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39. Further interpretation, gravity survey, Whitewater Creek dam site, Kingston.

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Shortly after initial mapping of two proposed dam sites on Whitewater Creek, near Kingston, a gravity survey was undertaken with the objective of examining the structural nature of the dolerite present and its relationship to faulting (Leaman, 1968, pp. 56-59). At that time the geology appeared straightforward. Subsequent investigations including drilling and additional geophysical work (Moore, 1973), have shown the area to be far more complicated than anticipated. A Tertiary lead system as well as additional cross faulting has been located.

Although there is now little prospect of a dam being built at either site in the valley, in view of leakage considerations, it was felt that a more complete interpretation of this survey should now be given. As a survey case-history it also shows that potential methods should not be applied in too restricted a manner.

INTERPRETATION

The original interpretation (Leaman, 1968) stated that the faults were not related to selective dolerite intrusions, nor were intruded by them. Further, that if a sheet were present it was common to all fault blocks covered.

A subsequent regional survey (Leaman, 1972) has verified a NE-SW strike to the regional trend which means that the anomaly range across the area (Leaman, 1968, fig. 15), is less than 2 mgals. The regional interpretation would also imply that the blocks west of the Permian/Triassic fault at the upper dam site are intruded by a major sheet and that this is absent to the east. However as the regional station spacing is some twenty five times that of the detailed survey no valid discrepancy can be stated since there is insufficient overlap of the two surveys. The gradient interpreted in Leaman (1972) as due to the sheet edge can now be shown to be not at the implied fault but slightly to the west and probably near the end of line H (Leaman, 1968).

Part of the Tertiary lead system is also reflected in the eastern end of lines A and B, (Leaman, 1968) which were near top water level and just lapped on to the basalt cap of the hill which conceals the lead. The eastern end of lines F, H and J show similar reversals suggesting a N-S lead across H-Q.

CONCLUSIONS

Although the original survey located problem areas along the centre lines of the dams and the adjacent faults, no work was carried out above TWL, or into the storage which was later shown to contain an effective leakage path.

Extension of the traverse lines to the west by less than 180 m would have done much to solve the problems of additional faulting through the storage as well as confirm the dolerite edge since postulated. Because the presence of dolerite must be proved for the quarries further west coverage should have been wider.

One or two more traverses south of A, 60 m apart, would have detected the lead system. A traverse has since been done and is included by Moore (1973).

REFERENCES

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