

COMPLETION REPORT  
PRODUCTION WELL

SCOTT PAPER LIMITED  
New Westminster, B.C.

W.L. Brown, P. Eng.

November, 1964

## INTRODUCTION

General geologic concepts and experience indicated that fresh water-bearing reservoirs should exist at depth beneath the Scott Paper Limited plant site in New Westminster. We believed that these reservoirs would exist above a depth of 200 feet, and also that deeper reservoirs exist at depths of 500 to 800 feet. Consequently, it was decided to drill a test well in the western part of the plant site near the Greenwood Mill. This test well had a 12-inch inside diameter so that if a promising zone was encountered it could be converted to a production well. A promising zone was encountered between depths of 77 and 116 feet and the test well was then successfully converted into a production well.

## RESULTS OF TESTING AND DRILLING

The well encountered the following sediments:

<u>Depth below present ground level</u>	<u>Description</u>
0 - 3 feet	sand and gravel fill
3 - 8 feet	silt
8 - 9-1/2	gravel, <u>water-bearing</u>
9-1/2 - 32	hard glacial till
32 - 33	gravel, loose, <u>water-bearing</u>
33 - 50-1/2	hard glacial till
50-1/2 - 54	sand and gravel, cobbles up to 6 inches in diameter, <u>water-bearing</u>
54 - 63	hard glacial till
63 - 69	fine to coarse sand and gravel, <u>water-bearing</u>
69 - 77	hard glacial till
77 - 93	fine to coarse sand and gravel, <u>water-bearing</u> static water level fluctuates between + 1 and - 4 feet from ground level
93 - 94	sand and gravel containing clay interbeds
94 - 106	fine to coarse sand and gravel, gravel with cobbles up to 6 inches in diameter, <u>water-bearing</u>
106 - 109	fine to coarse sand with minor amounts of gravel, silty, occasional clay interbed, <u>water-bearing</u>
109 - 116	fine to coarse sand and gravel, clean, <u>water-bearing</u>
116 - 117	clay beds three-quarter inch in thickness
117 - 120	fine to coarse sand and gravel, <u>water-bearing</u>
120 - 122	fine to coarse sand and gravel, silty, relatively dense

The well was stopped at a depth of 122 feet and 28 feet of 8-inch nominal 60/1,000 inch slot screen was set between depths of 121-1/2 and 93-1/2 feet. The screen was cleaned and a pump test was run. The well was pumped at a rate of 214 gpm with a pumping level of 58-1/2 feet. The specific capacity of the test well was therefore approximately 3-1/2 gpm per foot of drawdown. Pump test recovery data showed that the transmissibility of the water-bearing zone, which was open to the screen, was 5,000 U.S. gpd/foot. This pump test data showed that a completed production well would safely yield 250 gpm. It was therefore decided to set a proper screen and bring the well into production. The test screen was therefore removed and the 12-inch casing was redrilled to a depth of 116 feet.

## PRODUCTION WELL

An Everdur Johnson well screen 30 feet long with an inside diameter of 10 inches was set in the production well. The slot openings of the screen were 250/1,000-inch. The water-bearing zone between depths of 80 and 105 feet and 110 and 115 feet were screened. Five feet of 10-inch blank pipe separates the two parts of the screen at depths of 105 and 110 feet. This keeps the silt and clay interbeds which were encountered between 106 and 109 feet from clogging or smearing the screen. Also the uppermost water-bearing zone between 77 and 93 feet which was not included in the test well, is now open to the well below 80 feet. After the screen was set the 12-inch casing was withdrawn to expose the screen, a lead packer at the top of the screen was swedged out to make a seal between the screen and the 12-inch pipe and the screen was developed. An air surge was used to develop the well. This surge allowed water to be alternately drawn out of the well at a high rate of speed, carrying material up to one-quarter inch in diameter with it, and then the water was allowed to fall back into the well and back flush the screen. This surging action was continued until the water in the well became clean. The final production pump was set with the bottom of the pump at 79 feet 3 inches below the top of the casing. The present top of the casing is approximately two feet above ground. In order to prevent possible pollution or contamination from near-surface water, the annular space between the 16-inch surface casing which goes to a depth of 37 feet, and the 12-inch inside casing, was grouted with 13 bags of cement, at a pressure of approximately 300 psi.

## WATER QUALITY

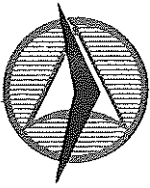
A sample of the water was chemically analysed by Coast Eldridge and the results of this analysis are attached to this report. It will be noted that this water had a colour of one on the colour scale, and that no turbidity was detected and only a trace of suspended matter was present. The total iron content is 0.15 ppm and only a trace of manganese was found. Since Albumoid nitrogen was not detected and only a trace of ammonia nitrogen was detected, we conclude that the water is free from any pollution by human wastes.

The results of the chemical tests show that the water is of excellent quality and can be used untreated for all but extremely special purposes.

## RECOMMENDATIONS and CONCLUSIONS

1. Available data indicates that the completed well is capable of producing continuously at a rate of 250 U.S. gpm with a safety factor of approximately 25%.
2. The well is influenced by the tide. At high tide the static water level is approximately one foot above general ground level and at low tide it is approximately four feet below ground surface.
3. Water level measurements using an electrical device made from a galvanometer, a hearing aid battery and TV antenna wire should be made and recorded once a week. The pumping level and the pumping rate should be recorded after the pump has been operating for at least one hour. These measurements should be taken at the same phase of the tide; for example at high tide.
4. Any marked changes should be reported as soon as possible, and the first year's records should be reviewed to ascertain the long-term hydrogeologic effects on the well.
5. Theoretical calculations based upon the primary assumption that the hydrogeologic characteristics of the subsurface reservoir discovered in the first well will remain practically constant beneath the plant site indicate that wells spaced 500 feet apart will have only a small amount of mutual interference.
6. Therefore, approximately five wells could be located that would most probably yield a total discharge of 1250 U.S. gpm on a continuous basis.
7. Of course more prolific reservoirs probably exist at depth.

W.L. Brown, P.Eng.

**COAST ELDRIDGE****ENGINEERS & CHEMISTS LTD.**

125 EAST 4TH AVE., VANCOUVER 10, B.C.

TELEPHONE: 876-4111

REPORT OF: **Chemical Analysis**

AT **Vancouver Laboratory**

PROJECT: **Water Samples**

REPORTED TO: **Robinson, Roberts & Brown Ltd.,  
4421 Patterdale,  
North Vancouver, B.C.**

FILE No. **C.3-R.7-64 14118**

DATE **October 20, 1964**

REPORT No.

ORDER No.

We have analyzed the water sample submitted to us on September 29, 1964, and report as hereunder :

SAMPLE IDENTIFICATION

Sample contained in brown gallon jug unlabelled.

*Scott Paper*TEST RESULTS

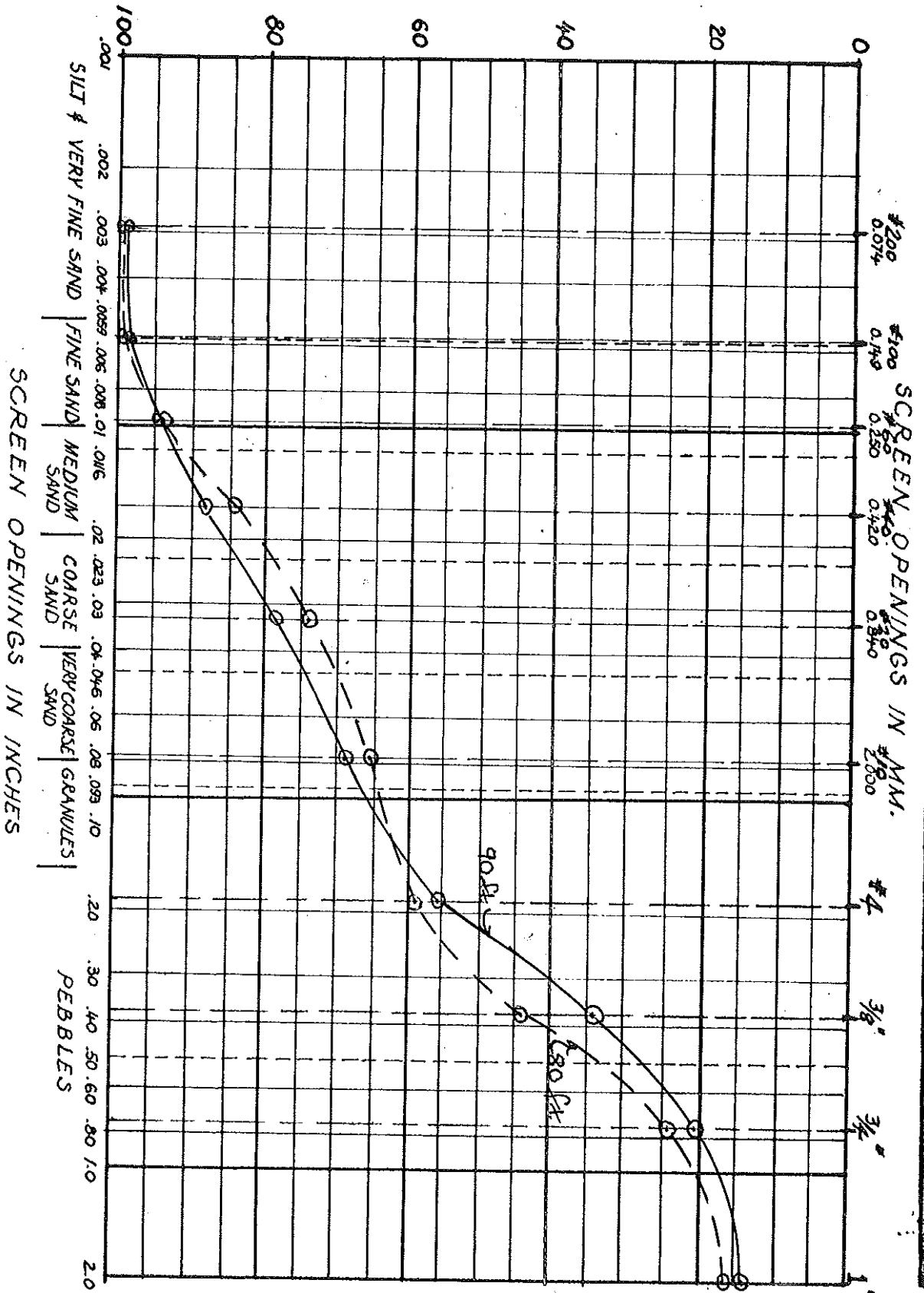
pH	7.9
Colour (Pt-Co Scale)	1.0
Turbidity (SiO <sub>2</sub> Scale)	Not Detected
Suspended Matter	Trace
Alkalinity : Carbonate	Not Detected
Bicarbonate	125.0 parts per million
Total Hardness (soap method)	75.3 parts per million
Chlorides	6.9 " " "
Sulphates	Trace
Total Dissolved Solids	185.0 " " "
Volatile Solids	64.0 " " "
Fixed Solids	121.0 " " "
Calcium	16.6 " " "
Magnesium	13.6 " " "
Sodium	5.2 " " "
Potassium	3.3 " " "
Manganese	Trace
Total Iron	0.15 " " "
Dissolved Iron	0.15 " " "
Total Aluminum	0.54 " " "
Dissolved Aluminum	0.24 " " "
Dissolved Silicon	10.0 " " "
Nitrate NO <sub>3</sub>	0.2 " " "
Albumoid N	Not Detected
Ammonia N	Trace
Vanadium	Trace
Copper	0.18 parts per million <i>from pipes ?</i>
Chromium	Not Detected

**COAST ELDRIDGE***J. G. Smith*  
**CHIEF CHEMIST**

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% RETAINED CUMULATIVE

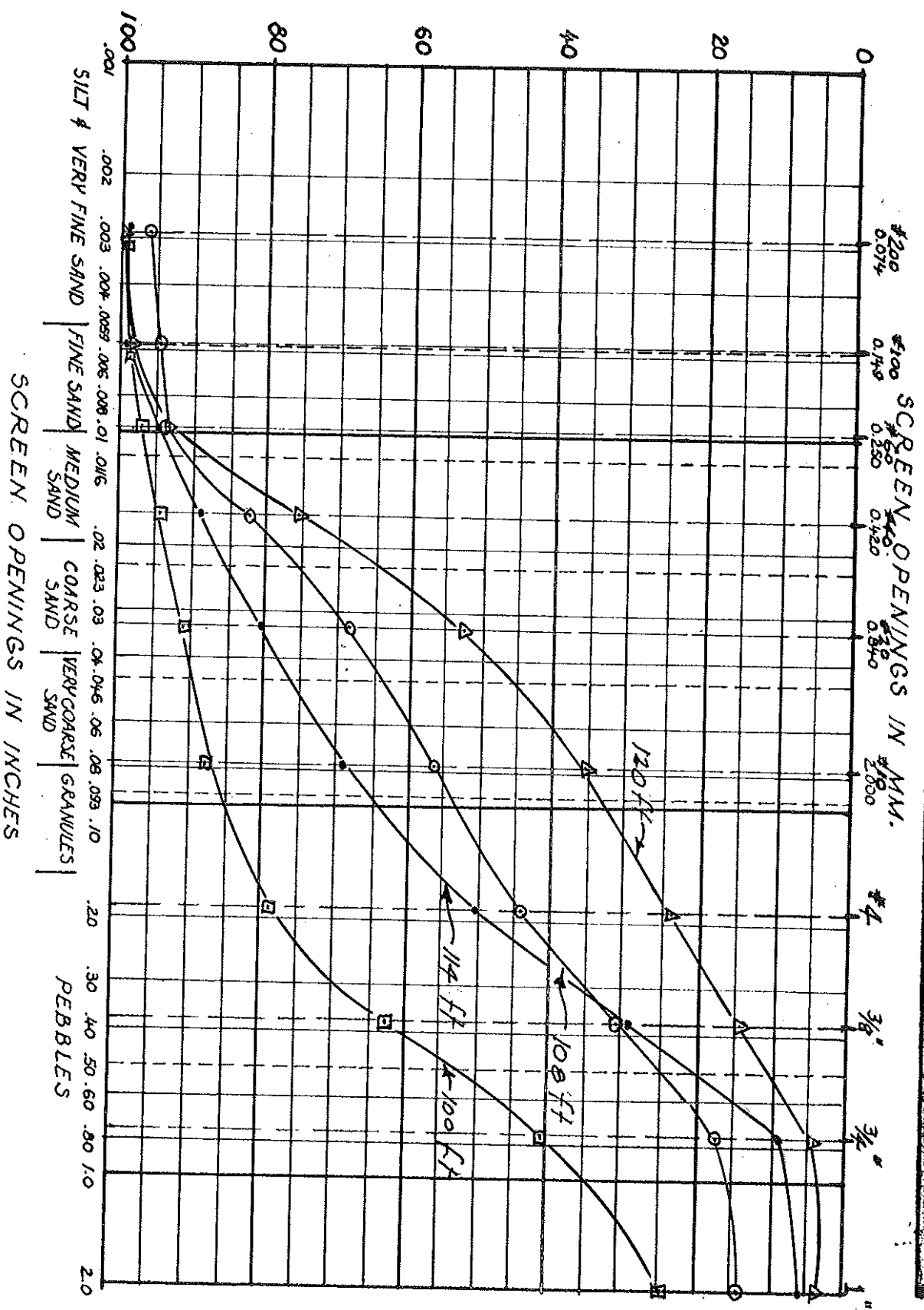


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