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Report on the water survey at Harts
range mica field

by

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COPY:

REPORT ON WATER SURVEY OF THE HARTS RANGE MICA FIELD.

Plans. One plan (scale 1 inch = 1 mile) accompanies this report.

SUMMARY.

Boring by the Alice Springs Works Department and by Webb Bros. of Mt. Riddock Station showed that subterranean water supplies in the schists and gneisses in this area are usually small in quantity and that the water is brackish.

The best chances of obtaining water for the mining fields seems to lie in sinking relatively shallow wells on the creeks and depressions running northward from the Harts Range. These depressions are believed to contain from 30 to 60 ft. of alluvium.

Turga Wells situated approximately 6 miles west of Jenkins' Mine (the most westerly deposit at present being exploited) yield the best supply in both quality and quantity yet obtained in the district. These wells are situated on a broad depression approximately 3 miles from the range. Attempts were made to locate similar sites for supplying the mines.

Since in some cases water derived from the archæan gneisses and schists which compose the Harts Range has been found to be brackish and unfit for human consumption, some thought was given to the suggestion (private communication) by Mr. H. B. Owen that wells should be located several miles from the range in order to obtain fresh water. Tabulation of the soaks, springs and wells in the area showed however, that more were drinkable than undrinkable. Secondly, it was found that as these depressions were followed northward from the range they died out very quickly and it was feared that difficulty might be experienced in obtaining useful quantities of water at distances of several miles from the range. In support of this it may be noted that a well sunk by Webb Bros. on the depression on which the Turga Wells occur at a point $2\frac{1}{2}$ miles north of the well, yielded no water at all. It was also thought desirable to try to obtain water as close to the mines as possible; in many cases it has to be carted by pack camel.

Eight possible sites for wells were selected, two being within the foothills of the main range and six at a distance of $1\frac{1}{2}$ to 2 miles from the foothills of the range. Six of these sites are now being tested by a light hand-boring plant. This plant is expected to penetrate the alluvium quickly and wells will be sunk where favourable results are obtained. The sites selected are within easy reach of the following mines:- Jenkins' Mine, The Spotted Tiger Mine, B. Rech's (Rex?) Mine, Hit and Miss Mine, Central Mine and Eldorado Mine.

The mines in the vicinity of Mt. Palmer comprising - The Billy Hughes, Ulgarna, Spotted Dog, Disputed and Caruso are difficult to supply with adequate quantities of water from nearby wells. The three miners on the Billy Hughes at present obtain water from a soak in Ulgarna Creek and if the proposed testing is successful, water could be obtained for the Caruso at a distance of about 6 miles. It could be carted by motor vehicle to a point about 1 to $1\frac{1}{2}$ miles from the mine.

Previous Search for Water:

Experience has shown that this is a difficult area in which to obtain water. It appears likely that as stated by Owen, the northern side of the range occupies a rain shadow. It is reliably reported that during the past three years there has been a virtual drought in this area.

The following search for water has been carried out by Webb Bros. of Mt. Riddock Station:-

- OWEN, H. B. Report on Mica Resources of Harts Range Area, 1942.

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1. Well at Mt. Riddock Homestead - Surface covered by calcareous travertine; water obtained at a depth of 25 ft. - well is sunk in alluvium at a distance of 2 to 3 miles from the range. The water is of good drinking quality though slightly mineralised; the supply is sufficient for the homestead and for about 50 head of cattle.
2. Turga Wells - situated 3.7 miles east of the homestead at a point 3.5 miles north of the main range. Here three wells each about 100 yds. apart and from 20 to 30 ft. in depth supply water for 2,000 to 3,000 head of cattle. One of the wells is fairly highly mineralised but one supplies water of good quality for human consumption.
3. At a point $2\frac{1}{2}$ miles north of Turga Wells and on the same depression, a well sunk to a depth of 80 ft. obtained no water.
4. A bore 2 miles west of the homestead was put down to a depth of 600 ft. into the underlying schists and gneisses at a point $1\frac{1}{2}$ miles north of the range. A little water was obtained but it was too mineralised to be used for cattle.
5. Another bore was put down in this vicinity to a depth of 80 ft. at a point about half a mile from the range; bedrock was encountered but no water.
6. At a point about 2 miles west of Benstead Creek and $2\frac{1}{2}$ miles from the range, a bore 150 ft. in depth encountered no water.
7. On the eastern bank of Ulgarna Creek at a point $2\frac{1}{2}$ to 3 miles north of the range, a well sunk to a depth of 70 to 80 ft. obtained a poor supply of fair drinking water. The supply was insufficient for watering cattle. An inspection of this site seemed to indicate that the well was not located on the main depression but slightly to the east of it.
8. A well 5 miles north of No. 7 above, obtained no water; the depth of this well is not known.

It was stated by one of the Station staff that the boring carried out cost 25/- per ft., the casing being supplied by the Station owner. The cost of the casing was approximately $7/6$ per ft. thus the 600 ft. bore mentioned under No. 4 would cost approximately £1,000.

Miscellaneous Wells, Springs and Soaks present in the Area.

(a) Non-Drinkable.

1. Stone's Well. The location of this well is shown on the accompanying plan. It occurs in an east-west valley in the ranges about one-third of a mile in width and is situated about 150 ft. from the steep range forming the south side of this valley. The rock on the dump consists of biotite gneiss, but it is probable that a fair depth of alluvium has been penetrated. The well is at present 42 ft. in depth, the level of the water being 34 ft. below the collar of the shaft. The supply is said to be sufficient for approximately 350 head of cattle but windmills placed at this point have been wrecked by gully winds which blow down the valley at nights so that the well is not now extensively used. Although natives drink the water with impunity, white miners do not use it as it appears to be strongly mineralised.

2. A small soak occurs in Benstead Creek about 1 mile above Jenkins' camp. The water here is extremely brackish and could not be drunk either by human beings or other animals. Other non-drinkable soaks may occur but the writer could obtain no information concerning them by questioning the miners on the field.

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(b) Drinkable Water.

1. Luce's Spring. (Location shown on accompanying plan). Here small quantities of water issue from garnet, muscovite, quartz, biotite gneiss where a small pegmatite dyke intrudes it. No reliance could be placed on this spring at the present time as it appears to have been temporarily ruined by cattle. In the past, however, this spring is reported to have yielded small but regular supplies of good quality water.
2. Spring at Central Mine. This occurs in biotite, muscovite gneiss and is reported to yield 40 to 50 gallons per day. It is good drinking water and is within 100 yds. of the camp on the mine. (G. Muratori stated that it was quite satisfactory for all purposes except for making bread; with this water the yeast would not rise. For bread-making, catchment water is obtained from small rock holes)
3. A spring half a mile above Central Mine on the same creek is similar to No. 2 described above.
4. The Spotted Tiger Soak. supplies approximately 150 gallons per day of excellent water. The soak is about 10 ft. in depth, the water at present being about 6 ft. below the surface. The soak occurs in the sandy bottom of Ulgarna Creek within easy reach of the mine.
5. The Billy Hughes Soak in Ulgarna Creek yields sufficient good quality drinking water for about five men.
6. A small soak on a tributary of Benstead Creek a few hundred yards north of Jenkins' camp yields small supplies of drinking water of good quality.

Other small soaks in creeks probably occur in the ranges but no information could be obtained concerning them.

It will be noted that although some of the water obtained in the ranges is undrinkable, quite a number of springs issuing directly from the schists and gneisses yield good quality water. Soaks in the sandy creeks often yield water of very good drinking quality.

Proposed Method of Obtaining Supplies for Mines:

It will be seen that deep boring has yielded very unsatisfactory results and although sufficient supplies for the present miners are obtained from small soaks and springs in the ranges, the latter would not be adequate if extensive new operations were begun. In view of the success of Turga Wells a number of sites with similar conditions were selected. These sites are shown on the accompanying plan.

Prospect No. 1. At a point 3.5 miles east of Turga Wells, creeks flowing from the hills enter a small basin-like depression in which the vegetation comprising ironwood, wattle, needlewood, whitewood and occasional bloodwood, looked green and luxuriant. No boring is contemplated here for the time being but it is merely desired to record the occurrence.

Prospect No. 2. This prospect occurs on Benstead Creek at a point $\frac{1}{2}$ miles north of where the road crosses the creek. It is located on a depression about 250 yds. in width. "Weeping willow" ironwoods are abundant at this point and a considerable depth of alluvium appears likely to be present.

Prospect No. 3 is situated approximately one mile below Jenkins' camp on the banks of Benstead Creek. It is bounded on the east and

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west by rather steep hills and is within the ranges. This site is to be tested first; if the results here are unfavourable, No.2 will then be bored. If site No.3 yields favourable results, it will not be necessary to test site No.2.

Prospect No.4 occurs on Ulgarna Creek approximately one mile from the Spotted Tiger Mine. This prospect is again well within the ranges and may not yield good quality water, if any. If, however, a supply was obtained here, it would be very well situated with regard to the Spotted Tiger Mine and B. Rech's Mine and might also supply the Caruso and Billy Hughes.

Prospect No.5 is situated at a point 2 miles north of where the main road crosses Ulgarna Creek close to a well previously sunk by Webb Bros. As stated previously this well may not be on the main channel and therefore testing here is thought to be warranted. This prospect however, will not be drilled if Prospect No.4 gives favourable results.

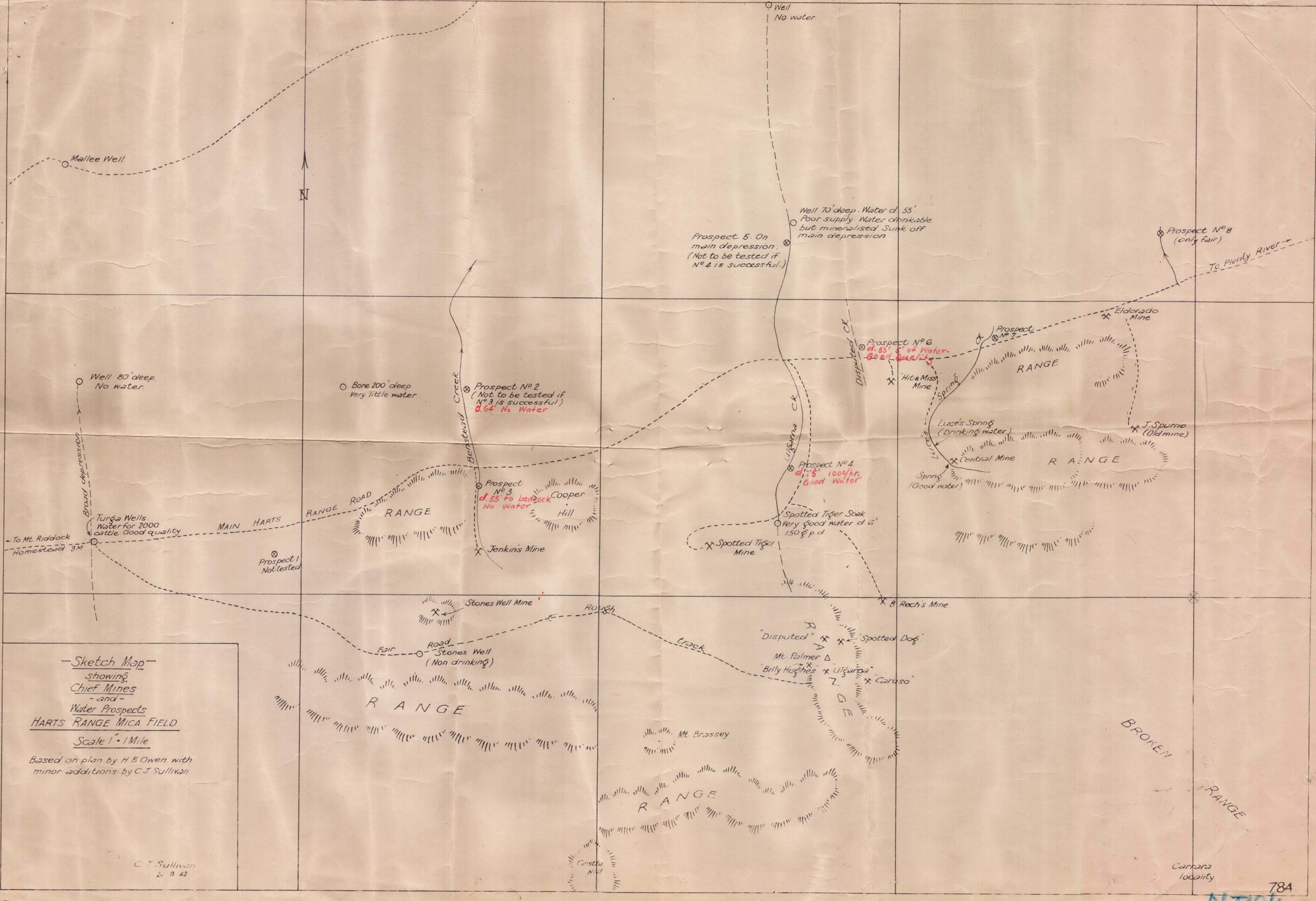
Prospect No.6 is situated on Disputed Creek which crosses the main road at a point 1.2 miles east of the Spotted Tiger turn-off. From an inspection of the geological features and of the vegetation, it would seem that there is a fair chance of obtaining considerable supplies here. A well here would serve the Hit and Miss Mine, the Central Mine and possibly the Eldorado mine. This point will be tested irrespective of results obtained in other localities.

Prospect No.7 is situated on a creek which flows from the Central Mine and on which Luce's Spring occurs, close to where it crosses the main road. The site was selected on account of the vegetation and by reason of the fact that considerable quantities of water which must flow down this creek would seem to be partially held up at this point by surrounding hills. A well here would also serve the Hit and Miss Mine and the Eldorado Mine; testing will be carried out here.

The drilling foreman has been instructed to furnish details of the material passed through and the type and quantity of water encountered in each bore, as soon as possible. Well sinking - which should not be expensive on account of the relatively soft nature of the country - could then be commenced. Samples of the water obtained in each drill hole will be kept for analysis and results of all scout drilling will be tabulated on the accompanying plan for future reference and information.

24th August, 1942.

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GEOLOGIST



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Carrara
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