



REPUBLIC OF BOTSWANA

GEOLOGICAL SURVEY DEPARTMENT

Director: T.P. Machacha

BULLETIN SERIES

Bulletin 35

THE GEOLOGY OF THE SHASHE AREA

An explanation of quarter degree sheet 2127A

by

D.T. ALDISS

1989

*Published by the Director Geological Survey Department,
Private Bag 14, Lobatse, Botswana*

*with the authority of the Ministry of Mineral Resources
and Water Affairs
Republic of Botswana*

PRINTED BY THE GOVERNMENT PRINTER, GABORONE, BOTSWANA

4.3.4 Sand and Gravel

Sand for local use in construction is extracted by the truck-load from the Shashe River, especially at Tonotha, and to a lesser extent at Borolong, and from the Dati River near Francistown. The reserves for this kind of small-scale extraction appear to be very considerable, although no investigations have been made of the quality of the material. There is assumed to be some seasonal replenishment of the river sands although this must now be relatively restricted below the Shashe Dam.

Gravel for major road construction was obtained from shallow pits which now remain at regular intervals along each of the main roads. This material is suitable for landfill and embankment construction but would be too impure for other uses, such as in concrete, for example.

4.4 Mineral Fuels

The existence of coal in the Tlapana Formation has been proven by the drilling operations of Shell Coal (Botswana) (Pty.) Ltd. immediately to the south and west of the Shashe area, but its quality is not encouraging (Smith and Phofuetsile 1985). It seems unlikely that significant developments of coal extend into the present area.

There are no indications that abnormal concentrations of radioactive elements exist in the Shashe area.

4.5 Gemstones

4.5.1 Diamond

The whole of the Shashe area was prospected for diamonds during the later 1960's. No significant diamond occurrences were reported.

4.5.2 Nephrite

A few specimens of pale grey and green tremolite rock were collected from several widespread localities (848, 1404, 1479) where it is interlayered with marbles and calc-silicate rocks of the Matsitama and Shashe Groups. Some of these samples were composed largely of aligned fibrous tremolite and so approach the composition of 'nephrite', which is one form of jade, and amongst the most valuable semi-precious stones. True nephrite, however, requires that the fibres be interlocking in random orientation. The specimens which were collected accepted a very good polish but contained numerous small fractures. They were collected from the surface, from float, or in one case from a 10 centimetre rib in marble, and it seems possible that sound material could be obtained from below the weathered zone. There is, however, no evidence that commercial-grade nephrite occurs, or that it forms workable bodies.

4.6 Water Resources

Surveys conducted within the Shashe area to assess underground water resources or to site water boreholes are noted briefly in Section 2.1.

One of the single most important sources of water in the whole of Botswana, the Shashe Dam, is situated in the southeast of the Shashe area, on the Shashe River near Tonotha. It normally becomes fully recharged during the rainy season. The reservoir extends some 9 km upstream from the spillway. The towns of Francistown and Selebi Phikwe, including the copper-nickel mine, are supplied from this reservoir by pipeline.

Small earth dams have been constructed recently in at least two places, one just to the west of Makobo, and the other just south of the Mphane River, southwest of Borolong village.

Water is pumped from the sand-beds of the Shashe, Dati, and Thalogang Rivers in

numerous places, to supply villages, farms, small irrigated fields, and isolated homesteads. In addition, there are ephemeral shallow wells in the sand-bed of the Shashe River, above the reservoir, and in all its major tributaries. There are also widespread hand-dug wells, some of which penetrate more than 30 m of bedrock. These wells supply local domestic and live-stock needs. Most of the wells have been placed beside small rivers, but even so many had dried up during 1987 before the rainy season.

Thus within the Shashe area there is considerably less reliance on boreholes pumping groundwater than in most other parts of Botswana. Boreholes are mainly found in the Tati block farms (especially in the hinterland remote from the main rivers), and around Francistown, and in the west of the area towards the headwaters to western tributaries of the Shashe.

Water quality is generally good, except in the few boreholes which have been drilled in the quartzites and marbles of the Matsitama-type metasediments (Section 3.3.2.2), which are locally reported to be rather saline.

According to Dechend (1979), the potential for underground water development is thought to be poor throughout the greater part of the Shashe area. The exceptions are the zone in the immediate vicinity of the Shashe River, which is considered to have poor to fair potential, and the outcrop of the Karoo sediments, where the prospects are considered fair to good.