THE CAPE TOWN BROCHURE

In 1580 Sir Francis Drake rounded the Cape and lyrically described it as "the fairest Cape in the whole circumference of the earth". Not known to many, much of the splendor of the Peninsula and beyond are enhanced and sustained by the numerous mountain streams in the Cape Fold Belt which are being fed by groundwater from thousands of springs.

The Cape Town Hydrogeological map is bordered by latitude 33 S. in the north, longitude 21 E. in the east, and by the Atlantic and Indian Oceans in the west and south respectively. The main features shown on the map are lithology, aquifer types, borehole yield expectations, groundwater use and groundwater quality, as well as schematic cross sections to illustrate the regional hydrogeology and targets for groundwater development. Dissimilar and divergent conditions, amongst others cold and warm ocean currents, rough mountains, mountain valleys and undulating plains, widely varying precipitation,, varying lithologies, from old metamorphic rocks to relatively recently deposited unconsolidated material, highly competent arenaceous to incompetent argillaceous rocks, large intrusive granite bodies and most importantly, cataclysmic tectonic events, all impact to various degrees on the groundwater environment.

Three modes of groundwater occurrence, namely **fractured**, **intergranular and fractured**, and **intergranular** appear in the map area. A distinct **two-layered aquifer** is also identified in the Breede River Valley.
Fractured aquifers cover about 82% of the map area. They are composed of the varying metamorphic rocks of the Malmesbury Group; the quartzitic sandstone of the Table Mountain Group (TMG), shale and subordinate sandstone of the Bokkeveld Group, shale and sandstone of the Witteberg Group, diamictite of the Dwyka Group, and shale and subordinate sandstone of the Ecca and Beaufort Groups. All these rock units were subjected to deformation, and a variety of fold and fault structures abound, resulting in widespread fracturing and jointing, notably in the more competent lithologies. The yield potential in the various Groups varies widely with yields in excess of 5 l/s quite common in the TMG and portions of the Bokkeveld Group. Groundwater quality in these high-yielding areas is likewise good, and ECs seldom exceed 100 mS/m. The yield potential in the rest of the fractured aquifers, particularly the pelitic components, are generally less prolific and yields of less than 2 l/s can commonly be expected. Groundwater quality also varies widely between 70 and 1000 mS/m. Groundwater in the fractured aquifers tends to be of a sodium-chloride nature.

The Cape Granite Suite represents the **intergranular and fractured regime** and it covers about 4% of the map area. Only 5% of boreholes yield more than 5 l/s in this regime, while 42% of boreholes yield less than 0.5 l/s. ECs vary between 30 and 350 mS/m and the groundwater has a sodium-chloride-sulphate nature.

The coastal Sandveld and Bredasdorp Groups and the Breede River alluvial aquifer represent the **intergranular** regime, which covers about 14% of the map area. About 30% of boreholes yield more than 2 l/s in both the Sandveld and Bredasdorp Groups while 36% of boreholes yield more than 2 l/s in the Breede River alluvial aquifer. ECs vary between 50 and 90 mS/m in the Sandveld Group, between 70 and 150 mS/m in the Bredasdorp Group and between 10 and 30 mS/m in the Breede River alluvial aquifer. Groundwater in al of these units tends to be of a sodium-chloride-calcium-alkaline nature.

Cold springs abound and occur particularly numerously in the TMG. Deep circulating, fracture-controlled and shallow circulating lithology-controlled springs are the most common types of springs. A number of springs, associated with the basal conglomerate of the Bredasdorp Group, emanate along the south coast.
Six thermal springs, with temperatures ranging between 33° C and 64° C occur in the map area, and they are all fault-controlled. The occurrence of relatively many thermal springs is substantive evidence of deep groundwater circulation in the Cape Fold Belt.

An important water management strategy in the map area is the practice of conjunctive use of surface water and groundwater whereby groundwater is abstracted in the dry summer months to supplement depleted surface water supplies. The area has a large-scale groundwater abstraction of about 126 million m^3/annum for both urban and agricultural use.

Seawater intrusion into the Sandveld Group aquifer along the West Coast and into the TMG aquifer along the south coast is the most important form of groundwater contamination in the map area.

Deep groundwater circulation, comparative rock competencies and associated brittle failure, manifestation of permeability inhibiting in-filling material such as iron and manganese into fractures, spring distribution and modes of spring occurrence, are some of the issues in need of future investigation.