

ORKUSTOFNUN
Raforkudeild

Sigalda Hydroelectric Project

Quarrying for asphalt aggregate
for the main dam.

by
Haukur Tómasson
Björn Jónasson

Quarrying for asphalt aggregate to be used for an impervious blanket on the main dam

Two localities can be considered feasible for this purpose. The one closer to the project site is the Vadalda hill, just east of the conjunction of Thjórsá and Tungnaá. The other alternative is a rock quarry located west of Thjórsá a short distance from the Búrfell intake structures, presently being mined for dyke construction (see accompanying geological maps).

Quarrying in Vadalda

At the root of Vadalda there appears a basalt layer of normal magnetism, about 20 - 30 m thick, its upper contact reaching 290 m elevation. It is overlain by a compact interbed made of tillite in the southern part of the hill. This can be observed in an old quarry. In the western part of Vadalda this interbed consists of conglomerate similar to móberg in appearance. The interbed is at least 6 m thick, but its lower contact is everywhere concealed by moraine. On top of the interbed, crowning the hill is a reversely magnetised basalt layer reaching a maximum thickness of 10 m.

Quarrying north of the Búrfell intake structures

In this case there is only one basalt layer of normal magnetism. It could possibly be the same layer as the one at the root of Vadalda (see section above).

Description of rock samples

Several rock samples were collected at these two quarry sites, of which four are described below.

S-1 From an opening in the uppermost part of the lower basalt layer in Vadalda. Medium - grained basalt, doleritic, with a few small vesicles and an open texture and fine phenocrysts.

S-2 From the middle section (270 m el.) of the lower basalt layer at Vadalda. This is a piece of core from borehole ST-8 located on the western flank of the hill.

Similar to S-1, but still more dense.

S-3 From an opening in the upper basalt layer at Vadalda.

Coarse - grained basalt with fine phenocrysts, dense except for individual small vesicles with celadonite - fillings.

S-4 From the quarry west of Thjórsá north of the Búrfell intake structures.

Medium - grained basalt, doleritic, with a few small vesicles, open texture and fine phenocrysts.

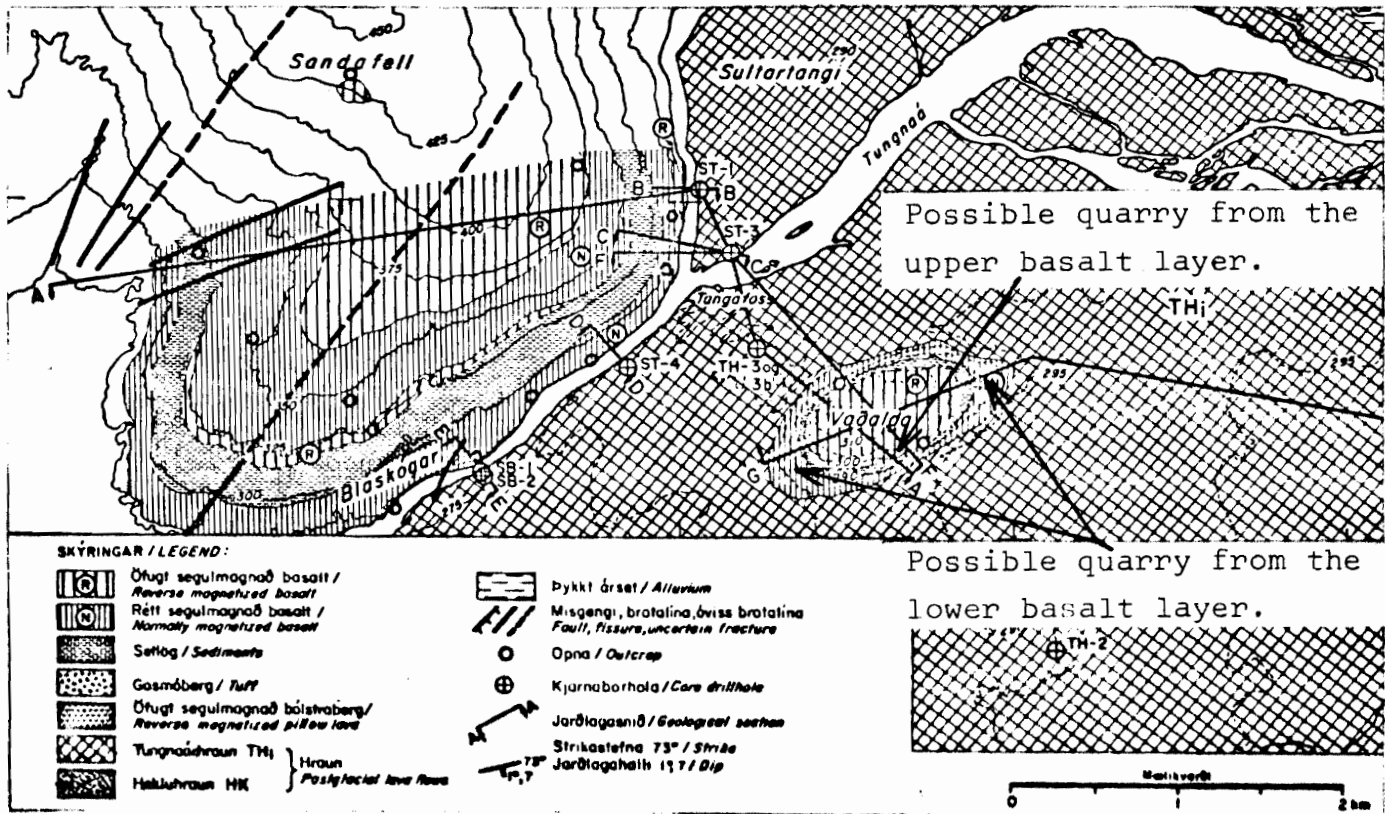
As the above description shows the samples S-1, S-2 and S-4 are all identical, except that S-2 is more dense as it is taken from the middle section of the lava.

The doleritic basalts, from which the above three samples were taken, exhibit coarse columnar structure, open texture and are only slightly vesicular. The sample S-3 is the opposite to all this; coarse grained and very dense basalt (tholeiite) which shows small columns and flow banding in places.

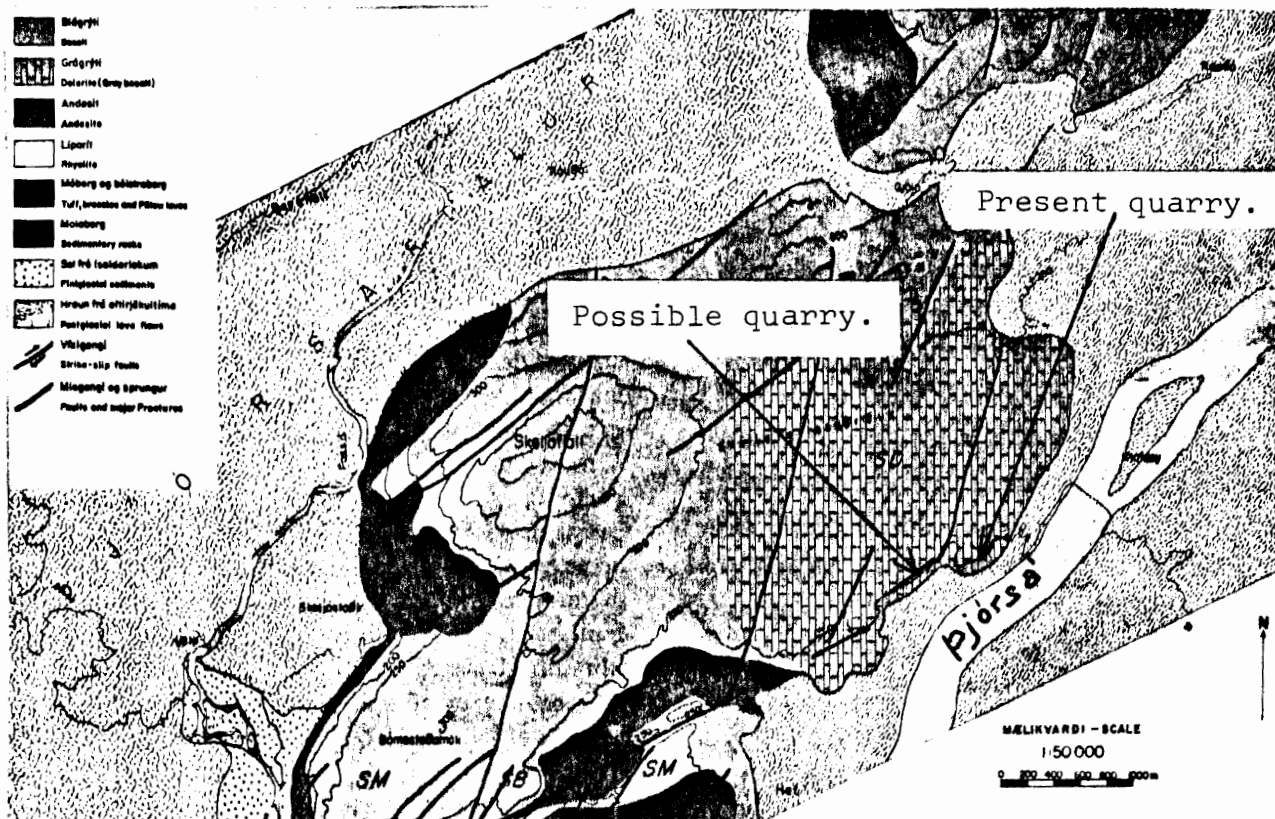
Quarrying

Should the lower basalt layer in Vadalda be selected the material must be quarried in either the northeastern or southwestern part of the hill (see geological map). The basalt is everywhere covered with moraine, which is already quite consolidated at about half m depth. At the southwestern root of the hill there is also some loessial soil accumulated on top of the moraine. Elsewhere the interbed and/or the upper basalt layer would have to be stripped off to make the basalt accessible for working.

As to quarrying the upper basalt layer at Vadalda and the locality west of Thjórsá no such problems are present (for locations see the geological map).



VADALDA - GEOLOGICAL MAP



QUARRYING NORTH OF THE BÚRFELL INTAKE STRUCTURES

GEOLOGICAL MAP