

SOUTH GAP PASTORAL STATION

HYDROLOGICAL SURVEY

GRID 1.6 -

by

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Plan No.

60/41

Title

South Gap Pastoral Station
Hydrological Survey

Scale

1 inch to the
mile.

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INTRODUCTION

During the week ending 26th February 1960 a geological survey was undertaken of South Gap Station to advise on prospects of obtaining more permanent supplies of stock water. The property generally relies on dams and several wells for supplies but most of the dams are dry owing to lack of rain during the past two seasons.

The property is situated north of Port Augusta, immediately west of Lake Torrens and is approached by way of Beakaloo rail siding. Average rainfall is probably 6-7 inches.

On the plateau vegetation consists principally of salt bush while on the sand plains there is a dense cover of timber, myall and mallee with saltbush and bluebush.

Further water supplies are most urgently required in the vicinity of South Gap No. 1 to cope with the demands of the coming shearing season.

GEOLOGY

The basement rocks are flat lying members of the Marinoan Series of the Adelaide System. The lowermost strata, exposed in the southwestern segment of the station in the Whittata H.S. locality, are principally gritty sandstone-quartzites. They exhibit cross bedding structures on a broad scale. These rocks give rise to low rolling hills and to abrupt 'breakaway' scarps.

The gritty formations are succeeded by purple and brown shales and siltstones which are generally obscured by quartzite talus and alluvium. They are best exposed on the steep slopes in the Whittata Hill - Tower Hill locality.

The shaley formations give way through passage beds of flaggy sandstones and sandy shales to massive and flaggy sandstone-quartzites which are of generally fine to medium grain, cross-bedded and carry clay pellet impressions. The quartzites cap the highest hills and are the plateau formers of the region. Dissection of these has given rise to a rough boulder strewn terrain.

Creek alluvium obscures bedrock formations in the hilly areas while elsewhere on the plains sand dunes are prominent features.

EXISTING WATER SUPPLIES; HYDROLOGY

Surface runoff is largely controlled by the construction of dams on the principal water courses but at the present time only Beare's Dam and Treasure Dam hold water. After heavy rains a number of swamps receive and store water for extended periods, but of these only Kelly's Swamp now holds water.

Water stored underground in the rocks of the region percolates after rainfall from the surface through pore spaces and along bedding and joint planes and other open fractures. Shaley rocks as occur about the flanks of the plateaux and in the South Gap valley provide notoriously poor aquifers because they are dense, fine grained non porous sediments in which permeability is at a minimum. It is noteworthy that most of the wells on the station abandoned as dry are located in shaley rocks. Where the strata are more sandy poor supplies have been cut - as in the well at the Woolshed and in Sandstone Wells. At the former the supplies are undoubtedly augmented by underflow from creek gravels and possibly are influenced by leakage from the dam; all of these are about 25 ft. deep.

The Homestead Well (30 ft. deep) is constructed in alluvial gravels and yields a fair supply of somewhat brackish water.

Several wells in the Whittata H.S. locality yield good stock water. Failures here due to high salinity possibly indicate stagnation and poor local replenishment of the aquifer.

In the elevated regions wells constructed in quartzites yield good stock water but to increase their capacity drives have been constructed in the principal ones, Yeings and South Tiffin; both are 70 ft. deep. At South Tiffin there are 5 wells a short distance apart and connected by large drives. At North Tiffin (on Fernatty Station) one well is reported to be 180 ft. deep with saline water and the other 50 ft. deep and yielding good stock supplies.

RECOMMENDATIONS

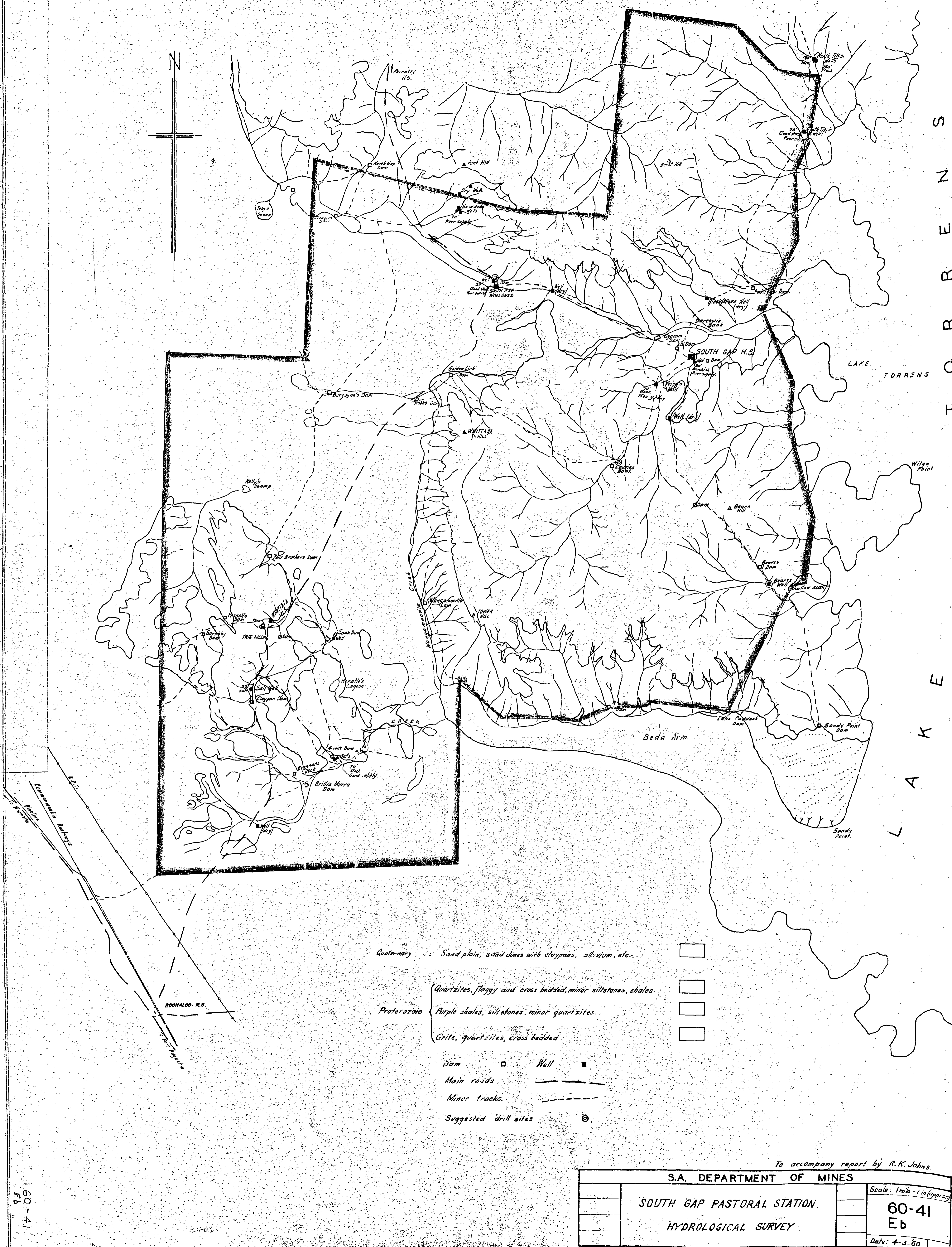
The prospects of providing large supplies of stock water where they are wanted most, at the Woolshed, are not good. Here the underlying sediments are sandy shales and siltstones which are served by small areas of surface catchment. The need is so desperate in this locality, however, that drilling is considered to be justified at the sites indicated to depths of about 50 feet. Supplies from these sources could also be augmented if sandstone wells were deepened.

Two other sites are recommended for drilling because they are served by large catchment areas which can be expected to provide underground recharge into reservoir rocks consisting principally of quartzite; these are at Lauries Bank and near Beare's Sink Well. Drilling at both sites is expected to be carried to 100 ft.

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14/3/60



60-41
Eb

To accompany report by R.K. Johns.

S.A. DEPARTMENT OF MINES		Scale: 1 mile = 1 in (approx)
SOUTH GAP PASTORAL STATION		60-41
HYDROLOGICAL SURVEY		Eb
		Date: 4-3-80