

# JOHNSON ENGINEERING, INC.

CIVIL ENGINEERS AND LAND SURVEYORS

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October 21, 1983

CARL E. JOHNSON  
1911-1968

**RECEIVED**  
OCT 25 1983  
RESOURCE CONTROL DEPARTMENT

Ms. Gail Murray  
Hydrogeologist  
South Florida Water Management District  
Post Office Box V  
West Palm Beach, FL 33402

Re: Babcock Florida Company Meeting - 10/4  
between Becky Serra and Bill Curry (Babcock  
Florida Company, President)

Dear Ms. Murray:

In accordance with your request to Mr. Curry at this meeting, I am enclosing the pump test made by Florida Mining and Materials, Inc. Please advise if I can be of further help.

Very truly yours,

JOHNSON ENGINEERING, INC.



Gary F. Reeves

ATG/j1A

c.c. Bill Curry  
Bayard Toussaint

13060

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CONFIDENTIAL

RESULTS OF PUMPING TEST

FOR

BABCOCK AGGREGATES  
CHARLOTTE COUNTY, FLORIDA  
A DIVISION OF FLORIDA MINING AND MATERIALS, INC.  
H-156

APRIL, 1982

PREPARED BY

SPRINGSTEAD AND ASSOCIATES, INC.  
BUSHNELL - LEESBURG, FLORIDA

## INTRODUCTION

A short term pumping test was conducted at "Babcock Aggregates", Charlotte County, Florida, on August 28, 1981. The pumping test was conducted to estimate the transmissivity and hydraulic conductivity of the unconfined aquifer by using a 6 inch well in Section 30, Township 42 South, Range 26 East.

*depth?*

Heavy rainfall occurred on the two (2) days preceding the test. The well fully penetrated the aquifer and was equipped with a centrifugal pump which delivered a constant 617 G.P.M. flow.

Three (3) 3 inch observation wells were drilled on line which was radial to the well. The observation wells were drilled at distances of 100, 200, and 300 feet from the 6 inch well.

Static water levels were recorded in the observation wells prior to commencement of pumping. The static water levels were measured using the top of the observation well casings as measuring points.

Pumping began at 10:23 A.M. on August 28, 1981, and continued until 4:00 P.M. on August 28, 1981.

Water levels were measured in each observation well at various times during pumping using the top of the observation well as a measuring point. The water level and times of measurement were recorded.

Although pumping was ended at 4:00 P.M. on August 28, 1981, water level measurements in Observation Well No. 1 were continued until 5:08 P.M. The water level in Observation Well No. 1 and the time in minutes since pumping stopped were recorded for use in a recovery test analyses.

## DISCUSSION OF DATA

The possibility of delayed yield due to heavy rainfall during the two (2) days preceding the pumping test was considered. The data did not indicate delayed yield.

The data from Observation Well No. 1 was used in the analyses to estimate transmissivity and hydraulic conductivity in the unconfined aquifer.

The data from Observation Well No. 2 was inconsistent. The draw-down in Observation Well No. 2 would increase for various periods of time then decrease. The data from Observation Well No. 2 was not used in the analyses.

The data from Observation Well No. 3 was consistent but the observation time span was not of sufficient duration for analysis.

## METHODS OF ANALYSIS

The pumping test data from Observation Well No. 1 was analyzed using a transient-state method developed by Chow.

The recovery test data was analyzed using Theis' equation for residual drawdown.

## RESULTS

### 1. Pumping Test:

Transmissivity (T): 22,900 sq.ft./day

Hydraulic Conductivity (K): 24 ft./hr.

$\times 7.48 = 171,292$

### 2. Recovery Test:

Transmissivity (T): 27,600 sq.ft./day

Hydraulic Conductivity (K): 29 ft./hr.

$= 206,448$

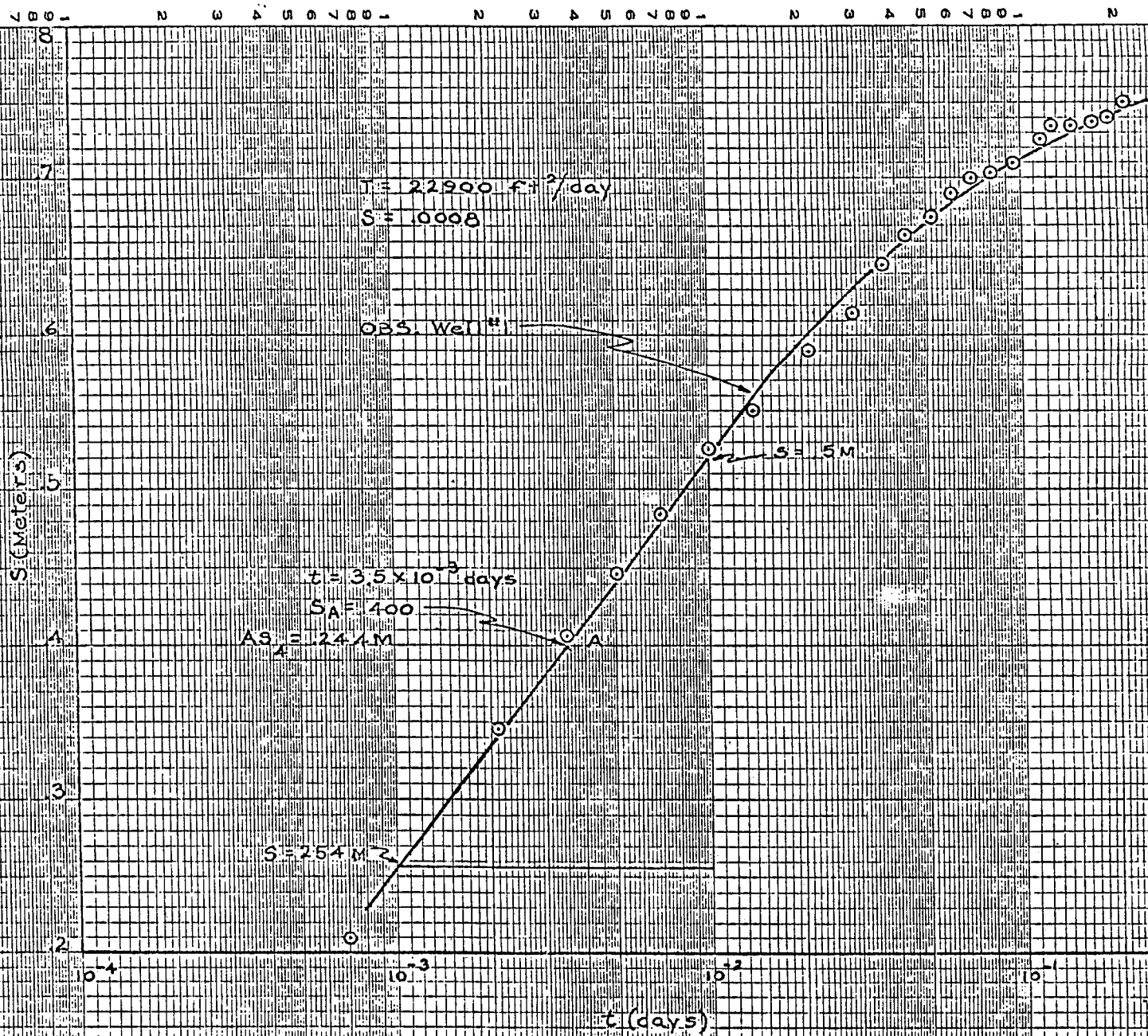
RESULTS (cont.)

3. Average:

Transmissivity (T): 25,250 sq.ft./day

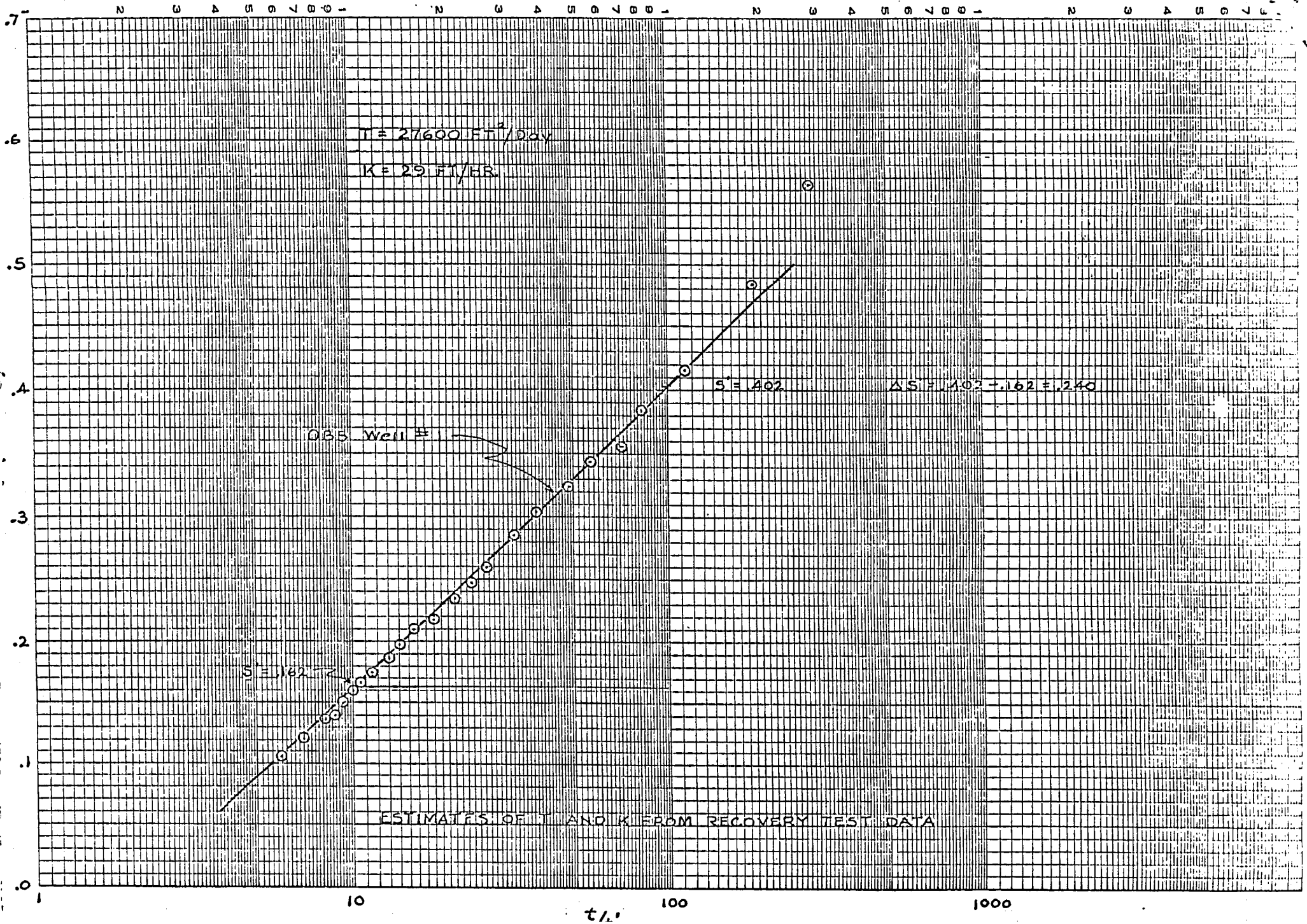
Hydraulic Conductivity (K): 26 ft./hr.

GRAPHS



CHOW SOLUTION FOR  $\tau = 5$

4 CYCLES X 10 DIVISIONS PER INCH





REDUCED DATA

# Pumping Test Data

Time (t) (min)	Drawdown (s) (ft)	
0	0	
1	0.69	<u>Best fit curve thru data</u>
3	1.14	
5	1.33	$.6788 \log(t) + .8617 = S$
7	1.46	
10	1.58	
15	1.72	
20	1.80	
30	1.94	
42	2.01	
52	2.11	
62	2.18	
77	2.22	
107	2.26	
122	2.29	
137	2.30	
152	2.32	
167	No reading	
182	2.39	
212	2.41	
242	<del>2.43</del> 2.42	
272	<del>2.46</del> 2.43	
302	<del>2.50</del> 2.46	
332	2.50	<del>Stopped Pumping at 337 minutes</del>

⊙ STOPPED PUMPING AT 337 MINUTES

# Recovery Test Data

Stopped pumping at 337 Minutes

$(t)$ Time since pumping started (min)	$(t')$ Time since pumping stopped (min)	$(S')$ Residual Drawdown (ft.)	$\left(\frac{t}{t'}\right)$
337	0	2.50	$\infty$
338	1	<del>1.59</del> 1.89	337 (1.80)
339	2	1.59	169.5
340	3	1.36	113.3
341	4	1.26	85.25
342	5	1.17	68.40 (1.2)
343	6	1.13	57.17
344	7	1.06	49.14
346	9	1.00	38.44
348	11	.94	31.64
350	13	.85	26.92
352	15	.81	23.47
354	17	.77	20.82
357	20	.72	17.85 .75
360	23	.69	15.65
363	26	.65	13.96
366	29	.61	12.62
369	32	.57	11.53
372	35	.55	10.63
375	38	.52	9.87 (.5)
378	41	.49	9.22
381	44	.46	8.66
384	47	.45	8.17
387	50	.44	7.74
393	56	.40	7.02
399	62	.36	6.44
405	68	.35	5.96 (.33)

best fit curve thru data:  $-.8384 \log\left(\frac{t}{t'}\right) + 1 = S'$

## Sources of Hydrologic information and Data

1. Bureau of Geology, Report of Investigation No. 78<sup>B</sup>, "Appraisal of the Water Resources of Charlotte County, Florida, By H. Sichel".
2. U.S. Geological Survey, Water-Resources Investigations 78-26, "Feasibility of Water Supply Development From the Unconfined Aquifer in Charlotte County, Florida", By Richard M. Wolensky.
- ~~3. U.S. G.S. F~~
3. U.S. Geological Survey, Ft. Myers, Fla. Office, furnished drilling logs and data for ~~two~~ U.S.G.S. observation wells located 1 mile south of the "Babcock Mine" at the Lee-Charlotte County line 813-334-7787
4. Florida Mining and Materials, Corp. Test boring logs.
5. U.S.G.S. Quadrangle maps.
6. A short term pumping test was ~~performed~~<sup>run</sup> on an existing 6 inch. well which penetrates the ground water aquifer. The well is located approximately 1000 ft. North of the proposed Plant and Facilities Area.