E&WS 3860/49

Hyd 57c

RB 35/110

DEPARTMENT OF MINES
SOUTH AUSTRALIA

Proposed Under round Water Supply Penola Township.

HD PENOLA

Note: This report should be read in conjunction with a preliminary report by Mr. Solomon, dated 9.10.52.

Requirements: The E. & W. S. Dept. has advised that a supply of 14,000 gallons per hour will be needed.

Prospects: The most reasonable prospect of obtaining subsurface water supplies in fairly large quantity is by drilling into the Gambier Limestone, the base of which probably occurs about 200 feet below natural surface. Below this base the rocks are sands and clays containing water under pressure, but supplies are probably limited, and expensive to develop. Drilling should therefore be not continued below the base of the limestone, in which the water quality is expected to be well below 100 grains per gallon.

Whether total requirements can be met by the construction of one bore is not known, but at least a considerable proportion should be, and drilling is therefore considered warranted.

If the yield from one bore is insufficient, consideration could perhaps be given to the construction of a second one, and to that end two sites are under review.

Siting of Bores: The general trend of movement of the main groundwater body is from east to west at a very slow rate. The water table is less than 10 feet below natural surface, and subject to seasonal fluctuations, so that surface and household drainage would have a fairly ready access to the groundwater.

Nightsoil disposal is at present by the pan system, but some houses (less than 20) are equipped with septic tanks, the effluent from which is disposed of underground. All other domestic sullage appears also to be disposed of underground, and would mix with the main body of groundwater. There is a very definite possibility therefore that the water from any bore located within the township boundary would be subject to some pollution. As the provision of an adequate water supply supply generally results in more and more of the residents installing septic tanks and discharging the effluent into pits, the

probability is that this danger of pollution will in the future increase.

From a geological viewpoint probably any site or sites would be satisfactory for a bore, but bearing in mind the pollution factor, it becomes evident that town bores should be sited beyond the limit of the residential area, and also on the east side of the town.

It is desirable to keep as close to the proposed high tension transmission line as possible, to reduce costs to a minimum, and also to be near the residential area in order to save expenditure on a long w water main.

Recommendations: The two suggested sites indicated on the plan submitt by the E. & W. S. Department are well located from these considerations, but the one near the Convent School is surrounded by buildings and is therefore considered unsuitable from a pollution viewpoint.

The other site near the east end of Elizabeth St., is not quite so disadvantageously situated, but the unoccupied land the the east is understood to be a potential residential area, and there is therefore a danger of future pollution occurring. If an assurance was available that no future building wouldbe permitted on the land east of this site and north ofthe Show Grounds, the site would, it is thought, be satisfactory. In such an event it would be preferable to drill this bore first, and if not enough water was available, a second bore could be constructed elsewhere. Alternatively, the first one would best be located at the south east corner of the Show Ground, near the intersection of Cameron St. and the Comaum Road. (Site (2) on plan).

As regards the other site, it is considered that a bore near the Convent School would not be desirable, and it is suggested that the site be moved eastwards to a point on Sec. 5, at least 5 chains from the eastern end of Julian Street (Site 3 on plan).

From a pollution viewpoint, Site (2) is considered to be probably the most desirable.

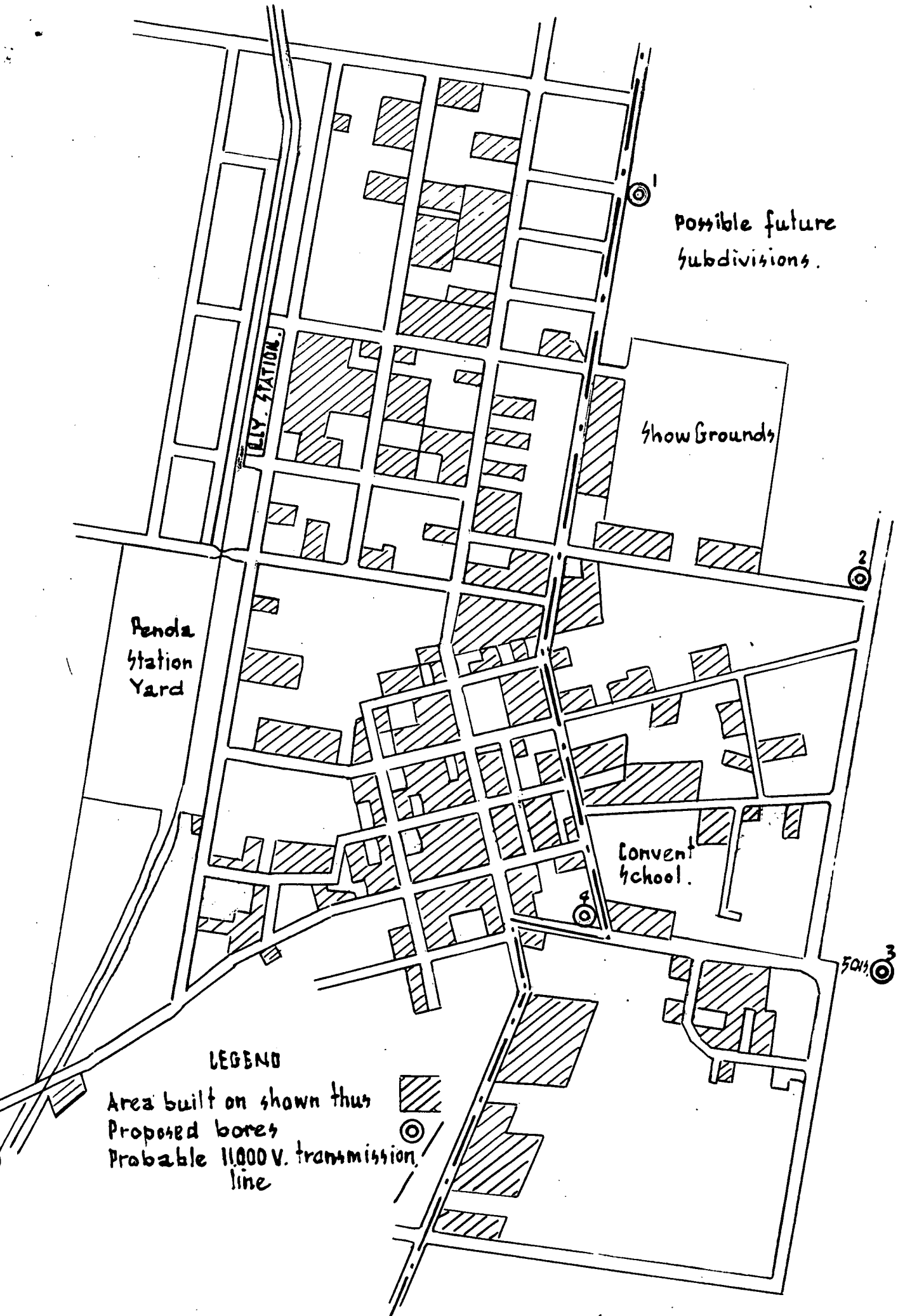
E.O'Driscoll 29/6/53

SENIOR GEOLOGIST

HYDROLOGY

29:6:53.

EPO'D:JLB.



To accompany report by E. O'Driscoll.

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	TOWN OF PENOLA PROPOSED TOWN WATER SUPPLY	D.M.	Scale 10 CHNS. TO INCH
		Tcd. 2		Rec.	S 797
		Ckd. R.R.			GdG
Director		Exd.			Date 30.6.53

RB 35/110 1.2

DM.1060/52

DEPARTMENT OF MINES - SOUTH AUSTRALIA.

UNDERGROUND WATER SUPPLY FOR PENOLA

Preliminary Report.

Penola is situated on flat ground between the Naracoorte and Stewart Ranges.

Water requirements are probably in the order of 6 - 7000 g.p.h.

Geology

The general succession near Penola is as follows:-

0 - 60 ft: sandstone, sand, sandy clay, clay, gritty limestone and travertine bars.

60 - about 200 ft: sandy Gambier limestone.

about 200 ft. onwards (total depth unknown): fine sands and clay, possibly gravels and lignite beds.

Underground Water

The rocks from 6 - 9 ft. to about 200 ft. below the surface are saturated with ground water. Information from the Naracoorte Town bores suggests that below 200 ft., there are impermeable clay beds confining water under pressure. If this confined water is tapped, the water will rise to approximately ground water level.

Supply

The majority of local bores are 15 to 30 ft. deep and there are none over 50 feet deep. Most of them yield windmill supplies and a few yield as much as 6000 g.p.h. without any appreciable drawdown. A few miles east of Penola a number of shallow bores met with drift sand troubles and were deepened to penetrate the Gambier limestone, from which supplies up to 1500 g.p.h. were obtained.

No nearby bores have encountered the beds below about 200 ft..

Quality

The total salt content in all local bores is well below

100 grains per gallon. Water struck below 200 ft. is likely to possess a considerably higher salt content.

Recommendations

Attempts should be made to obtain a sufficient supply from a bore, around 160 - 170 ft. deep. Care should be exercised in drilling, owing to the possibility of encountering troublesome sand below 20 or 30 ft.. It is considered unwise to continue boring below about 175 ft.. The bore should be drilled for 8" casing and left open in the Gambier limestone if possible. It is considered a bore to this depth has good prospects of yielding a supply of 6000 galls/hour, and is less likely to interfere with existing bores.

If more than one bore is necessary to obtain sufficient water, adequate spacing between the bores (say 400 - 600 yards) should be allowed to avoid interference.

Ground water flows westward and to avoid receiving water possibly contaminated by household sewage, the bore or bores should, if possible, be situated east of the town.

M. Solomon

MS:KS:JK
9/10/52.

(M. Solomon)
ASSISTANT GEOLOGIST

Hyd. 57A

D.M. 1482 52

TO THE DIRECTOR OF MINES.

Penola High School - Drainage Bore.

HD PENOLA

This school was visited on 22nd September 1954.

Penola Township has a Town bore constructed by this Department in 1953, but not yet connected up, residents being dependent on rain water tanks and shallow groundwater for drinking and domestic purposes. Such wells and bores are usually of the order of 20 feet in depth, and obtain water in the highly permeable bryozoal limestone which occurs below a depth of 5-10 feet.

Several residents in the immediate vicinity of the school use groundwater for drinking and domestic purposes during the summer, some all the year round. At the school itself, a shallow well is located a few yards from the septic tank, the water being laid on to the school taps for ablutions purposes. Separate drinking water is available, but enquiries reveal that the children are in the habit of drinking the well water.

The septic tank itself has a designed capacity of 250, but present school enrolment is 380. The system is therefore seriously overloaded, sludge digestion does not have time to occur and solids have overflowed the tank and passed into a drainage bore constructed in 1947, blocking it and causing the whole system to fail.

This bore has been passing the effluent into the bryozoal limestone from which drinking water is drawn by various users, and is believed to constitute a most serious danger to health, particularly to the children themselves. In the circumstances its reconditioning or the drilling of another bore into the limestone cannot be recommended, and Overseer Dixon was instructed to remove the drilling plant from the site.

It is possible that a drainage bore to a depth of perhaps 300 feet or deeper would pass through the limestone and penetrate the underlying sands and clays of the Knight formation. If this were done, the casing could be seated in clays and the limestone water sealed off, thus avoiding pollution.

However past experience with these deep sands shows that although highly water charged they are loose and "blowing", and are not considered to be a satisfactory medium for drainage. A deep bore cannot therefore be recommended.

Until such time as the town water mains are connected up, and groundwater usage for domestic purposes ceases, subsurface drainage of septic tank effluent at the school should be discontinued.

At present the effluent is lying exposed to the open air in several shallow excavations, from which the headmaster is understood to be arranging for its removal in buckets by the local sanitary contractor. The existing conditions are a health danger, and it is suggested that the Architect-in-Chief be advised that immediate steps appear warranted to have the effluent pumped into some kind of storage tank, for regular removal by the contractor, and the present drainage bore and the open pits be sealed.

Because of the proximity of the well supplying water for ablutions, any receiving or settling tanks should be made

thoroughly waterproof, to avoid local pollution.

The school is a considerable distance from the K.& W.S. town bore, and it is not considered to be a potential source of pollution for that bore.

C.P.O'D.
SENIOR GEOLOGIST,
HYDROLOGY.
27/9/54

KPDO'D/GC
24.9.54

Hyd 516

D.M. 1482 54

TO THE DIRECTOR OF MINES.

Penola Town Bore - Possible Pollution.

The existing bore constructed by this Department on behalf of the E.& W.S. Department for a township supply at Penola is situated at the corner of Cosmum and Cameron Streets, on the east side of the town.

When the site was selected, several existing houses were within a quarter of a mile or more of the site, but were understood to have a pan system for the collection of night soil.

Some recent building is now being extended into the area, and future houses may be nearer the bore. Septic tanks are being installed in some, effluent being disposed of underground in shallow pits, and it is felt that if this practice is permitted in new houses extending eastward along Cameron Street, or anywhere in the vicinity of the bore, there is a possible danger of pollution of the town supply.

It is recommended that the attention of the District Council of Penola be drawn to this matter, and it be suggested that no further building be permitted on the vacant land in Cameron Street, eastwards of the existing houses.

SENIOR GEOLOGIST.
HYDROLOGY.

EDO'D/GC.
24.9.54