928-11-97

97

ROBINSON, ROBERTS & BROWN LTD.
GROUND WATER GEOLOGISTS
1632 McGUIRE AVENUE
NORTH VANCOUVER, BRITISH COLUMBIA
TEL. 985-1293

AFFILIATED OFFICE
TACOMA, WASHINGTON

GROUNDWATER DEVELOPMENT

DEAN PARK AREA

W. L. Brown, P.Eng.
R. B. Erdman

April 1973

ROBINSON, ROBERTS & BROWN LTD.
GROUND WATER GEOLOGISTS
1632 McGUIRE AVENUE
NORTH VANCOUVER, BRITISH COLUMBIA
TEL. 985-1293

AFFILIATED OFFICE
TACOMA, WASHINGTON

INTRODUCTION

The Groundwater potential of the Dean Park area of North Saanich has been studied as requested in your letter of March 26, 1973 (your file 616). A review of the data available in our office and an air photo study was conducted. Our interpretation of the air photos was checked in the field and the additional information obtained incorporated into this report.

The drilling costs are based on the prevailing rates in April 1973 dollars.

Information obtained from last summer's billing from Central Saanich shows a maximum use of 2,246,000 gallons during July. This is equivalent to approximately 52 gallons per minute of continuous flow. One hundred gallon per minute would be required if no storage is available.

GROUNDWATER GEOLOGY AND HYDROLOGY

The attached map shows our interpretation of the geology of the subject area. Granitic type rocks underly most of the Dean Park area. These types of rock can only transmit water to wells when they are fractured. The faults and fracture zones observable on the air photos and on the ground are shown on the map.

Wells drilled into several of these zones for other clients have had safe productive capacities of from 20 to 250 U.S. gpm. The location of the well in relation to the fracture zone is very important. The central part of the zone may be so highly fractured that rock flour and small particles of rock can plug the fractures. It is very difficult to know precisely where to locate a well to obtain the maximum productivity until some wells have been drilled into a particular zone.

The promising areas are numbered 1 through 3 on the map in order of merit of our estimates of the chances of success.

Area No. 1 is considered to be the best location. This area is a major fracture zone trending north-south. It is understood that the residents along Dean Park Road have requested that the District extend the water mains westward. If this is done then Area 1 should be our first target.

In Area 2 on the west side of Dean Park Estates, several minor fracture zones are noted joining with the major fault of Zone 1.

Area 3 is a minor fault trending at approximately 35 degrees with the main fault. If the pipe line is not going to be extended into Area 1 then Area 3 would become our second choice.

WATER QUALITY

Analysis of waters collected from deep wells surrounding the Dean Park area indicates a water of acceptable quality. The water may be slightly harder than the Elk Lake water but should not be hard enough to cause any problems. The chlorides from these other wells are low.

If the well is to be drilled on or close to the road allowance it is most important that the surface casing be sealed into the rock and cemented into place. If any near surface fractures are found it may also be necessary to seal them off to stop ~~new~~ NEAR surface water contamination.

TESTING PROGRAM

A testing program to obtain from 50 to 100 gallons per minute of water is recommended. If this amount of water could be obtained from one well, then the program could be terminated. We estimate that there is a 90% chance of obtaining the required amount of water in two wells.

An 8-inch diameter well drilled in Area 1 is estimated to have a 95% chance of success if the fracture material is not too finely ground up that the water can't move through it. The nature of the fault material can be determined after 50 or so feet of the fault has been drilled. Area 2 is estimated to have a 90%, and Area 3 an 85%, chance of success.

The air photo interpretation of the faults show that they are in a near vertical position. This being the case, a well drilled a few feet too far away may not reach the fault within reasonable drilling depths.

It is estimated that a 500 foot 8-inch diameter well would cost approximately $10,000 to drill, develop, and pump test. This cost would include our engineering services. A three-well program would therefore be in the $30,000 range. Of course, if the desired amount of water was obtained in the first well the program could be suspended.

The above costs do not include any land acquisition, site clearing, and levelling costs.

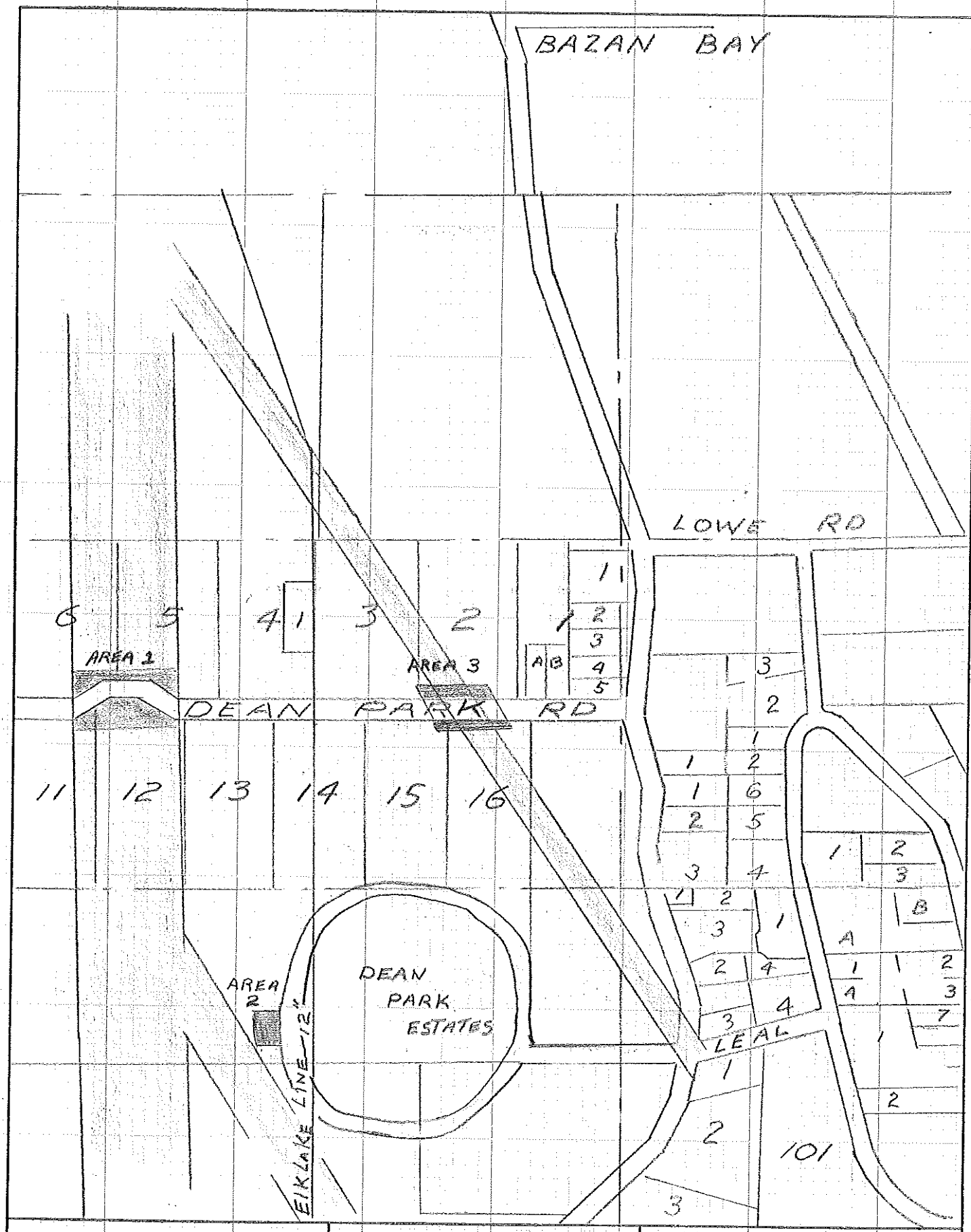
CONCLUSIONS AND RECOMMENDATIONS

1. A fault and fracture zone system is present on lands within the Dean Park Water System.

2. The individual per-well-yield is expected to range from 20 to 100 gpm.

3. The cost of a fully tested and successfully completed test well left as a production well is $10,000, including our specialized engineering services.

4. Immediately prior to the start of a test drilling program, we should be asked to write a short set of technical specifications and send them to several competent drilling contractors to obtain competitive bids and refined cost estimates.



District of North Saanich

Target Areas

Map of Dean Park area showing Fractured Zones

ROBINSON, ROBERTS & BROWN LTD.
CONSULTING GROUNDWATER GEOLOGISTS
NORTH VANCOUVER, CANADA

April 1973

01

May 2, 1973
(dictated April 26)

District of North Saanich
P. O. Box 2027
Sidney, British Columbia

Attention Mr. E. F. Fairs, Municipal Clerk

Dear Sirs:

Subject: Groundwater Development Dean Park Area

Please find enclosed 3 copies of our report on the possibility of developing ground water in the Dean Park area. If there are any questions that the Water Committee or the Council may have in regard to this report, we would be glad to meet with them at their convenience.

Yours truly,

W. L. Brown, P.Eng.

WLB:rvc
Enclosures