COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

1956/35.

WATER SUPPLY INVESTIGATIONS
HAAST BLUFF NATIVE SETTLEMENT, N.T.

by

J.B. Firman

CANBERRA. April, 1956.

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INTRODUCTION

Bore sites were selected near the Haast Bluff Native Settlement at the request of the Welfare Branch, Northern Territory Administration. A geological reconnaissance was carried out and nine bore sites were selected on the 16th and 17th March, 1956. One of the bore sites (and its alternative) is sited to supply water to the proposed native settlement site at Papunya; the others were sited to supply stock moving along the northern flank of the Western MacDonnell Ranges between Mount Liebig and Haast Bluff.

Localities mentioned in the report are shown on the accompanying plan (Plate 1).

The area surveyed is a rectangular strip about 8 miles wide which extends from east to west for 28 miles. The Papunya Bore, shown on plate 1, is approximately 16 miles north of Haast Bluff Native Settlement.

PREVIOUS INVESTIGATIONS

The Papunya Bore was put down in June 1953. When tested in March, 1956, it yielded 3,000 gallons per hour of water suitable for human consumption. The maximum yield is unknown. Another bore (No. 11 on Plate 1), which was put down 2 miles south of Papunya Bore on the same flood-out, was unsuccessful. No data are available for this bore.

The Mt. Liebig Bore, about 35 miles west of Papunya Bore, was established after an unsuccessful bore had been put down in the same area. No bore data are available, but the driller stated that the bore is similar to Papunya, that the dpth is about 170 feet, and that water analysis indicates that the water from Mt. Liebig Bore is suitable for human consumption.

Drillers logs and water analyses are appended.

GEOLOGY

The rocks in the mapped area are gneiss, schist, and quartzite, of the Archaean basement complex. The gneiss (garnet-mica gneiss, biotite gneiss and augen gneiss) forms the major part of most outcrops and is of granitic composition in most places. Mica schist, knotted mica schist, and quartzite are interbedded with the gneiss.

Tourmaline (associated with vein quartz), epidote, and small amounts of pyrite occur in the gneiss.

The regional trend of the rocks is east-west with a general dip to the north at a high angle. Local variations in strike and dip are common and a north-plunging synclinal fold, overturned to the west, has been mapped at the west end of the survey area. No large faults were found, but two small faults have been mapped at the west end of the survey area.

The excellent preservation of bedding, the abundance of biotite in the schist and gneiss, and the granitic composition of the gneiss suggest that the original rocks were quartzo-felspathic sediments which were subjected to regional metamorphism and alkali-metasomatism.

Much of the area is covered by alluvium and sand ridges. The alluvium overlying the basement complex serves as an aquifer in flood-out areas.

PROPOSED BORES

Bore No. 2 was selected close to Papunya Bore at the proposed site of a native settlement. The bore was intended to supplement the supply from Papunya Bore. The bore passed through

clay, sandy gravel and gravelly sand into gneiss at a depth of 162 feet. Water was struck at 152 feet, but the yield of 100 gallons per hour was too small. An alternative site a quarter of a mile south of the Papunya Bore has been selected.

Bore No.4 was sited 5 miles east-south-east of Papunya Bore to provide water for stock. The bore is placed on a flood-out from creeks with a relatively large catchment area. The bore was put down to 180 feet and yielded 1,200 gallons per hour. Drilling data are not yet available, but the bore is known to have penetrated clay and gravel. The water should be analysed.

Bore No.9 is sited on the only creek of any size in the area. The bore is intended to intersect sub-surface flow at shallow depth. No. 10 bore is alternative to No. 9 and is sited to intersect sub-surface flow where distributaries mark the up-stream end of the flood-out pattern.

Other bore-sites have been selected, but they are all on creeks or flood-outs with a small catchment area. The yield from bores put down at these sites would be low and they should not be drilled except in an emergency.

APPENDIX 1.

BORE DATA AND WATER ANALYSES.

PAPUNYA BORE

2 miles north of road to Mt. Liebig.

Mt. Doreen, 494099.

Depth (feet)	Drillers Log.	Remarks
0- 22	Clay	Drilled by J.P. Cole
22-160	Sandy loam	Started 5/6/53.
160-172	Gravels.	
		Good stock-water at 160 feet.
		Original test 1700 gallons /hour.
		Test in March, 1956 to maximum of equipment showed 3000 gallons per hour. (Not maximum yield).

WATER ANALYSIS

PAPUNYA BORE — HAASTS BLUFF

Received 10/8/55
Issued 14/9/55.

Analysis (Parts per Million).		Remarks
Hardness (Calculated as $CaCO_3$)		The sample, as analysed, is suitable for all stock and human consumption.
" Total	340	
" Temporary	340	
" Permanent	0	
Free Alkali (Calculated as $CaCO_3$)	20	
Chloride	215	This supply is suitable for domestic and garden purposes.
Sulphate	191	
Fluoride	1	
Calcium	58	
Bicarbonates	351	
Carbonates	43.2	
Sodium	172.5	
Potassium	16	
Magnesium	47.4	
Silica, iron and Aluminium oxides	-	
Nitrates	13	
Total dissolved solids	1108	

WATER ANALYSIS

MT. LIEBIG BORE. HAASTS BLUFF Received 8/9/55
Issued 3/10/55.

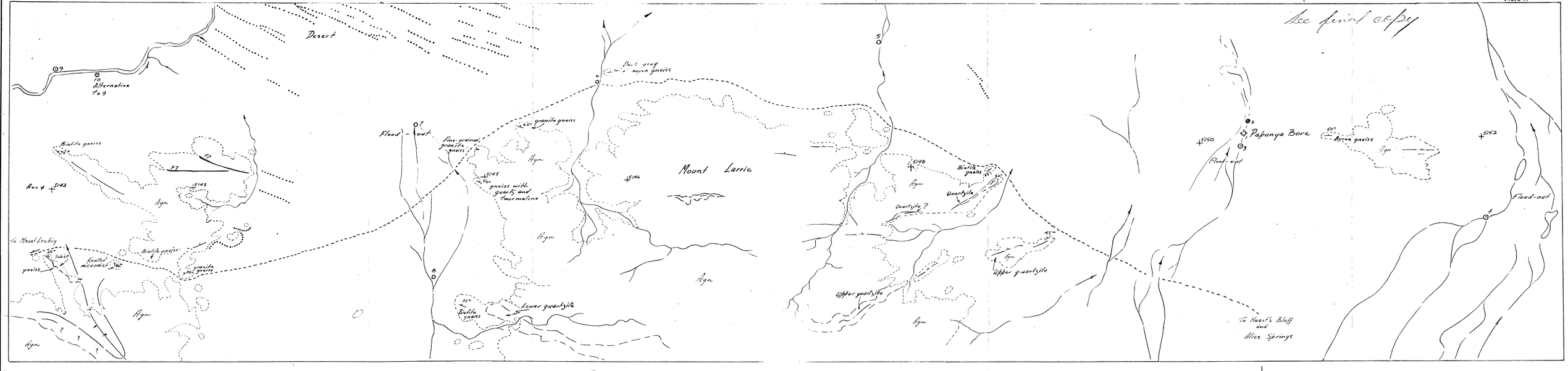
Analysis (Pts./ million).		Remarks
Hardness (Calc. as $CaCO_3$)		
" Total	226	The sample, as analysed, is suitable for human consumption.
" Temporary	226	
" Permanent	0	
Free Alkali (Calc. as $CaCO_3$)	34	It is highly satisfactory agriculture water.
Chloride	80	
Sulphate	40	
Fluoride	0.72	
Calcium	45	
Bicarbonates	329	
Carbonates	0	
Sodium	100	
Potassium	18	
Magnesium	27	
Silica, iron and aluminium oxides	-	
Nitrates	27	
	666	Total dissolved solids.

PAPUNYA No. 2. (Bore No. 2 on Plate 1).

400 yards north of Papunya Bore on same flood-out.

Depth (feet)	Drillers Log.	Remarks
0- 74	Clay	
74-158	Sandy gravel with large fragments of quartz.	Small supply of good quality water struck at 152 feet.
158-162	Coarse gravelly sand	Capacity : 100 gallons per hour.
162-170	Gneiss.	

Plate 1.



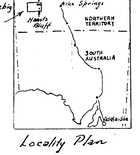
Reference

Archaean — Agn

Basement complex — Mainly gneiss of granitic composition (Garnet-mica gneiss, biotite gneiss and augen gneiss) with mica schist, knotted mica schist and quartzite. Intrusive vein-quartz with epidote and tourmaline in places.

- Geological boundary
- Outcrop boundary
- F? Fault — inferred
- Trend
- Dip and strike
- Fold axis and plunge
- ..... Sand ridge
- Stream course
- Rte 4 + S142 Photo centre
- ---- Road

- ◇1 Successful bore
- ⊙2 Proposed bore
- ○3 Other bore sites - low yield
- •4 Unsuccessful bore



Locality Plan

Scale

0 1 2 3

Miles

True North

Bureau of Mineral Resources

Geological Map

showing

Proposed Bore Sites

near

Hoast's Bluff Native Settlement

N.T.

J.B. Firman February, 1956