STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

May 3, 1989

Agua, Inc.
P.O. Box 1978
Hobbs, NM 88241

Attention: James D. Thornton

RE: Injection Pressure Increase
SWD Well No. H-35
Lea County, New Mexico

Dear Mr. Thornton:

Reference is made to your request dated March 16, 1989, to increase the surface injection pressure on the SWD Well No. H-35. This request is based on a step rate test conducted on the well on February 22, 1989. The results of the test have been reviewed by my staff and we feel an increase in injection pressure on the well is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following well.

WELL AND LOCATION	MAXIMUM INJECTION SURFACE PRESSURE
SWD Well No. H-35 Unit H, Section 35, T-22 South, R-37 East, NMPM, Lea County, New Mexico.	1263 PSIG

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

William J. LeMay
Director

cc: Oil Conservation Division - Hobbs
T. Gallegos

File: SWD-82
D. Catanach

AGUA, INC.

POST OFFICE BOX 1978
HOBBS, NEW MEXICO
88241

TELEPHONE: 505 393-6188

March 16, 1989

New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

Attn: Jerry Sexton

Re: Blinebry-Drinkard Salt Water Disposal System
SWD Well No. H-35
Unit H, Sec.35-T22S-R37E
Lea County, New Mexico

Dear Mr Sexton:

On February 22, 1989, John West Engineering performed a step rate test on the above referenced well. Mr. R.A. Saddler of the NMOCD witnessed the test.

Results of the step rate test indicate that we did not reach the break over point that would indicate the start of a fracture. Because the wellhead is rated at 2000 psi, the flow rate and surface pressure necessary to reach the fracture pressure cannot be obtained at this point in time. However, Agua requests that the current surface injection pressure limitation be raised to 1263 psig or 50 psi below the highest corrected surface injection pressure. All supporting documentation has been enclosed for your review.

Please note that the bottom hole pressure was converted to surface injection pressure using the average pressure gradient of the water that is currently being disposed of and the Hazen-Williams formula to calculate frictional pressure losses at the triplex pump rate of 159.4 barrels per hour. All formulas used have also been included for your review.

Should you have any questions concerning this application, please call me at (505) 393-6188.

Yours truly,
Agua

James D. Thornton
Engineer

JDT/jdt
Enclosures: As Stated

xc: David Catanach, NMOCD Santa Fe

BLINEBRY-DRINKARD SALT WATER DISPOSAL SYSTEM
SWD Well No. H-35
Step Rate Test

Unit H, Sec.35-T22S-R37E
Lea County
New Mexico

	ACTUAL DATA						CALCULATED DATA	
Step Number	Time	Rate (BPD)	SP (PSIA)	BHP (PSIA)	ST (Deg.F)	BHT (Deg.F)	SG Water (PSI/FT)	Corr. SP * (PSI)
	10:55	0	677	2,508	86.4	80.7	0.458	816
	11:00	720	665	2,516	87.4	80.5		824
	11:05	720	655	2,520	88.7	79.9		828
1	11:10	720	643	2,524	89.8	79.0		832
	11:15	1,114	630	2,534	91.0	77.9		842
	11:20	1,114	604	2,541	91.9	76.4		849
2	11:25	1,114	638	2,545	92.8	74.8		853
	11:30	1,373	613	2,555	93.3	71.7		863
	11:35	1,373	613	2,559	93.8	67.5		867
3	11:40	1,373	618	2,561	94.3	64.5		869
	11:45	1,632	639	2,569	94.4	62.5		877
	11:50	1,632	656	2,572	93.9	61.0		880
4	11:55	1,632	657	2,576	94.4	60.0		884
	12:00	2,621	730	2,598	94.5	59.2		906
	12:05	2,621	757	2,610	94.7	58.2		918
5	12:10	2,621	624	2,619	95.0	57.6		927
	12:15	3,715	914	2,652	95.3	57.1		960
	12:20	3,715	936	2,670	94.4	56.8		978
6	12:25	3,715	963	2,686	93.4	56.8		994
	12:30	4,051	1,041	2,711	93.0	57.0		1019
	12:35	4,051	1,068	2,729	92.9	57.2		1037
7	12:40	4,051	1,086	2,743	92.7	57.4		1051
	12:45	4,982	1,205	2,773	92.6	57.6		1081
	12:50	4,982	1,232	2,791	91.7	57.9		1099
8	12:55	4,982	1,260	2,808	91.0	58.3		1116
	13:00	5,808	1,374	2,837	90.5	58.7		1145
	13:05	5,808	1,404	2,858	90.3	59.0		1166
9	13:10	5,808	1,421	2,875	89.9	59.2		1183
	13:15	6,701	1,567	2,905	89.2	59.4		1213
	13:20	6,701	1,581	2,925	88.8	59.8		1233
10	13:25	6,701	1,615	2,943	88.9	60.0		1251
	13:30	7,618	1,742	2,971	88.6	60.2		1279
	13:35	7,618	1,751	2,990	88.4	60.4		1298
11	13:38	7,618		3,005	88.2	60.6		1313
Initial Shut-in			1,137	2,982	88.2	60.5	0.461	
	13:39	0	1,146	2,975	88.2	60.5	0.457	
	13:40	0	1,129	2,957	88.0	60.5	0.457	
	13:41	0	1,116	2,945	87.8	60.5	0.457	
	13:42	0	1,106	2,933	87.6	60.6	0.457	
	13:43	0	1,096	2,924	87.4	60.6	0.457	
	13:44	0	1,090	2,916	87.3	60.6	0.457	
	13:45	0	1,082	2,909	87.1	60.7	0.457	
	13:46	0	1,075	2,902	87.0	60.8	0.457	
	13:47	0	1,069	2,896	87.0	60.9	0.457	
	13:48	0	1,063	2,889	86.8	60.9	0.457	
	13:49	0	1,058	2,883	86.6	61.0	0.456	
	13:50	0	1,051	2,878	86.3	61.1	0.457	
						Average:	0.457 psi/ft	

* See attachment for formula to convert BHP to SP.

BLINEBRY-DRINKARD SALT WATER DISPOSAL SYSTEM
SWD Well No. H-35
Step Rate Test Attachment 1

DERIVATION OF FORMULA TO CONVERT BHP TO SP

SP = BHP@4000' - HHw@4000' + dPf - Pa

SP = BHP@4000' - 1692

Where: SP = Corrected Surface Pressure, psig

BHP@4000' = Bottom Hole Pressure at 4000 feet, psia

HHw@4000' = Hydrostatic Head of Water at 4000 feet, psi

dPf = Frictional Pressure Loss, psi

Pa = Atmospheric Pressure, 14.7 psi

Hydrostatic Head of Water

HHw@4000' = D x SG

HHw@4000' = 1828 psi

Where: HHw@4000' = Hydrostatic Head of Water at 4000 feet, psi

D = Depth to Bottom Hole Pressure Guage, 4000 ft

SG = Pressure Gradient of Water, 0.457 psi/ft

Frictional Losses

(Using HAZEN-WILLIAMS Formula)

$$dPf = L \left[Q / (0.442 \times d^{2.63} \times C)^{1.85} \right]$$

dPf = 150.7 psi

Where: dPf = Frictional Pressure Loss, psi

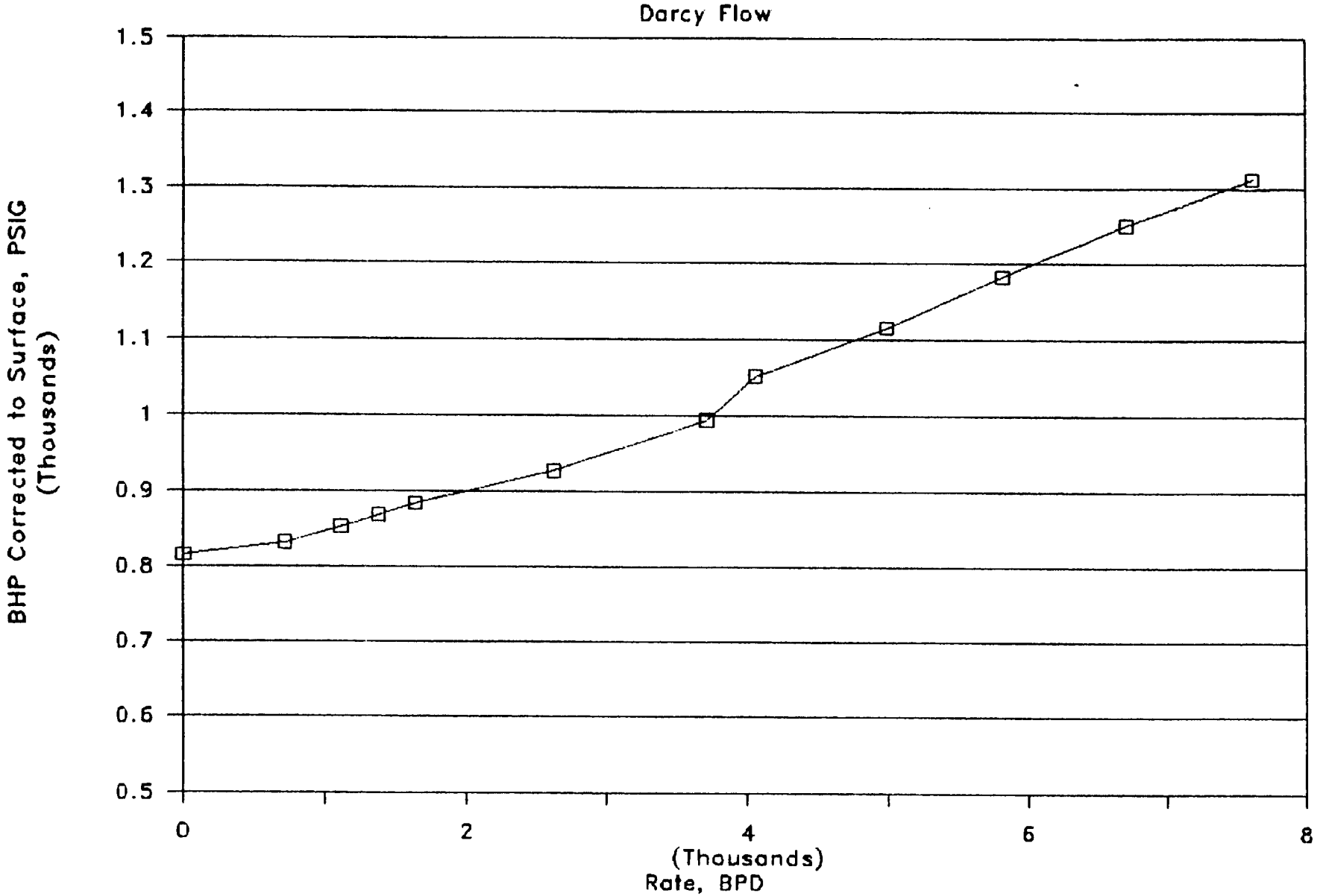
L = Length of Pipe, 3981 ft

Q = Flow Rate, (159.4 bph x 42 gpb / 60 minph) = 111.6 gpm

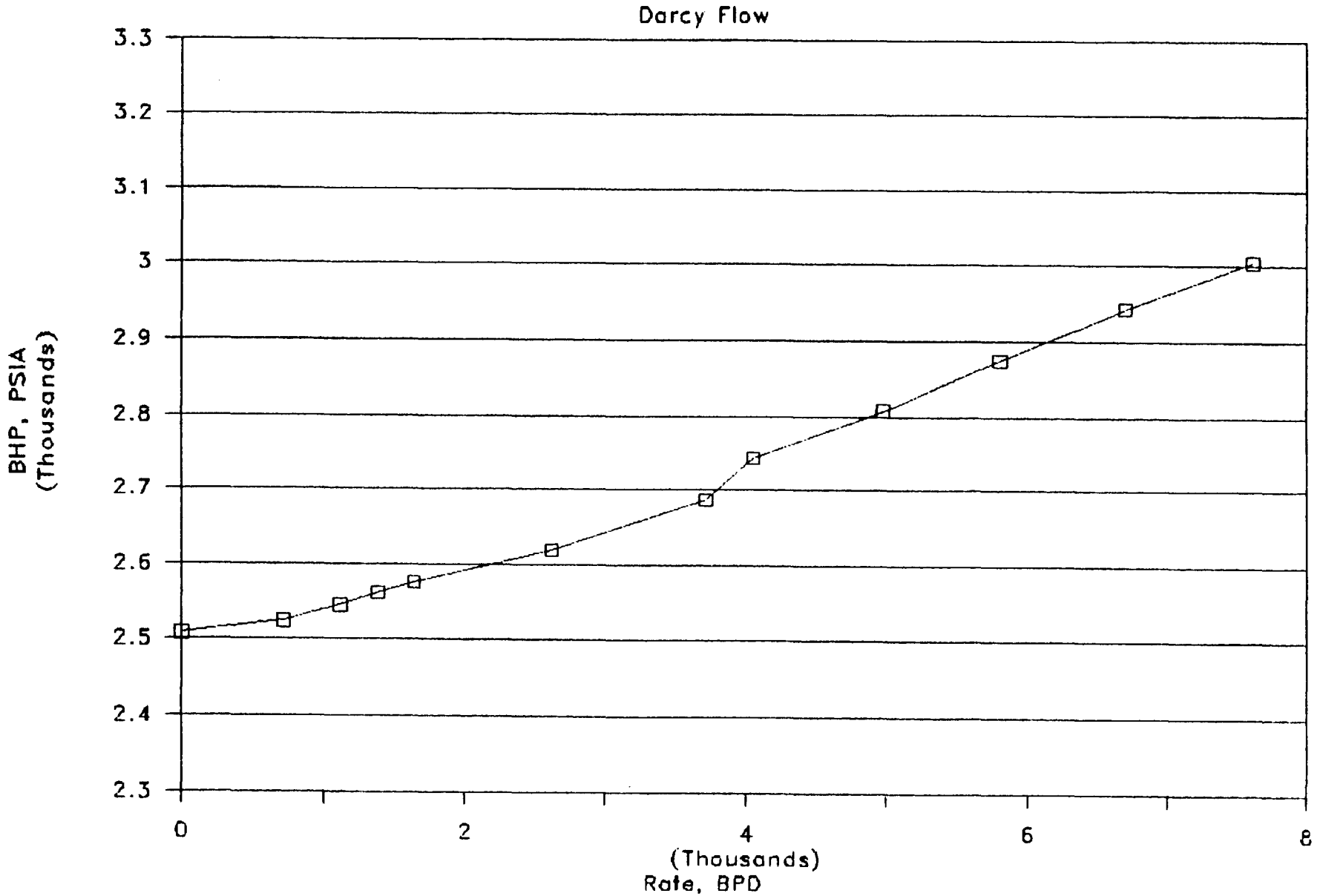
d = Inside Diameter of Pipe, 2.42 in

C = Flow Coefficient, 145

Step Rate Test of SWD Well No. H-35



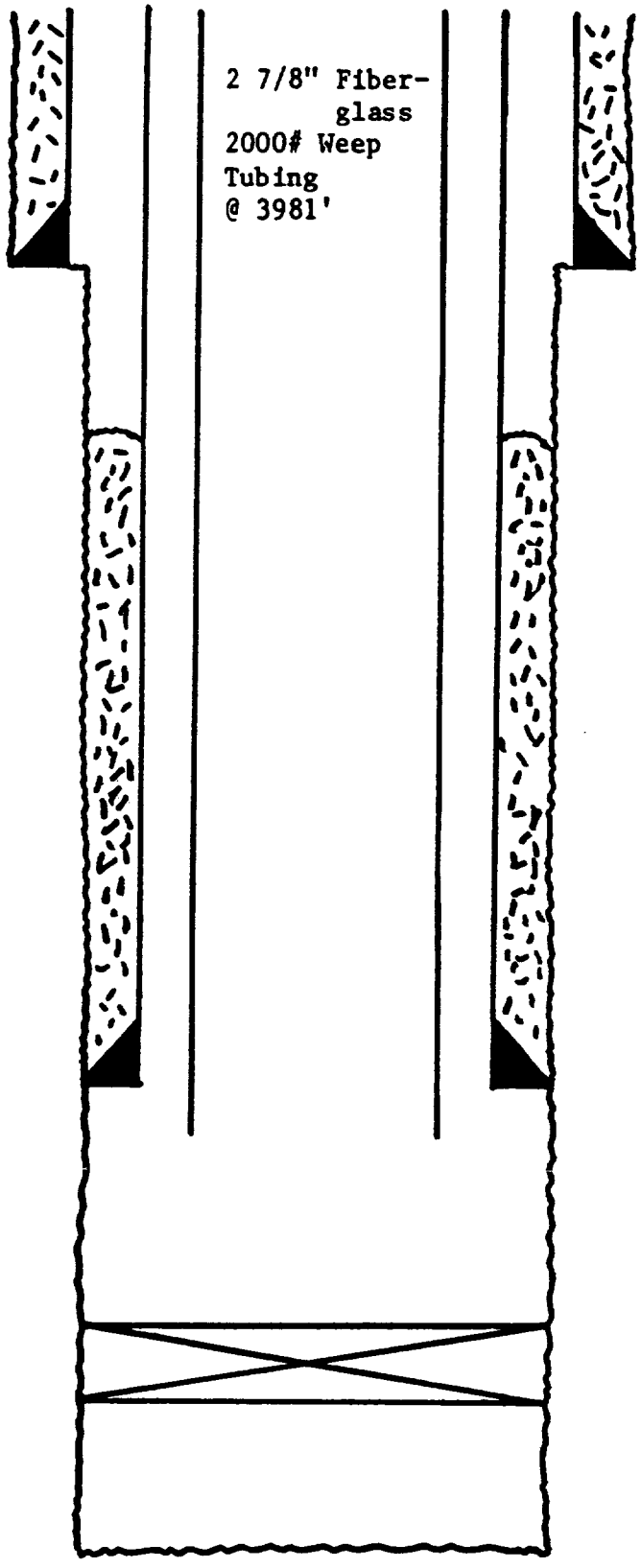
Step Rate Test of SWD Well No. H-35



BLINEBRY-DRINKARD SWDS

SALT WATER DISPOSAL WELL NO. H-35
UNIT H, SECTION 35, T22S, R37E
WELLBORE DIAGRAM

GR 3293
KB 3305



12½" Hole

9 5/8" 32.3 lb/ft
@ 1180' w/450 sx
"C" Cement TOC Surface

8 3/4" Hole

7" 20 lbs/ft
@ 3975 w/300 sx "C"
Cement TOC 2400'

B. Salt 2428 (+877)

T. Queen 3526 (-221)

T. Grayburg 3767 (-462)

T. San Andres 3932 (-627)

TOC Plug 4918
to 5070'

TD 5250