

Director



RECORDS OF THE GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

No. 1962/9

TITLE: REPORT ON GROUNDWATER POTENTIALITIES,
CENTRAL ABORIGINES RESERVE,
EASTERN DIVISION, W.A.

AUTHOR: J. Sofoulis, B.Sc.

DATE: 8th August, 1962.



NO PART OF THIS REPORT MAY BE PUBLISHED OR ISSUED IN ANY FORM
WITHOUT THE PERMISSION OF THE GOVERNMENT GEOLOGIST

REPORT ON GROUNDWATER POTENTIALITIES
CENTRAL ABORIGINES RESERVE,
EASTERN DIVISION, W.A.

by

J. Sofoulis, B.Sc.

Record No. 1962/9.

C O N T E N T S

	Page
INTRODUCTION	1
ROUTES INVESTIGATED	1
RESULTS OF INVESTIGATIONS	2
CONCLUSIONS	6
REFERENCES	6

8th August, 1962.

INTRODUCTION

A geological reconnaissance was made to assess the groundwater potentialities adjacent to the main access routes within the W.A. portion of the Central Aborigines Reserve. The investigation was made at the request of the W.A. Department of Native Welfare who are considering the possibilities of pastoral promotion within the region, in addition to providing further permanent water supplies for nomadic natives.

ROUTES INVESTIGATED

The access routes and adjacent areas investigated included the following:-

- (i) Cosmonewberry Native Mission to Warburton Range Native Mission (306 miles) traversing portions of Throssel, Westwood, Breaden, and Talbot 4 mile sheets.
- (ii) Warburton Range Mission area.
- (iii) Warburton Range Native Mission via Blackstone Mining Camp to Mount Davies Camp in South Australia (204 miles) traversing portions of Talbot, Cooper, Scott and Mann 4 mile sheets.
- (iv) Areas adjacent to Giles Weather Station, Walter James Range, Anne Range, Schwerin Mural Crescent and Rawlinson Range on Rawlinson and Scott 4 mile sheets.
- (v) Giles Weather Station to Warburton Range Mission (215 miles) traversing portions of Scott, Rawlinson, Cobb and Bentley 4 mile sheets.

RESULTS OF INVESTIGATIONS

Calcrete limestone drainage lines similar to those described in a previous report (Sofoulis, b) exist within the areas investigated. These ancient calcrete drainage lines are locally buried by aeolean sands and dunes, but are still serving as present drainage basins and would form the principal shallow-water aquifers of this and adjoining State regions.

The areas traversed can thus be regarded as containing tracts of country suitable for the accumulation of good quality groundwaters that could be developed as permanent water supplies for both pastoral and domestic purposes.

The potentialities of the various routes are briefly discussed below:-

(1) Cosmonewberry Mission to Warburton Range Mission.

Numerous wells and bores are now established about the Cosmonewberry and Mount Shenton areas and are providing the needs for the current domestic and pastoral activities. The principal water sources are from well defined calcrete drainage tracts and minor drainage lines in the granitic and metamorphic terrains. These are providing adequate supplies of good quality waters at relatively shallow depths (20feet to 50 feet). Additional watering points are at present being developed within these areas to cater for further pastoral extensions.

Some calcrete drainage lines noted along this route terminate in Lake Throssel. This lake is saline but outside the immediate lake zone the calcrete lines should contain fresh waters and can be regarded as potential sources for further stock and domestic water supplies.

The Wort Native Well referred to in a previous report (Sofoulis b) is in a calcrete limestone aquifer and is currently meeting the water requirements of sandalwooding parties and itinerant native groups. This well is located near the southern margin of Lake Throssel, approximately 123 miles by road from Cosmonewberry.

Other gnamma and rock holes sources known along this route include:- Yuratharra (80), Beegul (89), Morara (96), Terhan (161), Warr (153), Narra Tarra (204), Munada (223), Gunba (244), Winduldarra (258), and Babbogoola (270). The figures given in parentheses represent speedometer mileages from Cosmonewberry.

These gnamma and rock hole sources are similar to those described within the region by Talbot and Clarke (1917), Forman (1932) and more recently by the author (b). Most are confined to small water-courses or scoured depressions in the mottled or lateritised surfaces of low breakaways, above Palaeozoic sediments. All are short lived sources replenished by occasional rainfall.

These catchments serve as a useful water supply for nomadic natives, but in their present state, would be of little use for pastoral development as they are generally small and unreliable, inaccessible to stock, and usually too remote from suitable feeding grounds.

The catchments listed above were inspected with officers of the W.A. Department of Native Welfare (Messrs. J. Harman and I. Johnson) and suggestions for catchment improvements were given to these officers.

The potentialities of the sand plain and lower breakaway zones of the Palaeozoic areas (between the western end of Lake Throssel and the Warburton Range) are unknown, but would be regarded as worthy of testing should permanent water supplies be required in the non-calcrete areas.

(ii) Warburton Mission Area

Water potentialities of this area have been given in a previous report (Sofoulis b). In this region, the principal groundwater sources are the calcrete limestones and adjacent outwash plains as indicated on the map accompanying the geological report (Sofoulis a).

The Lilian Creek site suggested in the previous report has been developed as a well and is now providing good quality water from a depth of 15 feet.

It is considered that the headwater section of this same drainage and the southern extension to the Townsend Range would offer similar potentialities and further developments at regular intervals (about every five miles) along this same drainage could be established if required. Calcreted tributaries of this same drainage would also be capable of yielding shallow waters along most of their courses.

(iii) Warburton Mission to Mount Davies Camp.

Similar calcrete drainage tracts exist between the Warburton area and the Blackstone Ranges. A major calcrete system was noted in the north-western sector of the Cooper 4 mile sheet area. This passes via the western end of the "Blackstones" and extends into the Scott 4 mile sheet area. Other calcrete lines were noted along the Warburton-Blackstone road and

occurred on the average at intervals of one every ten miles of road traversed. All of these calcrete lines can be regarded as potential shallow-water sources that would be suitable for development if required.

The speedometer distances from the Warburton Mission to the various calcrete lines were recorded and supplied to the Native Welfare Officers.

Extensive outwash plains of these eastern regions would also have the potential of yielding water supplies but from greater depths. A bore sunk in this type of country exists at the Blackstone Mining Camp and is said to be approximately 100 feet deep.

Other rock hole catchments known along this route (e.g. Winburn Rocks, Lightning Rocks, etc.) are capable of yielding useful supplies but cannot be regarded as permanent.

(iv) Giles and Adjacent Areas.

The weather station at Giles is at present supplied with waters obtained from outwash plains and alluvial tracts associated with major drainages. Dependent on location, the depths of the developed bores range from 28 feet to 70 feet.

Other major drainages of the adjacent ranges (Anne Ra. Rawlinson Ra. Walter James Ra. Schwerin Mural Crescent, etc.) would also be capable of yielding similar supplies at comparable depths. Some calcrete lines noted about these areas have not been tested but would be amenable to development as shallow water sources.

(v) Giles to Warburton Mission.

The presence of major drainage lines and calcrete tracts along this route would suggest similar potentialities that should yield shallow ground waters. Buried calcrete drainage tracts existing along this route generally support strong stands of desert oak. Similar desert oak stands noted in the sand plain and dune areas are suspected of reflecting buried calcretes, and these calcretes would be worthy of testing should further sites be required in these non-outcrop or desert sectors.

CONCLUSIONS

The reconnaissance made in the W.A. portion of the Central Aborigines Reserve determined that areas adjacent to the routes traversed show conditions suitable for the accumulation of shallow ground waters. These could be developed as permanent sources of water supply for both pastoral and domestic purposes. The principal aquifers in these regions are the calcrete limestone drainage lines.

REFERENCES

- FORMAN, F.G., 1932, Preliminary report on a geological reconnaissance between Laverton and the Warburton Ranges:
West. Aust. Geol. Survey Ann. Rept. 1931.
- _____ 1932, Conclusions of report on reconnaissance of the country lying between Laverton and the Warburton Ranges:
West. Aust. Geol. Survey Ann. Rept. 1932.
- TALBOT, H.W.B., and CLARKE, E. de C. 1917, A geological reconnaissance of the country between Laverton and the South Australian border: West. Aust. Geol. Survey Bull. 75.
- SOFLOULIS, J., a, Geological Reconnaissance of the Warburton Range area, Western Australia: West. Aust. Geol. Survey Ann. Rept. 1961 (in press).

_____ b, Water supplies Warburton Range and adjoining
areas, Eastern Division, Western Australia:

West.Aust. Geol. Survey Ann. Rept. 1961 (in press).