10-1965

Biochemical Activity

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Twenty-Third Annual Report

PART FOUR

Biochemical Activity in the Androscoggin Pool

1965

Introduction. The 1965 investigation was similar to those made in 1964 and 1963. Data were collected from the sampling stations at North Turner and Turner Center Bridges, Mile 4.25, Mile 2.5, Gulf Island Dam and Deer Rips Dam. Systematic analyses were begun on June 18 and concluded September 13. An eleven week period was chosen for comparative study. The time of passage was assumed to be nine days; due to low flows this season, the actual average time was probably slightly longer. The data are recorded in the accompanying Tables and Figures and summarized in the "S" Tables.

North Turner Bridge. During the eleven week period, only ONE week was the D.O. in excess of that required for satisfaction of the five day B.O.D. The average daily D.O. deficit for the period was 6.50 tons/day. This is in marked contrast to conditions which existed in 1964 and 1963.

Year	B.O.D. av. T/d	D.O. av. T/d	D.O. Surplus + Deficit -
1965	18.16	11.66	- 6.50
1964	17.49	33.92	+16.43
1963	17.61	30.89	+13.28
1962	33.1	33.6	+ 0.5

Table D.O.-B.O.D. #1

NORTH TURNER BRIDGE

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
June							
18	6.64	5.18	34.40	-	3.53	23.44	-
19	6.16	3.77	23.22		5.72	35.24	
20*	6.67	3.41	22.75		4.99	32.28	
21	6.89	3.05	21.01	23.70(1)	4.26	29.35	30.66(1)
22	7.07	2.70	19.09		3.90	27.57	
23	6.99	2.88	19.43		4.93	34.46	
24	6.67	3.90	26.01		4.84	32.28	
25	5.89	2.50	14.73	-	4.33	25.50	-
26	6.35	2.23	14.16		2.02	12.83	
27*	5.43	2.27	12.37		3.00	16.29	
28	4.89	2.30	11.25	11.97(2)	3.98	19.46	18.34(2)
29	5.18	2.32	12.02		3.50	18.13	
30	4.86	1.72	8.36		4.27	20.75	
July							
1	4.54	2.40	10.90		3.40	15.44	
2	4.54	1.46	6.63	-	4.18	18.98	-
3	5.19	1.60	8.30		4.65	24.13	
4*	4.83	1.90	9.18		4.30	20.77	
5	4.08	2.21	9.02	16.42(3)	3.95	16.12	17.37(3)
6	5.62	4.12	23.15		1.85	10.40	
7	5.35	4.03	21.56		3.27	17.50	
8	6.08	6.10	37.09		2.25	13.68	
9	5.21	5.10	26.57	-	2.45	12.76	-
10	5.10	3.28	16.73		2.87	14.64	
11*	4.78	3.50	16.73		2.84	13.58	
12	5.56	3.71	20.63	14.98(4)	2.81	15.62	15.85(4)
13	5.29	2.52	13.33		2.79	14.76	
14	4.73	0.68	3.22		4.71	22.28	
15	4.70	1.63	7.66		3.68	17.30	
16	4.64	0.50	2.32	-	4.97	23.06	-
17	4.48	1.73	7.75		3.90	17.47	
18*	4.54	2.38	10.81		3.85	17.48	
19	5.27	2.82	14.86	8.28(5)	3.79	19.97	20.73(5)
20	6.83	0.00	0.00		4.07	23.73	
21	6.10	1.43	8.72		4.92	30.01	
22	4.73	2.85	13.48		2.83	13.39	
23	5.05	1.85	9.34	-	5.01	25.30	-
24	4.73	2.02	9.55		4.57	21.62	
25*	4.62	1.91	8.82		3.77	17.42	
26	4.70	1.80	8.46	8.47(6)	3.77	17.72	18.59(6)
27	4.73	2.05	9.70		2.97	14.05	
28	4.19	0.97	4.06		4.51	18.90	
29	4.73	1.98	9.37		3.20	15.14	

*Sunday calculated: Saturday plus Monday divided by two.

Table D.O.-B.O.D. #1

NORTH TURNER BRIDGE

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	
July							
30	4.16	1.11	4.62 -		4.59	19.09 -	
31	4.32	1.33	5.75		4.26	18.40	
August							
1*	4.29	1.47	6.31		2.78	11.93	
2	4.24	1.60	6.78	7.13(7)	3.30	13.99	14.94(7)
3	4.43	1.71	7.58		3.24	14.35	
4	4.43	1.95	8.64		3.01	13.33	
5	4.21	2.43	10.23		3.20	13.47	
6	4.54	1.19	5.40 -		4.02	18.25 -	
7	4.08	1.78	7.26		4.12	16.81	
8*	4.37	1.67	7.25		3.66	15.99	
9	4.70	1.56	7.33	7.82(8)	3.21	15.09	17.27(8)
10	4.81	2.08	10.00		3.32	15.97	
11	5.59	0.90	5.03		5.04	28.17	
12	5.54	2.25	12.47		1.92	10.64	
13	5.59	1.58	8.83 -		3.68	20.57 -	
14	4.56	0.00	0.00		3.55	16.19	
15*	3.94	0.30	1.18		3.85	15.17	
16	4.89	0.60	2.93	4.81(9)	4.14	20.25	18.17(9)
17	4.29	1.20	5.15		4.63	19.86	
18	4.54	0.90	4.09		3.87	17.57	
19	5.81	1.98	11.50		3.02	17.55	
20	6.08	1.53	9.30-		3.62	22.01 -	
21	5.64	1.55	8.74		2.78	15.68	
22*	5.63	1.86	10.47		2.53	14.24	
23	5.27	2.16	11.38	10.03(10)	2.27	11.96	14.51(10)
24	4.43	2.93	12.98		3.71	16.44	
25	4.24	1.70	7.21		2.64	11.19	
26	4.16	2.43	10.11		2.41	10.03	
27	4.43	1.18	5.23 -		3.19	14.13 -	
28	4.35	2.85	12.40		2.84	12.35	
29*	4.73	2.74	12.96		2.76	13.06	
30	4.54	2.63	11.94	14.72(11)	2.68	12.17	13.32(11)
31	4.37	3.98	17.39		2.42	10.58	
September							
1	4.64	3.22	14.94		2.72	12.62	
2	5.83	4.83	28.16		3.15	18.36	
3	8.94	3.42	30.58 -		4.64	41.48 -	
4	8.80	6.15	54.12		3.89	34.24	
5*	6.08	6.24	37.94	33.93(12)	3.08	18.73	23.28(12)**
6	4.10	6.33	25.95		2.27	9.31	
9	4.70	4.48	21.06		2.68	12.60	
11	4.81	3.13	15.06		1.62	7.79	

*Sunday calculated: Saturday plus Monday divided by two.
**Five day

These figures indicate that the TOTAL pollution load passing North Turner Bridge has remained about the same during the past three seasons and has decreased almost 50% from that present in 1962. This one result of the abandonment of sulphite pulp production at Brown and Oxford mills. The D.O. surpluses during 1964 and 1963 reflect the higher river flows of those years.

Turner Center Bridge. The Benthal deposits present on the river bed, between the two bridges, are not very deep but they remain quite active and produce large quantities of gas. The net loss of five day B.O.D. was 1.45 tons/day but this was accompanied by a daily loss of 3.59 tons of D.O. This would indicate a minimal benthal contribution of 2.14 tons of B.O.D. each day. The reaeration in this stretch of the river is not known, the Rips and in a much smaller amount the Nezinscott river, contribute an appreciable amount. The reaeration could be about ten tons per day and if this "guesstimate" is used, the Benthal B.O.D. load would be about twelve tons per day. Previous years data are listed for comparison.

Year	B.O.D. av. T/d	D.O. av. T/d
1965	16.71	8.07
1964	16.99	29.08
1963	15.08	25.30
1962	27.06	26.4

The losses between these two sampling stations were

1965	1.45	tons/d B.O.D.	3.59	tons/d D.O.
1964	0.5		2.84	
1963	2.53		5.59	
1962	5.5		4.2	

Table D.O.-B.O.D. #1

TURNER CENTER BRIDGE

Dissolved Oxygen - Biochemical Oxygen Demand

Date June	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
18	6.64	4.02	26.70		3.58	23.77	
19	6.16	3.55	21.87		4.19	25.81	
20*	6.67	3.42	22.81	-	3.90	26.01	-
21	6.89	3.28	22.60		3.61	24.87	
22	7.07	2.40	16.97		2.78	19.66	
23	6.99	1.32	9.23	16.25(1)	4.13	28.87	26.28(1)
24	6.67	2.95	19.68		4.39	29.28	
25	5.89	1.90	11.19		4.31	25.39	
26	6.35	1.78	11.30		4.70	29.85	
27*	5.43	1.74	9.45	-	4.22	22.92	-
28	4.89	1.70	8.31		3.73	18.24	
29	5.18	1.78	9.22		3.53	18.29	
30	4.86	2.53	12.30	8.13(2)	4.13	20.07	18.24(2)
July							
1	4.54	0.68	3.09		2.89	13.12	
2	4.54	1.14	5.18		2.97	13.48	
3	5.19	1.81	9.39		4.16	21.59	
4*	4.83	1.55	7.49	-	3.83	18.50	-
5	4.08	1.29	5.26		3.50	14.28	
6	5.62	1.67	9.39		2.51	14.11	
7	5.35	1.48	7.92	13.30(3)	3.51	18.78	16.54(3)
8	6.08	4.28	26.02		2.75	16.72	
9	5.21	3.09	16.10		3.25	16.93	
10	5.10	4.10	20.91		Lost		
11*	4.78	3.19	15.25	-	3.36	16.06	-
12	5.56	2.29	12.73		3.47	19.29	
13	5.29	0.78	4.13		2.88	15.24	
14	4.73	1.97	9.32	8.17(4)	3.07	14.52	16.38(4)
15	4.70	3.00	14.10		3.23	15.18	
16	4.64	0.00	0.00		3.86	17.91	
17	4.48	0.37	1.66		3.68	16.49	
18*	4.54	0.42	1.91	-	3.42	15.53	-
19	5.27	0.47	2.48		3.15	16.60	
20	6.83	0.22	1.50		4.07	23.73	
21	6.10	0.00	0.00	3.44(5)	4.03	24.58	20.63(5)
22	4.73	0.83	3.93		3.24	15.33	
23	5.05	1.53	7.73		4.40	22.22	
24	4.73	1.38	6.53		5.59	26.44	
25*	4.62	1.86	8.59	-	4.84	22.36	-
26	4.70	2.33	15.65		4.84	22.75	
27	4.73	0.37	1.75		4.08	19.30	
28	4.19	1.08	4.53	6.05(6)	3.87	16.22	16.86(6)
29	4.73	1.50	7.10		2.38	11.26	
30	4.16	0.08	0.33		3.46	14.39	
31	4.32	1.02	4.41		2.71	11.71	

*Sunday calculated: Saturday plus Monday divided by two.

Table D.O.-B.O.D. #1

TURNER CENTER BRIDGE

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
August							
1*	4.29	0.51	2.19	-	3.01	12.91	-
2	4.24	0.00	0.00		3.30	13.99	
3	4.43	0.49	2.17		3.84	17.01	
4	4.43	1.07	4.74	3.67(7)	2.95	13.07	13.90(7)
5	4.21	1.63	6.86		1.92	8.08	
6	4.54	1.12	5.09		3.66	16.62	
7	4.08	1.14	4.65		3.82	15.59	
8*	4.37	1.09	4.76	-	3.86	16.87	-
9	4.70	1.05	4.94		3.90	18.33	
10	4.81	0.57	2.74		3.54	17.03	
11	5.59	1.24	6.93	4.29(8)	3.06	17.11	14.80(8)
12	5.54	1.50	8.31		1.92	10.64	
13	5.59	0.00	0.00		2.71	15.15	
14	4.56	0.52	2.37		1.86	8.48	
15*	3.94	0.26	1.02	-	2.60	10.24	-
16	4.89	0.00	0.00		3.34	16.33	
17	4.29	0.42	1.80		3.16	13.56	
18	4.54	0.00	0.00	3.19(9)	3.32	15.07	13.30(9)
19	5.81	1.38	8.02		1.45	8.43	
20	6.08	0.62	3.77		2.44	14.84	
21	5.64	1.37	7.73		2.59	14.61	
22*	5.63	1.25	7.04	-	2.52	14.19	-
23	5.27	1.12	5.90		2.45	12.91	
24	4.43	1.95	8.64		3.27	14.49	
25	4.24	1.61	6.83	7.12(10)	1.78	7.55	10.48(10)
26	4.16	2.10	8.74		1.40	5.82	
27	4.43	1.37	6.07		2.32	10.28	
28	4.35	1.52	6.61		1.86	8.09	
29*	4.73	1.87	8.85	-	1.82	8.61	-
30	4.54	2.22	10.08		1.78	8.08	
31	4.37	3.02	13.20		1.83	8.00	
September							
1	4.64	3.47	16.10	22.09(11)	2.79	12.95	16.41(11)
2	5.83	4.53	26.41		2.53	14.75	
3	8.94	5.10	45.59		3.74	33.44	
4	8.80	3.91	34.41		3.30	29.04	
5*	6.08	4.60	27.97	-	2.71	16.48	-
6	4.10	5.28	21.65	23.70(12)	2.11	8.65	9.83(12)**
9	4.70	5.15	24.21		1.76	8.27	
11	4.81	4.36	20.97		1.23	5.92	

*Sunday calculated: Saturday plus Monday divided by two.
**Four days

Mile 4.25 This station is located about three miles south of Turner Center Bridge and at the downstream end of the "narrows". Water is sampled about midway between the surface and bed of the river. Benthal deposits in this area are quite active and much floating sludge originates there.

The average daily loss in B.O.D. was 4.42 tons, while the decrease in D.O. was 1.21 tons. The decrease in B.O.D. was 1.55 tons more than in this area during 1964.

Year	B.O.D. T/d	D.O. T/d
1965	12.29	6.86
1964	14.12	16.47
1963	13.35	25.24

The B.O.D. load for the past three seasons is again surprisingly constant especially when large average variations were recorded in the D.O. content.

Mile 2.5 The area between Mile 4.25 and Mile 2.5 has extensive Benthal deposits but they do not appear to be as active as those between Turner Center Bridge and Mile 4.25. Considerable gas is evolved in the area especially between Mile 4.25 and Mile 2.75 but it is much less than three and more years ago. The daily average B.O.D. load was 9.54 tons; the average D.O. load was 7.56 tons. The D.O. load figure is somewhat distorted by the high oxygen content during the tenth and eleventh weeks.

The changes, which occurred in the water between Mile 4.25 and Mile 2.5 during 1965, 1964 and 1963 are listed

Table D.O.-B.O.D. #1

MILE 4½

Dissolved Oxygen - Biochemical Oxygen Demand

Date June	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
18	6.64	3.60	23.90		4.92	32.67	
19	6.16	2.61	16.08		3.71	22.85	
20*	6.67	2.36	15.74		3.42	22.81	
21	6.89	2.12	14.61		3.13	21.57	
22	7.07	2.48	17.53 -		3.67	25.95 -	
23	6.99	1.03	7.20		3.30	23.07	
24	6.67	0.93	6.20		3.30	22.01	
25	5.89	0.82	4.83	6.80(1)	3.29	19.38	19.36(1)
26	6.35	0.84	5.33		4.27	21.11	
27*	5.43	0.70	3.80		2.92	15.86	
28	4.89	0.55	2.69		1.66	8.12	
29	5.18	1.62	8.39 -		2.90	15.02 -	
30	4.86	0.93	4.52		3.16	15.36	
July							
1	4.54	0.62	2.82		3.51	15.94	
2	4.54	0.31	1.41	5.10(2)	3.86	17.52	16.65(2)
3	5.19	2.18	11.31		3.65	18.94	
4*	4.83	1.24	6.00		3.75	18.11	
5	4.08	0.30	1.23		3.84	15.67	
6	5.62	0.36	2.02 -		1.44	8.09 -	
7	5.35	0.59	3.16		1.79	9.58	
8	6.08	2.42	14.71		2.42	14.71	
9	5.21	4.25	22.14	11.63(3)	3.05	15.89	10.71(3)
10	5.10	2.72	13.87		1.82	9.28	
11*	4.78	2.56	12.24		1.73	8.27	
12	5.56	2.39	13.29		1.64	9.12	
13	5.29	0.63	3.33 -		1.21	6.40 -	
14	4.73	1.27	6.01		1.67	7.90	
15	4.70	0.93	4.37		1.99	9.35	
16	4.64	0.59	2.74	4.25(4)	2.31	10.72	10.13(4)
17	4.48	1.45	6.50		1.67	7.48	
18*	4.54	0.96	4.36		2.51	11.40	
19	5.27	0.46	2.43		3.35	17.65	
20	6.83	0.00	0.00 -		3.30	19.24 -	
21	6.10	0.37	2.26		3.12	19.03	
22	4.73	0.19	0.90		3.38	15.99	
23	5.05	0.00	0.00	2.07(5)	3.64	18.38	17.48(5)
24	4.73	1.61	7.62		4.05	19.16	
25*	4.62	0.81	3.74		3.28	15.15	
26	4.70	0.00	0.00		3.28	15.42	

*Sunday Calculated: Saturday plus Monday divided by two.

Table D.O.-B.O.D. #1

MILE 4½

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg	B.O.D. 5 day 20°C ppm	T/d	Wk avg
July							
27	4.73	0.13	0.62	-	2.52	11.92	-
28	4.19	0.07	0.29		2.20	9.22	
29	4.73	0.19	0.90		2.33	11.02	
30	4.16	0.31	1.29	2.32(6)	2.45	10.19	9.85(6)
31	4.32	0.63	2.72		2.17	9.37	
August							
1*	4.29	1.03	4.42		2.07	8.88	
2	4.24	1.42	6.02		1.97	8.35	
3	4.43	1.20	5.32	-	2.47	10.94	-
4	4.43	0.58	2.57		2.75	12.18	
5	4.21	1.09	4.59		2.75	11.58	
6	4.54	1.61	7.31	3.80(7)	3.03	13.76	11.78(7)
7	4.08	0.00	0.00		2.93	11.95	
8	4.37	0.50	2.19		2.60	11.36	
9	4.70	0.99	4.65		2.27	10.67	
10	4.81	2.87	13.81	-	2.52	12.12	-
11	5.59	0.65	3.63		1.89	10.57	
12	5.54	1.36	7.53		1.64	9.09	
13	5.59	2.07	11.57	7.17(8)	1.38	7.71	9.17(8)
14	4.56	0.67	3.06		1.57	7.16	
15*	3.94	1.01	3.98		1.84	7.25	
16	4.89	1.35	6.60		2.11	10.32	
17	4.29	0.93	3.99	-	2.63	11.28	-
18	4.54	0.11	0.50		2.10	9.53	
19	5.81	0.21	1.22		1.87	10.86	
20	6.08	0.30	1.82	3.96(9)	1.64	9.97	9.89(9)
21	5.64	1.78	10.04		1.70	9.59	
22*	5.63	1.21	6.81		1.67	9.40	
23	5.27	0.63	3.32		1.63	8.59	
24	4.43	0.70	3.19	-	2.86	12.67	-
25	4.24	1.18	5.00		1.38	5.85	
26	4.16	1.06	4.41		1.12	4.66	
27	4.43	0.93	4.12	5.58(10)	0.86	3.81	6.10(10)
28	4.35	2.23	9.70		0.88	3.83	
29*	4.73	1.65	7.80		1.15	5.44	
30	4.54	1.07	4.86		1.42	6.45	
31	4.37	2.32	10.14	-	1.99	8.70	-
September							
1	4.64	2.31	10.72		1.66	7.70	
2	5.83	3.32	19.36		2.25	13.12	
3	8.94	4.33	38.71	22.77(11)	2.84	25.39	14.03(11)
4	8.80	4.07	35.82		2.35	20.68	
5	6.08	4.30	26.14		2.26	13.75	
6	4.10	4.52	18.53		2.17	8.90	
11	4.81	4.01	19.29		1.47	7.07	

*Sunday calculated: Saturday plus Monday divided by two.

Table D.O.-B.O.D. #1

MILE 2½

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg	B.O.D. 5 day 20°C ppm	T/d	Wk avg
June							
18	6.64	1.73	11.49 -		4.77	31.67 -	
19	6.16	1.30	8.01		3.21	19.77	
20*	6.67	0.94	6.27		2.04	13.61	
21	6.89	0.57	3.93	9.29(0)	1.72	11.85	19.10(0)
22	7.07	3.12	23.47		2.99	21.14	
23	6.99	0.77	5.38		3.01	21.04	
24	6.67	0.97	6.50		2.19	14.61	
25	5.89	1.18	6.95 -		1.38	8.13 -	
26	6.35	0.86	5.46		1.58	10.03	
27*	5.43	0.43	2.34		2.36	12.82	
28	4.89	0.00	0.00	4.53(1)	3.14	15.36	12.94(1)
29	5.18	0.78	4.04		4.92	25.49	
30	4.86	1.72	8.34		1.75	8.51	
July							
1	4.54	1.00	4.54		2.25	10.22	
2	4.54	0.27	1.23 -		2.74	12.44 -	
3	5.19	3.25	16.87		2.12	11.00	
4*	4.83	2.00	9.66		3.27	15.80	
5	4.08	0.75	3.06	6.86(2)	4.42	18.03	13.31(2)
6	5.62	0.19	1.07		2.02	11.35	
7	5.35	1.35	7.22		1.74	9.31	
8	6.08	1.46	8.88		2.51	15.26	
9	5.21	1.56	8.13 -		3.28	17.09 -	
10	5.10	1.82	9.28		1.24	6.33	
11*	4.78	1.22	5.83		1.43	6.84	
12	5.56	0.61	3.39	5.50(3)	1.62	9.01	9.57(3)
13	5.29	0.94	4.97		2.16	11.43	
14	4.73	0.47	2.22		1.78	8.42	
15	4.70	1.00	4.70		1.67	7.85	
16	4.64	1.52	7.05 -		1.57	7.29 -	
17	4.48	0.75	3.36		1.56	6.99	
18*	4.54	0.60	2.73		1.66	7.54	
19	5.27	0.46	2.43	4.15(4)	1.76	9.28	9.47(4)
20	6.83	1.36	9.29		0.73	4.26	
21	6.10	0.21	1.28		2.61	15.93	
22	4.73	0.62	2.93		3.17	14.99	
23	5.05	1.02	5.15 -		3.72	18.79 -	
24	4.73	0.17	0.81		3.43	16.22	
25*	4.62	0.09	0.42		1.87	8.64	
26	4.70	0.00	0.00	2.11(5)	1.87**	8.80	9.72(5)
27	4.73	0.58	2.74		0.51?	2.41?	
28	4.19	0.33	1.38		1.16	4.86	
29	4.73	0.91	4.30		1.76	8.33	

*Sunday calculated: Saturday plus Monday divided by two.
**Calculated

Table D.O.-B.O.D. #1

MILE 2½

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg	B.O.D. 5 day 20°C ppm	T/d	Wk avg
July							
30	4.16	1.48	6.16	-	2.36	9.82	-
31	4.32	0.00	0.00		0.80	3.46	
August							
1*	4.29	0.74	3.17		1.16	4.98	
2	4.24	1.47	6.23	3.44(6)	1.51	6.40	6.75(6)
3	4.43	0.00	0.00		1.57	6.96	
4	4.43	1.08	4.78		1.81**	8.02	
5	4.21	0.88	3.71		1.81	7.62	
6	4.54	0.67	3.05	-	2.04	9.26	-
7	4.08	1.19	4.86		2.87	11.71	
8*	4.37	1.71	7.47		2.53	11.06	
9	4.70	2.23	10.48	9.92(7)	2.18	10.25	9.62(7)
10	4.91	2.18	10.49		1.65	7.94	
11	5.59	3.88	21.69		1.73	9.67	
12	5.54	2.06	11.41		1.35	7.48	
13	5.59	0.26	1.45	-	0.97	5.42	-
14	4.56	0.00	0.00		0.88	4.01	
15*	3.94	0.99	3.90		1.67	6.58	
16	4.89	1.98	9.68	5.57(8)	2.47	12.08	7.95(8)
17	4.29	1.78	7.64		1.76	7.55	
18	4.54	1.82	8.26		1.69	7.67	
19	5.81	1.39	8.08		2.12	12.32	
20	6.08	0.96	5.84	-	2.54	15.44	-
21	5.64	0.08	0.45		1.49	8.40	
22*	5.63	0.71	4.00		1.58	8.90	
23	5.27	1.34	7.06	4.76(9)	1.67	8.80	8.87(9)
24	4.43	1.56	6.66		3.16	13.11	
25	4.24	1.11	4.71		0.80	3.39	
26	4.16	1.11	4.62		0.98	4.08	
27	4.43	1.11	4.85	-	1.15	5.01	-
28	4.35	0.70	3.05		0.65	2.83	
29*	4.73	1.28	6.05		0.90	4.26	
30	4.54	1.85	8.40	11.77(10)	1.15	5.22	5.05(10)
31	4.37	4.03	17.61		1.19	5.20	
September							
1	4.64	4.01	18.61		0.88	4.08	
2	5.83	4.09	23.84		1.50	8.75	
3	8.94	4.17	37.28	-	2.11	18.86	-
4	8.80	4.67	41.10		1.63	14.34	
5	6.08	3.87	23.53	24.58(11)	1.82	11.07	11.73(11)***
6	4.10	3.07	12.59		2.01	8.24	
11	4.81	1.75	8.42		1.28	6.16	

*Sunday calculated: Saturday plus Monday divided by two.
**Calculated
***Five days.

below.

Year	B.O.D. T/d	D.O. T/d	D.O. deficit T/d
1965	9.54	7.56	1.98
1964	11.22	11.01	0.21
1963	13.51	12.50	1.01

Water samples at this location are withdrawn at a lower level (five feet above the sludge) than at Mile 4.5 in order to obtain maximum Benthal contribution. This in part accounts for the consistent oxygen deficit. However, there was an average lower B.O.D. (275 tons/day) at this station than that at Mile 4.5

Gulf Island Dam. B.O.D. determinations were made twice each week from June 3 to September 16. This covers a period of fifteen weeks. Water is sampled about the five foot level and obviously is not representative of the water at sixty foot levels. The B.O.D. results are reasonable but the D.O.'s are much too high. For example, the D.O. daily average for the thirty days, when B.O.D. measurements were made is 14.10 tons, which is inconsistent with the data obtained at Deer Rips Dam sampling station.

Deer Rips Dam. Water passing through the wheels at Gulf Island Dam receives a thorough mixing and samples taken at Deer Rips Dam are as representative as is possible under the existing conditions. For the eleven week period, the daily average B.O.D. load was 6.37 tons and the average D.O. was 9.03 tons. These

Table D.O.-B.O.D. #1

DEER RIPS DAM

Dissolved Oxygen - Biochemical Oxygen Demand

Date June	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
18	6.64	0.52	3.45		3.46	22.97	
19	6.16	0.50	3.08		2.38	14.66	
20*	6.67	0.25	1.67		1.91	12.74	
21	6.89	0.00	0.00	-	1.44	9.92	-
22	7.07	0.52	3.68		1.59	11.24	
23	6.99	0.35	2.45		2.33	16.29	
24	6.67	1.53	10.21	7.51(0)	1.63	10.87	10.32(0)
25	5.89	1.98	11.66		0.96	5.65	
26	6.35	2.30	14.61		1.54	9.78	
27*	5.43	1.84	9.99		1.56	8.47	
28	4.89	1.37	6.70	-	1.58	7.73	-
29	5.18	1.51	7.82		1.43	7.41	
30	4.86	1.77	8.60		1.17	5.69	
July							
1	4.54	2.70	12.26	6.90(1)	1.40	6.36	6.99(1)
2	4.54	1.90	8.63		1.59	7.22	
3	5.19	0.47	2.44		1.17	6.07	
4*	4.83	0.38	1.84		1.75	8.45	
5	4.08	0.29	1.18	-	2.33	9.51	-
6	5.62	0.91	5.11		1.10	6.18	
7	5.35	2.04	10.91		2.00	10.70	
8	6.08	2.38	14.47	7.07(2)	0.95	5.78	7.44(2)
9	5.21	1.55	8.08		1.31	6.83	
10	5.10	1.02	5.20		1.02	5.20	
11*	4.78	0.95	4.54		1.65	7.89	
12	5.56	0.88	4.89	-	2.28	12.68	-
13	5.29	1.57	8.31		1.64	8.68	
14	4.73	0.68	3.22		0.99	4.68	
15	4.70	2.48	11.66	7.50(3)	1.11	5.22	7.51(3)
16	4.64	1.98	9.19		1.86	8.63	
17	4.48	1.62	7.26		1.44	6.45	
18*	4.54	1.76	7.99		1.37	6.22	
19	5.27	1.90	10.01	-	1.30	6.85	-
20	6.83	2.78	19.67		0.94	5.48	
21	6.10	2.23	13.60		0.95	5.80	
22	4.73	2.80	13.24	10.03(4)	1.05	4.97	6.86(4)
23	5.05	1.38	6.97		0.87	4.39	
24	4.73	0.62	2.93		2.24	10.60	
25*	4.62	0.82	3.79		2.15**	9.93	

*Sunday calculated: Saturday plus Monday divided by two.
**Calculated

Table D.O.-B.O.D. #1

DEER RIPS DAM

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
July							
26	4.70	1.02	4.79	-	2.15**	10.11	-
27	4.73	1.25	5.91		2.06	9.74	
28	4.19	0.31	1.30		2.16	9.05	
29	4.73	1.87	8.85	6.36 (5)	1.14	5.39	7.30(5)
30	4.16	2.12	8.82		0.78	3.25	
31	4.32	1.72	7.43		1.74	7.52	
August							
1*	4.29	1.73	7.42		1.41	6.05	
2	4.24	1.74	7.38	-	1.07	4.54	-
3	4.43	0.45	1.99		1.50	6.65	
4	4.43	0.50	2.22		0.45	1.99	
5	4.21	2.55	10.74	5.57(6)	0.85	3.58	4.51(6)
6	4.54	1.57	7.13		1.37	6.22	
7	4.08	0.88	3.59		1.02	4.16	
8*	4.37	1.36	5.94		1.01	4.41	
9	4.70	1.83	8.60	-	0.99	4.65	-
10	4.81	0.70	3.37		1.42	6.83	
11	5.59	0.98	5.48		1.29	7.21	
12	5.54	2.85	15.79	7.93(7)	1.32	7.31	5.50(7)
13	5.59	1.67	9.34		0.93	5.20	
14	4.56	1.65	7.52		0.83	3.78	
15*	3.94	1.38	5.44		0.89	3.51	
16	4.89	1.11	5.43	-	0.95	4.65	-
17	4.29	1.83	7.85		1.40	6.01	
18	4.54	1.43	6.49		1.54	6.99	
19	5.81	1.67	9.70	6.79(8)	0.94	5.46	7.25(8)
20	6.08	0.50	3.04		1.75	10.64	
21	5.64	1.40	7.90		1.59	8.97	
22*	5.63	1.26	7.09		1.42	8.00	
23	5.27	1.12	5.90	-	1.25	6.59	-
24	4.43	1.52	6.50		1.47	6.30	
25	4.24	1.21	5.13		0.77	3.27	
26	4.16	1.98	8.24	5.96(9)	0.78	3.25	4.12(9)
27	4.43	0.97	4.28		0.73	3.31	
28	4.35	0.92	4.00		0.54	2.48	
29*	4.73	1.62	7.67		0.77	3.64	

*Sunday calculated: Saturday plus Monday divided by two.
**Calculated

Table D.O.-B.O.D. #1

DEER RIPS DAM

Dissolved Oxygen - Biochemical Oxygen Demand

Date	FLOW MT/d	DISSOLVED OXYGEN ppm	T/d	Wk avg T/d	B.O.D. 5 day 20°C ppm	T/d	Wk avg T/d
August							
30	4.54	2.32	10.53	-	1.00	4.54	-
31	4.37	3.28	14.33		0.84	3.67	
September							
1	4.64	2.92	13.55		0.62	2.87	
2	5.83	3.50	20.41	20.12(10)	0.70	4.08	6.09(10)
3	8.94	3.68	32.90		1.18	10.55	
4	8.80	3.25	28.60		1.34	11.79	
5*	6.08	3.37	20.49		0.84	5.11	
6	4.10	3.48	14.27	-	0.34	1.40	-
7	5.75	4.11	23.63		1.77	10.18	
8	5.08	3.28	16.66		1.86	9.45	
9	4.70	3.93	18.47	15.10(11)	1.63	7.66	6.54(11)
10	4.48	2.42	10.84		1.64	7.35	
11	4.81	3.02	14.53		1.02	4.91	
12*	4.75	3.64	17.29		1.01	4.80	
13	4.75	4.25	20.19		1.01	4.80	

*Sunday calculated: Saturday plus Monday divided by two.

data indicate a D.O. surplus of 2.66 tons per day, and a population equivalent of 76,440. Comparison with 1964, 1963 suggests that the average B.O.D. load at Deer Rips Dam is decreasing. This may be due to better reaeration in the Pool due in part to the absence of zoogleal film during the past three years.

Year	B.O.D. T/d	D.O. T/d
1965	6.37	9.03
1964	7.97	16.85
1963	9.70	11.70

The net loss of B.O.D., during the fifteen mile passage from North Turner Bridge to Deer Rips Dam, was 11.79 tons per day equal to 1572 lbs./mile/day. The oxygen sag point is probably in the region of Mile three, on this basis the net loss in D.O. from North Turner Bridge to this area was about 650 lbs/mile/day. The increase in D.O. from Mile three to Deer Rips Dam was about 690 lbs/mile/day.

Pool Averages 1965

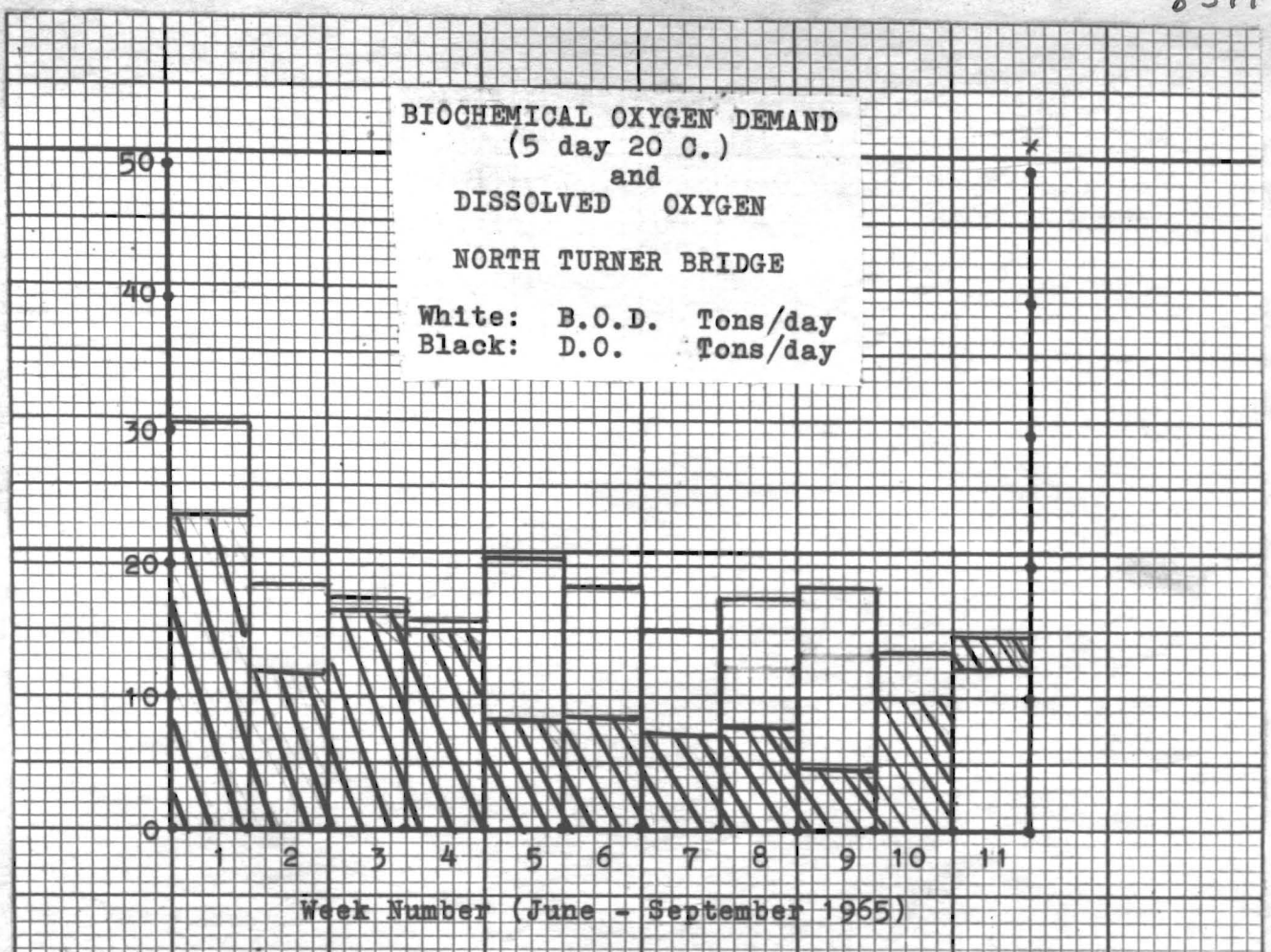
Location	B.O.D. T/d	D.O. T/d	D.O. Deficit - Surplus +
North Turner Bridge	18.16	11.66	- 6.50
Turner Center Bridge	16.71	8.07	- 8.64
Mile 4.25	12.29	6.86	- 5.43
Mile 2.5	9.54	7.56	- 1.98
Deer Rips Dam	6.37	9.03	+ 2.66

Table S #1

WEEKLY SUMMARY B.O.D. - D.O. and O.D.*
Average Tons per day

Week Number	NORTH TURNER BRIDGE B.O.D.	D.O.	O.D.-* O.S.+	DEER RIPS DAM B.O.D.	D.O.	O.D.-** O.S.+
0				10.32	7.51	- 2.81
1	30.66	23.70	- 6.96	6.99	6.90	- 0.09
2	18.34	11.97	- 6.37	7.47	7.07	- 0.40
3	17.37	16.42	- 0.95	7.51	7.50	- 0.01
4	15.85	14.98	- 0.87	6.86	10.03	+ 3.17
5	20.73	8.25	-12.48	7.30	6.36	- 0.94
6	18.59	8.47	-10.12	4.51	5.57	+ 1.06
7	14.94	7.13	- 7.81	5.50	7.93	+ 2.43
8	17.27	7.82	- 9.45	7.25	6.79	- 0.46
9	18.17	4.81	-13.36	4.12	5.96	+ 1.84
10	14.51	10.03	- 4.48	6.09	20.12	+14.03
11	13.32	14.72	+ 1.40	6.54	15.10	+ 8.56
12***	23.28	33.93	+10.65			
11 week aver.	18.16	11.66	- 6.50	6.37	9.03	+ 2.66

*Oxygen Deficit or Surplus as indicated
**Compensated for time of passage
***Not included in series average


BIOCHEMICAL OXYGEN DEMAND
(5 day 20 C.)
and
DISSOLVED OXYGEN
NORTH TURNER BRIDGE
White: B.O.D. Tons/day
Black: D.D. Tons/day
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11
Week Number (June - September 1965)

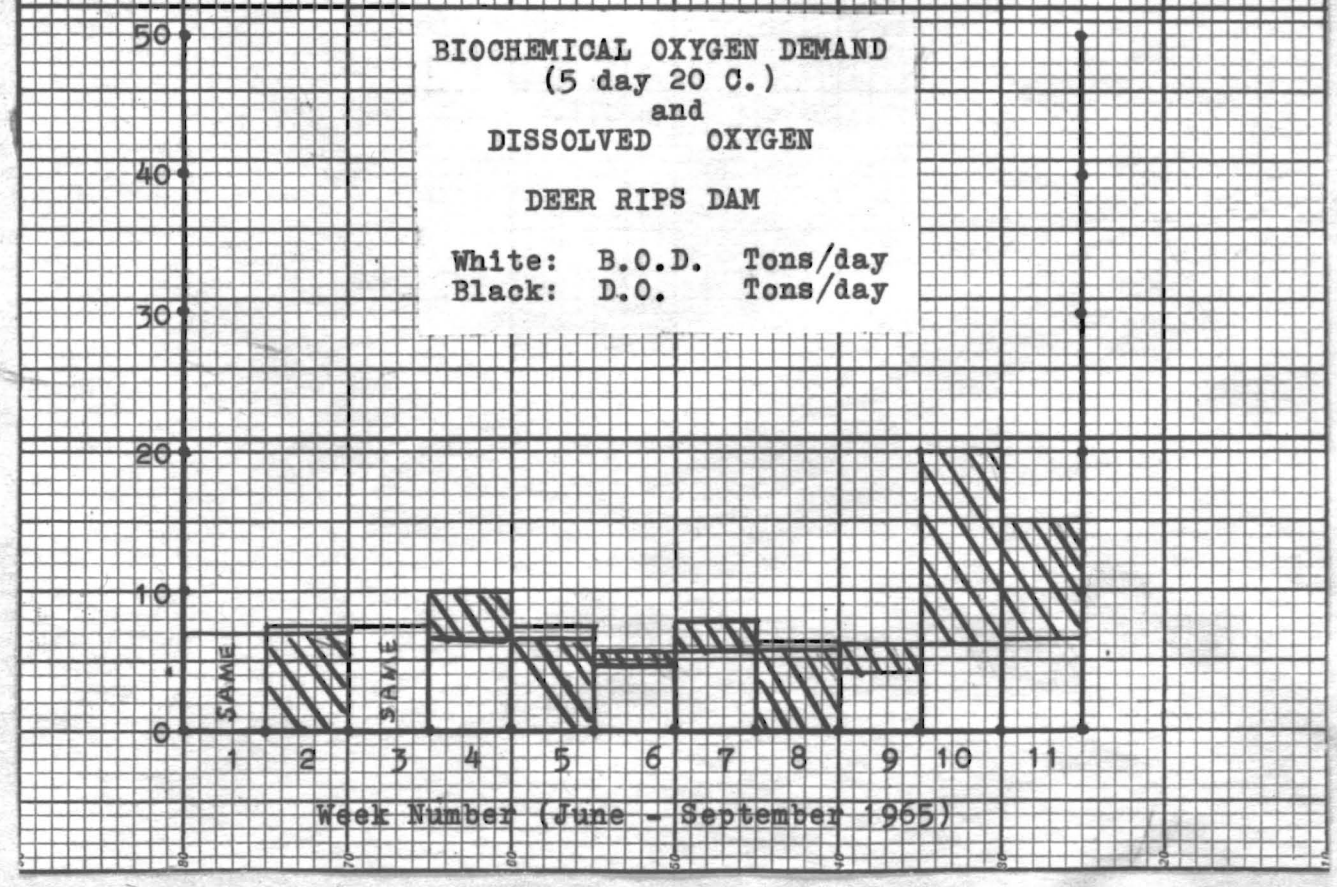

BIOCHEMICAL OXYGEN DEMAND
(5 day 20 C.)
and
DISSOLVED OXYGEN
DEER RIPS DAM
White: B.O.D. Tons/day
Black: D.O. Tons/day
50
40
30
20
10
0
SAME
SAME
1 2 3 4 5 6 7 8 9 10 11
Week Number (June - September 1965)

Table S #1A

WEEKLY SUMMARY B.O.D. - D.O. and O.D.*
Average Tons per day

	NORTH TURNER BRIDGE			TURNER CENTER BRIDGE		
Week Number	B.O.D.	D.O.	O.D.-* O.S.+	B.O.D.	D.O.	O.D.-** O.S.+
1	30.66	23.70	- 6.96	26.28	16.25	-10.03
2	18.34	11.97	- 6.37	18.24	8.13	-10.11
3	17.37	16.42	- 0.95	16.54	13.30	- 3.24
4	15.85	14.98	- 0.87	16.38	8.17	- 8.21
5	20.73	8.25	-12.48	20.63	3.44	-17.19
6	18.59	8.47	-10.12	16.86	6.05	-10.81
7	14.94	7.13	- 7.81	13.90	3.67	-10.23
8	17.27	7.82	- 9.45	14.80	4.29	-10.51
9	18.17	4.81	-13.36	13.30	3.19	-10.11
10	14.51	10.03	- 4.48	10.48	7.12	- 3.36
11	13.32	14.72	+ 1.40	16.41	22.09	+ 5.68
12***	23.28	33.93	+10.65	9.83	23.70	+13.87
11 week aver.	18.16	11.66	- 6.50	16.71	8.07	- 8.64

*Oxygen Deficit or Surplus as indicated
**Compensated for time of passage
***Not included in series average

Table S #1B

WEEKLY SUMMARY B.O.D. - D.O. and O.D.*
Average Tons per day

	TURNER CENTER BRIDGE			DEER RIPS DAM		
Week Number	B.O.D.	D.O.	O.D.-* O.S.+	B.O.D.	D.O.	O.D.-** O.S.+
1	26.28	16.25	-10.03	6.99	6.90	- 0.09
2	18.24	8.13	-10.11	7.44	7.07	- 0.40
3	16.54	13.30	- 3.24	7.51	7.50	- 0.01
4	16.38	8.17	- 8.21	6.86	10.03	+ 3.17
5	20.63	3.44	-17.19	7.30	6.36	- 0.94
6	16.86	6.05	-10.81	4.51	5.57	+ 1.06
7	13.90	3.67	-10.23	5.50	7.93	+ 2.43
8	14.80	4.29	-10.51	7.25	6.79	- 0.46
9	13.30	3.19	-10.11	4.12	5.96	+ 1.84
10	10.48	7.12	- 3.36	6.09	20.12	+14.03
11	16.41	22.09	+ 5.68	6.54	15.10	+ 8.56
12***	9.83	23.70	+13.87			
11 week aver.	16.71	8.07	- 8.64	6.37	9.03	+ 2.66

*Oxygen Deficit or Surplus as indicated
**Compensated for time of passage
***Not included in series average

Table S #1C

WEEKLY SUMMARY B.O.D. - D.O. and O.D.*
Average Tons per day

TURNER CENTER BRIDGE MILE 4.25

Week Number	B.O.D.	D.O.	O.D.-* O.S.+	B.O.D.	D.O.	O.D.-** O.S.+
1	26.28	16.25	-10.03	19.36	6.80	-12.56
2	18.24	8.13	-10.11	16.65	5.10	-11.55
3	16.54	13.30	- 3.24	10.71	11.63	+ 0.92
4	16.38	8.17	- 8.21	10.13	4.25	- 5.88
5	20.63	3.44	-17.19	17.48	2.07	-15.41
6	16.86	6.05	-10.81	9.85	2.32	- 7.53
7	13.90	3.67	-10.23	11.78	3.80	- 7.98
8	14.80	4.29	-10.51	9.17	7.17	- 2.00
9	13.30	3.19	-10.11	9.89	3.96	- 5.93
10	10.48	7.12	- 3.36	6.10	5.58	- 0.52
11	16.41	22.09	+ 5.68	14.03	22.77	+ 8.74
12***	9.83	23.70	+13.87			
11 week average	16.71	8.07	- 8.64	12.29	6.86	- 5.43

*Oxygen Deficit or Surplus as indicated
**Compensated for time of passage
***Not included in series average

Table S #1D

WEEKLY SUMMARY B.O.D. - D.O. and O.D.*
Average Tons per day

	TURNER CENTER BRIDGE			MILE 2.50		
Week Number	B.O.D.	D.O.	O.D.-* O.S.+	B.O.D.	D.O.	O.D.-** O.S.+
1	26.28	16.25	-10.03	12.94	4.53	- 8.41
2	18.24	8.13	-10.11	13.31	6.86	- 6.45
3	16.54	13.30	- 3.24	9.57	5.50	- 4.07
4	16.38	8.17	- 8.21	9.47	4.15	- 5.32
5	20.63	3.44	-17.19	9.72	2.11	- 7.61
6	16.86	6.05	-10.81	6.75	3.44	- 3.31
7	13.90	3.67	-10.23	9.62	9.92	+ 0.30
8	14.80	4.29	-10.51	7.95	5.57	- 2.38
9	13.30	3.19	-10.11	8.87	4.76	- 4.11
10	10.48	7.12	- 3.36	5.05	11.77	+ 6.72
11	16.41	22.09	+ 5.68	11.73	24.58	+12.85
12***	9.83	23.70	+13.87			
11 week average	16.71	8.07	- 8.64	9.54	7.56	- 1.98

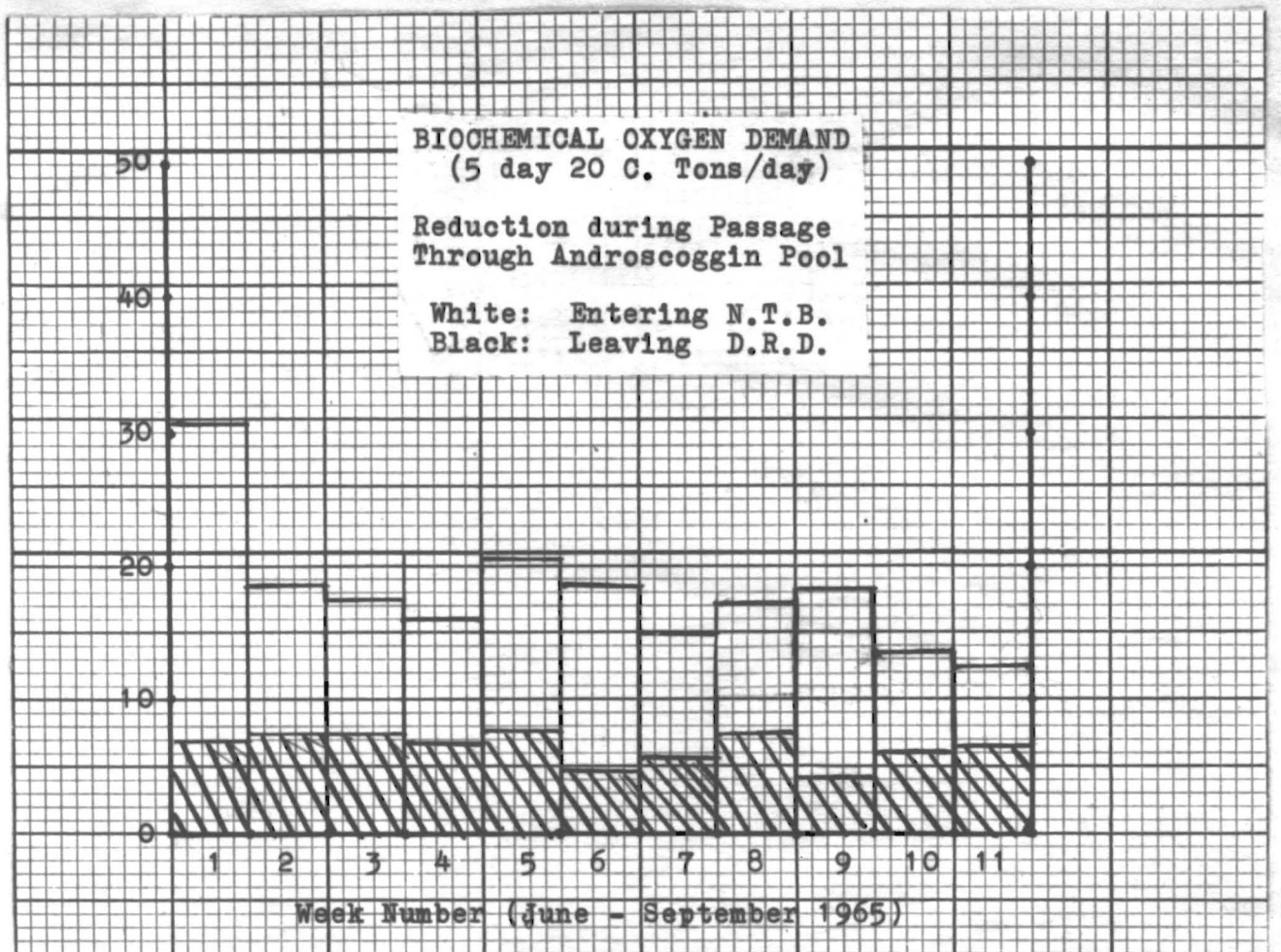
*Oxygen Deficit of Surplus as indicated
**Compensated for time of passage
***Not included in series average

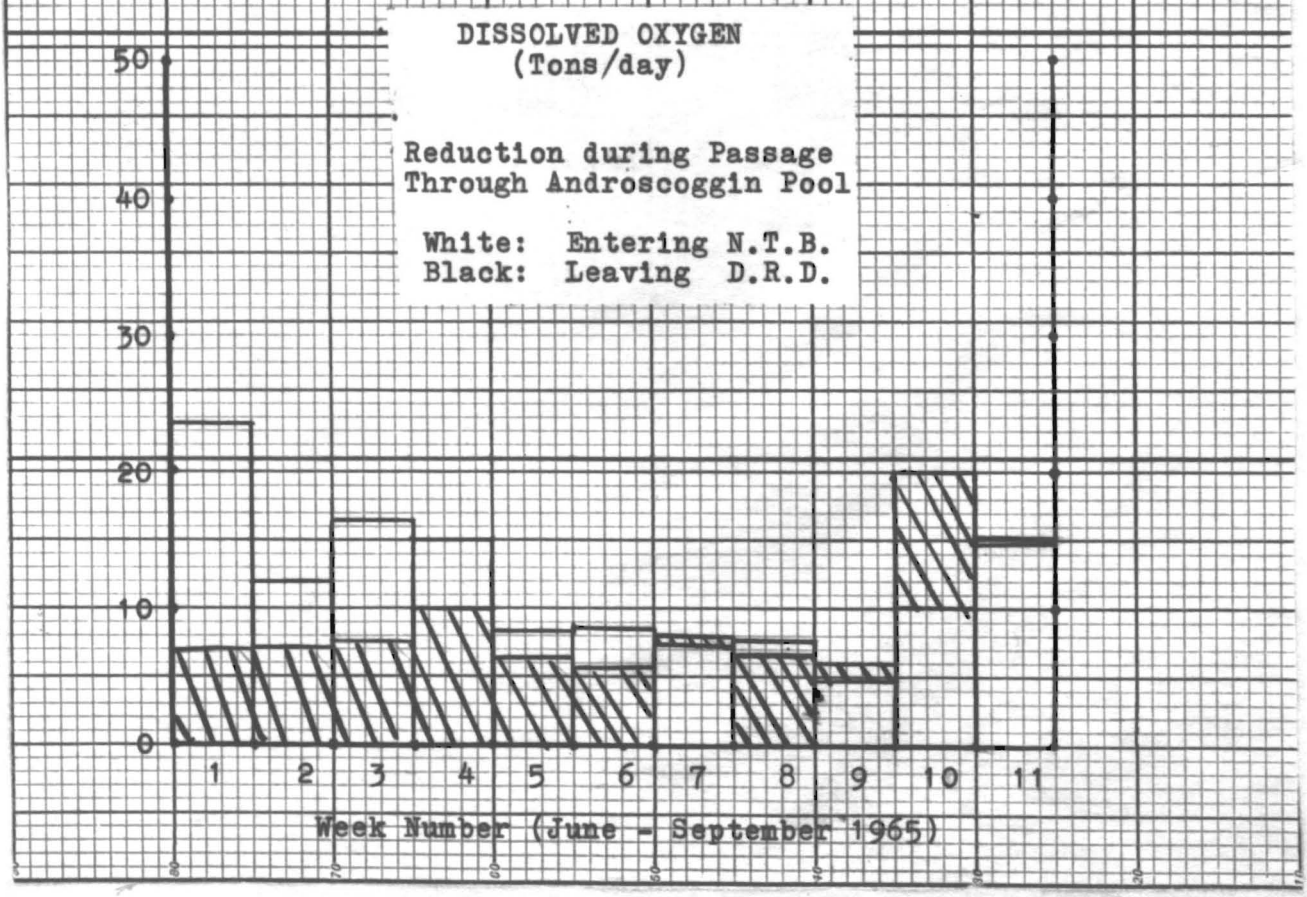
Table S #2

B.O.D. and D.O. Loss
Average Tons per day

Week Number	B.O.D.(a) loss	D.O.(a) loss- gain+
1	23.67	-16.80
2	10.87	- 4.90
3	9.86	- 8.92
4	8.99	- 4.95
5	13.43	- 1.89
6	14.08	- 2.90
7	9.44	+ 0.80
8	10.02	- 1.03
9	14.05	+ 1.15
10	8.42	+10.09
11	6.78	+ 0.38
11 week average	11.79	- 2.63

(a) Loss during passage through the Pool N.T.B. minus D.R.D.


BIOCHEMICAL OXYGEN DEMAND
(5 day 20 C. Tons/day)
Reduction during Passage
Through Androscoggin Pool
White: Entering N.T.B.
Black: Leaving D.R.D.
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11
Week Number (June - September 1965)


DISSOLVED OXYGEN
(Tons/day)
Reduction during Passage
Through Androscoggin Pool
White: Entering N.T.B.
Black: Leaving D.R.D.
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11
Week Number (June - September 1965)

Changes Between Stations

Location	B.O.D. T/d	B.O.D. % Redn	D.O. T/d	D.O. % Change
N.T.B. - T.C.B.	-1.45	8.0	-3.59	-30.8
T.C.B. - 4.25	-4.42	26.5	-1.21	-15.0
4.25 - 2.5	-2.75	22.4	+0.70	+10.2
2.5 - D.R.D.	-3.17	32.6	+1.47	+16.3
N.T.B. - D.R.D.	-11.79	65%	-2.63	-22.6%

There are several indications of gradual improvement in the Androscoggin Pool during the past three years. The more important are:

1. The disappearance of the zoogleal surface film, which has had a marked retardation of reaeration.

2. Decreased Benthal activity is evidenced by a somewhat lower gas evolution; sludge floaters now are seldom seen after July 15.

3. Grasses and aquatic plants are increasing in the shallow areas probably due, in part at least, to better light penetration in the water.

4. Coarse fish are now present in a few areas. Numerous catfish have been caught by neighborhood boys at the Waterman road landing.

5. Hydrogen sulphide concentration, in the water and air at Gulf Island Dam, was negligible at the low flows during this season.