

926-14-13

COMPLETION REPORT
on a
PRODUCTION WATER WELL
for the
ANACLA INDIAN RESERVE #12
BAMFIELD, BRITISH COLUMBIA

by

H. W. Reed

June 1976

74-380

1.0 INTRODUCTION

The Anacla Indian Reserve #12 is located at the mouth of the Pachena River on Vancouver Island west coast. A brief study of groundwater resources on the reserve was carried out in October 1974. Conclusions reached at that time indicated that additional potable water supplies might be developed from the shallow sediments at the river mouth.

Drilling of a 24-foot deep test production well was completed in May, 1976. Estimates of well yield indicate a productive capacity of up to 20 US gpm.

2.0 WELL CONSTRUCTION

Drilling commenced on May 19, 1976 with a 6-inch diameter test hole to a depth of 37 feet. Water bearing sand was encountered between depths of 13 and 32 feet (please see attached log). Sieve analyses were run on samples of the sand which were collected during drilling.

Since the sand was too fine to screen directly, it was necessary to abandon the test hole and construct an artificially sand packed well. A 10-inch diameter hole was then drilled and cased and a 6-inch diameter 0.020 inch slot size screen was set in the best zone of the aquifer between 20- and 24-foot depths. The annular space between casing and screen was packed with a graded filter sand chosen to complement the aquifer sand for optimum efficiency. Construction details are shown on the attached drawing.

The well was developed by blowing and surging with air from the drilling rig. Development was complete when no further fine material passed into the screen from the aquifer.

3.0 TESTING

Following development a small contractor's pump was used to pump the well. Discharge during this test was 24 US gpm for 100 minutes. The well stabilized at a pumping level of 19.5 feet after 10 minutes and recovered in 18 minutes when the pump was shut down.

4.0 TESTING RESULTS

Some estimates of the well performance can be made from the short pumping test.

The specific capacity of the well during pumping was 1.4 US gpm per foot of drawdown from the intital level of 3.1 feet.

Transmissibility calculated from the drawdown and recovery curve was in the range of 500 to 3000 US gpd per foot. A transmissibility of 2500 US gpd per foot was used in subsequent calculations as this is compatible with the observed well performance.

A storage coefficient of 0.001 was selected in keeping with the above parameters and from experience with similar aquifer deposits.

The period without rainfall in the area of the well is not likely to exceed 30 days. Using the aquifer parameters noted above, a discharge rate of 20 US gpm and a time of 30 days with no recharge, the pumping level in the well has been calculated at 20 feet. If the period of no recharge to the aquifer exceeds the estimated 30 days, then a re-evaluation of the productive potential of the well may be necessary.

5.0 WATER QUALITY

A sample of the water from the well was submitted for chemical analyses. The water proved to be of good quality for all parameters tested. A copy of the analysis is included with this report.

While the well was being pumped, an odor of hydrogen sulfide was noted from the water. This condition is not harmful to domestic users and can be eliminated by aeration (spraying into the storage tank).

6.0 CONCLUSIONS AND RECOMMENDATIONS

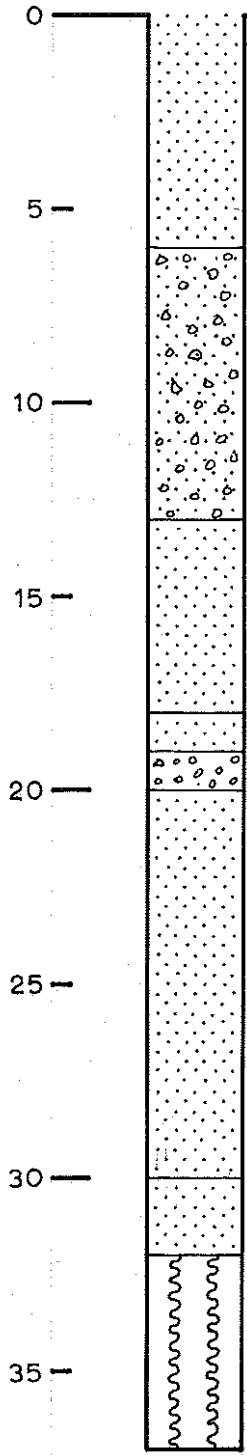
6.1 The completed well is capable of supplying 20 US gpm of water under conditions present during testing. This is sufficient water to supply 47 domestic connections under the present Water Utilities Standards.

6.2 The water is potable and of good quality.

- 6.3 A submersible type pump should be installed in the well with suction at a depth of 20 feet below ground level. The pump should be capable of delivering 20 US gpm against the system pressure at ground level. The maximum O.D. of the pump shall be 3-3/4 inches.
- 6.4 If more wells are required they should be spaced a distance of 500 feet apart to prevent undue interference between wells.

WTN 108128

Depth, ft.



0-6' Fine SAND, gray brown

6'-13' Fine sandy GRAVEL, gray brown, some shells

13'-18' Gray SAND, shells, water bearing

18'-19' Fine gray SAND, shells
19'-20' Gray GRAVEL

20'-30' Fine gray SAND, shells, silt increase with depth

30'-32' Fine silty SAND

32'-37' SILT with wood and organics, dark brown

ANACLA I. R.



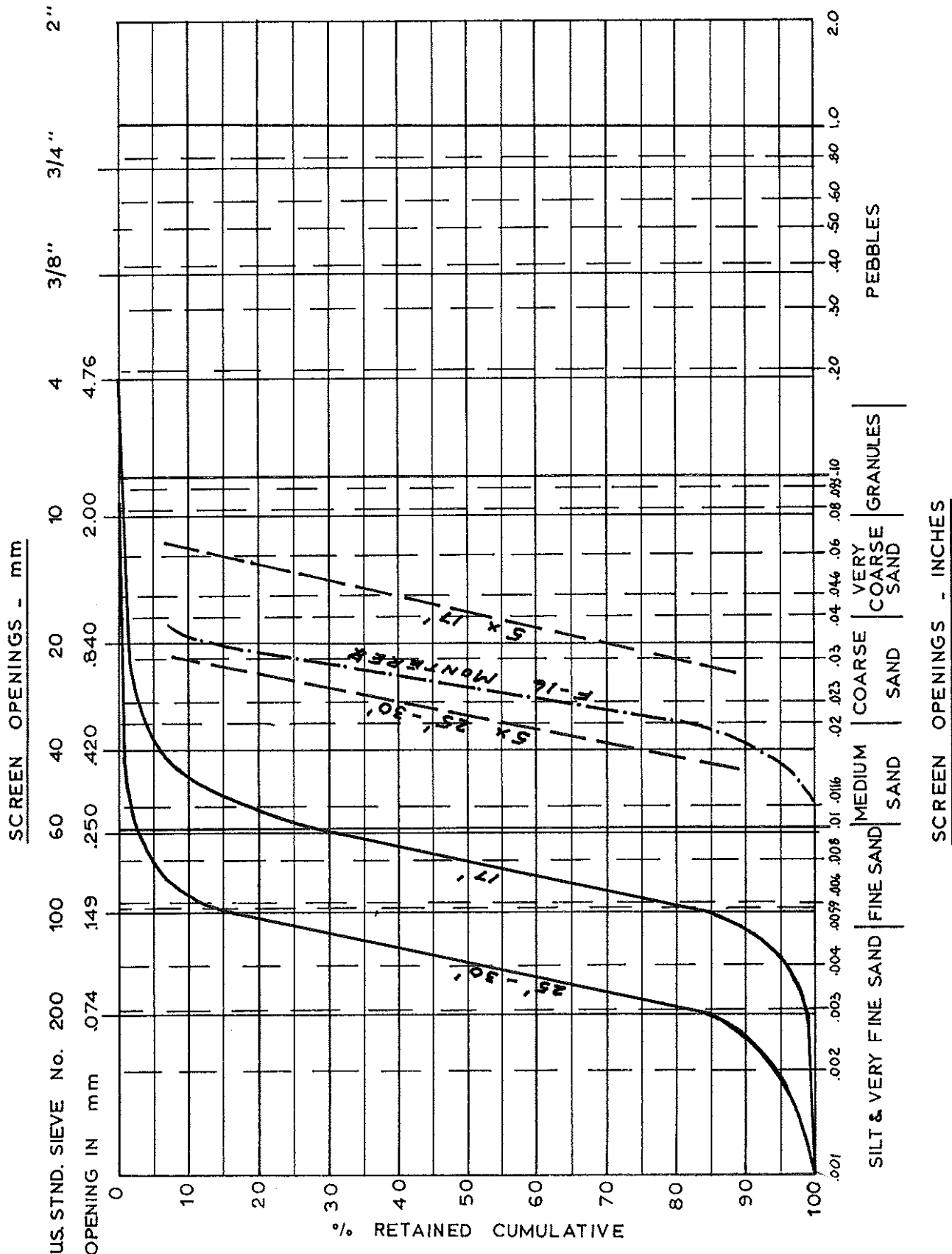
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 NORTH VANCOUVER, B.C.

BAMFIELD
 BRITISH COLUMBIA

LOG OF TEST WELL

BY:	HWR	DATE:	27-5-76
		DWG.:	1
74-380			

BC115479 PGM

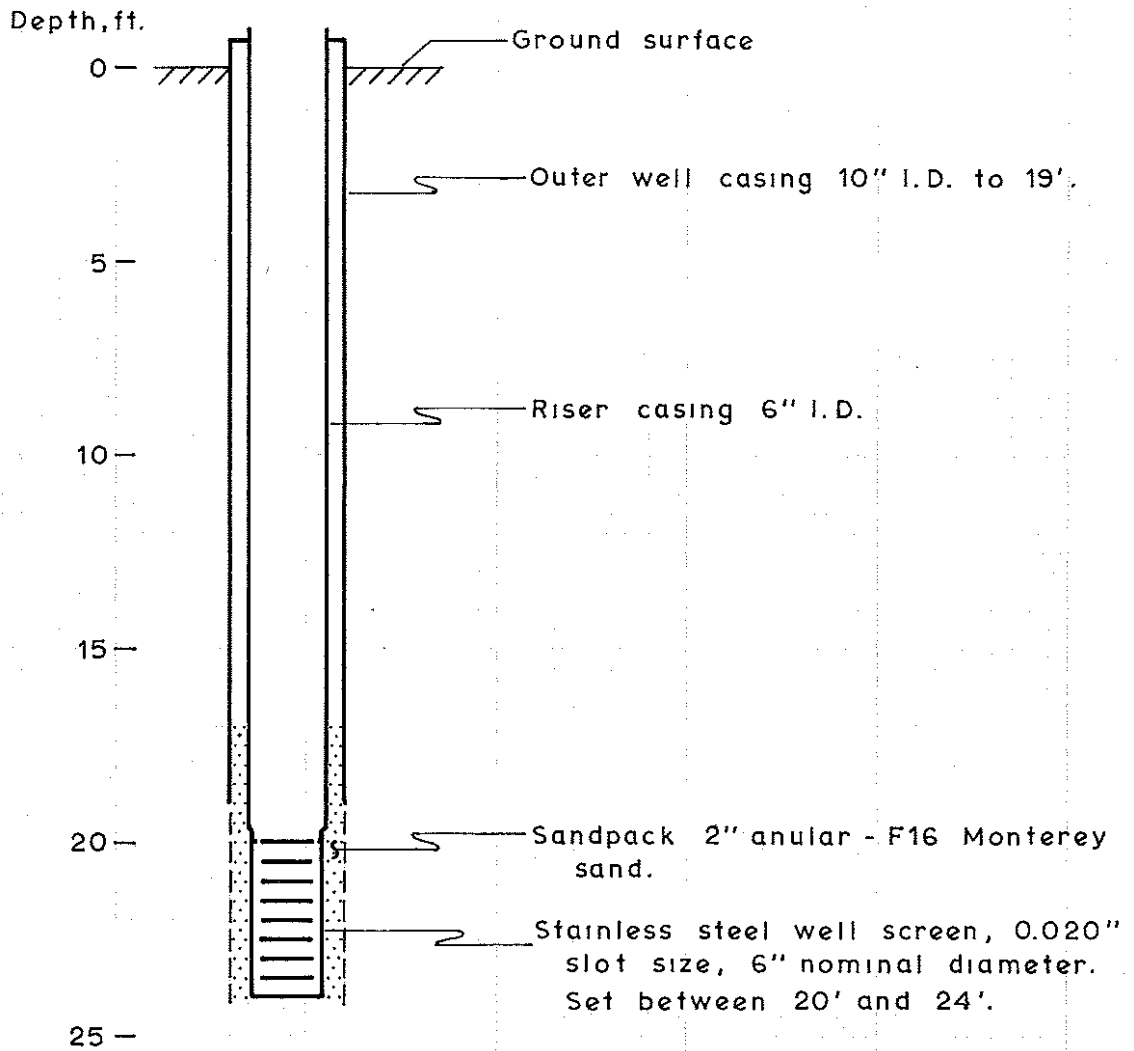


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SIEVE ANALYSIS
TEST HOLE # 1

BY: HWR	DATE: 21-5-76
JOB 74-380	DWG.: 2



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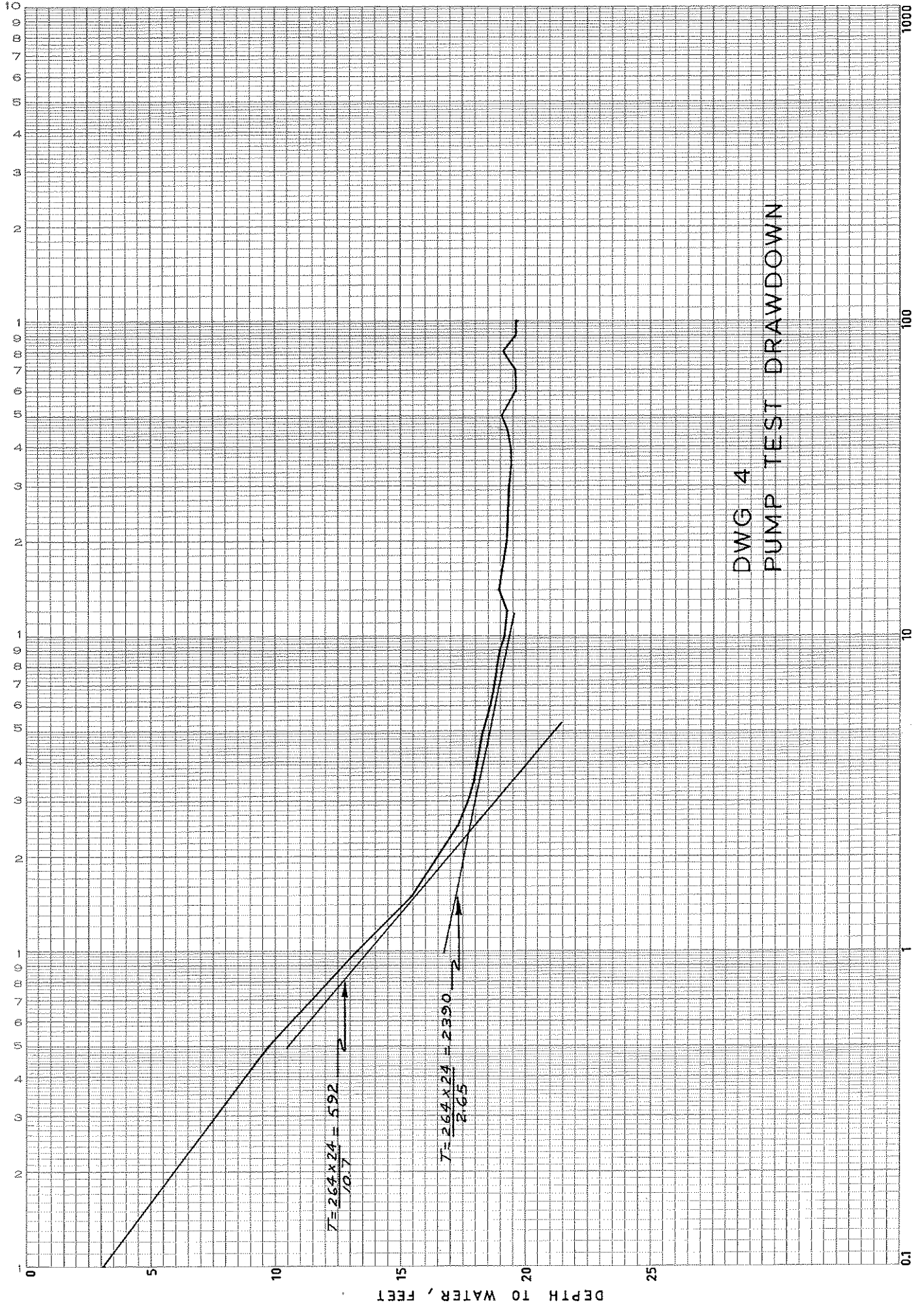
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WELL CONSTRUCTION
 DETAILS

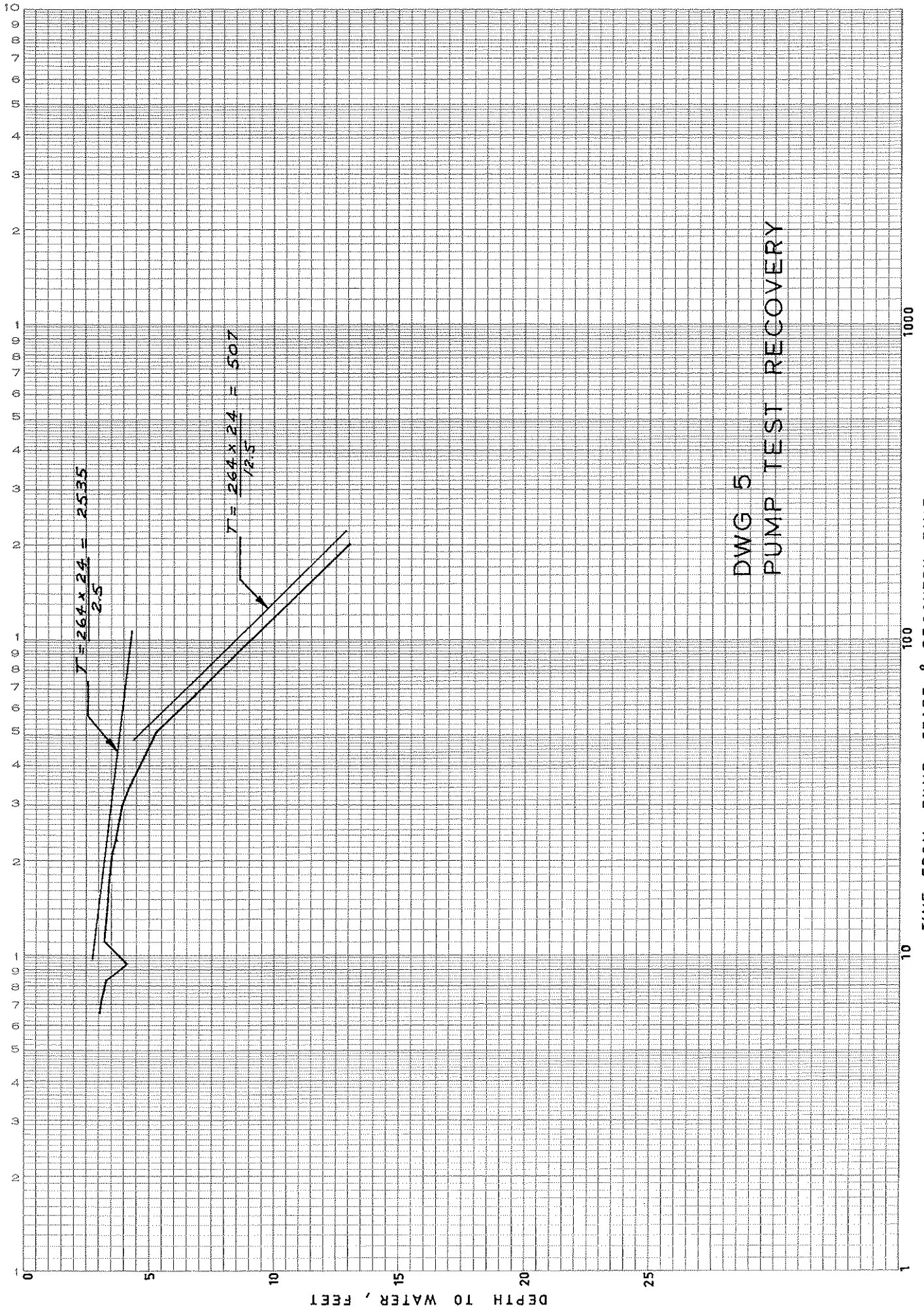
BY:	HWR	DATE:	28-5-76
	74-380	DWG.:	3

BCIL5479 P G M

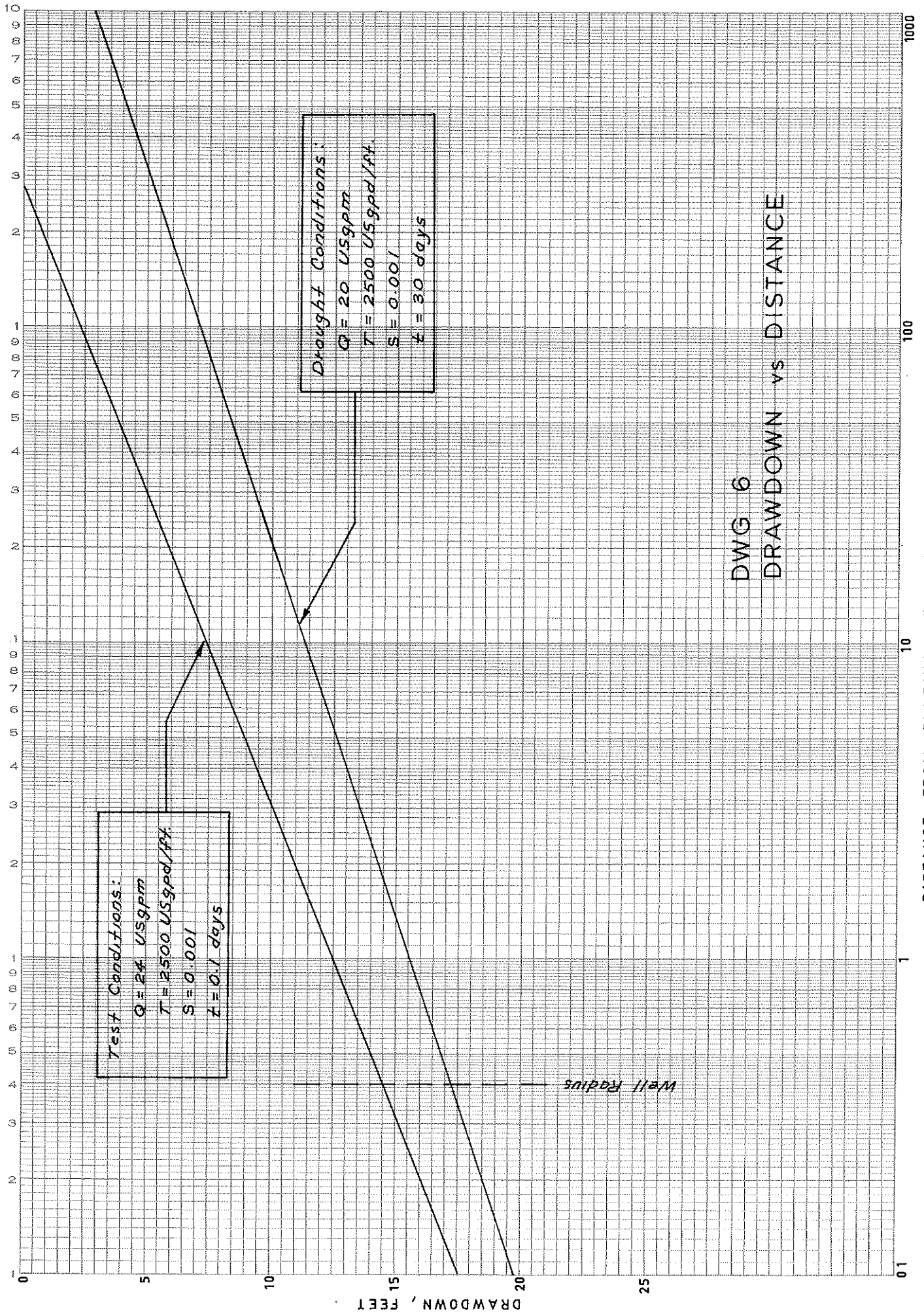


DWG 4
PUMP TEST DRAWDOWN

TIME FROM PUMP START, MINUTES



DWG 5
PUMP TEST RECOVERY

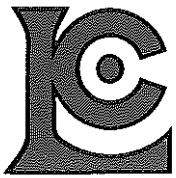


Test Conditions:
 $Q = 24 \text{ USgpm}$
 $T = 2500 \text{ USgpd/ft}$
 $S = 0.001$
 $t = 0.1 \text{ days}$

Drought Conditions:
 $Q = 20 \text{ USgpm}$
 $T = 2500 \text{ USgpd/ft}$
 $S = 0.001$
 $t = 30 \text{ days}$

DWG 6
DRAWDOWN vs DISTANCE

DISTANCE FROM PUMPING WELL, FEET



CHEMEX LABS LTD.

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 NORTH VANCOUVER, B.C.
 CANADA V7J 2C1
 TELEPHONE: 985-0648
 AREA CODE: 604
 TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO: Piteau Gadsby MacLeod Ltd.
 1409 Bewicke Ave.,
 North Vancouver, B.C.

CERTIFICATE NO. W2250
 INVOICE NO. 16799
 RECEIVED May 28/76
 ANALYSED June 7/76

ATTN: H. Reed

SAMPLE NO. :	Water Well (27-5-76 1700 Hr) Analla I.R. Bamfield
Turbidity (NTU)	1.1
pH	7.95
Apparent Color (Co-Pt)	12
Sus. Solids Fixed (mg/L)	2.8
Sus. Solids Volatile (mg/L)	1.2
Diss. Solids Fixed (mg/L)	97
Diss. Solids Volatile (mg/L)	59
Alkalinity HCO ₃ ⁻ (mg/L CaCO ₃)	132
" CO ₃ ⁻ "	< 0.1
" OH "	< 0.1
Diss. Cl (ppm)	5.5
" SO ₄ "	1.0
Diss. PO ₄ (mg/L P)	0.27
Diss. F (mg/L)	0.25
" NO ₃ (mg/LN)	0.03
Tot. Fe (ppm)	0.18
Tot. Hardness (mg/L Ca CO ₃)	123
Diss. Al (ppm)	0.02
" Ca "	40.0
" Mg "	5.60
" Na "	7.16
" K "	3.10
" Mn "	< 0.01
" Cu "	0.001
" Pb "	< 0.001
" Zn "	0.006
" Fe :	0.012



MEMBER
 CANADIAN TESTING
 ASSOCIATION

CERTIFIED BY:

R. J. Jones