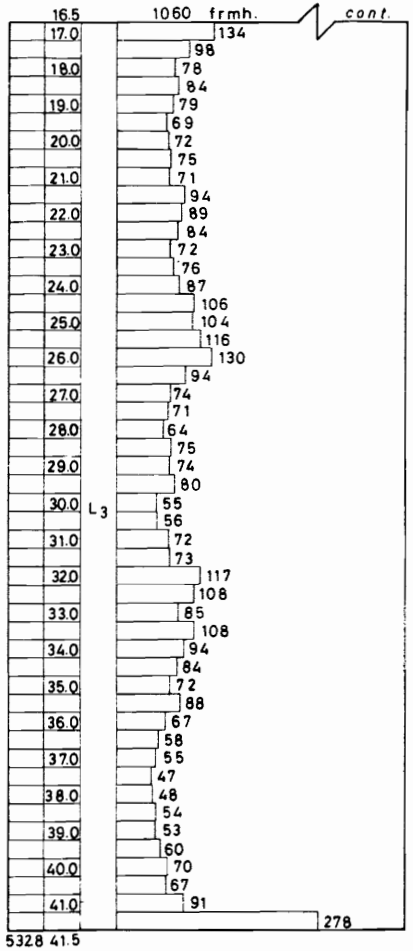












Staðsetning sjá
Location see Exh. 12-13

Ath: Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar, svo að höggafjöldi í efsta 1-1,5 m er allt of hár.

NB: The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1-1,5m is far too high.

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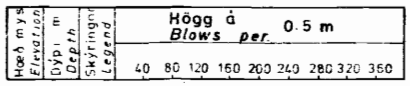
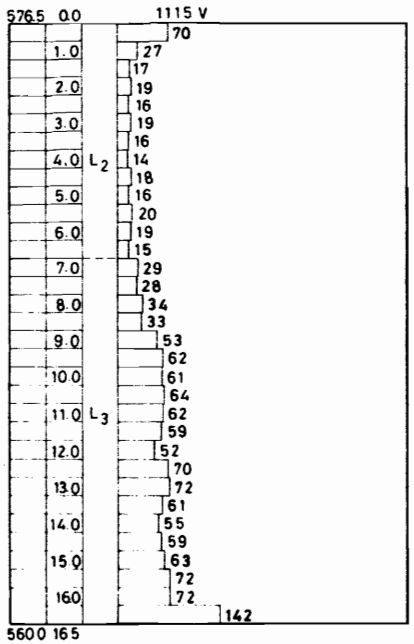
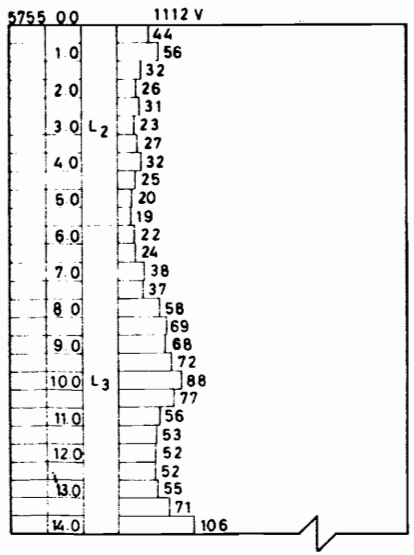
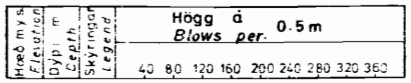
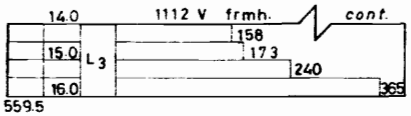
ORKUSTOFNUN
ÞÓRISVATN VATNSFELL ÞÓRISVATNSMIÐLUN
Borró borholur nr. 0912V - 1060
Borro soundings " "
25.9.'70. BJ/SF/MH Tnr 230
B-332
Fnr. 9600

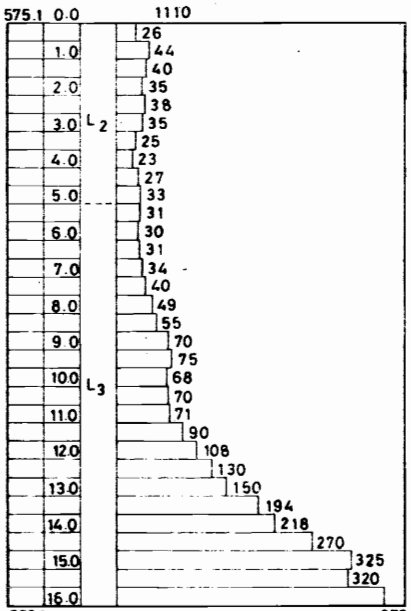


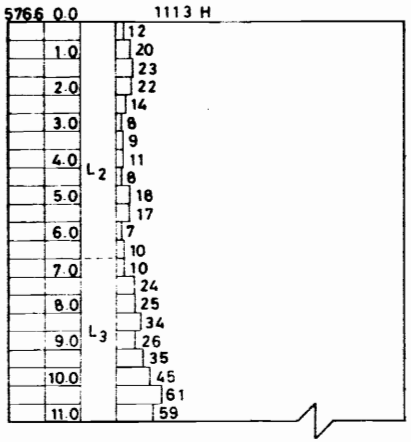


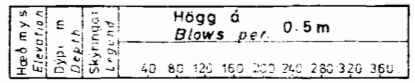


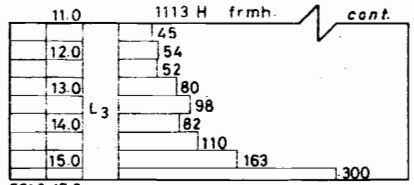


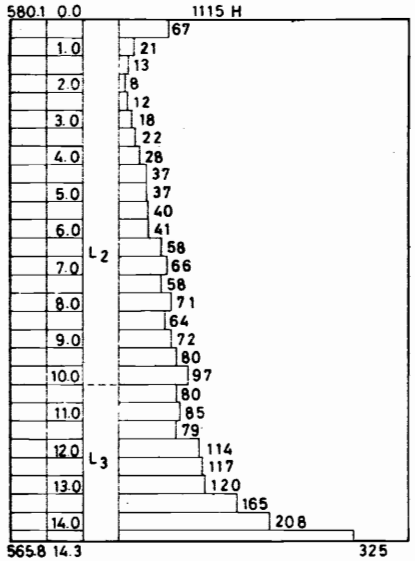


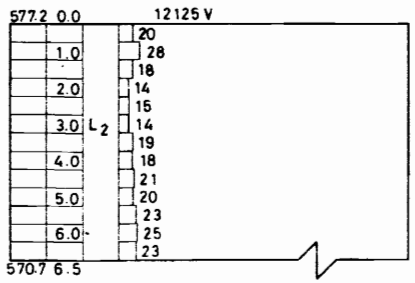


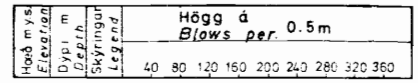


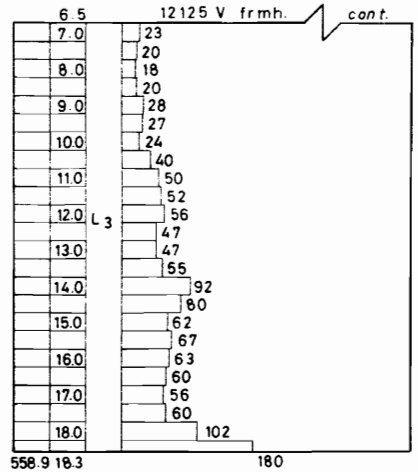












Ath: Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar, svo að höggafjöldi í efsta 1-1,5 m er allt of hár.

NB: The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1-15 m is far too high.

Skýringar sjá blað 14

Legend, see Exh. 14

Staðsetning sjá
Location see Exh. 13

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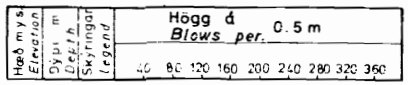
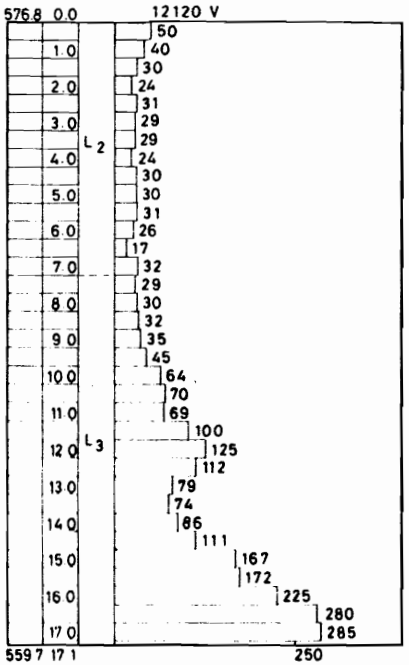
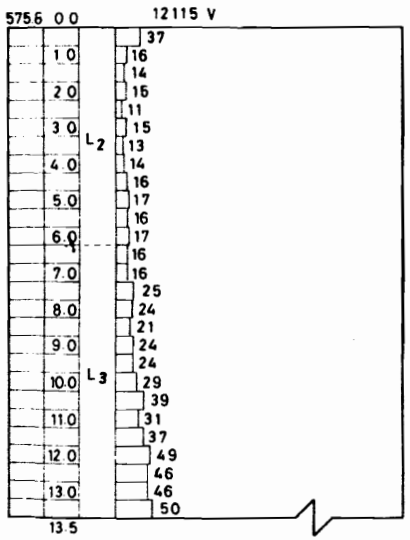
ORKUSTOFNUN

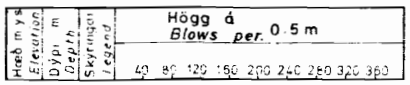
ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN
Borró borholur nr. 1115V—12125V
Borro soundings no. " "

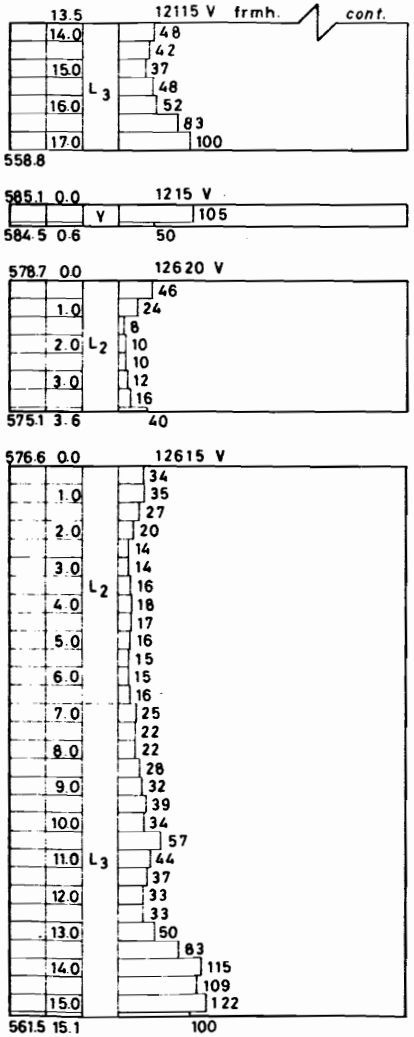
25.9.'70 BJ/SF/MH | Tnr. 231 | B-332 | Fnr. 9601

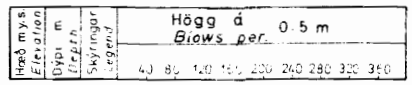


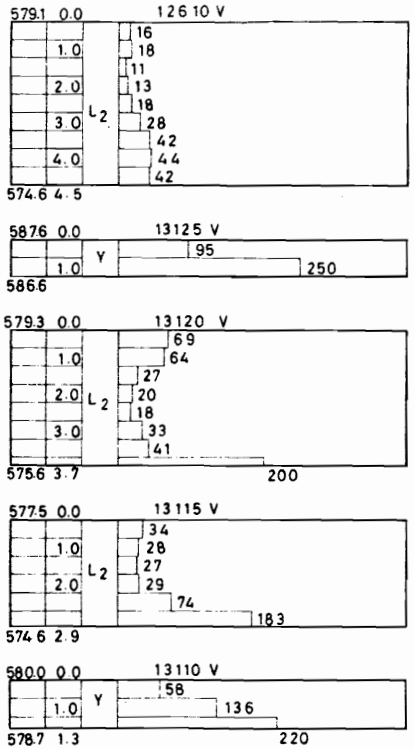


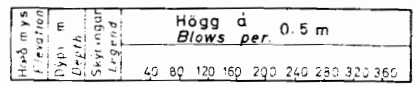


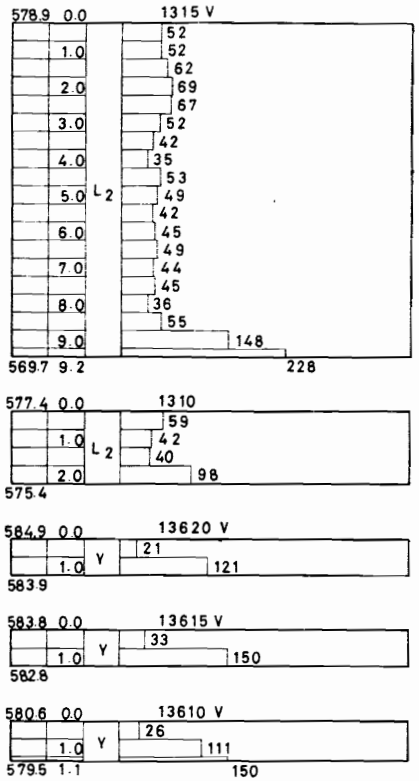












Skýringar, sjá blað 14

Legend, see Exh. 14

Staðsetning sjá
Location see Exh. 13

Ath: Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar, svo að höggafjöldi í efsta 1 - 1,5 m er allt of hár.

NB: *The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1 - 1,5 m is far too high.*

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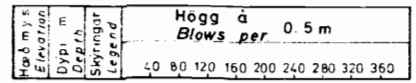
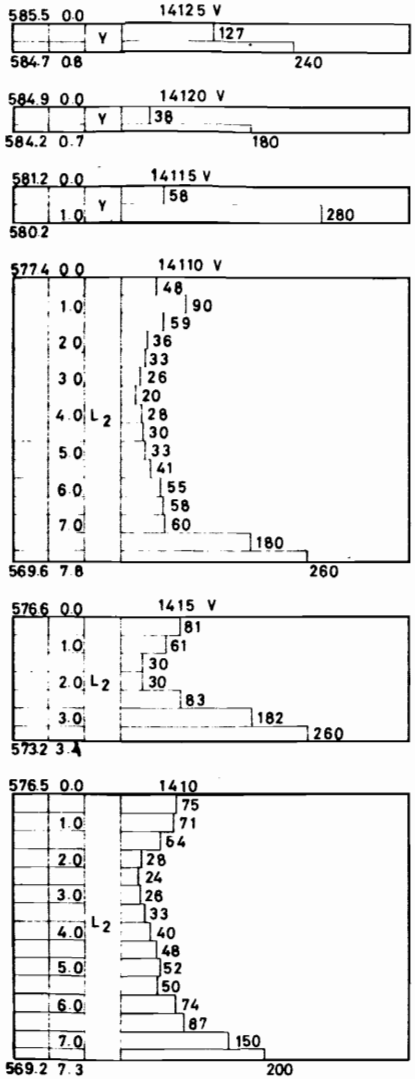
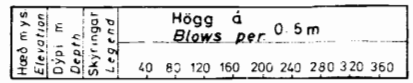
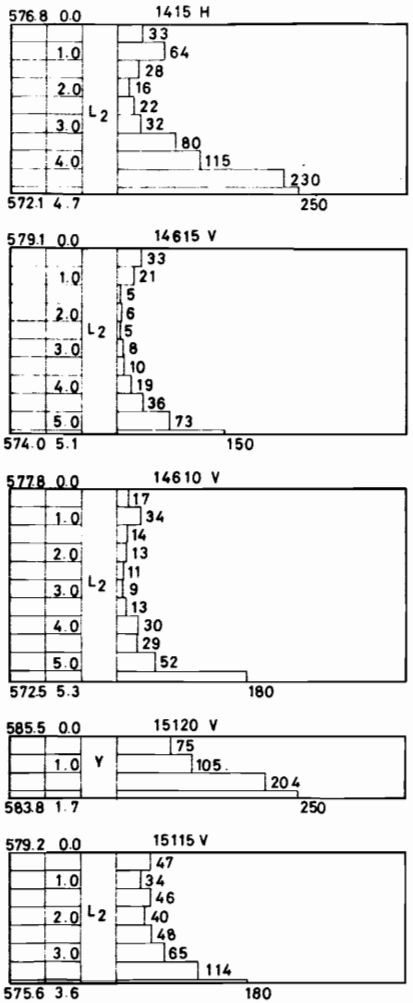
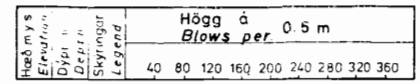
ORKUSTOFNUN
ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN
Borró borholur nr. 12120V-13610V
Borro soundings " "
25/9 '70 BJ/SF/MH T - 232
B - 332
Fnr. 9602

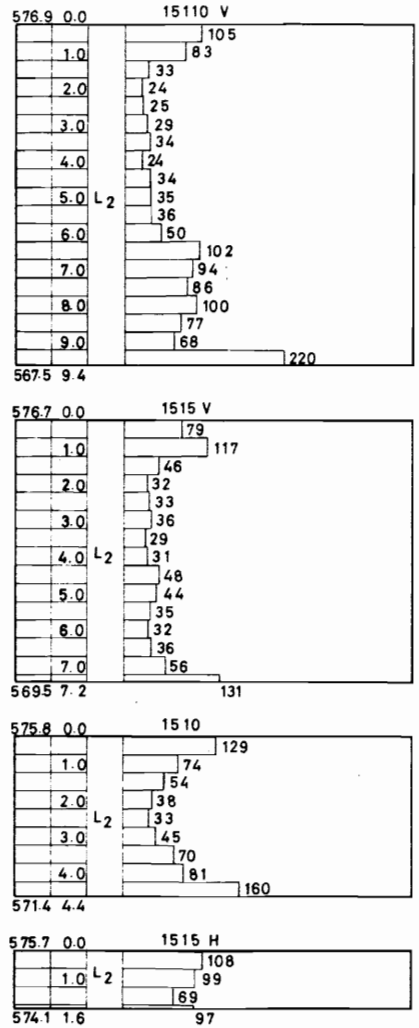


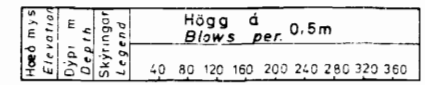


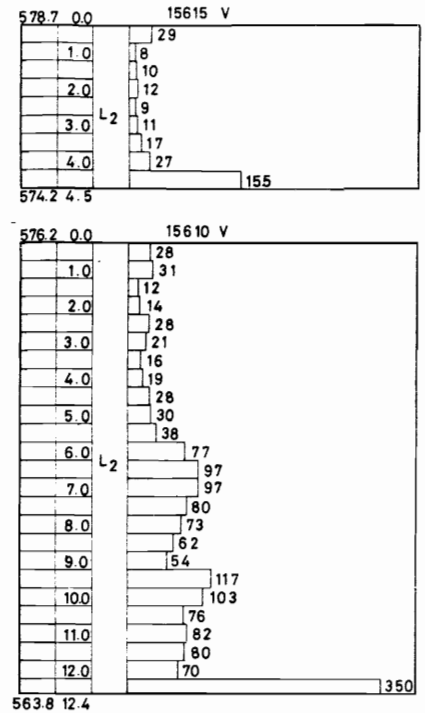












Skýringar, sjá blað 14
Legend, see Exh. 14

Staðsetning sjá *Location see* Exh. 13

Ath: Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar, svo að höggafjöldi í efsta 1 - 1,5 m er allt of hár.

NB: The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1 - 1,5 m is far too high.

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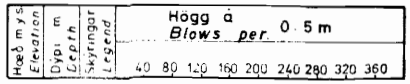
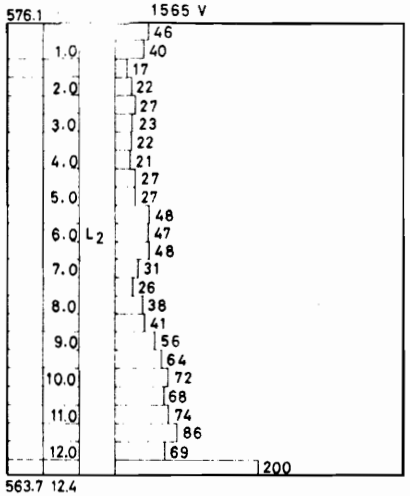
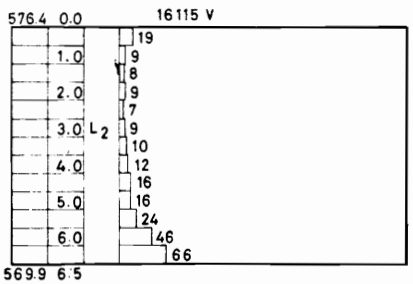
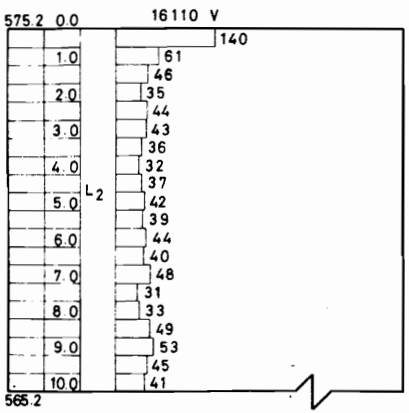
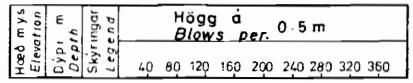
ORKUSTOFNUN
ÞÓRISVATN VATNSFELL: ÞÓRISVATNSMIÐLUN
Borró borholur nr. 14125 V - 15610 V
Borro sounding " "
25/8'70 BJ/SF/MH | Tnr. 233 | B - 332 | Fnr. 9603

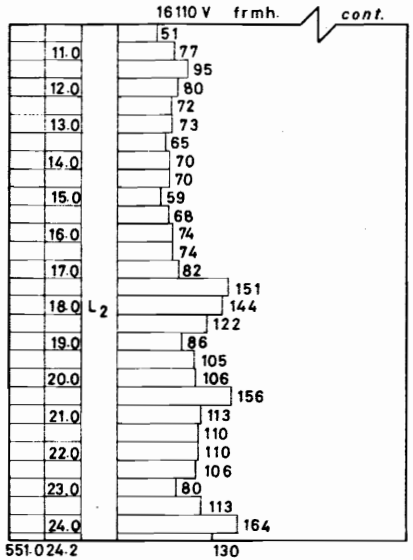


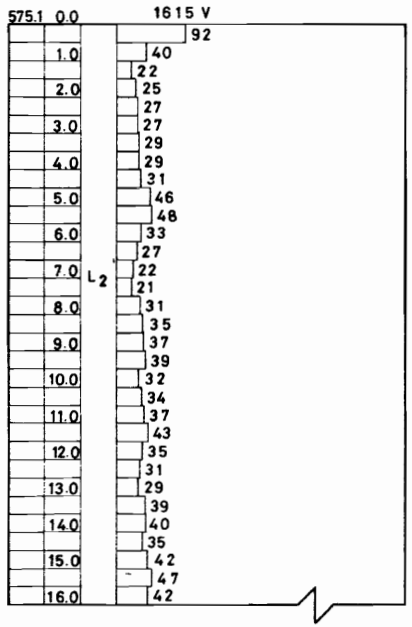


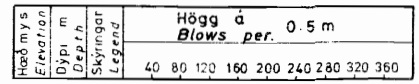


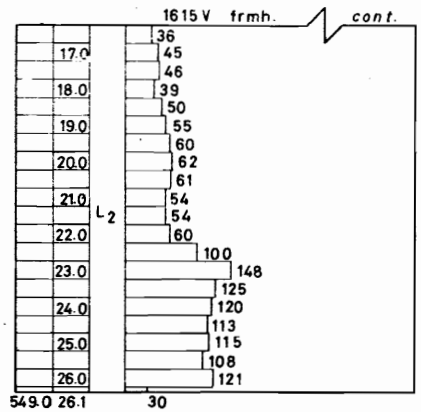


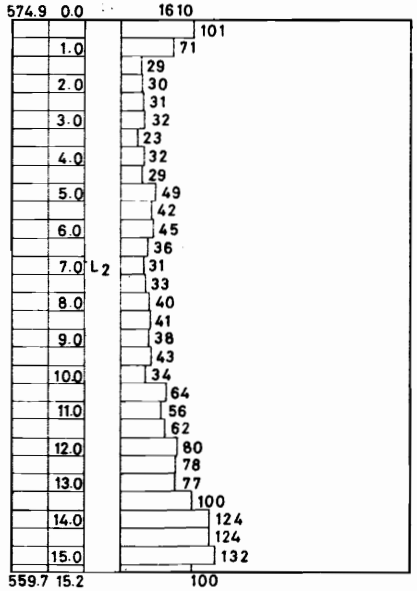


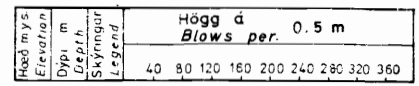


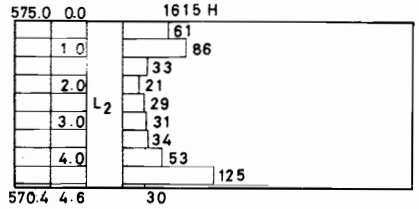












Ath. Klaki var ennþá í jörðu þegar borro boranirnar voru gerðar svo að höggafjoldi í efsta 1 - 1,5 m, er allt of hátt

NB: The surface was still frozen when the borro soundings were done, so the number of blows in the uppermost 1 - 1.5 m is far too high.

Skýringar, sjá blað 14
Legend, see Exh. 14

Staðsetning sjá
Location see Exh. 13

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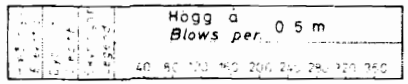
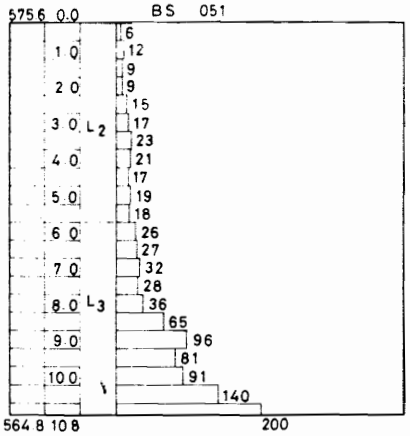
ORKUSTOFNUN

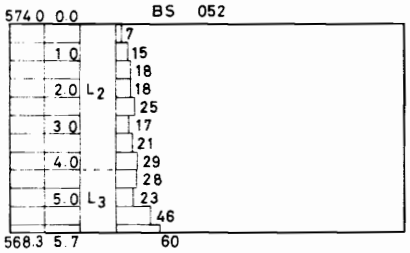
ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN
Borró borholur nr. 1565 V - 1615 H
Borro sounding " "

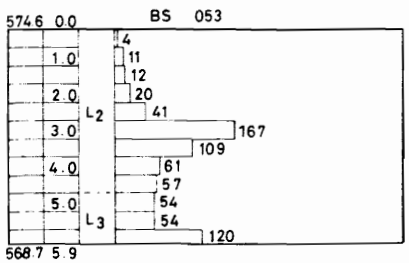
25.9.'70 BJ/SF/MH Tnr. 234
B - 332

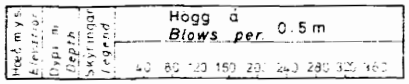
Fnr. 9604

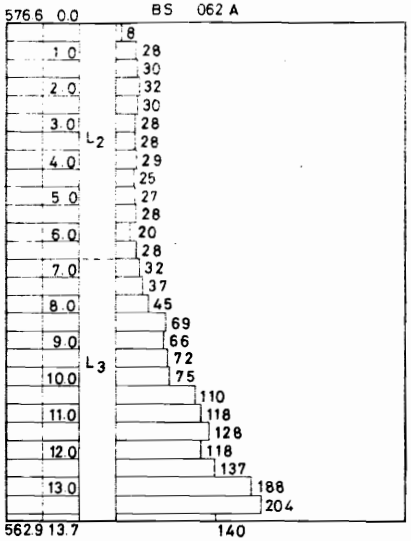


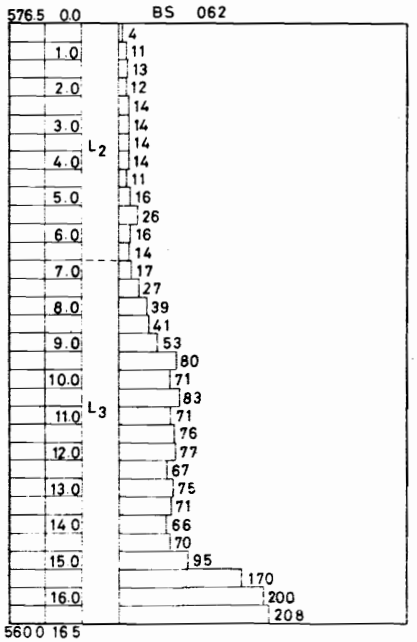


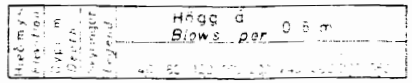


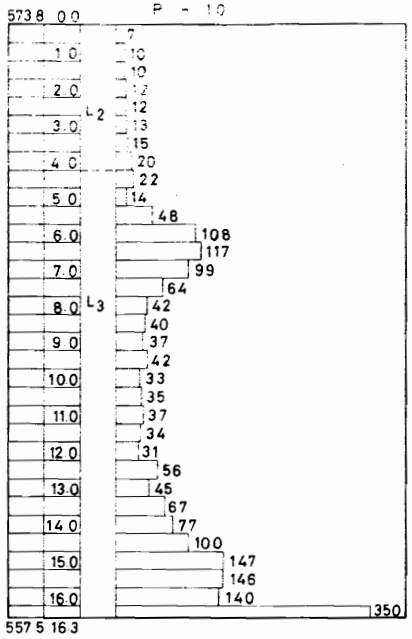












Skýringar, sjá blað 14

Legend, see Exh. 14

Staðsetning sjá *Location see* Exh. 13

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ÞÓRISVATN VATNSFELL. ÞÓRISVATNSMIÐLUN
Borró borholur nr. BS 051-062 and P-10
Borro sounding
25/9'70 BJ/SF/MH Tnr. 235
B - 332
Fnr. 9605