Rept. Bk. No. 52/39
G.S. No. 1936
D.M. 1441/60
HYD. 1080

RB 52/39

DEPARTMENT OF MINES
SOUTH AUSTRALIA

REPORT ON GROUNDWATER PROSPECTS

EYRE HIGHWAY

- HIGHWAYS & LOCAL GOVERNMENT DEPARTMENT -

PART III

KOONGAWA - WUDINNA SECTION

HDS, KOONGANA-MAMBLIN-KANNAMANA

REQUIREMENTS:

Advice on the prospects of obtaining up to 30,000 gallons per day of water for use in road construction. This section of the Highway was inspected during the week ending 21/1/61.

TOPOGRAPHY:

From an area of relatively high ground in the vicinity of Koongawa the land surface slopes gently downward to the west through undulating country. The highway traverses mainly sand dune country in which surface drainage is very ill-defined. Sand dunes occur throughout the area and trend generally south easterly. They rise to heights of 50-60 feet above the general level, and occur at intervals of ¼-½ mile.

Saline swamps and salt lakes occur in a broad arc south and west of Kyancutta in the lowest parts of the area.

Average rainfall in the area is approximately 12 inches per annum.

GEOLOGY:

Granite outcrops in the vicinity of Koongawa and also north east of Wudinna. The granite of these two localities is similar; being medium to coarse grained and light pink in colour.

Outcrops are generally confined to the summits of broad rounded hills of relatively low relief. However, several outcrops, particularly Wudinna Hill, form prominent landmarks, rising to a considerable height above the general level.

Bedrock in the Koongawa - Wudinna area is generally concealed beneath a cover of Pleistocene - Recent and possibly Tertiary sediments of unknown thickness. The underlying rock may consist of highly weathered gneiss or schist, but is not known to outcrop.

The Pleistocene - Recent sediments are composed of sand dunes, clay and thin travertine occurs at intervals, with possibly alluvial sand and gravel immediately above bedrock. Apart from the travertine, which is generally quite dense, these sediments are apparently unconsolidated. The sand dunes, which consist of fine white silica sand, are generally "fixed" by vegetation. Swamp deposits consist of silt and clay with some sand - probably wind blown, as there is very little evidence of run-off into the swamps.

Tertiary sands and clays associated with lignitic deposits may occur in some of the deeper bedrock depressions, although there is no evidence that they exist in this area. Further south toward Lock these sediments were intersected in a deep bore in Hundred of Ulyerra.

Lateritic deposits, of probable Tertiary age, consisting of grit, gravel and clay may occur in certain areas overlying bedrock, but are not known to outcrop. The thickness of these sediments is probably not more than 5-10 feet.

HYDROLOGY:

Apart from the possibility of obtaining very small supplies of fresh water in the vicinity of granite outcrops, the groundwater generally is expected to be highly saline.

Fresh water occurs at a depth of 12 feet near Wudinna Hill, and is derived by direct run-off from the impervious granite mass outcropping on the hill. Supplies from such sources may be expected to vary seasonally. It is considered that larger supplies would be obtained by drilling in the vicinity of some of the salt lakes in the Kyancutta area, where the saline groundwater table lies close to the surface. Drilling along the Wudinna-Minnipa section has shown that sufficient supplies were obtained only in the vicinity of salt lakes or swamps.

Four sites have therefore been selected adjacent to salt lakes in the area south and south east of Kyancutta. These sites which are shown on the accompanying plan are numbered 19, 20, 21 & 22 respectively. At all four sites it is expected that the depth should not exceed 50 feet, although water may occur within a few feet of the surface. The swamps and salt lakes are generally elongated in a south easterly direction, and may be the remnants of a former drainage pattern, in which sand or gravel has been deposited. Such conditions probably existed near Lake Yaninee, where gravel was intersected at shallow depth.

No sites have been selected between Kyancutta and Wudinna as supplies have already been obtained in that area. Bore No. 5 situated about 3½ miles south east of Wudinna yields approximately 1,200 gallons per hour, and will later be used for the Kyancutta-Wudinna section.

Another site (No. 18) has been selected on the highway adjacent to Section 30, Hundred of Mamblin. The site is in one of the larger depressions in that area, and some replenishment of the groundwater may occur although the yield is expected to be less than from bores near the salt lakes. However, drilling is warranted, as the site is on the main road, and, if successful, cartage costs would be considerably reduced. There are other possible sites in gullies along the main road between Koongawa and Kyancutta, but drilling in similar locations near Wudinna and Minnipa yielded only very small supplies. The

depth necessary at this site is not known and may be up to 150 feet, but drilling should not be continued in granite, as this rock usually yields only very slight quantities of groundwater.

A site (No. 17) has been selected in a low lying area approximately 3 miles south of Koongawa. There is limited run-off from the high ground extending south easterly from Koongawa and it appears that some replenishment of the groundwater occurs in this area. The site is in the vicinity of several small salt lakes, where it is possible that the water table lies at shallow depth. It is not expected that the depth should exceed 50 feet, but if bedrock of granite is encountered drilling should be discontinued.

The location of the various sites is shown on the accompanying plan.

CONCLUSIONS AND RECOMMENDATIONS:

Six bore sites have been selected between Koongawa and Kyancutta, in localities where it is considered that there are best prospects of obtaining the supplies required. No sites have been selected between Wudinna and Kyancutta as it is considered that bore No. 5 should provide adequate supplies for that section. Bores at sites 19-22 which are located near salt lakes, are expected to yield relatively good supplies at shallow depth. Maximum depth at these four sites should not exceed 50 feet, although water may occur within 10 feet of the surface. Suitable aquifers of sand or gravel are expected to occur, but their depth and thickness is not known. Similar results may be obtained at Site No. 17 although the yield will probably be less than at sites near the larger swamps. In addition there is a greater possibility of granite occurring at shallow depth.

At the sixth site (no. 18) which is situated on the highway approximately midway between Koongawa and Kyancutta, drilling may indicate that only a small supply of water is obtainable. However, it is considered that this is the only site on the highway where there are reasonable prospects. A depth of up to 150 feet may be necessary to test the sediments down to bedrock.

As on the Kimba - Koongawa section, drilling of additional bores may later be necessary in order to provide sufficient water for the proposed road works.

R. G. Shepherd
Geologist
HYDROLOGY

RGS:AGK
21/2/61