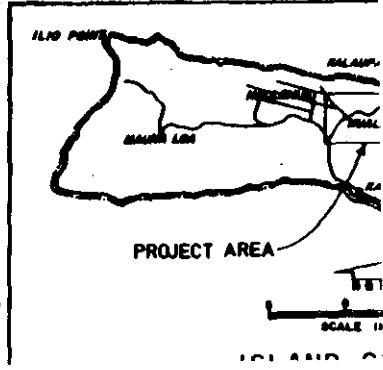


Kualapuu Mauka Well (Well No. 0801-03)





United States Department of the Interior

GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
P.O. BOX 50166
Honolulu, Hawaii 96850

1 26

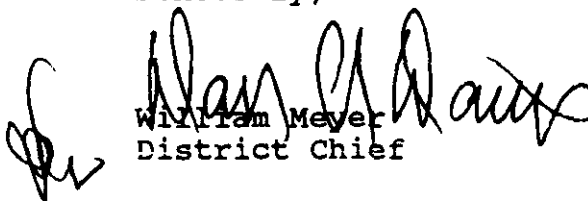
January 28, 1988

Mr. Manabu Tagomori
Manager-Chief Engineer
Department of Land and Natural Resources
Division of Water and Land Development
P.O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Tagomori:

Enclosed are the Analytical results for the water sample collected from Kualapuu Mauka Well, 4-0801-03, Island of Molokai. The data will be stored in our computers in Reston, Virginia. Please call us if you have any questions.

Sincerely,


William Meyer
District Chief

Enclosure

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	STATION NUMBER	DATE	TIME	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
SEP											
26...	210857157011701	870926	0800	0.28	69	9.6	11	33	2	3.0	64

DATE	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
SEP												
26...	11	0.2	46	<1	<100	<10	<1	<10	<1	4	<10	20

DATE	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI) (01132)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE) (01147)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)
SEP											
26...	<5	<10	<10	<1	2	<1	<10	<10	30	<1	0.2

January 14, 1988

MEMORANDUM FOR THE RECORD

FROM: Nobu Kaneshiro

SUBJECT: Trip to Molokai for Final Inspection of Job No. 35-9W-F
Drilling Kualapuu Mauka Exploratory Well

Persons Present:

Paul Wandke and Tui - Roscoe Moss Company
George Harada, Tom Matayoshi, Mitchell Ohye and Nobu Kaneshiro -
DOWALD

On Tuesday, January 12, 1988, Mitchell Ohye and I went to Molokai to conduct a final inspection for the subject well. As a requirement for this project the contractor ran a video log of the well from the surface to its total depth. The video log was successfully completed and the well was covered with a steel plate tack-welded to the top of the exposed casing. Hence, this well project was approved and accepted.

George Harada and I also inspected the Kualapuu Reservoir for potential erosion of embankment areas due to wave action. George indicated the water level is at about the 43-foot elevation and approximately 5 feet above the lined portion. The reservoir water was exceptionally calm with hardly any wave action. (See attached photos.)

Later, George, Tommy, Mitchell and I went through the Molokai tunnel to inspect the Waikolu Valley exploratory wells project. The contractor started to drill the first well (about 40 ft.) without much problem. The other two wells are upstream from the first well.



NOBU KANESHIRO

NK:ln
Attach.

JANUARY 19, 1988
MEMORANDUM FOR THE RECORD
FROM: MITCHELL DRYE
SUBJECT: KUALAPUU MAUKA WELL 9801-03 MAUIKAI
TELEVISION LOG

A TELEVISION LOG WAS MADE OF THE KUALAPUU MAUKA WELL ON JANUARY 19, 1988 BY THE ROGLOE MOSS CO. WEATHER WAS CLEAR AND BREEZY. PRESENT DURING LOGGING WERE PAUL WANKE AND 1 HELPER (ROGLOE MOSS CO.), MITCHELL DRYE AND TOMMY (T.D.W.A.L.D.)

THE CAMERA LENS WAS REFERENCED TO GROUND SURFACE.

WE STARTED LOGGING AT 0900 HRS. AND OBSERVED THE FOLLOWING:

- 1) THE BLANK CASING IS IN GOOD CONDITION DOWN TO 1027 FT. DEVIERS LOG SHOWS DEPTH OF BLANK CASING AT 1027 FT.
- 2) CAMERA LENS HIT WATER AT 1027 FT., PICTURE VERY CLOUDY, HARD TO SEE, CLOUDINESS DUE TO OIL FROM PUMP TESTING. W.L. @ 1027 FT. - 1027 FT = 10⁺ FT. SWL, MSL.
- 3) BOTTOM OF PERFORATED CASING IS AT 1079 FT. DEVIERS LOG SHOWS DEPTH OF PERFORATED AT 1077 FT.
- 4) BOTTOM OF WELL IS 1133 FT. LOG SHOWS 1136 FT. 3 FT. OF FILL MATERIAL.
- 5) END TELEVISION LOG AT 1030 HRS.

WELL TAPES MEAS. OF W.L. ON 7-27-87 IS 11.7 FT SWL, MSL

MITCHELL DRYE

October 6, 1987

MEMORANDUM FOR THE RECORD

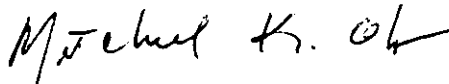
FROM: Mitchell K. Ohye

SUBJECT: Kualapuu-Mauka Well 0801-03, Molokai

A four-day pumping test was performed on the subject well from September 22-26, 1987. After it was deepened 36 ft. to a final depth of 1136 feet (-99 ft. msl). A sustained pumping rate of 1000 gallons per minute was established and the drawdown in the well ranged from 8.7 ft. to a stabilized 10.65 ft. The static water level measured 11.70 msl, on July 27, 1987 by steel tape. Chlorides were 66-70 ppm and temperature was 70.0°F.

The well was pumped for 96 continuous hours and recovered to within .5 ft. from the beginning static water level five minutes after shutdown.

On September 1, 1987, prior to deepening 36 feet from a depth of 1100 ft. (-63 ft., msl), the well was pumped for about 5 hours at a maximum rate of 517 gpm and drawdown of 21.15 ft. Therefore, the yield of the well was increased by the deepening.



MITCHELL K. OHYE

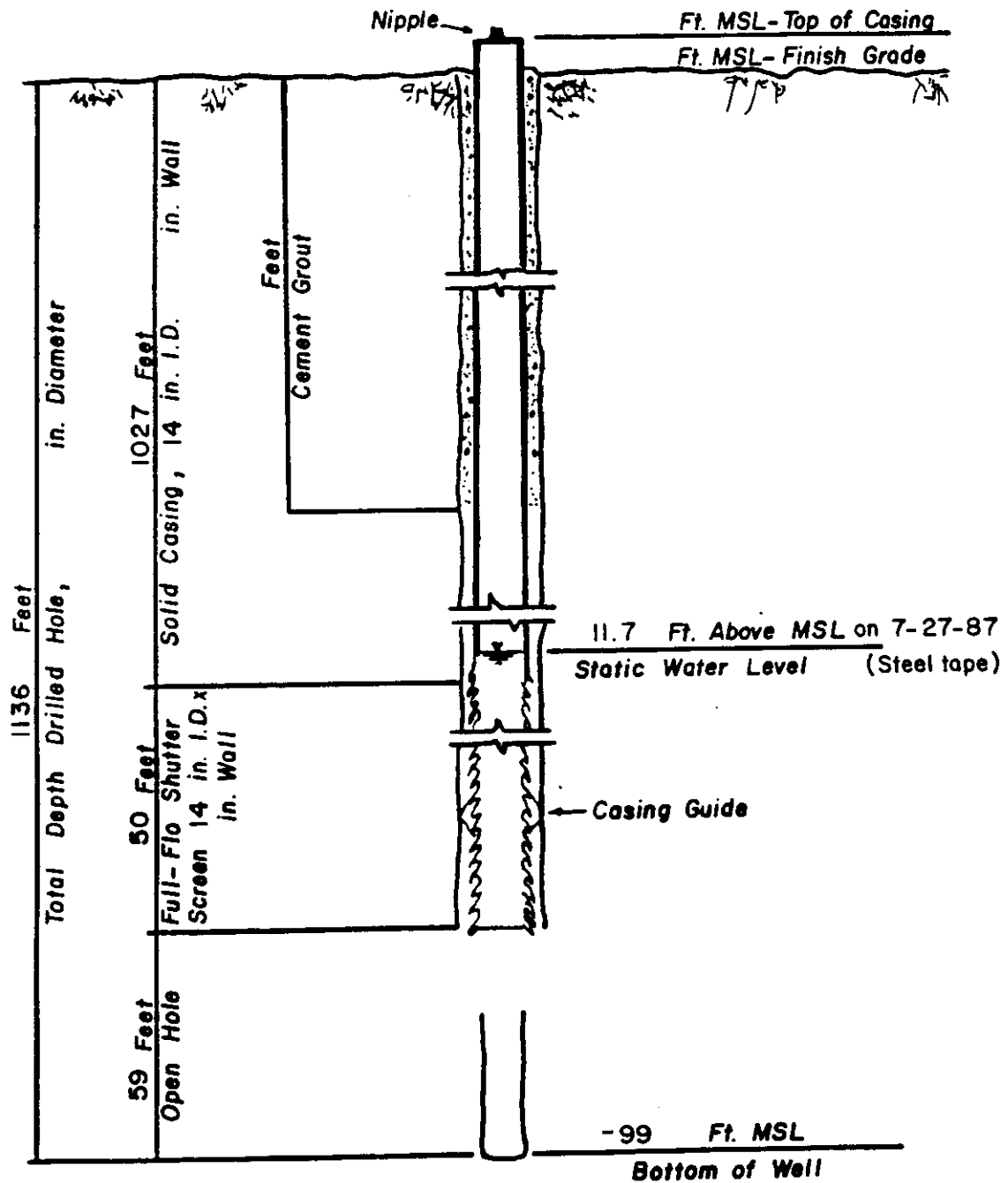
MKO:ko

KUALAPUU MAUKA 0801-03

AS BUILT SECTION

Drilled: September 1987

Driller: Roscoe Moss Company



NOT TO SCALE

Job No. 35-9W-F

Kualapuu Mauka Well 0801-03, Molokai

Ground Elevation - - - - - _____ ft. msl
 Top of Casing - - - - - _____ ft. msl
 Casing size - - - - - _____) 14 I.D. inches
 Blank Casing Depth - - - - - _____ 1027 ft.(ft. msl)
 Shutter Screen Depth - - - - - _____ 1077 ft.(ft. msl)
 Total Depth of Well - - - - - _____ 1136 ft.(ft. msl)
 Static Water Level (Elevation) - - - - _____ ft.(11.70 ft. msl)
 Bottom of Airline - - - - - _____ 1050 ft.(ft. msl)
 Test Conducted by - - - - - _____ Mitchell K. Ohye

Date & Time	Sample No.	Pumping Rate (GPM)	Airline (FEET)	Drawdown (FEET)	Chlorides (PPM)	Temp. (F)	Remarks
-------------	------------	--------------------	----------------	-----------------	-----------------	-----------	---------

September 22, 1987

Meter Reading
20339406

0810		0	21.80				
0815		0	21.80				
0830		0	21.80 (Static)				

Start Pumping-Adjust to 500 gpm

0837		556	18.80	3.00		70	
0845	1	536	18.90	2.90	66		
0900	2	545	18.80	3.00	68		
0915		500	19.10	2.70			
0930	3	517	19.00	2.80	70		
0945		500	19.10	2.70			
1000	4	492	19.15	2.65	70		

Adjust to 900 gpm

1005		930	14.60	6.20			
1015	5	900	14.80	6.00	70		70
1030	6	900	14.70	6.10	70		70
1045		893	14.75	6.05			
1100	7	900	14.50	6.30			

Date & Time	Sample No.	Pumping Rate (GPM)	Airline (FEET)	Drawdown (FEET)	Chlorides (PPM)	Temp. (F)	Remarks
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September 22, 1987

Adjust Rate to 900 gpm

1115		900	14.60	6.20			
1130	8	900	14.50	6.30	70	70	

Adjust Rate to 700 gpm

1135		724	16.80	5.00			
1145	9	707	16.90	4.90	70	70	
1230	10	707	16.90	4.90	70		
1300	11	700	16.95	4.85	70		
1400	12	700	16.95	4.85	70	70	
1430		700	17.00	4.80			

Adjust to 600 gpm

1435		631	17.65	4.15			
1445		642	17.55	4.25			
1500		642	17.55	4.25			
1515		631	17.70	4.10			
1530	13	631	17.75	4.05	70		

Adjust to 1000 gpm

1550		1000	13.10	8.70			
1600	14	1000	13.00	8.80	68		
1630		1000	12.90	8.90			
1700	15	1017	12.80	9.00	69		
1800	16	1017	12.65	9.15	69		
1900	17	1017	12.55	9.25	69		
2000	18	1017	12.50	9.30	70	70	
2100	19	1017	12.50	9.30	69		
2200	20	1017	12.35	9.45	68		
2300	21	1017	12.25	9.55	69		
2400	22	1017	12.15	9.65	68		

Date & Time	Sample No.	Pumping Rate (GPM)	Airline (FEET)	Drawdown (FEET)	Chlorides (PPM)	Temp. (F)	Remarks
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September 23, 1987

0100	23	1017	12.05	9.75	70		
0200	24	1017	12.05	9.75	70		
0300	25	1017	12.00	9.80	69		
0400	26	1017	11.95	9.85	68		
0500	27	1017	11.90	9.90	68		
0600	28	1017	11.75	10.05	68		
0700	29	1017	11.70	10.10	65		
0800	30	1017	11.85	9.95	65		
0900	31	1017	11.75	10.05	68		
1000	32	1017	11.70	10.10	68		
1100	33	1017	11.70	10.10			
1200	34	1010	11.80	10.00	68		
1300	35	1010	11.80	10.00			
1400	36	1010	11.90	9.80	68		
1500	37	1017	11.70	10.10			
1600	38	1017	11.65	10.15	68		
1700	39	1017	11.55	10.25			
1800	40	1017	11.55	10.25			
1900	41	1017	11.65	10.15			
2000	42	1017	11.55	10.25	68		
2100	43	1017	11.55	10.25			
2200	44	1017	11.65	10.15	68		
2300	45	1017	11.55	10.25			
2400	46	1017	11.55	10.25			

September 24, 1987

0100	47	1017	11.40	10.40	65		
0200	48	1017	11.25	10.55			
0300	49	1017	11.25	10.55	68		
0400	50	1017	11.25	10.55			
0500	51	1017	11.15	10.65	66		
0600	52	1017	11.15	10.65			
0700	53	1023	11.15	10.65			
0800	54	1027	11.15	10.65		69.5	
0900	55	1027	11.20	10.60			
1000	56	1017	11.30	10.50	68		
1100	57	1017	11.35	10.45			
1200	58	1017	11.35	10.45	68		

Date & Time	Sample No.	Pumping Rate (GPM)	Airline (FEET)	Drawdown (FEET)	Chlorides (PPM)	Temp. (F)	Remarks
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September 24, 1987

1300		1000	11.40	10.40			
1400		1000	11.45	10.35			
1500		1000	11.50	10.30			
1600	58	1000	11.65	10.15	68	70	
1700		1000	11.55	10.25			
1800	59	1000	11.55	10.25			
1900		1000	11.65	10.15		70	
2000	60	1000	11.55	10.25	68		
2100		1000	11.65	10.25			
2200	61	1000	11.65	10.25		70	
2300		1000	11.65	10.15			
2400	62	1000	11.55	10.25	68		

September 25, 1987

0100		1000	11.60	10.20			
0200	63	1000	11.60	11.20			
0300		1000	11.60	10.20			
0400	64	1000	11.80	10.00	68		
0500		1000	11.85	9.95			
0600	65	1000	11.90	9.90			
0700		1000	12.00	9.80			
0800	66	1000	11.75	10.05	66		
0900		1000	11.65	10.15			
1000	67	1017	11.45	10.35	70		
1100		1017	11.45	10.35			
1200	68	1000	11.90	9.90	70		
1300		1007	11.60	10.20			
1400	69	1007	11.50	10.30	68		
1500		1007	11.80	10.00			
1600	70	984	12.00	9.80			
1700		984	11.65	10.15			
1800	71	1000	11.95	9.85	68		
1900		1000	12.00	9.80			
2000	72	1000					
2100		1000	12.20	9.60			
2200	73	1000	12.20	9.60	68		
2300		1000	12.20	9.60			
2400	74	1000	11.75	10.05			

Date & Time	Sample No.	Pumping Rate (GPM)	Airline (feet)	Drawdown (feet)	Chlorides (ppm)	Temp. (F)	Remarks
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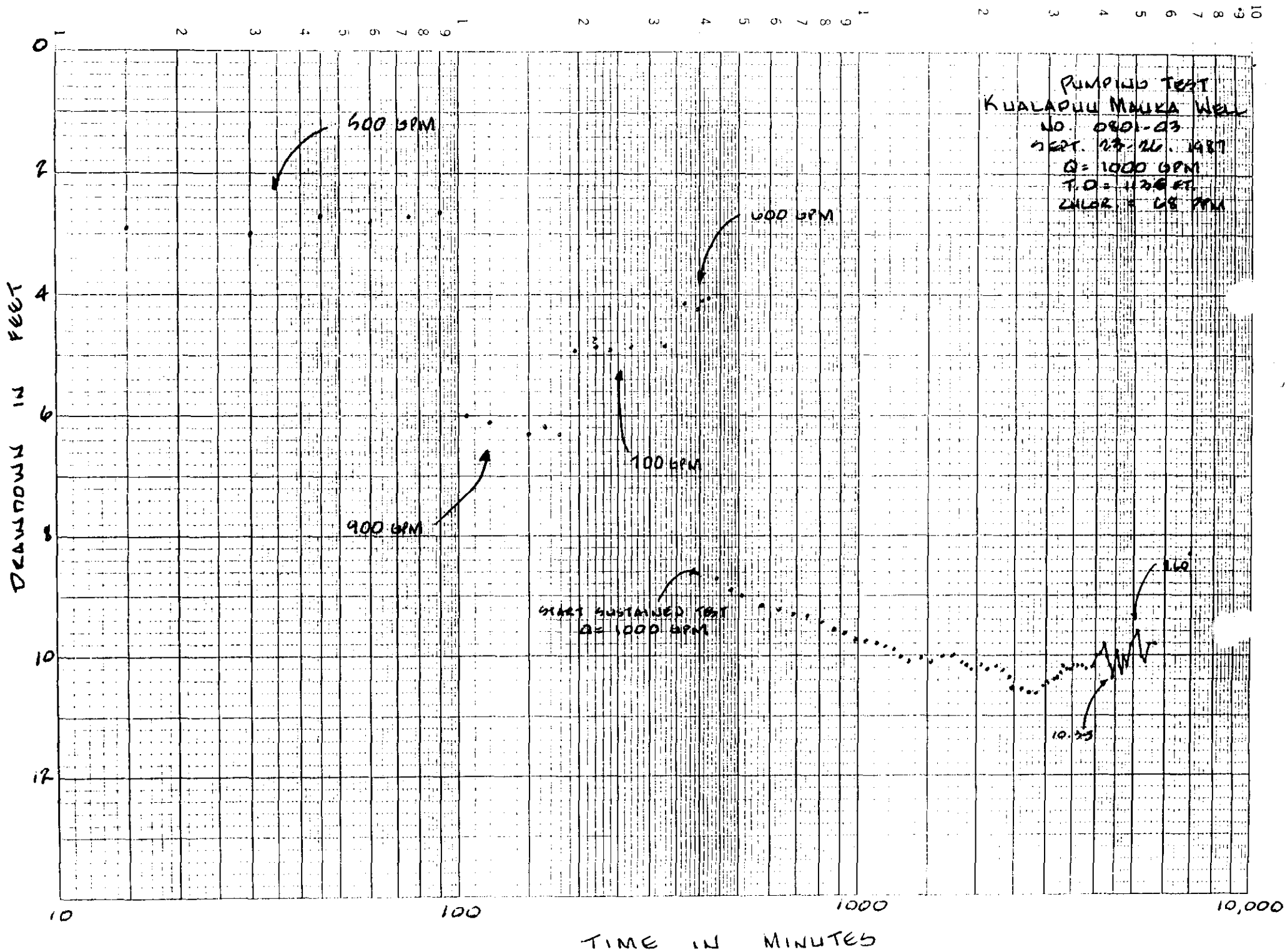
September 26, 1987

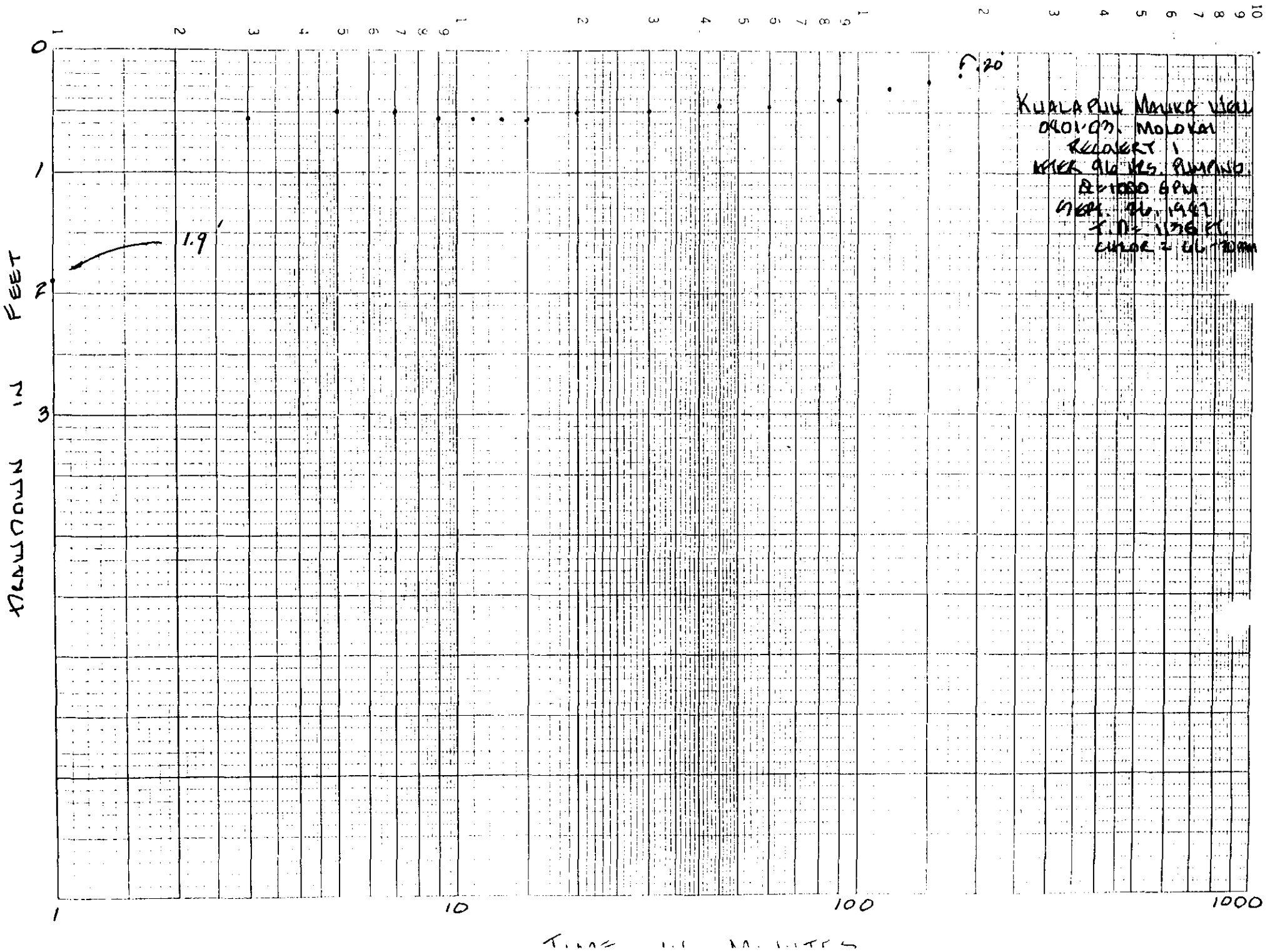
0100		1000	11.70	10.10			
0200	75	1000	11.70	10.10	68		
0300		1000	11.70	10.10			
0400	76	1000	11.90	9.90			
0500		1000	11.90	9.90			
0600	77	1000	11.90	9.90			
0700		1000	11.90	9.90			
0800	78	1000	11.90	9.90	68		

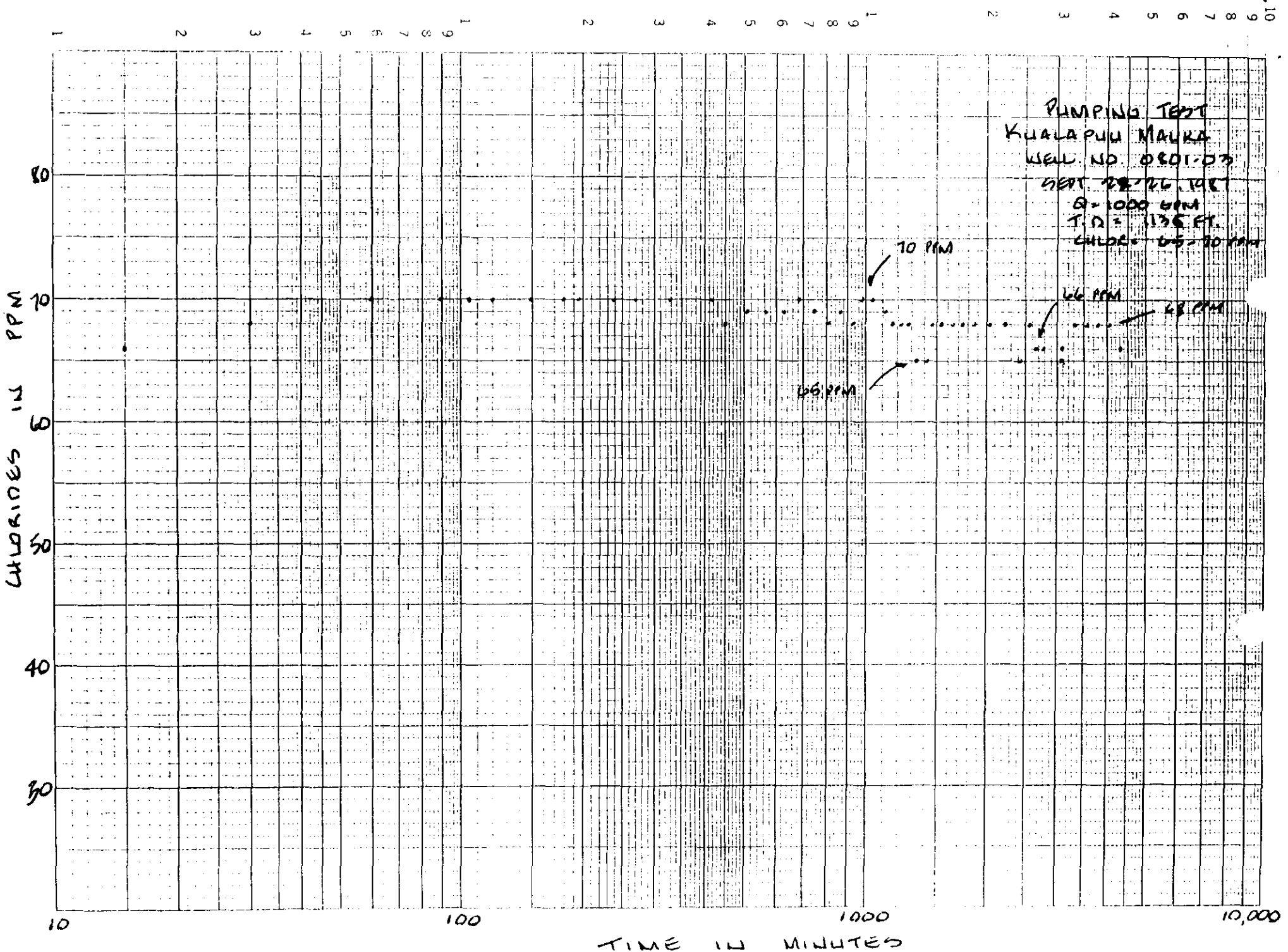
Stop Pumping- Recovery

Elapsed Time
minutes

01	0	19.90	1.90		Meter Rdg.
03	0	21.25	.55		26009500
05	0	21.30	.50		
07	0	21.30	.50	Gals. Pumped	5,670,100
09	0	21.25	.55		
11	0	21.25	.55		
13	0	21.25	.55		
15	0	21.25	.55		
20	0	21.30	.50		
30	0	21.30	.50		
45	0	21.35	.45		
(0900) 60	0	21.35	.45		
75	0				
90	0	21.40	.40		
(1000) 120	0	21.50	.30		
150	0	21.55	.25		
(1100) 180	0	21.60	.20		







*mitch
will file*

October 5, 1987

Mr. Vince G. Bagoyo, Jr.
Director
Department of Water Supply
County of Maui
P.O. Box 1109
Wailuku, Maui 96793-0343

Dear Mr. Bagoyo:

Results of Drilling and Testing of
Kualapuu-Mauka Exploratory Well 0801-03, Central Molokai

The Division of Water and Land Development has completed the drilling and testing of a 1,136-foot deep exploratory well at Kualapuu-Mauka, Central Molokai, with good results.

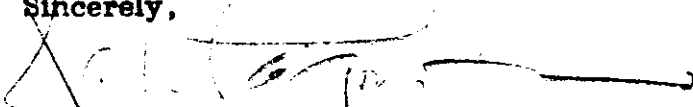
A four-day pumping test conducted on September 22-26, 1987, indicates that the well is capable of producing 1.4 million gallons per day of fresh potable water having a chloride content of only 70 milligrams per liter (U.S. Public Health Service arbitrary limit for potable water is 250 parts per million). The well was pumped for 96 hours at a rate of 1,000 gallons per minute (1.4 mgd) with a stabilized well drawdown (10.0 ft.) and chloride content. Recovery of the drawdown was nearly instantaneous after pumping was ended, and the temperature of the water measured 70.0°F.

Other pertinent facts about the well include: (1) ground elevation, 1037 feet above mean sea level; (2) static water level, 11.7 ft. above mean sea level; (3) casing size, 14-inch diameter; and (4) casing depth,

~~1,136 ft.~~
1,077 ft. 9/6/87

The favorable test outcome now allows your office to proceed with the next phase of the project--to get the well into production. If you have any questions, please call me at 548-7533.

Sincerely,



MANABU TAGOMORI
Manager-Chief Engineer

DL:dh

September 3, 1987

MEMORANDUM FOR THE RECORD

FROM: Mitchell Ohye

SUBJECT: Kualapuu Well 0801-03, Molokai Pumping Test

On September 1, 1987, Suzie and I traveled to the Kualapuu Mauka Well to perform a pumping test. During development of the well by pump surging, the diesel engine fan and right angle gear drive broke. According to the driller the equipment will have to be shipped to Honolulu for repairs.

The following data was collected before the breakdown:

<u>Pumping Rate</u>	<u>Drawdown (ft.)</u>
414 gpm	10.6'
453	12.05'
517	21.15'

Initial chlorides were 105 ppm decreasing to 90 ppm, after pump surging for 3 to 4 hours.

Recovery Data

<u>Time (after shutdown)</u>	<u>Drawdown</u>
1 minute	8.55 ft.
2	.95
3	+2.05
5	Above range of manometer
10	Static

Called in results to Dan Lum--he recommended that the pump be pulled and well deepened 30 to 40 ft.

Mitchell Ohye
MITCHELL OHYE

Water level on 7-27-87
11.70 FT. above msl.
steel tape meas.

OK: This info should be
used as part of this
memo, not

KUALAPU MAUKA 0801:03
 SEPT. 1, 1987
 PUMP SURGING DATA
 T.D. = 1100 FT.
 LL = 90 PPM

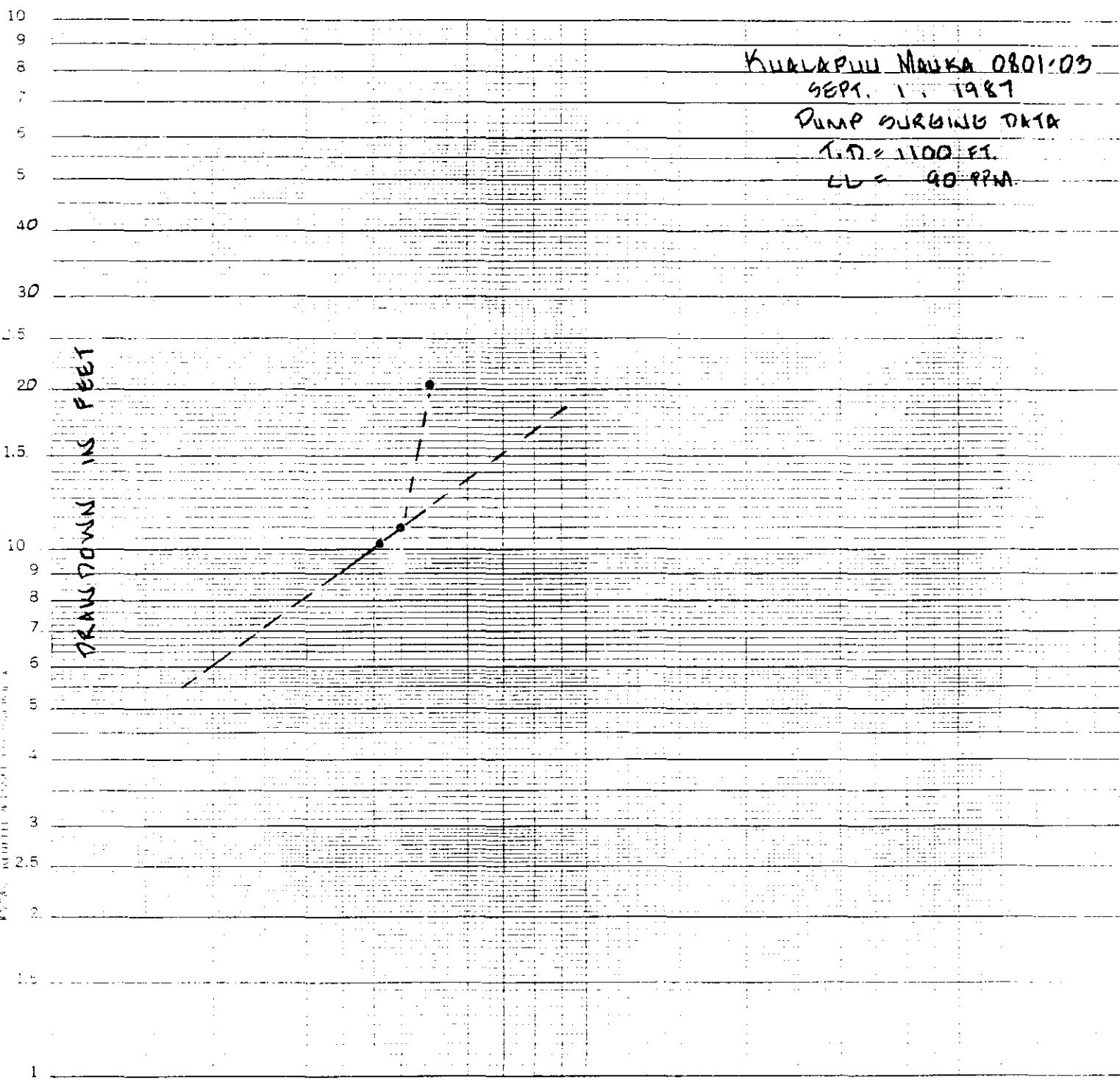
45 7200

DRAWDOWN IN FEET

LOG-ARITHMIC SCALE
 MODEL 80001 (REV. 10/80) A

1 1.5 2 2.5 3 4 5 6 7 8 9 10 1.5 2 2.5 3 4 5 6 7 8 9 10

GALLONS PER MINUTE X 100



September 3, 1987

MEMORANDUM FOR THE RECORD

FROM: Mitchell Ohye

SUBJECT: Kualapuu Well 0801-03, Molokai Pumping Test

On September 1, 1987, Suzie and I traveled to the Kualapuu Mauka Well to perform a pumping test. During development of the well by pump surging, the diesel engine fan and right angle gear drive broke. According to the driller the equipment will have to be shipped to Honolulu for repairs.

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1 minute	8.55 ft.
2	.95
3	+2.05
5	Above range of manometer
10	Static

Called in results to Dan Lum--he recommended that the pump be pulled and well deepened 30 to 40 ft.

Mitchell Ohye
MITCHELL OHYE

July 28, 1987

MEMORANDUM FOR THE RECORD

FROM: Mitchell K. Ohye

SUBJECT: Kualapuu Mauka Exploratory Well 0801-03, Molokai
Job No. 35-MW-F, Water Level Measurement

On July 27, 1987, I visited the subject well to accurately measure the water level. The reference point used was top of the 14-inch steel casing which stands 2.15 ft. above ground level. A temporary B.M. was transferred onto the drill rig and that point stands 1.7 ft. above ground level. Therefore, 2.15 ft. (height of 14-inch casing) minus 1.70 ft. (height of B.M.) equals .45 ft. difference plus 1039-ft. elevation of B.M.) equals 1039.45 ft. top of the 14-inch casing elevation (see attached).

A total of 1029 ft. of steel tape was lowered into the well, and a wet mark of 1.25 ft. recorded $1029 - 1.25 = 1027.75$ ft.-depth to water from top of the 14-inch casing. 1039.45 ft.-top of casing elevation minus 1027.75 ft.-depth to water equals a water level of 11.70 ft. above msl at 10:30 a.m.

Mitchell K. Ohye

MITCHELL K. OHYE

MKO:ko
Attach.