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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WASHINGTON 25, D. C.

47

December 21, 1955

Memorandum

To: Director  
From: Chief, Water Resources Division  
Subject: Approval of report

Attached is a brief report by S. G. Brown, entitled "Capacity test of the Frank Suppah well, Schoolie Flat, Warm Springs Indian Reservation, Oreg.," which was prepared at the request of the U. S. Public Health Service. The report has been reviewed in the Ground Water Branch and is believed to be in good order. It contains no geologic names. It is requested that you approve the report for release to the Public Health Service and to the open file.

Chief, Water Resources Division

Attachment

*Approved*  
*H. D. Munroe*  
*12/29/55*

2215

# Office Memorandum • UNITED STATES GOVERNMENT

TO : Mr. A. N. Sayre, Washington, D. C.

DATE: January 31, 1956

FROM : R. C. Newcomb, Portland, Oregon

Attention: Reports Section

SUBJECT: Transmittal (in final form) of the small report "Capacity test of the Frank Suppah well, Schoolie Flat, Warm Springs Indian Reservation, Oregon

Per Mr. McGuinness' recent letter of instructions, the subject report has been retyped and the chemical analyses incorporated. The original and a carbon copy are enclosed for the Washington Office files.

The marked-up original also is returned herewith, if any checking is desired in your office. The marked-up copy and the corresponding carbon copy now in your office may be discarded as superseded, so far as this office is concerned.

Two copies are being sent to the Bureau of Public Health with our 1081 covering the expenses of the task.

RCN:rls

Enclosures - 2

*R. C. Newcomb*  
R. C. Newcomb  
District Geologist

*Delivered  
2/6/56  
m.m.*

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

CAPACITY TEST OF THE FRANK SUPPAH WELL, SCHOOLIE FLAT,  
WARM SPRINGS INDIAN RESERVATION, OREGON

By

S. G. Brown

Prepared in cooperation with the Division of Indian Health,  
Public Health Service of the Department of  
Health, Education and Welfare

December 1955

Open-file report, not reviewed for conformance with editorial standards  
of the Geological Survey

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## ILLUSTRATIONS

Plate 1.- Water level in Suppah well during capacity test. .	Following page 7
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CAPACITY TEST OF THE FRANK SUPPAH WELL, SCHOOLIE FLAT,  
WARM SPRINGS INDIAN RESERVATION, OREGON

By S. G. Brown

INTRODUCTION

Authorization for the Work

In accordance with the letter of October 28, 1955, from Dr. Ruth E. Dunham, Area Medical Officer of the Division of Indian Health, Public Health Service, Department of Health, Education, and Welfare, and the authorization of November 10 from the Director of the Geological Survey, the Portland office of the Geological Survey made a capacity test of the Frank Suppah well located in the NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 7 S., R. 12 E., at the eastern edge of Schoolie Flat on the Warm Springs Indian Reservation.

Arrangements for the Test

The driller of the well, Bert C. Abrams of Madras, was interviewed and the information, as shown on the following log of the well, was furnished by him.

Log of the Frank Suppah well in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T. 7 S., R. 12 E.,  
Oregon. Altitude about 2,800 ft. Drilled by Bert C. Abrams, 1950

Materials	Thickness (feet)	Depth (Feet)
Soil and gravel . . . . .	12	12
Lava rock, soft, water-bearing at depth of 88 ft	108	120
Lava rock, hard . . . . .	58	178
Clarno formation(?):		
Rock, creviced and fractured . . . . .	122	300
Casing, 6-inch, set to depth of 12 ft; open 6-inch hole to bottom.		

No water believed developed in lower 150 ft of hole. Bailer test at completion showed yield of 4 gpm and static water level 87 ft below surface.

Unpublished records  
subject to revision

An inventory of deep-well pumps available for the test showed that only a helical-rotor or "water-screw" pump was approximately adaptable to the job. The discharge of this pump could not be valved down, so that regulating the speed of the engine was the only mechanical means of controlling the rate of water discharge from the pump.

The owner's windmill pump was removed and the helical-rotor pump was installed and made ready for the test by a commercial pump company. The pump was set with the bottom of its intake pipe at a depth of 205 feet below the top of the casing, which is at land-surface level.

Arrangement was made with the Quality of Water Branch to make chemical analyses of samples of the water taken on November 5 and during the pumping test.

The depth to water level in the well was 100.39 feet below the top of the casing when the windmill was removed on December 1.

#### TESTS OF THE WELL

After the helical-rotor pump was set on December 1, a short preliminary pumping run was made to test the pump. It started at a discharge of about 30 gallons per minute (gpm) and the discharge declined to 10 gpm within 26 minutes, at which time the water level had been drawn down to the pump intake and the pump broke suction with the water level at 205 feet below the land surface. By 12:30 p.m. on December 2, the water level had recovered to 104.80 feet below the measuring point.

The well test was run on December 2. With the nonpumping level of the water at 104.80 feet below the surface, the pump was turned on at 12:55 p. m. at a rate of 15.5 gallons per minute and the speed of the engine was adjusted to try to keep the discharge at 10 gpm. The following table

Unpublished records subject to revision

shows the time, depth to water level, and discharge of pump during the test:

Time December 2	Depth to water level (feet below land surface)	Pump discharge (gallons per minute)
12:30 p.m.	104.80	
12:55	104.80	Pump on
12:57	108.12	15.5
12:58	112.56	
12:59	115.00	14.5
1:00	117.99	
1:01	120.85	
1:03	123.82	
1:04	126.40	
1:05	126.75	8.1
1:07	127.02	
1:09	127.80	
1:10	128.39	8.3
1:15	138.55	6.4
1:15 $\frac{1}{2}$		8.3 (speed raised)
1:20	143.58	8.3
1:30		5.4
1:30 $\frac{1}{2}$		8.3 (speed raised)
1:35		7.5
1:35 $\frac{1}{2}$		8.3 (speed raised)
1:55	185.30	7.5
1:55 $\frac{1}{2}$		8.3 (speed raised)
2:10		6.7
2:10 $\frac{1}{2}$		8.3 (speed raised)
2:20		9.5
2:21 $\frac{1}{2}$	205	5.0 (broke suction)
2:22		0.0 (pump off)

The water level was measured at 4:05 p. m. on December 2, when it had recovered to 170.50 feet below the surface, and at 9:10 a. m. on December 4, when it was 107.10 feet.

The drawdown and recovery of the water level in the well during the test are shown graphically on the attached chart (pl. 1).

Analyses of water samples taken before and during the test show the following values:

Chemical analyses of water from the Frank Suppah well  
(7/12-3411), Scheolie Flat, Warm Springs Indian  
Reservation, Oregon  
 (Analyses by Quality of Water Branch, Geological Survey)

	Parts per million Nov. 5, 1955	Parts per million Dec. 2, 1955
Silica ( $\text{SiO}_2$ )	41	40
Calcium ( $\text{Ca}$ )	12	10
Magnesium ( $\text{Mg}$ )	2.8	3.8
Sodium ( $\text{Na}$ )	12	13
Potassium ( $\text{K}$ )	1.4	1.4
Bicarbonate ( $\text{HCO}_3$ )	71	72
Sulfate ( $\text{SO}_4$ )		2.6
Chloride ( $\text{Cl}$ )	2	2.8
Fluoride ( $\text{F}$ )		1.0
Nitrate ( $\text{NO}_3$ )	2.1	2.3
Total dissolved solids		113
Hardness (as $\text{CaCO}_3$ )		
Total	41	41
Noncarbonate	0	0
Percent sodium	38	40
Specific conductance in micromhos at $25^\circ \text{C}$ .	134	136
pH	8.0	8.1
Temperature when collected		$56^\circ \text{F}$ .



## CONCLUSIONS

The test results warrant the following conclusions as to the capacity of the well:

1. The well was pumped for 87 minutes at an average rate of 8.1 gpm.

At the end of this time the water level had lowered 100 feet, to 205 feet below land surface, and the pump broke suction.

2. The total water pumped during the 87-minute pumping period was about 705 gallons, of which about 142 gallons came from the bore of the well and about 553 from the aquifer. The rate of withdrawal from the aquifer thus was approximately 6.4 gpm.

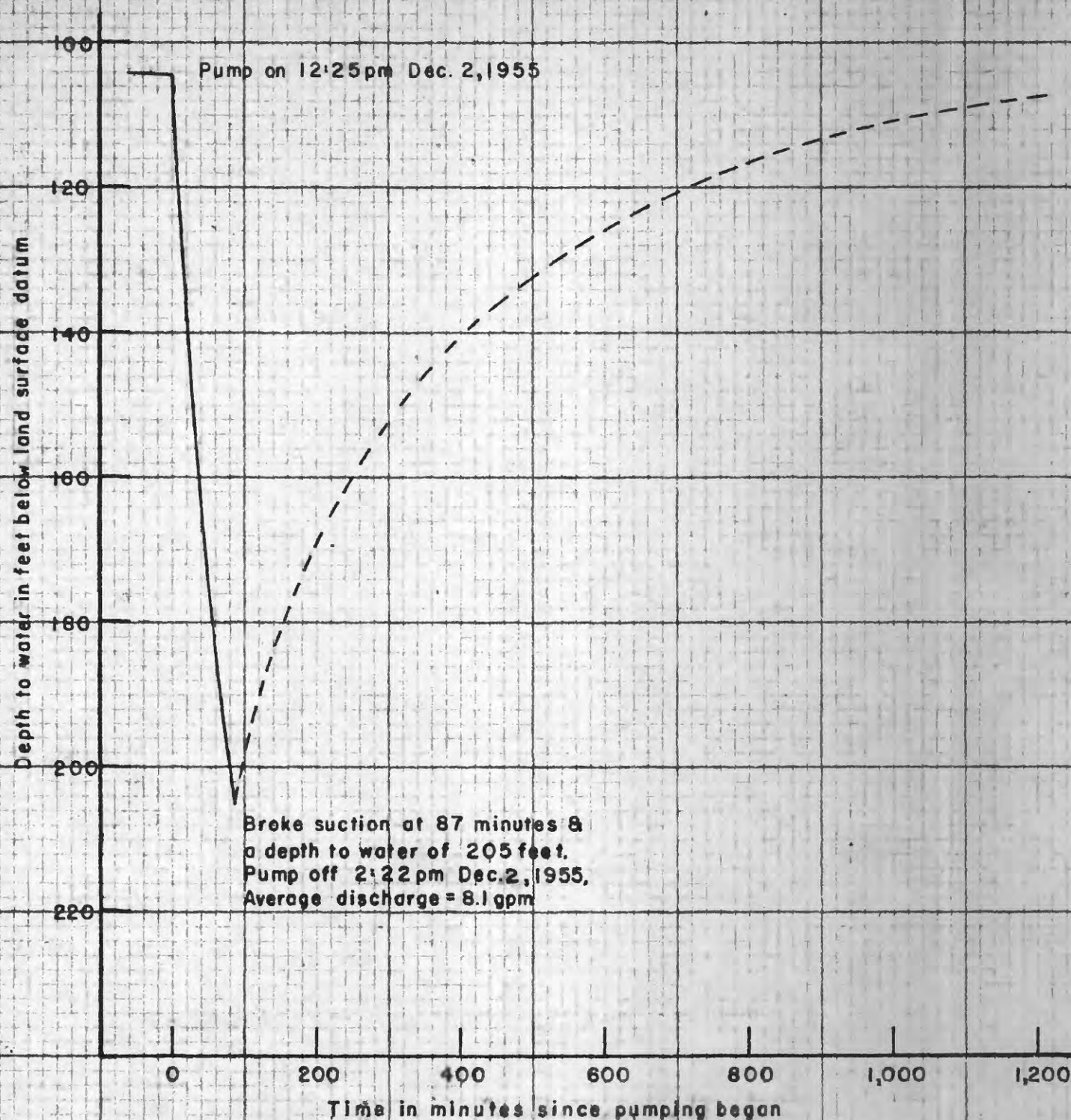
3. The sustained yield at a drawdown of 100 feet is much less than 10 gpm.

4. The shape of the drawdown curve, obtained by plotting the water level against the time (see pl. 1), indicates no substantial increase in maximum long-term capacity of the well would be obtained by setting the pump at greater depth in the well.

5. The driller's estimate from a bailer test, of 4 gpm as the yield of the well, may be approximately correct for the short-term yield of the well.

6. The sustained yield of the well may be in the order of 2 gpm, or about 3,000 gallons per day.

7. The chemical analyses show the water to be of good quality.



WATER LEVEL IN SUPPAH WELL DURING CAPACITY TEST