

# MITTELHAUSER corporation

2401 Crow Canyon Road, Suite 100  
San Ramon, California 94583  
(415) 743-0335

August 13, 1991

Mr. Tom Gandsbury  
Water Quality Engineer  
Regional Water Quality Control Board  
2101 Webster, 5th floor  
Oakland, CA 94612

Dear Tom:

Enclosed please find a copy of the groundwater pump test done by Western Geologic Resources (WGR) at the ~~former Chevron asphalt facility in Emeryville, California~~.


The test was run in monitoring well MW-12 which is located near the eastern boarder of the property. I understand from WGR that this well was chosen because the four-inch completion was amenable to the test and the water from this well was shown to be uncontaminated. The well was originally installed by Harding Lawson Associates in August of 1988. A log of the boring and completion is included in this attachment.

The test done by WGR would seem to indicate that the local shallow aquifer is a fairly tight formation which exhibited a sustained yield of not more then 0.26 gallons per minute. From this data WGR calculated a transmissivity value of 1.48 cubic feet of water per foot of drawdown.

I hope this information is helpful. We will be contacting you to schedule a followup meeting with yourself and Dennis Byrne.

Sincerely,

MITTELHAUSER CORPORATION

  
Dwight R. Hoenig  
Manager, San Francisco Operations

DRH/jvk  
1749L2

cc: Lucia Chou, Chevron U.S.A.  
Dan Nourse, Wareham Properties  
Dennis Byrne, Alameda County Environmental  
Health Department

2169 E. FRANCISCO BOULEVARD, SUITE B  
SAN RAFAEL, CALIFORNIA 94901  
415/457-7595 FAX: 415/457-8521

25 April 1990

Lisa Marinaro  
Chevron USA  
2410 Camino Ramon  
San Ramon, CA 94583-0804

KLD 25 '90

Re: Pump Test Information

~~Emeryville, California~~

~~Emeryville, California~~

WGR #1-045.44

Dear Ms. Marinaro:

Enclosed are pump test and well recovery data tables for backup to the recovery curve contained in the Western Geologic Resources, Inc. (WGR) Groundwater Remediation Workplan dated April 1990, for the former Chevron Asphalt Plant, Emeryville, California.

The 24 hour pump test was performed with a constant head pump manufactured by Clean Environments Company. This style of air-driver pump will pump at whatever rate is required to draw the groundwater surface down to a given level. This approach to aquifer testing is used by WGR for evaluating the feasibility of using pump and treat methods for groundwater remediation. When the pumping rate stabilizes for a substantial time period, a condition very similar to a constant rate test is reached, and as a result, aquifer recovery after termination of pumping can be plotted. The straight portion of the curve of water level versus  $T/T^1$  (a ratio of test duration to total time) will give a value of transmissivity. The attached graph reproduced from the workplan details this curve.

If you have questions concerning this aquifer test data, please contact me at (415) 457-7595.

Sincerely,  
Western Geologic Resources, Inc.

Christopher S. Alger  
Project Geologist

CSA:va

Attachments:

Emeryville Pump Test Tables  
Recovery Curve Graph

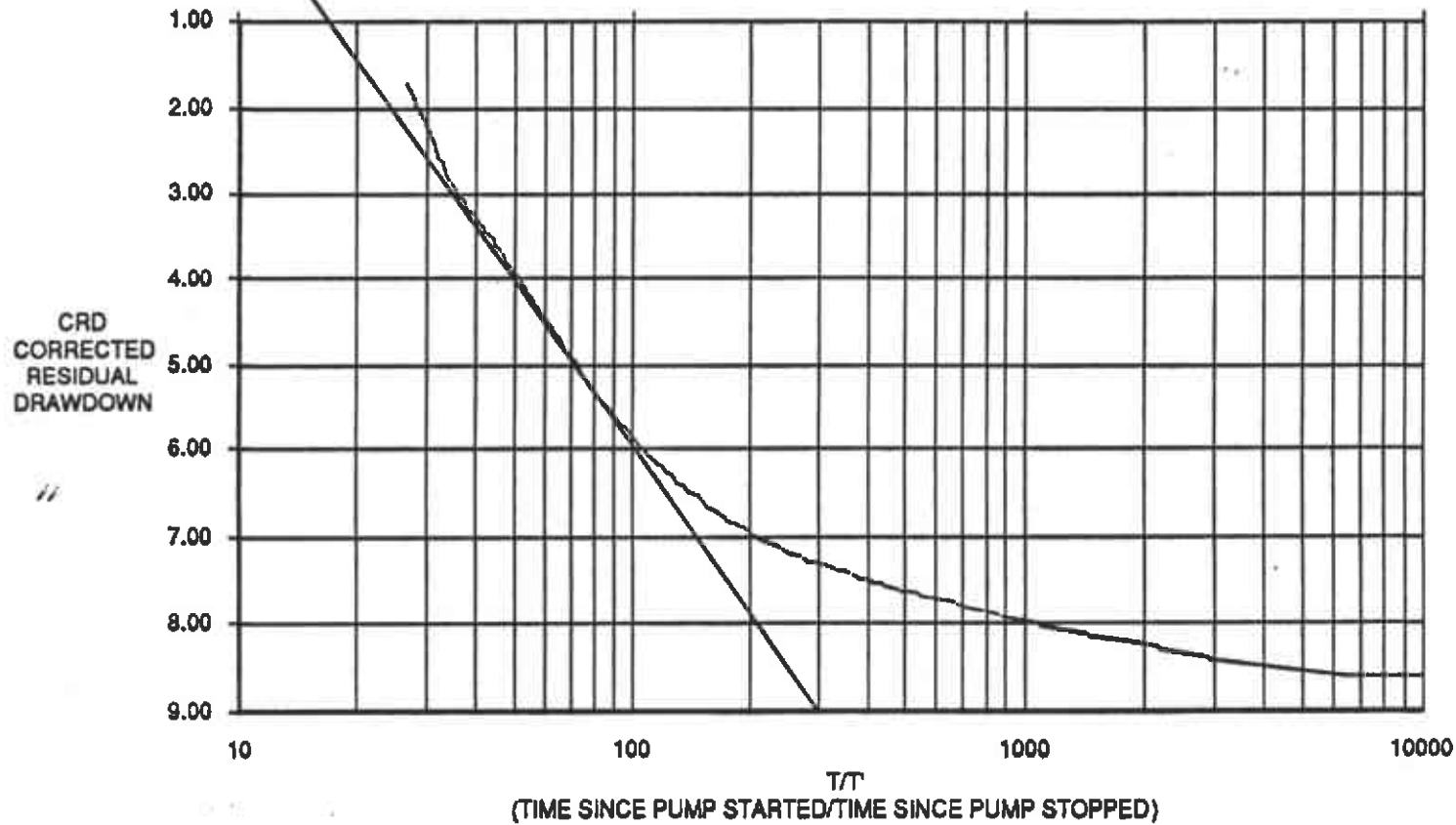
045L4AP0.WP

$$T = \frac{264Q}{\Delta s'}$$

where  $Q = 50.06 \text{ ft}^3/\text{day}$   
 $\Delta s' = 6.8' - 0.5' = 6.3'$

$$T = 1.48 \text{ ft}^3$$

EMERYVILLE PUMP TEST  
 MW 12 FEB 21 1990



Reference:

Driscoll, F. G., 1986 ed., Groundwater and Wells: Johnson Division, Pubs.,  
 St. Paul, Minnesota, p. 257.

Top of PVC Casing  
Elevation 13.01 ft

Equipment CME-55

Elevation 11 ft MSL Date 8/18/88

GROUND SURFACE

TOP OF CASING  
2 ft above ground surface

BENTONITE-CEMENT SEAL  
0 to 3 ft

BENTONITE PELLET SEAL  
3 to 4.5 ft

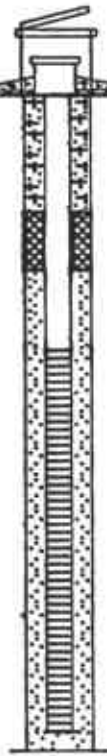
4 INCH DIAMETER SCH. 40 PVC  
BLANK CASING +2 to 6.5 ft

10 INCH DIAMETER BOREHOLE  
0 to 17 ft

4 INCH DIAMETER SLOTTED  
SCREEN (0.010 slot size)  
6.5 to 16 ft

SANDPACK (Lonestar #1/20)  
4.5 to 17 ft

BOTTOM WELL CAP at 17 ft  
HOLE CLEANED OUT TO 17 ft



OVA (ppm)

ND

ND

ND

ND

Depth (ft)  
Sample

0

5

10

15

20

25

30

35

40

ASPHALT  
LIGHT BROWNISH GRAY GRAVELLY SILTY SAND (SP)  
loose, 25% silt, 10% sand  
VERY DARK BROWN TO BLACK SANDY CLAY (CL)  
medium stiff, moist

GRAYISH GREEN SANDY CLAY (CL) medium stiff,  
moist, 13% fine- to medium-grained sand,  
trace iron oxide concretions

LIGHT BROWN SILTY SANDY CLAY (CL) medium  
stiff, moist, 30% fine- to medium-grained  
sand, 15% silt, trace gravel

LIGHT BROWN CLAYEY SAND (SC) loose, wet,  
fine- to medium-grained, trace silt

bottom of boring at 17.5 ft



Harding Lawson Associates  
Engineers and Geoscientists

Log of Boring and Well Completion Detail 12  
1520 Powell St  
Emeryville, California

PLATE

DRAWN  
EH

JOB NUMBER  
18452,005.02

APPROVED  
*[Signature]*

DATE  
10/88

REVISED

DATE

	A	B	C	D	E	F
1	EMERYVILLE PUMP TEST					
2	PROJECT MANAGER			CHRIS ALGER		
3	PROJECT NUMBER 1-045					
4	MW 12		FEB 21, 1990			
5						
6						
7						
8						
9						
10	TIME - TIME OF DAY					
11	RUN TIME - CONTINUOUS RUNNING TIME					
12	CUM VOL - CUMULATIVE PULSE VOLUME					
13	DEC TIME- RUN TIME IN DECIMAL VALUE					
14						
15	TIME	PULSE VOL	CUM VOL	RUN TIME	DEC TIME	
16	9.54	0		9.54	0.4125	
17	9.55	4.25	4.25	9.55	0.413194444	
18	9.56	4.25	8.5	9.56	0.413888888	
19	9.57	4.25	12.75	9.57	0.414583333	
20	9.57	4.25	17	9.57	0.414583333	
21	9.58	4.25	21.25	9.58	0.415277777	
22	9.59	4.25	25.5	9.59	0.415972222	
23	10	4.25	29.75	10	0.416666666	
24	10.01	4.25	34	10.01	0.417361111	
25	10.02	4.25	38.25	10.02	0.418055555	
26	10.05	4.25	42.5	10.05	0.420138888	
27	10.09	4.25	46.75	10.09	0.422916666	
28	10.13	4.25	51	10.13	0.425694444	
29	10.17	4.25	55.25	10.17	0.428472222	
30	10.21	4.25	59.5	10.21	0.43125	
31	10.26	4.25	63.75	10.26	0.434722222	
32	10.32	4.25	68	10.32	0.438888888	
33	10.37	4.25	72.25	10.37	0.442361111	
34	10.42	4.25	76.5	10.42	0.445833333	
35	10.47	4.25	80.75	10.47	0.449305555	
36	10.52	4.25	85	10.52	0.452777777	
37	10.58	4.25	89.25	10.58	0.456944444	
38	11.04	4.25	93.5	11.04	0.461111111	
39	11.09	4.25	97.75	11.09	0.464583333	
40	11.15	4.25	102	11.15	0.46875	
41	11.21	4.25	106.25	11.21	0.472916666	
42	11.25	4.25	110.5	11.25	0.475694444	
43	11.31	4.25	114.75	11.31	0.479861111	
44	11.36	4.25	119	11.36	0.483333333	
45	11.42	4.25	123.25	11.42	0.4875	
46	11.47	4.25	127.5	11.47	0.490972222	
47	11.53	4.25	131.75	11.53	0.495138888	
48	11.59	4.25	136	11.59	0.499305555	
49	12.04	4.25	140.25	12.04	0.502777777	
50	12.09	4.25	144.5	12.09	0.50625	
51	12.15	4.25	148.75	12.15	0.510416666	

	A	B	C	D	E	F
52	12.21	4.25	153	12.21	0.514583333	
53	12.26	4.25	157.25	12.26	0.518055555	
54	12.32	4.25	161.5	12.32	0.522222222	
55	12.37	4.25	165.75	12.37	0.525694444	
56	12.43	4.25	170	12.43	0.529861111	
57	12.49	4.25	174.25	12.49	0.534027777	
58	12.54	4.25	178.5	12.54	0.5375	
59	13	4.25	182.75	13	0.541666666	
60	13.06	4.25	187	13.06	0.545833333	
61	13.11	4.25	191.25	13.11	0.549305555	
62	13.17	4.25	195.5	13.17	0.553472222	
63	13.23	4.25	199.75	13.23	0.557638888	
64	13.29	4.25	204	13.29	0.561805555	
65	13.34	4.25	208.25	13.34	0.565277777	
66	13.4	4.25	212.5	13.4	0.569444444	
67	13.46	4.25	216.75	13.46	0.573611111	
68	13.51	4.25	221	13.51	0.577083333	
69	13.57	4.25	225.25	13.57	0.58125	
70	14.03	4.25	229.5	14.03	0.585416666	
71	14.08	4.25	233.75	14.08	0.588888888	
72	14.14	4.25	238	14.14	0.593055555	
73	14.2	4.25	242.25	14.2	0.597222222	
74	14.26	4.25	246.5	14.26	0.601388888	
75	14.31	4.25	250.75	14.31	0.604861111	
76	14.37	4.25	255	14.37	0.609027777	
77	14.43	4.25	259.25	14.43	0.613194444	
78	14.49	4.25	263.5	14.49	0.617361111	
79	14.54	4.25	267.75	14.54	0.620833333	
80	15	4.25	272	15	0.625	
81	15.06	4.25	276.25	15.06	0.629166666	
82	15.12	4.25	280.5	15.12	0.633333333	
83	15.18	4.25	284.75	15.18	0.6375	
84	15.23	4.25	289	15.23	0.640972222	
85	15.29	4.25	293.25	15.29	0.645138888	
86	15.35	4.25	297.5	15.35	0.649305555	
87	15.41	4.25	301.75	15.41	0.653472222	
88	15.47	4.25	306	15.47	0.657638888	
89	15.53	4.25	310.25	15.53	0.661805555	
90	15.59	4.25	314.5	15.59	0.665972222	
91	16.05	4.25	318.75	16.05	0.670138888	
92	16.11	4.25	323	16.11	0.674305555	
93	16.17	4.25	327.25	16.17	0.678472222	
94	16.23	4.25	331.5	16.23	0.682638888	
95	16.28	4.25	335.75	16.28	0.686111111	
96	16.34	4.25	340	16.34	0.690277777	
97	16.4	4.25	344.25	16.4	0.694444444	
98	16.46	4.25	348.5	16.46	0.698611111	
99	16.52	4.25	352.75	16.52	0.702777777	
100	16.58	4.25	357	16.58	0.706944444	
101	17.04	4.25	361.25	17.04	0.711111111	
102	17.09	4.25	365.5	17.09	0.714583333	

	A	B	C	D	E	F
103	17.16	4.25	369.75	17.16	0.719444444	
104	17.21	4.25	374	17.21	0.722916666	
105	17.27	4.25	378.25	17.27	0.727083333	
106	17.33	4.25	382.5	17.33	0.73125	
107	17.39	4.25	386.75	17.39	0.735416666	
108	17.45	4.25	391	17.45	0.739583333	
109	17.51	4.25	395.25	17.51	0.74375	
110	17.57	4.25	399.5	17.57	0.747916666	
111	18.03	4.25	403.75	18.03	0.752083333	
112	18.09	4.25	408	18.09	0.75625	
113	18.15	4.25	412.25	18.15	0.760416666	
114	18.21	4.25	416.5	18.21	0.764583333	
115	18.27	4.25	420.75	18.27	0.76875	
116	18.33	4.25	425	18.33	0.772916666	
117	18.39	4.25	429.25	18.39	0.777083333	
118	18.45	4.25	433.5	18.45	0.78125	
119	18.5	4.25	437.75	18.5	0.784722222	
120	18.57	4.25	442	18.57	0.789583333	
121	19.03	4.25	446.25	19.03	0.79375	
122	19.08	4.25	450.5	19.08	0.797222222	
123	19.14	4.25	454.75	19.14	0.801388888	
124	19.2	4.25	459	19.2	0.805555555	
125	19.27	4.25	463.25	19.27	0.810416666	
126	19.32	4.25	467.5	19.32	0.813888888	
127	19.39	4.25	471.75	19.39	0.81875	
128	19.45	4.25	476	19.45	0.822916666	
129	19.51	4.25	480.25	19.51	0.827083333	
130	19.57	4.25	484.5	19.57	0.83125	
131	20.03	4.25	488.75	20.03	0.835416666	
132	20.09	4.25	493	20.09	0.839583333	
133	20.15	4.25	497.25	20.15	0.84375	
134	20.21	4.25	501.5	20.21	0.847916666	
135	20.27	4.25	505.75	20.27	0.852083333	
136	20.33	4.25	510	20.33	0.85625	
137	20.39	4.25	514.25	20.39	0.860416666	
138	20.45	4.25	518.5	20.45	0.864583333	
139	20.51	4.25	522.75	20.51	0.86875	
140	20.57	4.25	527	20.57	0.872916666	
141	21.03	4.25	531.25	21.03	0.877083333	
142	21.09	4.25	535.5	21.09	0.88125	
143	21.15	4.25	539.75	21.15	0.885416666	
144	21.22	4.25	544	21.22	0.890277777	
145	21.28	4.25	548.25	21.28	0.894444444	
146	21.34	4.25	552.5	21.34	0.898611111	
147	21.4	4.25	556.75	21.4	0.902777777	
148	21.46	4.25	561	21.46	0.906944444	
149	21.52	4.25	565.25	21.52	0.911111111	
150	21.58	4.25	569.5	21.58	0.915277777	
151	22.04	4.25	573.75	22.04	0.919444444	
152	22.1	4.25	578	22.1	0.923611111	
153	22.16	4.25	582.25	22.16	0.927777777	

	A	B	C	D	E	F
154	22.22	4.25	586.5	22.22	0.931944444	
155	22.28	4.25	590.75	22.28	0.936111111	
156	22.34	4.25	595	22.34	0.940277777	
157	22.4	4.25	599.25	22.4	0.944444444	
158	22.47	4.25	603.5	22.47	0.949305555	
159	22.53	4.25	607.75	22.53	0.953472222	
160	22.59	4.25	612	22.59	0.957638888	
161	23.05	4.25	616.25	23.05	0.961805555	
162	23.11	4.25	620.5	23.11	0.965972222	
163	23.17	4.25	624.75	23.17	0.970138888	
164	23.23	4.25	629	23.23	0.974305555	
165	23.29	4.25	633.25	23.29	0.978472222	
166	23.35	4.25	637.5	23.35	0.982638888	
167	23.41	4.25	641.75	23.41	0.986805555	
168	23.47	4.25	646	23.47	0.990972222	
169	23.53	4.25	650.25	23.53	0.995138888	
170	23.59	4.25	654.5	23.59	0.999305555	
171	0.05	4.25	658.75	24.05	1.003472222	
172	0.11	4.25	663	24.11	1.007638888	
173	0.18	4.25	667.25	24.18	1.0125	
174	0.24	4.25	671.5	24.24	1.016666666	
175	0.3	4.25	675.75	24.3	1.020833333	
176	0.36	4.25	680	24.36	1.025	
177	0.42	4.25	684.25	24.42	1.029166666	
178	0.48	4.25	688.5	24.48	1.033333333	
179	0.54	4.25	692.75	24.54	1.0375	
180	1	4.25	697	25	1.041666666	
181	1.06	4.25	701.25	25.06	1.045833333	
182	1.12	4.25	705.5	25.12	1.05	
183	1.18	4.25	709.75	25.18	1.054166666	
184	1.24	4.25	714	25.24	1.058333333	
185	1.31	4.25	718.25	25.31	1.063194444	
186	1.37	4.25	722.5	25.37	1.067361111	
187	1.43	4.25	726.75	25.43	1.071527777	
188	1.49	4.25	731	25.49	1.075694444	
189	1.55	4.25	735.25	25.55	1.079861111	
190	2.01	4.25	739.5	26.01	1.084027777	
191	2.07	4.25	743.75	26.07	1.088194444	
192	2.13	4.25	748	26.13	1.092361111	
193	2.19	4.25	752.25	26.19	1.096527777	
194	2.26	4.25	756.5	26.26	1.101388888	
195	2.32	4.25	760.75	26.32	1.105555555	
196	2.38	4.25	765	26.38	1.109722222	
197	2.44	4.25	769.25	26.44	1.113888888	
198	2.5	4.25	773.5	26.5	1.118055555	
199	2.56	4.25	777.75	26.56	1.122222222	
200	3.02	4.25	782	27.02	1.126388888	
201	3.09	4.25	786.25	27.09	1.13125	
202	3.15	4.25	790.5	27.15	1.135416666	
203	3.21	4.25	794.75	27.21	1.139583333	
204	3.27	4.25	799	27.27	1.14375	



	A	B	C	D	E	F
205	3.33	4.25	803.25	27.33	1.147916666	
206	3.39	4.25	807.5	27.39	1.152083333	
207	3.45	4.25	811.75	27.45	1.15625	
208	3.51	4.25	816	27.51	1.160416666	
209	3.57	4.25	820.25	27.57	1.164583333	
210	4.03	4.25	824.5	28.03	1.16875	
211	4.09	4.25	828.75	28.09	1.172916666	
212	4.16	4.25	833	28.16	1.177777777	
213	4.22	4.25	837.25	28.22	1.181944444	
214	4.28	4.25	841.5	28.28	1.186111111	
215	4.34	4.25	845.75	28.34	1.190277777	
216	4.4	4.25	850	28.4	1.194444444	
217	4.46	4.25	854.25	28.46	1.198611111	
218	4.52	4.25	858.5	28.52	1.202777777	
219	4.58	4.25	862.75	28.58	1.206944444	
220	5.04	4.25	867	29.04	1.211111111	
221	5.11	4.25	871.25	29.11	1.215972222	
222	5.17	4.25	875.5	29.17	1.220138888	
223	5.29	4.25	879.75	29.29	1.228472222	
224	5.35	4.25	884	29.35	1.232638888	
225	5.41	4.25	888.25	29.41	1.236805555	
226	5.47	4.25	892.5	29.47	1.240972222	
227	5.53	4.25	896.75	29.53	1.245138888	
228	5.59	4.25	901	29.59	1.249305555	
229	6.05	4.25	905.25	30.05	1.253472222	
230	6.11	4.25	909.5	30.11	1.257638888	
231	6.18	4.25	913.75	30.18	1.2625	
232	6.24	4.25	918	30.24	1.266666666	
233	6.3	4.25	922.25	30.3	1.270833333	
234	6.36	4.25	926.5	30.36	1.275	
235	6.42	4.25	930.75	30.42	1.279166666	
236	6.48	4.25	935	30.48	1.283333333	
237	6.54	4.25	939.25	30.54	1.2875	
238	7	4.25	943.5	31	1.291666666	
239	7.07	4.25	947.75	31.07	1.296527777	
240	7.13	4.25	952	31.13	1.300694444	
241	7.19	4.25	956.25	31.19	1.304861111	
242	7.25	4.25	960.5	31.25	1.309027777	
243	7.31	4.25	964.75	31.31	1.313194444	
244	7.38	4.25	969	31.38	1.318055555	
245	7.44	4.25	973.25	31.44	1.322222222	
246	7.5	4.25	977.5	31.5	1.326388888	
247	7.56	4.25	981.75	31.56	1.330555555	
248	8.02	4.25	986	32.02	1.334722222	
249	8.09	4.25	990.25	32.09	1.339583333	
250	8.15	4.25	994.5	32.15	1.34375	
251	8.21	4.25	998.75	32.21	1.347916666	
252	8.27	4.25	1003	32.27	1.352083333	
253	8.33	4.25	1007.25	32.33	1.35625	
254	8.4	4.25	1011.5	32.4	1.361111111	
255	8.45	4.25	1015.75	32.45	1.364583333	

	A	B	C	D	E	F	G	H
1								
2		EMERYVILLE PUMP TEST FEB 21 1990						
3		MW-12 CHRIS ALGER PROJECT MANAGER						
4		WELL RECOVERY DATA						
5	T'	-TIME SINCE PUMP WAS STOPPED						
6	T	-TIME SINCE START OF PUMP						
7	DECTIME	-TIME OF DAY IN DECIMAL VALUE						
8								
9								
10								
11		DTW	DECTIME	TIME	T'	DTW-6.51	T	T/T'
12	1208	15.1	0.50555555	12.08	.0000000	8.59	1.502083	1.00E+04
13	1208.2	15.1	0.50578472	12.0833	.0002292	8.59	1.50231217	6555.39
14	1208.45	14.89	0.50607638	12.0875	.0005208	8.38	1.50260383	2884.97
15	1209	14.78	0.50625	12.09	.0006945	8.27	1.50277745	2163.98
16	1209.15	14.69	0.50642361	12.0925	.0008681	8.18	1.50295106	1731.39
17	1209.3	14.63	0.50659722	12.095	.0010417	8.12	1.50312467	1442.99
18	1209.45	14.57	0.50677083	12.0975	.0012153	8.06	1.50329828	1236.99
19	1210	14.52	0.50694444	12.1	.0013889	8.01	1.50347189	1082.50
20	1210.15	14.46	0.50711805	12.1025	.0015625	7.95	1.50364550	962.33
21	1210.3	14.42	0.50729166	12.105	.0017361	7.91	1.50381911	866.20
22	1210.45	14.36	0.50746527	12.1075	.0019097	7.85	1.50399272	787.54
23	1211	14.33	0.50763888	12.11	.0020833	7.82	1.50416633	722.00
24	1211.15	14.27	0.5078125	12.1125	.0022570	7.76	1.50433995	666.54
25	1211.3	14.24	0.50798611	12.115	.0024306	7.73	1.50451356	619.00
26	1211.45	14.21	0.50815972	12.1175	.0026042	7.7	1.50468717	577.80
27	1212	14.18	0.50833333	12.12	.0027778	7.67	1.50486078	541.75
28	1212.15	14.14	0.50850694	12.1225	.0029514	7.63	1.50503439	509.94
29	1212.3	14.12	0.50868055	12.125	.0031250	7.61	1.50520800	481.67
30	1212.45	14.09	0.50885416	12.1275	.0032986	7.58	1.50538161	456.37
31	1213	14.05	0.50902777	12.13	.0034722	7.54	1.50555522	433.60
32	1213.15	14.03	0.50920138	12.1325	.0036458	7.52	1.50572883	413.00
33	1213.3	14	0.509375	12.135	.0038195	7.49	1.50590245	394.27
34	1213.45	13.98	0.50954861	12.1375	.0039931	7.47	1.50607606	377.17
35	1214	13.94	0.50972222	12.14	.0041667	7.43	1.50624967	361.50
36	1214.15	13.91	0.50989583	12.1425	.0043403	7.41	1.50642328	347.08
37	1214.3	13.89	0.51006944	12.145	.0045139	7.38	1.50659689	333.77

	A	B	C	D	E	F	G	H
38	1214.45	13.86	0.51024305	12.1475	.0046875	7.35	1.50677050	321.44
39	1215	13.83	0.51041666	12.15	.0048611	7.32	1.50694411	310.00
40	1215.15	13.82	0.51059027	12.1525	.0050347	7.31	1.50711772	299.34
41	1215.3	13.80	0.51076388	12.155	.0052083	7.29	1.50729133	289.40
42	1215.45	13.78	0.5109375	12.1575	.0053820	7.27	1.50746495	280.10
43	1216	13.74	0.51111111	12.16	.0055556	7.23	1.50763856	271.37
44	1216.3	13.71	0.51145833	12.165	.0059028	7.21	1.50798578	255.47
45	1217	13.65	0.51180555	12.17	.0062500	7.14	1.50833300	241.33
46	1217.3	13.60	0.51215277	12.175	.0065972	7.09	1.50868022	228.68
47	1218	13.56	0.5125	12.18	.0069445	7.05	1.50902745	217.30
48	1218.3	13.51	0.51284722	12.185	.0072917	7	1.50937467	207.00
49	1219	13.45	0.51319444	12.19	.0076389	6.94	1.50972189	197.64
50	1219.3	13.40	0.51354166	12.195	.0079861	6.89	1.51006911	189.09
51	1220	13.34	0.51388888	12.2	.0083333	6.83	1.51041633	181.25
52	1220.3	13.31	0.51423611	12.205	.0086806	6.8	1.51076356	174.04
53	1221	13.26	0.51458333	12.21	.0090278	6.75	1.51111078	167.38
54	1221.3	13.21	0.51493055	12.215	.0093750	6.7	1.51145800	161.22
55	1222	13.17	0.51527777	12.22	.0097222	6.66	1.51180522	155.50
56	1222.3	13.09	0.515625	12.225	.0100695	6.58	1.51215245	150.17
57	1223	13.04	0.51597222	12.23	.0104167	6.53	1.51249967	145.20
58	1223.3	13.01	0.51631944	12.235	.0107639	6.5	1.51284689	140.55
59	1224	12.94	0.51666666	12.24	.0111111	6.43	1.51319411	136.19
60	1224.3	12.91	0.51701388	12.245	.0114583	6.4	1.51354133	132.09
61	1225	12.87	0.51736111	12.25	.0118056	6.36	1.51388856	128.24
62	1225.3	12.79	0.51770833	12.255	.0121528	6.28	1.51423578	124.60
63	1226	12.75	0.51805555	12.26	.0125000	6.24	1.51458300	121.17
64	1226.3	12.70	0.51840277	12.265	.0128472	6.19	1.51493022	117.92
65	1227	12.64	0.51875	12.27	.0131945	6.13	1.51527745	114.84
66	1227.3	12.59	0.51909722	12.275	.0135417	6.08	1.51562467	111.92
67	1228	12.56	0.51944444	12.28	.0138889	6.05	1.51597189	109.15
68	1229	12.45	0.52013888	12.29	.0145833	5.94	1.51666633	104.00
69	1230	12.34	0.52083333	12.3	.0152778	5.83	1.51736078	99.32
70	1231	12.24	0.52152777	12.31	.0159722	5.73	1.51805522	95.04
71	1232	12.14	0.52222222	12.32	.0166667	5.63	1.51874967	91.12
72	1233	12.04	0.52291666	12.33	.0173611	5.53	1.51944411	87.52
73	1234	11.95	0.52361111	12.34	.0180556	5.44	1.52013856	84.19
74	1235	11.85	0.52430555	12.35	.0187500	5.34	1.52083300	81.11

	A	B	C	D	E	F	G	H
75	1236	11.77	0.525	12.36	.0194445	5.26	1.52152745	78.25
76	1237	11.65	0.52569444	12.37	.0201389	5.14	1.52222189	75.59
77	1238	11.55	0.52638888	12.38	.0208333	5.04	1.52291633	73.10
78	1239	11.45	0.52708333	12.39	.0215278	4.94	1.52361078	70.77
79	1240	11.37	0.52777777	12.4	.0222222	4.86	1.52430522	68.59
80	1241	11.28	0.52847222	12.41	.0229167	4.77	1.52499967	66.55
81	1242	11.17	0.52916666	12.42	.0236111	4.66	1.52569411	64.62
82	1243	11.09	0.52986111	12.43	.0243056	4.58	1.52638856	62.80
83	1244	11.03	0.53055555	12.44	.0250000	4.52	1.52708300	61.08
84	1245	10.95	0.53125	12.45	.0256945	4.44	1.52777745	59.46
85	1246	10.87	0.53194444	12.46	.0263889	4.36	1.52847189	57.92
86	1247	10.8	0.53263888	12.47	.0270833	4.29	1.52916633	56.46
87	1248	10.72	0.53333333	12.48	.0277778	4.21	1.52986078	55.07
88	1249	10.65	0.53402777	12.49	.0284722	4.14	1.53055522	53.76
89	1250	10.59	0.53472222	12.5	.0291667	4.08	1.53124967	52.50
90	1251	10.51	0.53541666	12.51	.0298611	4	1.53194411	51.30
91	1252	10.45	0.53611111	12.52	.0305556	3.94	1.53263856	50.16
92	1253	10.39	0.53680555	12.53	.0312500	3.88	1.53333300	49.07
93	1254	10.34	0.5375	12.54	.0319445	3.83	1.53402745	48.02
94	1255	10.26	0.53819444	12.55	.0326389	3.75	1.53472189	47.02
95	1256	10.19	0.53888888	12.56	.0333333	3.68	1.53541633	46.06
96	1257	10.14	0.53958333	12.57	.0340278	3.63	1.53611078	45.14
97	1258	10.07	0.54027777	12.58	.0347222	3.56	1.53680522	44.26
98	1259	10.02	0.54097222	12.59	.0354167	3.51	1.53749967	43.41
99	1300	9.96	0.54166666	13	.0361111	3.45	1.53819411	42.60
100	1301	9.93	0.54236111	13.01	.0368056	3.42	1.53888856	41.81
101	1302	9.88	0.54305555	13.02	.0375000	3.37	1.53958300	41.06
102	1303	9.83	0.54375	13.03	.0381945	3.32	1.54027745	40.33
103	1304	9.76	0.54444444	13.04	.0388889	3.25	1.54097189	39.62
104	1305	9.74	0.54513888	13.05	.0395833	3.23	1.54166633	38.95
105	1306	9.7	0.54583333	13.06	.0402778	3.19	1.54236078	38.29
106	1307	9.64	0.54652777	13.07	.0409722	3.13	1.54305522	37.66
107	1308	9.59	0.54722222	13.08	.0416667	3.08	1.54374967	37.05
108	1309	9.55	0.54791666	13.09	.0423611	3.04	1.54444411	36.46
109	1310	9.5	0.54861111	13.1	.0430556	2.99	1.54513856	35.89
110	1311	9.46	0.54930555	13.11	.0437500	2.95	1.54583300	35.33
111	1312	9.41	0.55	13.12	.0444445	2.91	1.54652745	34.80

	A	B	C	D	E	F	G	H
112	1313	9.37	0.55069444	13.13	.0451389	2.86	1.54722189	34.28
113	1314	9.32	0.55138888	13.14	.0458333	2.81	1.54791633	33.77
114	1315	9.25	0.55208333	13.15	.0465278	2.74	1.54861078	33.28
115	1316	9.14	0.55277777	13.16	.0472222	2.63	1.54930522	32.81
116	1317	9.10	0.55347222	13.17	.0479167	2.59	1.54999967	32.35
117	1318	9.03	0.55416666	13.18	.0486111	2.52	1.55069411	31.90
118	1319	8.96	0.55486111	13.19	.0493056	2.45	1.55138856	31.46
119	1320	8.88	0.55555555	13.2	.0500000	2.37	1.55208300	31.04
120	1321	8.82	0.55625	13.21	.0506945	2.31	1.55277745	30.63
121	1322	8.76	0.55694444	13.22	.0513889	2.25	1.55347189	30.23
122	1323	8.73	0.55763888	13.23	.0520833	2.22	1.55416633	29.84
123	1324	8.66	0.55833333	13.24	.0527778	2.15	1.55486078	29.46
124	1325	8.60	0.55902777	13.25	.0534722	2.09	1.55555522	29.09
125	1326	8.56	0.55972222	13.26	.0541667	2.05	1.55624967	28.73
126	1327	8.49	0.56041666	13.27	.0548611	1.98	1.55694411	28.38
127	1328	8.44	0.56111111	13.28	.0555556	1.93	1.55763856	28.04
128	1329	8.39	0.56180555	13.29	.0562500	1.88	1.55833300	27.70
129	1330	8.35	0.5625	13.3	.0569445	1.84	1.55902745	27.38
130	1331	8.30	0.56319444	13.31	.0576389	1.79	1.55972189	27.06
131	1332	8.25	0.56388888	13.32	.0583333	1.74	1.56041633	26.75
132	1333	8.21	0.56458333	13.33	.0590278	1.7	1.56111078	26.45