UR1974_17

Groundwater investigation for G. & K. French, Sawmillers, Scottsdale.

W.R. Moore

Two sites on the Tasman highway were investigated at the request of G. & K. French. The first site is located 2 km east of Scottsdale [EQ447416] and is for domestic supply for homesteads and the second site, 3 km east of Scottsdale [EQ461405], is for the timber mill at Ling Siding.

GEOLOGY

At the homestead site granodiorite crops out along the ridge to the south and west. Weathered outcrops of granodiorite are exposed in the nearby railway and road cuttings. No geophysical investigation was undertaken at this site because of the high cost of drilling a bore in granodiorite, a rock unit in which only one hole has been drilled in the current Department of Mines underground water investigation.

The second site located at the sawmill is of more interest from a geological point of view as it is situated on a narrow N-S flat which separates the granite hill of Mt Stronach to the east and a low ridge of granodiorite to the west and north-west. This ridge is capped by the gravel and sand of Tertiary age and separates the isolated small Tertiary basin of the McKenzie River area from the main Tertiary Scottsdale basin to the north. There are no outcrops in this flat area but it is probably underlain by Tertiary sediments.

GEOPHYSICAL WORK

Two E-W seismic spreads were undertaken from the railway crossing west of Ling Siding to the eastern boundary of the mill. A resistivity probe was carried out in a N-S direction in the paddock adjoining the western boundary of the mill.

The seismic velocities, the depth of the layers present and their geological interpretation is shown below.

EASTERN SPREAD (244 m in length, geophone spacing 7.6 m).

Velocity layers	Velocities m/s	Depth (m)	Geological interpretation	Remarks
East end				
V_0	910-1070	6.7-7.3	Tertiary sand, gravel and clay.	V_0/V_1 interface slopes steeply to the west (valley side).
V_1	3350	18.0-21.0	Granite.	
V_2	4570		Unjointed granite.	
West end				
V_0	1220-1680	12-14	Tertiary sand, gravel and clay.	Lens of deeply weathered granite appears from west end.
V_1	2130	39-43	Weathered granite.	
V_2	6100		Unjointed granite.	

WESTERN SPREAD (320 m in length, geophone spacing 15.2 m).

Velocity layers	Velocities m/s	Depth (m)	Geological interpretation	Remarks
V_0	1220-1520	27-34	Tertiary sand, gravel and clay.	Deeper to the east.
V_1	3050-3650		Granite.	

The seismic spreads indicate the presence of a buried river channel at the mill, the eastern edge of the valley being located near the eastern boundary of the mill. The other side of the valley is probably near the granodiorite exposure on the railway line 150 m west of the rail crossing.

The resistivity probe indicated the presence of some surface gravel underlain by clay at depth. The current did not penetrate the clay to indicate the presence of granite forming the floor of the valley.

The valley has been traced south to Rickett's farm near the Waterhouse-Scottsdale road. North of this locality it appears to be overlain by basalt before it connects with the Surveyors Creek lead of the Scottsdale basin. This is the only known locality where a 'lead' has been found to connect the main Scottsdale Tertiary basin with the small intramontane Tertiary basins to the south, *e.g.* Springfield, McKenzie and Tonganah basins.

GEOHYDROLOGY

The amount of groundwater in the Tertiary sediments filling this valley will depend on the percentage of clay present in these sediments.

In a bore drilled by the Department of Mines on Campbell's property, 2 km to the north, 30 m of sand, gravel and clay of Tertiary age were encountered overlying deeply weathered and decomposed granite. The total depth of the bore is 50 m penetrating to unweathered granodiorite. The bore yielded 106 *l*/min during an 8 hour pump test with a drawdown of 10 m. The water quality was good (total dissolved solids: 120 ppm).

CONCLUSIONS

Similar yields and water qualities to those mentioned above could be anticipated at French's Mill. The Tertiary sequence, which is 30-40 m in thickness, is unlikely to consist entirely of clay or sandy clay, thus yielding little or no groundwater.

Until further drilling in granites and granodiorites is undertaken by the Department of Mines the first site is not recommended.

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