

Improvement Dist. Engineering Section

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Water s Branch

Water Investigations Branch

Att'n: Mr. J.W. Webber

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Aquifer near Mills Rd., N. Saanich

0239013/0235027

Attached is a map of the airport area at a scale of 1" = 1000' showing the approximate limit of the sand aquifer north of the airport. The limit of the aquifer is approximate only as it is taken from logs of rather widely scattered wells. The aquifer is overlain over most of its area by glacio-marine sediments which locally consist of clay-silt with scattered stones. This material has low permeability as far as we know. It limits recharge especially where soil and vegetation is relatively thin as for instance on the north side of the airport. However, this covering protects the aquifer from pollution and prevents rapid discharge of water on the flanks of the aquifer where artesian conditions exist.

Observations on a well on Mills Road indicate that the aquifer is full of water throughout the year. Maximum fluctuation in the aquifer is only about three feet indicating that loss of water through leakage or pumping from wells is much less than recharge. It is impossible with the data on hand to estimate recharge. In places where there is no cover over the sand recharge is probably over 50% of the precipitation. In covered areas, it may be very low.

The thickness of the sand is about 50 feet in the central part near the intersection of Littlewood and Glamorgan Roads. It pinches out in every direction as far as we know although there is a possibility that it might be connected by a thin sand layer to the aquifer southwest of Sidney which is almost certainly of the same age. The average saturated thickness of the aquifer over its entire area may be as great as 15 to 20 feet. For estimated purposes, we may assume that the useful saturated thickness is 12 feet with a useful porosity of 25%. This represents three feet of water over the area shown on the map ^{an area of} about 20 million feet². This represents about 60 million feet³ of water or about 300 million gallons of water.

The yearly recharge is almost certainly not this great unless water is moving into this aquifer from the south through some unknown course. Thus, it would appear that removal of water at a rate of 360 million gallons per year would deplete the aquifer. In this case, artificial recharge should be considered. The location and conditions at the gravel pits near the intersection of Littlewood and Glamorgan Roads are ideal for artificial recharge. A source of water, preferably low cost water, is needed to operate such a scheme. During the winter months, it should be possible to purchase water from Sidney or from the Saanich pipeline. Perhaps storm drain water from the airport runways could also be used for this purpose.

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A pumping test at Sidney showed transmissibility of the aquifer to be about 10^6 U.S. gallons per day per foot width. The transmissibility of the aquifer under discussion is probably higher in its central part because of greater thickness but it is likely to be of the same order of magnitude. The transmissibility limits the size of wells which may be constructed in the aquifer. This limit may not be estimated with any degree of accuracy without more data but rough calculations indicate that the maximum capacity of wells in the thickest part of the aquifer may be about 200 U.S. gallons per minute.

It is obvious from this discussion that more information is needed about this aquifer. The best data could be obtained by construction and pumping test of a well in the aquifer to get data on the aquifer characteristics followed by controlled use of the well over a period of at least one year to get an idea of the rate of recharge. At least one observation well would be desirable.

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For map see .0235-827

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