

RESULTS OF WELL CONSTRUCTION AND
TEST PUMPING, SPRINGWOOD SUBDIVISION WELL
DESERT SPRINGS WATER SYSTEM,
SPANISH SPRINGS VALLEY, NEVADA

February 5, 1991

WASHOE COUNTY
DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

P.O. BOX 11130 RENO, NEVADA ,89520



SUMMARY

During September of 1990, an 8-inch diameter well was constructed to a depth of 200 feet for the purpose of supplying potable water to the Springwood Subdivision. Construction and testing of the well was done by Aqua Well Drilling of Reno, Nevada. Data collection, construction supervision, and data analyses were done by Washoe County Utility Division Hydrogeologists.

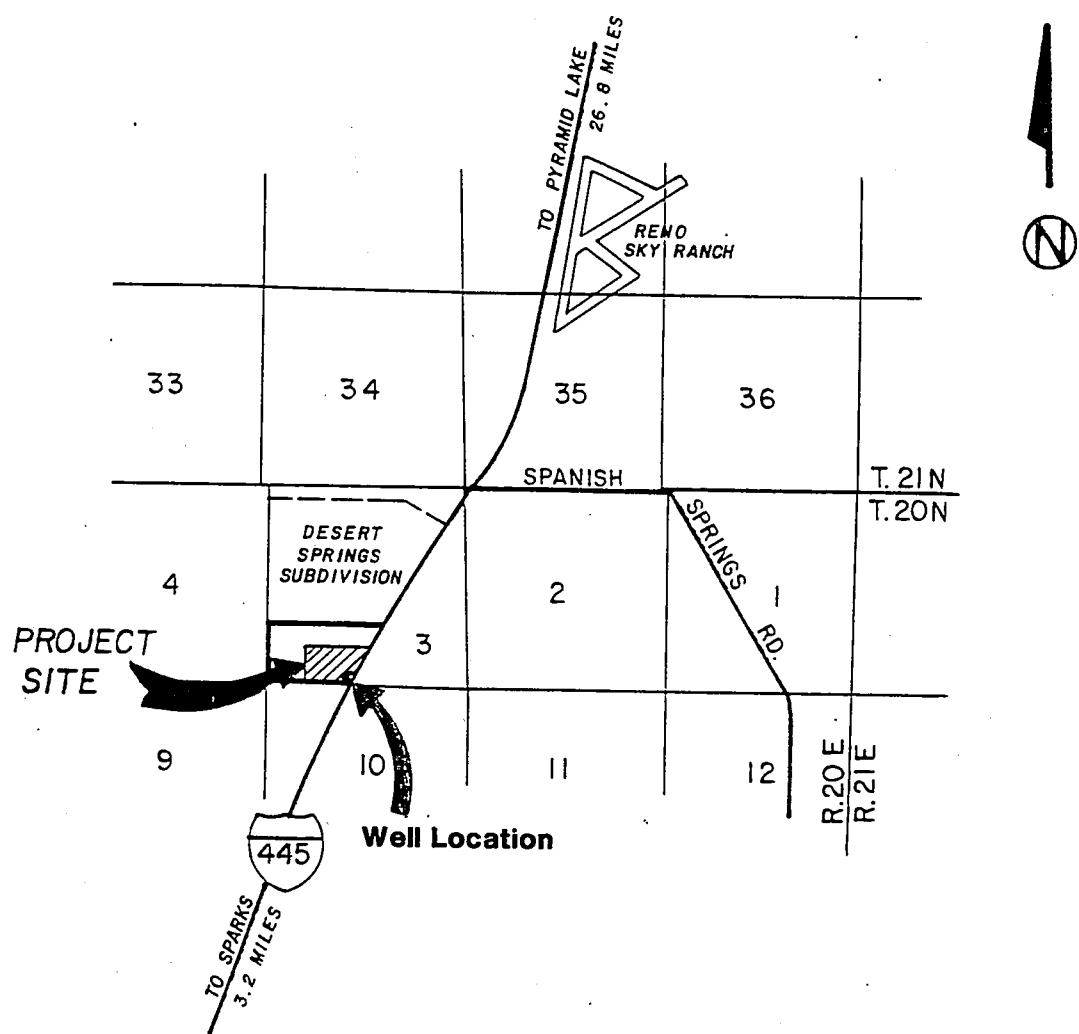
Test pumping included step-drawdown testing and a 72-hour constant discharge test conducted at a discharge rate of 312 gallons per minute. Water quality analyses were run on a sample collected at the end of the 72-hour pumping test.

The projected demand for the Springwood Subdivision is 150 gallons per minute. The well is capable of producing that amount easily and efficiently. The water quality results show that the water meets all current standards for drinking water and is better quality than most wells in the Spanish Springs groundwater basin.

This report contains the following in regards to the construction and testing of this well:

1. Vicinity Map
2. Geophysical log of borehole
3. Geologist drill-cuttings log of monitoring well borehole
4. As-constructed section diagram of completed well
5. Water quality analyses results
6. Test pumping data summary
7. All data collected during test pumping
8. Recommended pump and appurtenances
9. Well drillers report to Division of Water Resources

SPRINGWOOD SUBDIVISION
WASHOE COUNTY, NEVADA



VICINITY MAP
N.T.S.

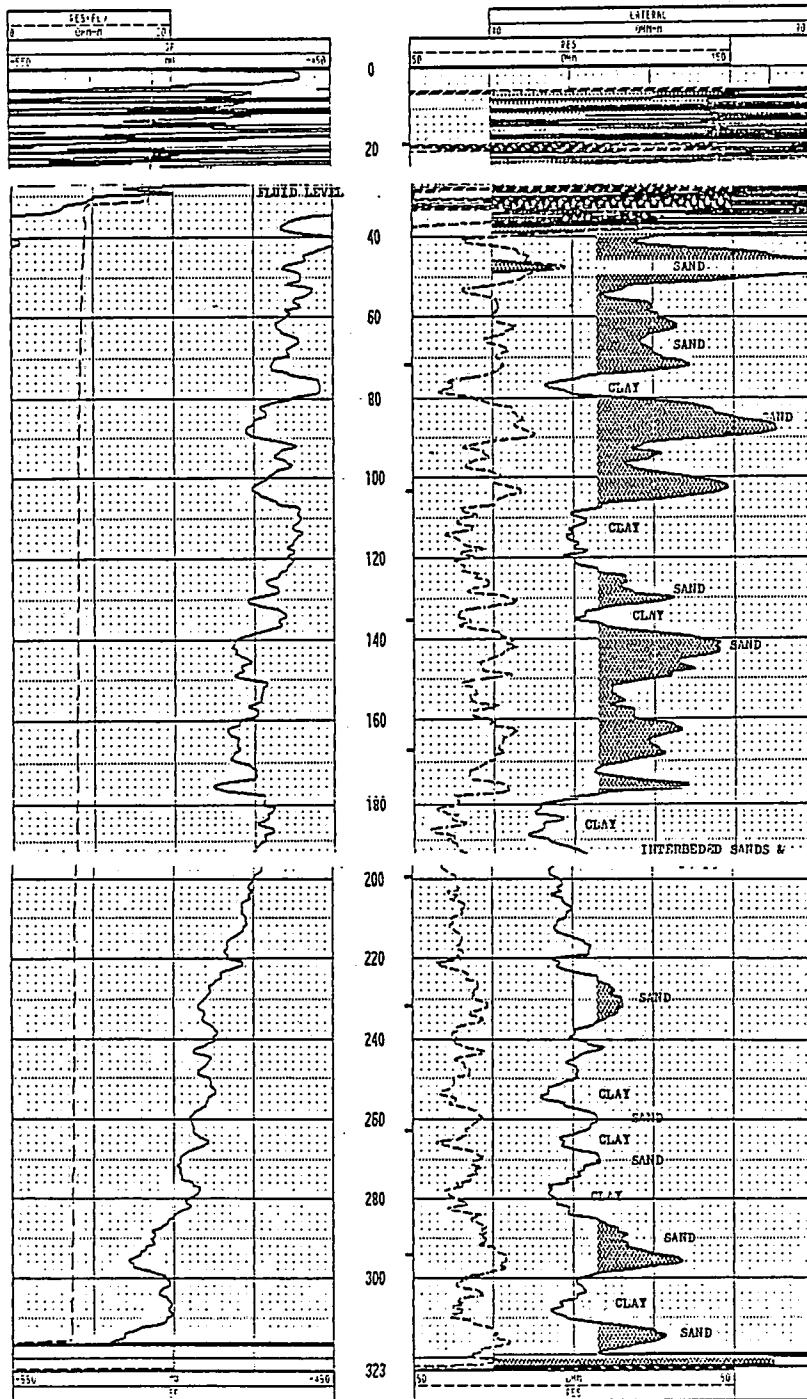
GEOPHYSICAL LOG OF BOREHOLE

GEO-HYDRO-DATA

INCORPORATED

GROUNDWATER LOG

COMPANY	SPRINGWOOD SUBDIVISION	OTHER SERVICES:	
WELL	TEST HOLE 1A	INVOICE	
LOCATION/FIELD	SPANISH SPRINGS	7184	
COUNTY	WASHOE	500 PPM	
STATE	NEVADA		
SECTION	N/A	RANGE : N/A	
DATE	87/28/98	PERMANENT DATUM : G.L.	ELEVATIONS
DEPTH DRILLER	346 FEET	ELEV. PERM. DATUM: G/L	XB : N/A
LOG BOTTOM	323.16	LOG MEASURED FROM: G.L.	DF : N/A
LOG TOP	6.28	DRL MEASURED FROM: G.L.	GL : N/A
CASING DRILLER	-	LOGGING UNIT : 2	
CASING TYPE	-	FIELD OFFICE : STOCKTON, CA	
CASING THICKNESS	-	RECORDED BY : D SHANHOLTER	
BIT SIZE	6	BOREHOLE FLUID : CLAY GEL	FILE : ORIGINAL
MAGNETIC DECL.	-	RM : -	TYPE : 9841A
MATRIX DENSITY	-	RM TEMPERATURE : -	LOG : 6
FLUID DENSITY	-	MATRIX DELTA T : -	PLOT : GHD 4
NEUTRON MATRIX	N/A	FLUID DELTA T : -	THRESH: 300
REMARKS	DRILLED BY AQUA DRILLING & WELL SERVICE SPARKS, NV. WITNESSED-LEONARD-DRILLER CONSULTANT-HIBDON, P.E.-RENO, NV. A. WASHOE CO. WATER QUALITY-FAIR 600 TO 800 PP BY CONTRACT WITH THE CONTRACTOR IN NEVADA TERMS AND CONDITIONS		



GEOLOGIST LOG

20 JULY 90 LITHOLOGIC LOG

TIME	FT	INTERNAL DESCRIPTION
20	0 - 10'	BROWN SILT AND FINE SAND ALLUVIUM. COADS.
10:43	20'	SAND SIZED WHITE/YELLOW AND GREY VOLCANICS
	10 - 23'	SILTY CLAY; MOST INTO DRILLING SOLUTION WITH VARYING GREEN, BROWN, YELLOW VOLCANIC SANDS
	23 - 26'	COARSE VOLCANIC GRAVEL LAYER, ANGULAR WITH MED-COARSE VOLCANIC SANDS. GREY, GRN, BROWN.
	26 - 30'	SILTY BROWN CLAY MOST INTO SOLUTION, KHYOLITIC AND VOLCANIC SANDS.
	30' - 38'	COARSE, ANGULAR, MIXED GREY, GRN, TAN VOLCANIC GRAVELS. MINOR DIOXITE IN COARSE FRAGMENTS.
05.40'	38 - 45'	BROWN SANDY STICKY CLAY, CHUNKS ANGULAR 5mm IN SIZE.
11:33	45 - 74'	VOLCANIC GRAVEL, MED & FINE SAND WITH FINE MUSHY CLAY. INTERMIXED SAND GRAVEL AND CLAY LENSES.
	74 - 79'	STICKY BROWN SANDY CLAY. LENSES IN THE MIXED GRAVEL AND SANDS.
	79 -	MODERATELY SORTED VOLCANIC & INTUSIVE COARSE SANDS, SMALL GRAVEL. GREY, GREEN, BROWN, PINK IN COLOR. ANGULAR TO SUB-KROUND. QUARTZ PRESENT
11:56	80'	GRAVE @ 97' THIN SANDY BROWN CLAY LENSES. IN GRAVEL AND SANDS.
11:56	790 = 100'	GRAVE @ 97' THIN SANDY BROWN CLAY LENSES. IN GRAVEL AND SANDS.
	104 - 118'	BROWN SILTY CLAY IN 2-5mm BALLS, MINOR AMOUNTS VOLCANIC SANDS AND GRAVELS IN LENSES. GRAVEL, SAND LENSES - INTUSIVE ELEMENTS.

20 JULY 90

SPRINGWOOD (?)

9:20 ARRIVE ON SITE, AQUA HERE STARTING TO MOVE TALKER TO LEGWAK ABOUT HOLE. PLAN TO DRILL E-LOG TODAY. UNCASED HOLE TEMPORARILY 6" CASING WILL BE INSTALLED.

9:30 CALL OFFICE TALK WITH MIKE W. ABOUT THE UNCONSTRUCTION OF HOLES.

9:50 START TO DRILL WITH AIR IN 10' FOR SHAKER - SEPARATOR OPERATION.

10:20 START MUD DRILLING

DO 260' - 240-260 BROWN STICKY CLAY WITH VOLCANIC LENS
COARSE, SUBROUND TO ANGULAR. CLAY INCREASING T

+ 4.00 DFW: From 6:00-11:00, -DATA ARRIVES

COANCE, SURROUNDING ENVIRONMENT. GREAT INCREASING T

:00 THILLS ALMOST OUT OF H₂O. HOLE CUTTIN'S ALW.
CLAY. DECIDE TO STOP AT 1320' AND LOG HOLE.

22 280' - 282' GRAVEL LINE

-280-240 Slight increase in mixed gravel, cobbles, sand, & fine
volcanic sand. Brown sandy clay - T inclay.

290-300 Same started so speed up @ 297"

:12 300

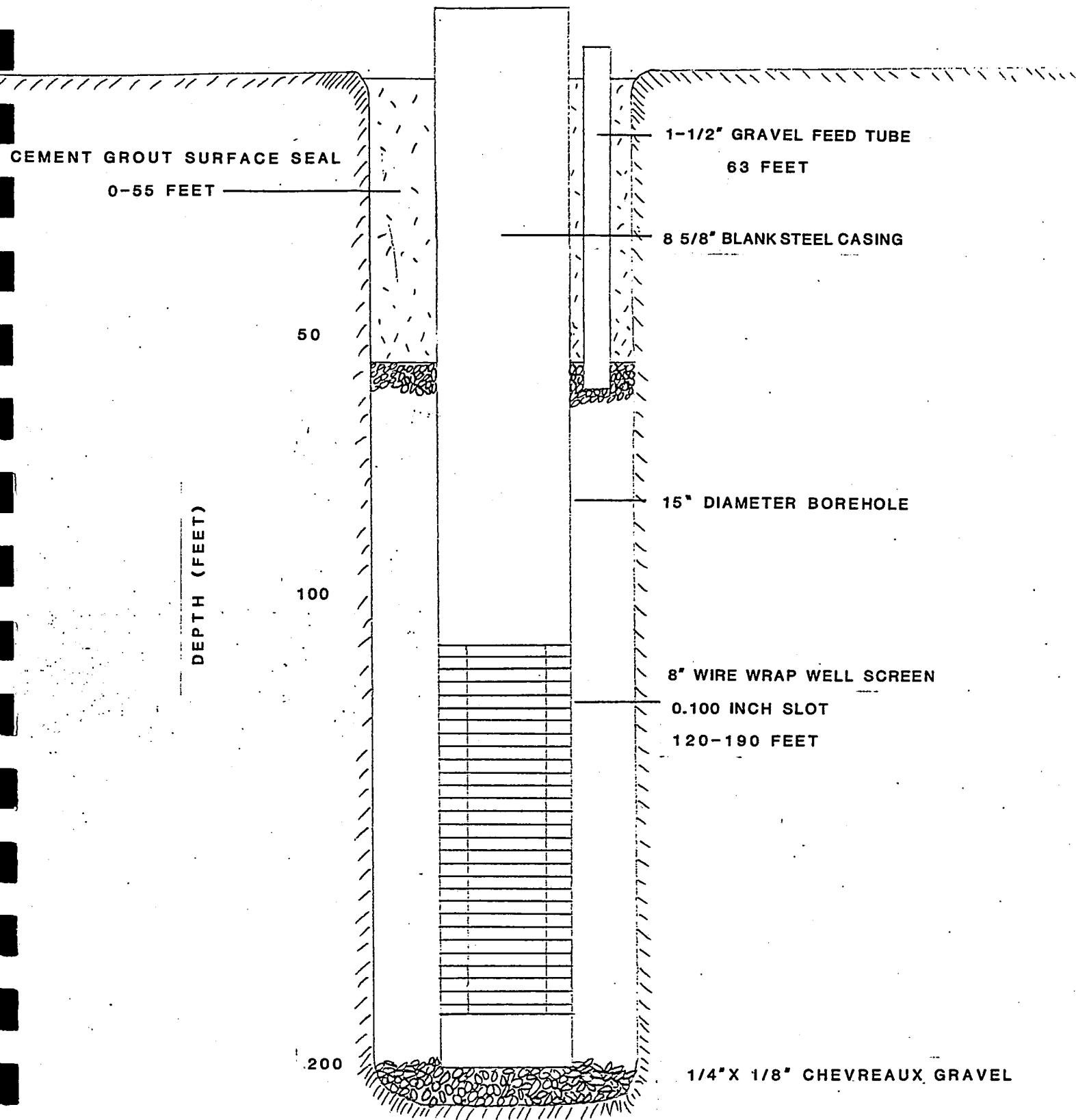
300-310 ↑ IN SLICK SMOOTH CLAY CHANNELED. MINOR
AMOUNTS OF VOLCANIC SAND AND SMALL GRAVEL.

105 320' 310-320 BROWN CLAY, MINOR SAND-LEADS @
1 BOTTOM OF HOLE.

AS-CONSTRUCTED SECTION DIAGRAM

SPRINGWOOD WELL

AUGUST 1990



WATER QUALITY ANALYSES

089633

WATER CHEMISTRY ANALYSIS:

Fees may apply to some types of samples.

TYPE OF ANALYSIS:

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

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 DRAGAN Date 9/21/90
Owner WC UTILITY (to be Phone 705-473-3

Address DEDICATED TO COUNTY

City _____ State _____

REPORT TO:Name WASHOE CO UTILITY DIVISIONAddress PO BOX 11130City RENOState NV Zip 89520

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

State NV County WASHOE
Township 20 Range 20 Section 3
General Location SPANISH SPRINGS
Source Address JUST SOUTH OF DESERT SPRINGS
SPRINGWOOD SUBD.

REASON FOR ANALYSIS: USE OF WATER:

- | | |
|---|---|
| <input type="checkbox"/> Loan | <input checked="" type="checkbox"/> Domestic drinking water |
| <input type="checkbox"/> Personal health reasons | <input type="checkbox"/> Geothermal |
| <input type="checkbox"/> Purchase of the property | <input type="checkbox"/> Industrial or mining |
| <input type="checkbox"/> Rental or sale of property | <input type="checkbox"/> Irrigation |
| <input type="checkbox"/> Subdivision approval | <input type="checkbox"/> Other..... |
| <input checked="" type="checkbox"/> Other <u>SDWA</u> | Initials _____ |

SOURCE OF WATER:

Filter	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Type _____
Public	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Name _____
Spring	Surface _____		
Well	<input checked="" type="checkbox"/>	Depth <u>205</u> ft.	Casing diameter <u>8"</u> in.
Hot	<input type="checkbox"/>	Cold <u>✓</u>	Casing depth <u>205</u> ft.
IN USE	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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	ppm	S.U.	Constituent	ppm
T.D.S. @ 103° C.	212	Chloride	9	Iron	0.02	Color	<u>Cd</u>	<0.001
Hardness	102	Nitrate	9.2	Manganese	0.00	Turbidity	<u>Cr</u>	<0.005
Calcium	26	Alkalinity	128	Copper	0.01	pH	<u>Ag</u>	<0.005
Magnesium	9	Bicarbonate	132	Zinc	0.00	EC	<u>Hg</u>	<0.0005
Sodium	28	Carbonate	12	Barium	0.07		<u>Pb</u>	<0.005
Potassium	3	Fluoride	0.18	Boron	0.0		<u>Se</u>	<0.001
Sulfate	18	Arsenic	<.003	Silica	40			
<u>MBAS</u>		<u>50.1</u>		<u>GROSS ALPHA</u>		<u>GROSS BETA</u>		

Fee Bill

Collected by _____

BWS I.D. _____

OWA-Pri. _____ Sec. _____

1st. _____ 2nd. _____ 3rd. _____

Date Rec'd. 11/1/90

ppm = parts per million, milligrams per liter

S.U. = Standard Units

Remarks SPRINGWOOD TEST PUMP *Ex 10-16-90*

FUTURE PUBLIC WATER SUPPLY WELL

SAMPLES TAKEN AFTER 70 HRS 10-5-90
(PUMPING 31.2 GPM)

Billed 11/7/90

TEST PUMPING DATA SUMMARY

TEST PUMPING SUMMARY

Step-drawdown test

The step-drawdown test was run at pumping rates of 100, 200, 300, and 400 gallons per minute (gpm). Analysis of the step drawdown data show the well is highly efficient with efficiencies above 90% at pumping rates up to 300 gpm. At the desired pumping rate of 150 gpm, efficiency exceeds 93%.

Constant discharge test

The constant discharge test was run for 72 hours at a pumping rate of 312 gpm. Data was collected from the pumping well and one observation well approximately 35 feet from the pumping well. At the end of 72 hours of pumping 312 gpm, the drawdown was 19.43 feet with a pumping level of 72.25 feet. The following hydrologic parameters were determined from the constant discharge pumping test:

1. Specific capacity (gpm/ft.drawdown) at the end of the 72 hour test at 312 gpm was 16.06 gpm/ft.
2. Aquifer transmissivity is about 65,000 gallons per day per foot, as determined from the pumping well and the observation well.
3. The anticipated maximum pumping level at the desired pumping rate of 150 gpm is about 65 feet below ground surface.

TEST PUMPING DATA

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SPRINGWOOD SUBDIVISION

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN

HOW Q MEASURED BRIFICE 4" X 3"

M.P. for WL's elev.

HOW WL's MEASURED

DEPTH of PUMP/AIRLINE 113 Irrake wrt

PUMPED WELL NO. SPRINGWOOD SUBDIVISION

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 19 SEP 90 time 1004

DISTANCE from PUMPED WELL

PUMP OFF: date 19 SEP 90 time 1540

TIME at t = 0				WATER LEVEL DATA STATIC WATER LEVEL 52.73					WATER PRODUCT.	COMMENTS	
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	MANOM. TUBE	Q _{gpm}	(NOTE ANY CHANGES IN OBSERVERS)	
1004		2		57.74	STEP I		5.01	SC=24.95	10"	125	
1006		4		58.40			5.67				
1008		6		58.47			5.74				
1010		8		58.84			6.11				
1012		10		58.88			6.15				
1014		12		59.17			6.44				
1016		14		59.20			6.47				
1018		16		59.53			6.80				
1020		18		59.77			7.04	SC=17.76	10"	125	
1022		20		59.80			7.15				
1024		22		60.21			7.48	SC=18.32	12"	137	
1026		24		60.38			7.65				
1028		26		60.43			7.70				
1030		28		60.44			7.71				
1032		30		60.44			7.71				
1034		32		60.45			7.72				
1036		34		60.45			7.72				
1038		36		60.50			7.77	SC=17.63	12"	137	
1048		46		60.53			7.80				
1058		56		60.56			7.83	SC=17.50	12"	137	
1108		66		60.57			7.84				
1122		80		60.59			7.86			SP.Cap 17.43	
1127	85	5		64.40	STEP II		11.67	SC=17.89	28"	209	
1137	95	15		64.60			11.87			Q↑	
1147	105	25		64.66			11.93				
1157	115	35		64.71			11.98				
1207	125	45		64.88			12.15			Q adjusted, was really hard	
1217	135	55		64.89			12.16				
	155	75		64.90			12.17	SC=17.17	28"	209	
	160	80		64.88	!		12.15	!		17.20 Sp. Cap	
	170	10		68.29	STEP III		15.56	SC=17.35	46 1/2	270	Some air bubbles in Piz.
	180	20		68.45			15.72				
	190	30		68.49			15.76				
	210	50		68.53			15.80	SC=17.09	46 1/2	270	
	220	60		68.53			15.80				
	240	80		68.56			15.83		46 1/2	270	17.06 Sp. Cap



WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SPRINGWOOD SUBDIVISION

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST STEP DRAWDOWN

HOW Q MEASURED ORIFICE 4" x 3"

M.P. for WL's _____ elev.

HOW WL's MEASURED

DEPTH of PUMP/AIRLINE 113' INTAKE wrt

PUMPED WELL NO.

% SUBMERGENCE : initial : pumping

RADIUS of PUMPED WELL

PUMP ON : date 19 SEP 98 time 1004

DISTANCE from PLUMBED WELL

PUMP OFF : date 19 SEP 90 time 1540

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WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL 1 North SPRINGWOOD

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE 1 OF 1

TYPE of PUMPING TEST Step DRAWDOWN

HOW Q MEASURED Orifice Weir 3" x 4"

M.P. for WL's Top of 6" casing elev.

HOW WL's MEASURED

DEPTH of PUMP/AIRLINE wrt

PUMPED WELL NO. SPRINGWOOD SUBDIVISION

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL 4-inches (8" casing)

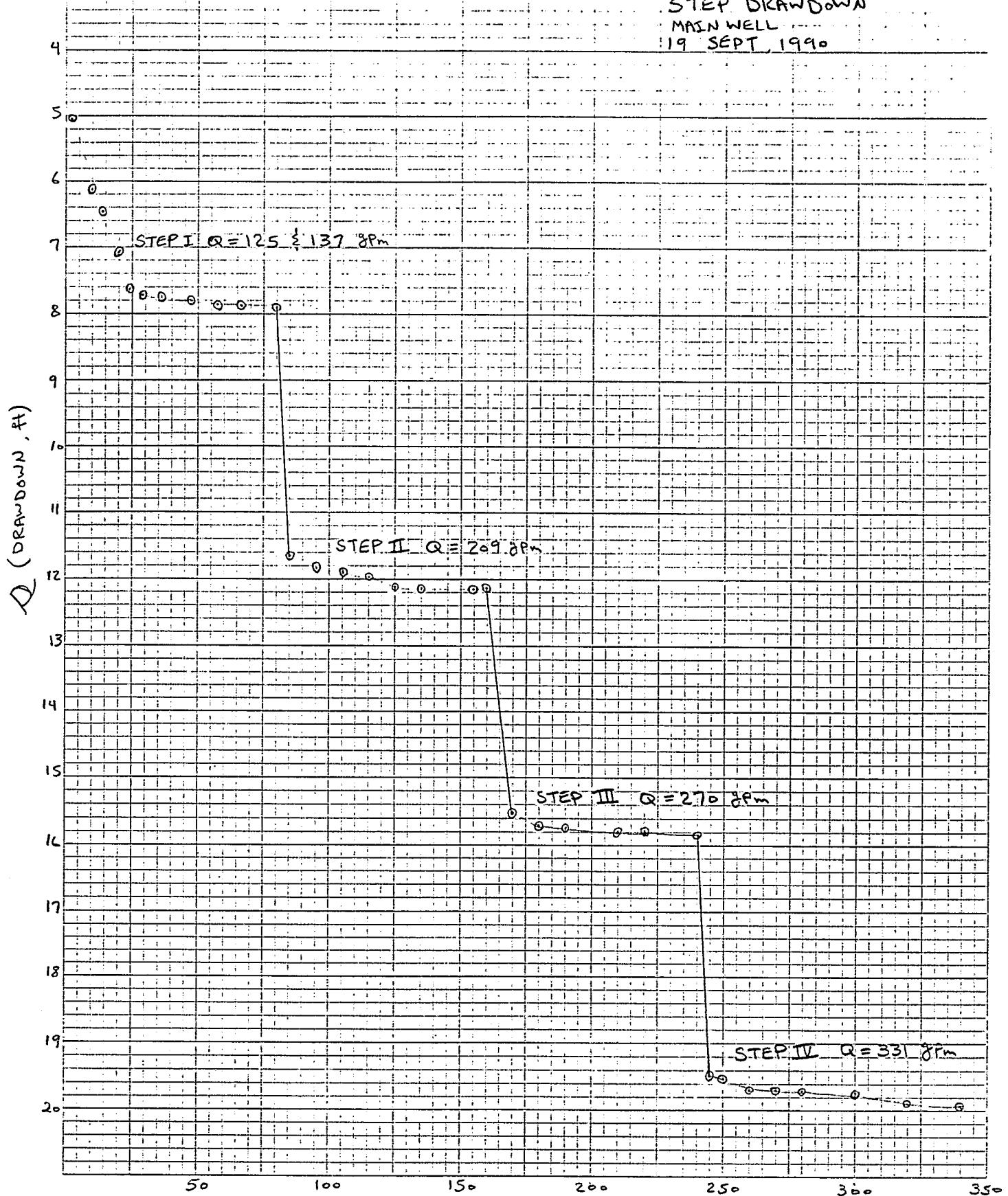
PUMP ON: date 19 SEP 90 time 1004

DISTANCE from PUMPED WELL 35 ft.

PUMP OFF: date 19 SEP 90 time 320 min later

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 53.68 FROM TOP OF 6" casing				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S or S')	ORIFICE TUBE Q gpm	(NOTE ANY CHANGES IN OBSERVERS)
		8		55.72	STEP I		2.04	Sc=61.24	10" 125
		10		55.80			2.12		
		15		55.93			2.25		
		20		56.16			2.48		
		25		56.40			2.72		
		28		56.44			2.76		
		32		56.50			2.82		
		38		56.54			2.86		
		42		56.54			2.86	Sc=47.90	137
		52		56.55			2.87		
		62		56.60			2.92		
		72		56.62			2.94		
		78		56.63			2.95		
		93	15	57.93	STEP II		4.25	28"	209
		100	22	57.97			4.29		
		110	32	58.04			4.36		
		130	52	58.11			4.43		
		150	72	58.20			4.52		
		175	25	59.32	STEP III		5.64	46 1/2"	270
		185	35	59.40			5.72		
		200	50	59.45			5.77		
		208	58	59.48			5.80		
		228	78	59.50			5.82	46 1/2"	270
		237	87	59.54			5.86		
		247	10	60.54			6.86	70"	331
		257	20	60.69			7.01		
		267	30	60.76			7.09	70"	331
		277	40	60.80			7.12		
		297	60	60.86			7.18	70"	331
		317	80	60.94			7.26		
		337	100	60.95			7.27	70"	331

2
3 SPRINGWOOD SUBDIVISION
4 STEP DRAWDOWN
5 MAIN WELL
6 19 SEPT, 1990



B = .533

.0555

.595

$$C = \frac{0.515 - 0.5555}{2.00}$$

$$C = 0.00002$$

SPECIFIC DRAWDOWN (ft/gpm)

.04

.03

.02

.01

.00

$$\begin{aligned} \text{TOTAL DRAWDOWN} &= CQ^2 + BQ \\ \text{FORMATION LOSS} &= BQ \\ \text{WELL LOSS} &= CQ^2 \\ \% \text{ EFFICIENCY} &= \frac{1}{1 + (C/B)Q} \end{aligned}$$

Q	FORMATION LOSS (ft)	TOTAL DRAWDOWN (ft)	% EFF
100	5.33	5.33	9.6 %
200	10.66	10.66	9.3 %
300	15.99	15.99	9.0 %
400	21.32	21.32	8.7 %

SPRINGWOOD SUBDIVISION
STED DRAWDOWN DATA

300

200

100

9PM

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SPRINGWOOD WELL

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 4" X 3" ORIFICE WEIR

M.P. for WL's TOP PVC S. WEL elev.

HOW WL's MEASURED ACTAT

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. SPRINGWOOD

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL 4" (8" casing)

PUMP ON: date 9/20/90 time 0900

DISTANCE from PUMPED WELL -

PUMP OFF: date 9/23/90 time 0900

TIME $t =$ $at t=0$				WATER LEVEL DATA STATIC WATER LEVEL 52.82					WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or (S')	Q/S	HEAD OF GAGE TUBE	Q _{appm}	(NOTE ANY CHANGES IN OBSERVERS)
0900		1		65.48		12.66			62	312	E.E.
		2		68.39		15.57					
		3		68.82		16.00					
		4		69.05		16.23					
		5		69.28		16.46	SC: 19.0				
		6		69.38		16.56					
		7		69.52		16.70					
		8		69.51		16.69		61"			L1 Q↑
0910		10		70.08		17.26	SC: 18.1	63"			Q↑ Q↓
		12		69.93		17.11		62"			
		14		70.00		17.18					
		16		70.07		17.25					
		18		70.14		17.32					
0920		20		70.17		17.35		62"	312	Q↑	
0925		25		70.33		17.51					Q↑
0930		30		70.50		17.68		62 1/2"			
0935		35		70.56		17.74					
0940		40		70.63		17.81					
0945		45		70.67		17.85					
0950		50		70.73		17.91	SC: 17.4				
1000		60		70.82		18.00		62"			
1010		70		70.88		18.06		62"			
1020		80		70.94		18.12		62"	312		
1030		90		71.00		18.18					
1040		100		71.13		18.31	SC: 17.0	62 1/2-63			Q↑
1100		120		71.12		18.30					T = 67,500
1120		140		71.19		18.37					
1140		160		71.21		18.39	SC: 16.9	62"			
1200		180		71.23		18.41					
1230		210		71.29		18.47					
1300		240		71.29		18.47		62 1/2-62"			Q↑ overadjusted value
1330		270		71.29		18.47					Q↑
1400		300		71.36		18.54		62-62 1/2"			
1430		330		71.37		18.55					
1500		360		71.39		18.57	SC: 16.8	62-62 1/2"	312		
1530		390		71.41		18.59		62"			
1600		420		71.42		18.60					
1630		450		71.42		18.60		62"+			Q↑
1700		480		71.49		18.67					
1800		540		71.11G							

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL SPRINGWOOD WELL

PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 4" X 3" ORIFICE WEIR

M.P. for WL's TOP PVC S.W.E.U. elev.

HOW WL's MEASURED ACTAT

DEPTH of PUMP/AIRLINE _____ wrt

PUMPED WELL NO. SPRINGWOOD MAIN

% SUBMERGENCE: initial _____; pumping

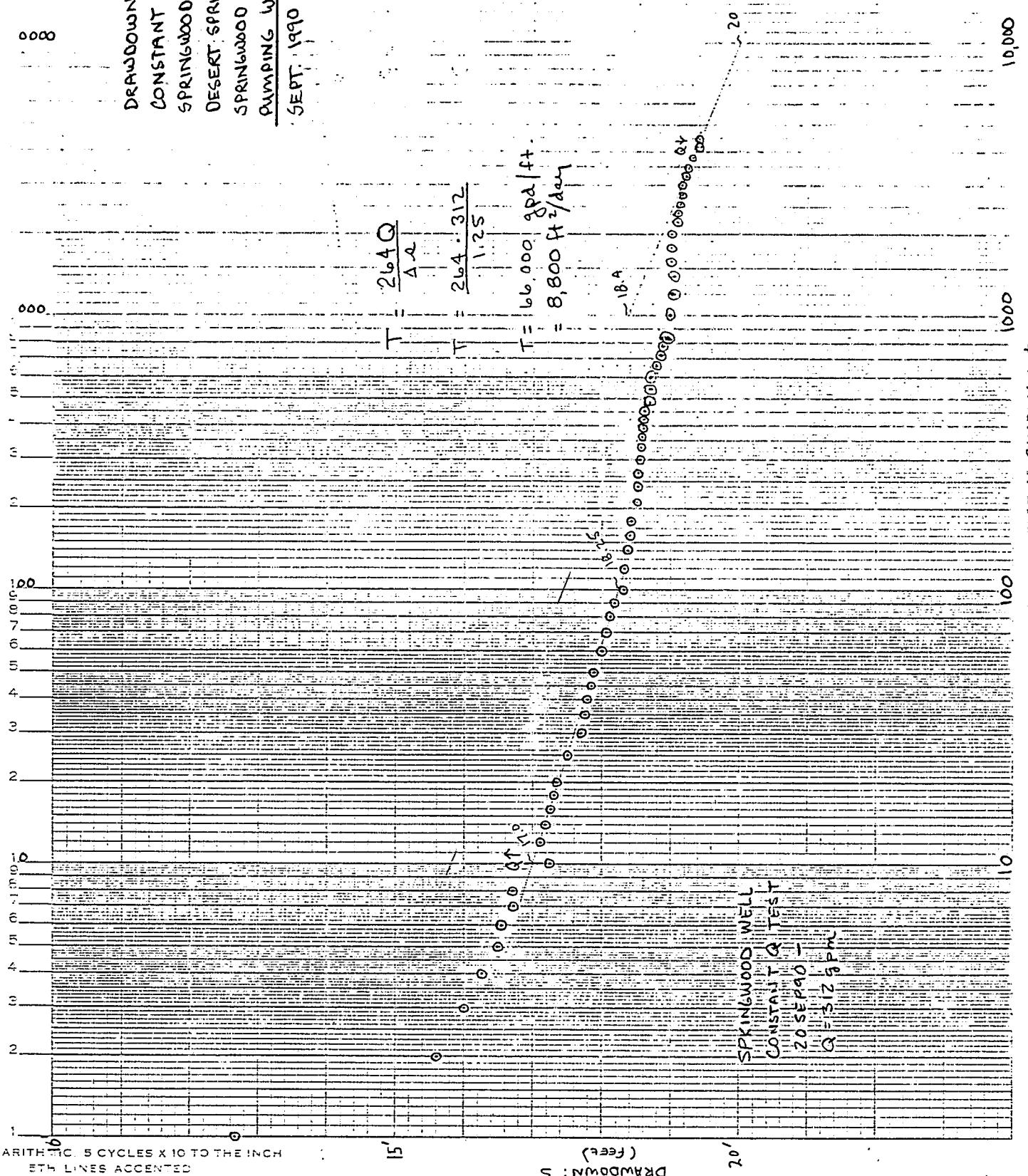
RADIUS of PLUMPED WELL

PUMP ON: date 20SEP90 time 0900

DISTANCE from PLUMBED WELL

PUMP OFF : date 23 Sept 90 time 0900

DRAWDOWN DATA
 CONSTANT Q PUMPING TEST
 SPRINGWOOD SUBDIVISION
 DESERT SPRINGS WATER SYSTEM
 SPRINGWOOD WELL
 PUMPING WELL
 SEPT. 1990



WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL OP WFC - SPRINGWOOD

PUMPING / OBSERVATION WELL

PUMPING / RECOVERY DATA

PAGE 1 OF 2

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 4" X 3" ORIFICE WEIR

M.P. for WL's TOP 6" CASING elev.

HOW WL's MEASURED ACTAT

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. SPRINGWOOD MAIN WELL

% SUBMERGENCE: initial _____; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 20 SEP 90 time 0900

DISTANCE from PUMPED WELL _____

PUMP OFF: date _____ time _____

TIME $t =$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL <u>53.66</u>				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)
		3		58.14		4.48	62"	312	D.D.
		4		58.36		4.70			
		5		58.53		4.87			
		6		58.66		5.00			
		7		58.77		5.11			
		8		58.87		5.21			
		9		59.00		5.24			
		10		59.06		5.40			
		12		59.17		5.51			
		14		59.24		5.58			
		16		59.34		5.68			
		18		59.43		5.77			
		20		59.47		5.81			
		25		59.61		5.95			
		30		59.73		6.07			
		35		59.83		6.17			
		40		59.90		6.24			
		45		59.95		6.29			
		50		60.00		6.34			
		60		60.10		6.44			
		70		60.16		6.50			
		80		60.20		6.54			
		90		60.27		6.61			
		102		60.31		6.65		E.E.	
1102		122		60.38		6.72		T= 63,360	
1122		142		60.43		6.79			
1142		162		60.46		6.82			
1202		182		60.49		6.85			
1225		205		60.52		6.86			
1302		242		60.55		6.89			
1332		272		60.57		6.91			
1402		302		60.60		6.94			
1432		332		60.63		6.97			
1502		362		60.64		6.98			
1532		392		60.65		6.99			
1602		422		60.66		7.00			
1632		452		60.67		7.01			
1702		482		60.70		7.04			
1802		542		60.71		7.05			

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL OB WELL - SPRINGWOOD

PUMPING / OBSERVATION WELL

PUMPING RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 4" X 3" ORIFICE WEIR

M.P. for WL's TOP 6" CASING elev.

HOW WL's MEASURED — ACTAT

DEPTH of PUMP/AIRLINE _____ wrt

PUMPED WELL NO. SPRINGWOOD TEST WELL

% SUBMERGENCE: initial _____; pumping

RADIUS of PUMPED WELL

PUMP ON : date 20 SEP 90 time 0900

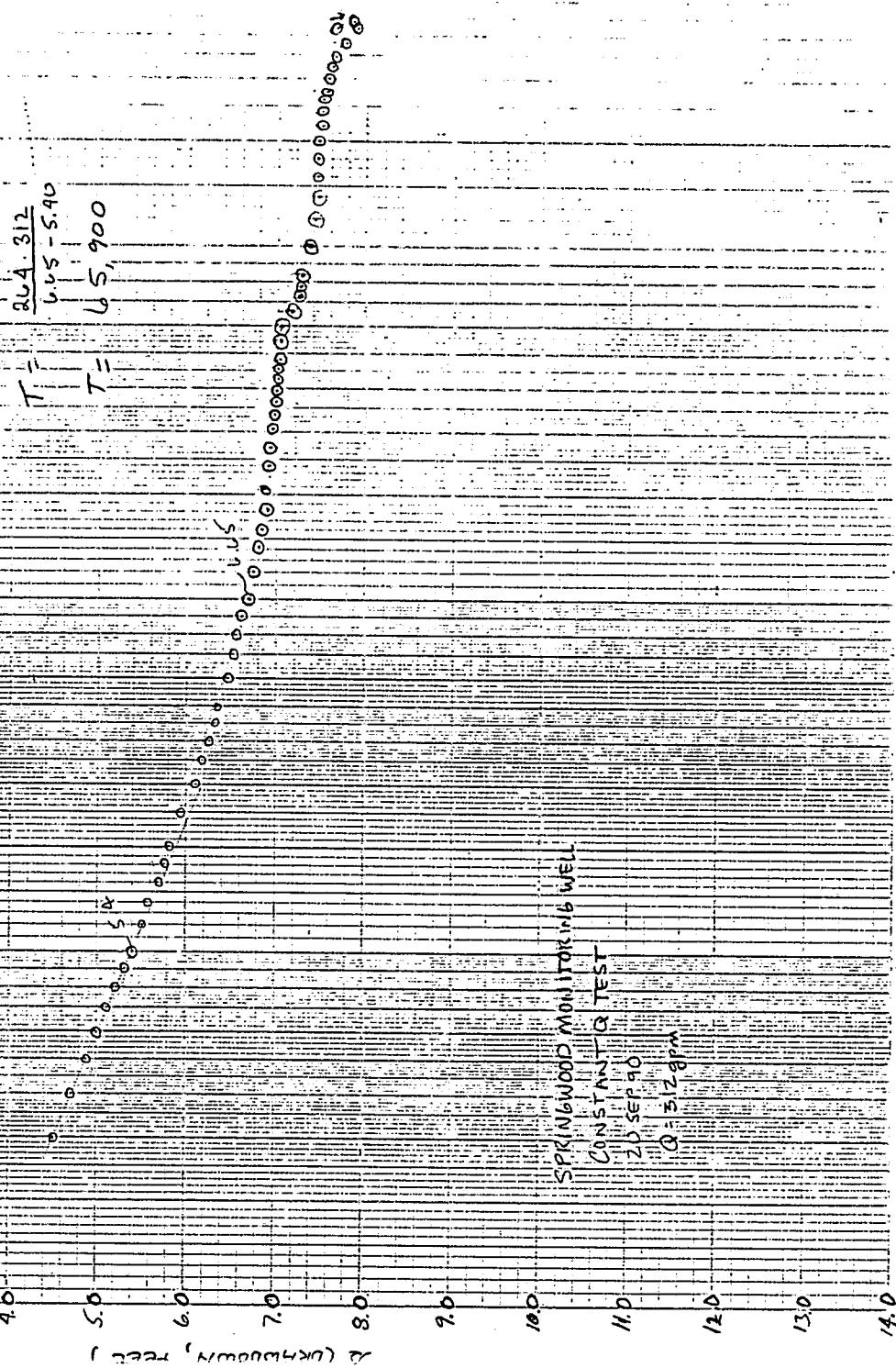
DISTANCE from PUMPED WELL

PUMP OFF : date _____ time _____

DRAWDOWN DATA
 CONSTANT Q PUMPING TEST
 SPRINGWOOD SUBDIVISION
 DESERT SPRINGS WATER SYSTEM
 SPRINGWOOD WELL
OBSERVATION WELL

SEPT 1990

$$T = \frac{264 Q}{\Delta z}$$



time (minutes) since pumping started 1/1000

MILOGARITHMIC, 5 CYCLES X 10 TO THE 13TH
 5TH LINES ACCENTED

Δh (FEET) t (MINUTES)

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL SPRINGWOOD WELL

(PUMPING/OBSERVATION WELL
PUMPING/RECOVERY DATA)

PAGE 1 OF 2

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 4" x 2" DIA. LF W.F.E.

M.P. for WL's TOP OF PTC elev.

HOW WL's MEASURED Electric sounder Actat

DEPTH of PUMP/AIRLINE wrt

PUMPED WELL NO. SPRINGWOOD SUDITION

% SUBMERGENCE: initial ; pumping

RADIUS of PUMPED WELL

PUMP ON: date 20 Sept 90 time 0900

DISTANCE from PUMPED WELL

PUMP OFF: date 23 Sept 90 time 0900

TIME $t = 4320$ at $t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 52.82				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t / t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	S or S'	Q	(NOTE ANY CHANGES IN OBSERVERS)	
0900		4321	1	4321	57.46		4.58		
0902		4322	2	2161	56.39		3.57		
0903		4323	3	1441	56.02		3.20		
0904		4324	4	1081	55.82		3.00		
0905		4325	5	865	55.60		2.78		
0906		4326	6	721	55.48		2.66		
0907		4327	7	618	55.38		2.56		
0908		4328	8	541	55.27		2.45		
0909		4329	9	481	55.19		2.37		
0910		4330	10	433	55.13		2.31		
0912		4332	12	361	55.03		2.21		
0914		4334	14	310	54.93		2.11		
0916		4336	16	271	54.84		2.02		
0918		4338	18	241	54.78		1.96		
0920		4340	20	217	54.71		1.89		
0925		4345	25	174	54.59		1.77		
0930		4350	30	145	54.47		1.65		
0935		4355	35	124	54.40		1.58		
0940		4360	40	109	54.33		1.51		
0945		4365	45	97	54.27		1.45		
0950		4370	50	87	54.23		1.41		
1000		4380	60	73	54.13		1.31		
1010		4390	70	63	54.07		1.25		
1020		4400	80	55	53.99		1.17		
1030		4410	90	49	53.95		1.13		
1040		4420	100	44	53.93		1.11		
1100		4440	120	37	53.86		1.04		
1120		4460	140	32	53.79		0.97		
1140		4480	160	28	53.75		0.93		
1200		4500	180	25	53.71		0.89		
1220		4520	200	23	53.68		0.86		
1240		4540	220	21	53.65		0.83		
1300		4560	240	19	53.62		0.80		
1340		4600	280	16	53.59		0.77		
1420		4640	320	15	53.58		0.76		
1500		4680	360	13	53.54		0.72		
1540		4720	400	12	53.54		0.72		
1640		4780	460	10	53.53		0.71		
1740		4840	520	9.3	53.45		0.63		



WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WEIL Sonnenblumen

PUMPING/OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF 2

TYPE of PUMPING TEST Constant

HOW Q MEASURED 4" V 3" OR FILE W/IN

M.P. for W.L.'s top of P.V.C. elev

DEPTH of PUMP/AIRLINE

HOW WL'S MEASURED

Electric Sounder Latent

SEY. VII OF FOMF, AIRLINE

% SUBMERGENCE: initial _____;

PUMPED WELL NO. Springwater

PUMP ON : date 20 Sept 70 time 1

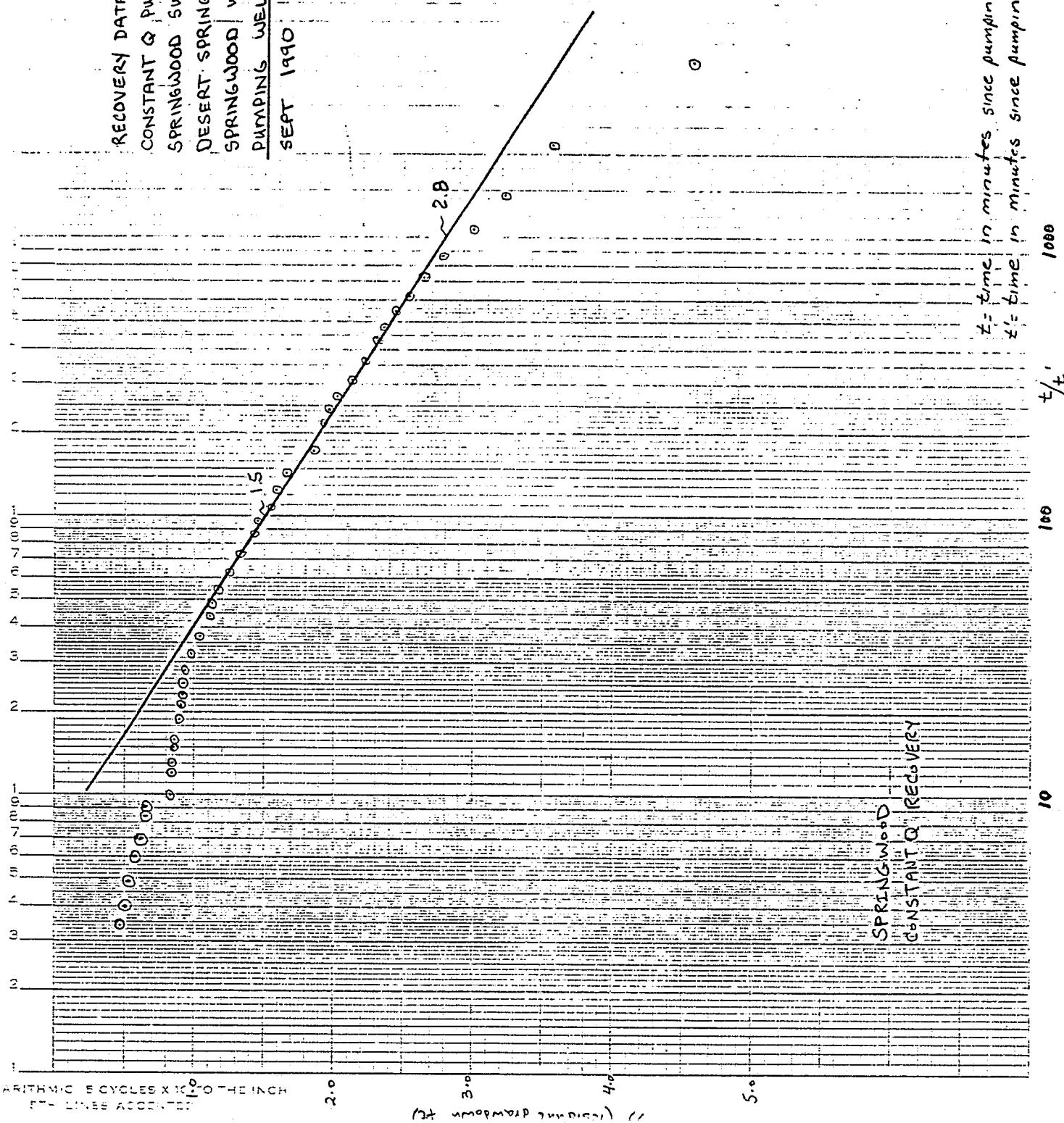
DISTANCE from PUMPED WELL

From off - date _____ to time _____

BROWNSVILLE WORK VACATION WEEK

A. WATER C.

RECOVERY DATA
 CONSTANT Q PUMPING TEST
 SPRINGWOOD SUBDIVISION
 DESERT SPRINGS WATER SYSTEM
 SPRINGWOOD WELL
 PUMPING WELL
 SEPT 1990



WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL DP Well - SFR - 153

PUMPING OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 1 OF 1

TYPE of PUMPING TEST CONSTANT Q

HOW Q MEASURED 4" x 3" DRILLED WEIR

M.P. for WL's Top 6" Casing elev.

HOW WL's MEASURED A/TAT

DEPTH of PUMP/AIRLINE _____ wrt _____

PUMPED WELL NO. SPRINGWOOD MAIN

% SUBMERGENCE: initial _____ ; pumping _____

RADIUS of PUMPED WELL _____

PUMP ON: date 20 Sept 90 time 0900

DISTANCE from PUMPED WELL _____

PUMP OFF: date 23 Sept 90 time 0900

TIME $t = 4320 \text{ at } t' = 0$			WATER LEVEL DATA STATIC WATER LEVEL 53.66				WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins hrs	t	t'	READING	CONVERSIONS OF CORRECTIONS	WATER LEVEL	S or S'	Q gpm	(NOTE ANY CHANGES IN OBSERVERS)
									312
4321	1	4321	57.97			4.31			
4322	2	2161	57.35			3.69			
4323	3	1441	57.01			3.35			
4324	4	1081	56.77			3.11			
4325	5	865	56.61			2.95			
4326	6	721	56.46			2.80			
4327	7	618	56.35			2.69			
4328	8	541	56.26			2.60			
4329	9	481	56.18			2.52			
4330	10	433	56.11			2.45			
4332	12	361	56.00			2.34			
4334	14	310	55.90			2.24			
4336	16	271	55.82			2.16			
4338	18	241	55.75			2.09			
4340	20	217	55.69			2.03			
4345	25	174	55.56			1.90			
4350	30	145	55.46			1.80			
4355	35	124	55.37			1.71			
4360	40	109	55.30			1.64			
4365	45	97	55.25			1.59			
4370	50	87	55.20			1.54			
4380	60	73	55.11			1.45			
4391	71	62	55.00			1.34			
4401	81	54	54.95			1.29			
4411	91	49	54.87			1.21			
4421	101	44	54.84			1.18			
4441	121	37	54.78			1.12			
4461	141	32	54.74			1.08			
4481	161	28	54.67			1.01			
4501	181	25	54.66			1.00			
4521	201	23	54.62			0.96			
4541	221	21	54.59			0.93			
4561	241	19	54.56			0.90			
4601	281	16	54.53			0.87			
4641	321	15	54.49			0.83			
4681	361	13	54.45			0.79			
4721	401	12	54.43			0.77			
4780	460	10	54.43			0.77			
4841	51	92	54.41			~ 2 ~			

WASHOE COUNTY

**DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION**

PUMPING TEST DATA

WELL 13 well - Eastern كودو

PUMPING / OBSERVATION WELL

PUMPING/RECOVERY DATA

PAGE 2 OF _____

8517

TYPE of PUMPING TEST Cov San Q

HOW Q MEASURED 4° y 3" from waist

HOW WL's MEASURED Actual Electric Sounder

PUMPED WELL NO. Springwood man

RADIUS of PLUMPED WELL

RADIUS of PLUMBED WELL _____

M.P. for WL's top 3, 6' elev.

DEPTH of PUMP/AIRLINE _____

9% SURMERSION : initial

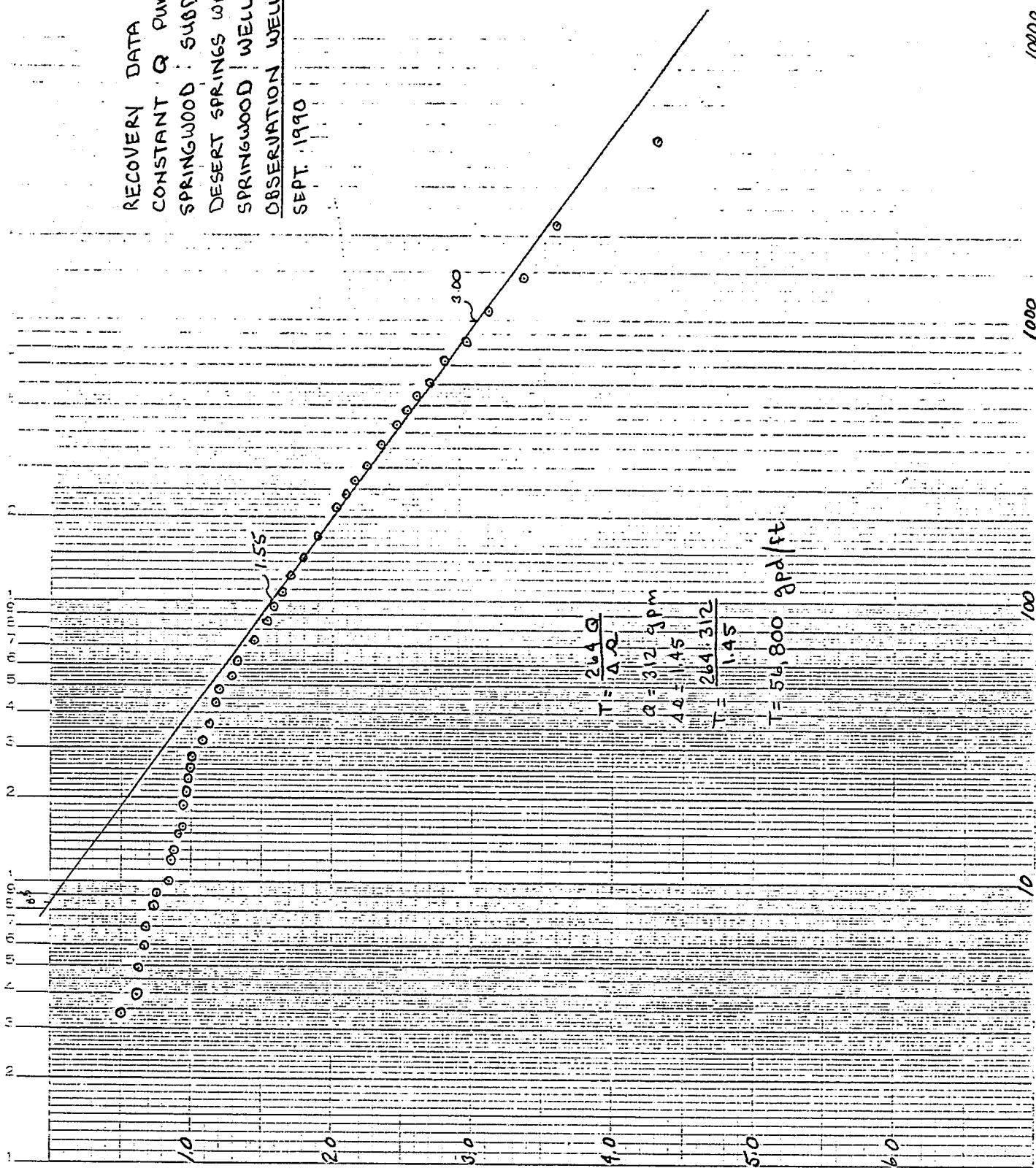
% SUBMERGENCE: initial _____; pumping _____
326 ± 90 611

PUMP ON: date 10-10-10 time 0900

PUMP OFF : date 23 Dec. 90 time 0900

Digitized by srujanika@gmail.com

RECOVERY DATA
 CONSTANT Q PUMPING TEST
 SPRINGWOOD SUBDIVISION
 DESERT SPRINGS WATER SYSTEM
 SPRINGWOOD WELL
OBSERVATION WELL
 SEPT. 1990



SEMI-LOGARITHMIC, 5 CYCLES X 10 TO THE INCH
 5TH LINES ACCENTED

RESIDUAL DRAWDOWN (ft)

RECOMMENDED PUMP AND APPURTEANCES

RUY H. HIBDON, P.E.
CIVIL ENGINEERING CONSULTANT
1479 South Wells Avenue Suite 15
RENO, NEVADA 89502
(702) 323-4801

JOB _____
SHEET NO. 1 OF 2
CALCULATED BY R.H. DATE _____
CHECKED BY _____ DATE _____
SCALE _____

SPRINGWOOD SUBDIVISION

WELL DUMP SIZING

BEST TO PUMP TEST DATA

DATED 9/20/90 by WASH & CO.

CH 114' 0"

STEP D Pump Head

Q gpm : DD ft

1/25 2.53

1/37 2.85

2/09 7.14

2/10 10.82

3/31 14.93

RUY H.
HIBDON
CIVIL
No. 2358 N.D.
9/2

Long Term TEST

3/2 19.43

Pump to be sized for Q = 150 gpm
which is for subdivision 103
part of West Weir property.

At Well + Ground Surface Elev: 4520'

Storage tank Base elev: 4648.5'

Height at tank 16' elev 4664.5'

At Q = 150 gpm for pump b +
DD (conservative)

5273 + 254.20 = 55273' (used 100')

Submergence

bR elev 4420' (to top of pump)

ROY H. HIBDON, P.E.
CIVIL ENGINEERING CONSULTANT
1479 South Wells Avenue Suite 15
RENO, NEVADA 89502
(702) 323-4801

JOB # 2
SHEET NO. 2 OF 2
CALCULATED BY R.H.
CHECKED BY DATE
SCALE

Pumpline Head

Tank Base	-	46.48.5"
Plump Settings	-	44.20.0"
		228.5"
3" Galvaniz'd	-	5.0' +
Piping		233.5'
Tank Elevation		116.0'
$h_p = 336' \times \frac{36}{1000} \times .54$		6.5'
		TD + 1256'

1996 F & E 67206 A 15
15 HP + 4 Stage / 460 Volts / 3 φ

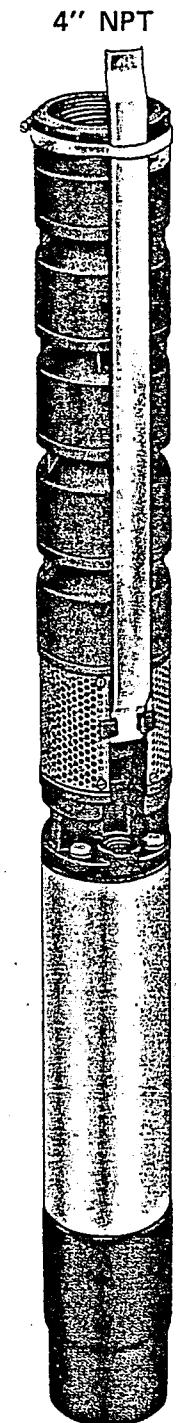
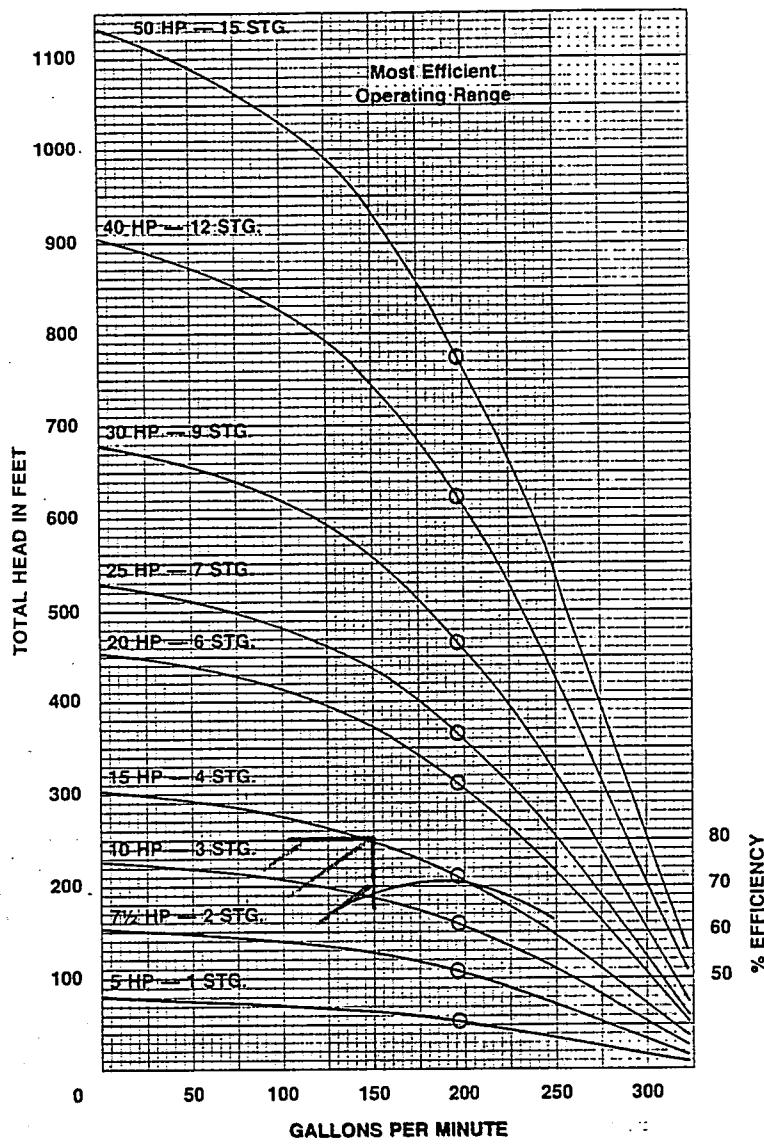
4" Column -
MASI D. Class Unit + 3"



FEATURE FOR FEATURE THE FINEST

200 G.P.M. - 5 THRU 50 H.P. 3450 R.P.M. - 60 CYCLE

COMPOSITE PERFORMANCE CURVES
MINIMUM WELL SIZE: 6" I.D.



WEIGHT AND LENGTH DATA "GT" 200 GPM							
PUMP TYPE	H.P.	NO. OF STAGES	VOLTS	PHASE	LENGTH - INCHES PUMP	SHIPPING WEIGHT PUMP	SHIPPING WEIGHT MOTOR
GT200A05	5	1	230	1	14.5	29.94	46
			230	3	14.5	29.94	46
			460	3	14.5	29.94	46
GT200A07	7 1/2	2	230	1	19.1	33.59	60
			230	3	19.1	30.84	60
			460	3	19.1	30.84	60
GT200A10	10	3	230	1	23.8	37.22	74
			230	3	23.8	33.59	74
			460	3	23.8	33.59	140
GT200A15	15	4	230	3	28.3	37.22	88
			460	3	28.3	37.22	150
GT200A20	20	6	230	3	37.5	41.22	117
			460	3	37.5	41.22	180
GT200A25	25	7	230	3	42.1	45.22	130
			460	3	42.1	45.22	200
GT200A30	30	9	230	3	51.3	45.22	162
			460	3	51.3	45.22	200
GT200A40	40	12	460	3	65.1	71.53	231
GT200A50	50	15	460	3	78.9	79.53	340

*Motor 4" diameter — discharge pipe size 4" — check valve not furnished.



"6T" SERIES SUBMERSIBLES

6" 200 G.P.M. 5 THRU 50 H.P.

SELECTION CHART
"6T" SERIES 200 GALLON PER MINUTE TURBINE PUMP

MODEL NO.	HP	STAGES	DISCHARGE PS	DEPTH TO WATER LEVEL IN FEET — CAPACITIES IN GALLONS PER MINUTE																		TOTAL SHUT OFF FT.	PSI		
				50	75	100	125	150	175	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000
6T200A05	5	1	0 20 40 60	200	50																			80	34
6T200A07	7½	2	0 20 40 60	280 220 90	247 170 75	202 155																		152	66
6T200A10	10	3	0 20 40 60	280 264 217 156	256 240 185 90	234 213 182 145	203 140 75	172 66	116															226	98
6T200A15	15	4	0 20 40 60	282 286 254 220	265 252 237 197	247 233 215 170	227 210 192 135	203 160 123 70	145 50														304	132	
6T200A20	20	6	0 20 40 60	282 285 255 265	273 262 252 242	270 250 237 228	257 236 225 213	233 208 195 182	205 175 130 138	172 132 50 60	122 45												454	196	
6T200A25	25	7	0 20 40 60	282 286 275 278	273 266 256 258	273 266 247 248	282 265 247 238	272 255 235 227	252 233 210 215	230 209 183 187	207 182 150 153	172 146 90	122 84	75										530	229
6T200A30	30	9	0 20 40 60	282 286 278 286	275 265 252 278	273 265 256 272	282 273 261 263	287 275 261 256	273 260 246 232	259 245 228 210	244 228 210 190	226 208 188 166	206 187 163 135	178 162 131 100	157 128 90	122 75	65						682	295	
6T200A40	40	12	0 20 40 60	282 290 284 290	273 260 250 278	273 260 250 272	282 272 262 272	287 283 272 272	270 260 250 250	258 248 237 225	247 236 225 212	236 224 209 195	220 209 193 178	206 193 175 158	190 175 155 134	173 155 130 100	152 128 90 40	124 90 30				909	393		
6T200A50	50	15	0 20 40 60	282 286 278 292	273 260 252 287	273 260 252 278	282 278 269 278	286 278 260 270	270 260 252 263	258 248 233 233	247 236 220 223	236 224 209 210	220 212 197 197	206 195 182 183	192 182 167 143	178 167 150 153	163 128 102	123 96 55	80			1139	493		

DROP CABLE SELECTION CHART

Cable Size	3 WIRE, THREE PHASE																		
	FRANKLIN MOTORS MAXIMUM CABLE LENGTH IN FEET																		
14	—	—	—	—	630	—	460	—	—	—	—	—	—	—	—	—	—	—	—
12	—	—	—	250	1000	—	730	—	550	—	—	—	—	—	—	—	—	—	—
10	216	—	—	390	1570	290	1150	—	850	—	590	—	—	—	—	—	—	—	—
8	315	270	—	620	2470	450	1800	340	1340	—	920	—	700	—	570	—	—	—	—
6	490	362	250	960	—	700	2810	520	2090	360	1430	—	1100	—	890	—	730	—	—
4	750	553	425	1470	—	1070	—	800	3190	550	2190	420	1670	340	1360	—	1110	850	680
2	1142	842	650	2230	—	1630	—	1220	—	830	3340	640	2550	520	2070	420	1690	1300	1040
0	1540	1136	875	—	—	2200	—	1640	—	1130	—	860	3440	700	2800	570	2280	1750	1400
00	—	1420	1100	—	—	—	—	—	—	1680	—	1280	—	1040	—	850	3400	2610	2090
000	—	—	—	—	—	—	—	—	—	—	1510	—	1230	—	1000	—	3720	2450	—
0000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

IMPORTANT! If required length falls between two wire sizes, use larger of two wire sizes (smaller number). CAUTION! Use of wire sizes smaller than determined WILL VOID WARRANTY.

WELL DRILLERS REPORT TO WATER RESOURCES

STATE OF NEVADA
DIVISION OF WATER RESOURCES

OFFICE USE ONLY

60 ft

PRINT OR TYPE ONLY

WELL DRILLER'S REPORT

Please complete this form in its entirety

NOTICE OF INTENT NO. 15584

1. OWNER	Springwood/ Bighorn Development	ADDRESS AT WELL LOCATION
MAILING ADDRESS	901 N Stewart St	Pyramid Hwy
	Carson City, Nv 89701	
2. LOCATION	SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 3 T. 20	N/S R. 20 E. Washoe County
PERMIT NO.	52524/52588 Issued by Water Resources	Parcel No. Spanish Springs Subdivision Name

3. TYPE OF WORK	4. PROPOSED USE	5. TYPE WELL
New Well <input checked="" type="checkbox"/> Recondition <input type="checkbox"/>	Domestic <input type="checkbox"/>	Cable <input type="checkbox"/> Rotary <input checked="" type="checkbox"/>
Deepen <input type="checkbox"/> Other <input type="checkbox"/>	Municipal <input checked="" type="checkbox"/>	Stock <input type="checkbox"/> Mud <input type="checkbox"/>

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
D. G. Brown		0	17	17
Multi-colored sands w/traces brown & tan				
clay		17	75	58
Multi-colored sand w/ fine brown sand trace				
brown & tan clay		75	112	37
Multi-colored coarse sands w/trace red clay & fine sand		112	116	4
Brown clay w/some multi-colored sands		116	129	13
Course multi-colored sands some brown clay		129	170	41
Multi-colored sands w/some brown sticky clay		170	175	5
Multi-colored coarse sands w/ streaks				
brown clay		175	200	25
T. D. 200 feet				

Date started 8/29/90, 19_____
Date completed 9/5/90, 19_____

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
Blew with air to clean and develop.			
Test pumped at 300 GPM for 72 hrs.			

BAILER TEST

G.P.M. Draw down feet hours
G.P.M. Draw down feet hours
G.P.M. Draw down feet hours

8. WELL CONSTRUCTION

Diameter 15 inches Total depth 200 feet
inches
inches
Casing record 8 5/8 inch
Weight per foot 16.94 Thickness .188
Diameter From To
8 5/8 inches +1 feet 200 feet
inches feet
inches feet
inches feet
inches feet
inches feet

Surface seal: Yes No Type near cement

Depth of seal 52 feet

Gravel packed: Yes No

Gravel packed from 52 feet to 3200 feet

Perforations:

Type perforation screen [Roscoe Moss]
Size perforation .100
From 120 feet to 190 feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

9. WATER LEVEL

Static water level 51 feet below land surface

Flow G.P.M. P.S.I.

Water temperature cold °F Quality good

10. DRILLER'S CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Aqua Drilling & Well Service, Inc Contractor

Address 625 Spice Islands Dr Suite L Sparks Contractor 89431

Nevada contractor's license number issued by the State Contractor's Board 15291

Nevada contractor's driller's number issued by the Division of Water Resources 1132

Nevada driller's license number issued by the Division of Water Resources, the on-site driller 1509

Signed Roger M. Thrall By driller performing actual drilling on site or contractor

Date Roger M. Thrall 9/21/90

