Province of British Columbia
Ministry of Environment and Parks
WATER MANAGEMENT BRANCH

MEMORANDUM

To: J.C. Foweraker, Head
Groundwater Section
Water Management Branch

Date: October 15, 1986

Our File: 92 B/5

Re: Groundwater Potential, Sooke River

On October 2, 1986 a field inspection was carried out by Dr. Foweraker and myself to confirm geologic conditions in the area and select suitable sites for drilling and geophysical survey lines. This memorandum summarizes the results of the field inspection and provides recommendations for further consideration. Figure 1 shows the inferred areal distribution of geologic deposits in the vicinity of the Sooke River based on information obtained in the field and interpretation of air photographs. Peak water supply demand in the Sooke area is presently estimated at 1,800 gpm (pers. comm. K. Pleasance, Greater Victoria Water District, October, 1986).

Potential Testhole Sites

A number of testholes may be required to adequately test subsurface conditions adjacent to the Sooke River. Four potential testhole sites which would be readily accessible are shown in Figure 1. A brief discussion of each of these sites is as follows:

Site A

This site is situated within a large fluvial-glacial deposit situated along the eastern bank. Although prospects appear favourable for intersecting permeable sand and gravel deposits at depth the region around the well is moderately developed with nearby subdivisions on septic systems. There are a number of gravel pits in the deposit also, some of which are being used for waste disposal such as hog fuel and old car bodies.

If a relatively deep and confined aquifer could be located in this area the potential threat of any contaminants from waste disposal practices at the surface could be minimal. A shallow unconfined aquifer in this area, however, may be susceptible to pollution.

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Site B

This site is situated on the west side of the Sooke River near the mouth of De Mamiel Creek. The site is subject to tidal influence and any shallow unconfined aquifer present would likely contain brackish groundwater. Deeper drilling for potential freshwater aquifers beneath a confining layer would be the target at this site.

Site C

This site is situated along the western bank of the Sooke River along Phillips Road. The site lies within a series of terraced fluvial-glacial deposits. Geologic conditions at depth are presently unknown.

Site D

This site is situated in alluvial fan deposits at the mouth of the Charters River. Difficult drilling conditions may be encountered in this area with the probability of large boulders at depth. A dark brown and very hard glacial till was observed in the bed of the Charters River approximately 150 feet from its mouth. Flow in the Charters River is reported to be supplemented by water from Sooke Lake via a pipeline. Sufficient aquifer storage therefore would be necessary at this locale during the summer months in the event the flow of Charters Creek is not maintained.

Recommendations

Prior to any test drilling consideration should be given to undertaking a number of shallow seismic and resistivity surveys in the vicinity of the proposed test sites. These can be conducted along existing roadways. Approximate costs for one line mile of geophysical surveys is estimated at $8,000. Two line miles would be required to incorporate all of the proposed drill sites. These surveys should provide information on probable depth to bedrock (thickness of unconsolidated deposits) and nature of the materials (likelihood of permeable sand and gravel deposits being present).

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Test drilling sites should be selected on the basis of the geophysical surveys where subsurface conditions appear the most favourable. Test drilling utilizing a cable tool rig and 8-inch diameter casing is recommended. Approximate costs for drilling and testing a successful 8-inch diameter test well to a depth of 150 feet would be $14,000 not including engineering supervision. Tentative costs for a complete exploration program including up to four testholes could amount to $86,000 including engineering supervision (Table 1). If any of the 8-inch diameter test wells are successful and aquifer capability is proven it may be advantageous to consider larger diameter wells (12 to 16 inch diameter) for production purposes. Costs to construct one 16-inch diameter production well capable of theoretically supplying 1,000 gpm is estimated at $25,000 not including engineering supervisory costs.

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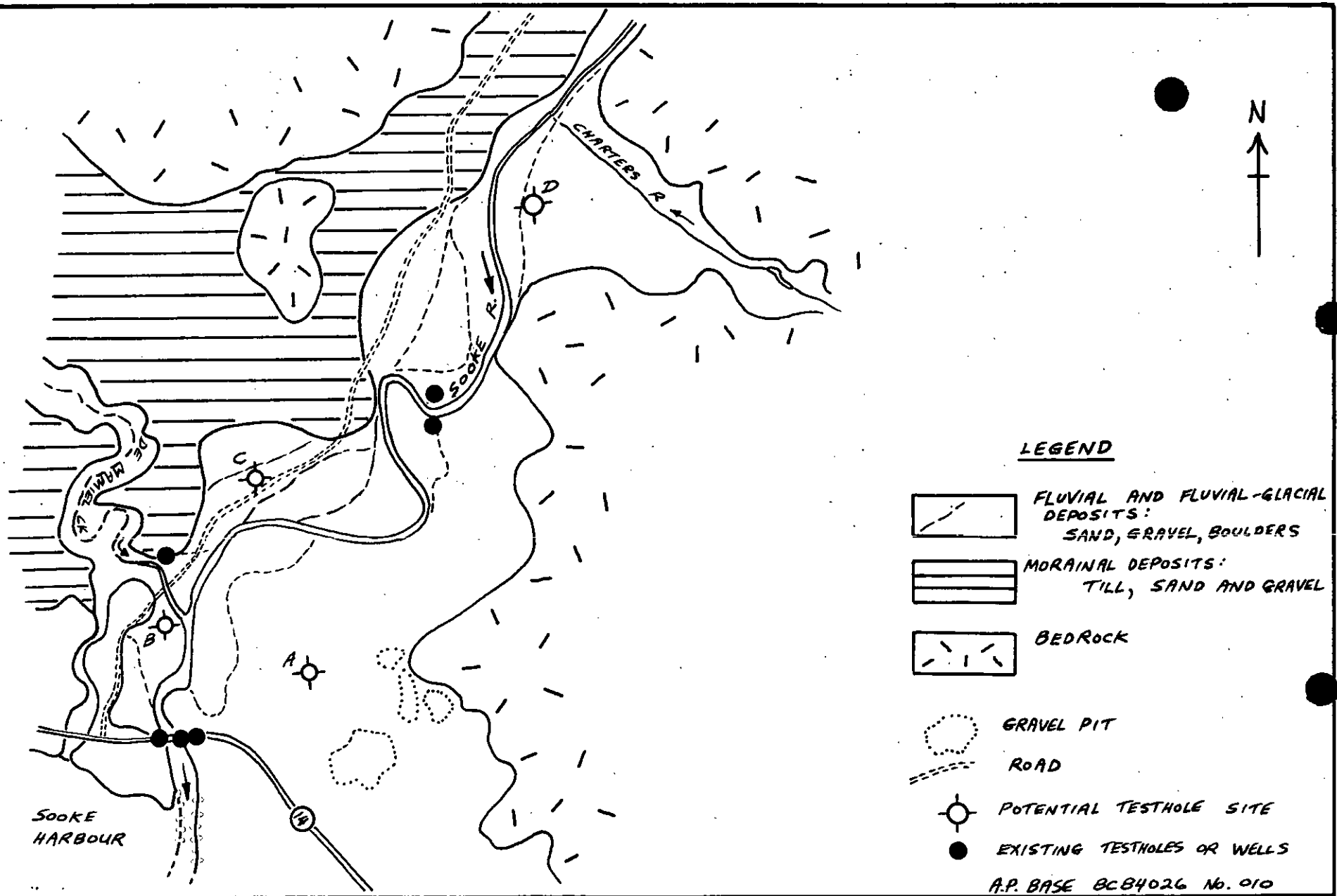
APK/dma



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TO ACCOMPANY REPORT ON

GROUNDWATER PROSPECTS
SOOKE RIVER

SCALE: VERT.....
HOR. 1" = 1320'

DATE
OCT 1986.

APK ENGINEER

FILE No..... DWG. No. FIG. 1

BCIL 7674-M.E.

TABLE 1

Groundwater Exploration Cost Estimates, Sooke River

1.	Geophysical Surveys 2 line miles @ $8,000/mile including supervisory costs and report	$ 16,000.
2.	Test well construction and testing 4 test wells @ $14,000	$ 56,000.
3.	Engineering supervision for well drilling contract and report	$ 14,000.
	TOTAL	$ 86,000.