4/5/95
Carl Schroeder

WR File
21 (d)

Delong Lake SED SOLIDS, pH

1. Reason for listing: DEC 88 Statewide WQA Report & '89 NPSWQA. References MUA WQ Monitoring Prgm 1989

2. Data Reviewed: 1992-94 Weekly monitoring for pH 8/105 exceedances, those exceedances were slight. not deemed significant.

SED, SOLIDS - need to review 89 data - however Turb data from 1991 do not indicate a problem which only recent related data.

FC 1992-94 Weekly data show significant counts, i.e July + Aug.

3. Impaired? PH Not impaired.
SED, SOLIDS - NO

TMDL - not for SED, SOLIDS, or pH
FC - list as Water of Concern

Reported cadmium, total chromium, copper, lead, and nickel concentrations lie below detectable levels. In comparison with other lakes monitored for Level II parameters, chloride, hardness, and zinc lie within average levels (Figures 4-13, 4-14, and 4-19). Among other parameters, arsenic was detected but at a level below water quality standards (Figure 4-20). Iron greatly exceeded the aquatic life standard and was the highest among Level II lakes (Figure 4-21). Mercury was not measured at detectable levels (Figure 4-15). Total organic carbon levels were recorded at concentrations comparable to other Level II lakes (Figure 4-16). Nutrient levels in Connors Lake are relatively low, as nitrates remain undetected and phosphorus levels are comparatively low (Figures 4-18 and 4-17).

4.4.4 DeLong Lake

DeLong Lake is bordered by suburban development with municipal sewer service, and by parks and undeveloped shoreline. The lake has one of the smaller drainage areas but receives direct runoff from streets. Waterfowl have been observed in small numbers at the sampling sites, with dense patches of bird feces found during some rounds.

The bacteriological quality of water in DeLong Lake, as for other lakes in the program, can vary significantly between sampling locations. A single water sample producing high values for fecal coliform and *E. coli* (near 6000 colonies per 100 ml), was taken with goose fecal material in the water at the sampling site. These values would make DeLong Lake appear more polluted than most lakes in the Anchorage area. However, typical bacteria counts occur one to two orders of magnitude lower than the reported maximum values, falling between primary and secondary contract recreation standard levels. During winter monitoring, coliform and enterococci bacteria were not detected, suggesting that the reported bacteriological contamination arises from spring, summer, and fall populations of waterfowl, and from other potential sources such as street runoff.

Based on limited Level I analyses, the chemical/physical quality of water in DeLong Lake is generally quite good, but pH violations of the water quality standard were observed. Median dissolved oxygen levels occur near saturation levels, and specific conductance is among the lowest of Anchorage area lakes (Figures 4-9 and 4-11). Median pH falls within all water quality standard limits, with minimum values reported below the aquatic life and drinking water standards.

4.4.5 Edmonds Lake

Edmonds Lake is located in a rural area east of Anchorage. The lake has a relatively small drainage area, no major connecting streams, and has very few residences along its shore. Houses in the area have private septic systems. Waterfowl are seldom seen during sampling events.

The bacteriological quality of water in Edmonds Lake is among the best in the Anchorage area. No exceedence of the primary contact recreation standard was recorded for any of the bacteria parameters (Figures 4-6, 4-7, and 4-8). None of the bacteria parameters were detected in any of the spring or winter monitoring events, suggesting that septic systems may not be a primary cause of moderately elevated bacteria levels observed during the summer. Waterfowl, animals, and overland flow may introduce bacteria into the lake during the summer months.

Based on limited Level I analyses, the physical/chemical quality of Edmonds Lake water is variable. The average dissolved oxygen concentration resides above the aquatic life standard, with extreme values recorded well below the standard. It was noticed while sampling at shoreline stations that the dissolved oxygen concentration was often quite low a few inches above a dense mat of decaying leaf vegetation covering the lake bottom Anaerobic conditions were recorded within

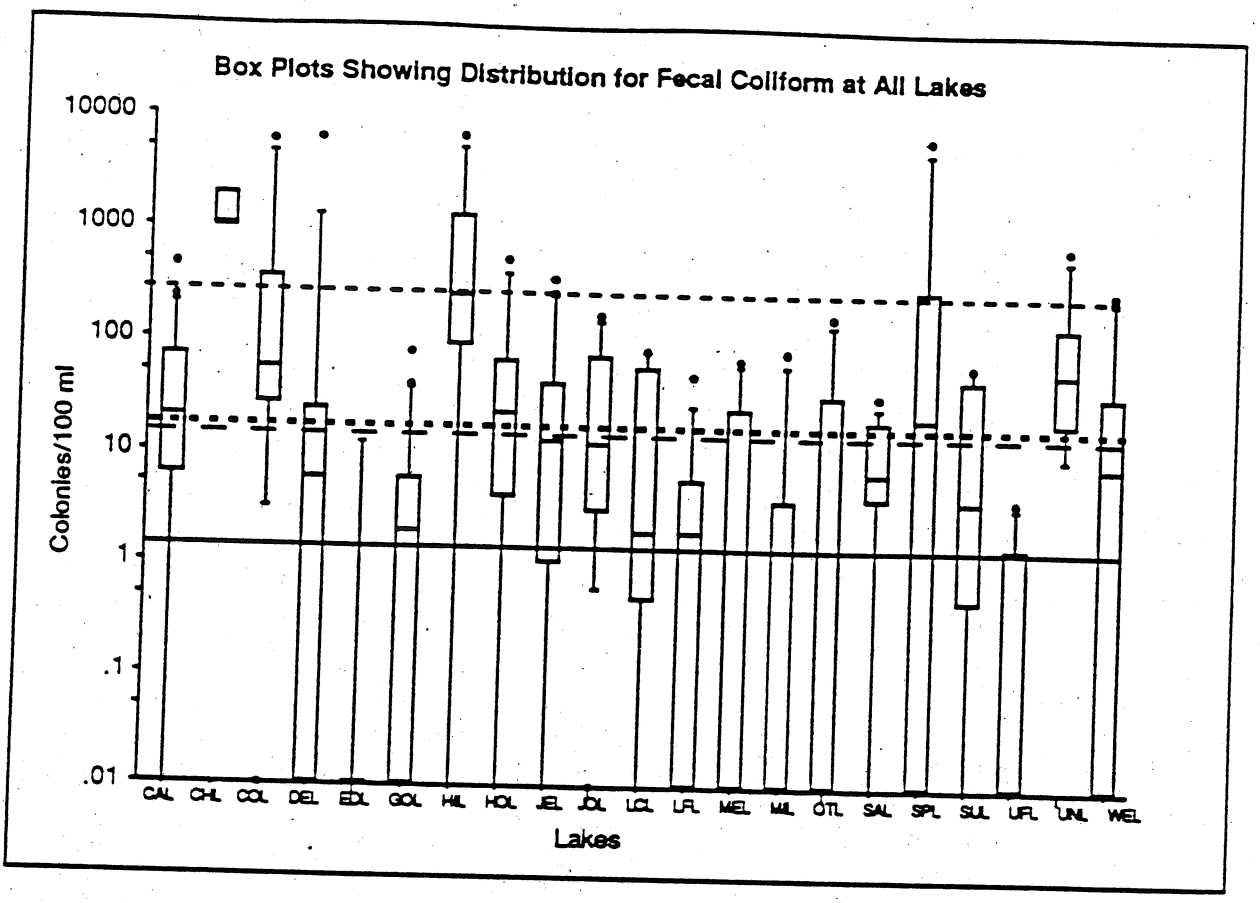
TABLE 4-1

Summer and Winter Range of pH, Conductivity, and Dissolved Oxygen For 21 Anchorage Area Lakes

LAKE	pH SUMMER Min/Max	pH WINTER Min/Max	Specific Conductance (µmhos/cm) SUMMER Min/Max	Specific Conductance (µmhos/cm) WINTER Min/Max	Dissolved Oxygen (ppm) SUMMER Min/Max	Dissolved Oxygen (ppm) WINTER Min/Max
Campbell	6.58/8.33	7.04/7.25	84/113	157/163	9.0/12.7	12.6/13.8
Cheney	7.64/8.81	6.79/7.20	147/204	270/365	8.1/9.9	9.4/11.4
Connors	6.81/7.29	6.05/7.58	155/215	155/232	3.4/6.6	4.4/4.8
Delong	6.65/8.07	5.39/7.58	93/95	96/115	6.2/7.9	6.6/9.0
Edmonds	8.41/8.80	6.96/7.41	154/194	401/480	9.8/11.1	0.0/4.9
Goose	7.79/8.50	6.26/7.20	94/101	72/162	7.2/9.0	5.7/7.2
Hidden	6.38/7.39	5.72/7.40	169/192	260/359	7.6/10.3	2.0/7.4
Hood	7.65/7.80	6.07/7.09	376/445	370/482	5.9/7.2	0.6/5.4
Jewel	7.41/8.45	6.00/7.07	111/114	75/137	6.3/9.3	7.5/8.1
Jones	6.50/6.80	6.62/6.66	92/103	484/810	5.1/8.1	1.6/1.6
Little Campbell	7.22/7.35	6.96/6.98	35/36	45/46	6.7/8.6	7.6/8.1
Lower Fire	6.70/8.19	7.07/7.39	169/178	101/358	8.0/8.6	4.8/7.3
Meadow	7.10/7.35	6.62/7.31	330/339	531/617	5.2/6.3	0.0/3.1
Mirror	7.00/8.57	6.97/7.25	214/247	393/509	7.2/9.2	0.9/6.2
Otis	7.56/8.02	6.59/6.59	93/99	136/136	6.8/8.1	1.6/1.6
Sand	7.26/7.84	6.29/7.02	106/108	150/153	5.9/8.9	5.1/6.5
Spenard	7.28/7.72	6.49/7.58	384/439	325/447	4.6/5.2	2.2/4.8
Sundi	7.00/7.58	5.52/6.72	54/55	53/70	5.2/8.1	6.7/10.5
Upper Fire	7.30/7.93	6.93/7.28	166/172	210/311	10.0/11.0	0.0/10.4
University	6.79/7.64	6.78/7.03	182/194	234/268	8.2/8.4	8.8/14.0
Westchester Lagoon	8.70/10.08	6.66/7.68	207/228	336/494	7.4/9.0	6.1/13.1

6.5 - 8.5 is std.

Figure 4-6



LEGEND

Water Quality Standards

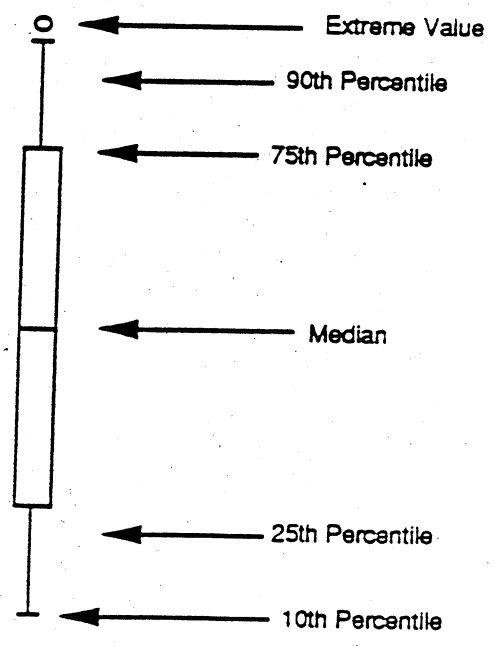
Drinking Water Standard (18AAC 70) = 20 FC/100ml

Primary Contact Standard (18AAC 70) = 20 FC/100ml

Secondary Contact Standard = 200 FC/100 ml

Detection Limit

CAL = CAMPBELL LAKE
CHL = CHENEY LAKE
COL = CONNORS LAKE
DEL = DELONG LAKE
EDL = EDMONDS LAKE
GOL = GOOSE LAKE
HIL = HIDEAWAY LAKE
HOL = HOOD LAKE
JEL = JEWEL LAKE
JOL = JONES LAKE
LCL = LITTLE CAMPBELL LAKE
LFL = LOWER FIRE LAKE
MEL = MEADOW LAKE
MIL = MIRROR LAKE
OTL = OTIS LAKE
SAL = SAND LAKE
SPL = SPENARD LAKE
SUL = SUNDI LAKE
UFL = UPPER FIRE LAKE
UNL = UNIVERSITY LAKE
WEL = WESTCHESTER LAGOON



DeLong Lake

STA	DATE	TIME	FECAL	PH	H2OT	COND	DISSO2	COMMENTS
~~F1~~	~~07/16/86~~	~~1128~~	~~4200~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~07/14/86~~	~~945~~	~~200~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~07/09/86~~	~~1336~~	~~160~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~07/02/86~~	~~1213~~	~~72~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~06/25/86~~	~~1334~~	~~806~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~06/18/86~~	~~1026~~	~~80~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~06/11/86~~	~~1346~~	~~30~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~06/04/86~~	~~910~~	~~92~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~05/29/86~~	~~1419~~	~~14~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~05/29/86~~	~~1257~~	~~14~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~05/14/86~~	~~1500~~	~~1000~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~05/05/86~~	~~1350~~	~~2~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~04/25/86~~	~~1400~~	~~10~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~04/21/86~~	~~1406~~	~~270~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
~~F1~~	~~04/15/86~~	~~0~~	~~630~~	~~0.000~~	~~0.0~~	~~0~~	~~0.0~~	
DLLW	09/30/94	1010	7	7.690 6.5-	9.5	62	8.8	
DLLW	09/23/94	1340	0	6.490 8.5	12.5	70	18.7	
DLLW	09/19/94	1615	4	6.640 pH	14.2	62	13.1	
DLLW	09/12/94	1420	9	6.600 std.	14.8	60	17.7	
DLLW	09/01/94	1220	19	7.700	16.1	73	10.0	
DLLW	08/22/94	1315	132	7.480	19.5	80	8.7	
DLLW	08/11/94	1320	15	7.540	20.1	80	12.5	
DLLW	08/08/94	1005	0	7.620	19.2	71	11.2	
DLLW	08/02/94	1020	11	7.380	19.1	78	9.2	
DLLW	07/27/94	1025	2	7.520	17.0	72	9.4	
DLLW	07/22/94	940	5	7.400	17.4	73	0.0	
DLLW	07/15/94	940	9	7.540	18.4	75	9.3	
DLLW	07/08/94	1005	182	7.560	19.0	77	9.3	
DLLW	07/01/94	920	3	7.930	18.2	74	8.8	
DLLW	06/24/94	915	22	6.060	15.8	70	10.8	
DLLW	06/15/94	1010	14	6.390	20.4	79	9.1	
DLLW	06/07/94	1335	32	7.880	17.2	71	9.8	
DLLW	09/28/93	1045	3	8.090	9.0	60	11.1	
DLLW	09/21/93	1020	2	8.080	10.7	60	10.7	
DLLW	09/15/93	1100	3	7.470	14.0	70	10.0	
DLLW	09/09/93	950	2	8.010	14.7	65	10.0	
DLLW	09/02/93	1200	4	6.830	16.0	75	9.4	
DLLW	08/27/93	1045	0	7.970	17.1	75	9.5	
DLLW	08/19/93	1705	11	8.050	18.2	80	9.6	
DLLW	08/09/93	1640	34	7.980	22.0	80	8.8	
DLLW	08/04/93	1540	10	7.980	21.1	78	8.9	
DLLW	07/27/93	1420	N/A 0	7.910	22.7	85	8.7	
DLLW	07/23/93	1618	32	7.930	22.0	80	8.9	
DLLW	07/16/93	1045	62	7.440	21.6	85	0.0	
DLLW	07/09/93	1030	10	7.750	19.5	80	0.0	
DLLW	07/01/93	1540	43	0.000	18.0	70	9.3	
DLLW	06/23/93	1530	154	8.540	20.5	75	8.9	
DLLW	06/18/93	1100	7	8.260	17.8	70	9.7	
DLLW	06/07/93	1100	1	7.910	16.2	70	10.1	
DLLW	06/03/93	1020	5	7.750	18.1	75	9.3	
DLLW	05/26/93	945	131	6.700	14.5	65	10.3	
DLLW	05/20/93	1540	14	7.620	24.5	80	8.3	
DLLW	09/10/92	1340	5	7.200	12.9	60	0.0	

STA	DATE	TIME	FECAL	PH	H2OT	COND	DISSO2	COMMENTS
DLLW	09/04/92	1115	0	7.440	14.4	60	10.4	
DLLW	08/28/92	1435	104	0.000	0.0	50	9.5	
DLLW	08/21/92	1410	1	7.030	16.4	60	9.5	
DLLW	08/12/92	1115	9	7.220	17.8	60	9.8	
DLLW	08/03/92	1446	14	9.500	18.8	70	9.5	
DLLW	08/03/92	1446	14	7.320	18.8	70	9.5	
DLLW	07/28/92	930	21	7.940	18.5	70	9.2	DUCKS,GEESE
DLLW	07/28/92	930	21	7.940	18.5	70	9.2	
DLLW	07/21/92	1417	82	7.420	19.7	70	9.1	
DLLW	07/21/92	1417	82	7.420	19.7	70	9.1	
DLLW	07/15/92	1005	44	7.880	19.2	70	9.1	FECAL MATTER
DLLW	07/15/92	1005	44	7.880	19.2	70	9.1	
DLLW	07/09/92	938	33	7.730	18.3	70	9.3	
DLLW	07/09/92	938	33	7.730	18.3	70	9.3	
DLLW	07/01/92	1126	90	0.000	0.0	0	0.0	H2O TEMP W\D
DLLW	06/25/92	1202	11	0.000	0.0	0	0.0	
DLLW	06/19/92	1050	10	7.210	16.0	65	9.6	
DLLW	06/19/92	1050	10	7.210	16.0	65	9.6	
DLLW	06/11/92	1035	16	7.210	19.3	70	9.4	
DLLW	06/11/92	1035	16	7.210	19.3	70	9.4	
DLLW	06/09/92	1323	2	6.470	19.5	75	9.5	KIDS SWIMMIN
DLLW	06/05/92	1058	3	0.000	0.0	0	0.0	
DLLW	05/27/92	1143	1	7.370	14.8	0	10.3	
DLLW	05/22/92	1242	2	7.230	15.2	0	10.5	
DLLE	09/30/94	1005	1	7.430	9.3	61	8.3	
DLLE	09/23/94	1345	1	6.740	12.4	60	19.9	
DLLE	09/19/94	1620	5	6.350	13.9	71	13.9	
DLLE	09/12/94	1415	188	6.870	15.5	70	19.9	
DLLE	09/01/94	1215	7	7.630	15.0	72	9.8	
DLLE	08/22/94	1310	23	7.570	19.5	80	8.8	
DLLE	08/11/94	1315	38	7.750	20.0	79	11.8	
DLLE	08/08/94	1000	55	7.830	19.1	78	11.1	
DLLE	08/02/94	1020	4	7.690	19.4	89	9.3	
DLLE	07/27/94	1025	1	7.700	17.2	72	9.3	
DLLE	07/22/94	940	1	7.560	17.5	72	0.0	
DLLE	07/15/94	940	17	7.690	18.4	75	9.3	
DLLE	07/08/94	1005	500	7.750	18.9	78	8.9	
DLLE	07/01/94	920	1	7.720	18.4	62	9.2	
DLLE	06/24/94	915	63	5.870	15.8	70	11.0	
DLLE	06/15/94	1010	8	6.070	19.6	78	8.8	
DLLE	06/07/94	1335	45	7.950	17.4	72	9.8	
DLLE	09/28/93	1045	1	8.220	8.9	55	11.1	
DLLE	09/21/93	1020	69	7.920	10.4	60	10.8	
DLLE	09/15/93	1100	9	7.510	14.0	70	9.8	
DLLE	09/09/93	950	1	8.040	14.7	65	10.1	
DLLE	09/02/93	1200	40	6.820	16.0	70	9.5	
DLLE	08/27/93	1045	5	8.060	17.6	80	9.5	
DLLE	08/19/93	1705	104	7.990	18.1	75	9.5	
DLLE	08/09/93	1640	900	7.890	22.0	80	8.7	
DLLE	08/04/93	1540	19	8.070	21.7	78	8.9	
DLLE	07/27/93	1420	0	8.200	23.5	85	8.5	
DLLE	07/23/93	1613	118	7.750	24.1	80	8.6	
DLLE	07/16/93	1045	700	7.340	22.1	90	0.0	

STA	DATE	TIME	FECAL	PH	H2OT	COND	DISSO2	COMMENTS
DLLE	07/09/93	1030	28	7.880	21.0	80	0.0	
DLLE	07/01/93	1540	600	0.000	18.0	80	9.4	
DLLE	06/23/93	1530	3000	8.200	21.9	80	8.9	
DLLE	06/18/93	1100	116	8.310	18.0	80	9.8	
DLLE	06/07/93	1100	5	7.890	16.1	70	10.2	
DLLE	06/03/93	1015	10	7.880	17.6	70	9.1	
DLLE	05/26/93	950	74	6.690	13.5	65	10.3	
DLLE	05/20/93	1340	18	7.530	21.0	75	8.7	
DLLE	09/10/92	1340	3	7.210	12.7	60	0.0	
DLLE	09/04/92	1115	0	7.460	14.4	50	10.4	
DLLE	08/28/92	1435	6	0.000	0.0	50	9.3	
DLLE	08/21/92	1415	2	7.510	17.7	70	9.4	
DLLE	08/12/92	1125	8	7.250	17.8	70	9.8	
DLLE	08/03/92	1443	13	0.000	0.0	0	0.0	
DLLE	07/28/92	932	13	0.000	0.0	0	0.0	
DLLE	07/21/92	1419	118	0.000	0.0	0	0.0	
DLLE	07/15/92	1008	72	0.000	0.0	0	0.0	
DLLE	07/09/92	942	35	0.000	0.0	0	0.0	
DLLE	07/01/92	1123	122	7.510	19.2	75	9.2	H2O VERY CLE
DLLE	07/01/92	1123	121	7.510	19.2	75	9.2	
DLLE	06/25/92	1158	79	6.790	15.9	65	9.5	
DLLE	06/25/92	1158	79	6.790	15.9	65	9.5	
DLLE	06/19/92	1055	4	0.000	0.0	0	0.0	
DLLE	06/11/92	1040	68	0.000	0.0	0	0.0	DUCKS
DLLE	06/09/92	1330	77	0.000	0.0	0	0.0	
DLLE	06/05/92	1050	0	7.230	15.3	60	9.9	
DLLE	05/27/92	1148	4	7.280	14.8	0	10.4	
DLLE	05/22/92	1235	3	7.220	13.5	0	10.2	
~~CL4~~	~~11/30/88~~	~~910~~	~~0~~	~~7.380~~	~~0.5~~	~~160~~	~~12.4~~	
~~CL4~~	~~11/22/88~~	~~915~~	~~0~~	~~7.360~~	~~0.7~~	~~145~~	~~11.9~~	
~~CL4~~	~~11/15/88~~	~~915~~	~~0~~	~~7.110~~	~~0.9~~	~~195~~	~~13.7~~	
~~CL4~~	~~11/10/88~~	~~845~~	~~0~~	~~7.420~~	~~1.0~~	~~195~~	~~13.9~~	
~~CL4~~	~~11/01/88~~	~~910~~	~~0~~	~~7.260~~	~~1.9~~	~~175~~	~~13.6~~	
~~CL4~~	~~10/27/88~~	~~846~~	~~0~~	~~7.190~~	~~2.0~~	~~175~~	~~12.6~~	
~~CL4~~	~~10/11/88~~	~~855~~	~~0~~	~~7.430~~	~~3.2~~	~~125~~	~~11.2~~	
~~CL4~~	~~09/30/88~~	~~850~~	~~0~~	~~7.720~~	~~5.7~~	~~165~~	~~12.0~~	
~~CL4~~	~~09/21/88~~	~~1120~~	~~0~~	~~7.630~~	~~10.6~~	~~180~~	~~9.9~~	
~~CL4~~	~~09/15/88~~	~~900~~	~~0~~	~~8.030~~	~~10.5~~	~~175~~	~~11.1~~	
~~CL4~~	~~09/06/88~~	~~850~~	~~0~~	~~7.700~~	~~11.8~~	~~172~~	~~10.1~~	
~~CL4~~	~~09/02/88~~	~~830~~	~~0~~	~~7.490~~	~~12.3~~	~~170~~	~~9.6~~	
~~CL4~~	~~08/26/88~~	~~855~~	~~0~~	~~7.330~~	~~13.4~~	~~180~~	~~8.7~~	
~~CL4~~	~~08/23/88~~	~~1415~~	~~0~~	~~7.760~~	~~15.4~~	~~198~~	~~9.7~~	
~~CL4~~	~~08/22/88~~	~~1235~~	~~0~~	~~7.400~~	~~14.4~~	~~190~~	~~9.0~~	
~~CL4~~	~~08/18/88~~	~~850~~	~~0~~	~~7.670~~	~~15.5~~	~~185~~	~~9.3~~	
~~CL4~~	~~08/08/88~~	~~945~~	~~0~~	~~7.620~~	~~16.2~~	~~190~~	~~9.2~~	
~~CL4~~	~~08/01/88~~	~~920~~	~~0~~	~~8.260~~	~~17.3~~	~~183~~	~~9.6~~	
~~CL4~~	~~07/27/88~~	~~910~~	~~0~~	~~7.500~~	~~16.3~~	~~190~~	~~9.4~~	
~~CL4~~	~~07/22/88~~	~~935~~	~~0~~	~~7.370~~	~~17.0~~	~~180~~	~~9.8~~	
~~CL4~~	~~07/21/88~~	~~920~~	~~0~~	~~8.140~~	~~17.5~~	~~180~~	~~8.9~~	
~~CL4~~	~~07/12/88~~	~~905~~	~~1400~~	~~8.330~~	~~17.5~~	~~180~~	~~9.0~~	
~~CL4~~	~~06/24/88~~	~~925~~	~~0~~	~~8.850~~	~~14.8~~	~~170~~	~~10.2~~	
~~CL4~~	~~06/20/88~~	~~880~~	~~0~~	~~8.430~~	~~14.1~~	~~205~~	~~9.9~~	
~~CL4~~	~~06/16/88~~	~~850~~	~~0~~	~~8.820~~	~~15.6~~	~~190~~	~~10.2~~	