

E. KARST LANDFORMS

Field Note E3. Doline provinces

There is a multitude of dolines on the limestone Hard Dunes in the Study Area. In her MSc and PhD theses, Lin Russell has classified the dolines of De Hoop Nature Reserve in several categories. It is the intention of this study to revisit the above classification; nevertheless, at this stage, and as the study is about an area, which is much greater than that of the reserve, the classification below is not according to the formation of the dolines, but according to their spatial distribution patterns. So far this study found that the dolines in the Study Area can be categorised into four geographic sections, or provinces (Figure 1).

[The doline provinces described below are only a few of doline provinces in the Study Area. The rest of the provinces will be described and discussed once they have been studied].

The provinces differ from each other in the geology and morphology, resulting in somewhat different types and distribution patterns of the dolines. Unfortunately, to the time of compiling this note, access to the southwest doline province is denied by the Denel OTR. The four doline provinces are described below in a counter-clockwise order around the De Hoop Vlei.



Figure 1. Satellite image of part of the Study Area, showing the four doline provinces around the De Hoop Vlei (DHV), namely the NW, SW, SE and NE Provinces. The provinces' boundaries have been generalised and simplified.

The DHV northwest doline province

In the northwest doline province the rock is the Wankoe Formation of the Bredasdorp Group. The province is characterised by plateaus incised by ravines (dry valleys) (Figures 2 and 3).

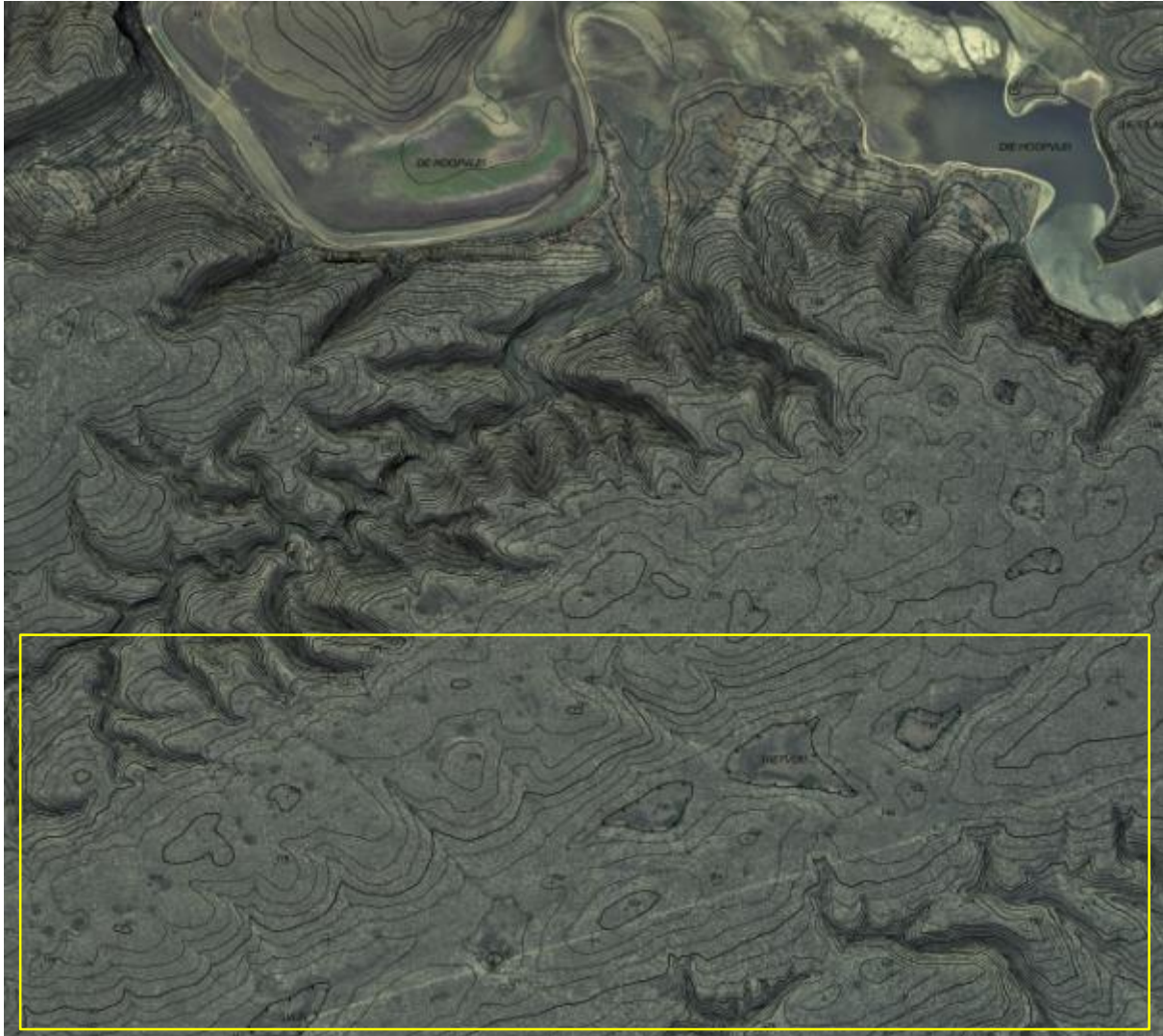


Figure 2. Topographic map (1:10,000) of a section of the northwest doline province. The area in the yellow box is shown in Figure 2.



Figure 3. Geology map of a section of the northwest doline province.

The DHV southwest doline province

In the southwest doline province the rock is the Waenhuiskrans Formation of the Bredasdorp Group. The terrain is of low relief. The dolines, some of which are joined, forming elongated depressions, are located along slightly concave lines, which are sub-parallel to the present shoreline (Figures 4 to 6).

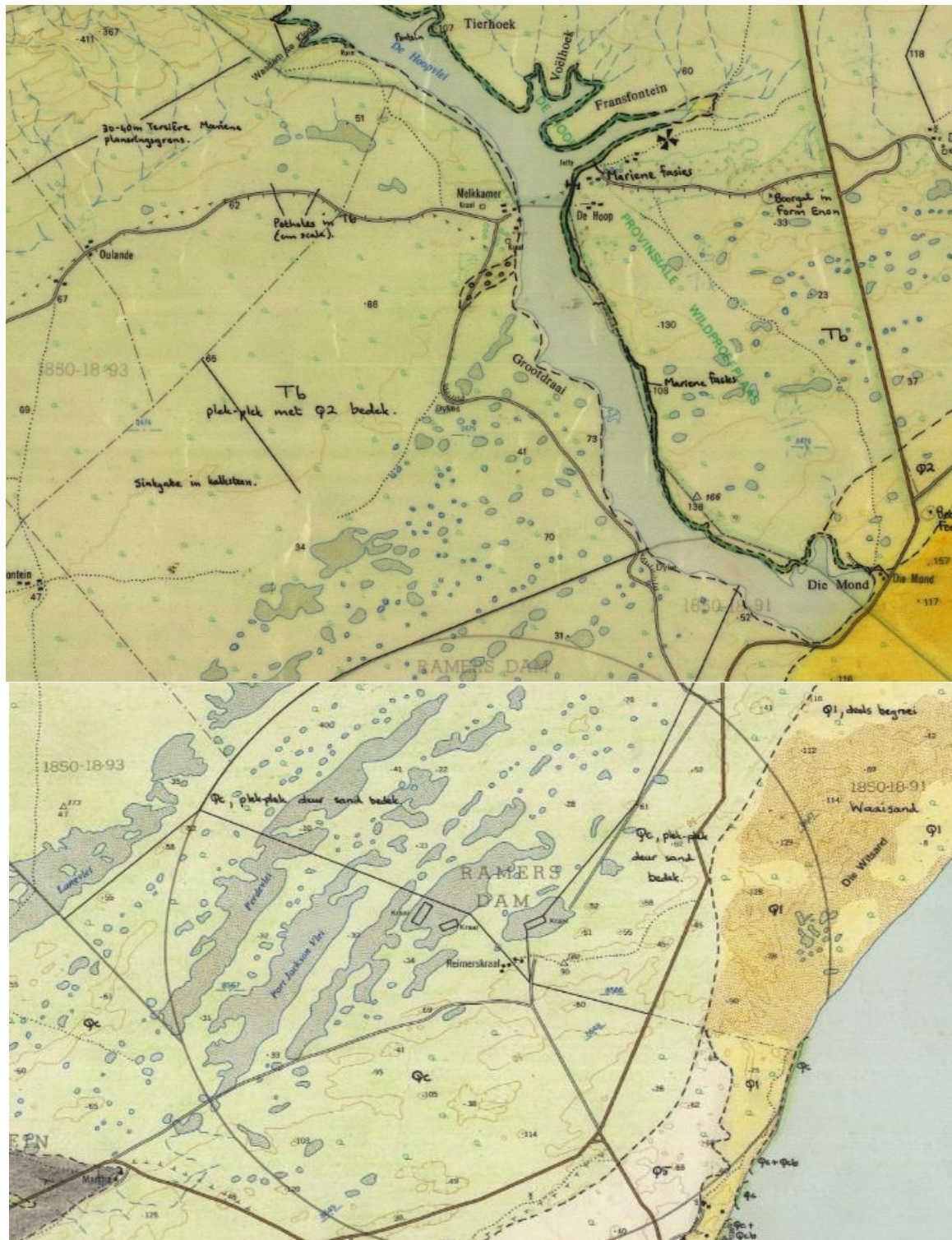


Figure 4. Geology map of part of the southwest doline province. The geology maps (match of two adjacent sheets) were selected here, as they present the doline pattern better than the topography maps.



Figure 5. Satellite image (2018) of part of the southwest doline province. The yellow box is enlarged below.



Figure 6. Enlargement of the box in Figure 5 (2009). Some dolines contain water.

The DHV southeast doline province

In the southeast doline province the rock is the Waenhuiskrans Formation (Bredasdorp Group). The terrain is of low relief. No particular pattern can be discerned (Figures 7 and 8).



Figure 7. Topographic map of a section of the southeast doline province.



Figure 8. Enlargement (satellite image) of the boxed area in Figure 7.

The DHV northeast doline province

In the northeast doline province the rock is the Wankoe Formation of the Bredasdorp Group. This province is characterised by high relief of long ridges and long dry valleys. The doline density is low (Figure 9).



Figure 9. Topographic map of a section of the northeast doline province.

The doline provinces, briefly described above, are only a few of doline provinces in the Study Area. They are described in detail in the following Field Notes.