

Water Sampling in Lyman Lakes

During the Summer of 1984

Dennis Easley

September 1984

CARLETON COLLEGE
NORTHFIELD, MINNESOTA
55057

OFFICE OF SUPT. OF GROUNDS

September 20, 1984

TO: Ed Buchwald
Gerry Hill
Tim Vick ✓
Gary Wagenbach

FROM: Dennis Easley



Enclosed are qualitative notes and lab reports from this summer's water tests on Lyman Lakes. I would appreciate any comments or recommendations you might have.

I will send along the remaining results and notes as we obtain them.

Thanks.

Water Sampling in Lyman Lakes
During the Summer of 1984

- LLL1 - Lower Lyman Lakes Sample Point #1. This point located on the dam side of the wild island about 5-10 meters from the bank of the island.
- LLL2 - Lower Lyman Lakes Sample Point #2. This point located about 10 meters from the NORTH corner of Mai Fête Island.
- ULL1 - Upper Lyman Lakes Sample Point #1. This point located in the middle of Upper Lyman Lakes. 75-100ft east of Dam

Sample For 6/27/84 (approx. 12:00, Noon)

	Setche Disc	Conductivity	Temperature	D.O.
LLL1	2.0 feet	600 μ mhos	21°C	13.6 ppm
LLL1 LLL2	3.0 feet	600 μ mhos	22°C	10.6 ppm
ULL1	72.6 ft (bottom)	600 μ mhos	19°C (18 16.2°C bottom)	11.2 ppm

Weather - Sunny, clear weather

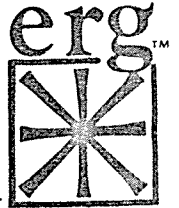
Qualitative Notes - High population of carp (spawning) in lower lake increasing turbidity.
Upper Lake clear and periphyton growths on lake bottom.

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HEALY LABORATORIES, INC.
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P.O. Box 7006, 135 State Street St. Paul, Minnesota 55107 (612) 227-4637



Report Date: 07/05/84

Standard Analysis for:

JOEL G. SCHILLING (ERG)

Sample Received: 06/25/84

P.O. BOX 8936
ST. PAUL, MN 55110

Lab Report Number: 15201

No. Analysis	LL-01	LL-02	ULL-03
1 ALKALINITY	270 mg/l	270 mg/l	280 mg/l
2 CHLOROPHYLL "A"	60 mg/l	56 mg/l	
3 APPARENT COLOR CO-PT UNITS	35 COLOR UNIT	25 COLOR UNIT	20 COLOR UNIT
4 NITROGEN - AMMONIA	0.09 mg/L	0.08 mg/L	0.17 mg/L
5 NITROGEN, NITRATE + NITRITE	6.5 mg/L	6.9 mg/L	9.8 mg/L
6 (TKN) NITROGEN-TOTAL KJELDAHL	1.1 mg/l	0.94 mg/l	0.59 mg/l
7 pH	8.04	8.05	7.85
8 PHOSPHORUS- ORTHO PHOSPHATE	<0.01 mg/l	<0.01 mg/l	0.01 mg/l
9 PHOSPHORUS (P) TOTAL	0.12 mg/l	0.10 mg/l	0.04 mg/l
10 SOLIDS - TOTAL SUSPENDED	28 mg/l	17 mg/l	12 mg/l
11 SPECIFIC CONDUCTANCE	650 umhos	590 umhos	680 umhos
12 TURBIDITY	9.5 NTU	6.0 NTU	4.0 NTU

John E. Findley
John E. Findley
Lab Manager

NITROGEN, NITRATE +
NITRITE Performed by EPA Colorimetric Automated Cadmium
Reduction Method 353.2. Only levels less than
10.0 are FHA or VA acceptable.

Sample For 7/10/84 (9:00 - 10:00 AM)

	<u>Setche Disc</u>	<u>Conductivity</u>	<u>Temperature</u>	<u>D.O.</u>
LLL 1	8.5 decimeters	550 μ MHOs	20.5°C	7.5 ppm
LLL 2	8.5 decimeters	700 μ MHOs	20.5°C	7.48 ppm
ULL 1	4.0 decimeters	415 μ MHOs	22.5°C	6.4 ppm

Weather - Dry until about 12 hours before samples taken. Since about 12 hours ago before samples taken have had fairly heavy rains (5 inches). When samples taken sky overcast and it was raining.

Qualitative Notes - D.O. reading may be inaccurate due to probe being immersed totally when reading taken. Upper Lyman Lakes very brown and cloudy.

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P.O. Box 7006, 135 State Street St. Paul, Minnesota 55107 (612) 227-4637



Report Date: 09/26/84

Standard Analysis for:

JOEL B. SCHILLING (ERG)

Sample Received: 07/10/84

P.O. BOX ~~592~~ 10936
ST. PAUL, MN 55110

Lab Report Number: 15409

No. Analysis	CARTELON C. LLL1	CARTELON C. ULL1	CARTELON C. LLL2
1 ALKALINITY	250 mg/l	140 mg/l	260 mg/l
2 CHLOROPHYLL "A"	13 ug/L	11 ug/L	14 ug/L
3 APPARENT COLOR CO-PT UNITS	30 COLOR UNIT	50 COLOR UNIT	30 COLOR UNIT
4 NITROGEN - AMMONIA	0.21 mg/L	0.31 mg/L	0.11 mg/L
5 NITROGEN, NITRATE + NITRITE	4.9 mg/L	3.9 mg/L	7.2 mg/L
6 (TKN) NITROGEN-TOTAL KJELDAHL	1.1 mg/l	1.4 mg/l	1.3 mg/l
7 pH	7.93	7.68	8.09
8 PHOSPHORUS- ORTHO PHOSPHATE	<0.01 mg/l	0.02 mg/l	<0.01 mg/l
9 PHOSPHORUS (P) TOTAL	0.05 mg/l	0.19 mg/l	0.07 mg/l
10 SOLIDS - TOTAL SUSPENDED	11 mg/l	57 mg/l	3 mg/l
11 SPECIFIC CONDUCTANCE	470 umhos	290 umhos	500 umhos
12 TURBIDITY	6.0 NTU	34 NTU	5.8 NTU

John E. Findley
John E. Findley
Lab Manager

NITROGEN, NITRATE +
NITRITE

Performed by EPA Colorimetric Automated Calcium
Reduction Method 808.2. Only levels less than
10.0 are EPA or VA acceptable.

Sample For 7/25/84

(9:00 - 10:00)

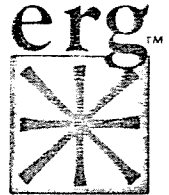
	<u>Secche Disc</u>	<u>Conductivity</u>	<u>Temperature</u>	<u>D.O.</u>
LLL 1	.8 m 8 dm	550 420 u/mho	23.5°C	17.1
LLL 2	10½ decimeters	575	23.5°C	14.5
ULL 1	(is visible to bottom at 7½ decimeters)	575	20°C ±.	13.6

Weather - Clean to partly cloudy, no rain in the past 8 days since 7/15.

Additive Notes -

D.O. reading - in open air was about 9 ppm, when put back in water it climbed to abt 17.1

ENVIRONMENTAL RESEARCH GROUP, INC.



135 State Street P.O. Box 70006 St. Paul, Minnesota 55107 (612) 293-9268

AUGUST 28, 1984

JOEL G. SCHILLING
P.O. BOX 10936
ST. PAUL, MN 55110

SAMPLE RECEIVED: 7-26-84

LAB REPORT NO.: 15794

ANALYSIS	LL-01	ULL-01	LLL-2
ALKALINITY	237 MG/L	272 MG/L	241 MG/L
CHLOROPHYLL "A"	29 UG/L	7.1 UG/L	<1 UG/L
APPARENT COLOR	25 CO-PT UNIT	15 CO-PT UNIT	20 CO-PT UNIT
NITROGEN-AMMONIA	0.06 MG/L	0.22 MG/L	0.11 MG/L
NITROGEN, NITRATE + NITRATE (TKN) NITROGEN-TOTAL KJELDAHL	4.4 MG/L	8.8 MG/L	3.0 MG/L
PH	0.90 MG/L	0.64 MG/L	0.71 MG/L
PHOSPHORUS-ORTHO PHOSPHATE	7.99	7.92	8.02
PHOSPHORUS-TOTAL	<0.01 MG/L	<0.01 MG/L	<0.01 MG/L
SOLIDS - TOTAL SUSPENDED	0.36 MG/L	0.32 MG/L	0.31 MG/L
SPECIFIC CONDUCTANCE	15 MG/L	16 MG/L	16 MG/L
TURBIDITY	830 UMHOS	570 UMHOS	530 UMHOS
COLIFORM-FECAL MPN	5.4 NTU	4.7 NTU	3.7 NTU
STREPTOCOCCUS FECAL	13/100 ML	54/100 ML	
	0/100 ML	100/100 ML	

John E. Findley
JOHN E. FINDLEY
LAB MANAGER

NITROGEN, NITRATE +
NITRITE

PERFORMED BY EPA COLORIMETRIC AUTOMATED CADMIUM
REDUCTION METHOD 353.2. ONLY LEVELS LESS THAN
10.0 ARE FHA OR VA ACCEPTABLE.

Sample 8/7/84

(9:30 - 10:30)

	<u>Secche Disc</u>	<u>Conductivity</u>	<u>Temperature</u>	<u>D.O.</u>
LLL1	11 dm	450	24°C	11.9 ppm
LLL2	12 dm	575	24°C	12.3 ppm
ULL1	7 dm (on bottom)	650	18°C	12.8 ppm

Weather - Cloudy, brief thunderstorms during the past 24 hrs, not much rain, No wind

Qualitative Notes - Upper Lyman Lakes seems to be almost completely full of algae. The entire bottom is covered and about 25-50% of the lakes surface is covered by the top of algal mats. Smells as if algae on surface decaying. No fish jumping in either lake.

ENVIRONMENTAL RESEARCH GROUP, INC.



135 State Street P.O. Box 70006 St. Paul, Minnesota 55107 (612) 293-9268

AUGUST 28, 1984

JOEL G. SCHILLING
P.O. BOX 10936
ST. PAUL, MN 55110

SAMPLE RECEIVED: 8-7-84

LAB REPORT NO. 15964

ANALYSIS	LLL 1 8-7-84 9:30	LLL 2 8-7-84 9:45	ULL 1 8-7-84 10:10
COLIFORM-FECAL MPN	92/100 ML	35/100 ML	160/100 ML
STREPTOCOCCUS-FECAL	30/100 ML	20/100 ML	540/100 ML
ALKALINITY	240 MG/L	240 MG/L	290 MG/L
NITROGEN-AMMONIA	0.50 MG/L	0.07 MG/L	0.34 MG/L
NITROGEN, NITRATE + NITRITE	7.6 MG/L	7.0 MG/L	9.9 MG/L
PH	7.88	7.87	7.47
PHOSPHORUS-ORTHO PHOSPHATE	<0.01 MG/L	<0.01 MG/L	<0.01 MG/L
PHOSPHORUS TOTAL	0.03 MG/L	0.04 MG/L	0.03 MG/L
SOLIDS-TOTAL SUSPENDED	3 MG/L	10 MG/L	7 MG/L
SPECIFIC CONDUCTANCE	380 UHMOS	390 UHMOS	500 UHMOS
(TKN) NITROGEN-TOTAL KJELDAHL	0.86 MG/L	0.86 MG/L	0.59 MG/L
TURBIDITY	3.4 NTU	4.4 NTU	2.4 TKN
APPARENT COLOR	35 CO-PT UNIT	35 CO-PT UNIT	20 CO-PT UNIT
CHLOROPHYLL "A"	15 UG/L	17 UG/L	2.1 UG/L

John E. Findley
JOHN E. FINDLEY
LAB MANAGER

Sample

8/29/84

9:00

	<u>Secche Disc</u>	<u>Conductivity</u>	<u>Temperature</u>	<u>D.O.</u>
L L L 1	11.5 dm	600 μ MHO	23°C	10.9 ppm
L L L 2	11.25 dm	609 μ MHO	22.5°C	12.1 ppm
V L L 1	7.5 dm (on bottom)	625 μ MHO	18.5°C	5.8 ppm

Weather - Sunny and Clear, Yesterday very hot temps as is the case today. No rain recently.

Qualitative Notes - Again ^{Upper} 25-50% of lake surface covered with algae, entire bottom of lake is covered. Upper lake much clearer than lower lake. Looks good enough to drink.

7/17/84 (8:00 - 9:00 AM)

	<u>Secche Disc</u>	<u>Conductivity</u>	<u>Temperature</u>	<u>D.O.</u>
LLL1 LLL1	9.5 dm (in shade)	460 μ mhos	16.5°C	12.6 ppm
LLL2	13 dm	480 μ mhos	15.5°C	11.7 ppm
ULL1	7 dm (on bottom)	550 μ mhos	14.5°C	5.2 ppm

Weather = sunny, clear, air temp 15.5°C

Qualitative Notes: Only small (2" diam) patches of very dark green algae floating in Lower Lyman Lakes. Some small patches of foam

Upper Lyman Lakes more full than previous sampling times of algae. I didn't need the net because the boat was held by algae. Small flecks of foam also in this Lake. Some of the algae at top of mats (under water) turning brown, leaves shrivelling.