RB 3828

HYD. 48

DEPARTMENT OF MINES

SOUTH AUSTRALIA

REPORT ON GROUNDWATER PROSPECTS, CRAFERS PUBLIC SCHOOL MT. LOFTY PARK, PT. SEC. 840, HD. ONKAPARINGA

This inspection was made on 31/7/54.

REQUIREMENTS:

The Architect-in-Chief has requested advice as to the possibility of obtaining groundwater for use in the proposed new septic tank system, and as to the best means of effluent disposal. There are at present 155 children enrolled.

LOCATION, TOPOGRAPHY:

The school grounds adjoin the north side of Picadilly Road, just west of the War Memorial. They are on the moderately steep southern slope of a hill, and all pavement and roof runoff and ablutions water can be adequately disposed of on the surface by discharge into the road table drain.

The slope extends downhill for some considerable distance, three private residences being located close to the road, and immediately downslope from the school grounds.

Rainfall is high, approximately 45 inches per annum.

GEOLOGY, HYDROLOGY:

The underlying rocks are Torrensian sandstones and quartzites which have been folded against the Crafers fault to the eastward, and are well jointed. There is a sandy clay soil cover several feet in thickness, in which limited drainage from shallow soakage pits should be obtainable.

Several bores exist in the neighbourhood, and yield excellent quality water from depths varying between 200 feet and 400 feet, supplies being sometimes quite large. Because of the relatively permeable nature of the sandstones, no difficulty is anticipated in obtaining sufficient good quality water for

operating the septic tank system, and a bore to an estimated depth of 250 feet to 300 feet should be a satisfactory source of supply.

Subsurface drainage presents difficulties. The high rainfall results in a body of shallow subsoil water moving rapidly downslope, but being constantly replenished by rain falling on the slopes above. Because of the interconnecting joint system in the rocks below, this rain water soakage also has a limited but fairly direct access to the rocks at depth, and in winter time the pressure builds up to such an extent that deep bores often commence to flow, and continue flowing during the winter months. A drainage bore subject to such conditions would be quite ineffective.

About 250 feet directly downslope from the proposed point of disposal as indicated on the Architect-in-Chief's layout plan, there is an existing well 70 feet in depth, with a bore to 405 feet. The static water level when not being pumped varies from 0 to 10 feet below surface. Apart from the water obtained in the well, this bore is reported as having cut water at depths of 275 feet and 400 feet, and the supply has been tested at 3000 gallons per hour. In summer time the water is used for all domestic purposes in two residences. Quite apart from any other considerations, therefore, discharge of septic tank effluent into a bore on the school grounds would probably cause pollution of this supply, the direction of water movement being from the school down to the private bore. Under the influence of pumping from the latter, water movement would be at a relatively fast rate.

Effluent discharge into a bore therefore cannot be recommended from two considerations.

(a) the serious possibility of pollution of adjacent domestic supplies.

(b) The almost complete loss of hydrostatic head for drainage purposes in winter, when the water level in any bore may be expected to be near to, if not overflowing the surface.

It seems probable therefore that shallow pit or trench drainage will have to be utilised. One of the troubles which may be anticipated for this type of drainage originates once again with the body of shallow rainwater soakage moving downslope through the subsoil, and practically waterlogging it in wet periods. With such waterlogging, pit or trench drainage is restricted. The water can probably be prevented from entering a shallow pit, however, by the construction of a deeper interceptor drain along the contour, immediately upslope, with an earthernware agricultural pipe outfall at one end leading the water out on to natural surface at a lower elevation. Such a drain would keep the area around the soakage pit dewatered, and materially assist soakage of the effluent.

CONCLUSIONS & RECOMMENDATIONS:

Water for operating the septic tank system should be readily obtainable from a bore to a depth of 250 - 300 feet, at an estimated cost of £500 plus casing as required at 10/- per foot. It should be located as far as possible from McGregor's bore on the south, to avoid its being dewatered when the latter is pumped.

Effluent disposal should be into a shallow pit or trench, with a deeper interceptor drain around the upslope side to prevent subsoil water from having access to the pit. Water from this cut off drain could be led away in a pipe to discharge at natural surface further downhill. It might be more satisfactory to keep the two toilet blocks separate, with individual disposal pits.

P. O'Driscoll 5/8/54

SENIOR GEOLOGIST
HYDROLOGY

EPO'D:BK
4/8/54

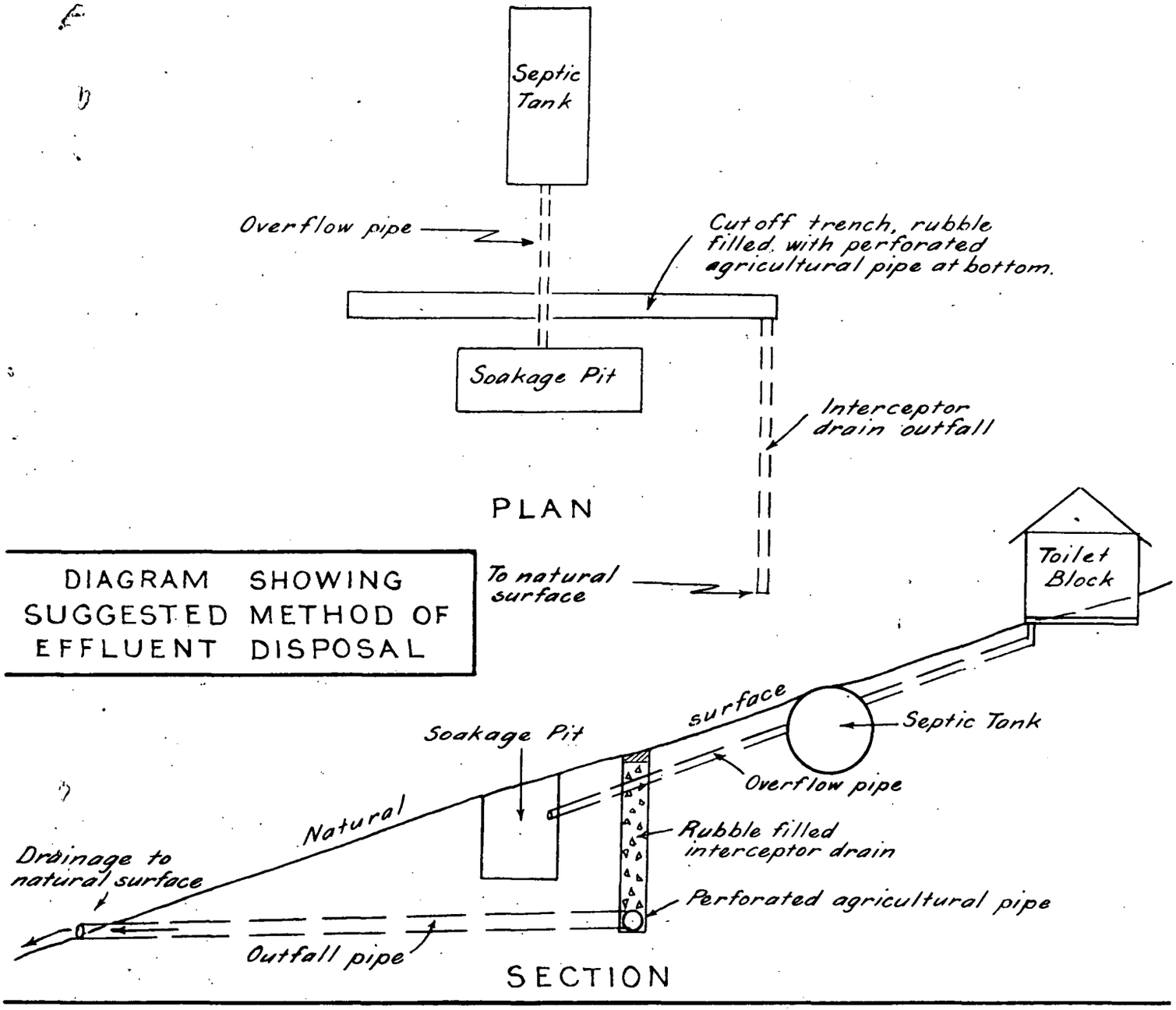
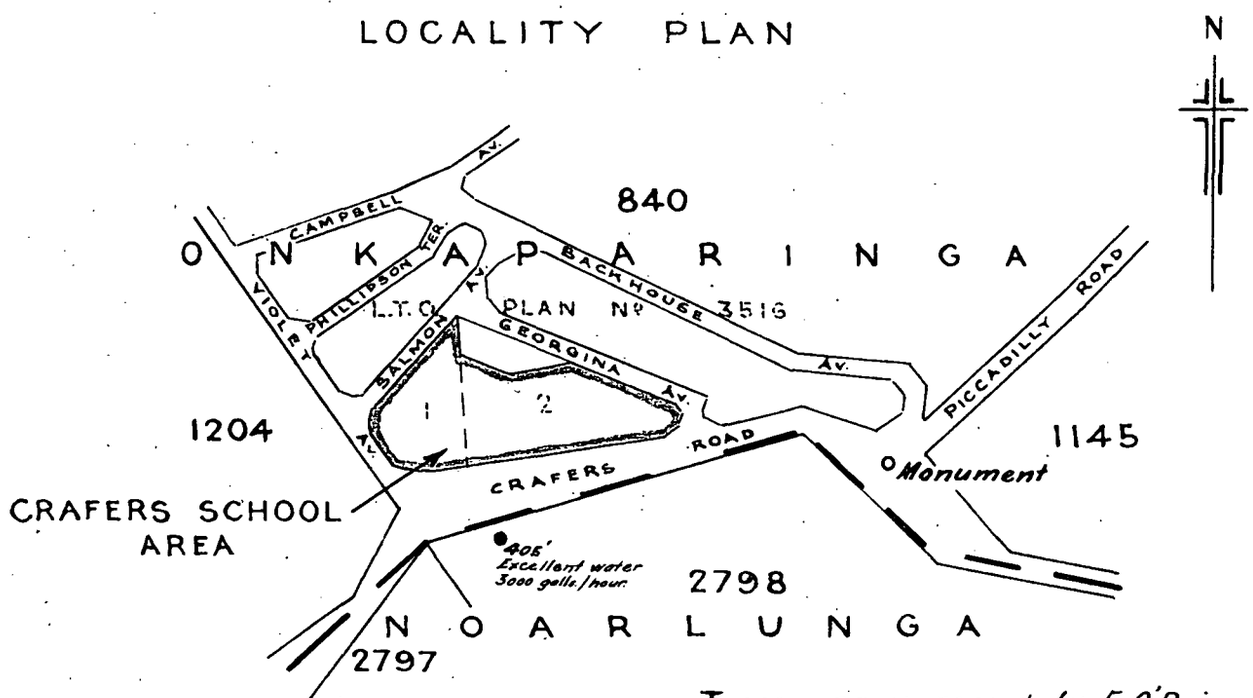


DIAGRAM SHOWING SUGGESTED METHOD OF EFFLUENT DISPOSAL

LOCALITY PLAN



To accompany report by E.O'Driscoll.

S.A. DEPARTMENT OF MINES					
Approved	Passed	Drn. R.R.	UNDERGROUND WATER SURVEY	D.M.	Scale Locality Plan 500 feet to 1 inch
		Tcd.	CRAFERS PUBLIC SCHOOL	Req.	S 939
		Ckd.	Hd ONKAPARINGA Pt Sec. 840		Ha 7
Director		Exd.	DRAINAGE PLAN		Date 5·8·54