

1506-00041

1.5 gpm / lot.

1992 TEST PUMPING DATA
STAMP MILL ESTATES
WADSWORTH NEVADA

TABLE OF CONTENTS

Purpose of pumping tests

Memo to Terri Svetich from Dan Dragan summarizing test pump results.

Water quality analyses results

Step Drawdown data and results of efficiency calculations

Constant discharge data and graphs of pumping tests

Invoice from MacKAY Pump & Geothermal, Inc.

PURPOSE OF PUMPING TEST

The pumping tests were run to determine the capacity of the wells and to determine if they could provide capacity to serve the community of Wadsworth as well as Stampmill Estates. The wells are currently equipped to pump less than 65 gallons per minute.



WASHOE COUNTY

"To Protect and To Serve"



UTILITY DIVISION
DEPARTMENT OF PUBLIC WORKS
John M. Collins, Chief Sanitary Engineer

1195-B CORPORATE BOULEVARD
POST OFFICE BOX 11130
RENO, NEVADA 89520
PHONE: (702) 785-4743

16 April 92

TO: Terri Svetich
FROM: Dan Dragan
SUBJECT: Results of test pumping of Stampmill Estates wells.

Terri,

We've finished the test pumping of the Stampmill wells and will prepare a summary report once we receive the results of the water quality testing. For design purposes you may use the following criteria:

Well No.1 (East Well)

Recommended maximum pumping capacity.....400 gpm
Predicted maximum pumping level..... 63 ft. below ground surface
Recommended pump setting..... 120 ft. below ground surface (in blank section of casing).

Well No. 2 (West Well)

Recommended maximum pumping capacity.....200 gpm
Predicted maximum pumping level..... 60 ft. below ground surface.
Recommended pump setting.....120 ft. below ground surface (in blank section of casing).

The wells seem to be influenced by a recharge boundary and the pumping rates are more limited to well design rather than aquifer performance. We generally avoid allowing pumping levels to drop below the top of the well screen interval, which in the case of these wells is 60 feet below ground surface. I doubt pumping levels will rarely, if ever, reach this limit at these design capacities. Let me know if you need any additional information.

DCD/dcd
c: John Presco

TRIPPLICATE
(PLEASE PRINT OR TYPE)

NEVADA STATE HEALTH LABORATORY

NEVADA DIVISION OF HEALTH

1660 N. Virginia Street
Reno, Nevada 89503

SAMPLE ID: STAMPMILL ESTATES
WEST WELL

(702) 785-0335

096440

WATER CHEMISTRY ANALYSIS

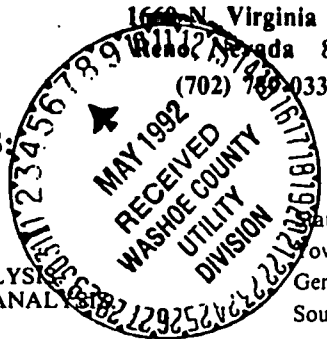
Attn: Fees may apply to some types of samples.

All of the information below must be filled in
or the analysis will not be performed.

TYPE OF ANALYSIS:

Check here for ROUTINE DOMESTIC ANALYSIS
Circle the constituents needed for PARTIAL ANALYSIS

Date: NEVADA County WASHOE
Township 20N Range 24E Section 8
General Location WARDSWORTH, NV
Source Address: SUNRISE - STAMPMILL ESTATES



SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by MIKE WIDMER Date 4/15/92
Owner WASHOE COUNTY Phone 785-4743
Address P.O. Box 11130
City RENO State NV

REASON FOR ANALYSIS:

- Loan
- Personal health reasons
- Purchase of the property
- Rental or sale of property
- Subdivision approval
- Other 24 Hour Pump Test

USE OF WATER:

- Domestic drinking water
 - Geothermal
 - Industrial or mining
 - Irrigation
 - Other MUNICIPAL Supply
- Initials _____

REPORT TO:

Name DAN DRALAN; WASHOE COUNTY UTILITY DIVISION
Address P.O. Box 11130
City RENO
State NV Zip 89520

SOURCE OF WATER:

- Filter Yes No
 - Public Yes No
 - Spring _____
 - Well Depth 230 ft.
 - Hot _____ Cold
 - IN USE Yes No
- Type _____
Name _____
Surface _____
Casing diameter 10 in.
Casing depth 22.5 ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY						PRINT OTHER DESIRED CONSTITUENTS BELOW	
Constituent	ppm	Constituent	ppm	Constituent	S.U.	Constituent	ppm
T.D.S. @ 103° C.	291	Chloride	18	Iron	0.08	Color	5
Hardness	188	Nitrate	6.1	Manganese	0.00	Turbidity	1
Calcium	44	Alkalinity	172	Copper	0.00	pH	7.95
Magnesium	19	Bicarbonate	210	Zinc	0.03	EC	462
Sodium	27	Carbonate	0	Barium	0.06		
Potassium	5	Fluoride	0.12	Boron	0.3		
Sulfate	48	Arsenic	<0.003	Silica	34		

RECEIVED
APR 30 1992
HEALTH PROTECTION SERVICES

Fee _____
Collected by _____
PWS I.D. _____
SDWA—Pri. _____ Sec. _____
1st _____ 2nd _____ 3rd _____
Date Rec'd 4.15.92 Init [Signature]
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks: Chemical quality meets the State of Nevada Drinking Water Standards.
PO# 124511
Billed 4/15/92
4/18/92

TRIPPLICATE
(PLEASE PRINT OR TYPE)

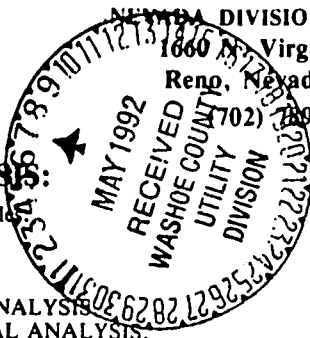
NEVADA STATE HEALTH LABORATORY

NEVADA DIVISION OF HEALTH

SAMPLE ID: STAMPMILL ESTATE
EAST WELL

1860 N. Virginia Street
Reno, Nevada 89503

702-780-0335



096439

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples

All of the information below must be filled in
or the analysis will not be performed.

TYPE OF ANALYSIS:

Check here for ROUTINE DOMESTIC ANALYSIS
Circle the constituents needed for PARTIAL ANALYSIS.

State NEVADA County WASHOE
Township 20N Range 24E Section 8
General Location WADSWORTH, NV
Source Address SUNRISE - STAMPMILL ESTATES

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by DAN DUKALAN Date 4/11/92
Owner WASHOE COUNTY Phone 785-4743
Address P.O. Box 11130
City RENO State NV

REASON FOR ANALYSIS:

- Loan
- Personal health reasons
- Purchase of the property
- Rental or sale of property
- Subdivision approval
- Other 24 Hour Pump Test

USE OF WATER:

- Domestic drinking water
- Geothermal
- Industrial or mining
- Irrigation
- Other Municipal Well

REPORT TO:

Name DAN DUKALAN, WASHOE COUNTY UTILITY DIVISION
Address P.O. Box 11130
City RENO
State NV Zip 89520

SOURCE OF WATER:

Filter Yes No Type _____
Public Yes No Name _____
Spring _____ Surface _____
Well Depth 200 ft. Casing diameter 10 in.
Hot _____ Cold Casing depth 195 ft.
IN USE Yes No

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY						PRINT OTHER DESIRED CONSTITUENTS BELOW	
Constituent	ppm	Constituent	ppm	Constituent	S.U.	Constituent	ppm
T.D.S. @ 103° C.	294	Chloride	25	Iron	0.02	Color	3
Hardness	159	Nitrate	7.4	Manganese	0.00	Turbidity	0.4
Calcium	39	Alkalinity	158	Copper	0.00	pH	7.92
Magnesium	15	Bicarbonate	193	Zinc	0.06	EC	459
Sodium	33	Carbonate	0	Barium	0.06		
Potassium	5	Fluoride	0.12	Boron	0.3		
Sulfate	48	Arsenic	0.003	Silica	36		

RECEIVED
APR 30 1992
HEALTH PROTECTION SERVICES

Fee _____
Collected by _____
PWS I.D. _____
SDWA - Pri. _____ Sec. _____
1st _____ 2nd _____ 3rd _____
Date Rec'd 4.15.92
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks
Post 124511
Billed 4/16/92
Chemical quality meets the State of Nevada Drinking Water Standards
4/28/92



WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL EAST STAMP MILL WELL

PUMPING/OBSERVATION WELL
PUMPING/RECOVERY DATA
PAGE 1 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN

HOW Q MEASURED INLINE PIEZOMETER, MCGROWMETER

M.P. for WL's IDP 1" P.V.C. elev. _____

HOW WL's MEASURED SOUND ELECTRIC SOUNDER

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. _____

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 4/9/92 time 1130

DISTANCE from PUMPED WELL _____

PUMP OFF: date 4/9/92 time 1650

TIME					WATER LEVEL DATA				WATER PRODUCT.		COMMENTS	
t =		at t' = 0			STATIC WATER LEVEL 23.15'				Q/s	Q		
CLOCK TIME	ELAPSED TIME		t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	Sors'	Q/s	Q	
	mins	hrs										
1130											230	STEP I
			1			35.56			12.41			227 HOURS on generator
			2			37.48			14.33			
			3			38.44			15.29			
			4			38.88			15.73			Q↓
			5			35.34			12.19			
			6			35.13			11.98			
			7			35.28			12.13			
			8			35.21			12.06			
			9			35.24			12.09			
			10			35.23			12.08	19.0		
			12			35.25			12.10			
			14			35.24			12.09			
			16			35.26			12.11			
			18			35.26			12.11			
			20			35.30			12.15			
			25			35.31			12.16			
			30			35.38			12.23		235+	Q↓
			35			35.58			12.43			Q↓ DAN TURNS WEST WELL ON TO FILL TANK
			40			35.73			12.58			
			50			35.87			12.72			36 PSI
			60			36.02			12.89			
			70			36.06			12.93			
			79			36.10			12.95	17.8		
STOP WATCH											280	STEP II
			82	3		41.92			18.77	14.4		
			85	6		42.54			19.39			25 PSI QT
1:27			87	8		42.32			19.17			Q↓
1:29			89	10		42.23			19.08			
1:34			94	15		42.20			19.05			
1:39			99	20		42.24			19.09	14.7		
1:49			109	30		42.36			19.21			
1:59			119	40		42.46			19.31			
2:09			129	50		42.46			19.31	14.5		
2:20			140	60		42.48			19.33			
2:30			150	70		42.48			19.33			
2:39			159	80		42.46			19.31			

EAST WELL
STEP



WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL EAST STAMPMILL WELL

PUMPING OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE OF PUMPING TEST STEP DRAWDOWN TEST

HOW Q MEASURED FLOWMETER, McLOMETER

M.P. for WL's TOP 1" P.V.C. elev. _____

HOW WL's MEASURED SOLNIST ELECTRIC SOUNDER

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. _____

% SUBMERGENCE: initial _____; pumping _____

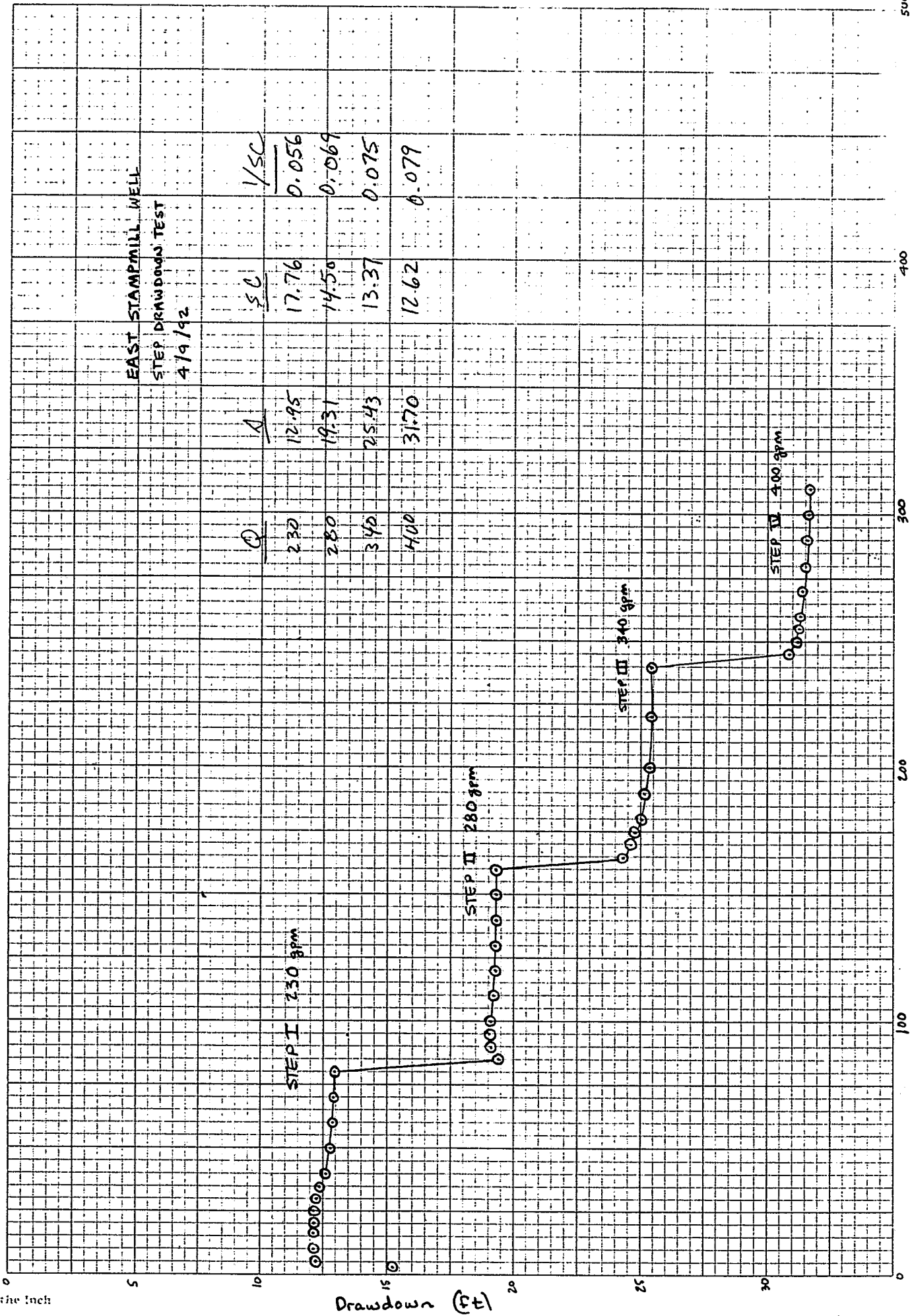
RADIUS of PUMPED WELL _____

PUMP ON: date 4/9/92 time 1130

DISTANCE from PUMPED WELL _____

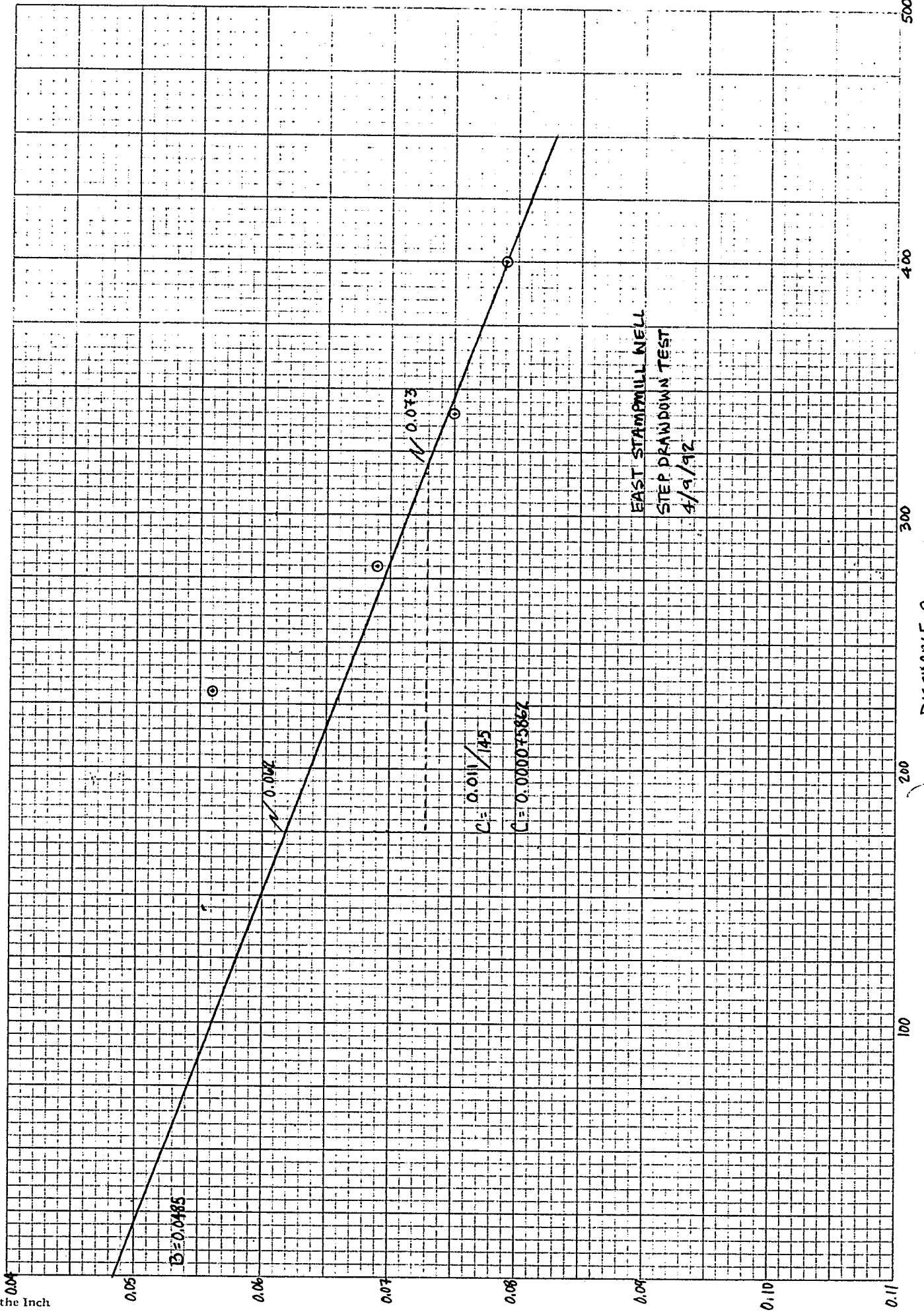
PUMP OFF: date 4/9/92 time 1650

TIME					WATER LEVEL DATA					WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME		t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	PH	Q/S	Q		
	mins	hrs									t	t'
2:42	/		162	3	47.18		24.03			340	STEP III	
2:44	/		164	5	47.53		24.38					
2:46	/		166	7	47.62		24.47				PSI 20-24	
2:49	/		169	10	47.81		24.66				Q↑	
2:54	/		174	15	47.87		24.72		13.75			
2:59	/		179	20	48.22		25.07				Q↑	
3:10	/		190	31	48.30	.378 mS @ 23.5°C	25.15	7.45				
3:20	/		200	41	48.48		25.33					
3:40	/		220	61	48.62		25.47					
3:59	/		239	80	48.58		25.43		13.4		20 PSI	
											STEP IV	
4:02	/		242	3	53.78		30.63		13.1	400	Q↑	
4:05	/		245	6	54.08		30.93				14 PSI	
4:12	/		250	13	54.34		31.19					
4:15	/		255	16	54.35		31.20					
4:26	/		260	21	54.44	.370 mS @ 23.8	31.29	7.50	12.8			
4:30	/		270	31	54.58		31.43					
4:40	/		280	41	54.64		31.49		12.7			
4:50	/		290	51	54.66		31.51					
5:00	/		300	61	54.72		31.57		12.7			
5:10	/		310	71	54.80		31.65					
5:19	/		319	80	54.74							
											OPEN VALVE TO MAX	
5:22	/			3	60.20							



Drawdown (ft)

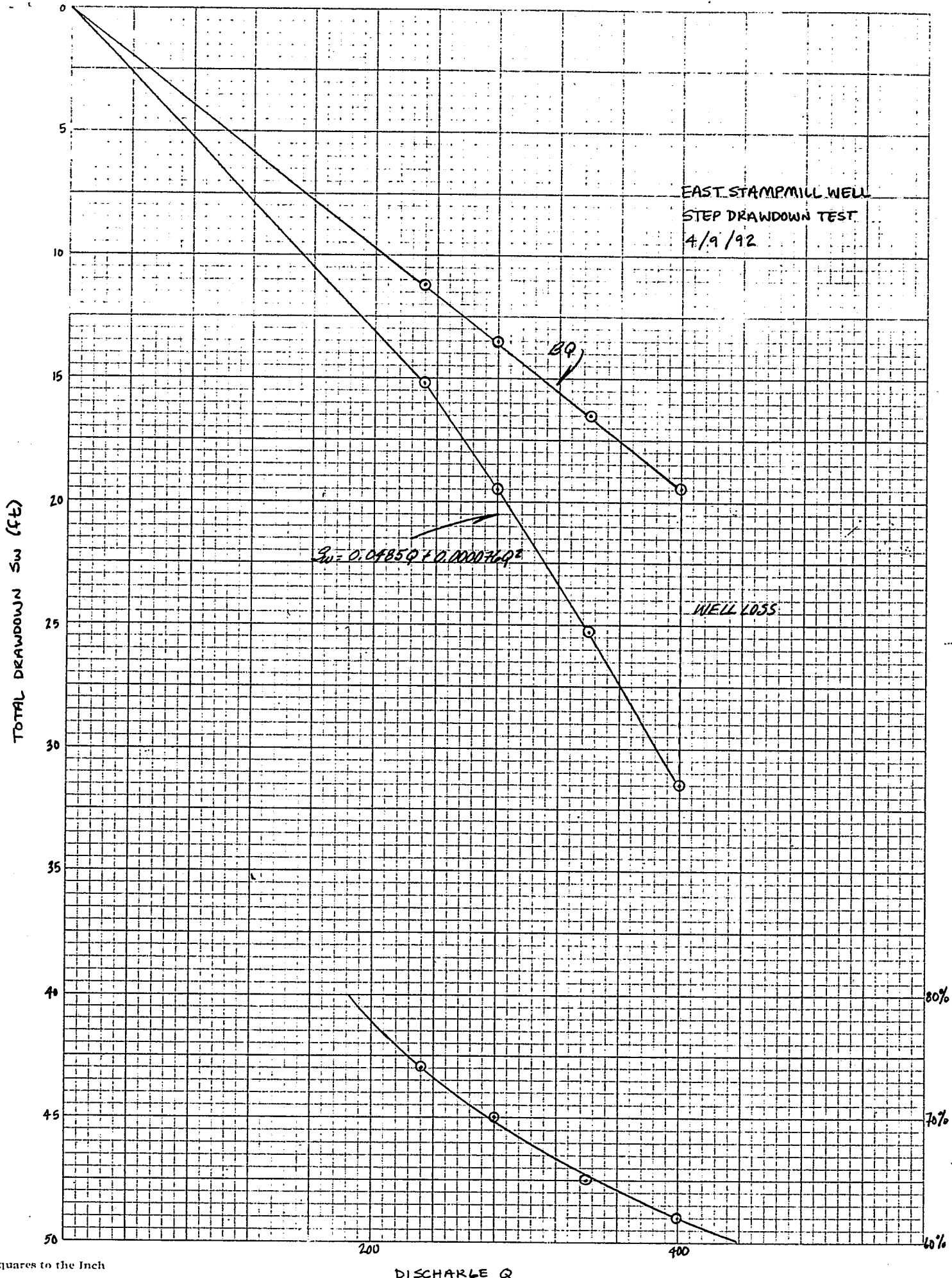
gpm



SPECIFIC DRAWDOWN s/Q

DISCHARGE Q (gpm)

10
Squares
to the
Inch



10 Squares to the Inch

DISCHARGE Q

80%
70%
60%
WELL EFFICIENCY



WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL STAMP MILL WEST
PUMPING/OBSERVATION WELL
PUMPING/RECOVERY DATA
PAGE 1 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN ORIFICE

HOW Q MEASURED ORIFICE 3" XL'

HOW WL's MEASURED SOUNDING SOUNDER

PUMPED WELL NO. _____

RADIUS of PUMPED WELL _____

DISTANCE from PUMPED WELL _____

M.P. for WL's TOP PVC STILLWELL elev. _____

DEPTH of PUMP/AIRLINE _____ wrt _____

% SUBMERGENCE: initial _____; pumping _____

PUMP ON: date 4/13/92 time _____

PUMP OFF: date 4/13/92 time _____

TIME					WATER LEVEL DATA				WATER PRODUCT.		COMMENTS (NOTE ANY CHANGES IN OBSERVERS)
CLOCK TIME	ELAPSED TIME		t/t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	S or S'	Q	Q		
	mins	hrs								t	
								10"	100		
				32.40			9.14			Dirty silty brew	
				32.88			9.62				
				34.26			11.00			QT	
				35.76			12.50				
				38.06			14.80				
				38.18			14.92			QT	
				38.36			15.10				
				38.50			15.24				
				38.38			15.12			QT	
				38.42			15.16				
				40.13			16.87			QT	
				41.12			17.86				
				41.42			18.14				
				41.22			17.96			QT	
				41.56			18.30				
				41.55			18.29			Still Dirty	
				41.55			18.29				
				41.52			18.26			5.48 ^{5/0} gpm/ft	
				41.38			18.12			QT	
				41.38			18.12			52 psi	
				41.05			17.79				
								20 1/2	150		
				45.70			22.44			QT	
				46.80			23.54			QT	
				47.30			24.04			QT	
				47.38			24.12				
				47.55			24.29				
				47.76			24.50			QT	
				47.58			24.32				
				47.50			24.24				
				47.48			24.22			QT	
				48.10			24.84			QT	
				48.10			24.84			S/A - 604	
				47.94			24.68			44 psi Cloudy	
				55.20			31.94		37"	200 Dirty	
				55.05			31.79				
				56.40			33.14			S/Q 6.04	
				56.50			33.44				

WEST WELL
STEP TEST



WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL WEST STAMPMILL WELL

PUMPING/OBSERVATION WELL
PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN TEST

HOW Q MEASURED 6" X 3" ORIFICE M.P. for WL's TOP PK STILL WELL elev. _____

HOW WL's MEASURED SOUND ELECTRIC SOUNDER DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. _____ % SUBMERGENCE: initial _____; pumping _____

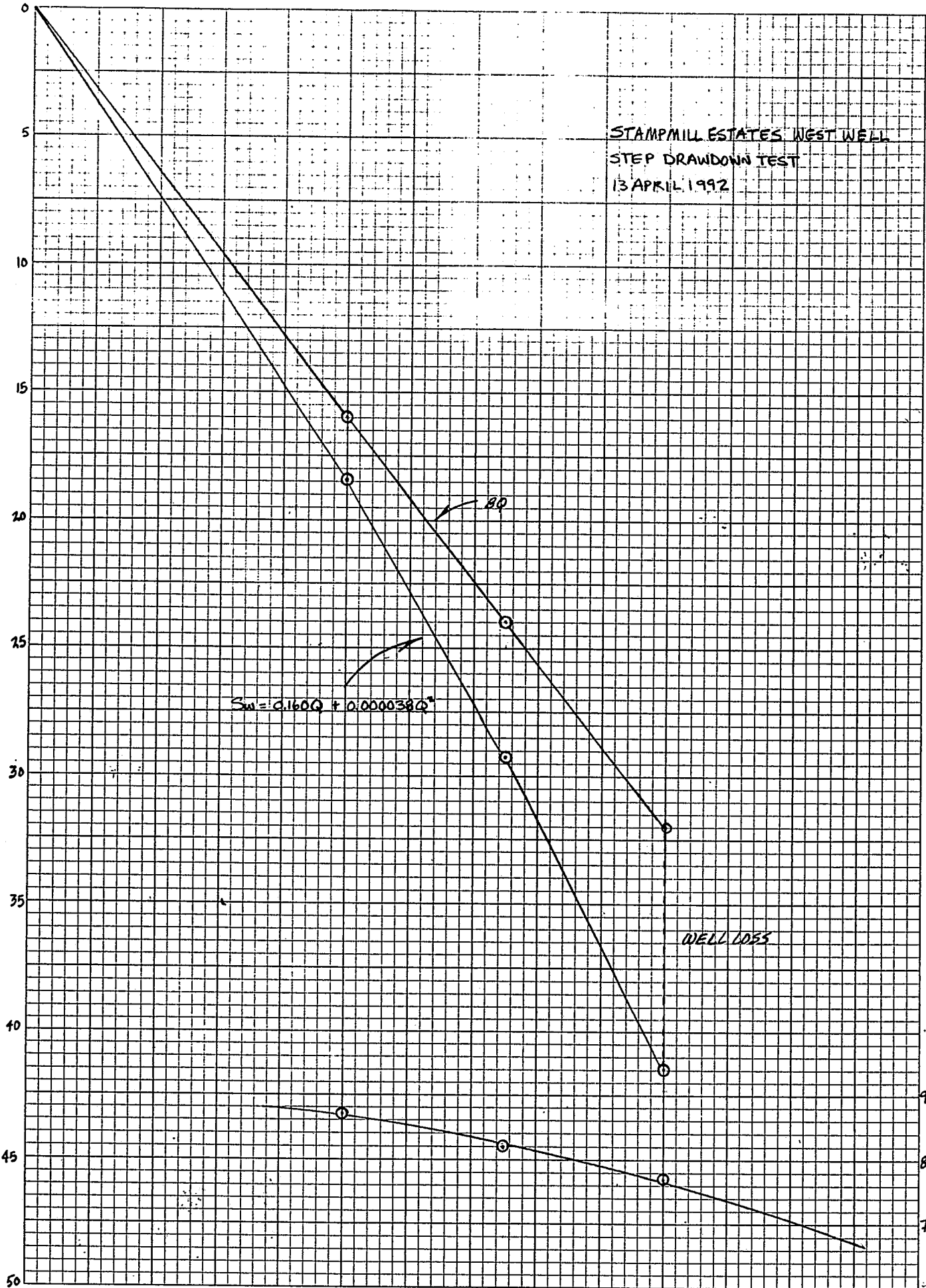
RADIUS of PUMPED WELL _____ PUMP ON: date 4/13/92 time _____

DISTANCE from PUMPED WELL _____ PUMP OFF: date 4/13/92 time _____

TIME				WATER LEVEL DATA				WATER PRODUCT.		COMMENTS
t = _____ at t' = 0				STATIC WATER LEVEL <u>23.26</u>				Q	(NOTE ANY CHANGES IN OBSERVERS)	
CLOCK TIME	ELAPSED TIME		t/t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	S or S'			Q
	mins	hrs								
/			30	56.70			33.44	200	STEP 3	
/			50	56.70			33.44			
/			70	56.80			33.54			
/			99	56.62			33.36	200	Cloudy 32 PSI	
/				2	167.20			250	STEP 4	
/				5	74.90				Very dirty again	
/									ORIFICE DIDNT WORK	
/									Q, 250 - BACK PRESSURE	

STAMP MILL ESTATES WEST WELL
STEP DRAWDOWN TEST
13 APRIL 1992

TOTAL DRAWDOWN S_w (FE)



$$S_w = 0.160Q + 0.000038Q^2$$

80

WELL LOSS

90%
80%
70%

WELL
EFFICIENCY