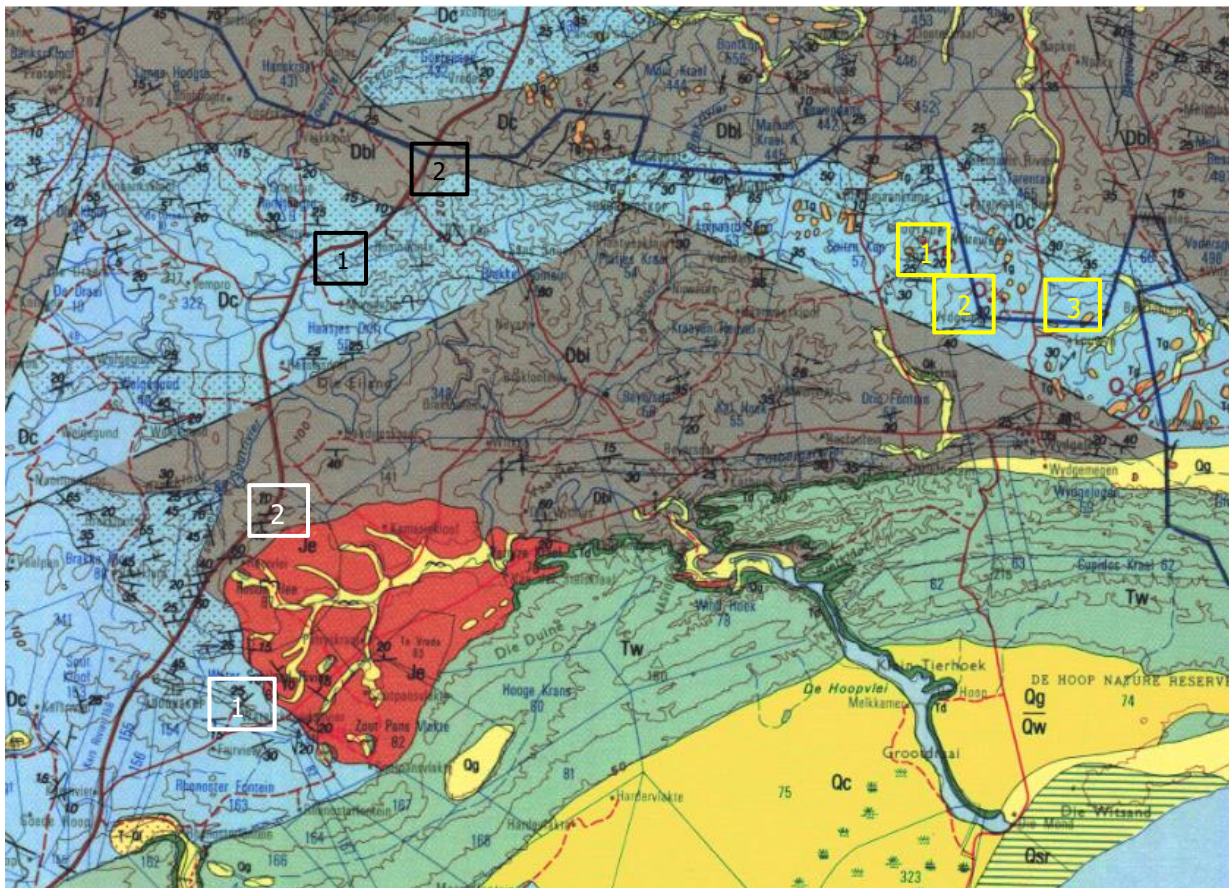


## CHAPTER S. SHALE HILLS

### Field Note S2b3. Western sandstone lenses

Several sandstone lenses are present in the shale hills area. This Field Note describes the western lenses. All lenses were named by the author after the nearest farms or geographic features (Figure 1).



**Figure 1. Geology map (Riversdale Sheet, 1:250,000, 1993) of the middle part of the Study Area, showing the locations of sandstone lenses (taken from J Malan's 1984 field sheets):**

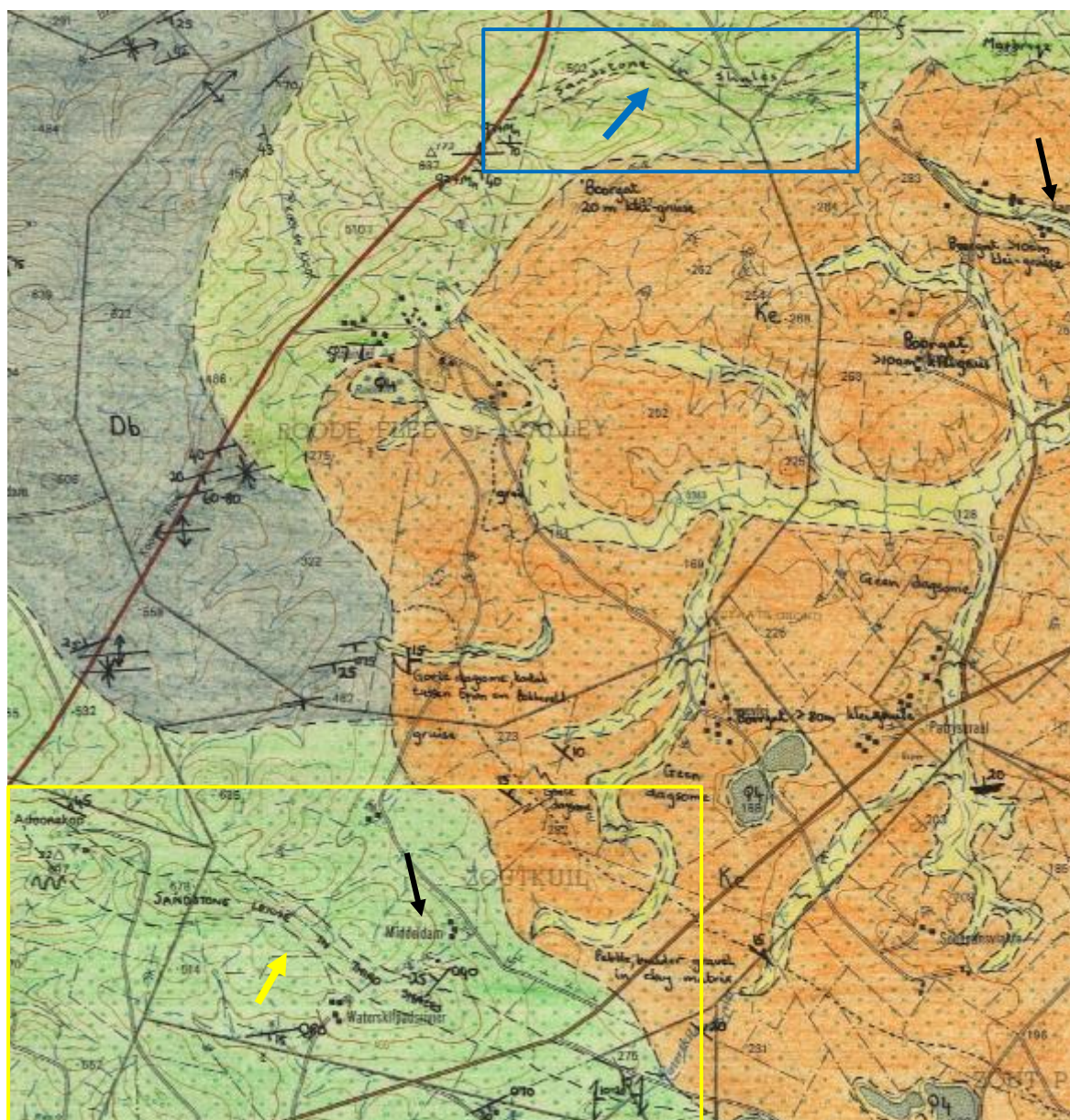
**Western Lenses (white): 1 - Middledam Lenses; 2 – Kamasiekraal Lenses.**

**Eastern Lenses (yellow): 1 - Grootkop Lens; 2 – Spitskop-Daskop Lenses; 3 - Frederickskraal Lens.**

**Lenses outside the Study Area (black) (not described); 1 - Hasiesdrift Lens; 2 - Spitskop Lens. Names of lenses were given by the author.**



The Middledam Lenses and the Kamasiekraal Lenses (named so after nearby farms) comprise the western lenses (Figure 2).

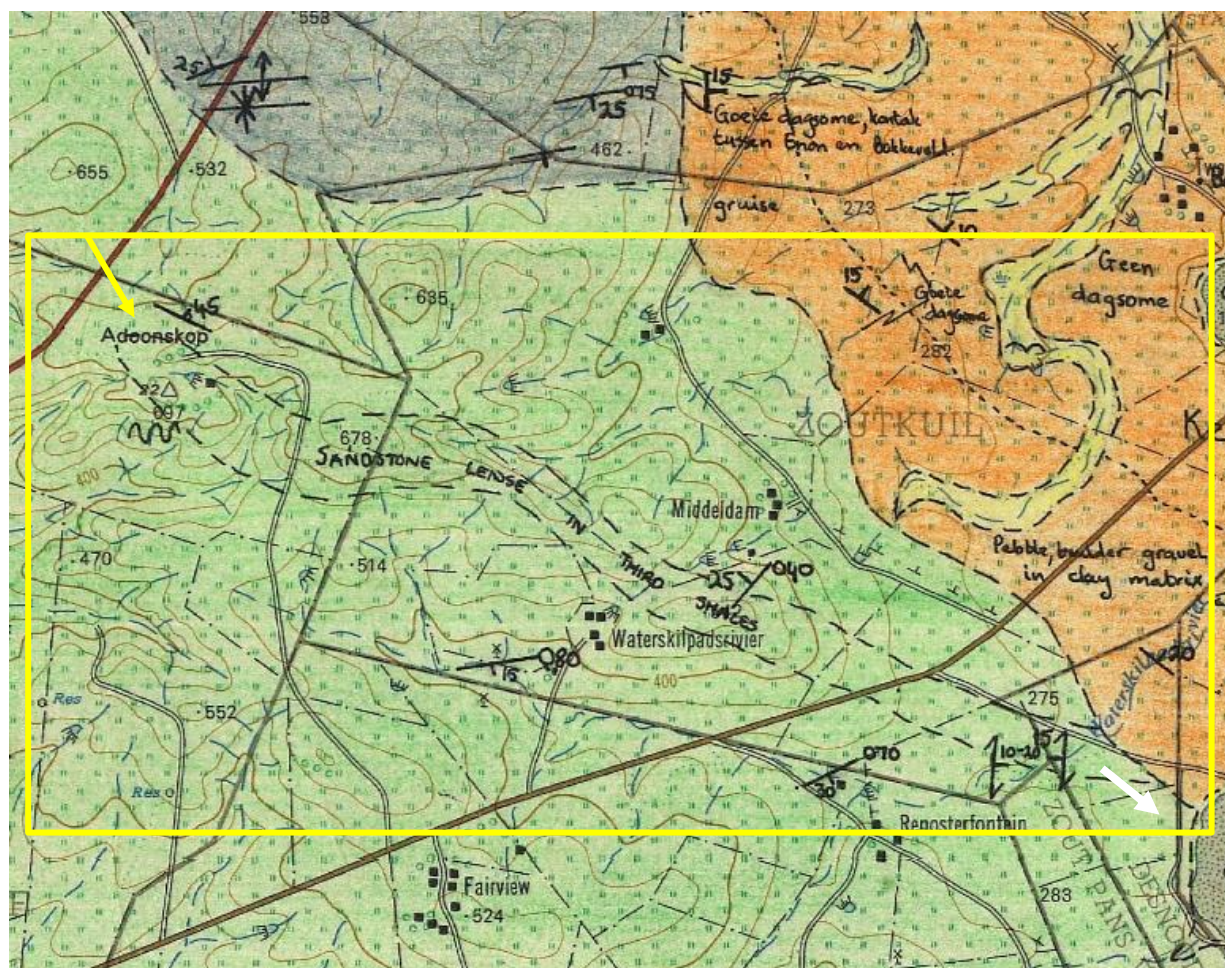


**Figure 2. Geology map (J Malan's field Sheet, 1:50,000, 1993) showing the locations of the Western Lenses (names given by the author). 1 - Middledam Lenses (yellow box, yellow arrow; black arrow points to the Middledam Farmhouses); 2 – Kamasiekraal Lenses (blue box, blue arrow; black arrow points to the Kamasiekraal Farmhouses).**

Some sandstone lenses are very hard and could damage farming machinery. Sandstone lenses which are not ploughed can be recognised as 'islands', or strips of land covered with low vegetation within a cultivated area, from ground and aerial photography (Figures 4 to 6).



The Middeldam lenses were named after the farm where they are exposed (the lenses extend to the northwest into Adoonskop Farm) (Figure 3). These lenses are about 6 km long.



**Figure 3. Top: geology map (J Malan's field Sheet, 1:50,000, 1993) showing the Middeldam Lenses ('sandstone lens in third shale'), extending from a saltpan in the southeast (white arrow) to Adoonskop, near the R319, in the northwest (yellow arrow). Bottom: Satellite image of the boxed area in the top figure. Boxes are enlarged in the figures below: red – Figure 4, blue – Figure 5 and white – Figure 6.**





**Figure 4. Exposed sections of the sandstone lenses (yellow arrows) south of the Middledam Farmhouses (white arrow).**



**Figure 5. Exposed sections of the sandstone lenses (yellow arrows) west of the Middledam Farmhouses (white arrow).**



**Figure 6. Sections of the sandstone lenses (yellow arrows) near the Adoonskop Farmhouses (white arrow).**

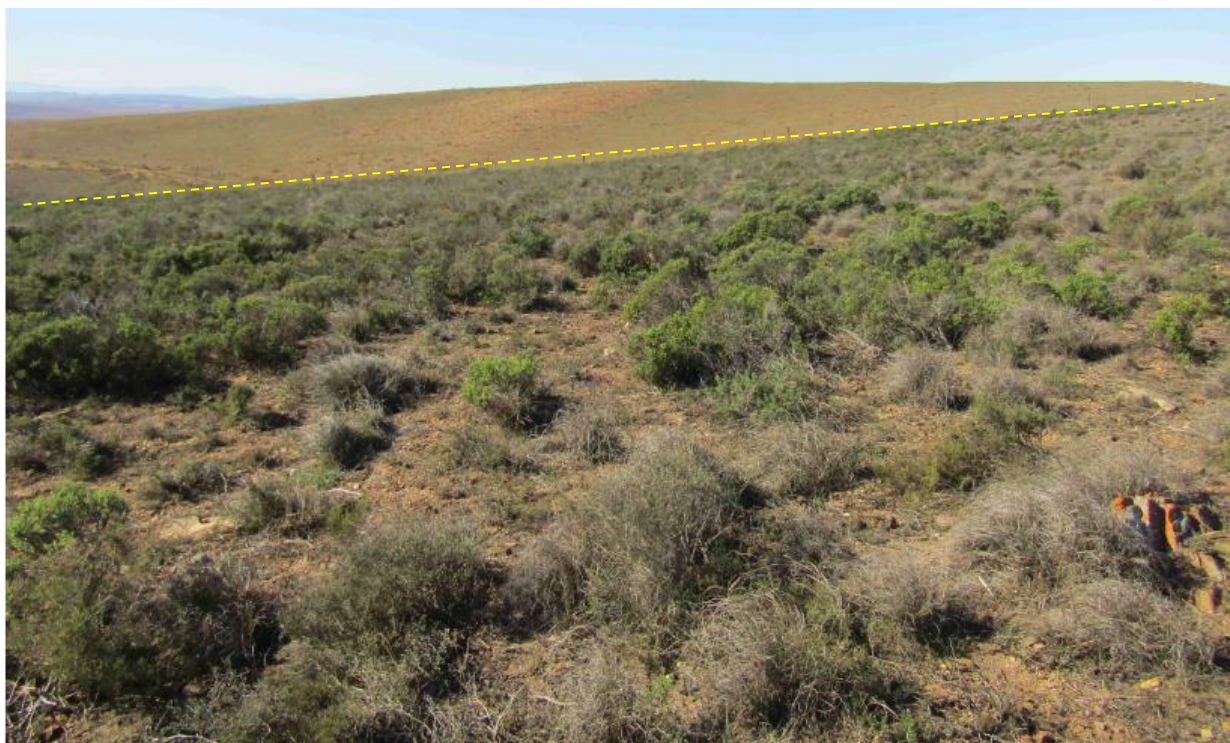


The sandstone lenses can usually be easily distinguished from the surrounding shales (Figures 7 to 9).



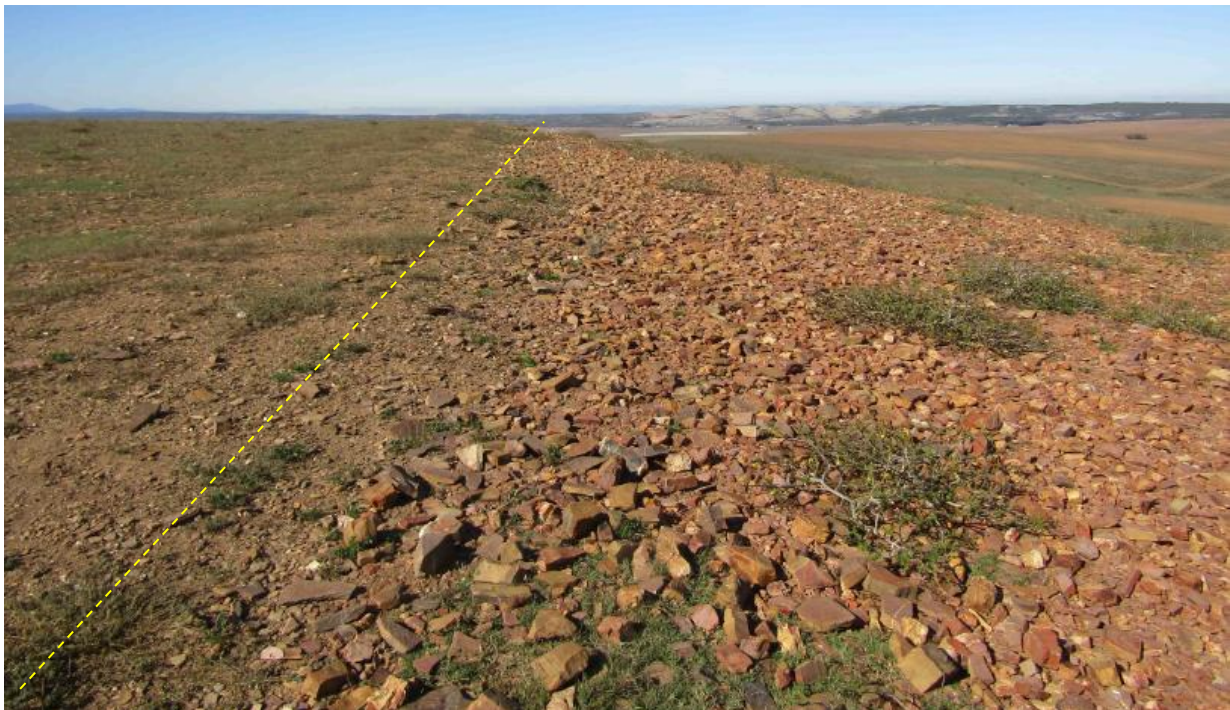
**Figure 7. Top and bottom: outcrops of the Middledam sandstone lenses.**





**Figure 8. Top and bottom: the Middledam sandstone lenses are covered with low vegetation. Dashed lines show the contacts between the ploughed areas and the lenses.**





**Figure 9. Top and bottom: the Middledam sandstone lenses are covered with low vegetation. Dashed lines show the contacts between the ploughed areas and the lenses.**



Some sandstone outcrops, found in shallow gullies, may constitute parts of the Middledam Lenses (Figures 10 and 11).



**Figure 10. Sandstone outcrop in a shallow gully near the Middledam lenses. Top – satellite image; arrow indicates location and direction of photography. Bottom - ground photograph, view to the west.**

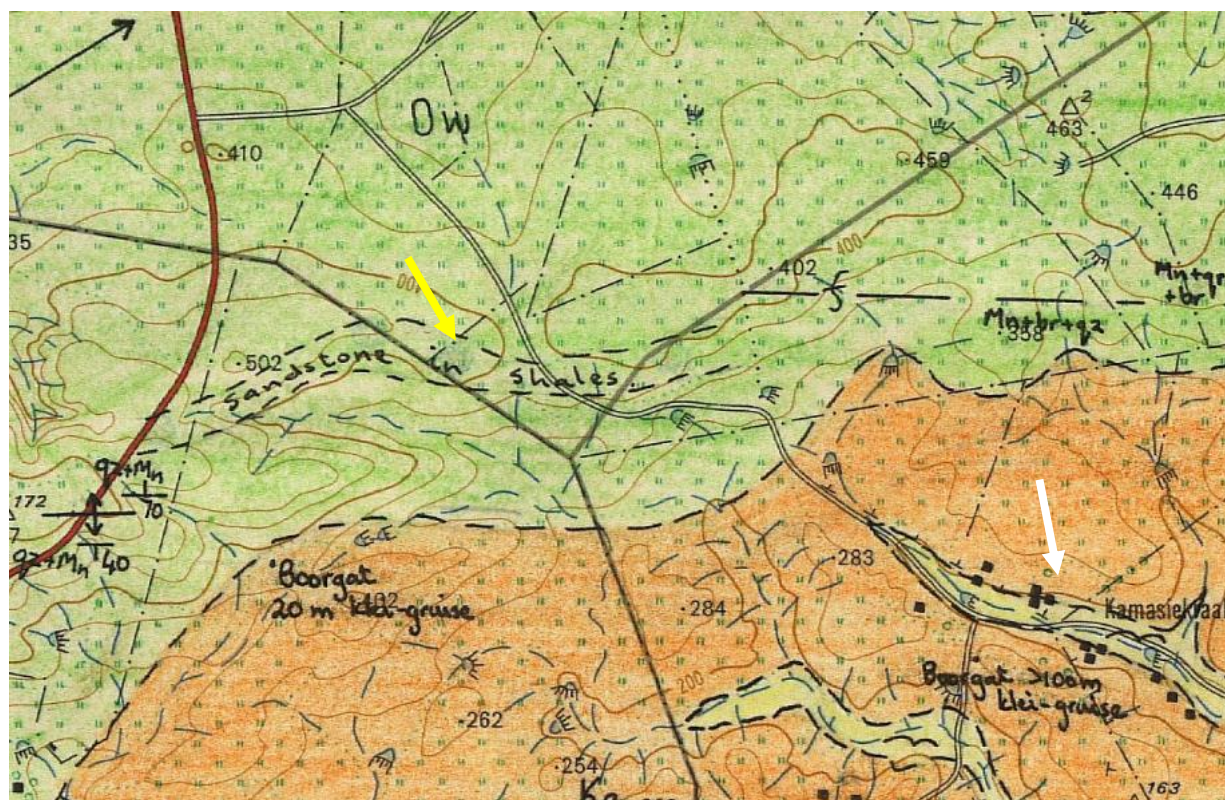




**Figure 11. Sandstone outcrop in a shallow gully near the east end of the Middledam lenses. Top – satellite image. Bottom - ground photograph, view to the east.**

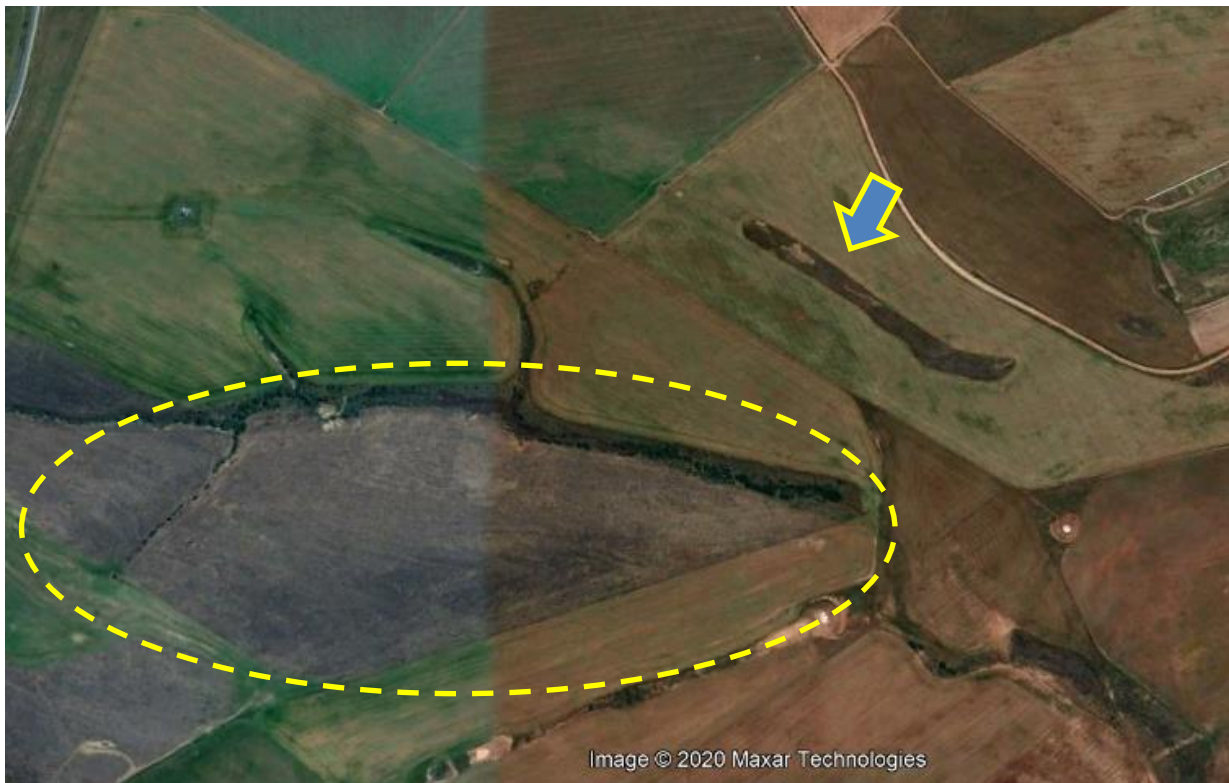


The Kamasiekraal Lenses are about 1.5 km long. On the east side they are ploughed and can hardly be distinguished from the shale fields around them (Figures 12 and 13).



**Figure 12. Top - geology map (J Malan's field Sheet, 1:50,000, 1993) and bottom - satellite image showing the Kamasiekraal Lenses ('sandstone in shales') (yellow arrows), west of the Kamasiekraal Farmhouses (white arrow).**





**Figure 13. The west side of the Kamasiekraal sandstone lenses. Top – satellite image: ellipsoid indicates sandstone lenses; arrow indicates location and direction of photography of the bottom figure. Bottom: ground view (to the south) from the road north of the lenses. Note the low vegetation cover of the lenses.**





**Figure 14. View to the east from the R319 on the sandstone strata of the Kamasiekraal Lenses.**