ENERGY WEST MINING
HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - LEFT FORK (RCLF1)

		<----- Field Measurements ------>						
			Flow			Cond.		
Date	Time	Temp.	ft.	GPM	pH	(uS)	Weather	Comments
JAN.-MAR 92		INACCESSIBLE						
04-07-92		INACCESSIBLE					clear 40's	
05-18-92	1445			DRY			PC 70's	
06-12-92	1225			DRY			clear 70's	
07-20-92	1415			DRY			cloudy 80's	
08-14-92	1100			DRY			PC 80'S	
09-03-92	1310			DRY			cloudy 50's	
10-30-92	1405			DRY			rain 40's	
NOV.-DEC		INACCESSIBLE						
JAN-FEB 93		INACCESSIBLE						

ENERGY WEST MINING
HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #2 (RCF2)

	<------ Field Measurements ------->							
			Flow			Cond.		
Date	Time	Temp.	ft.	GPM	pH	(uS)	Weather	Comments
JAN.-MAR 92		INACCESSIBLE						
04-07-92	1010		DRY				clear 40's	
05-18-92	1550	52	0.24	300	8.8	390	PC 70's	
06-12-92	1310	52	0.22	262	8.54	408	clear 70's	
07-20-92	1430		DRY				cloudy 80's	
08-14-92	1110		DRY				PC 80'S	
09-03-92	1405		DRY				cloudy 50's	
10-30-92	1415		DRY				rain 40's	
NOV.-DEC		INACCESSIBLE						
JAN-FEB 93		INACCESSIBLE						

ENERGY WEST MINING
HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #3 (RCF3)

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
JAN.-MAR 92		INACCESSIBLE							
04-07-92	1020	49	0.03	12	8.16	704	7.90	clear 40's	
05-18-92	1615	50	0.15	146	8.22	467	8.70	PC 70's	
06-12-92	1325	54	0.25	319	8.35	476	9.00	clear 70's	
07-20-92	1440	56	0.02	7	8.19	700	7.80	cloudy 80's	
08-14-92	1115	57	0.02	7	8.16	684	8.60	PC 80'S	
09-03-92	1425	53	0.02	7	8.47	722	6.70	cloudy 50's	
10-30-92	1425	54	0.03	12	7.91	687	7.30	rain 40's	
NOV.-DEC		INACCESSIBLE							
JAN-FEB 93		INACCESSIBLE							

ENERGY WEST MINING
HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - WEIR #4 (RCW4)

Date	Time	Field Measurement Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
JAN.-MAR 92		INACCESSIBLE							
04-07-92	1115	45	0.38	97	8.86	690	8.70	clear 40's	
05-18-92	1635	52	0.60	305	8.54	633	9.20	PC 70's	
06-12-92	1345	54	0.67	402	8.59	585	5.90	clear 70's	
07-20-92	1510	58	0.32	63	8.80	718	7.80	cloudy 80's	
08-14-92	1145	55	0.38	97	8.58	730	7.60	PC 80'S	
09-03-92	1510	52	0.30	54	8.85	719	10.10	cloudy 50's	
10-30-92	1455	44	0.35	79	8.34	713	7.40	rain 40's	
NOV.-DEC		INACCESSIBLE							
JAN-FEB 93		INACCESSIBLE							

EAST MOUNTAIN SPRINGS DISCHARGE
1992

Spring	Date Sampled	Flow (GPM)	Temp. F	Date Sampled	Flow (GPM)	Temp. F	Seasonal Net Change %
Sheba	07-15-92	6.3	44.7	10-15-92	1.1	47.1	-83
Elk Spring	07-15-92	116.8	42.0	10-15-92	41.4	41.5	-65
Burnt Tree	07-16-92	4.0	46.4	10-20-92	2.4	46.3	-40
Jerk Water							
Pine Springs							
Pine Sp. Trough							
Ted's Tub	07-16-92	13.6	59.0	10-15-92	5.5	45.6	-60
79-1							
79-2	07-16-92	2.3	44.7	10-20-92	1.5	44.5	-35
79-3							
79-4							
79-5							
79-6							
79-7							
79-8							
79-9							
79-10	07-15-92	10.5	46.0	10-15-92	4.3	47.0	-5
79-11							
79-12	07-16-92	DRY		10-15-92	DRY		
79-13							
79-14							
79-15	07-15-92	4.1	61.4	10-15-92	1.5	52.2	-6
79-16							
79-17							
79-18							
79-19							
79-20							
79-21							
79-22							
79-23	07-16-92	DRY		10-20-92	DRY		
79-24	07-16-92	DRY		10-20-92	DRY		
79-25							
79-26	07-16-92	DAMP		10-20-92	DRY		
79-27							
79-28	07-16-92	0.3	47.8	10-20-92	0.5	46.6	6
79-29	07-16-92	0.8	43.0	10-20-92	0.8	45.2	-
79-30							
79-31							
79-32	07-16-92	STANDING WATER		10-20-92	DAMP		
79-33		NO FLOW					
79-34	07-15-92	DAMP		10-15-92	DRY		
79-35	07-15-92	4.4	47.6	10-15-92	1.5	45.2	-6
79-36							
79-37							
79-38	07-16-92	2.3	51.9	10-20-92	1.4	45.6	-3
79-39							
79-40	07-16-92	DRY		10-20-92	DRY		
80-41	07-16-92	DRY		10-20-92	DRY		

EAST MOUNTAIN SPRINGS DISCHARGE
1992

Spring	Date Sampled	Flow (GPM)	Temp. F	Date Sampled	Flow (GPM)	Temp. F	Seasona Net Change *
80-42							
80-43	07-16-92	DRY		10-20-92	DRY		
80-44	07-16-92	DRY		10-20-92	DRY		
80-45							
80-46	07-16-92	DRY		10-20-92	DRY		
80-47	07-16-92	3.3	54.2	10-20-92	2.6	47.0	-2
80-48	07-15-92	2.5	47.7	10-20-92	1.2	50.7	-5
80-49							
80-50							
82-51	07-16-92	DAMP		10-20-92	DRY		
82-52	07-16-92	1.0	45.0	10-20-92	1.6	42.2	6
84-53	07-16-92	DRY		10-20-92	DRY		
84-54							
84-55							
84-56	07-16-92	0.6	45.1	10-20-92	0.5	49.0	-2
85-57							
86-58							
86-59							
89-60	07-16-92	1.0	48.0	10-20-92	DAMP		
89-61	07-15-92	42.8	42.0	10-15-92	17.1	40.8	-6
89-62							
89-63							
89-64							
89-65	07-15-92	0.7	45.0	10-15-92	0.2	44.5	-7
89-66	07-15-92	SEEP <0.1 GPM		10-15-92	DAMP		
89-67	07-15-92	3.0	40.8	10-15-92	1.8	41.4	-4
89-68	07-15-92	0.8	46.5	10-15-92	DAMP		
89-69							
89-70							
89-71							
91-72	07-16-92	6.0	64.6	10-22-92	6.2	47.6	
91-73	07-16-92	1.5	69.0	10-22-92	1.5	48.1	

TOTAL FLOW FOR JULY 221.1 86.9
(W\OUT 91-72 & 73)

Net Change - Average -
Net Change - By Volume -

TOTAL FOR JULY 1991 = 244.7 GPM
JULY 1992 11 % LOWER THAN JULY 1991

PACIFICORP - FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING
SPRING DISCHARGE RECESSION STUDY

YEAR 1992

SPRING		JUL	AUG	SEP	OCT		
79-10	F	10.5	6.5	5.0	4.3		
	T	46	46	46	47		
SHEBA SPRINGS	F	6.3	2.1	1.3	1.1		
	T	45	47	48	47		
ELK SPRING	F	116.8	67.0	46.0	41.4		
	T	42	45	43	42		
79-35	F	4.4	3.0	1.5	1.5		
	T	48	46	45	45		
79-26	F	DRY	DRY	DRY	DRY		
	T						
79-29	F	0.8	0.8	0.8	0.8		
	T	43	46	44	45		
84-56	F	0.6	0.5	0.7	0.5		
	T	48	46	45	49		
80-44	F	DRY	DRY	DRY	DRY		
	T						
80-46	F	DRY	DRY	DRY	DRY		
	T						
BURNT TREE	F	4.0	*	2.7	2.4		
	T	47		48	46		
79-23	F	DRY	DRY	DRY	DRY		
	T						
82-52	F	1.0	0.5	1.7	1.6		
	T	45	51	46	42		

* POND LEVEL ABOVE DIVERSION

DEER CREEK MINE DISCHARGE

PACIFICORP - FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK DISCHARGE QUALITY AND QUANTITY

Quality				Quantity	
Date	Time	GPM	Temp.(F)	Month	Gallons/day
01-10-90	1330	2000	56	Jan-90	2,254,703
02-20-90	1055	926	54	Feb	3,093,132
03-06-90	1335	2700	55	Mar	2,988,000
03-26-90	930	2700	56	Apr	4,483,410
04-03-90	940	2000	56	May	4,712,224
04-10-90	1030	2000	55	Jun	4,131,746
05-22-90	1000	3545	55	Jul	4,347,921
06-13-90	830	3520	56	Aug	4,529,814
07-30-90	1450	3200	56	Sep	4,736,944
08-13-90	1310	3100	56	Oct	4,267,881
09-06-90	1430	3200	56	Nov	4,109,980
10-08-90	1350	3000	56	Dec	4,402,690
11-20-90	1610	2730	55	Jan-91	4,275,910
12-06-90	1450	3135	52	Feb	3,697,433
01-28-91	1225	2900	54	Mar	2,876,779
02-19-91	1155	2290	55	Apr	3,854,686
03-05-91	1430	2190	57	May	3,480,520
04-08-91	1300	2825	55	Jun	3,642,290
05-14-91	1125	3475	57	Jul	3,360,890
06-11-91	1425	1760	56	Aug	2,998,104
07-18-91	940	3400	59	Sep	3,315,660
08-19-91	1520	1750	59	Oct	3,095,322
09-10-91	1355	900	57	Nov	2,851,731
10-21-91	1650	1800	56	Dec	3,000,000
11-13-91	1400	2400	56	Jan-92	2,527,968
12-12-91	1045	2000	54	Feb	2,439,338
01-06-92	1150	2000	52	Mar	2,347,738
02-17-92	1135	1960	57	Apr	2,504,597
03-18-92	1425	1585	58	May	2,462,354
04-07-92	1205	1690	58	Jun	1,088,211
05-20-92	1420	1780	58	Jul	3,036,217
06-25-92	1500	600	57	Aug	3,507,595
07-20-92	1600	2000	59	Sep	2,407,920
08-20-92	1455	2366	60	Oct	1,759,680
09-28-92	1350	1350	60	Nov	1,630,080
10-23-92	1415	1200	58	Dec	1,461,600
11-25-92	1140	2225	54		
12-17-92	1120	1431	55		

PACIFICORP - FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - GRIMES WASH
PERMIT # 0022896-001A

Left Fork Grimes Wash

Quality				Quantity	
Date	Time	GPM	Temp. (F)	Month	Gallons/day
Jan-Jul 86		NO DISCHARGE		Jan-Jul 86	NO DISCHARGE
Aug				Aug	76,296
Sep-Dec 86		NO DISCHARGE		Sep-Dec 86	NO DISCHARGE
Jan-Dec 87		NO DISCHARGE		Jan-Dec 87	NO DISCHARGE
Jan-Dec 88		NO DISCHARGE		Jan-Jul 88	NO DISCHARGE
Jan-Sep 89		NO DISCHARGE		Jan-Sep 89	NO DISCHARGE
10-25-89	1440	245	54	Oct	336,644
11-14-89	1410	245	55	Nov	83,093
12-11-89	1055	240	52	Dec	216,385
01-15-90	1245	240	56	Jan 90	168,554
02-19-90	1320	240	56	Feb	410,975
03-12-90	1030	450	55	Mar	304,631
04-16-90	1235	526	56	Apr	109,490
05-14-90	1130	209	54	May	96,358
06-19-90	1015	450	56	Jun	127,178
07-23-90	1100	380	55	Jul	244,290
08-21-90	1020	450	56	Aug	146,619
09-24-90	1025	5	56	Sep	110,930
10-08-90	1130	500	55	Oct	173,825
11-12-90	1200	20	56	Nov	27,686
12-17-90	1155	1	56	Dec	42,266
01-21-91	1210	450	54	Jan 91	22,039
02-05-91	1500	526	55	Feb	95,514
02-27-91	1145	24	55	Mar	130,306
03-13-91	1100	550	48	Apr	201,866
03-21-91	1220	535	48	May	339,470
04-09-91	1605	450	50	Jun	144,145
05-28-91	1600	20	57	Jul	190,904
06-05-91	1445	6	56	Aug	266,565
07-16-91	1515	3	59	Sep	232,793
08-27-91	1505	550	57	Oct	78,507
09-12-91	1100	550	59	Nov	211,935
10-08-91	1440	13	58	Dec	133,975
11-04-91	1230	550	53	Jan-92	208,766
12-10-91	1310	7	51	Feb	146,352
01-06-92	1035	6	50	Mar	113,957
02-04-92	1345	7	53	Apr	191,280
03-19-92	1515	150	53	May	259,297
04-28-92	1450	11.6	57	Jun	140,003
05-04-92	1600	12	56	Jul	311,827
06-16-92	1420	15	56	Aug	1,435,584
07-22-92	1100	550	58	Sep	2,297,987
08-11-92	1400	811	61	Oct	1,423,935
09-21-92	1230	1800	57	Nov	1,552,140
10-21-92	1430	925	59	Dec	1,523,808

WILBERG MINE DISCHARGE - GRIMES WASH

PACIFICORP - FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - GRIMES WASH
PERMIT # 0022896-001A

Left Fork Grimes Wash

		Quality			Quantity
Date	Time	GPM	Temp. (F)	Month	Gallons/day
11-03-92	1515	550	55		
12-18-93	1035	1200	56		

WILBERG MINE DISCHARGE - MILLER CANYON

PACIFICORP - FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - MILLER CANYON
PERMIT # 0022896-004A

Miller Canyon Breakout

	Quality				Quantity
Date	Time	GPM	Temp. (F)	Month	Gallons/day
01-21-91	1105	10	46	Feb	68,184
02-25-91	1115	77	53	Mar	93,600
03-13-91	1030	65	54	Apr	NO DISCHARGE
April	NO DISCHARGE			May	12,240
05-28-91	1515	9	60	Jun	17,280
06-06-91	1545	12	58	Jul	20,880
07-16-91	1430	15	64	Aug	27,360
08-27-91	1410	18	58	Sep	18,360
09-12-91	950	18	52	Oct	20,160
10-18-91	1455	14	51	Nov	29,520
11-04-91	1145	25	46	Dec	10,800
12-13-91	1045	9	43	Jan-92	11,520
01-20-92	1545	9	42	Feb	17,280
02-04-92	1530	12	47	Mar	18,720
03-19-92	1430	12	56	Apr	22,320
04-10-92	1320	20	54	May	23,040
05-04-92	1450	16	57	Jun	18,000
06-29-92	1131	5	62	Jul	24,480
07-22-92	1215	18	63	Aug	23,760
08-11-92	1325	18	67	Sep	24,000
09-09-92	1225	25	64	Oct	31,680
10-22-92	1400	20	55	Nov	30,240
11-17-92	1230	24	48	Dec	14,400
12-18-92	1145	10	34		

DEER CREEK IN-MINE

PACIFICORP FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK IN-MINE QUALTIY & LONG TERM FLOW

Date	Location	QUALITY Time	Temp.(F)	GPM	Date	LONG TERM FLOW(GPM) Site #1	Site #2
10-07-87	3rd N XC-41	1350	50	4.1	12-15-88		38.0
10-07-87	EM - 3	1450	53	1.8	03-08-89		25.0
12-14-87	EM - 3	1510	57	1.6	06-06-89		16.7
12-14-87	3rd SB XC-21	1444	55	0.5	09-14-89		8.6
03-25-88	3rd N XC-41	1300	54	3.8	12-06-89		4.5
03-25-88	3rd SB XC-21	1245	56	0.4	03-09-90		11.9
07-30-88	3rd N XC-41	1450	54	3.7	06-29-90		6.0
07-30-88	1st W XC-25	1420	56	103.7	09-07-90		3.3
10-26-88	3rd N XC-41	1100	55	3.5	12-19-90		5.0
10-26-88	1st W XC-25	1045	56	120.7	03-05-91		4.3
12-15-88	3rd N XC-41	1040	56	4.1	06-13-91		4.9
12-15-88	1st W XC-25	1050	55	112.2	09-04-91	0.4	6.3
12-15-88	TW-10	1200	44	38.0	12-05-91	0.5	6.0
03-08-89	3rd N XC-41	1410	54	3.1	03-20-92	0.4	6.0
03-08-89	1st W XC-25	1430	52	99.6	06-25-92	0.5	6.0
03-08-89	TW-10	1400	44	25.0	09-11-92	0.5	6.0
06-06-89	1st W XC-25	1000	54	10.7	12-09-92	0.4	5.6
06-06-89	TW-10	1030	48	16.7			
09-14-89	1st W XC-25	1040	54	0.4			
09- -89	TW-10	1115	43	8.6			
09-14-89	3rd N XC-41	1100	50	2.6			
12-06-89	TW-10	1130	46	4.5			
12-06-89	3rd N XC-41	1115	52	3.2			
03-09-90	TW-10	1110	48	11.9			
03-09-90	3rd N XC-41	1120	55	1.4			
03-09-90	1st R Fault	950	52	300.0			
03-26-90	1st R Fault	855	46	300.0			
04-03-90	3rd N Slope	915	46	15.0			
04-10-90	2nd R XC-38	1000	50	200.0			
06-29-90	2nd R XC-38	1130	54	781.0			
06-29-90	TW-10	1000	46	6.0			
09-07-90	2nd R XC-38	1630	55	270.0			
09-07-90	TW-10	1605	55	3.3			
12-19-90	2nd R XC-38	1020	57	122.5			
12-19-90	TW-10	930	56	5.0			
03-05-91	2nd R XC-38	1055	51	150.0			
03-05-91	TW-10	945	42	4.3			
03-05-91	4th R XC-26	1030	54	1.9			
06-13-91	TW-10	1030	42	4.9			
06-13-91	5th R XC-38	1100	48	NA			
09-04-91	TW-10	1220	44	6.3			
09-04-91	M. NORTH-WEST	1030	51	0.4			
12-05-91	TW-10	1045	44	6.0			
12-05-91	M. NORTH-WEST	1330	49	0.5			
03-20-92	TW-10	1035	46	6.0			
03-20-92	M. NORTH-WEST	1000	49	0.4			
03-20-92	1ST R.-3RD N.	1105	52	<.1			
06-25-92	TW-10	1250	45	6.0			

DEER CREEK IN-MINE

PACIFICORP FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK IN-MINE QUALTIY & LONG TERM FLOW

		QUALITY				LONG TERM FLOW(GPM)	
Date	Location	Time	Temp.(F)	GPM	Date	Site #1	Site #2
06-25-92	M. NORTH-WEST	1100	50	0.5			
09-11-92	TW-10	1600	49	6.0			
09-11-92	M. NORTH-WEST	1700	52	0.5			
12-09-92	TW-10	1140	46	5.6			
12-09-92	M. NORTH-WEST	900	56	0.4			

Site #1 Main North - Main West
Site #2 3rd North XC-65 2R, TW-10

3rd North XC-41 2R, terminated as of 6/90 (ceased flowing)
2nd R XC-38 B, terminated as 4/91 - inaccessible

PACIFICORP FUEL RESOURCES
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG-COTTONWOOD IN-MINE QUALTIY & LONG TERM FLOW

		QUALITY				LONG TERM FLOW(GPM)		
Date	Location	Time	Temp.(F)	GPM	Date	Site #1	Site #2	Site #3
03-23-88	2nd S XC-11	1330	54	0.07	03-08-90	0.08	0.18	
03-23-88	4th E XC-24	1445	54	0.30	06-28-90	0.07	0.18	
07-27-88	2nd S XC-11	1020	56	0.03	09-06-90	0.07	0.16	
07-27-88	4th E XC-24	1320	55	0.27	12-20-90	0.06	0.13	
10-26-88	2nd S XC-11	1015	56	0.08	03-27-91	0.07	0.13	
10-26-88	4th E XC-24	1330	58	0.25	06-12-91	0.07	0.12	
12-15-88	2nd S XC-11	1355	53	0.08	09-04-91	0.07	0.12	
12-15-88	4th E XC-24	1330	54	0.23	12-10-92	0.06	0.11	
03-29-89	2nd S XC-11	1240	55	0.08	03-04-92	0.06	0.11	
03-29-89	4th E XC-24	1505	54	0.21	06-26-92	*	0.10	
07-17-89	2nd S XC-11	830	56	0.07	09-16-92	0.07	**	
07-17-89	4th E XC-24	840	56	0.20	12-09-92	frozen		
09-14-89	2nd S XC-11	1015	54	0.08				
09-14-89	4th E XC-24	1045	53	0.20				
12-04-89	2nd S XC-11	945	51	0.08				
12-04-89	4th E XC-24	1240	54	0.20				
03-08-90	2nd S XC-11	930	54	0.08				
03-08-90	4th E XC-24	945	55	0.18				
06-28-90	2nd S XC-11	1300	55	0.07				
06- -90	4th E XC-24	1320	55	0.08				
09-06-90	2nd S XC-11	1220	56	0.07				
09-06-90	4th E XC-24	1035	56	0.16				
12-20-90	2nd S XC-11	1120	56	0.06				
12-20-90	4th E XC-24	1335	56	0.13				
03-27-91	2nd S XC-11	915	54	0.07				
03-27-91	4th E XC-24	1120	55	0.13				
06-12-91	2nd S XC-11	1030	55	0.07				
06-12-91	4th E XC-24	1145	56	0.12				
09-04-91	2nd S XC-11	1130	53	0.07				
09-04-91	4th E XC-24	1200	54	0.12				
12-10-92	2nd S XC-11	1045	54	0.06				
12-10-92	4th E XC-24	1120	53	0.11				
03-04-92	2nd S XC-11	1355	51	0.06				
03-04-92	4th E XC-24	1230	55	0.11				
06-26-92	4th E XC-24	1300	54	0.1				
06-26-92	12th R XC-02	1520	54	1.4				
09-16-92	2nd S XC-11	1430	55	0.07				
09-16-92	8th R XC-8.5	1405	54	0.5				
12-09-92	2nd S XC-11	1230		frozen				
12-09-92	7th R XC-12	1106	56	2.0				

Site #1 2nd South cross cut 11
Site #2 8th R XC-8.5
* sampling hose plugged
** 4th East cross cut 24, terminated as of 6/92 (ceased flowing)

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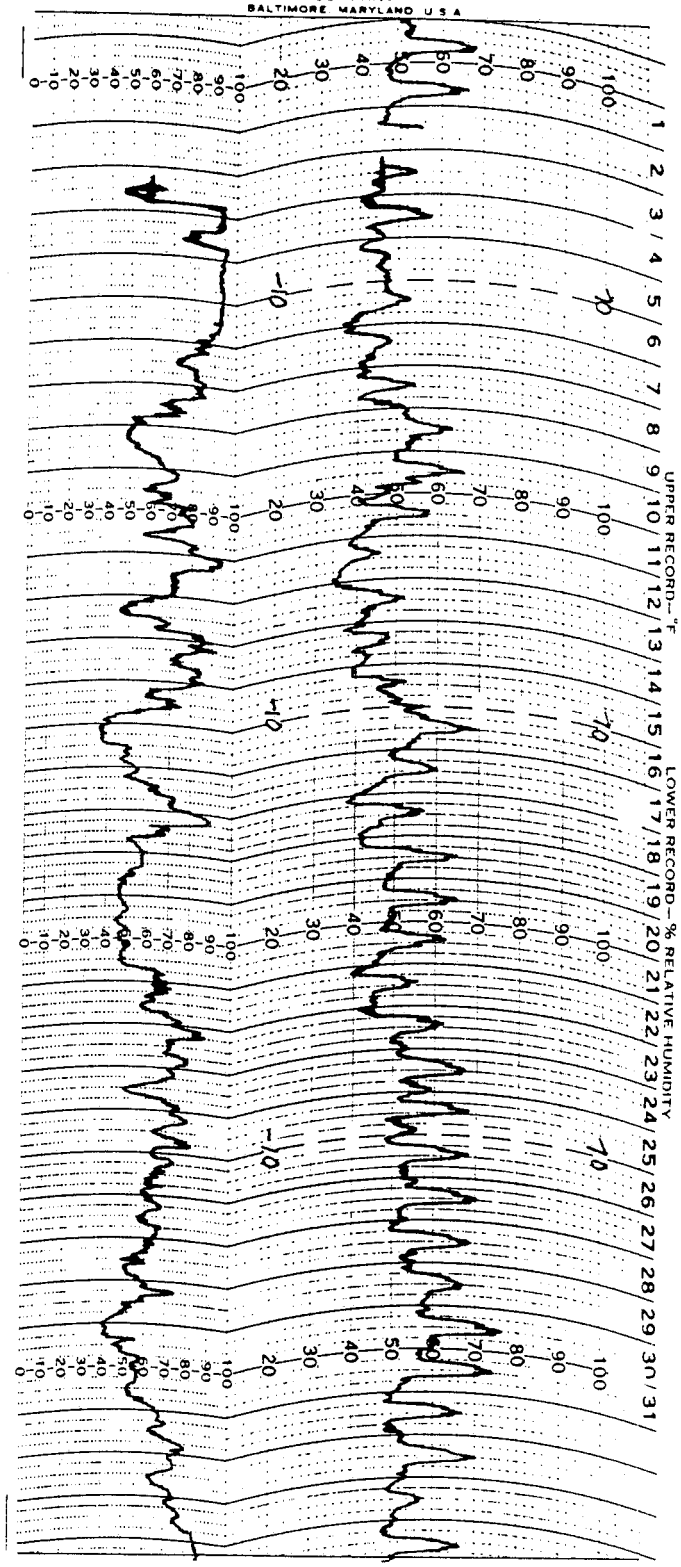
HYGROTHERMOGRAPH
CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE MARYLAND U.S.A.



OBSERVER [illegible] ON [illegible] AM PM 19[illegible]

STATION [illegible] OFF 1045 AM PM 2-7 1992

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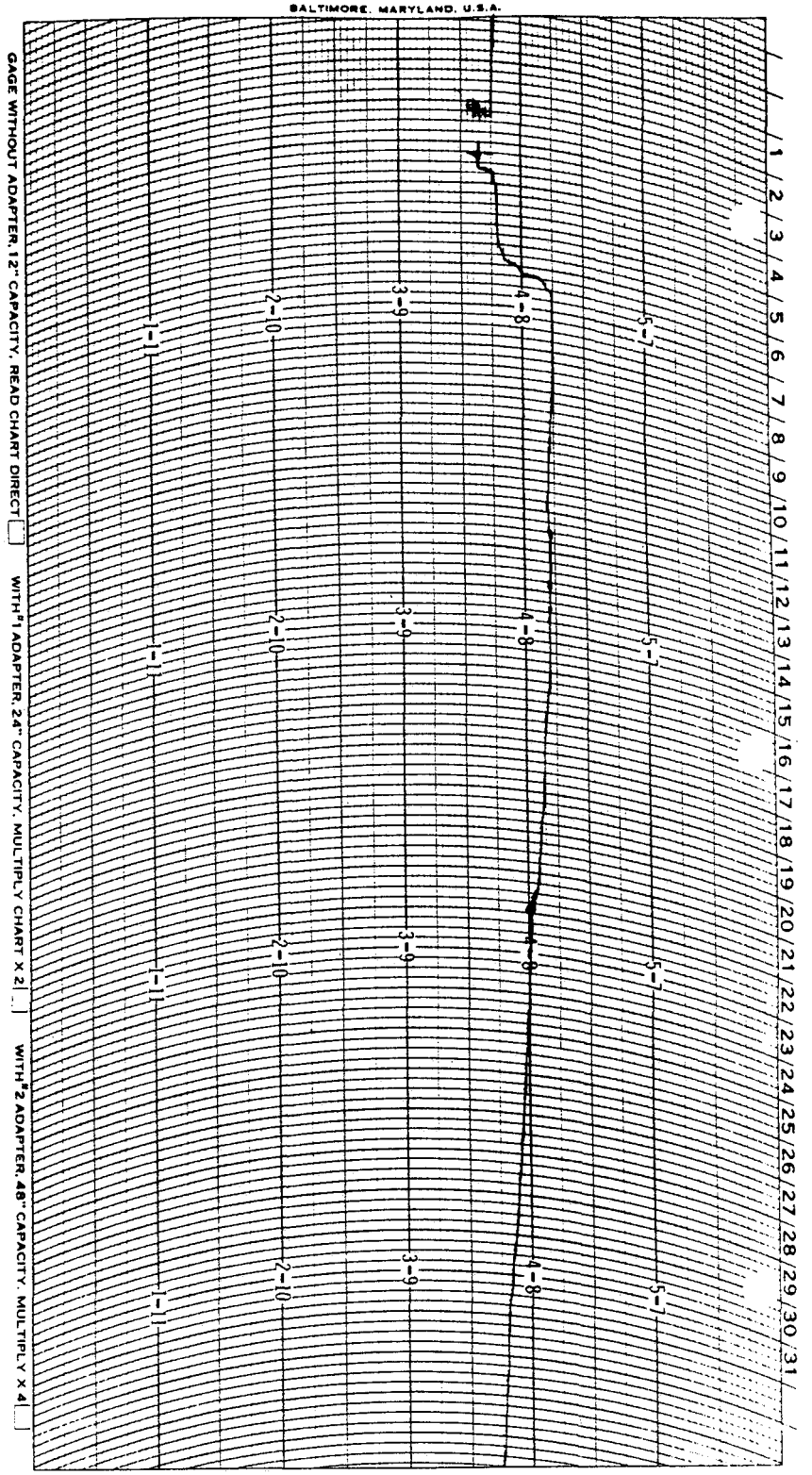
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT ☐ WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 ☐ WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 ☐

OBSERVER _____ ON _____ A.M. P.M. _____ 19

STATION _____ OFF 10:40 A.M. P.M. 2-7 19 92

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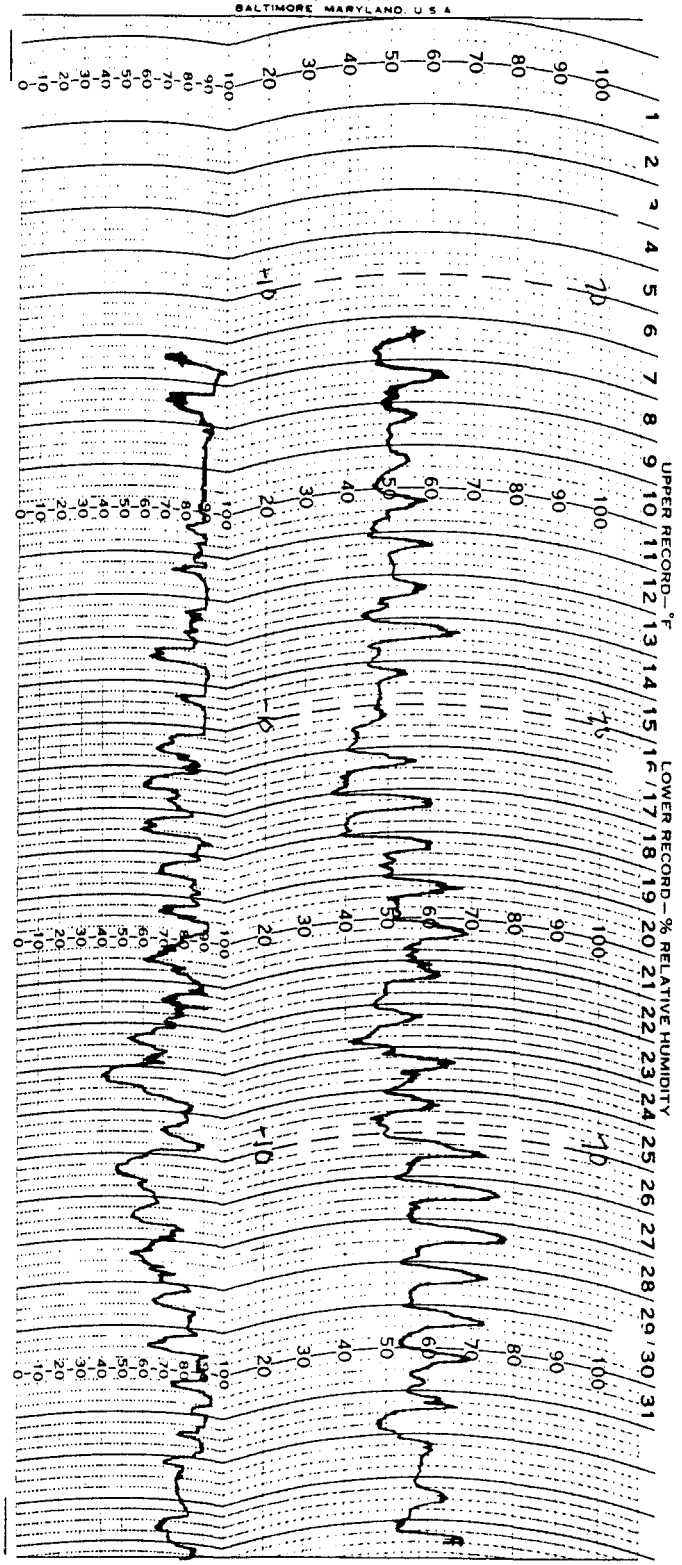
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER Semborski ON 1045 AM/PM 3/7 1992

STATION East Mountain OFF 1130 AM/PM 3/6 1992

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CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
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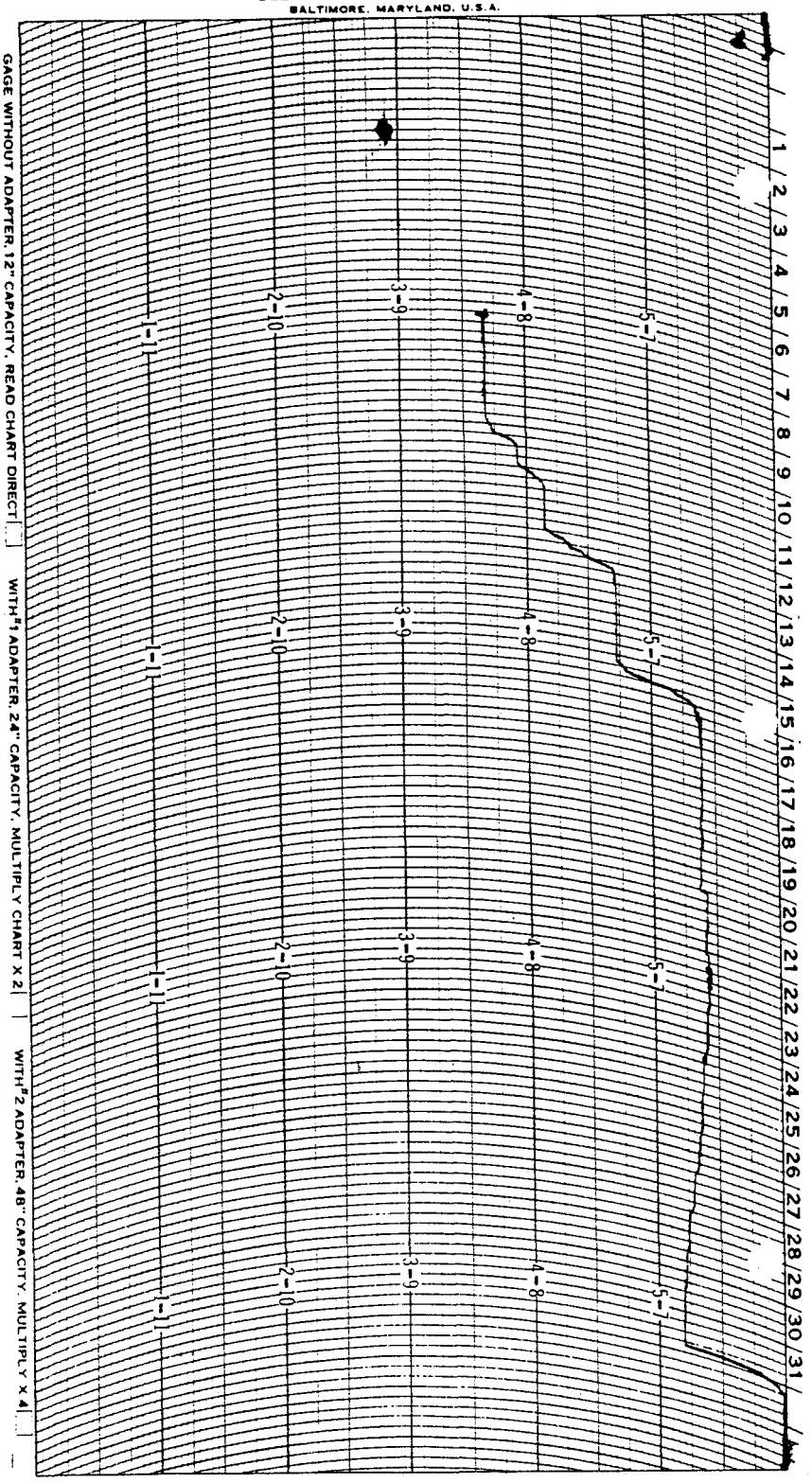

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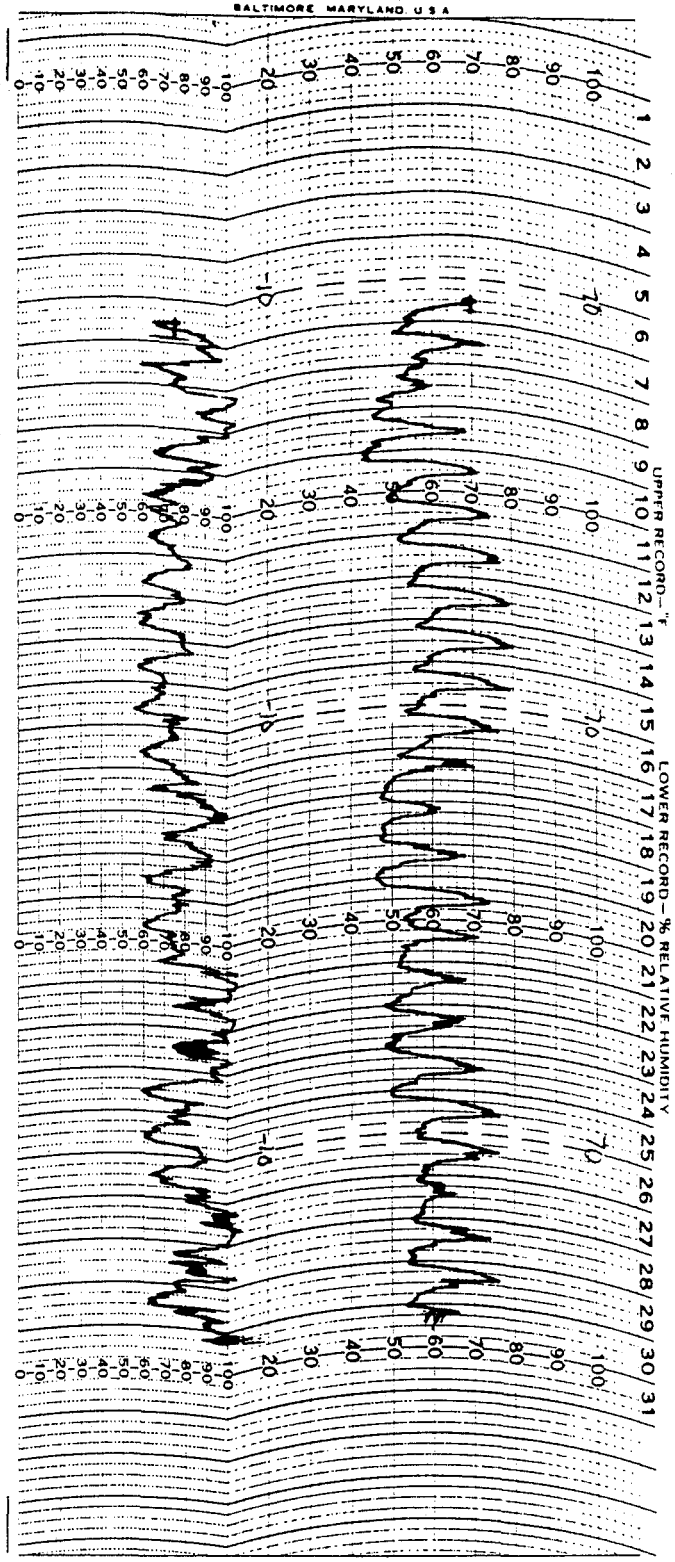
OBSERVER SEMBORSKI ON 2/7 AM PM 1040 1992

STATION EAST MOUNTAIN OFF 3-6 AM PM 1125 1992

CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE MARYLAND U.S.A.

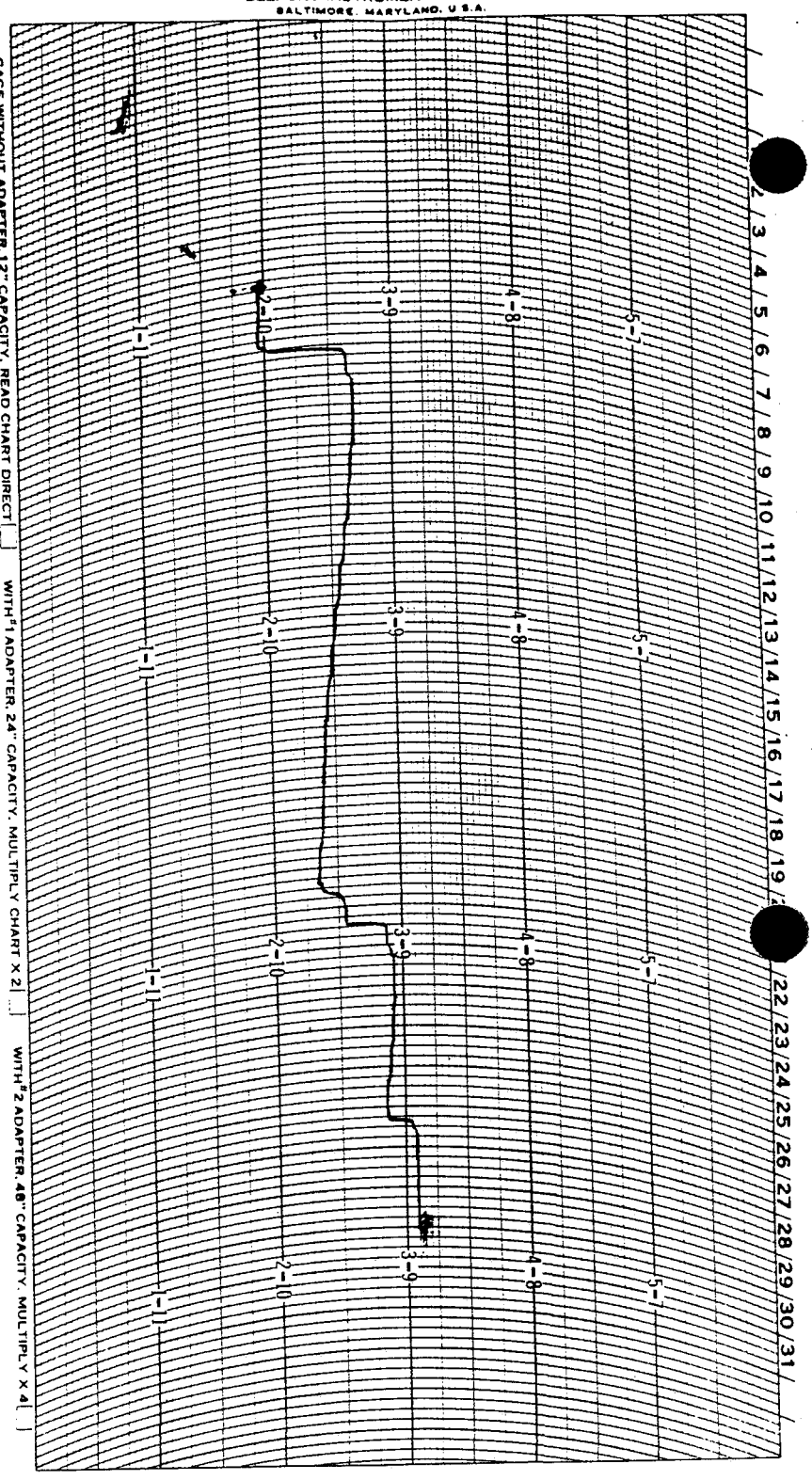


OBSERVER SEMBORSKI ON 1130 AM PM 3-6 1992
STATION EAST MOUNTAIN OFF 1020 AM PM 3-30 1992

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT [ ]

WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 [ ]

WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 [ ]

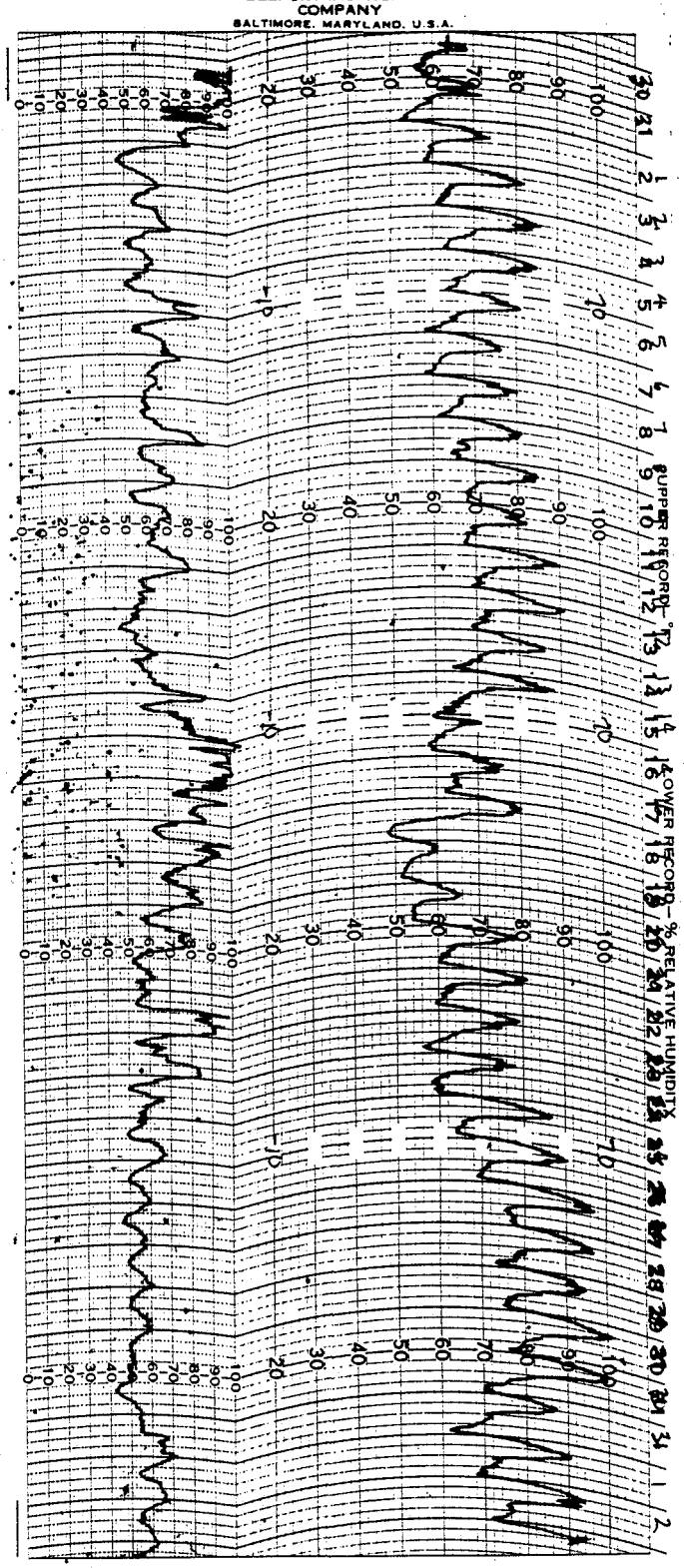
OBSERVER SEMBORSKI

STATION EAST MOUNTAIN

ON 1125 AM/PM 3-6 1992

OFF 1015 AM/PM 3-30 1992

CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER SEMBORSKI ON 1020 A.M. P.M. 3-30 1992
STATION EAST MOUNTAIN OFF 1155 A.M. P.M. 5/4 1992

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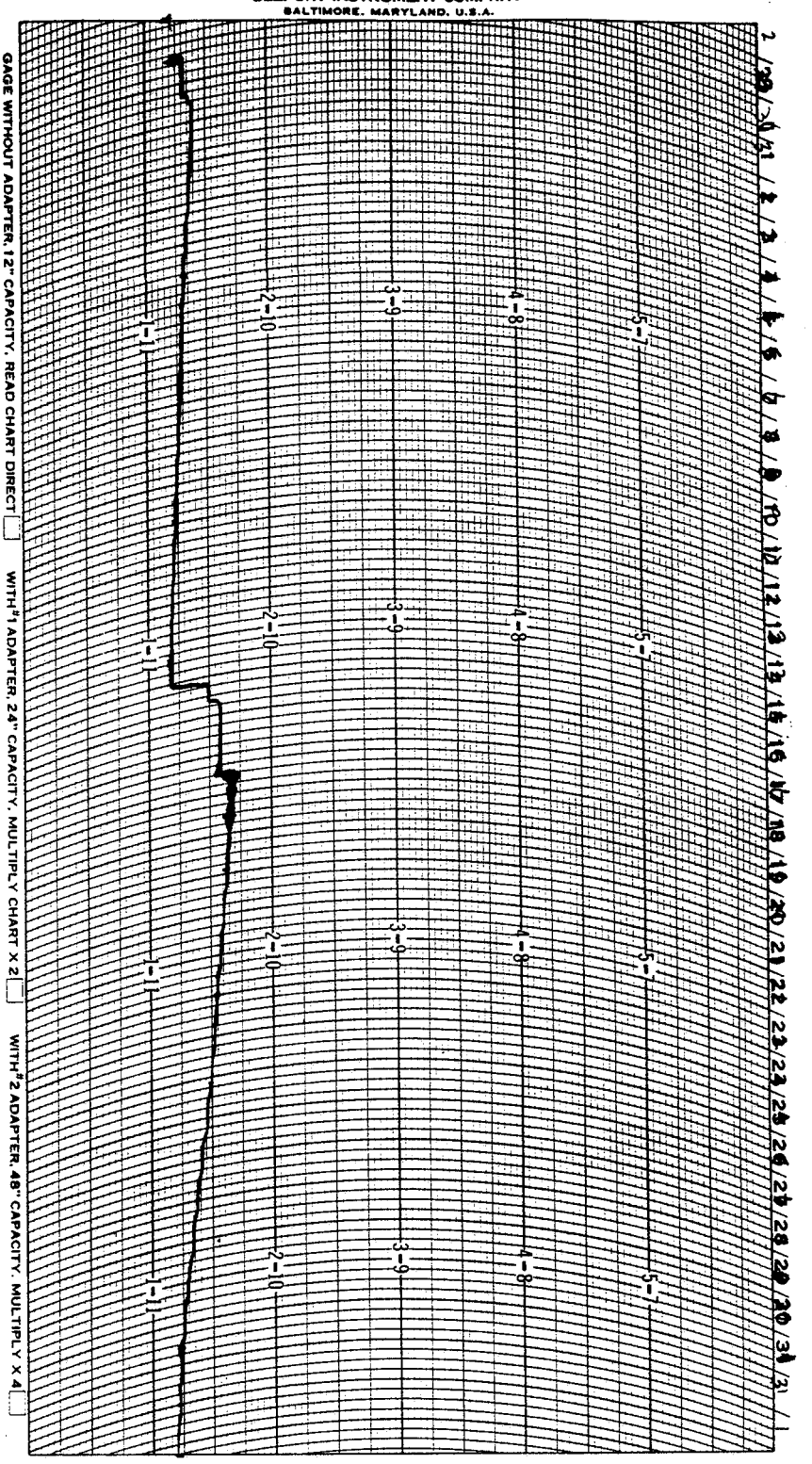
CHART NO. 15008

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

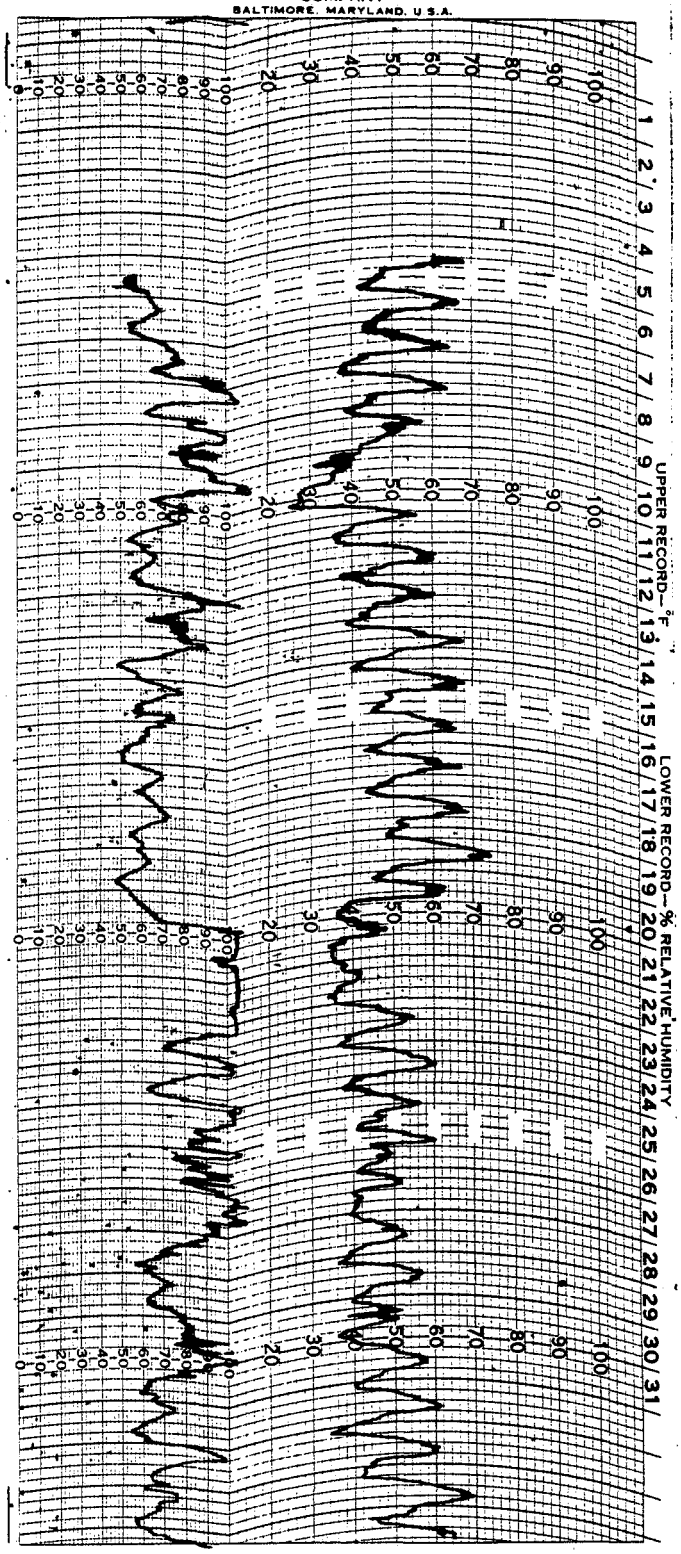
BALTIMORE, MARYLAND, U.S.A.



OBSERVER SEMBORSKI ON 1015 A.M. P.M. 3/30 1992

STATION EAST MOUNTAIN OFF 1150 A.M. P.M. 5/4 1992

CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Sembosski/Housekeeper ON 1155 A.M. P.M. 5/4 1992
STATION East Mountain OFF 1:40 A.M. P.M. 6/3 1992

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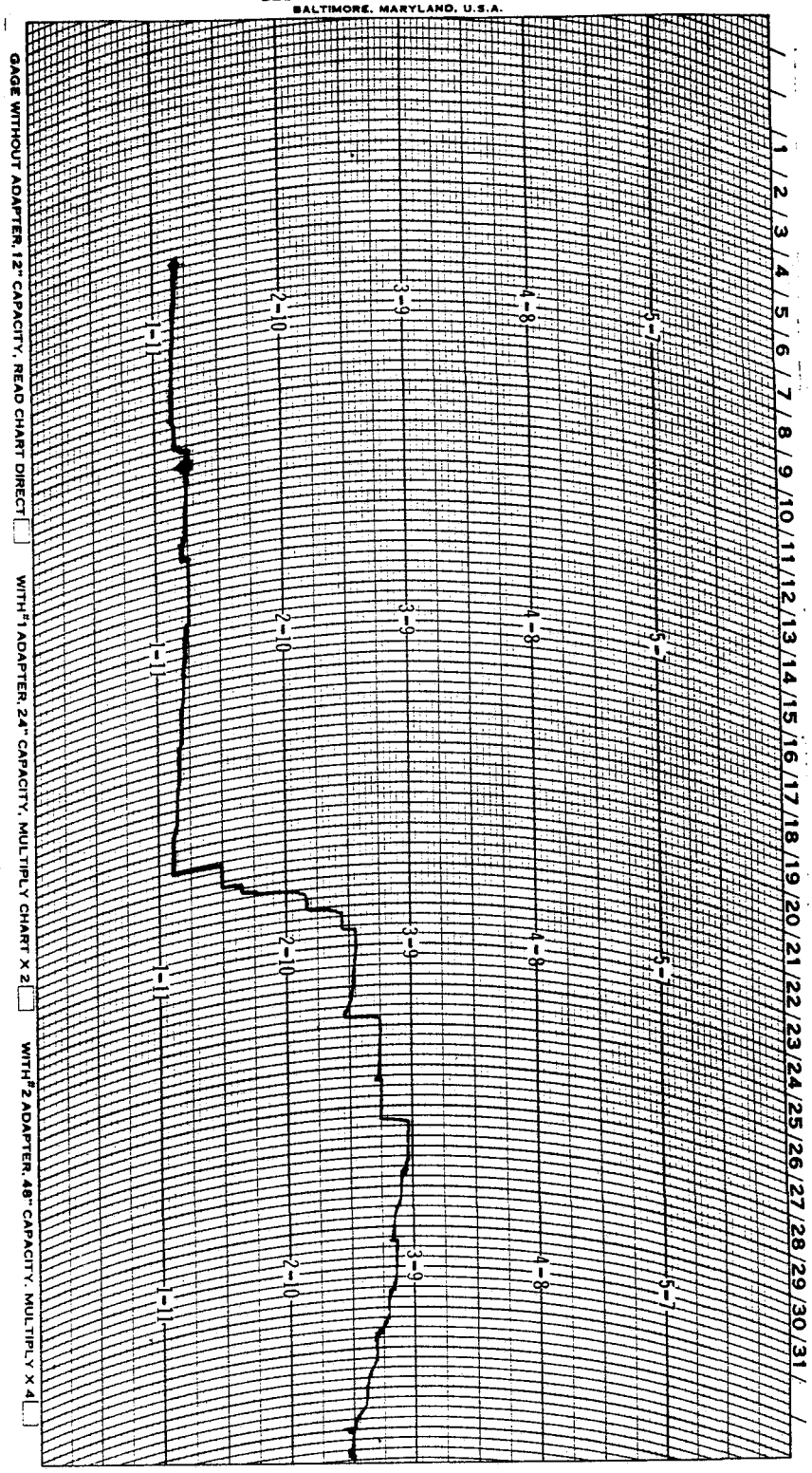
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Semborski / Housekeeper ON 1150 AM PM 5/4 1992

STATION _____ OFF 1330 AM PM 6/3 1992

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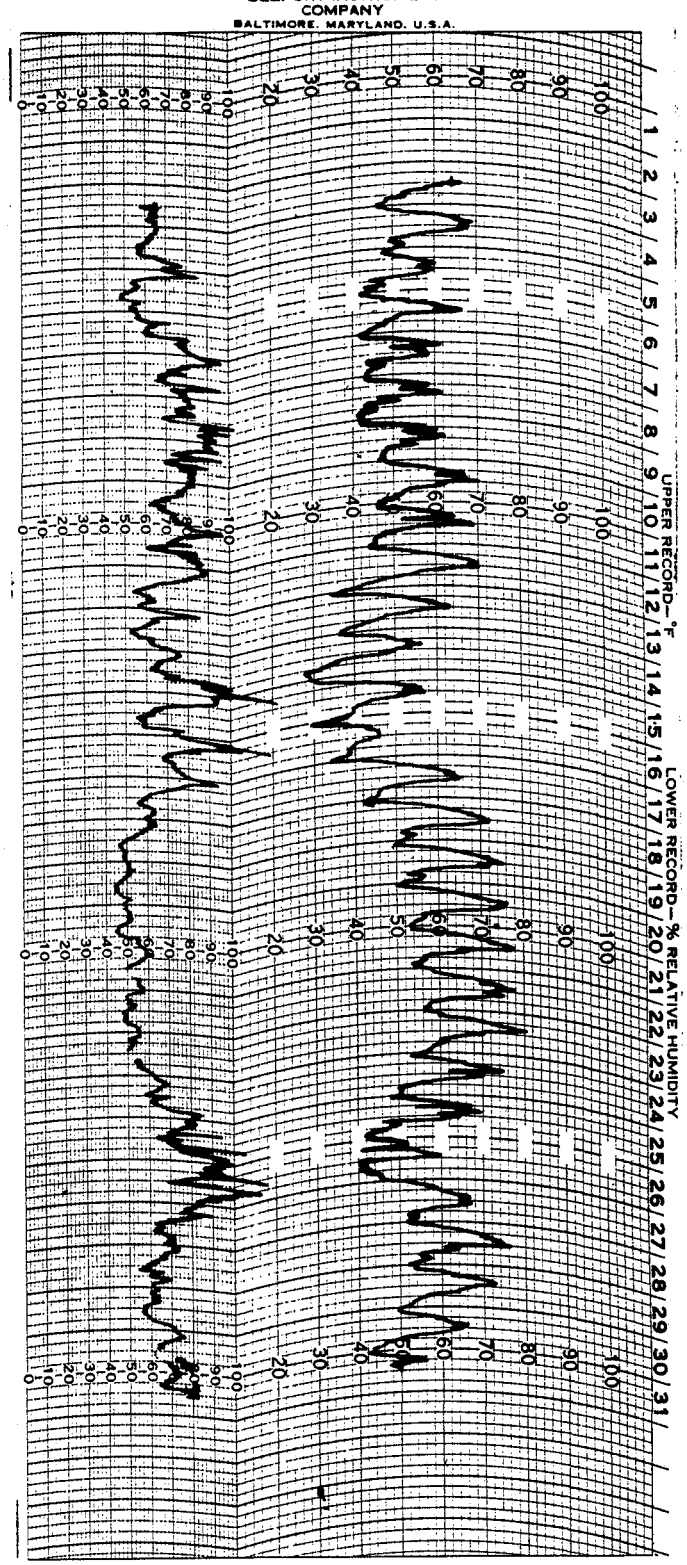
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER Housekeeper/Sambonski ON 1:40 A.M. P.M. 6/3 19 92

STATION East Mountain OFF 5:10 A.M. P.M. 7/1 19 92

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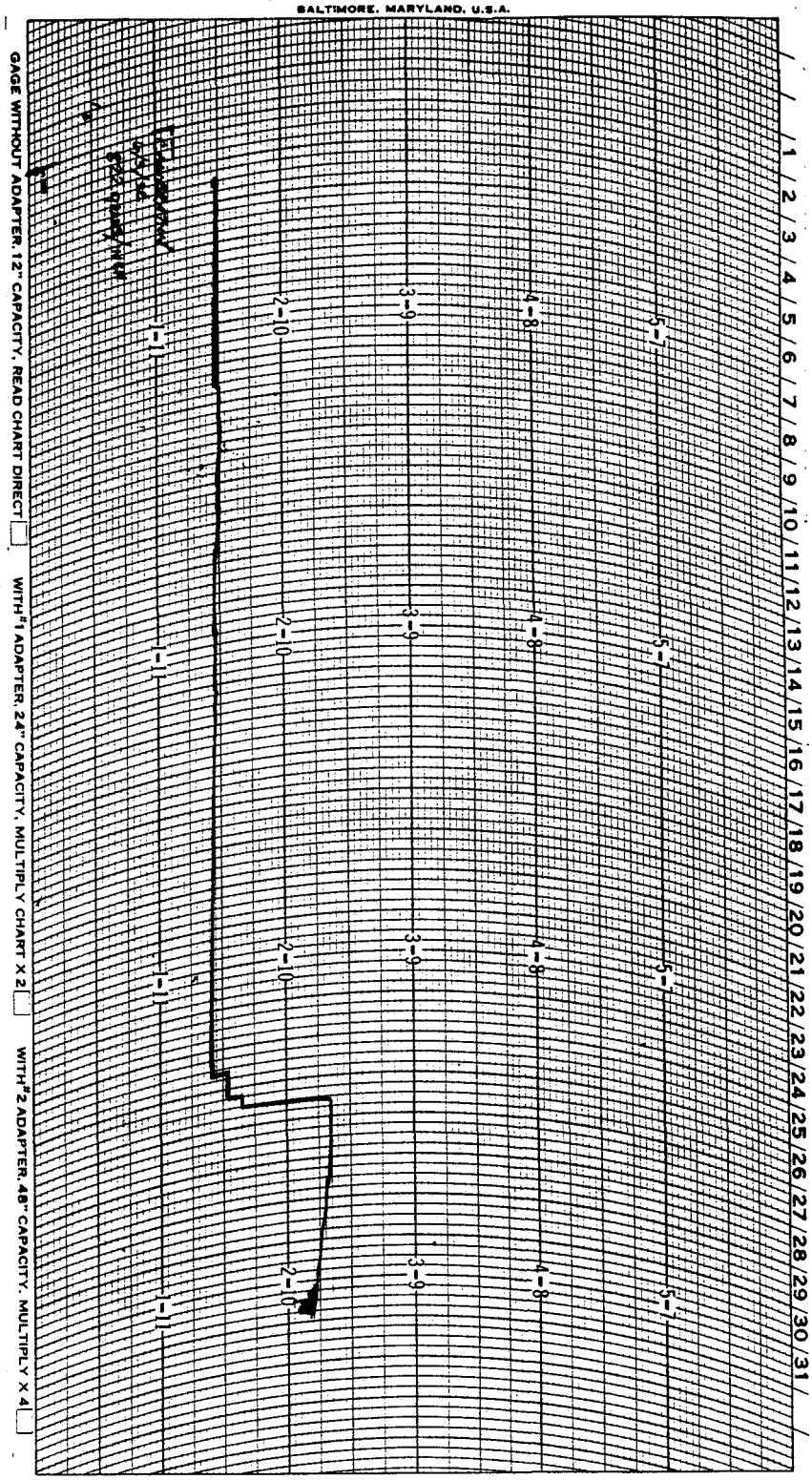
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER SEMBORSKI/HOUSKEEPER ON 1335 A.M. P.M. 6/3 19 92

STATION _____ OFF 1503 A.M. P.M. 7/1 19 92

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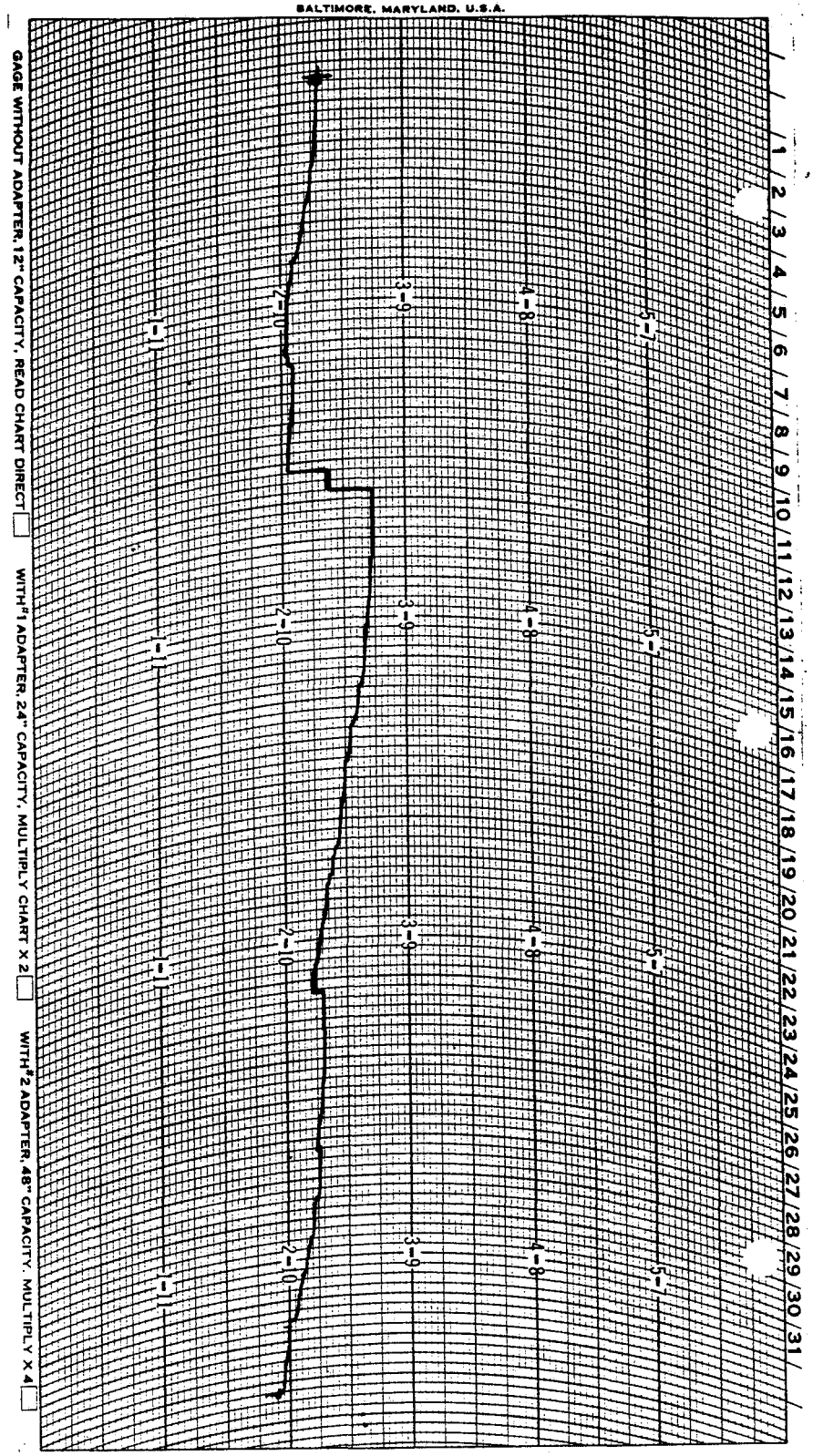
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Housekeeper

STATION

ON 15:04 A.M. P.M. 7/1 19 92

OFF 9:58 A.M. P.M. 8/3 19 92

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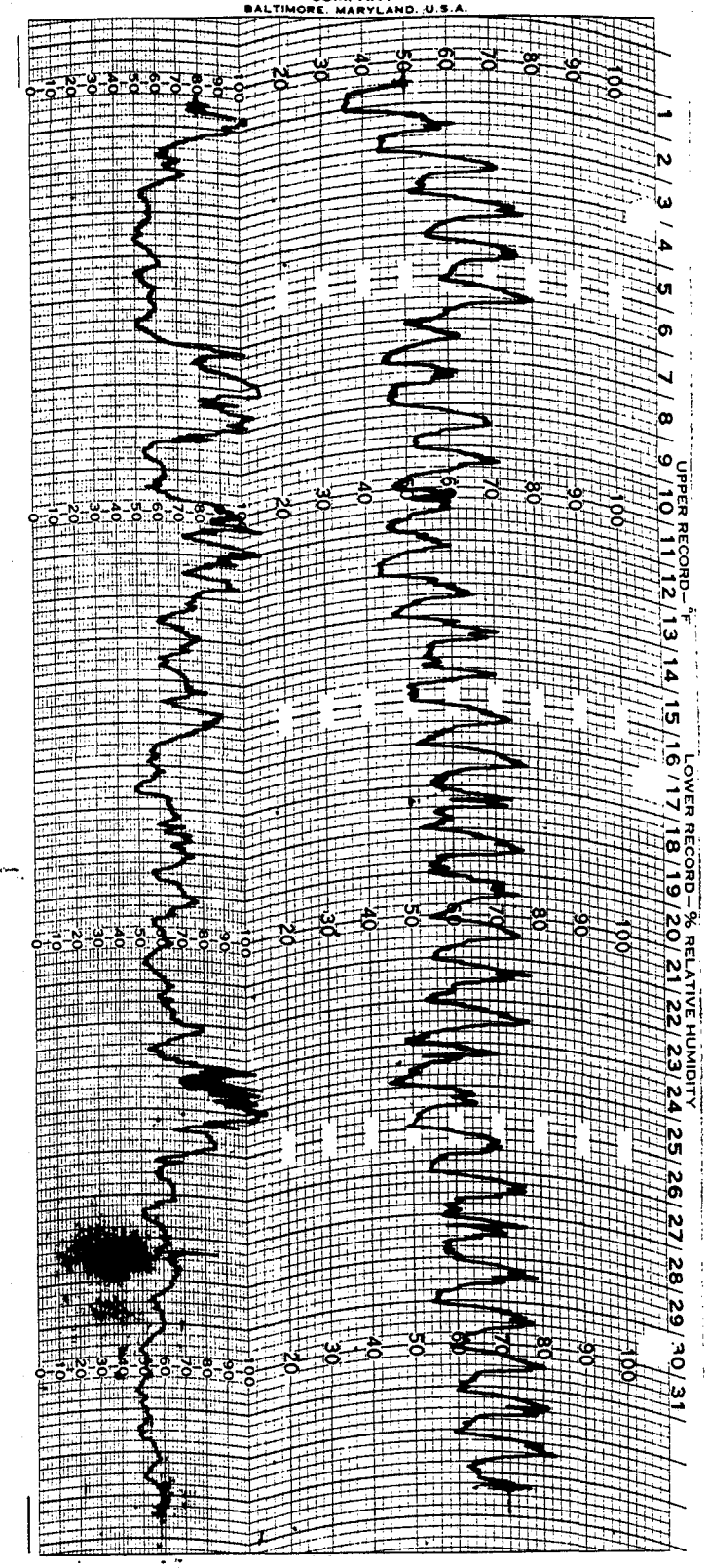
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

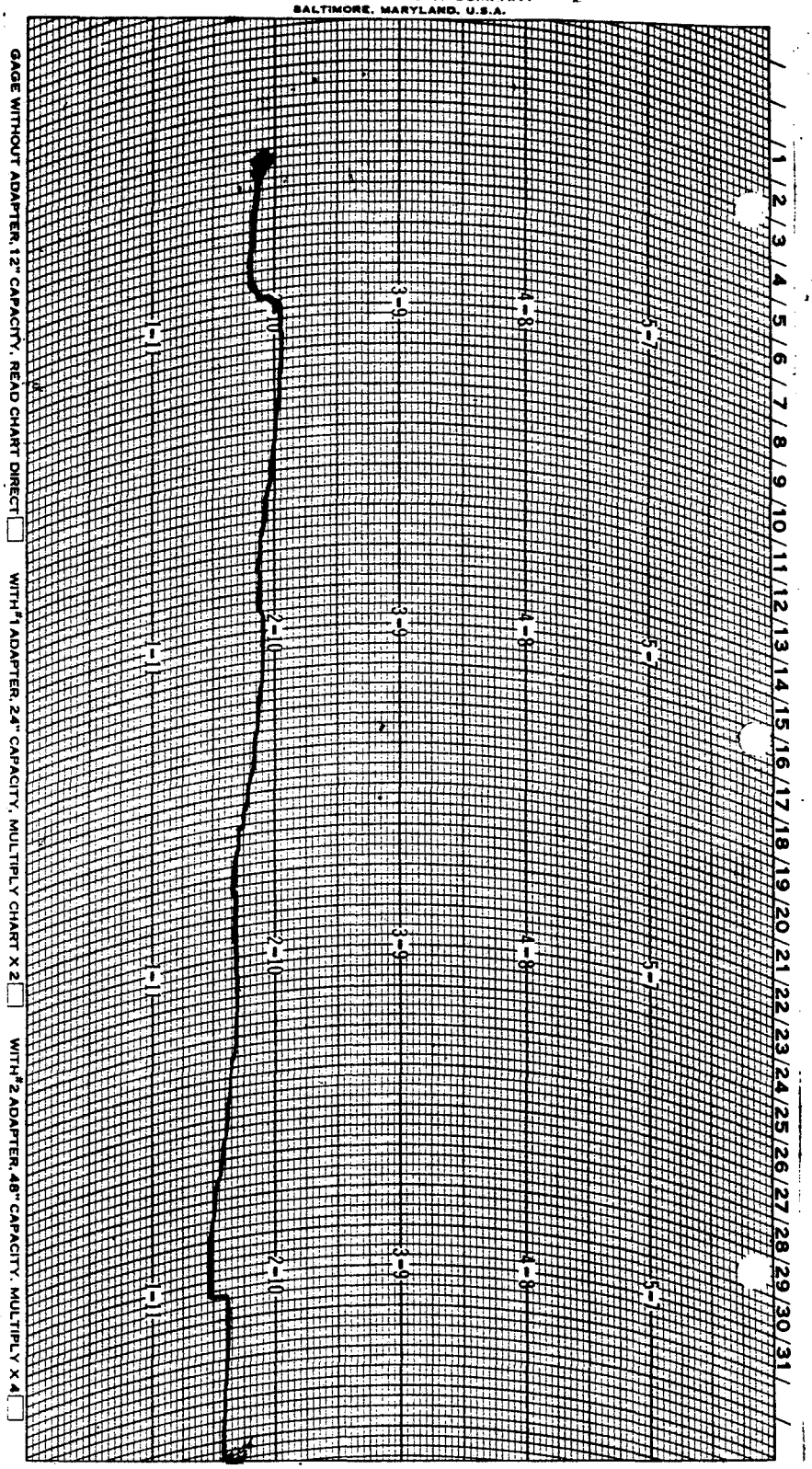
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Housekeeper ON 15:11 A.M. P.M. 7/1 19 92

STATION _____ OFF 10:06 A.M. P.M. 8-3 19 92

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT ☐ WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 ☐ WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 ☐

OBSERVER Housekeeper ON 9:59 A.M. P.M. 8-3 19 92

STATION _____ OFF 11:10 A.M. P.M. 9-4 19 92

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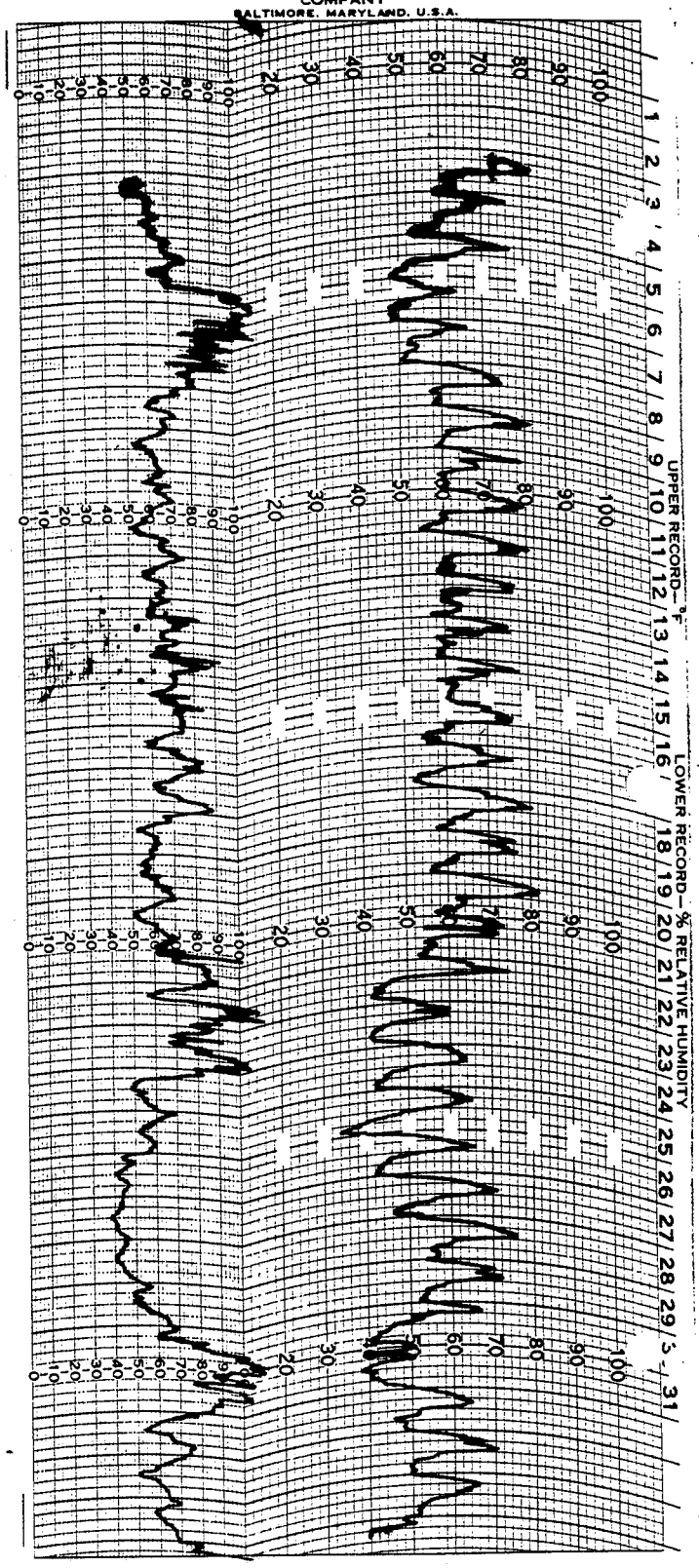
HYGROTHERMOGRAPH
CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Housekeeper ON 10:07 A.M. P.M. 8-3 19 92

STATION _____ OFF 11:12 A.M. P.M. 9-4 19 92

92

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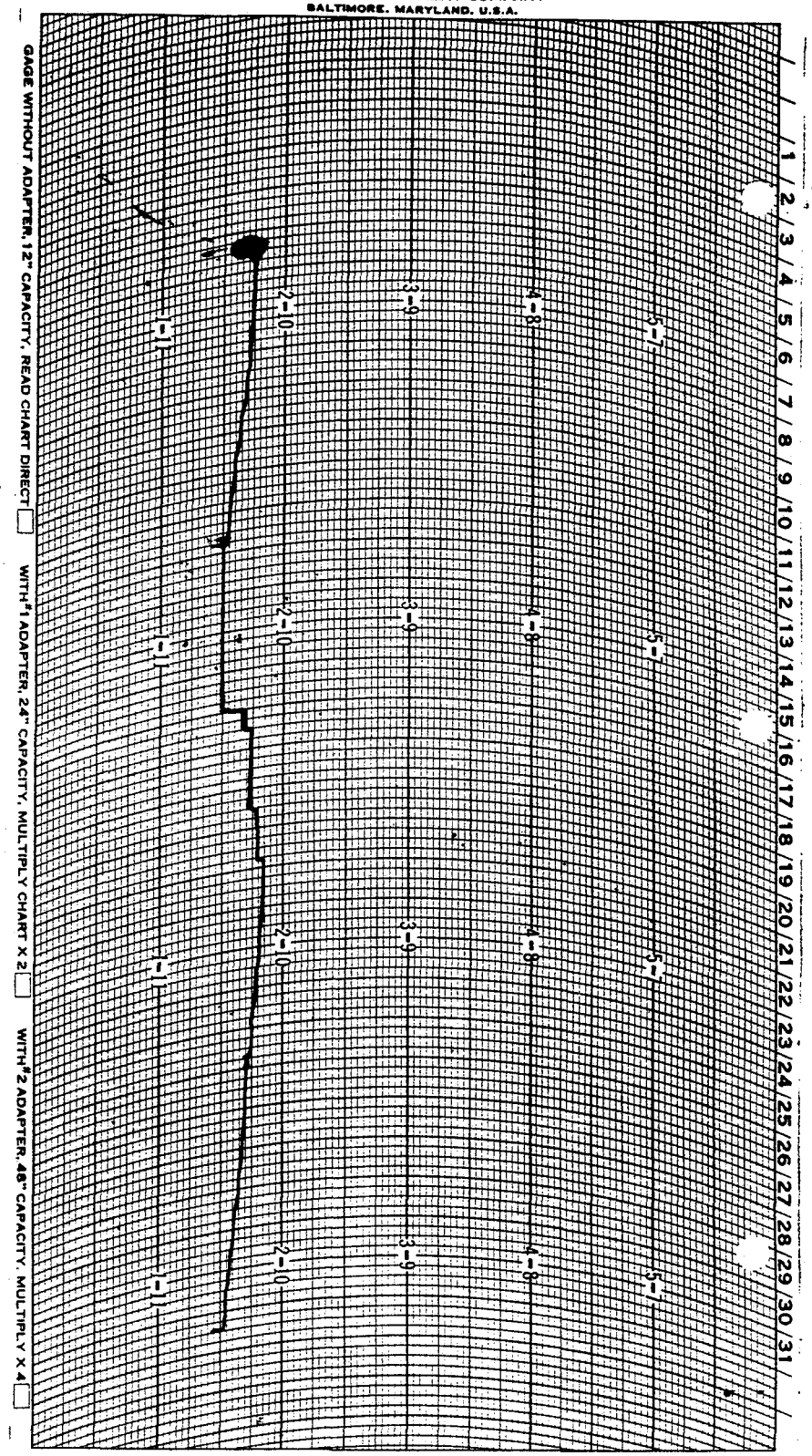
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Karl R. Houstecek ON 11:11 A.M. P.M. 9-4 1992

STATION _____ OFF 3:15 A.M. P.M. 10-1 1992

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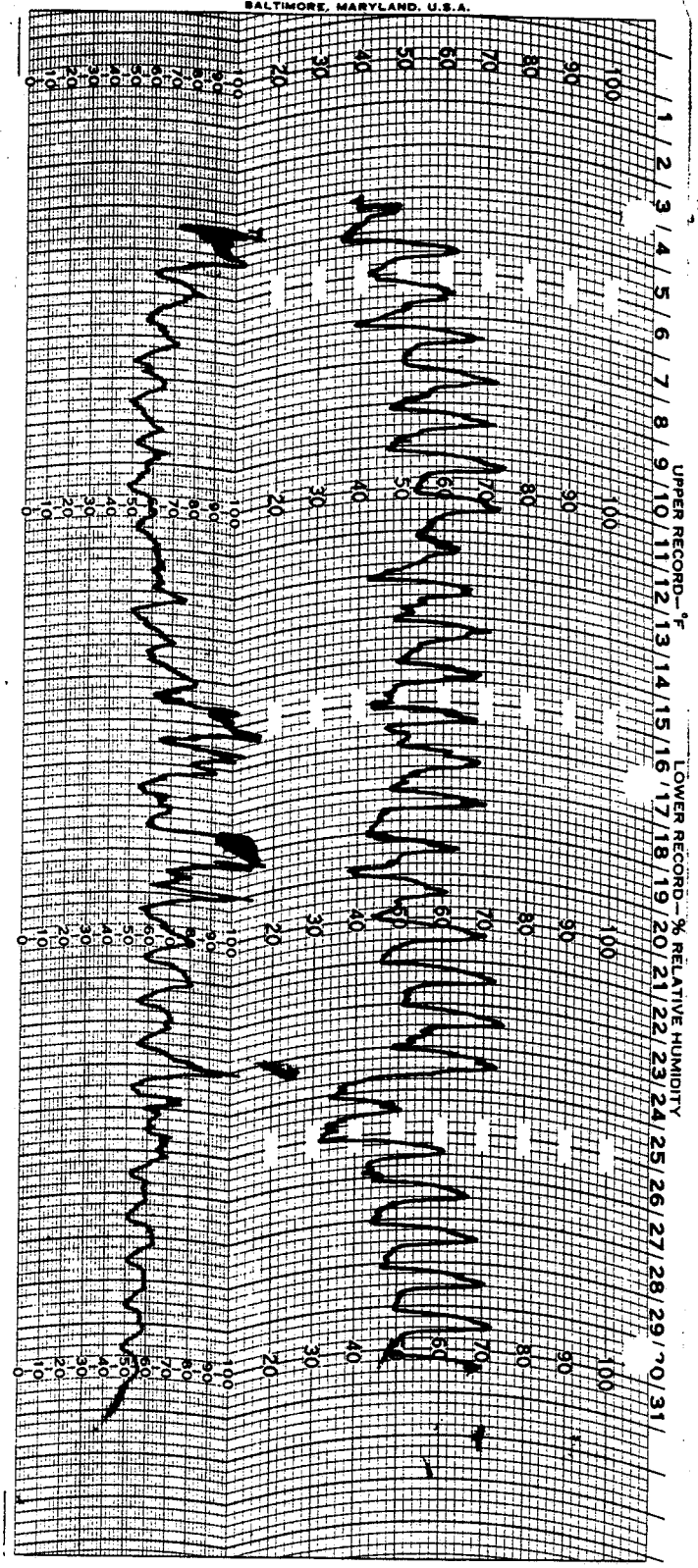
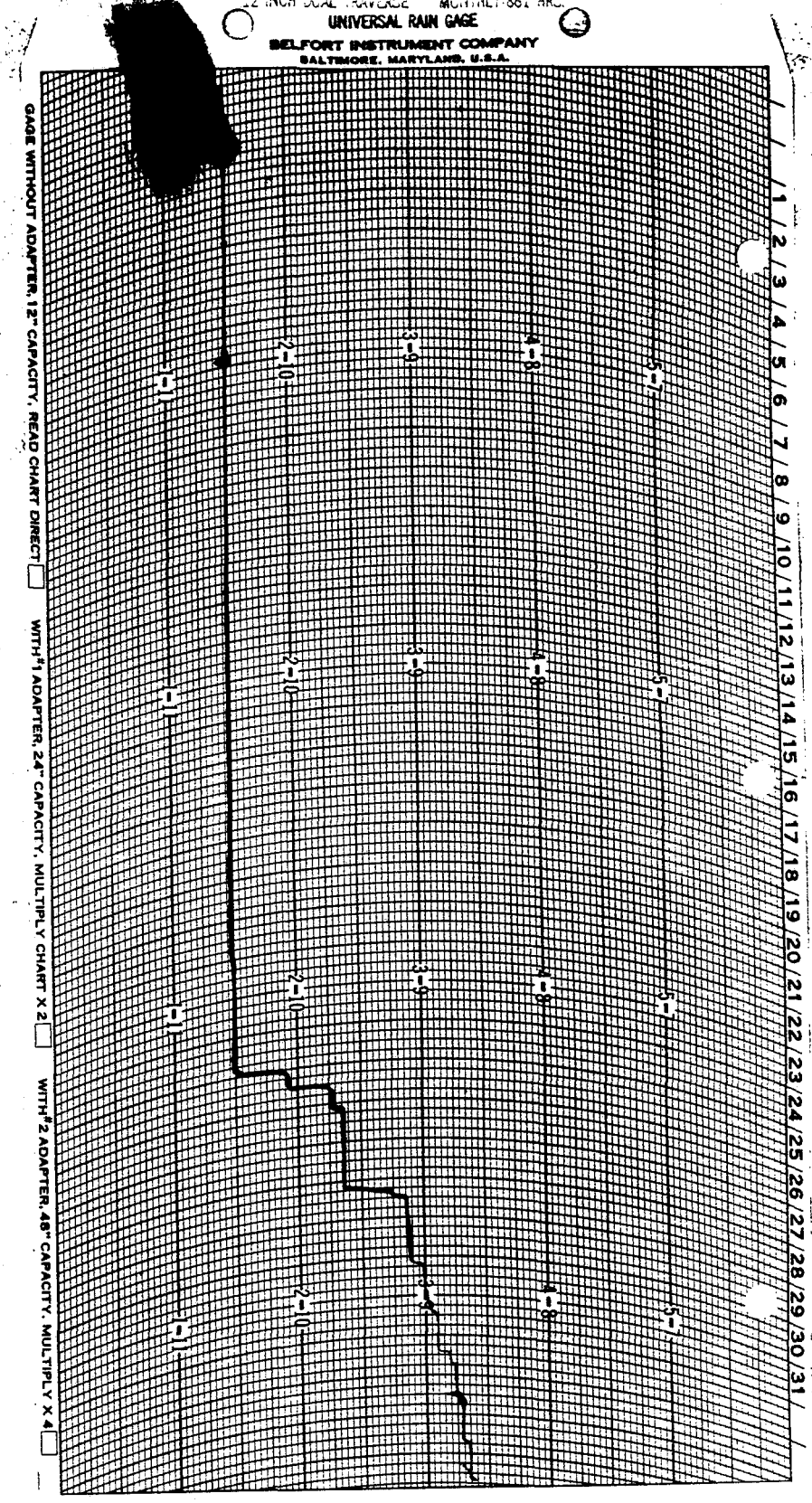
HYGROTHERMOGRAPH
CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Karl R. Houstoun ON 9-4 19 92 A.M. P.M. 11:11

STATION _____ OFF 3:20 A.M. P.M. 10-1 19 92



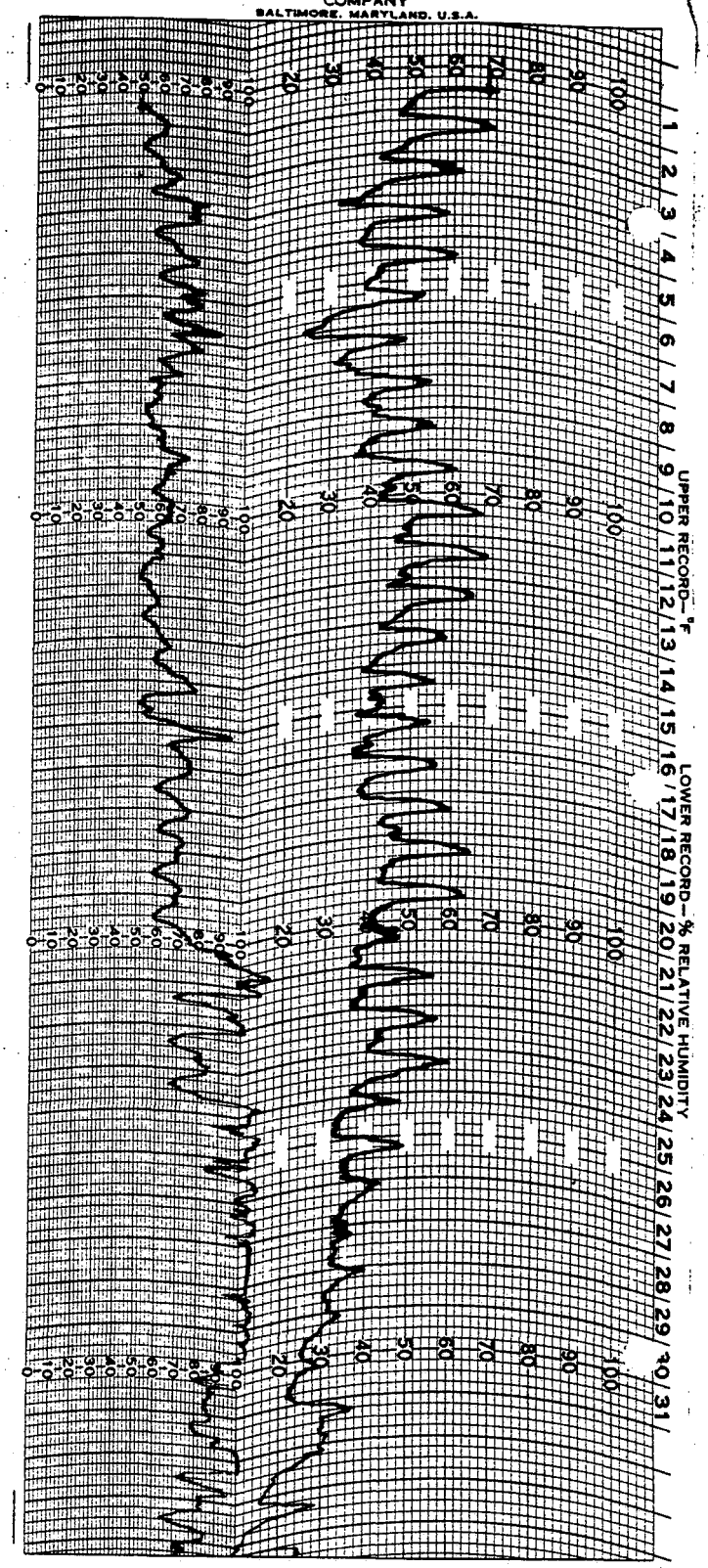
OBSERVER Karl R. Housekeeper

STATION

ON 3:15 A.M. P.M. 10-1 1992

OFF 11:30 A.M. P.M. 11/4 1992

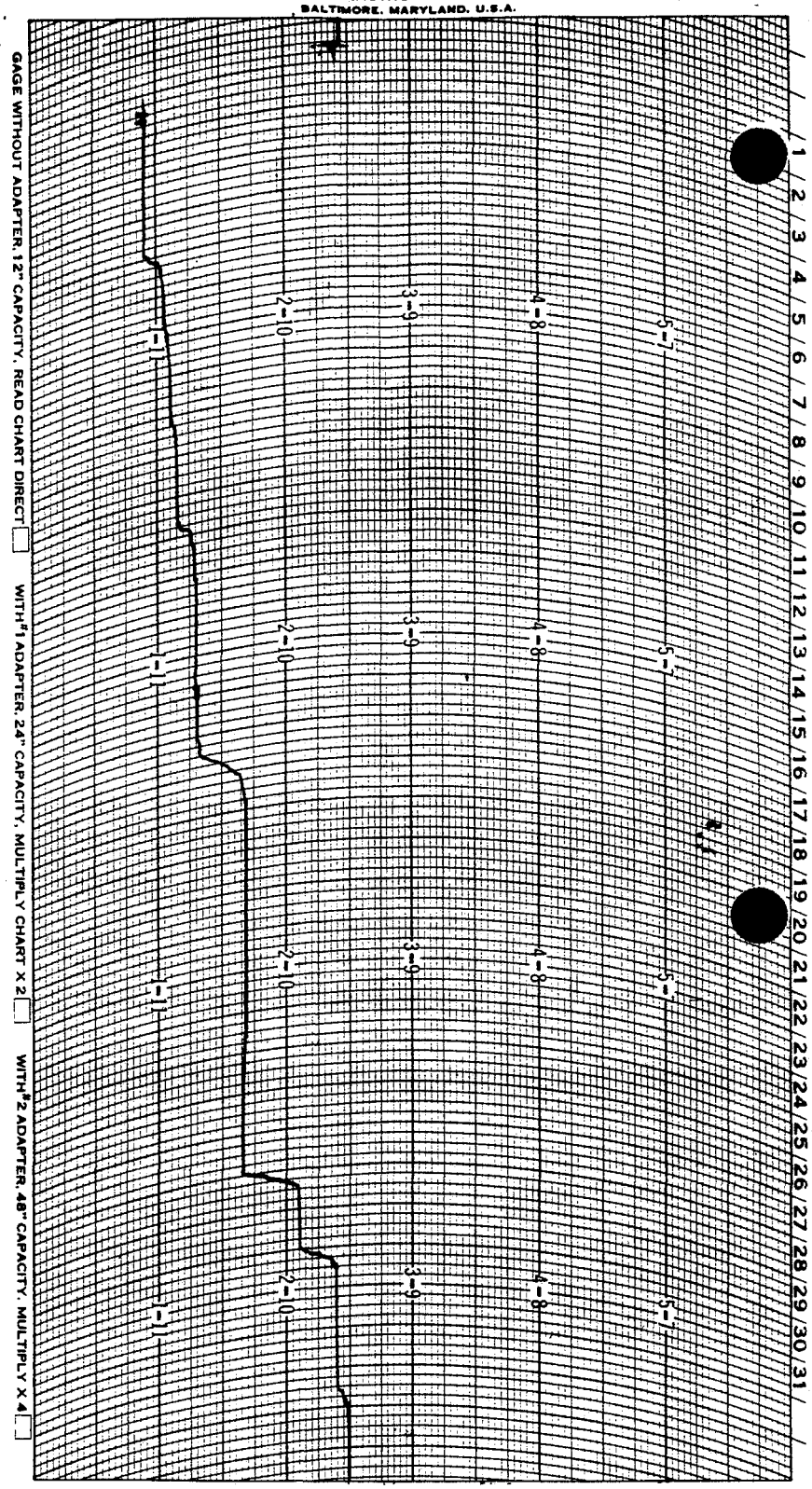
BELFORT INSTRUMENT
COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Karl R. Houghton ON 3:20 A.M. P.M. 10-1 1992

STATION _____ OFF 11:38 A.M. P.M. 11-4 1992

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT ☐ WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 ☐ WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 ☐

OBSERVER SEMBORSKI/HOUSKEEPER ON 15 00 A.M. P.M. 12/1 19 92

STATION EAST MTN OFF 1256 A.M. P.M. 1/5 19 93

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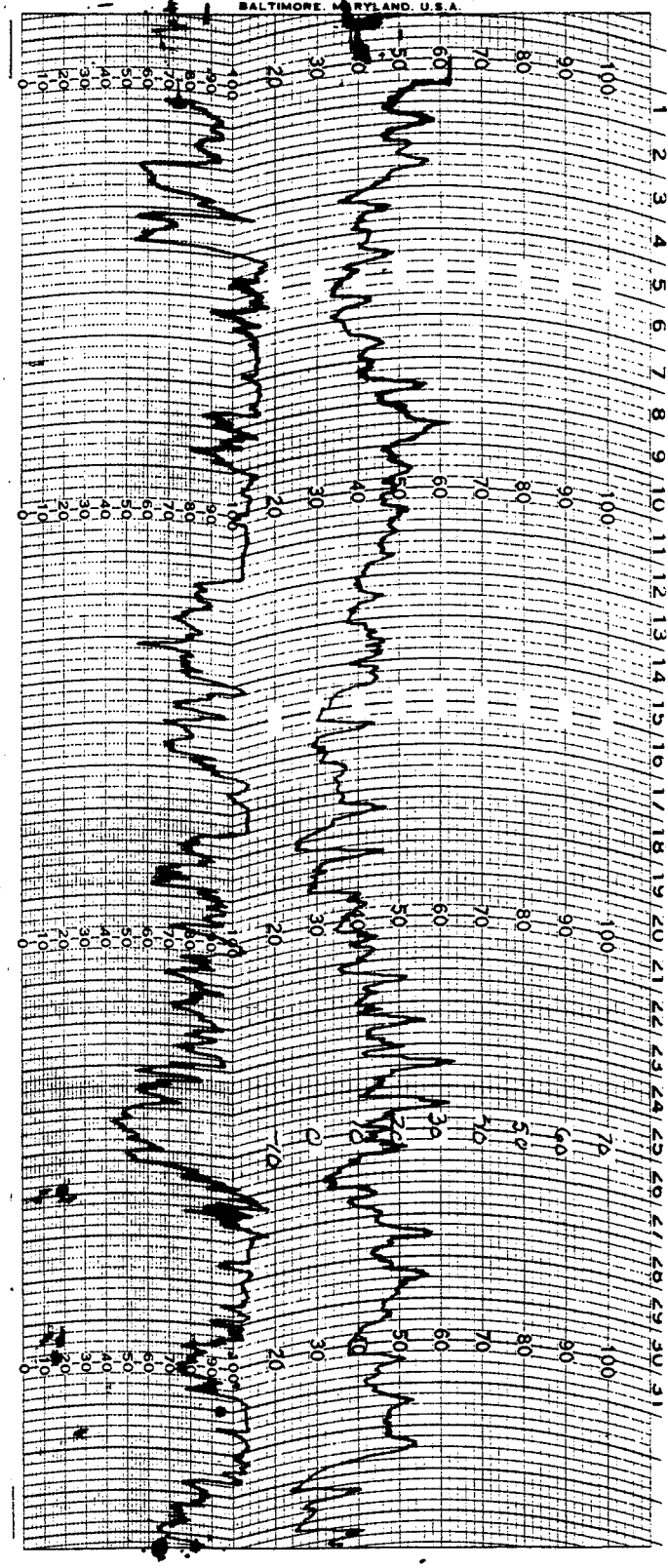
HYGROTHERMOGRAPH
CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER CAS & KRH ON 12-1-92 A.M. P.M. 3:15 19

STATION OFF 15:02 A.M. P.M. 1-5-93 19

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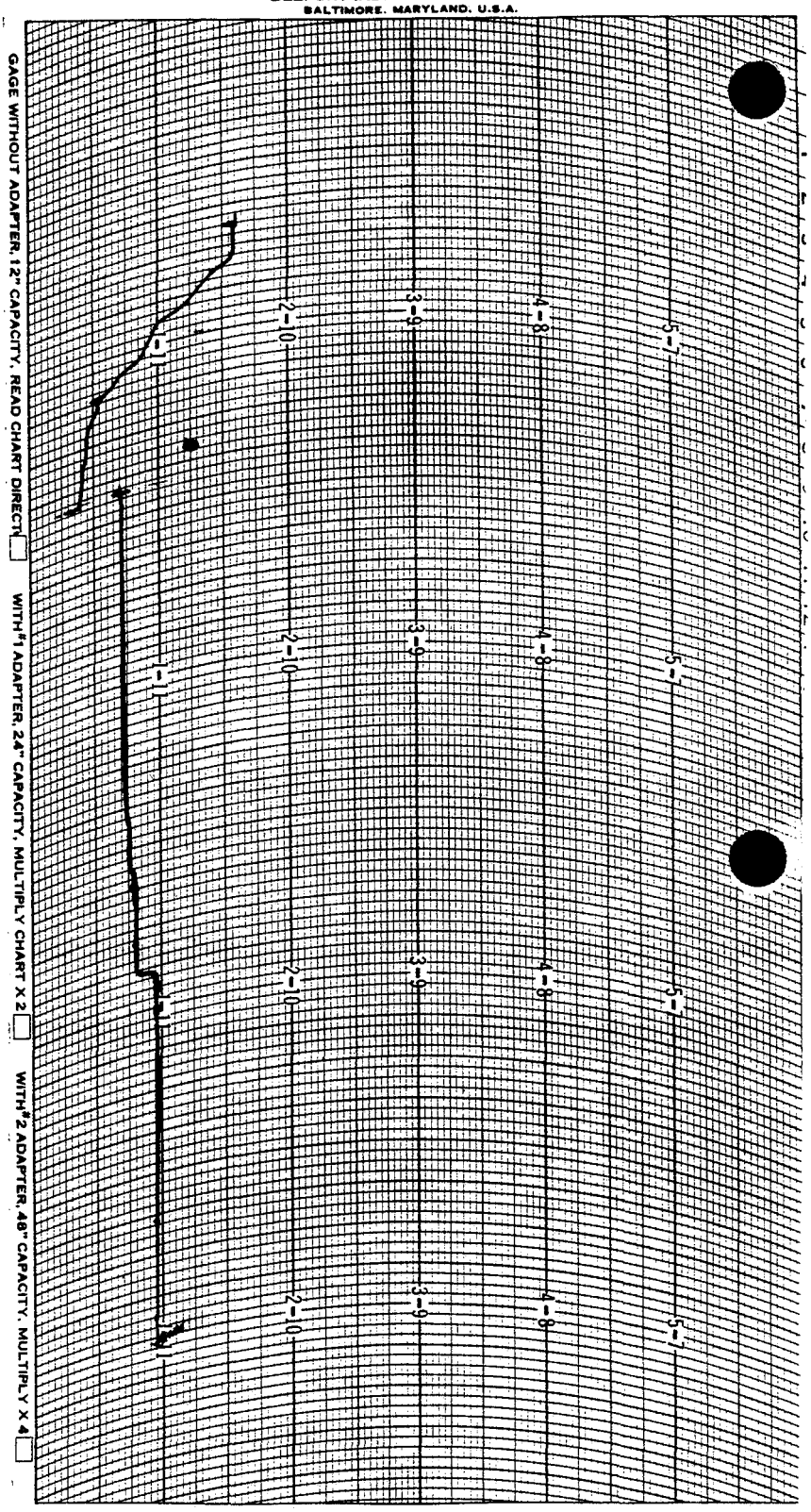
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER Semborski/Housekeeper ON 1130 A.M. P.M. 11/4 1992

STATION _____ OFF 1500 A.M. P.M. 12/1 1992

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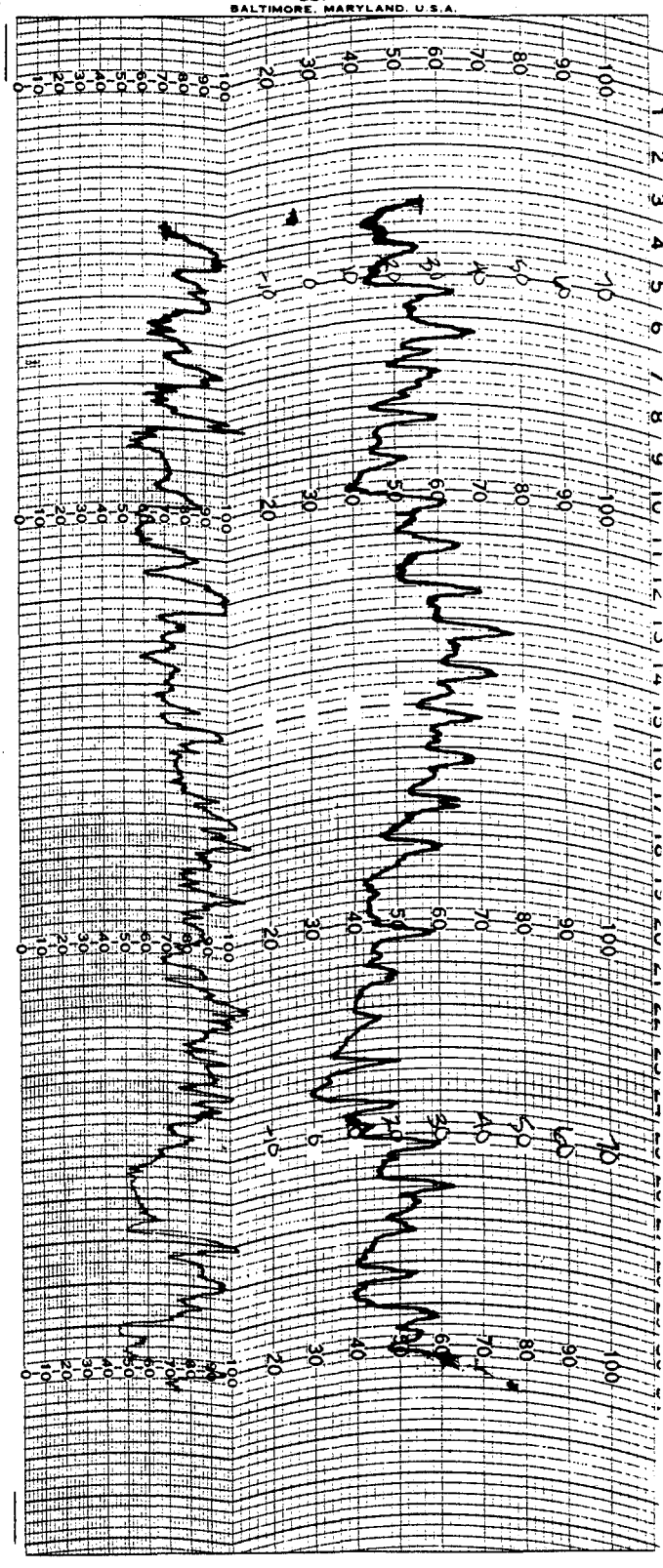
HYGROTHERMOGRAPH
CHART NO. 15627
MONTHLY-861 HRS.
BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER KRH & CAS ON 11:40 (A.M. / P.M.) 11-4 1992

STATION _____ OFF 3:14 (A.M. / P.M.) 12-1 1992

PACIFICORP
FUEL RESOURCES
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, and DES-BEE-DOVE MINES

I. Monitoring Locations

A. Surface Water Hydrology (see Map HM-1 for locations listed below)

1. Cottonwood Creek Drainage System
   a. Cottonwood Canyon Creek - USGS Flume: 700 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.
   b. Grimes Wash
      (1) GWR01 - Right Fork: (Approximately 1500 feet upstream from the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southwest corner of Section 22, Township 17 South, Range 7 East.
      (2) GWR02 - Left Fork: (Approximately 50 feet upstream from the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.
      (3) GWR03 - Below the mine: (Approximately 500 feet downstream from the outlet culvert below the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.
      (4) Reclamation Monitoring: In addition to location (3) above, monitoring will occur at a point immediately above the sediment ponds (see Map 4-1).

2. Huntington Creek Drainage System
   a. Huntington Creek: *UP&L's Environmental Department monitors the following four sites along Huntington Creek:
      (1) Below Electric Lake**
      (2) Above the Forks**
      (3) Above the power plant diversion
      (4) Below the power plant

b. Huntington Creek - Fuel Resources

(1) HCC01 - Above Deer Creek Confluence: 1400 feet north, 2200 feet west of the southeast corner of Section 36, Township 16 South, Range 7 East.

(2) HCC02 - Below Deer Creek Confluence: 300 feet north, 300 feet west of the southwest corner of Section 31, Township 16 South, Range 8 East.

(3) HCC03 - Below Huntington Power Plant: 2500 feet north, 1500 feet east of the southeast corner of Section 6, Township 17 South, Range 8 East.

(4) HCC04 - @ Research Farm**
800 feet north, 200 feet east of the southwest corner of Section 5, Township 17 South, Range 8 East.

* The sites listed above are not considered part of PacifiCorp's Hydrologic Monitoring Program but will be included in the annual report as long as data is available.

** Not listed on map due to scale.

c. Deer Creek

(1) DCR01 - Above the mine:
(Approximately 600 feet upstream from the mine facility.) 200 feet North, 800 feet West of the Southeast corner of Section 10, Township 17 South, Range 7 East.

(2) DCR02 - Near Discharge:
(Exit of undisturbed drainage)
2700 feet north, 700 feet east of the southwest corner of Section 10, Township 17 South, Range 7 East.

(3) DCR03 - Below Coal Pile:
(Below old American Fuel Mine)
1200 feet south, 1900 feet east of the northwest corner of Section 11, Township 1 South, Range 7 East.

(4) DCR04 - At Permit:
(Approximately 5,000 feet downstream from the mine facility.) 480 feet North, 3360 feet East of the Northwest corner of Section 1, Township 17 South, Range 7 East.

(5) DCR05 - Below the Mine:
(Approximately 12,000 feet downstream from the mine facility.) 480 feet South, 3360 feet

East of the Northwest corner of Section 1, Township 17 South, Range 7 East.

(6) DCR06 - @ Huntington Creek Confluence: (Approximately 15,000 feet downstream from the facility)
1400 feet north, 1100 feet east of the southeast corner of Section 36, Township 16 South, Range 7 East.

d. Meetinghouse Canyon - South Fork:
(Approximately 200 feet upstream from the north and south convergence.) 800 feet North, 1500 feet East of the Southwest corner of Section 35, Township 16 South, Range 7 East.

e. Rilda Canyon:

(1) RCF-1 - Rilda Canyon - Right Fork: 400 feet South, 200 feet West of the Northeast corner of Section 30, Township 16 South, Range 7 East.

(2) RCLF1 - Rilda Canyon - Left Fork: 2400 feet North, 2100 feet West of the Southeast corner of Section 29, Township 16 South, Range 7 East.

(3) RCF2 - Rilda Canyon: 2500 feet South, 400 feet West of the Northeast corner of Section 29, Township 16 South, Range 7 East.

(4) RCF3 - Rilda Canyon: 2550 feet South, 1000 feet East of the Northeast corner of Section 28, Township 16 South, Range 7 East.

(5) RCW4 - Rilda Canyon: 850 feet North, 1900 feet West of the Southeast corner of Section 26, Township 16 South, Range 7 East.

3. Reclamation Monitoring: Following stage 1 final reclamation backfilling and grading monitoring will be conducted at points immediately above and below the last sediment pond(s).

B. Groundwater Hydrology

1. East Mountain Springs (see maps HM-4 and 5 for spring locations)

Burnt Tree * +
Elk Spring * +
Sheba Springs * +
Ted's Tub
79-2
79-10 * +

79-15
79-23 * +
79-24
79-26 * +
79-28 (Flag Lake)
79-29 * +
79-32
79-34
79-35 * +
79-38
79-40
80-41
80-43
80-44 * +
80-46 * +
80-47
80-48
82-51
82-52 * +
84-56 * +
89-60 (Alpine Spring)
89-61
89-65
89-66
89-67
89-68

* Recession Study Springs
+ Baseline analysis performed in 1991 and will be repeated every five years.

2. Piezometric Data
   a. Surface
      (1) Rilda Canyon (see Map HM-1 for locations)
         P1
         P2 (terminated)
         P3
         P4
         P5
         P6
         P7
         EM-47
      (2) Cottonwood Canyon Creek
         EM-31
   b. Underground: In-Mine
      (1) Deer Creek Mine (see Map HM-2 for locations)
         (a) DCP1 3rd N xc-8

(b) DCP2 3rd N xc-29 (terminated)
(c) DCP3 3rd N xc-55 (terminated)
(d) DCP4 1st W xc-29

(2) Wilberg/Cottonwood Mine (see Map HM-3 for locations)
(a) WCP1 5th W xc-16 (terminated)
(b) WCP2 3rd S xc-14 (terminated)
(c) WCP3 3rd S xc-44 (terminated)

3. In-Mine
a. Deer Creek Mine (see Map HM-2 for locations)
(a) Main North - Main East
(b) 3rd North xc-65 (TW-10)
b. Wilberg/Cottonwood Mines (see Map HM-3 for locations)
(a) 2nd South xc-11
(b) 4th East xc-24

4. Waste Rock Wells (see Map HM-1 for locations)
a. Deer Creek
b. Cottonwood

II. Monitoring Schedule

A. Field Measurement: Listed below are the sites which will be monitored by PacifiCorp - Fuel Resources in accordance with the guidelines established by DOGM; i.e.,
- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved oxygen (perennial streams only)

1. Cottonwood Canyon Creek
a. Cottonwood Canyon Creek - USGS Flume
b. Grimes Wash
(1) GWR01
(2) GWR02
(3) GWR03

2. Huntington Canyon Drainage
   a. Deer Creek
      (1) DCR01
      (2) DCR04
      (3) DCR06
   b. Huntington Creek
      (1) HCC01
      (2) HCC02
      (3) HCC04
   c. Meetinghouse Canyon - South Fork
   d. Rilda Canyon
      (1) RCF1
      (2) RCF3
      (3) RCW4

3. East Mountain Springs (see monitoring location list)

4. In-Mine
   a. Deer Creek
   b. Wilberg/Cottonwood

5. Waste Rock Wells
   a. Deer Creek
   b. Cottonwood

All sites will be monitored monthly except for East Mountain Springs, in-mine locations, and waste rock wells. East Mountain Springs will be field tested during the months of July and October. In addition, the Recession Study Springs (denoted by asterisks in the Monitoring Location section) will be field tested from July through October. In-mine locations will be field tested for all field parameters except pH, conductivity, and dissolved oxygen. Waste rock wells will be field tested quarterly.

B. Quality Sampling (Laboratory Measurements)

1. Surface Water Hydrology: Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table #1). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 1991 and will be repeated every five years thereafter.

a. Cottonwood Creek Drainage, Grimes Wash
   (1) GWR01
   (2) GWR02
   (3) GWR03
b. Huntington Creek Drainage
   (1) Deer Creek
      (a) DCR01
      (b) DCR04
      (c) DCR06
   (2) Huntington Creek
      (a) HCC01
      (b) HCC02
      (c) HCC04
   (3) Meetinghouse Canyon - South Fork: MCH01
   (4) Rilda Canyon
      (a) RCF1
      (b) RCF3
      (c) RCW4

2. Groundwater Hydrology
   a. East Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
   b. In-Mine: Two water samples will be collected and analyzed per mine quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
   c. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

III. Annual Reports

All data collected regarding the hydrology of East Mountain will be summarized by the applicant in an annual Hydrologic Monitoring Report. Copies of the report will be submitted to the OSM; U.S. Forest Service; and the Utah State Division of Oil, Gas and Mining. In addition, any raw data collected will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

YEAR -- 1992-1995

			LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SURFACE	HYDROLOGY	COTTONWOOD CREEK DRAINAGE SYSTEM	COTTONWOOD CANYON CREEK	field	field	field	field	field	field	field	field	field	field	field	field
			GRIMES WASH		TABLE 1										
			GWR01	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			GWR02	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			GWR03	field	field	operational	field	field	operational	field	field	operational	field	field	operational
		HUNTINGTON CREEK DRAINAGE SYSTEM	DEER CREEK		TABLE 1										
			DCR01	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			DCR04	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			DCR06	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			MEETINGHOUSE CANYON		TABLE 1										
			MCH01	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			RILDA CANYON		TABLE 1										
			FLUME 1 RCF1	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			FLUME 2 RCF2	field	field	field	field	field	field	field	field	field	field	field	field
			FLUME 3 RCF3	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			WEIR 4 RCW4	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			RCLF1	field	field	field	field	field	field	field	field	field	field	field	field
			HUNTINGTON CREEK		TABLE 1										
			HCC01	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			HCC02	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			HCC04	field	field	operational	field	field	operational	field	field	operational	field	field	operational
GROUNDWATER	HYDROLOGY		EAST MOUNTAIN SPRINGS		TABLE 2					operational *			operational *		
			RECESSION STUDY SPRINGS								field	field			
			IN-MINE		TABLE 2										
			DEER CREEK			operational			operational			operational			operational
			WILBERG/ COTTONWOOD			operational			operational			operational			operational

* includes recession study springs

TABLE 1

SURFACE WATER BASELINE, OPERATIONAL, AND
POSTMINING WATER QUALITY PARAMETER LIST

FIELD MEASUREMENTS:

- * - Water Levels or Flow
- * - pH
- * - Specific Conductivity (umhos/cm)
- * - Temperature (degrees Centigrade)
- * - Dissolved Oxygen (ppm) [perennial streams only]

LABORATORY MEASUREMENTS: (mg/l) [Major, minor ions and trace elements are to be analyzed in total and dissolved forms.]

- * - Total Dissolved Solids
- # * - Total Settleable Solids
- # * - Total Suspended Solids
- * - Total Hardness (as $CaCO_3$)
- * - Acidity ($CaCO_3$)
- * - Alkalinity - Total
- - Aluminum (Al)
- - Arsenic (As)
- - Barium (Ba)
- - Boron (B)
- * - Carbonate (CO_3^{-2})
- * - Bicarbonate (HCO_3^-)
- - Cadmium (Cd)
- * - Calcium (Ca)
- * - Chloride (Cl^-)
- - Chromium (Cr)
- * - Conductivity
- - Copper (Cu)
- * - Dissolved Oxygen
- - Fluoride (F^-)
- * - Iron (Fe) - Total and Dissolved
- - Lead (Pb)
- * - Magnesium (Mg)
- * - Total Manganese (Mn)
- - Mercury (Hg)
- - Molybdenum (Mo)
- - Nickel (Ni)
- - Nitrogen: Ammonia (HN_3)
- - Nitrate (NO_2)
- - Nitrite (NO_3)
- * - Oil and Grease
- * - pH
- * - Potassium (K)
- - Phosphate (PO_4^{-3})
- - Selenium (Se)
- * - Sodium (Na)
- * - Sulfate (SO_4^{-2})
- - Sulfide (S^-)
- # * - Turbidity
- - Zinc (Zn)
- * - Cation-Anion Balance

Sampling Period:

- \- Baseline
- * Operational, Postmining
- \# Construction

Sampling Locations:

Deer Creek	1)	DCR01 - Above Mine
	2)	DCR04 - @ Permit Boundary
	3)	DCR06 - @ Huntington Creek Confluence
Grimes Wash	1)	GWR01 - Right Fork (Above Mine)
	2)	GWR02 - Left Fork (Above Mine)
	3)	GWR03 - Below Mine
Huntington Canyon	1)	HCC01 - Above Plant
	2)	HCC02 - Above Plant, Below DC Confluence
	3)	HCC04 - Below Plant, @ Research Farm
Meetinghouse Canyon		MHC01 - Left Fork
Rilda Canyon	1)	RCF1
	2)	RCF3
	3)	RCW4

TABLE 2

GROUNDWATER BASELINE, OPERATIONAL, AND
POSTMINING WATER QUALITY PARAMETER LIST

FIELD MEASUREMENTS:

- • - Water Levels or Flow
- • - pH
- • - Specific Conductivity (umhos/cm)
- • - Temperature (degrees Centigrade)

LABORATORY MEASUREMENTS: (mg/l) [Major, minor ions and trace elements are to be analyzed in total and dissolved forms.]

- • - Total Dissolved Solids
- • - Total Suspended Solids
- • - Total Hardness (as $CaCO_3$)
- • - Alkalinity ($CaCO_3$)
- - Aluminum (Al)
- - Arsenic (As)
- - Barium (Ba)
- - Boron (B)
- • - Carbonate (CO_3^{-2})
- • - Bicarbonate (HCO_3^-)
- - Cadmium (Cd)
- • - Calcium (Ca)
- • - Chloride (Cl^-)
- - Chromium (Cr)
- • - Conductivity
- - Copper (Cu)
- • - Dissolved Oxygen
- - Fluoride (F^-)
- • - Iron (Fe)
- - Lead (Pb)
- • - Magnesium (Mg)
- • - Manganese (Mn)
- - Mercury (Hg)
- - Molybdenum (Mo)
- - Nickel (Ni)
- - Nitrogen: Ammonia (HN_3)
- - Nitrate (NO_2)
- - Nitrite (NO_3)
- • - pH
- • - Potassium (K)
- - Phosphate (PO_4^{-3})
- - Selenium (Se)
- • - Sodium (Na)
- • - Sulfate (SO_4^{-2})
- - Sulfide (S^-)
- - Zinc (Zn)
- • - Cation-Anion Balance

Sampling Period:

- - Baseline
- • Operational, Postmining

Sampling Locations:

In-Mine
  Deer Creek
  Wilberg/Cottonwood
East Mountain Springs
Waste Rock Wells
  Deer Creek
  Wilberg/Cottonwood

TABLE 3

MINE DISCHARGE AND SEDIMENT POND

FIELD MEASUREMENTS:

- • - Water Levels or Flow
- • - pH
- • - Specific Conductivity (umhos/cm)
- • - Temperature

LABORATORY MEASUREMENTS: (mg/l) [Major, minor ions and trace elements are to be analyzed in total and dissolved forms.]

•	x	-	Total Dissolved Solids
•		-	Total Settleable Solids
•	x	-	Total Suspended Solids
•	x	-	Total Hardness (as $CaCO_3$)
•	x	-	Acidity ($CaCO_3$)
•	x	-	Alkalinity - Total
		-	Aluminum (Al)
		-	Arsenic (As)
		-	Barium (Ba)
		-	Boron (B)
•	x	-	Carbonate (CO_3^{-2})
•	x	-	Bicarbonate (HCO_3^-)
		-	Cadmium (Cd)
•	x	-	Calcium (Ca)
•	x	-	Chloride (Cl^-)
		-	Chromium (Cr)
•	x	-	Conductivity
		-	Copper (Cu)
•	x	-	Dissolved Oxygen
		-	Fluoride (F^-)
•	x	-	Iron (Fe) - Total and Dissolved
		-	Lead (Pb)
•	x	-	Magnesium (Mg)
•	x	-	Total Manganese (Mn)
		-	Mercury (Hg)
		-	Molybdenum (Mo)
		-	Nickel (Ni)
		-	Nitrogen: Ammonia (HN_3)
		-	Nitrate (NO_2)
		-	Nitrite (NO_3)
•	x	-	Oil and Grease
•	x	-	pH
•	x	-	Potassium (K)
		-	Phosphate (PO_4^{-3})
		-	Selenium (Se)
•	x	-	Sodium (Na)
•	x	-	Sulfate (SO_4^{-2})
		-	Sulfide (S^-)
	x	-	Turbidity
		-	Zinc (Zn)
•	x	-	Cation-Anion Balance

Sampling Period:

- - Baseline
- • Sediment Pond Discharge
- x Mine Discharge

Sampling Locations:

Mine Discharge
- Deer Creek
- Wilberg/Cottonwood
  - 1) Grimes Wash
  - 2) Miller Canyon

Sediment Ponds
- Deer Creek
- Des-Bee-Dove
- Wilberg/Cottonwood

YEAR -- 1996
(Baseline monitoring)

		LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SURFACE	HYDROLOGY	COTTONWOOD CREEK DRAINAGE SYSTEM												
		COTTONWOOD CANYON CREEK	field	field	field	field	field	field	field	field	field	field	field	field
		GRIMES WASH		TABLE 1										
		GWR01	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		GWR02	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		GWR03	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		HUNTINGTON CREEK DRAINAGE SYSTEM												
		DEER CREEK		TABLE 1										
		DCR01	operational		January	through	May	baseline	operational		July	through	November	baseline
		DCR04	operational		January	through	May	baseline	operational		July	through	November	baseline
		DCR06	operational		January	through	May	baseline	operational		July	through	November	baseline
		MEETINGHOUSE CANYON		TABLE 1										
		MCH01	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		RILDA CANYON		TABLE 1										
		FLUME 1 RCF1	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		FLUME 2 RCF2	field	field	field	field	field	field	field	field	field	field	field	field
		FLUME 3 RCF3	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		WEIR 4 RCW4	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		RCLF1	field	field	field	field	field	field	field	field	field	field	field	field
		HUNTINGTON CREEK		TABLE 1										
		HCC01	operational		January	through	May	baseline	operational		July	through	November	baseline
		HCC02	operational		January	through	May	baseline	operational		July	through	November	baseline
		HCC04	operational		January	through	May	baseline	operational		July	through	November	baseline
GROUNDWATER	HYDROLOGY	EAST MOUNTAIN SPRINGS		TABLE 2					baseline *			baseline *		
		RECESSION STUDY SPRINGS								field	field			
		IN-MINE		TABLE 2										
		DEER CREEK			operational			baseline			operational			baseline
		WILBERG/ COTTONWOOD			operational			baseline			operational			baseline

* includes recession study springs

YEAR -- 1992-1995

LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MINE DISCHARGE												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - WILBERG/COTTONWOOD												
Grimes Wash	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Miller Canyon	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
SEDIMENT PONDS												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - DES-BEE-DOVE												
	Sampled on an as-needed basis											
TABLE 3 - WILBERG/COTTONWOOD												
Wilberg Mine	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Cottonwood Canyon	Sampled on an as-needed basis											
WASTE ROCK WELLS												
TABLE 3 - DEER CREEK												
DCWR 1			operational			operational			operational			operational
TABLE 3 - WILBERG/COTTONWOOD												
WCWR 1			operational			operational			operational			operational

YEAR -- 1996

BASELINE

LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MINE DISCHARGE												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - WILBERG/COTTONWOOD												
Grimes Wash	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Miller Canyon	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
SEDIMENT PONDS												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - DES-BEE-DOVE												
	Sampled on an as-needed basis											
TABLE 3 - WILBERG/COTTONWOOD												
Wilberg Mine	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Cottonwood Canyon		Sampled on an as-needed basis										
WASTE ROCK WELLS												
TABLE 3 - DEER CREEK												
DCWR 1			baseline			operational			baseline			operational
TABLE 3 - WILBERG/COTTONWOOD												
WCWR 1			baseline			operational			baseline			operational

WATER SAMPLE DOCUMENTATION

The following information will be included on the lab sheets:

1. Sample time and date
2. Individual taking sample
3. Field parameters (except in-mine)
   - Temperature
   - Flow
   - pH (units)
   - Conductivity (umhos/cm)
   - Dissolved Oxygen (PPM), depending on location
4. Precipitation date if applicable
5. Date and time each parameter is analyzed at the lab

ANALYTICAL METHOD AND DETECTION LIMIT

Parameter	MDL	UNITS	Method
Acidity	1	mg/l $CaCO_3$	EPA 305.1
Alkalinity, Bicarbonate	1	mg/l $CaCO_3$	EPA 310.1
Alkalinity, Carbonate	1	mg/l $CaCO_3$	EPA 310.1
Alkalinity, Total	1	mg/l $CaCO_3$	EPA 310.1
Aluminum	.5	mg/l	EPA 202.1
Anions	----	meq/l	----------
Arsenic	.002	ug/l	EPA 206.3
Barium	.03	mg/l	EPA 208.1
Boron	.01	mg/l	EPA 212.3
Cadmium	.005	mg/l	EPA 213.1
Calcium	.1	mg/l	EPA 215.1
Cations	----	meq/l	----------
Chloride	.1	mg/l	EPA 325.3
Chromium	.02	mg/l	EPA 218.1
Conductivity	2	umhos/cm	EPA 120.1
Copper	.01	mg/l	EPA 220.1
Fluoride	.01	mg/l	EPA 340.2
Hardness, Total	1	mg/l $CaCO_3$	----------
Iron	.02	mg/l	EPA 236.1
Iron, Dissolved	.02	mg/l	EPA 236.1
Lead	.05	mg/l	EPA 239.1
Magnesium	.01	mg/l	EPA 242.1
Manganese	.01	mg/l	EPA 243.1
Mercury	.002	mg/l	EPA 245.1
Nickel	.02	mg/l	EPA 249.1
Nitrogen, Ammonia	.01	mg/l	EPA 350.3
Nitrogen, Nitrate	.01	mg/l	EPA 353.3
Nitrogen, Nitrite	.01	mg/l	EPA 354.1
Oil & Grease	1	mg/l	EPA 413.1
Oxygen, Dissolved	.01	mg/l	EPA 360.1
pH	----	Units	EPA 150.1
Phosphorus, Total	.01	mg/l	EPA 365.2
Potassium	.01	mg/l	EPA 258.1
Selenium	.002	ug/l	EPA 270.3
Sodium	.01	mg/l	EPA 273.1
Solids, Settleable	.5	mg/l	EPA 160.5
Solids, Total Dissolved	.5	mg/l	EPA 160.1
Solids, Total Suspended	.5	mg/l	EPA 160.2
Sulfate	.1	mg/l	EPA 375.4
Sulfide	.1	mg/l	EPA 376.1
Turbidity	.1	NTU	EPA 180.1
Zinc	.01	mg/l	EPA 289.1

TRAIL MOUNTAIN

ANNUAL HYDROLOGIC REPORT

1992

ACT 015/009

RECEIVED
MAY 0 6 1993
DIVISION OF
OIL GAS & MINING

Energy West Mining Company
Trail Mountain Mine

WATER MONITORING PROGRAM
TRAIL MOUNTAIN MINE

STATION	LOCATION	TYPE	FREQUENCY	STATUS	RESULTS TO:	REMARKS
SW-1	Cottonwood Cyn. Above Mine	Perrenial Stream	Monthly-Field Qtr.- Quality	Operational	DOGM	Oil & Grease Quarterly
SW-2	Cottonwood Cyn. Below Mine	Perrenial Stream	Monthly-Field Qtr. - Quality	Operational	DOGM	Oil & Grease Quarterly
SW-3	Cottonwood Cyn. Below Mine	Perennial Stream	Monthly-Field Qtr. - Quality	Operational	DOGM	Oil & Grease Quarterly
TM-21	Trail Mt. Sec. 21	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
TM-22	Trail Mt. Sec. 22	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
TM-23	Cottonwood Cyn. Above Roan Cyn.	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
T-6	Trail Mt. Sec. 2	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter

Energy West Mining Company
Trail Mountain Mine

STATION	LOCATION	TYPE	FREQUENCY	STATUS	RESULTS TO:	REMARKS
T-10	Trail Mt. Sec. 26	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
T-14	Trail Mt. Sec. 25	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
T-14A	Trail Mt. Sec. 26	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
T-15	Trail Mt. Sec. 35	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
T-16	Trail Mt. Sec. 35	Spring	4 Times Annually As Cond. Permit	Operational	DOGM	Inaccessible During Winter
TM-1	Mine Surface Near Portal	Well	Quarterly	Operational	DOGM	
T-18	Straight Cyn. Oliphant Mine	Spring (Mine Discharge)	Quarterly	Operational	DOGM	
T-19	Straight Cyn. Aquifer Sec. 3	Spring	Quarterly	Operational	DOGM	
UG-2	Underground	Gr. Water	Quarterly	Operational	DOGM	

Energy West Mining Company
Trail Mountain Mine

STATION	LOCATION	TYPE	FREQUENCY	STATUS	RESULTS TO:	REMARKS
UG-3	Underground	Gr. Water	Quarterly	Operational	DOGM	
26-1P	Trail Mt. Sec. 26	Pond	Inspections 4 Times/ Annum	N/A	*	Inspections & Photos Only Required
26-2P	Trail Mt. Sec. 26	Pond	Inspections 4 Times/ Annum	N/A	*	Inspections & Photos Only Required
26-3P	Trail Mt. Sec. 26	Pond	Inspections 4 Times/ Annum	N/A	*	Inspections & Photos Only Required
26-4P	Trail Mt. Sec. 26	Pond	Inspections 4 Times/ Annum	N/A	*	Inspections & Photos Only Required
35-1P	Trail Mt. Sec. 35	Pond	Inspections 4 Times/ Annum	N/A	*	Inspections & Photos Only Required
35-2P	Trail Mt. Sec. 35	Pond	Inspections 4 Times/ Annum	N/A	*	Inspections & Photos Only Required

* Office File

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: SW-1
Location: Up. N.F. Cot. Cr.
Type: P. Stream
Frequency: Monthly-Quarterly

Date Sampled

Field Measurements	01/26/92	02/25/92	03/30/92	04/24/92	05/13/92	06/22/92	07/20/92	08/24/92	09/21/92	10/24/92	11/25/92	12/15/92	MEAN
Flow [gpm]	12.00	8.60	29.00	69.00	21.00	24.00	15.00	12.00	8.00	22.00	4.50	FROZEN	18.76
PH	8.00	8.10	8.00	7.80	7.80	8.00	7.64	7.80	7.53	7.90	8.25		7.24
Sp.Con. [ohms]	600.00	600.00	410.00	490.00	310.00	600.00	612.65	671.66	610.00	490.00	764.00		513.19
Temp [C]	1.00	1.00	2.00	4.00	3.00	14.00	21.00	19.00	20.00	9.00	2.80		8.07
Diss. O. [ppm]	8.00	7.00	7.00	9.00	8.00	9.00	8.00	9.00	8.50	9.00	10.10		7.72

Date Sampled

Lab. Meas. [mg/l]	02/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS	478.00	330.00	452.00		315.00
TSS	2.00	4.00	10.00		4.00
O & G	0.80	BROKEN	<.05		0.20
Al CaCO3	327.00	256.00	313.00		224.00
Hd CaCO3	432.00	294.00	390.00		279.00
HCO3	398.00	312.00	382.00		273.00
CO3	0.00	0.00	0.00		0.00
Cl	27.40	8.24	15.00		12.66
SO4	95.90	53.50	92.80		60.55
Ca	75.70	69.50	60.70		51.47
Mg	59.20	29.30	58.10		36.65
K	3.46	1.61	2.23		1.83
Na	20.80	14.30	23.70		14.70
Cat/An	1.78	0.60	1.59		0.99
Fe	0.07	0.15	0.10		0.08
Mn	<.02	<.02	<.02		0.00

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: SW-2
Location: Mid Property
Type: P. Stream
Frequency: Monthly-Quarterly

Date Sampled

Field Measurements	01/26/92	02/25/92	03/30/92	04/24/92	05/13/92	06/22/92	07/30/92	08/24/92	09/21/92	10/24/92	11/25/92	12/15/92	MEAN
Flow [gpm]	28.00	18.70	72.00	72.00	47.00	NO FLOW	NO FLOW	NO FLOW	NO FLOW	7.40	55.00	FROZEN	25.01
PH	7.80	8.00	7.90	8.10	8.10					8.00	8.18		4.67
Sp.Con. [ohms]	600.00	690.00	740.00	540.00	600.00					640.00	617.00		368.92
Temp [C]	1.00	2.00	2.00	4.00	12.00					10.00	12.80		3.65
Diss. O. [ppm]	7.00	8.00	7.00	8.00	8.00					9.00	9.50		4.71

Date Sampled

Lab. Meas. [mg/l]	02/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS	503.00	340.00			210.75
TSS	8.00	8.00			4.00
O & G	2.18	<.25			0.54
Al CaCO3	303.00	258.00			140.25
Hd CaCO3	428.00	314.00			185.50
HCO3	370.00	314.00			171.00
CO3	0.00	0.00			0.00
Cl	40.80	14.00			13.70
SO4	120.00	69.40			47.35
Ca	55.20	62.40			29.40
Mg	70.60	38.40			27.25
K	3.50	2.06			1.39
Na	31.10	20.10			12.80
Cat/An	1.47	1.46			0.73
Fe	0.14	0.28			0.11
Mn	<.02	<.02			0.00

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: SW-3
Location: Lower Cottonwood
Type: P. Stream
Frequency: Monthly-Quarterly

Date Sampled

Field Measurements	01/26/92	02/25/92	03/30/92	04/24/92	05/13/92	06/22/92	07/20/92	08/24/92	09/21/92	10/24/92	11/25/92	12/15/92	MEAN
Flow [gpm]	35.00	62.00	60.00	94.00	47.00	100.00	DRY	100.00	30.00	38.00	65.00	60.00	57.58
PH	7.00	8.00	7.80	8.10	8.00	8.00		7.50	7.73	8.00	8.59	8.14	7.24
Sp.Con. [ohms]	800.00	1200.00	1150.00	640.00	1070.00	1000.00		1110.00	1113.00	900.00	1170.00	1160.00	942.75
Temp [C]	1.00	2.00	3.00	5.00	12.00	14.00		16.00	21.00	10.00	6.90	3.20	7.84
Diss. O. [ppm]	8.00	9.00	8.00	9.00	8.00	10.00		8.00	9.00	9.00	9.70	7.60	7.94

Date Sampled

Lab. Meas. [mg/l]	02/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS	895.00	744.00	832.00	802.00	818.25
TSS	3.00	1.00	2.00	15.00	5.25
O & G	0.61	<.25	<.25	1.20	0.45
Al CaCO3	356.00	264.00	289.00	327.00	309.00
Hd CaCO3	619.00	494.00	493.00	614.00	555.00
HCO3	434.00	323.00	352.00	302.00	352.75
CO3	0.00	0.00	0.00	0.00	0.00
Cl	65.40	49.90	48.60	50.00	53.47
SO4	336.00	313.00	301.00	280.00	307.50
Ca	104.00	68.60	88.10	120.00	95.18
Mg	87.40	78.60	66.40	76.30	77.18
K	3.71	3.82	3.52	0.00	2.76
Na	85.10	79.70	82.00	87.80	83.65
Cat/An	0.70	0.85	0.33	8.03	2.48
Fe	0.04	0.07	0.04	0.12	0.07
Mn	<.02	<.02	<.02	0.02	0.01

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-10
Location: E Trail Mt.
Type: Spring
Frequency: 4 Time/Year

Date Sampled

Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	Mean
Flow [gpm]	DRY	DRY	DRY	DRY	DRY
PH					
Sp. Cond. [ohms]					
Temp. [C]					
Diss. O [ppm]					

Date Sampled

Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	Mean
TDS					
TSS					
O & G					
Al CaCO3					
Hd CaCO3					
HCO3					
CO3					
Cl					
SO4					
Ca					
Mg					
K					
Na					
Cat/An					
Fe					
Mn					

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-14
Location: Deep Draw
Type: Spring
Frequency: 4 Times/Year

Date Sampled

Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	Mean
Flow [gpm]	DRY	DRY	DRY	DRY	DRY
PH					
Sp. Cond. [ohms]					
Temp. [C]					
Diss. O [ppm]					

Date Sampled

Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	Mean
TDS					
TSS					
O & G					
Al CaCO3					
Hd CaCO3					
HCO3					
CO3					
Cl					
SO4					
Ca					
Mg					
K					
Na					
Cat/An					
Fe					
Mn					

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-14A
Location: Deep Draw Upper
Type: Spring
Frequency: 4 Times/Year

	Date Sampled				
Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	MEAN
Flow [gpm]	DRY	DRY	DRY	DRY	DRY
PH					
Sp. Cond. [ohms]					
Temp. [C]					
Diss. O [ppm]					

	Date Sampled				
Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	MEAN
TDS					
TSS					
O & G					
Al CaCO3					
Hd CaCO3					
HCO3					
CO3					
Cl					
SO4					
Ca					
Mg					
K					
Na					
Cat/An					
Fe					
Mn					

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-15
Location: Trough
Type: Spring
Frequency: 4 Times/Year

Date Sampled

Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	Mean
Flow [gpm]	5.00	0.33	0.33	0.50	1.54
PH	7.50	7.92	7.68	7.25	7.59
Sp. Cond. [ohms]	700.00	952.00	710.63	711.53	768.54
Temp. [C]	9.00	11.00	17.00	18.00	13.75
Diss. O [ppm]	N/R	N/R	N/R	N/R	N/R

Date Sampled

Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	Mean
TDS	426.00	452.00	462.00	470.00	452.50
TSS	1.00	<1.00	29.00	1.00	7.75
O & G	N/R	N/R	N/R	N/R	N/R
Al CaCO3	312.00	319.00	321.00	316.00	317.00
Hd CaCO3	230.00	250.00	238.00	240.00	239.50
HCO3	381.00	389.00	392.00	385.00	386.75
CO3	0.00	0.00	0.00	0.00	0.00
Cl	41.60	42.70	42.20	42.60	42.27
SO4	50.00	48.20	48.20	49.40	48.95
Ca	39.40	41.10	43.20	56.10	44.95
Mg	32.10	35.80	31.70	24.40	31.00
K	1.17	0.78	1.21	1.08	1.06
Na	86.40	78.60	92.10	88.70	86.45
Cat/An	0.39	0.84	1.08	0.87	0.79
Fe	0.16	0.12	0.43	1.30	0.50
Mn	<.02	<.02	<.02	<.02	0.00

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-16
Location: Trail Mt.
Type: Spring
Frequency: 4 Times/Year

Date Sampled

Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	Mean
Flow [gpm]	DRY	DRY	DRY	DRY	DRY
PH					
Sp. Cond. [ohms]					
Temp. [C]					
Diss. O [ppm]					

Date Sampled

Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	Mean
TDS					
TSS					
O & G					
Al CaCO3					
Hd CaCO3					
HCO3					
CO3					
Cl					
SO4					
Ca					
Mg					
K					
Na					
Cat/An					
Fe					
Mn					

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-18
Location: Old Portal
Type: Spring
Frequency: Quarterly

Field Measurements	Date Sampled 02/25/92	05/13/92	08/24/92	12/15/92	Mean
Flow [gpm]	3.20	1.20	1.80	0.70	1.72
PH	8.00	8.10	8.25	8.21	8.14
Sp. Cond. [ohms]	500.00	610.00	589.70	587.00	571.68
Temp. [C]	3.00	3.00	16.00	7.50	7.38
Diss. O [ppm]	N/R	N/R	N/R	9.60	2.40

Lab. Meas. [mg/l]	Date Sampled 02/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS	404.00	584.00	422.00	392.00	450.50
TSS	8.00	1.00	4.00	2.00	3.75
O & G	N/R	N/R	N/R	0.40	0.10
Al CaCO3	242.00	234.00	252.00	244.00	243.00
Hd CaCO3	333.00	325.00	314.00	381.00	338.25
HCO3	295.00	285.00	307.00	297.00	296.00
CO3	0.00	0.00	0.00	0.00	0.00
Cl	14.40	8.24	6.89	15.00	11.13
SO4	115.00	115.00	109.00	150.00	122.25
Ca	59.20	71.70	65.40	87.90	71.05
Mg	45.00	35.50	36.70	39.10	39.08
K	5.42	4.00	3.79	3.90	4.28
Na	19.70	21.70	21.00	23.00	21.35
Cat/An	0.02	1.64	1.40	2.17	1.31
Fe	0.08	<.05	<.05	0.07	0.04
Mn	<.02	<.02	<.02	0.00	0.00

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-19
Location: Straight Canyon
Type: Stream
Frequency: Quarterly

Date Sampled

Field Measurements	2/25/92	05/13/92	08/24/92	12/15/92	Mean
Flow [gpm]	62.00	18.70	DRY	FROZEN	20.18
PH	7.90	7.90			3.95
Sp. Cond. [ohms]	640.00	440.00			270.00
Temp. [C]	1.00	2.00			0.75
Diss. O [ppm]	8.00	9.00			4.25

Date Sampled

Lab. Meas. [mg/l]	2/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS	853.00	594.00			361.75
TSS	5.00	<1			1.25
O & G	N/R	N/R			0.00
Al CaCO3	305.00	290.00			148.75
Hd CaCO3	476.00	334.00			202.50
HCO3	373.00	353.00			181.50
CO3	0.00	0.00			0.00
Cl	67.90	38.40			26.58
SO4	336.00	181.00			129.25
Ca	61.10	46.30			26.85
Mg	78.80	53.10			32.98
K	3.53	3.63			1.79
Na	122.00	92.80			53.70
Cat/An	0.26	0.11			0.09
Fe	0.24	0.06			0.08
Mn	<.02	<.02			0.00

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: T-6
Location: Trough-Spring
Type: Spring
Frequency: 4 Time/Year

Date Sampled

Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	MEAN
Flow [gpm]	0.25	0.02	*NO FLOW	*NO FLOW	0.14
PH	8.00	7.80	7.37	7.31	7.62
Sp. Cond. [ohms]	800.00	1256.00	913.00	1290.00	1064.75
Temp. [C]	12.00	11.00	19.00	18.00	15.00
Diss. O [ppm]	N/R	N/R	N/R	N/R	N/R

* SAMPLED FROM METAL CONTAINER

Date Sampled

Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	MEAN
TDS	520.00	560.00	570.00	594.00	561.00
TSS	5.00	18.00	2.00	4.00	7.25
O & G	N/R	N/A	N/A	N/A	N/A
Al CaCO3	316.00	341.00	335.00	329.00	330.25
Hd CaCO3	370.00	379.00	405.00	398.00	388.00
HCO3	386.00	416.00	409.00	401.00	403.00
CO3	0.00	0.00	0.00	0.00	0.00
Cl	44.70	46.30	43.80	44.60	44.85
SO4	120.00	121.00	126.00	128.00	123.75
Ca	56.50	59.50	65.40	61.70	60.78
Mg	55.60	56.00	58.90	59.30	57.45
K	1.17	2.35	1.02	1.13	1.42
Na	64.80	62.80	61.10	62.00	62.68
Cat/An	0.76	1.37	1.12	0.87	1.03
Fe	0.56	1.28	0.19	0.15	0.54
Mn	0.03	0.03	0.02	<.02	0.02

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: TM-1
Location: Well #1 Portal
Type: Well
Frequency: Quarterly

Date Sampled

Field Measurements	02/25/92	05/13/92	08/24/92	12/15/92	Mean
Flow [fs]	23.33	22.00	21.50	15.96	20.70
PH	8.00	8.00	8.75	8.61	8.34
Sp. Cond. [ohms]	1100.00	1200.00	1318.00	1290.00	1227.00
Temp. [C]	3.00	5.00	8.00	7.80	5.95
Diss. O [ppm]	N/R	N/R	N/R	3.00	0.75

Date Sampled

Lab. Meas. [mg/l]	02/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS	799.00	850.00	858.00	774.00	820.25
TSS	98.00	11.00	35.00	41.00	46.25
O & G	N/R	N/R	N/R	0.80	0.20
Al CaCO3	529.00	536.00	554.00	536.00	538.75
Hd CaCO3	47.60	34.50	50.00	74.00	51.53
HCO3	647.00	653.00	677.00	653.00	657.50
CO3	0.00	0.00	0.00	19.00	4.75
Cl	120.00	107.00	105.00	100.00	108.00
SO4	33.80	37.10	30.00	40.00	35.23
Ca	9.26	11.80	10.50	17.20	12.19
Mg	5.97	1.22	5.75	7.61	5.14
K	3.00	2.20	2.60	2.23	2.51
Na	310.00	309.00	327.00	326.00	318.00
Cat/An	0.64	1.12	1.98	1.47	1.30
Fe	2.77	0.30	1.15	0.96	1.30
Mn	0.05	<.02	0.02	0.02	0.02

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: TM-21
Location: Trail Mt. Trough
Type: Spring
Frequency: 4 Times/Year

Date Sampled

Field Measurements	06/22/92	07/20/92	08/24/92	09/21/92	Mean
Flow [gpm]	0.30	0.14	0.10	0.13	0.17
PH	7.50	7.35	7.18	8.30	7.58
Sp. Cond. [ohms]	500.00	974.00	592.28	1040.00	776.57
Temp. [C]	10.00	11.00	15.00	14.00	12.50
Diss. O [ppm]	N/R	N/R	N/R	N/R	N/R

Date Sampled

Lab. Meas. [mg/l]	06/22/92	07/20/92	08/24/92	09/21/92	Mean
TDS	394.00	388.00	398.00	422.00	400.50
TSS	<1	<1	2.00	2.00	1.00
O & G	N/R	N/R	N/R	N/R	N/R
Al CaCO3	322.00	334.00	329.00	320.00	326.25
Hd CaCO3	255.00	271.00	234.00	241.00	250.25
HCO3	393.00	407.00	402.00	391.00	398.25
CO3	0.00	0.00	0.00	0.00	0.00
Cl	27.80	28.80	26.90	27.00	27.63
SO4	16.70	15.60	14.00	16.10	15.60
Ca	54.10	54.80	58.40	56.30	55.90
Mg	29.10	32.60	21.50	24.40	26.90
K	1.56	1.17	1.71	1.57	1.50
Na	60.20	49.90	59.20	57.30	56.65
Cat/An	1.18	1.34	2.24	1.05	1.45
Fe	0.79	0.23	<.05	<.05	0.26
Mn	0.02	<.02	<02	<.02	0.00

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: TM-22
Location: Trough
Type: Spring
Frequency: 4 Times/Year

Field Measurements	Date Sampled 06/22/92	07/20/92	08/24/92	09/21/92	Mean
Flow [gpm]	4.00	2.50	4.00	0.25	2.69
PH	7.50	7.37	8.02	7.42	7.58
Sp. Cond. [ohms]	400.00	865.00	581.00	588.13	608.53
Temp. [C]	11.00	18.00	16.00	14.00	14.75
Diss. O [ppm]	N/R	N/R	N/R	N/R	N/R

Lab. Meas. [mg/l]	Date Sampled 06/22/92	07/20/92	08/24/92	09/21/92	Mean
TDS	318.00	316.00	344.00	352.00	332.50
TSS	5.00	15.00	73.00	4.00	24.25
O & G	N/R	N/R	N/R	N/R	N/R
Al CaCO3	306.00	314.00	315.00	304.00	309.75
Hd CaCO3	288.00	297.00	296.00	276.00	289.25
HCO3	374.00	384.00	384.00	371.00	378.25
CO3	0.00	0.00	0.00	0.00	0.00
Cl	8.74	9.25	8.84	8.81	8.91
SO4	17.30	16.70	16.90	18.70	17.40
Ca	51.50	51.60	57.60	53.20	53.47
Mg	38.70	40.90	36.90	34.80	37.82
K	0.78	0.78	0.99	0.89	0.86
Na	23.50	22.80	22.90	23.00	23.05
Cat/An	0.43	0.42	0.31	1.33	0.62
Fe	0.21	0.82	1.12	<.05	0.54
Mn	0.03	0.03	0.03	<.02	0.02

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: TM-23
Location: Cottonwood Canyon
Type: Spring
Frequency: Quarterly

	Date Sampled				
Field Measurements	02/25/92	05/13/92	08/24/92	12/15/92	Mean
Flow [gpm]	DRY-FROZEN	DRY	DRY	DRY	
PH					
Sp. Cond. [ohms]					
Temp. [C]					
Diss. O [ppm]					

	Date Sampled				
Lab. Meas. [mg/l]	02/25/92	05/13/92	08/24/92	12/15/92	Mean
TDS					
TSS					
O & G					
Al CaCO3					
Hd CaCO3					
HCO3					
CO3					
Cl					
SO4					
Ca					
Mg					
K					
Na					
Cat/An					
Fe					
Mn					

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: UG-2
Location: Underground
Type: Spring
Frequency: Quar. BL

Date Sampled

Field Measurements	03/04/92	06/30/92	09/30/92	12/15/92	Mean
Flow [gpm]	>1	>1	>1	0.05	0.01
PH	7.80	7.60	7.76	8.00	7.79
Sp. Cond. [ohms]	3000.00	3000.00	3490.00	438.00	2482.00
Temp. [C]	12.00	10.00	12.00	13.30	11.83
Diss. O [ppm]	N/R	N/R	N/R	3.80	0.95

Date Sampled

Lab. Meas. [mg/l]	03/04/92	06/30/92	09/30/92	12/15/92	Mean
TDS	3100.00	2954.00	3170.00	244.00	2367.00
TSS	4.00	27.00	2.00	3.00	9.00
O & G	N/R	N/R	N/R	N/R	0.00
Al CaCO3	136.00	114.00	96.90	305.00	162.98
Hd CaCO3	2110.00	2419.00	2020.00	546.00	1773.75
HCO3	167.00	139.00	118.00	372.00	199.00
CO3	0.00	0.00	0.00	0.00	0.00
Cl	332.00	340.00	355.00	10.00	259.25
SO4	1720.00	1800.00	1670.00	8.00	1299.50
Ca	513.00	683.20	509.00	126.00	457.80
Mg	201.00	173.20	181.00	56.20	152.85
K	14.20	18.90	15.20	5.80	13.52
Na	108.00	107.90	116.00	148.00	119.98
Cat/An	0.46	3.83	1.02	8.23	3.39
Fe	0.60	0.00	0.00	0.15	0.19
Mn	0.02	0.00	0.00	0.00	0.01

WATER MONITORING REPORT

Property: TRAIL MOUNTAIN MINE
Station: UG-3
Location: #9 Mine Underground
Type: Spring
Frequency: Quarterly

Field Measurements	Date Sampled 03/04/92	06/30/92	09/30/92	12/15/92	Mean
Flow [gpm]	11.50	10.40	N/A	15.00	9.23
PH	8.00	8.10	7.96	8.10	8.04
Sp. Cond. [ohms]	500.00	400.00	556.00	380.00	459.00
Temp. [C]	12.00	10.00	N/A	12.20	8.55
Diss. O [ppm]	N/R	N/R	N/R	5.10	1.28

Lab. Meas. [mg/l]	Date Sampled 03/04/92	06/30/92	09/30/92	12/15/92	Mean
TDS	280.00	325.00	294.00	310.00	302.25
TSS	22.00	0.00	<1	4.00	6.50
O & G	N\R	N\R	N\R	N\R	0.00
Al CaCO3	249.00	282.00	244.00	239.00	253.50
Hd CaCO3	162.00	204.00	185.00	195.00	186.50
HCO3	303.00	344.00	298.00	291.00	309.00
CO3	0.00	0.00	0.00	0.00	0.00
Cl	6.89	48.30	7.35	10.00	18.13
SO4	25.90	30.00	44.00	80.00	44.98
Ca	30.30	48.30	36.30	41.00	38.98
Mg	21.00	20.20	23.10	22.60	21.73
K	3.90	3.00	3.65	3.50	3.51
Na	51.90	55.29	51.70	58.00	54.22
Cat/An	1.20	-0.15	0.36	0.97	0.59
Fe	0.14	0.00	0.00	0.06	0.05
Mn	0.00	0.00	0.00	0.00	0.00