

SUMMARY REPORT  
NORTH SASKATCHEWAN RIVER  
POLLUTION SURVEY

**ENVIRONMENTAL HEALTH SERVICES DIVISION  
GOVERNMENT OF THE PROVINCE OF ALBERTA  
DEPARTMENT OF HEALTH**

1968 - 1969



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SUMMARY REPORT  
NORTH SASKATCHEWAN RIVER  
SURVEY 1968-1969

I INTRODUCTION

The North Saskatchewan River serves as a source of water supply and a receiving stream for the wastes of many industries and municipalities. This report presents the summary of over 110 samples taken mostly during the critical winter months, to assess the river quality with respect to pollutional loads. The following locations were used for sampling (Figure 1 and Table I)

|      |                              | Frequency of Sampling |
|------|------------------------------|-----------------------|
| NS 1 | Brazeau Reservoir Discharge  | Once a month          |
| NS 2 | Drayton Valley               | Once a month          |
| NS 3 | Devon Bridge                 | Once a month          |
| NS 4 | 105 Street Bridge (Edmonton) | Bi weekly             |
| NS 5 | Fort Saskatchewan Bridge     | Weekly                |
| NS 6 | Vinca                        | Weekly                |
| NS 7 | Waskatenau                   | Bi weekly             |
| NS 8 | Duvernay Bridge              | Bi weekly             |
| NS 9 | Elk Point Bridge             | Bi weekly             |
| N 11 | Lloydminster Ferry           | Bi weekly             |

In addition to the above samples, Dissolved Oxygen values were measured by the Canadian Salt Co. Ltd. personnel.

The Division's RM-25 Robot Monitor situated at Vinca Ferry continuously monitored the North Saskatchewan River for Dissolved Oxygen, pH, Temperature, Conductivity, and Oxidation Reduction Potential.

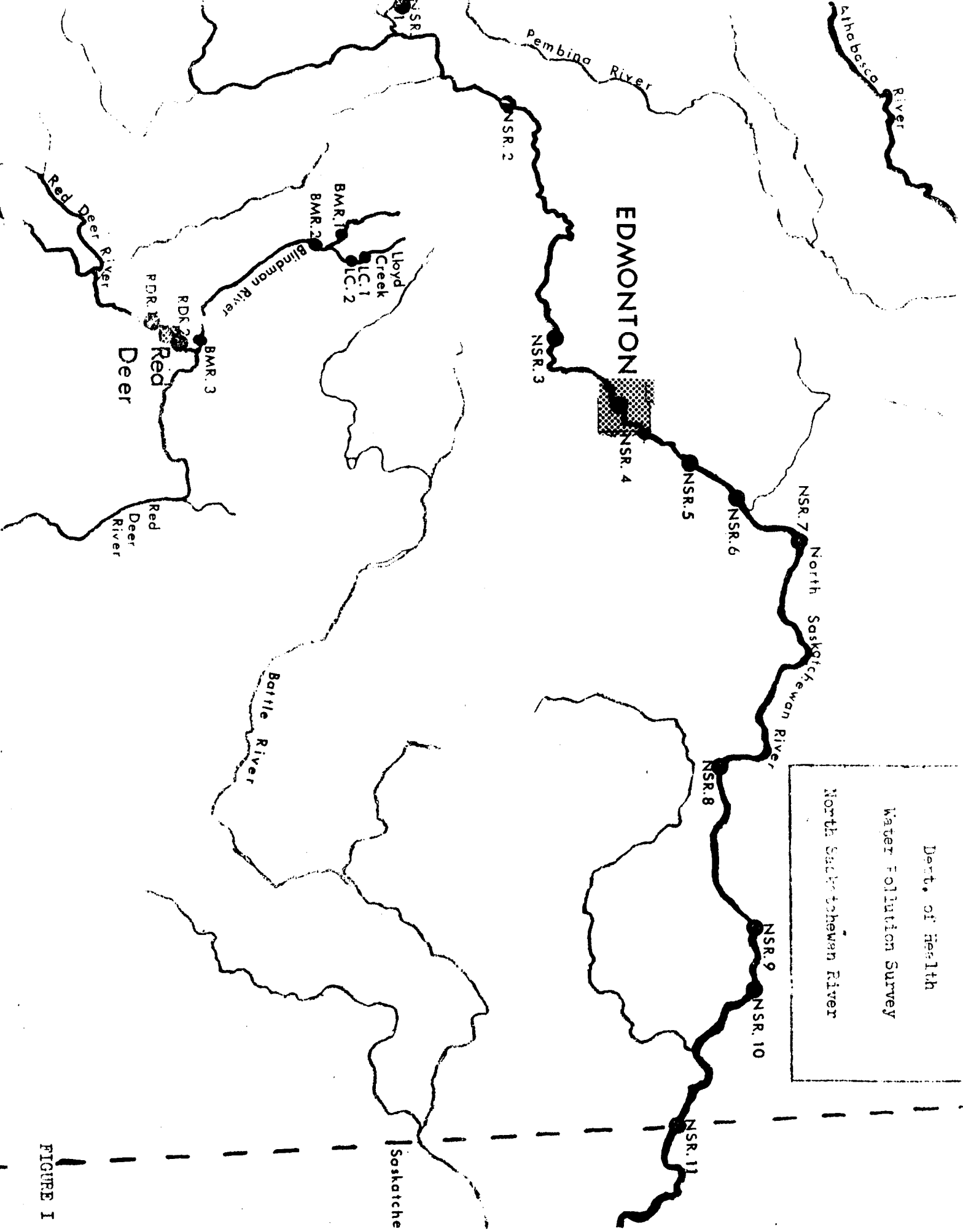


FIGURE I

TABLE I

NORTH SASKATCHEWAN RIVER

APPROXIMATE RIVER DISTANCES IN STATUTE MILES BETWEEN LOCATION

| Location Points                | Distance<br>From Edmonton<br>(miles) | Travel Time*<br>Hours | Days | Distance<br>Between Points<br>(miles) |
|--------------------------------|--------------------------------------|-----------------------|------|---------------------------------------|
| <u>UPSTREAM</u>                |                                      |                       |      |                                       |
| Rocky Mountain House           | 152                                  | 111.4                 | 4.6  | 42                                    |
| NS 1 Brazeau                   | 110                                  | 80.7                  | 3.4  | 15                                    |
| NS 2 Drayton Valley            | 95                                   | 69.7                  | 2.9  | 71                                    |
| NS 3 Devon Bridge              | 24                                   | 17.6                  | 0.7  | 24                                    |
| <u>EDMONTON</u>                | 0                                    | 0                     | 0    | 0                                     |
| NS 5 Fort Saskatchewan Bridge  | 22                                   | 16.1                  | 0.2  | 22                                    |
| NS 6 Vinca                     | 39                                   | 28.6                  | 1.2  | 17                                    |
| NS 7 Waskatenau                | 55                                   | 47.7                  | 2.0  | 26                                    |
| NS 8 Duvernay Bridge           | 107                                  | 78.5                  | 3.3  | 42                                    |
| NS 9 Elk Point Bridge          | 143                                  | 104.9                 | 4.4  | 36                                    |
| N 11 Lloydminster Bridge       | 190                                  | 139.3                 | 5.8  | 47                                    |
| North Battleford, Saskatchewan | 302                                  | 221.5                 | 9.2  | 112                                   |

The major polluttional load to the North Saskatchewan River occurs at or near the Edmonton area and a somewhat greater sampling frequency was conducted downstream with monthly samples collected upstream and bi-weekly samples collected downstream.

All industrial and municipal samples represent 24-hour composites and were co-ordinated with river sampling data in all cases.

The summary of data is presented in the main body of this report while detailed analyses are presented in Appendix A. River profiles of selected pollutants are presented in Appendix B.

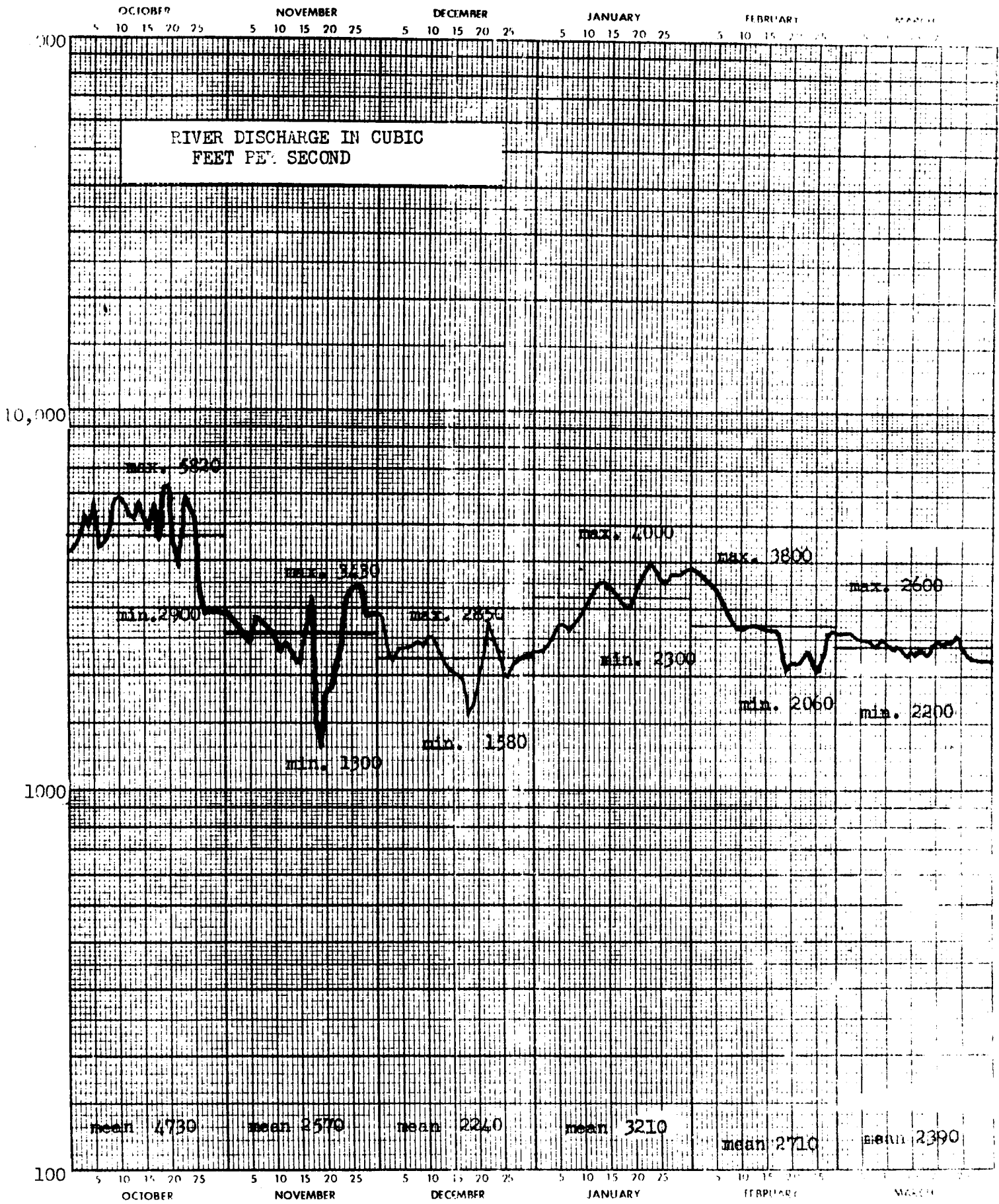
## II FLOWS IN THE NORTH SASKATCHEWAN RIVER

The daily flows in the North Saskatchewan River at Edmonton (Station No. 5DF-1), Lea Park (Station No. 5EF-3) and the discharge rates from the Brazeau Reservoir for the period of October 1968 to March 1969 are presented in Figures 2, 3 and 4.

At Edmonton the River remained open all winter from the High Level Bridge to three or four miles downstream of Beverly Bridge. At Lea Park ice cover commenced November 5, 1968 and lasted until April 5, 1969. The minimum monthly mean flow at Edmonton was 2240 cfs during December, while the minimum daily discharge was 1300 cfs (November 19, 1968). At Lea Park, the minimum monthly mean flow was 2390 cfs during December with a daily minimum of 1350 cfs on November 22, 1968.

## III NORTH SASKATCHEWAN RIVER UPSTREAM OF EDMONTON (Summary A-1 A-2 Appendix)

Dissolved Oxygen at Brazeau Reservoir Discharge varied from 8.6 mg/l (February 4, 1969) to 12.0 mg/l (November 13, 1968). At Drayton Valley the Dissolved Oxygen values were significantly higher varying from 10.6 mg/l (October 2, 1968) to 13.0 mg/l (December 11, 1968). These values were in all probability quite close to saturation. Biochemical Oxygen Demand values varied from 0.10 mg/l to 1.70 mg/l at Drayton Valley, typical of



NORTH SASKATCHEWAN RIVER AT EDMONTON  
FIGURE 2

STATION NO. 51F-1



OCTOBER

NOVEMBER

DECEMBER

JANUARY

FEBRUARY

MARCH

5 10 15 20 25

5 10 15 20 25

5 10 15 20 25

5 10 15 20 25

5 10 15 20 25

5 10 15 20 25

RIVER DISCHARGE IN CUBIC FEET PER SECOND

15,000

Max. 6310

Min. 2800

max. 5270

min. 1350

max. 4000

min. 1700

max. 4500

min. 2440

MAX 3820

min. 1800

min. 3280

min. 2080

1000

ICE COVER NOVEMBER 5, 1968 - APRIL 5, 1969

Mean 4980

mean 2620

mean 2390

mean 3190

mean 2550

mean 2830

100

OCTOBER

NOVEMBER

DECEMBER

JANUARY

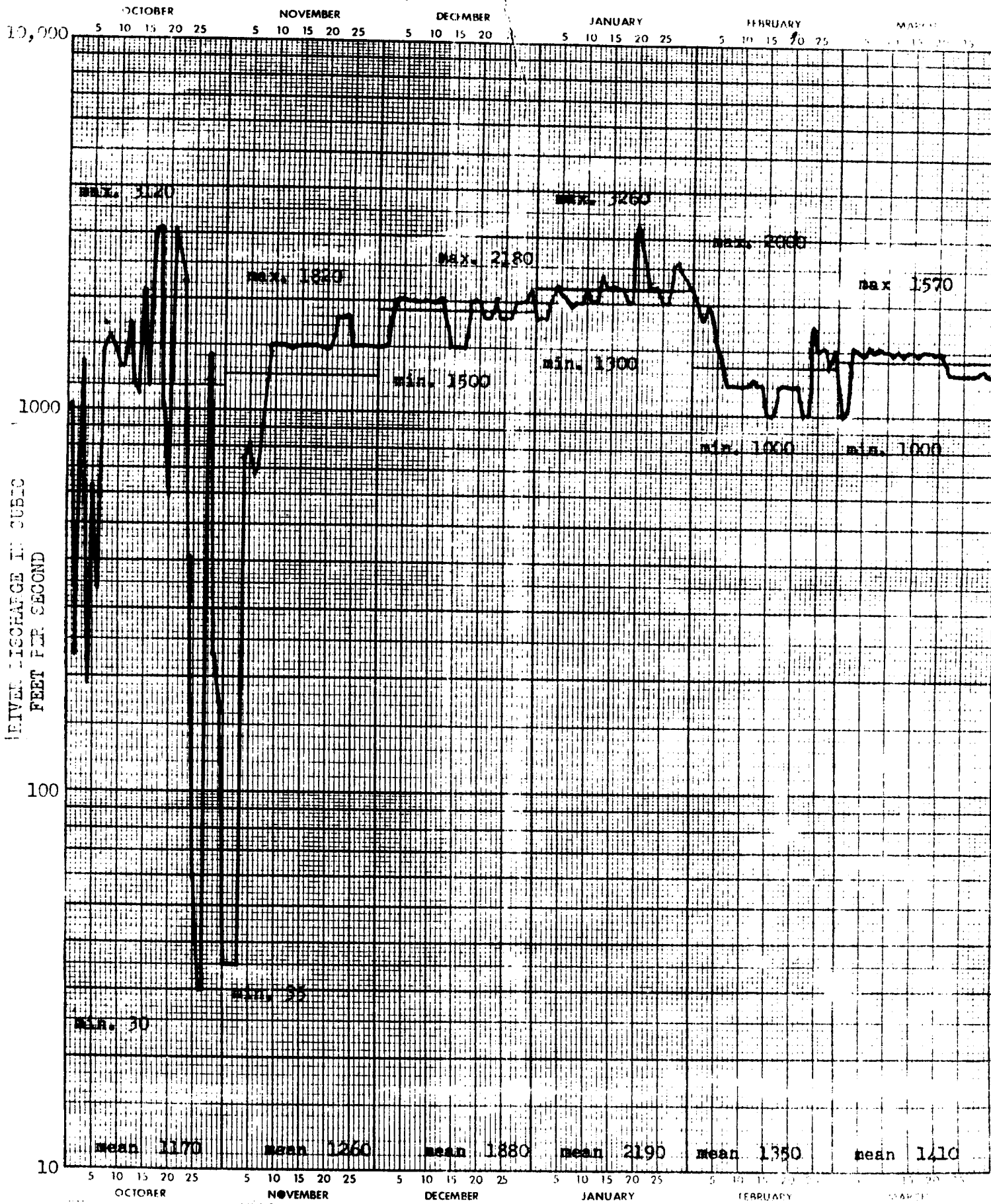
FEBRUARY

MARCH

NORTH SASKATCHEWAN RIVER AT  
LEA PARK

STATION NO. 5EF-3

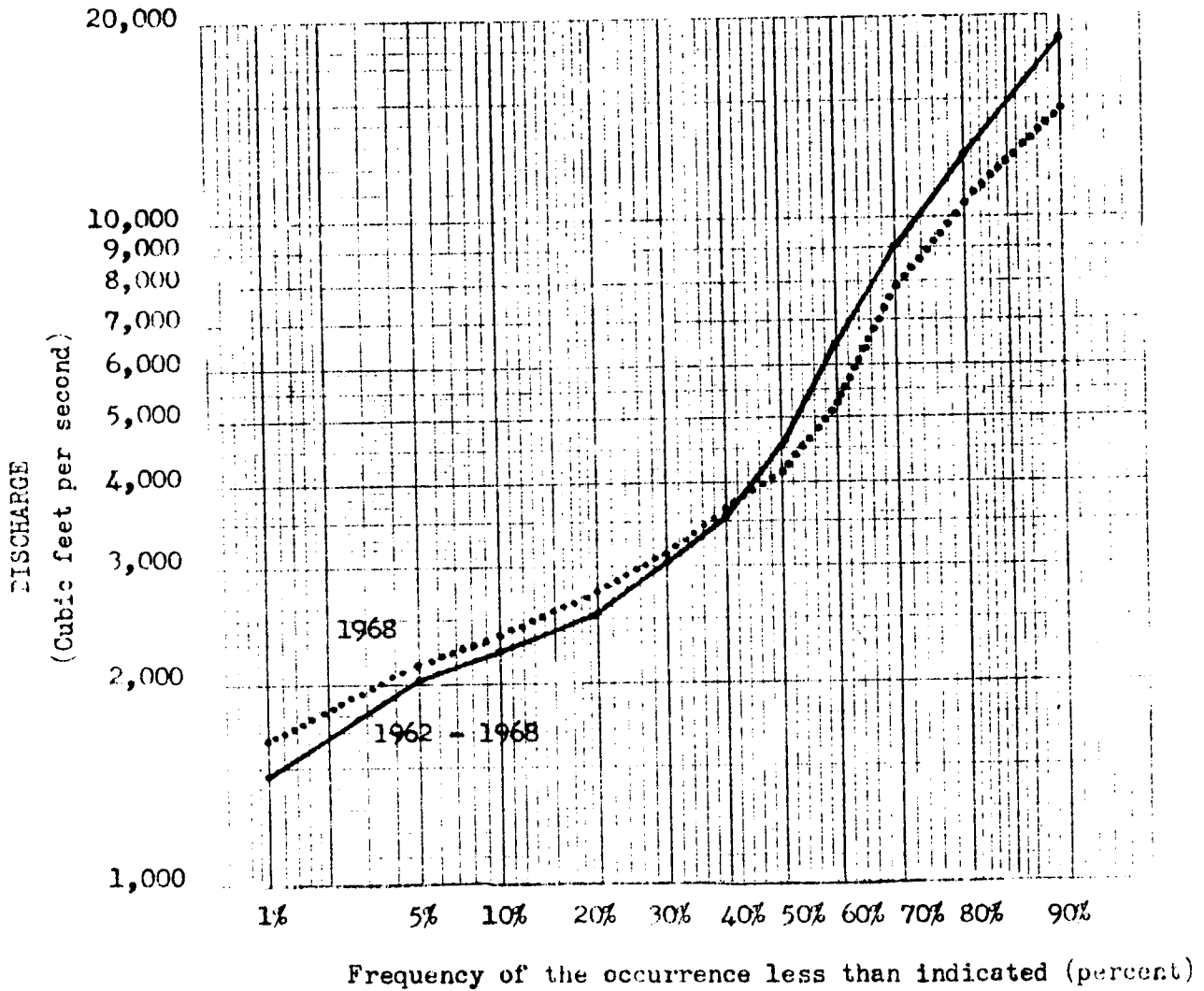
FIGURE 3



BRAZEAU RESERVOIR DISCHARGE

FIGURE 4

FIGURE 5



STATISTICAL FLOOD ANALYSIS FOR THE NORTH SASKATCHEWAN RIVER AT EDMONTON

1962 - 1968    Maximum flow is 91,600 Cubic Feet per Second  
                   Minimum flow is 1,070 Cubic Feet per Second

1968            Maximum flow is 21,100 Cubic Feet per Second  
                   Minimum flow is 1,300 Cubic Feet per Second

upstream background values.

IV NS 4 NORTH SASKATCHEWAN RIVER AT 105 STREET BRIDGE (Summary A-5 Appendix)

A maximum Dissolved Oxygen value of 13.6 mg/l was observed November 27, 1968 (101% saturation) with a minimum value of 8.60 mg/l (July 25, 1968). The next lowest value was 10.2 mg/l (February 26, 1969). The median value was 11.7 mg/l. The maximum Biochemical Oxygen Demand was 2.20 mg/l (February 26, 1969) with a minimum of 0.5 mg/l being observed in several instances. A Biochemical Oxygen Demand of 0.5 mg/l represents the median value with an average value being 0.76 mg/l.

The average value of Phenolics at this location was 1.85 ppb with a median value of 1.0 ppb. Ammonia-Nitrogen values ranged from 0 to 0.4 mg/l with an average value of 0.17 mg/l.

V NS 5 NORTH SASKATCHEWAN RIVER AT FORT SASKATCHEWAN (Summary A-7 Appendix)

Maximum Dissolved Oxygen observed at Fort Saskatchewan was 15.0 mg/l (126 percent of saturation) observed October 31, 1968. A minimum value of 7.4 mg/l (80% saturation) was observed July 25, 1968. The average Dissolved Oxygen at Fort Saskatchewan was 11.52 mg/l (80-90% saturation).

A maximum Biochemical Oxygen Demand of 5.8 mg/l was observed February 26, 1969 while the low of 0.9 mg/l was observed January 9, and February 5, 1969. The average Biochemical Oxygen Demand was 2.34 mg/l compared to the median value of 1.9 mg/l.

Average Phenolics were 2.67 mg/l. Ammonia-Nitrogen at this location varied from 0.4 mg/l to 3.5 mg/l.

VI NS 6 NORTH SASKATCHEWAN RIVER AT VINCA FERRY (Summary A-10 Appendix)

The lowest Dissolved Oxygen recorded at this location was 7.1 mg/l (July 25, 1968), the next lowest 8.0 mg/l (February 14, 15 and 16, 1969). The maximum Dissolved Oxygen was 13.5 mg/l (October 16, 1968 112% saturation)

with an average value of 10.37 mg/l.

Maximum Biochemical Oxygen Demand observed during the sampling period was 4.1 mg/l (November 20, 1968) with a mean of 1.85 mg/l and a median of 1.8 mg/l.

The maximum Ammonia-Nitrogen recorded at this location was 4.0 mg/l (November 20, 1968) with an average of 1.55 mg/l and a median of 1.1 mg/l.

#### VII NS 7 NORTH SASKATCHEWAN RIVER AT WASKATENAU (Summary A-12 Appendix)

The maximum Biochemical Oxygen Demand observed at this location was 3.6 mg/l (December 17, 1968) with a 0.9 mg/l minimum. A mean Biochemical Oxygen Demand of 1.95 mg/l was slightly higher than the median value of 1.5 mg/l. The maximum Dissolved Oxygen observed at this point was 12.6 mg/l (November 14, 1968) with a minimum of 7.5 mg/l (July 25, 1968). The next lowest value was 9.1 mg/l (February 26, 1969). The average Dissolved Oxygen was 10.48 mg/l.

#### VIII NS 8 NORTH SASKATCHEWAN RIVER AT DUVERNAY BRIDGE (Summary A-14 Appendix)

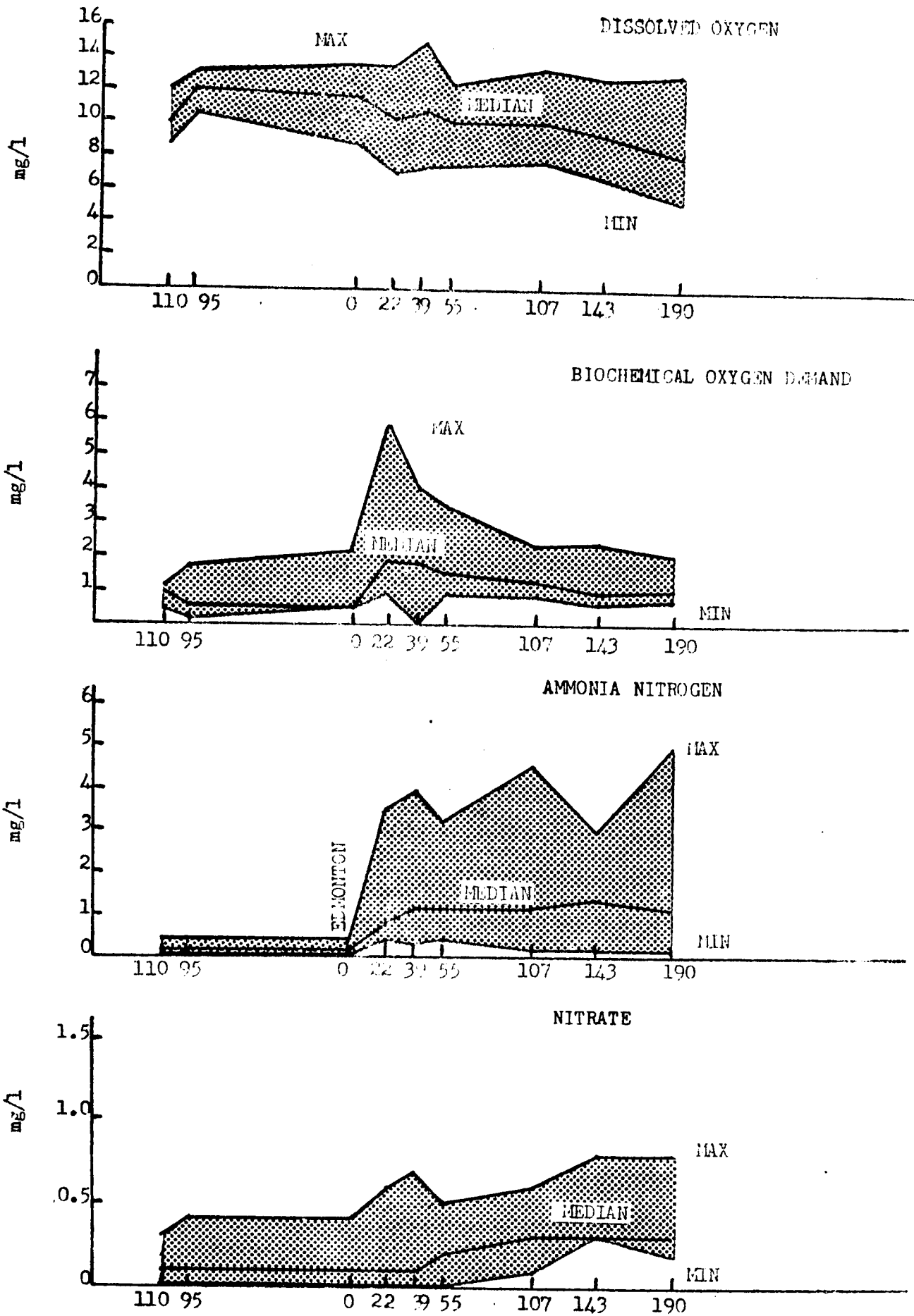
The minimum Dissolved Oxygen recorded at this location during the winter season was 7.8 mg/l (February 26, 1969). A maximum of 13.6 mg/l was observed (October 17, 1968) with a median value for the survey of 10.2 mg/l.

A maximum Biochemical Oxygen Demand of 2.3 mg/l was observed October 2, October 17, 1968 and February 26, 1969 with a minimum of 0.8 mg/l observed January 15, 1969. The mean of 1.58 mg/l was considerably lower than last year's mean of 2.09 mg/l.

#### IX NS 9 NORTH SASKATCHEWAN RIVER AT ELK POINT BRIDGE (Summary A-16 Appendix)

The highest Dissolved Oxygen observed at Elk Point Bridge was 12.8 mg/l observed November 14, 1968. The minimum was 6.8 mg/l (February 26, 1969) with an average of 9.87 mg/l. Maximum Biochemical Oxygen Demand was 2.4 mg/l (October 2, 1968) with a minimum of 0.6 mg/l (January 15, 1969). The

MAXIMUM, MINIMUM VALUES OF RIVER COMPONENTS DOWNSTREAM FROM EDMONTON



RIVER DISTANCE DOWNSTREAM FROM EDMONTON  
FIGURE 6

mean and median were 1.27 and 1.0 mg/l respectively.

#### X N 11 NORTH SASKATCHEWAN RIVER AT LLOYDMINSTER FERRY (Summary A-18 Appendix)

Minimum observed Dissolved Oxygen leaving Alberta was 5.5 mg/l (February 26, 1969). The mean for the survey period was 9.64 compared with 9.86 during the 1967-68 survey. Maximum Biochemical Oxygen Demand was 2.10 mg/l (July 25, 1968) with a minimum of 0.7 mg/l (March 19, 1969). The median was 1.1 mg/l with an average of 1.17 mg/l for the sampling period.

#### XI DISSOLVED OXYGEN AND BIOCHEMICAL OXYGEN DEMAND IN THE NORTH SASKATCHEWAN RIVER

Figure 6 shows the Dissolved Oxygen depletion and the Biochemical Oxygen Demand profiles with regard to downstream distance. These plots enable a general assessment of the extremes of the Oxygen depletion and Biochemical Oxygen Demand to be made along the North Saskatchewan River. The Dissolved Oxygen downstream displayed very little evidence of reaching unacceptable values although a significant downward trend especially downstream of Edmonton is exemplified.

Maximum Biochemical Oxygen Demand occurred as expected immediately downstream of Edmonton. Figure 6 shows that approximately 1.5 mg/l of Biochemical Oxygen Demanding materials are being absorbed in the River while the oxygen utilized from Edmonton to Lloydminster Ferry is about 3 mg/l (median values).

A comparison of the Dissolved Oxygen values taken at Lindbergh by Canadian Salt Co. Ltd. personnel and the Division's IM-25 Robot Monitor at Vinca Ferry is presented in Figure 8. The lowest Dissolved Oxygen monitored at Lindbergh was 6.6 mg/l (February 20, 1969) while the lowest Dissolved Oxygen at Vinca Ferry was 8.0 mg/l (February 14 to 16, 1969).

MAXIMUM, MINIMUM VALUES OF RIVER COMPONENTS DOWNSTREAM OF EDMONTON

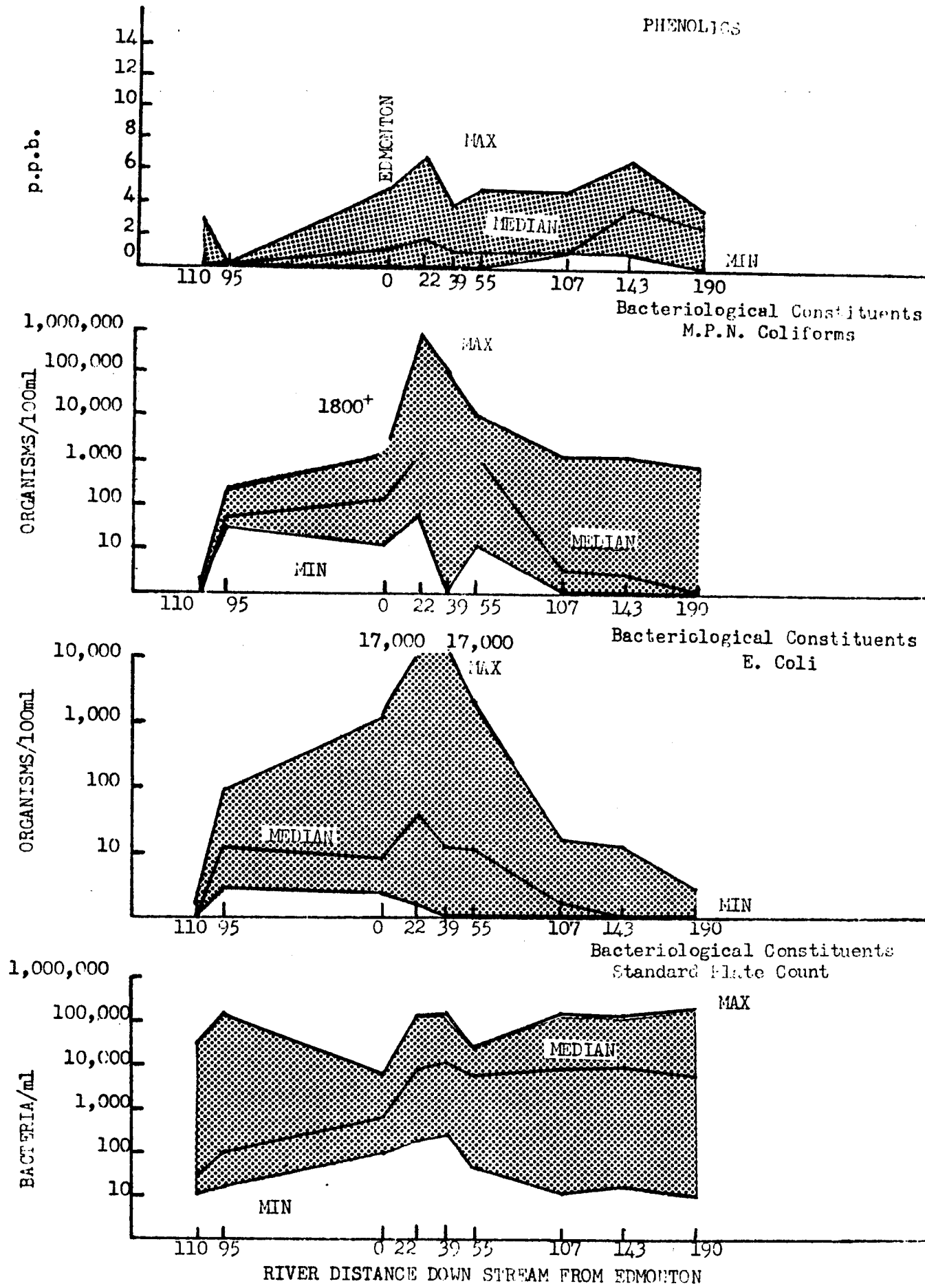


FIGURE 7



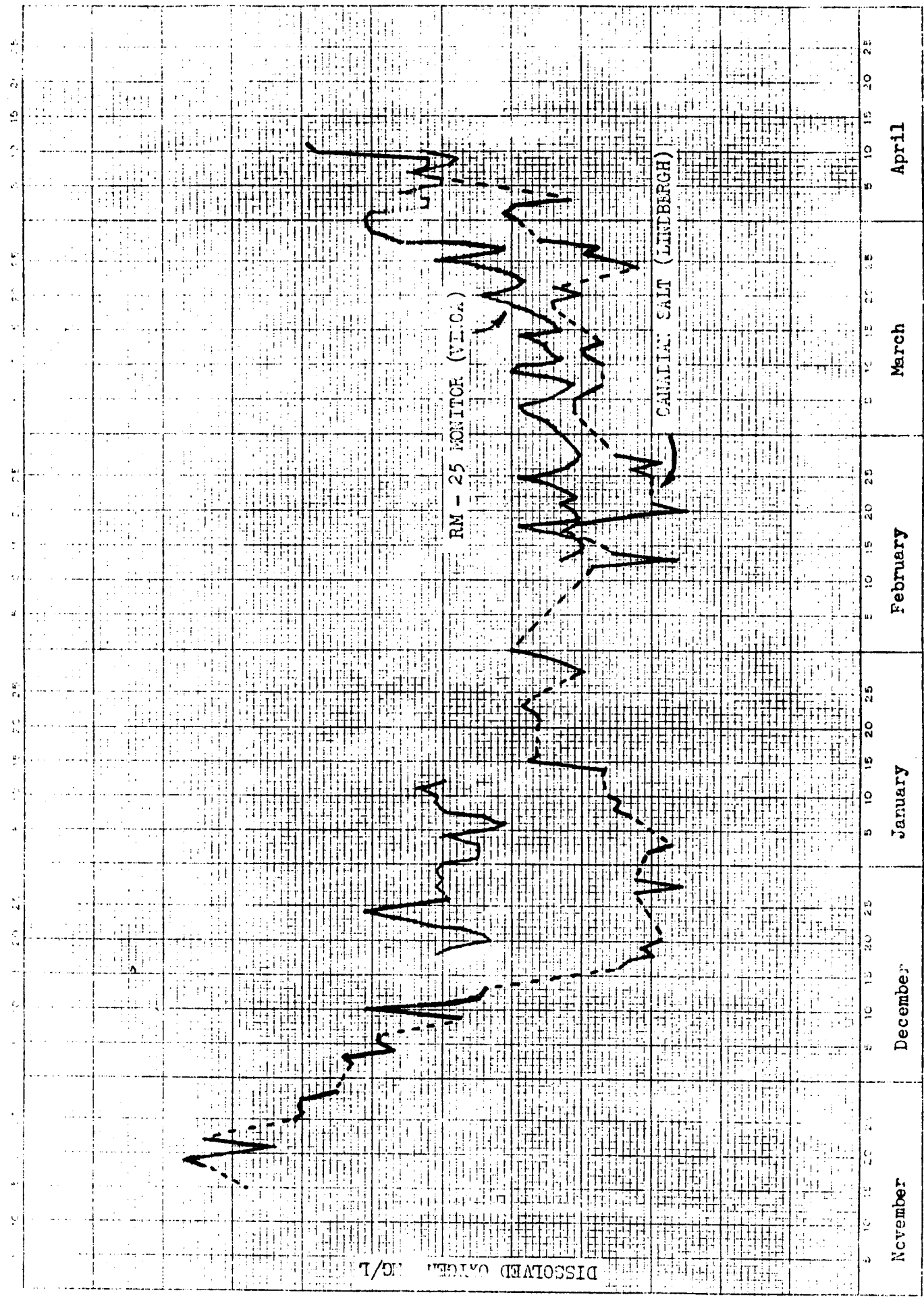


FIGURE 8

DISSOLVED OXYGEN IN NORTH SASKATCHEWAN RIVER AT LINDBERGH

## XII OTHER POLLUTIONAL PARAMETERS IN THE NORTH SASKATCHEWAN RIVER

### Ammonia-Nitrogen

A River profile of Ammonia-Nitrogen showing maximum, minimum and median values is presented in Figure 6. The level of Ammonia-Nitrogen is relatively constant upstream of Edmonton (0.1 - 0.2 mg/l). The highest value of Ammonia-Nitrogen observed was 5.0 mg/l January 15, 1969 at Lloydminster.

Ammonia-Nitrogen from Vinca Ferry to Lloydminster varied from 1.47 to 1.8 mg/l while the median varied from 1.1 to 1.4 mg/l, indicating the probability of slugs of Ammonia in the River. It is also interesting to note that the average Ammonia-Nitrogen at Fort Saskatchewan Bridge was 1.13 mg/l with a median value of 0.7 mg/l. The Ammonia-Nitrogen in the North Saskatchewan River downstream of Edmonton is excessive and is not within the guidelines of acceptability.

### Phenolics

The River profiles of minimum, maximum and median Phenolic concentrations are presented at the top of Figure 7. The highest Phenolic value was 7 ppb January 15, 1969 at Fort Saskatchewan and 7 ppb October 2, 1968 at Elk Point Bridge. Phenolics in general were quite low downstream of Edmonton with average values around 2 to 3 ppb.

### Taste and Odor

Several complaints were received by the Environmental Health Services Division from downstream users regarding unpleasant tastes in the River. One in particular, November 19, 1968 corresponded to the yearly lowest flow in the North Saskatchewan River (1300 cfs). Odors at Fort Saskatchewan on November 20, 1968 were 32 - "Chemical" and at Vinca Ferry; 16 - "Chemical". Odor values of 16 - "Chemical" were noticed at Vinca Ferry through the first part of December and latter part of January.

### Oils and Greases

The highest value for Oil and Grease was 10.8 mg/l February 26, 1969 at Vinca Ferry. This corresponded to an accidental spill. The level of Oil and Grease in the North Saskatchewan River during the month of February seemed unusually high, ranging from 6.1 to 6.7 mg/l at Fort Saskatchewan Bridge and 4.0 - 10.8 mg/l at Vinca Ferry. This is considerably higher than the median values of 0.8 - 0.9 recorded at these locations.

### Bacteriological Constituents

The plot of maximum, minimum and median values for Standard Plate Count, Most Probable Number of Coliforms and Most Probable Number of Escherichia Coli is presented in Figure 7. As expected, marked increases in every constituent occurred at Edmonton. Median values of Standard Plate Count showed an increase of approximately 7000 orgs/ml at Edmonton. The median value of E. Coli upstream of Edmonton was 9.2 orgs/100 ml increasing to 60 org/100 ml as indicated by the Fort Saskatchewan Bridge samples. These organisms do not survive to any great extent in cold water which is fairly obvious from the plot.

### Pesticides

Three pesticide samples were taken during the winter survey; one at Vinca Ferry February 14, 1969, and two at Lindbergh November 13 and 20, 1968 (A-19 Appendix). The results show that the values were below the lower detection limits for Insecticides (0.1 ppb) and Herbicide esters and acids (1.0 ppb).

### Carbon Chloroform Extracts

Carbon Chloroform extracts were taken at Devon (February 24-28, 1969) and Vinca Ferry (February 24-28, 1969 and March 3-6, 1969). These results are summarized in A-20 Appendix. The Devon samples showed a total organics concentration of 61 ppb upstream of Edmonton, while downstream (Vinca Ferry)

TABLE II

NORTH SASKATCHEWAN EFFLUENT DISCHARGERS

| Source  | Type of Discharge and Treatment   | Discharge To |
|---|---|--------------|
| Town of Rocky Mountain House  | Domestic Sewage (Raw)   | N.S.R.       |
| Town of Drayton Valley  | Domestic Sewage (L)   | N.S.R.       |
| Town of Devon   | Domestic Sewage (ST)  | N.S.R.       |
| Imperial Oil - Devon  | Industrial Waste (L)  | N.S.R.       |
| City of Edmonton  | Domestic Sewage (ST in Winter)  | N.S.R.       |
| Canadian Industries Ltd.  | Industrial Waste (WELL)   |              |
| Building Products Ltd   | Industrial Waste (Aerated Lagoons)                                      | N.S.R.       |
| Imperial Oil Ltd.   | Industrial Waste (A.P.I., Well)   | N.S.R.       |
| Texaco  | Industrial Waste (A.P.I., Well, L)                                      | N.S.R.       |
| Union Carbide   | Industrial Waste (L)  | N.S.R.       |
| S & L Oil   | Industrial Waste (L)  | N.S.R.       |
| Gulf Oil Canada Ltd.  | Industrial Waste (A.P.I., L)  | N.S.R.       |
| Chemcell  | Industrial Waste (Well, L)  | N.S.R.       |
| Uniroyal  | Industrial Waste (L-Summer Discharge)                                   | N.S.R.       |
| Alberta Hospital - Oliver<br>City of Edmonton Packing Plants<br>Sherwood Park | Waste Storage & Disposal during<br>Summer Months (L) to<br>City Lagoons | N.S.R.       |
| Town of Fort Saskatchewan   | Domestic Sewage (L)   | N.S.R.       |
| Sherritt Gordon Mines Ltd.  | Industrial Waste (L)  | N.S.R.       |
| Dow Chemical Ltd.   | Industrial Waste (L, Well)  | N.S.R.       |
| Redwater Imperial Fertilizer  | Industrial Waste (L)  | N.S.R.       |
| Redwater Imperial Oil Gas Plant   | Industrial Waste (L)  | N.S.R.       |
| Town of Redwater  | Domestic Sewage (L)   | N.S.R.       |
| Waskatenau  | Domestic Sewage (L)   | N.S.R.       |
| Chemcell - Duvernay   | Industrial Waste (NT)   | N.S.R.       |
| Elk Point   | Domestic Sewage (L)   | N.S.R.       |
| Canadian Salt Co. Ltd.  | Industrial Waste (NT)   | N.S.R.       |

L - Lagoon  
ST - Secondary Treatment

NT - No Treatment  
API - A.P.I. Separator

TOTAL LOADING TO RIVER IN LBS/DAY

TABLE II

DATE RIVER FLOW C.F.S. Oct. 1/68 4290 Nov. 12/68 2440 Dec. 9/68 2360 Jan. 13/69 3500 Feb. 3/69 3600 Mar. 17/69 2360

ANALYSIS

|                                       |        |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|--------|
| BIOCHEM. OX. DEMAND 5 DAY 20 DEG.     | 75000  | 81000  | 46000  | 33000  | 57000  | 55000  |
| CHEM. OX. DEMAND                      | 140000 | 250000 | 100000 | 86000  | 110000 | 110000 |
| ALKALINITY AS CaCO3                   | 44000  | 31000  | 100000 | 130000 | 45000  | 57000  |
| TOTAL ALKALINITY AS CaCO3             | 160000 | 150000 | 230000 | 170000 | 150000 | 170000 |
| TOTAL RESIDUE                         | 470000 | 880000 | 840000 | 980000 | 550000 | 890000 |
| IGNITION LOSS OF TOTAL RESIDUE        | 160000 | 170000 | 150000 | 130000 | 130000 | 130000 |
| NONFILTRABLE RESIDUE                  | 59000  | 100000 | 80000  | 55000  | 47000  | 59000  |
| IGNITION LOSS OF NONFILTRABLE RESIDUE | 33000  | 35000  | 30000  | 36000  | 35000  | 37000  |
| OILS AND GREASES                      | 7500   | 6800   | 6000   | 4500   | 7200   | 8900   |
| PHENOLS                               | 52     | 19     | 23     | 18     | 20     | 25     |
| CHLORIDES                             | 250000 | 300000 | 280000 | 170000 | 180000 | 230000 |
| PHOSPHATES                            | 5600   | 1000   | 5100   | 8700   | 11000  | 11000  |
| AMMONIA NITROGEN                      | 19000  | 14000  | 27000  | 26000  | 19000  | 23000  |
| NITRATE NITROGEN                      | 190    | 240    | 230    | 240    | 150    | 460    |
| SULPHATES                             | 21000  | 89000  | 36000  | 18000  | 28000  | 120000 |
| HEXAVALENT CHROMIUM                   | 2.9    | 1.1    | 0.2    | 2.3    | 3.8    | 4.6    |
| COPPER                                | 35     | 18     | 38     | 44     | 100    | 140    |
| NICKEL                                | 280    | 38     | 79     | 330    | 2100   | 580    |

the organics concentration was 644 ppb. The sample taken in March at Vinca Ferry showed an organics concentration of 1100 ppb. , This value is considered to be above acceptable water quality guidelines.

### XIII LOADINGS TO THE NORTH SASKATCHEWAN RIVER

The total loadings to the North Saskatchewan River (all major sources) determined on a monthly basis during the winter season is presented in Table III. A list of all dischargers is presented in Table II. Of particular interest is the Biochemical Oxygen Demand load to the River, the maximum being 81,000 lbs per day (November 12, 1968) and the minimum 33,000 lbs per day (January 13, 1969).

Ammonia-Nitrogen loading varied from 14,000 lbs per day (November 12, 1968) to a high of 27,000 lbs per day (December 9, 1968).

Oil and Grease loading was up sharply from those of last year, varying from 4,500 lbs per day January 13, to 89,000 lbs per day March 17, 1969.

Phenolic loadings were generally maintained at a low level throughout the winter (18-52 lbs per day).

### DISCUSSION

With respect to Dissolved Oxygen, the North Saskatchewan River was in a healthy condition and remained above the guide lines of acceptability (5 mg/l). The concentration of Biochemical Oxygen Demanding materials in the River was lower than that of previous years primarily due to increased discharges from the Brazeau Dam particularly during the months of January, February and March (Figure 5).

The problem of the occurrence of odors in the North Saskatchewan River continues and efforts to control odorous industrial wastes are presently being made.

Levels of Ammonia-Nitrogen are again excessive and it would appear that greater efforts are required to control the Ammonia-Nitrogen so as to meet the guidelines of acceptability (1.5 mg/l).

The level of Oil and Grease in the North Saskatchewan River was unusually high this year and greater control of the discharges will have to be exercised. The amount of organics as shown by the Carbon Chloroform Extracts also appears to be high downstream of Edmonton.

A handwritten signature in cursive script, reading "E. Kupchanko". The signature is written in dark ink and is positioned above the typed name.

Eugene E. Kupchanko, P.Eng.  
Head, Water Pollution Control Section.

May 6, 1969.

A P P E N D I X A



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Summaries of average, maximum, minimum and median values are presented at the end of each section.

NSI NORTH SASKATCHEWAN RIVER AT BRAZEAU RESERVOIR DISCHARGE

1968-1969

| DAY<br>MONTH<br>YEAR     | 2<br>OCT<br>1968 | 13<br>NOV<br>1968 | 11<br>DEC<br>1968 | 14<br>JAN<br>1969 | 4<br>FEB<br>1969 | 17<br>MAR<br>1969 |
|--------------------------|------------------|-------------------|-------------------|-------------------|------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                | G                 | G                 | G                 | G                | G                 |
| INITIAL SAMPLING TIME    | 1100             | 1200              | 1130              | 1130              | 1300             | 1100              |
| TEMPERATURE, DEG. CENT.  | 5.5              | 0.0               | 0.0               | 0.0               | 0.0              | 1.0               |
| BAROMETRIC PRES. IN. HG  | *0.00            | *0.00             | *0.00             | 26.90             | 26.68            | 26.70             |
| DISSOLVED OXYGEN, MG/L   | 11.4             | 12.0              | 9.7               | 8.9               | 8.6              | 11.1              |
| PERCENT SATURATION       | *00.             | *00.              | *00.              | 68.               | 66.              | 73.               |
| BIOCHEM. OX. DEMAND MG/L | 1.2              | 1.1               | 0.4               | 1.0               | 0.9              | 0.5               |
| HYDROGEN ION CONC., PH   | 8.3              | 7.9               | 8.0               | 7.8               | 7.9              | 8.5               |
| ALKALINITY MG/L          | 135              | 124               | 131               | 128               | 131              | 132               |
| THRESHOLD ODOR NO., TYPE | 4 M              | 4 M               | 8 M               | 4 M               | 4 M              | 4 M               |
| TOTAL SOLIDS MG/L        | 206              | 298               | 228               | 218               | 220              | 239               |
| IGNITION LOSS MG/L       | 68               | 90                | 108               | 44                | 20               | 159               |
| TURBIDITY AS SiO2 MG/L   | 6                | 5                 | 6                 | 14                | 8                | 7                 |
| TOTAL HARDNESS MG/L      | 144              | 150               | 176               | 160               | 162              | 157               |
| CHLORIDES MG/L           | 0                | 0                 | 0                 | 2                 | 1                | 1                 |
| AMMONIA NITROGEN MG/L    | 0.4              | 0.4               | 0.2               | 0.1               | 0.0              | 0.1               |
| NITRATE NITROGEN MG/L    | 0.2              | 0.0               | 0.3               | 0.2               | 0.1              | 0.0               |
| PHOSPHATES AS PO4 MG/L   | 0.1              | 0.0               | 0.1               | 0.1               | 0.1              | 0.0               |
| PHENOLS PPB              | 0                | 3                 | 0                 | 0                 | 1                | 1                 |
| OILS & GREASES MG/L      | 0.5              | 0.2               | 0.1               | 0.9               | 1.6              | 2.9               |
| FLUORIDES MG/L           | 0.19             | 0.18              | 0.18              | 0.14              | 0.15             | 0.14              |
| COLIFORM M.P.N./100ML.   | 2.               | 0.                | 0.                | 0.                | 0.               | 0.                |
| MPN OF E COLI/100ML.     | 2.               | 0.                | 0.                | 0.                | 0.               | 0.                |
| STANDARD PLATE COUNT/ML  | 46000            | 50                | 20                | 40                | 10               | 9300              |
| RIVER DISCHARGE C.F.S.   | 230.             | 1470.             | 2010.             | 2200.             | 1510.            | 1670.             |

\* DENOTES DATA NOT AVAILABLE

NSI NORTH SASKATCHEWAN RIVER AT BRAZEAU RESERVOIR DISCHARGE

1968-69

|                         | AVERAGE | MAXIMUM | MINIMUM | MEAN   |
|-------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 10.28   | 12.00   | 8.60    | 9.70   |
| BOD MG/L                | 0.67    | 1.20    | 0.40    | 0.93   |
| HYDROGEN ION CONC., PH  | 8.03    | 8.60    | 7.80    | 7.98   |
| ALKALINITY MG/L         | 131.83  | 142.00  | 124.00  | 131.7  |
| TOTAL RESIDUE MG/L      | 222.33  | 264.00  | 198.00  | 213.0  |
| IGNITION LOSS MG/L      | 72.33   | 108.00  | 20.00   | 68.0   |
| TURBIDITY AS SiO2 MG/L  | 6.83    | 14.00   | 2.00    | 6.89   |
| TOTAL HARDNESS MG/L     | 160.00  | 176.00  | 144.00  | 160.00 |
| CHLORIDES MG/L          | 0.67    | 2.00    | 0.00    | 0.60   |
| AMMONIA NITROGEN MG/L   | 0.20    | 0.40    | 0.00    | 0.19   |
| NITRATE NITROGEN MG/L   | 0.13    | 0.30    | 0.00    | 0.10   |
| TOTAL PHOS. AS PO4 MG/L | 0.07    | 0.10    | 0.00    | 0.10   |
| PHENOLS PPB             | 0.83    | 3.00    | 0.00    | 0.90   |
| OILS AND GREASES MG/L   | 1.07    | 2.90    | 0.10    | 0.9    |
| FLUORIDES MG/L          | 0.16    | 0.19    | 0.14    | 0.16   |
| COLIFORM M.P.N./100ML.  | 0.33    | 2.00    | 0.00    | 0.33   |
| M.P.N. OF E COLI/100ML  | 0.33    | 2.00    | 0.00    | 0.33   |
| STANDARD PLATE COUNT/ML | 9237.   | 46000.  | 10.     | 9237.  |

152 NORTH SASKATCHEWAN RIVER AT DRAYTON VALLEY

1968-69

| DAY<br>MONTH<br>YEAR     | 2<br>OCT<br>1968 | 13<br>NOV<br>1968 | 11<br>DEC<br>1968 | 14<br>JAN<br>1969 | 4<br>FEB<br>1969 | 19<br>MAR<br>1969 |
|--------------------------|------------------|-------------------|-------------------|-------------------|------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                | G                 | G                 | G                 | G                | G                 |
| INITIAL SAMPLING TIME    | 1100             | 1330              | 1530              | 1430              | 1200             | 1230              |
| TEMPERATURE, DEG. CENT.  | 6.5              | 6.0               | 0.0               | 0.0               | 0.0              | 0.0               |
| BAROMETRIC PRES. IN. HG  | *0.00            | *0.00             | *0.00             | 27.10             | 26.92            | *0.00             |
| DISSOLVED OXYGEN, MG/L   | 10.6             | 12.5              | 13.0              | 12.2              | 10.7             | 11.9              |
| PERCENT SATURATION       | *00.             | *00.              | *00.              | 92.               | 81.              | *00.              |
| BIOCHEM. OX. DEMAND MG/L | 1.4              | 0.5               | 0.2               | 0.1               | 1.7              | 0.9               |
| HYDROGEN ION CONC., PH   | 8.3              | 8.1               | 8.3               | 7.9               | 7.8              | 8.0               |
| ALKALINITY MG/L          | 125              | 141               | 153               | 141               | 146              | 149               |
| THRESHOLD ODOR NO., TYPE | 2 M              | 4 M               | 8 M               | 1 M               | 4 M              | 1 M               |
| TOTAL SOLIDS MG/L        | 230              | 224               | 318               | 270               | 148              | 250               |
| IGNITION LOSS MG/L       | 82               | 54                | 92                | 42                | 18               | 58                |
| TURBIDITY AS SI02 MG/L   | 7                | 8                 | 11                | 7                 | 4                | 7                 |
| TOTAL HARDNESS MG/L      | 156              | 174               | 214               | 196               | 200              | 174               |
| CHLORIDES MG/L           | 5                | 0                 | 0                 | 2                 | 1                | 1                 |
| AMMONIA NITROGEN MG/L    | 0.2              | 0.2               | 0.4               | 0.1               | 0.0              | 0.1               |
| NITRATE NITROGEN MG/L    | 0.1              | 0.1               | 0.4               | 0.2               | 0.1              | 0.3               |
| PHOSPHATES AS PO4 MG/L   | 0.0              | 0.0               | 0.1               | 0.1               | 0.1              | 0.1               |
| PHENOLS PPB              | 0                | 0                 | 0                 | 0                 | 0                | 0                 |
| OILS & GREASES MG/L      | 0.1              | 0.1               | 0.3               | 0.9               | 2.6              | 2.8               |
| FLUORIDES MG/L           | 0.24             | 0.24              | 0.19              | 0.16              | 0.17             | 0.16              |
| COLIFORM M.P.N./100ML.   | 79.              | 49.               | 79.               | 350.              | 130.             | 149.              |
| M.P.N. OF E COLI/100ML.  | 5.               | 11.               | 17.               | 33.               | 34.              | 25.               |
| STANDARD PLATE COUNT/ML  | 170000           | 30                | 20                | 100               | 120              | 5500              |

\* DENOTES DATA NOT AVAILABLE

152 NORTH SASKATCHEWAN RIVER AT DRAYTON VALLEY

1968-69

|                         | AVERAGE | MAXIMUM | MINIMUM | MEAN   |
|-------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 11.82   | 13.00   | 10.60   | 11.90  |
| POD MG/L                | 0.50    | 1.70    | 0.10    | 0.50   |
| HYDROGEN ION CONC., PH  | 8.07    | 8.30    | 7.80    | 8.00   |
| ALKALINITY MG/L         | 142.50  | 153.00  | 125.00  | 141.00 |
| TOTAL RESIDUE MG/L      | 240.00  | 318.00  | 148.00  | 270.00 |
| IGNITION LOSS MG/L      | 57.67   | 92.00   | 18.00   | 59.00  |
| TURBIDITY AS SI02 MG/L  | 6.50    | 11.00   | 2.00    | 7.00   |
| TOTAL HARDNESS MG/L     | 189.00  | 214.00  | 156.00  | 174.00 |
| CHLORIDES MG/L          | 1.50    | 5.00    | 0.00    | 1.00   |
| AMMONIA NITROGEN MG/L   | 0.17    | 0.40    | 0.00    | 0.17   |
| NITRATE NITROGEN MG/L   | 0.15    | 0.40    | 0.00    | 0.19   |
| TOTAL PHOS. AS PO4 MG/L | 0.07    | 0.10    | 0.00    | 0.10   |
| PHENOLS PPB             | 0.00    | 0.00    | 0.00    | 0.00   |
| OILS AND GREASES MG/L   | 1.13    | 2.80    | 0.10    | 0.50   |
| FLUORIDES MG/L          | 0.19    | 0.24    | 0.16    | 0.17   |
| COLIFORM M.P.N./100ML.  | 137.83  | 350.00  | 49.00   | 149.00 |
| M.P.N. OF E COLI/100ML  | 32.42   | 95.00   | 4.50    | 17.00  |
| STANDARD PLATE COUNT/ML | 29295.  | 170000. | 20.     | 100.   |

53 NORTH SASKATCHEWAN RIVER AT FLEVEE BRIDGE

1969

| DAY                                | 13    | 17    | 4     |
|------------------------------------|-------|-------|-------|
| MONTH                              | DEC   | JAN   | FEB   |
| YEAR                               | 1968  | 1969  | 1969  |
| COMPOSITE OR GRAB SAMPLE           | G     | G     | G     |
| INITIAL SAMPLING TIME              | 930   | 1000  | 1015  |
| TEMPERATURE, DEG. CENT.            | 0.0   | 0.0   | 0.0   |
| BAROMETRIC PRES. IN. HG            | *0.00 | *0.00 | 27.41 |
| DISSOLVED OXYGEN, MG/L             | 13.2  | 9.7   | 10.4  |
| PERCENT SATURATION                 | *00.  | *00.  | 78.   |
| BIOCHEM. OX. DEMAND MG/L           | 0.8   | 0.4   | 3.8   |
| HYDROGEN ION CONC., PH             | 8.4   | 8.1   | 7.8   |
| ALKALINITY MG/L                    | 173   | 149   | 146   |
| THRESHOLD ODOR NO., TYPE           | 2 M   | 4 M   | 4 M   |
| TOTAL SOLIDS MG/L                  | 254   | 312   | 312   |
| IGNITION LOSS MG/L                 | 46    | 76    | 72    |
| TURBIDITY AS STP MG/L              | 6     | 3     | 11    |
| TOTAL HARDNESS MG/L                | 225   | 200   | 204   |
| CHLORIDES MG/L                     | 1     | 1     | 1     |
| AMMONIA NITROGEN MG/L              | 0.2   | 0.2   | 0.1   |
| NITRATE NITROGEN MG/L              | 0.2   | 0.2   | 0.1   |
| SULFATES AS SO <sub>4</sub> MG/L   | 64    | 68    | *00   |
| PHOSPHATES AS PO <sub>4</sub> MG/L | 0.1   | 1.4   | 0.2   |
| PHENOLS PPB                        | 0     | 1     | 2     |
| OILS & GREASES MG/L                | 1.3   | *.0   | 3.7   |
| FLUORIDES MG/L                     | 0.34  | 0.21  | 0.18  |
| COLIFORM M.P.N./100ML.             | 23.   | 17.   | 220.  |
| MPN OF E. COLI/100ML.              | 5.    | 4.    | 14.   |
| STANDARD PLATE COUNT/ML            | 200   | 6000  | 60    |

\* DENOTES DATA NOT AVAILABLE

NS4 NORTH SASK. RIVER AT 105 ST. BRIDGE

1968-69

| DAY                      | 25         | 13     | 3     | 16    | 31    | 14    | 27    |
|--------------------------|------------|--------|-------|-------|-------|-------|-------|
| MONTH                    | JUL        | AUG    | OCT   | OCT   | OCT   | NOV   | NOV   |
| YEAR                     | 1968       | 1968   | 1968  | 1968  | 1968  | 1968  | 1968  |
| COMPOSITE OR GRAB SAMPLE | G          | G      | G     | G     | G     | G     | G     |
| INITIAL SAMPLING TIME    | 1330       | 1400   | 1400  | 1415  | 1415  | 1300  | 1330  |
| TEMPERATURE, DEG.CENT.   | 16.0       | *0.0   | 8.0   | 5.0   | 4.0   | 1.0   | 0.0   |
| BAROMETRIC PRES. IN.HG   | 27.80      | *0.00  | *0.00 | 28.00 | 27.70 | 27.45 | 27.65 |
| DISSOLVED OXYGEN, MG/L   | 8.6        | *0.0   | 11.2  | 12.6  | 13.3  | 13.4  | 13.6  |
| PERCENT SATURATION       | 93.        | *00.   | *00.  | 105.  | 110.  | 103.  | 101.  |
| BIOCHEM. OX. DEMAND MG/L | 0.5        | 0.5    | 0.5   | 1.0   | 0.5   | 0.5   | 0.6   |
| HYDROGEN ION CONC., PH   | 8.0        | 8.2    | 8.6   | 8.3   | 8.3   | 8.0   | 7.8   |
| ALKALINITY MG/L          | 164        | 113    | 140   | 141   | 155   | 160   | 152   |
| THRESHOLD ODOR NO., TYPE | 1 M        | 2 M    | 2 M   | 4 M   | 4 M   | 2 M   | 4 M   |
| TOTAL SOLIDS MG/L        | 412        | 186    | 178   | 256   | 176   | 226   | 282   |
| IGNITION LOSS MG/L       | 138        | 70     | 64    | 54    | 48    | 74    | 62    |
| TURBIDITY AS SiO2 MG/L   | 166        | 18     | 13    | 13    | 8     | 15    | 22    |
| TOTAL HARDNESS MG/L      | 126        | 150    | 168   | 170   | 172   | 206   | 200   |
| CHLORIDES MG/L           | 1          | 2      | 2     | 3     | 2     | 2     | 0     |
| AMMONIA NITROGEN MG/L    | 0.4        | 0.3    | 0.1   | 0.2   | 0.1   | 0.1   | 0.1   |
| NITRATE NITROGEN MG/L    | 0.1        | 0.0    | 0.2   | 0.1   | 0.1   | 0.4   | 0.3   |
| SULFATES AS SO4 MG/L     | 34         | 40     | 58    | 54    | 66    | 70    | 68    |
| PHOSPHATES AS PO4 MG/L   | 1.0        | 0.1    | 0.3   | 0.4   | 0.1   | 0.0   | 0.0   |
| PHENOLS PPB              | 3          | 1      | 1     | 1     | 0     | 1     | 1     |
| OILS & GREASES MG/L      | 0.8        | 0.0    | 0.6   | *.0   | 1.0   | 0.1   | *.0   |
| FLUORIDES MG/L           | 0.13       | 0.16   | 0.21  | 0.17  | 0.08  | 0.40  | 0.25  |
| COLIFORM M.P.N./100ML.   | 69.*00000. |        | 21.   | 79.   | 49.   | 540.  | 920.  |
| MPN OF E COLI/100ML.     | 7.*00000.  |        | 9.    | 8.    | 11.   | 9.    | 170.  |
| STANDARD PLATE COUNT/ML  | 900        | *00000 | 8000  | 700   | 550   | 2000  | 480   |
| RIVER DISCHARGE C.F.S.   | 18200.     | 13400. | 5330. | 4840. | 2900. | 2160. | 3400. |

\* DENOTES DATA NOT AVAILABLE

| DAY                      | 12    | 17    | 15     | 5     | 26     | 19    |
|--------------------------|-------|-------|--------|-------|--------|-------|
| MONTH                    | DEC   | DEC   | JAN    | FEB   | FEB    | MAR   |
| YEAR                     | 1968  | 1968  | 1969   | 1969  | 1969   | 1969  |
| COMPOSITE OR GRAB SAMPLE | G     | G     | G      | G     | G      | G     |
| INITIAL SAMPLING TIME    | 1500  | 1400  | 1530   | 1400  | 1500   | 1430  |
| TEMPERATURE, DEG.CENT.   | 0.0   | 0.0   | 0.0    | 0.0   | 0.0    | 0.0   |
| BAROMETRIC PRES. IN.HG   | 28.08 | 27.65 | *0.00  | 27.80 | *0.00  | 27.80 |
| DISSOLVED OXYGEN, MG/L   | 12.8  | 12.9  | 11.7   | 10.7  | 10.2   | 11.4  |
| PERCENT SATURATION       | 93.   | 96.   | *00.   | 79.   | *00.   | 84.   |
| BIOCHEM. OX. DEMAND MG/L | 0.6   | 1.1   | 0.9    | 0.5   | 2.2    | 0.5   |
| HYDROGEN ION CONC., PH   | 8.4   | 8.1   | 8.0    | 7.8   | 8.0    | 8.1   |
| ALKALINITY MG/L          | 173   | 174   | 153    | 149   | 149    | 150   |
| THRESHOLD ODOR NO., TYPE | 4 M   | 1 M   | 4 M    | 4 M   | 2 M    | 2 M   |
| TOTAL SOLIDS MG/L        | 316   | 264   | 274    | 270   | 250    | 270   |
| IGNITION LOSS MG/L       | 138   | 30    | 40     | 76    | 30     | 90    |
| TURBIDITY AS SiO2 MG/L   | 10    | 7     | 18     | 9     | 11     | 8     |
| TOTAL HARDNESS MG/L      | 238   | 212   | 200    | 192   | 196    | 192   |
| CHLORIDES MG/L           | 0     | 2     | 0      | 2     | 0      | 2     |
| AMMONIA NITROGEN MG/L    | 0.3   | 0.2   | 0.2    | 0.1   | 0.1    | 0.0   |
| NITRATE NITROGEN MG/L    | 0.3   | 0.1   | 0.4    | 0.1   | 0.4    | 0.1   |
| SULFATES AS SO4 MG/L     | 66    | 72    | 64     | 66    | 74     | 72    |
| PHOSPHATES AS PO4 MG/L   | 0.1   | 0.1   | 0.1    | 0.1   | 0.0    | 0.1   |
| PHENOLS PPB              | 2     | 1     | 5      | 2     | 4      | 2     |
| OILS & GREASES MG/L      | 0.1   | *.0   | 0.7    | 4.0   | 1.9    | 2.1   |
| FLUORIDES MG/L           | 0.18  | 0.17  | 0.15   | 0.21  | 0.17   | 0.16  |
| COLIFORM M.P.N./100ML.   | 69.   | 920.  | 1600.+ | 170.  | 1800.+ | 1600. |
| MPN OF E COLI/100ML.     | 4.    | 13.   | 8.     | 22.   | 6.     | 1600. |
| STANDARD PLATE COUNT/ML  | 800   | 1000  | 4500   | 100   | 400    | 7200  |
| RIVER DISCHARGE C.F.S.   | 2300. | 1970. | 3400.  | 3490. | 2090.  | 2340. |

\* DENOTES DATA NOT AVAILABLE

NS4 NORTH SASK. RIVER AT 105 ST. BRIDGE

1967-69

|                         | AVERAGE | MAXIMUM              | MINIMUM | REQUIRE. |
|-------------------------|---------|----------------------|---------|----------|
| DISSOLVED OXYGEN MG/L   | 11.87   | 13.60                | 3.60    | 11.70    |
| BOD MG/L                | 0.76    | 2.20                 | 0.50    | 0.50     |
| HYDROGEN ION CONC., PH  | 8.12    | 8.60                 | 7.80    | 8.10     |
| ALKALINITY MG/L         | 151.77  | 174.00               | 113.00  | 152.00   |
| TOTAL RESIDUE MG/L      | 258.46  | 412.00               | 176.00  | 256.00   |
| FIXATION LOSS MG/L      | 70.31   | 138.00               | 30.00   | 64.00    |
| TURBIDITY AS SiO2 MG/L  | 24.46   | 166.00               | 7.00    | 13.00    |
| TOTAL HARDNESS MG/L     | 186.31  | 238.00               | 126.00  | 192.00   |
| CHLORIDES MG/L          | 1.38    | 3.00                 | 0.00    | 2.00     |
| AMMONIA NITROGEN MG/L   | 0.17    | 0.40                 | 0.00    | 0.10     |
| SULFATES AS SO4 MG/L    | 61.85   | 74.00                | 34.00   | 66.00    |
| NITRATE NITROGEN MG/L   | 0.20    | 0.40                 | 0.00    | 0.10     |
| TOTAL PHOS. AS PO4 MG/L | 0.18    | 1.00                 | 0.00    | 0.10     |
| PHENOLS PPB             | 1.85    | 5.00                 | 0.00    | 1.00     |
| OILS AND GREASES MG/L   | 1.13    | 4.00                 | 0.00    | 0.70     |
| FLUORIDES MG/L          | 0.19    | 0.40                 | 0.08    | 0.17     |
| COLIFORM M.P.N./100ML.  |         | 1800.00 <sup>+</sup> | 21.00   | 170.00   |
| "P.N. OF E CULT/100ML   | 155.55  | 1600.00              | 3.60    | 9.20     |
| STANDARD PLATE COUNT/ML | 2219.   | 8000.                | 100.    | 800.     |

NS5 NORTH SASKATCHEWAN RIVER AT FORT SASKATCHEWAN BRIDGE

1968-69

| DAY<br>MONTH<br>YEAR     | 25<br>JUL<br>1968 | 3<br>OCT<br>1968 | 9<br>OCT<br>1968 | 16<br>OCT<br>1968 | 24<br>OCT<br>1968 | 31<br>OCT<br>1968 | 7<br>NOV<br>1968 |
|--------------------------|-------------------|------------------|------------------|-------------------|-------------------|-------------------|------------------|
| COMPOSITE OR GRAB SAMPLE | G                 | G                | G                | G                 | G                 | G                 | G                |
| INITIAL SAMPLING TIME    | 1230              | 1300             | 830              | 1315              | 1200              | 1315              | 1145             |
| TEMPERATURE, DEG. CENT.  | 16.0              | 9.5              | 5.0              | 6.0               | 5.0               | 5.0               | 2.0              |
| BAROMETRIC PRES. IN. HG  | 27.80             | *0.00            | 27.90            | 28.05             | *0.00             | 27.80             | 28.05            |
| DISSOLVED OXYGEN, MG/L   | 7.4               | 12.1             | 9.6              | 14.6              | 11.9              | 15.0              | 12.8             |
| PERCENT SATURATION       | 80.               | *00.             | 80.              | 125.              | *00.              | 126.              | 99.              |
| BIOCHEM. OX. DEMAND MG/L | 1.3               | 1.9              | 2.6              | 2.3               | 3.0               | 1.5               | 3.2              |
| HYDROGEN ION CONC., PH   | 7.6               | 8.8              | 8.1              | 8.6               | 8.6               | 8.5               | 8.1              |
| ALKALINITY MG/L          | 117               | 138              | 134              | 142               | 149               | 151               | 158              |
| THRESHOLD ODOR NO., TYPE | 4 C               | 4 C              | 4 C              | 4 M               | 8 C               | 4 M               | 4 M              |
| TOTAL SOLIDS MG/L        | 472               | 226              | 226              | 192               | 286               | 256               | 272              |
| IGNITION LOSS MG/L       | 144               | 70               | 90               | 74                | 82                | 76                | 88               |
| TURBIDITY AS SiO2 MG/L   | 170               | 8                | 9                | 10                | 8                 | 6                 | 21               |
| CHLORIDES MG/L           | 1                 | 3                | 4                | 2                 | 4                 | 4                 | 6                |
| AMMONIA NITROGEN MG/L    | 0.6               | 0.4              | 0.5              | 0.6               | 0.7               | 0.7               | 1.2              |
| NITRATE NITROGEN MG/L    | 0.1               | 0.3              | 0.1              | 0.1               | 0.1               | 0.0               | 0.6              |
| SULFATES AS SO4 MG/L     | 36                | 60               | 60               | 52                | 56                | 64                | 68               |
| PHOSPHATES AS PO4 MG/L   | 0.8               | 0.4              | 0.4              | 0.5               | 0.3               | 0.4               | 1.0              |
| PHENOLS PPB              | 6                 | 2                | 2                | 1                 | 4                 | 1                 | 4                |
| OILS & GREASES MG/L      | 0.6               | 0.2              | 0.5              | *.0               | 0.1               | 0.1               | 0.1              |
| FLUORIDES MG/L           | 0.14              | 0.19             | 0.19             | 0.19              | 0.18              | 0.14              | 0.24             |
| COLIFORM M.P.N./100ML.   | *00000.           | 69.              | 1800. +          | 1600. +           | 1800. +           | 3500.             | 1800. +          |
| MPN OF E COLI/100ML.     | *00000.           | 8.               | 920.             | 54.               | 45.               | 50.               | 11.              |
| STANDARD PLATE COUNT/ML  | *00000            | 160000           | 7500             | 30000             | 16000             | 28000             | 60000            |
| DETERGENTS MG/L          |                   | 0.03             |                  |                   |                   |                   |                  |

\* DENOTES DATA NOT AVAILABLE

| DAY<br>MONTH<br>YEAR     | 14<br>NOV<br>1968 | 20<br>NOV<br>1968 | 27<br>NOV<br>1968 | 6<br>DEC<br>1968 | 12<br>DEC<br>1968 | 17<br>DEC<br>1968 | 9<br>JAN<br>1969 |
|--------------------------|-------------------|-------------------|-------------------|------------------|-------------------|-------------------|------------------|
| COMPOSITE OR GRAB SAMPLE | G                 | G                 | G                 | G                | G                 | G                 | G                |
| INITIAL SAMPLING TIME    | 1130              | 1345              | 1230              | 1345             | 1315              | 1315              | 1330             |
| TEMPERATURE, DEG. CENT.  | 2.0               | 1.0               | 0.0               | 0.0              | 0.0               | 0.0               | 0.0              |
| BAROMETRIC PRES. IN. HG  | 27.55             | 27.50             | 27.70             | *0.00            | 28.12             | 27.70             | *0.00            |
| DISSOLVED OXYGEN, MG/L   | 12.9              | 10.8              | 12.1              | 12.1             | 11.0              | 11.1              | 11.7             |
| PERCENT SATURATION       | 102.              | 83.               | 90.               | *00.             | 80.               | 82.               | *00.             |
| BIOCHEM. OX. DEMAND MG/L | 1.7               | 3.4               | 1.9               | 2.8              | 1.7               | 2.8               | 0.9              |
| HYDROGEN ION CONC., PH   | 8.0               | 8.1               | 7.8               | 8.1              | 8.2               | 7.9               | 8.1              |
| ALKALINITY MG/L          | 159               | 173               | 157               | 175              | 162               | 171               | 163              |
| THRESHOLD ODOR NO., TYPE | 4 C               | 32 C              | 8 M               | 8 C              | 16 C              | 4 C               | 4 C              |
| TOTAL SOLIDS MG/L        | 322               | 268               | 278               | 254              | 314               | 288               | 268              |
| IGNITION LOSS MG/L       | 86                | 106               | 48                | 50               | 102               | 50                | 88               |
| TURBIDITY AS SiO2 MG/L   | 15                | 12                | 18                | 31               | 16                | 10                | 7                |
| CHLORIDES MG/L           | 4                 | 6                 | 1                 | 5                | 3                 | 3                 | 2                |
| AMMONIA NITROGEN MG/L    | 0.8               | 3.5               | 0.6               | 1.1              | 1.0               | 1.7               | 0.4              |
| NITRATE NITROGEN MG/L    | 0.2               | 0.2               | 0.2               | 0.2              | 0.4               | 0.1               | 0.1              |
| SULFATES AS SO4 MG/L     | 70                | 82                | 74                | 74               | 70                | 72                | 64               |
| PHOSPHATES AS PO4 MG/L   | 0.3               | 1.9               | 0.5               | 0.3              | 0.6               | 0.6               | 0.3              |
| PHENOLS PPB              | 5                 | 4                 | 1                 | 2                | 1                 | 1                 | 2                |
| OILS & GREASES MG/L      | 0.6               | 1.0               | 1.1               | 5.9              | 0.7               | 0.9               | 0.9              |
| FLUORIDES MG/L           | 0.18              | 0.40              | 0.35              | 0.24             | 0.20              | 0.27              | 0.15             |
| COLIFORM M.P.N./100ML.   | 4300.             | 18000. +          | 18000. +          | 92000. +         | 130000.           | 810.              | 1800. +          |
| MPN OF E COLI/100ML.     | 90.               | 280.              | 450.              | 8000.            | 17000.            | 15.               | 54.              |
| STANDARD PLATE COUNT/ML  | 15000             | 4500              | 8500              | 33000            | 7500              | 280               | 12000            |
| DETERGENTS MG/L          | 0.02              |                   |                   |                  | 0.12              |                   |                  |

\* DENOTES DATA NOT AVAILABLE

NS5 NORTH SASKATCHEWAN RIVER AT FORT SASKATCHEWAN BRIDGE

1968-69

| DAY                      | 15           | 5     | 26    | 19     |
|--------------------------|--------------|-------|-------|--------|
| MONTH                    | JAN          | FEB   | FEB   | MAR    |
| YEAR                     | 1969         | 1969  | 1969  | 1969   |
| COMPOSITE OR GRAB SAMPLE | G            | G     | G     | G      |
| INITIAL SAMPLING TIME    | 1330         | 1300  | 1400  | 1300   |
| TEMPERATURE, DEG. CENT.  | 0.0          | 0.0   | 0.0   | 0.0    |
| BAROMETRIC PRES. IN. HG  | *0.00        | 27.90 | *0.00 | 27.80  |
| DISSOLVED OXYGEN, MG/L   | 11.0         | 10.2  | 9.9   | 11.2   |
| PERCENT SATURATION       | *00.         | 75.   | *00.  | 83.    |
| BIOCHEM. OX. DEMAND MG/L | 1.5          | 0.9   | 5.8   | 2.9    |
| HYDROGEN ION CONC., PH   | 8.0          | 7.9   | 8.0   | 8.4    |
| ALKALINITY MG/L          | 160          | 151   | 152   | 154    |
| THRESHOLD DOUR NO., TYPE | 4 C          | 4 M   | 8 C   | 16 C   |
| TOTAL SOLIDS MG/L        | 282          | 242   | 262   | 290    |
| IGNITION LOSS MG/L       | 18           | 40    | 40    | 90     |
| TURBIDITY AS SiO2 MG/L   | 8            | 11    | 6     | 14     |
| CHLORIDES MG/L           | 3            | 5     | 3     | 4      |
| AMMONIA NITROGEN MG/L    | 1.1          | 3.4   | 1.4   | 0.7    |
| NITRATE NITROGEN MG/L    | 0.4          | 0.1   | 0.1   | 0.1    |
| SULFATES AS SO4 MG/L     | 66           | 62    | 78    | 70     |
| PHOSPHATES AS PO4 MG/L   | 0.3          | 0.3   | 0.8   | 1.1    |
| PHENOLS PPB              | 7            | 1     | 4     | 0      |
| OILS & GREASES MG/L      | 1.4          | 6.7   | 6.1   | 2.9    |
| FLUORIDES MG/L           | 0.16         | 0.15  | 0.18  | 0.20   |
| COLIFORM M.P.N./100ML.   | 1800.+40000. |       | 1600. | 16000. |
| MPN OF E COLI/100ML.     | 20.          | 9000. | 2.    | 16000. |
| STANDARD PLATE COUNT/ML  | 1000         | 6000  | 7500  | 550    |
| DETERGENTS MG/L          | 0.04         | 0.03  | 0.12  | 0.038  |

\* DENOTES DATA NOT AVAILABLE

NS5 NORTH SASKATCHEWAN RIVER AT FORT SASKATCHEWAN BRIDGE

1968-69

|                         | AVERAGE | MAXIMUM   | MINIMUM | MEDIAN |
|-------------------------|---------|-----------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 11.52   | 15.00     | 7.40    | 11.20  |
| BOD MG/L                | 2.34    | 5.80      | 0.90    | 1.90   |
| HYDROGEN ION CONC., PH  | 8.16    | 8.80      | 7.60    | 8.10   |
| ALKALINITY MG/L         | 153.67  | 175.00    | 117.00  | 154.00 |
| TOTAL RESIDUE MG/L      | 277.67  | 472.00    | 192.00  | 254.00 |
| IGNITION LOSS MG/L      | 74.56   | 144.00    | 18.00   | 76.00  |
| TURBIDITY AS SiO2 MG/L  | 21.11   | 170.00    | 6.00    | 10.00  |
| CHLORIDES MG/L          | 3.50    | 6.00      | 1.00    | 3.00   |
| AMMONIA NITROGEN MG/L   | 1.13    | 3.50      | 0.40    | 0.70   |
| SULFATES AS SO4 MG/L    | 65.44   | 82.00     | 36.00   | 66.00  |
| NITRATE NITROGEN MG/L   | 0.19    | 0.60      | 0.00    | 0.10   |
| TOTAL PHOS. AS PO4 MG/L | 0.60    | 1.90      | 0.30    | 0.40   |
| PHENOLS PPB             | 2.67    | 7.00      | 0.00    | 2.00   |
| OILS AND GREASES MG/L   | 1.75    | 6.70      | 0.10    | 0.90   |
| FLUORIDES MG/L          | 0.21    | 0.40      | 0.14    | 0.19   |
| COLIFORM M.P.N./100ML.  |         | 920,000.  | 69.00   |        |
| M.P.N. OF E COLI/100ML  | 3059.36 | 17 000.00 | 1.80    | 60.10  |
| STANDARD PLATE COUNT/ML | 23372.  | 160000.   | 280.    | 8500.  |



NS6 NORTH SASKATCHEWAN RIVER AT VINCA FERRY

1968-69

| DAY                      | 25    | 6     | 3      | 9       | 16    | 24      | 31    |
|--------------------------|-------|-------|--------|---------|-------|---------|-------|
| MONTH                    | JUL   | SEP   | OCT    | OCT     | OCT   | UCT     | OCT   |
| YEAR                     | 1968  | 1968  | 1968   | 1968    | 1968  | 1968    | 1968  |
| COMPOSITE OR GRAB SAMPLE | G     | G     | G      | G       | G     | G       | G     |
| INITIAL SAMPLING TIME    | 1130  | 1030  | 1200   | 945     | 1130  | 1030    | 1230  |
| TEMPERATURE, DEG.CENT.   | 15.5  | 14.0  | 9.5    | 6.0     | 5.0   | 4.0     | 4.0   |
| BAROMETRIC PRES. IN.HG   | 27.80 | *0.00 | *0.00  | 27.90   | 28.10 | *0.00   | 27.90 |
| DISSOLVED OXYGEN, MG/L   | 7.1   | *0.0  | 11.8   | 11.8    | 13.5  | 11.1    | 10.4  |
| PERCENT SATURATION       | 76.   | *00.  | *00.   | 101.    | 112.  | *00.    | 85.   |
| BIOCHEM. OX. DEMAND MG/L | 1.8   | 1.5   | 1.8    | 1.3     | 1.5   | 2.5     | 2.5   |
| HYDROGEN ION CONC.,PH    | 7.7   | 8.4   | 8.7    | 8.3     | 8.5   | 8.5     | 8.4   |
| ALKALINITY MG/L          | 139   | 126   | 142    | 133     | 132   | 151     | 169   |
| THRESHOLD ODOR NO.,TYPE  | 4 C   | 4 M   | 8 C    | 4 C     | 4 M   | 8 C     | 8 M   |
| TOTAL SOLIDS MG/L        | 486   | 192   | 218    | 216     | 242   | 176     | 314   |
| IGNITION LOSS MG/L       | 94    | 104   | 74     | 94      | 88    | 42      | 86    |
| TURBIDITY AS SiO2 MG/L   | 160   | 10    | 10     | 10      | 15    | 9       | 8     |
| CHLORIDES MG/L           | 3     | 15    | 3      | 3       | 4     | 3       | 25    |
| AMMONIA NITROGEN MG/L    | 0.6   | 0.2   | 0.3    | 0.4     | 0.4   | 0.6     | 3.4   |
| NITRATE NITROGEN MG/L    | 0.1   | 0.1   | 0.2    | 0.1     | 0.0   | 0.1     | 0.0   |
| SULFATES AS SO4 MG/L     | 38    | 33    | 60     | 52      | 52    | 56      | 72    |
| PHOSPHATES AS PO4 MG/L   | 0.8   | 0.3   | 0.3    | 0.4     | 0.3   | 0.2     | 1.2   |
| PHENOLS PPB              | 4     | 3     | 2      | 0       | 0     | 1       | 1     |
| OILS & GREASES MG/L      | 0.6   | 2.4   | *.0    | 0.5     | *.0   | *.0     | *.0   |
| FLUORIDES MG/L           | 0.13  | 0.22  | 0.18   | 0.19    | 0.18  | 0.14    | 0.12  |
| COLIFORM M.P.N./100ML.   | 24.   | 1800. | +1600. | 1800. + | 430.  | 1800. + | 1700. |
| MPN OF E COLI/100ML.     | 6.    | 5.    | 17.    | 32.     | 24.   | 64.     | 120.  |
| STANDARD PLATE COUNT/ML  | 20000 | 22000 | 31000  | 27000   | 20000 | 10000   | 16000 |

\* DENOTES DATA NOT AVAILABLE

| DAY                      | 7       | 14     | 20    | 27       | 6     | 12     | 17    |
|--------------------------|---------|--------|-------|----------|-------|--------|-------|
| MONTH                    | NOV     | NOV    | NOV   | NOV      | DEC   | DEC    | DEC   |
| YEAR                     | 1968    | 1968   | 1968  | 1968     | 1968  | 1968   | 1968  |
| COMPOSITE OR GRAB SAMPLE | G       | G      | G     | G        | G     | G      | G     |
| INITIAL SAMPLING TIME    | 1100    | 1030   | 1230  | 1045     | 1230  | 1215   | 1130  |
| TEMPERATURE, DEG.CENT.   | 2.0     | 1.0    | 1.0   | 0.0      | 0.0   | 0.0    | 0.0   |
| BAROMETRIC PRES. IN.HG   | 28.15   | 27.60  | 27.45 | 27.70    | *0.00 | 28.20  | 27.80 |
| DISSOLVED OXYGEN, MG/L   | 12.0    | 12.5   | 11.8  | 11.2     | 11.5  | 10.9   | 9.9   |
| PERCENT SATURATION       | 92.     | 95.    | 91.   | 83.      | *00.  | 79.    | 73.   |
| BIOCHEM. OX. DEMAND MG/L | 3.0     | 1.6    | 4.1   | 2.4      | 2.3   | 1.8    | 1.9   |
| HYDROGEN ION CONC.,PH    | 8.2     | 8.3    | 8.4   | 7.9      | 8.3   | 8.7    | 8.0   |
| ALKALINITY MG/L          | 160     | 162    | 179   | 164      | 185   | 182    | 166   |
| THRESHOLD ODOR NO.,TYPE  | 4 M     | 4 C    | 16 C  | 8 M      | 16 C  | 16 C   | 4 C   |
| TOTAL SOLIDS MG/L        | 280     | 368    | 292   | 310      | 334   | 340    | 302   |
| IGNITION LOSS MG/L       | 80      | 96     | 114   | 46       | 108   | 144    | 48    |
| TURBIDITY AS SiO2 MG/L   | 15      | 18     | 14    | 18       | 24    | 14     | 7     |
| CHLORIDES MG/L           | 12      | 12     | 16    | 8        | 14    | 13     | 9     |
| AMMONIA NITROGEN MG/L    | 2.4     | 2.5    | 4.0   | 0.9      | 2.0   | 3.2    | 1.6   |
| NITRATE NITROGEN MG/L    | 0.7     | 0.1    | 0.1   | 0.2      | 0.2   | 0.5    | 0.1   |
| SULFATES AS SO4 MG/L     | 72      | 76     | 86    | 76       | 78    | 72     | 76    |
| PHOSPHATES AS PO4 MG/L   | 1.2     | 0.5    | 0.6   | 0.6      | 0.6   | 1.0    | 0.7   |
| PHENOLS PPB              | 4       | 3      | 3     | 2        | 1     | 1      | 1     |
| OILS & GREASES MG/L      | *.0     | 0.8    | *.0   | *.0      | *.0   | 0.7    | *.0   |
| FLUORIDES MG/L           | 0.30 +  | 0.34   | 0.45  | 0.26 +   | 0.27  | 0.20   | 0.20  |
| COLIFORM M.P.N./100ML.   | 1800. + | 16000. | 9200. | 18000. + | 0.1   | 10000. | 350.  |
| MPN OF E COLI/100ML.     | 6.      | 111.   | 380.  | 320.     | 0.    | 17000. | 9.    |
| STANDARD PLATE COUNT/ML  | 65000   | 8000   | 37000 | 8800     | 300   | 2200   | 620   |

\* DENOTES DATA NOT AVAILABLE

NS6 NORTH SASKATCHEWAN RIVER AT VINCA FERRY

1968-69

| DAY                      | 9      | 15     | 20      | 30    | 5       | 14    | 20     |
|--------------------------|--------|--------|---------|-------|---------|-------|--------|
| MONTH                    | JAN    | JAN    | JAN     | JAN   | FEB     | FEB   | FEB    |
| YEAR                     | 1969   | 1969   | 1969    | 1969  | 1969    | 1969  | 1969   |
| COMPOSITE OR GRAB SAMPLE | G      | G      | G       | G     | G       | G     | G      |
| INITIAL SAMPLING TIME    | 1130   | 1200   | 1100    | 1330  | 1200    | 1130  | 1130   |
| TEMPERATURE, DEG.CENT.   | 0.0    | 0.0    | 0.0     | 0.0   | 0.0     | 0.0   | 0.0    |
| BAROMETRIC PRES. IN.HG   | *0.00  | 29.09  | *0.00   | *0.00 | 27.85   | *0.00 | *0.00  |
| DISSOLVED OXYGEN, MG/L   | 10.4   | 9.2    | 9.8     | 9.8   | 10.0    | 8.1   | 8.5    |
| PERCENT SATURATION       | *00.   | 65.    | *00.    | *00.  | 74.     | *00.  | *00.   |
| BIOCHEM. OX. DEMAND MG/L | 1.1    | 0.5    | 0.7     | 1.3   | 1.1     | 0.0   | 0.7    |
| HYDROGEN ION CONC.,PH    | 8.1    | 8.0    | 7.8     | 7.8   | 7.9     | 7.9   | 7.7    |
| ALKALINITY MG/L          | 170    | 160    | 144     | 156   | 152     | 151   | 155    |
| THRESHOLD ODDR NO.,TYPE  | 4 C    | 8 C    | 16 C    | 16 C  | 4 C     | 4 M   | 8 M    |
| TOTAL SOLIDS MG/L        | 324    | 276    | 286     | 328   | 300     | 310   | 336    |
| IGNITION LOSS MG/L       | 86     | 36     | 36      | 74    | 114     | 82    | 48     |
| TURBIDITY AS SiO2 MG/L   | 10     | 11     | 8       | 11    | 11      | 6     | 12     |
| CHLORIDES MG/L           | 5      | 7      | 3       | 6     | 4       | 12    | 8      |
| AMMONIA NITROGEN MG/L    | 1.0    | 1.1    | 0.6     | 2.9   | 2.2     | 1.9   | 2.2    |
| NITRATE NITROGEN MG/L    | 0.1    | 0.5    | 0.1     | 0.1   | 0.1     | 0.1   | 0.2    |
| SULFATES AS SO4 MG/L     | 56     | 74     | 61      | 90    | 60      | 76    | 84     |
| PHOSPHATES AS PO4 MG/L   | 0.6    | 0.6    | 0.1     | 0.5   | 0.6     | 0.7   | 0.8    |
| PHENOLS PPB              | 0      | 0      | 3       | 3     | 2       | 1     | 4      |
| OILS & GREASES MG/L      | 0.5    | 0.9    | 0.6     | *.0   | 4.0     | 6.0   | 4.0    |
| FLUORIDES MG/L           | 0.16   | 0.16   | 0.15    | 0.13  | 0.17    | 0.22  | 0.24   |
| CULIFORM M.P.N./100ML.   | 1600.* | 1800.* | *00000. | 9000. | 110000. | 900.  | 13000. |
| MPN OF E COLI/100ML.     | 8.     | 4.*    | *00000. | 1000. | 14000.  | 0.    | 1000.  |
| STANDARD PLATE COUNT/ML  | 16000  | 3000   | *00000  | 10000 | 4000    | 16000 | 500    |

\* DENOTES DATA NOT AVAILABLE

NS6 NORTH SASKATCHEWAN RIVER AT VINCA FERRY

1968-69

| DAY                      | 26    | 11      | 19      |
|--------------------------|-------|---------|---------|
| MONTH                    | FEB   | MAR     | MAR     |
| YEAR                     | 1969  | 1969    | 1969    |
| COMPOSITE OR GRAB SAMPLE | G     | G       | G       |
| INITIAL SAMPLING TIME    | 1225  | 1230    | 1200    |
| TEMPERATURE, DEG.CENT.   | 0.0   | 0.0     | 0.0     |
| BAROMETRIC PRES. IN.HG   | 28.32 | 28.40   | 27.90   |
| DISSOLVED OXYGEN, MG/L   | 8.5   | 9.2     | 9.6     |
| PERCENT SATURATION       | 62.   | 66.     | 71.     |
| BIOCHEM. OX. DEMAND MG/L | 3.5   | 2.5     | 3.0     |
| HYDROGEN ION CONC.,PH.   | 8.0   | 8.1     | 8.1     |
| ALKALINITY MG/L          | 156   | 157     | 151     |
| THRESHOLD ODDR NO.,TYPE  | 8 M   | 8 CH    | 8 C     |
| TOTAL SOLIDS MG/L        | 270   | 294     | 308     |
| IGNITION LOSS MG/L       | 46    | 84      | 92      |
| TURBIDITY AS SiO2 MG/L   | 20    | 17      | 13      |
| CHLORIDES MG/L           | 4     | 4       | 7       |
| AMMONIA NITROGEN MG/L    | 1.8   | 0.2     | 0.7     |
| NITRATE NITROGEN MG/L    | 0.2   | 0.1     | 0.3     |
| SULFATES AS SO4 MG/L     | 82    | 76      | 80      |
| PHOSPHATES AS PO4 MG/L   | 2.5   | 1.0     | 1.0     |
| PHENOLS PPB              | 1     | 0       | 2       |
| OILS & GREASES MG/L      | 10.8  | 8.5     | 1.2     |
| FLUORIDES MG/L           | 0.18  | 0.21    | 0.18    |
| CULIFORM M.P.N./100ML.   | 430.* | *00000. | 24000.* |
| MPN OF E COLI/100ML.     | 10.*  | *00000. | 16000.  |
| STANDARD PLATE COUNT/ML  | 2200  | *00000  | 1950    |

\* DENOTES DATA NOT AVAILABLE

## NS6 NORTH SASKATCHEWAN RIVER AT VINCA FERRY

1968-69

|                         | AVERAGE | MAXIMUM | MINIMUM | MEDIAN |
|-------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 10.37   | 13.50   | 7.10    | 10.40  |
| BOD MG/L                | 1.85    | 4.10    | 0.00    | 1.80   |
| HYDROGEN ION CONC., PH  | 8.15    | 8.70    | 7.70    | 8.10   |
| ALKALINITY MG/L         | 155.92  | 185.00  | 126.00  | 156.00 |
| TOTAL RESIDUE MG/L      | 295.92  | 486.00  | 176.00  | 310.00 |
| INGITION LOSS MG/L      | 79.83   | 144.00  | 36.00   | 84.00  |
| TURBIDITY AS SI02 MG/L  | 18.79   | 160.00  | 6.00    | 11.00  |
| CHLORIDES MG/L          | 8.33    | 25.00   | 3.00    | 7.00   |
| AMMONIA NITROGEN MG/L   | 1.55    | 4.00    | 0.20    | 1.10   |
| SULFATES AS SO4 MG/L    | 68.25   | 90.00   | 33.00   | 72.00  |
| NITRATE NITROGEN MG/L   | 0.18    | 0.70    | 0.00    | 0.10   |
| TOTAL PHOS. AS PO4 MG/L | 0.71    | 2.50    | 0.10    | 0.60   |
| PHENOLS PPB             | 1.75    | 4.00    | 0.00    | 1.00   |
| OILS AND GREASES MG/L   | 2.65    | 10.8    | 0.00    | 0.80   |
| FLUORIDES MG/L          | 0.21    | 0.45    | 0.12    | 0.18   |
| COLIFORM M.P.N./100ML.  |         | 110,000 | 0.00    |        |
| M.P.N. OF E COLI/100ML  | 2278.00 | *000.00 | 0.00    | 24.00  |
| STANDARD PLATE COUNT/ML | 22799.  | 200000. | 300.    | 10000. |

NS7 NORTH SASKATCHEWAN RIVER AT WASKATENAU

1968-69

| DAY<br>MONTH<br>YEAR     | 25<br>JUL<br>1968 | 3<br>OCT<br>1968 | 16<br>OCT<br>1968 | 31<br>OCT<br>1968 | 14<br>NOV<br>1968 | 27<br>NOV<br>1958 | 12<br>DEC<br>1968 |
|--------------------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                 | G                | G                 | G                 | G                 | G                 | G                 |
| INITIAL SAMPLING TIME    | 1030              | 1030             | 1015              | 1130              | 1000              | 1000              | 1130              |
| TEMPERATURE, DEG. CENT.  | 15.0              | 9.0              | 5.0               | 4.0               | 1.0               | 0.0               | 0.0               |
| BAROMETRIC PRES. IN. HG  | 27.90             | *0.00            | 28.10             | 27.90             | 27.70             | 27.75             | 28.25             |
| DISSOLVED OXYGEN, MG/L   | 7.5               | 10.8             | 12.4              | 12.3              | 12.6              | 11.2              | 10.1              |
| PERCENT SATURATION       | 79.               | *00.             | 103.              | 101.              | 96.               | 83.               | 73.               |
| BIOCHEM. OX. DEMAND MG/L | 0.9               | 1.5              | 2.7               | 1.9               | 1.4               | 2.1               | 1.1               |
| HYDROGEN ION CONC., PH   | 7.7               | 8.8              | 8.4               | 8.3               | 8.1               | 8.0               | 8.4               |
| ALKALINITY MG/L          | 135               | 141              | 142               | 154               | 164               | 164               | 182               |
| THRESHOLD ODOR NO., TYPE | 4 C               | 4 C              | 4 M               | 4 M               | 4 M               | 8 M               | 4 M               |
| TOTAL SOLIDS MG/L        | 450               | 234              | 238               | 284               | 356               | 322               | 358               |
| IGNITION LOSS MG/L       | 118               | 94               | 88                | 80                | 54                | 66                | 182               |
| TURBIDITY AS SiO2 MG/L   | 136               | 10               | 12                | 8                 | 18                | 12                | 11                |
| CHLORIDES MG/L           | 1                 | 5                | 2                 | 16                | 9                 | 13                | 12                |
| AMMONIA NITROGEN MG/L    | 0.4               | 0.5              | 0.8               | 1.1               | 1.0               | 1.6               | 2.2               |
| NITRATE NITROGEN MG/L    | 0.1               | 0.4              | 0.1               | 0.0               | 0.1               | 0.3               | 0.5               |
| SULFATES AS SO4 MG/L     | 34                | 60               | 50                | 66                | 80                | 74                | 78                |
| PHOSPHATES AS PO4 MG/L   | 0.8               | 0.2              | 0.4               | 0.5               | 0.4               | 0.8               | 0.8               |
| PHENOLS PPB              | 5                 | 3                | 0                 | 1                 | 3                 | 2                 | 1                 |
| OILS & GREASES MG/L      | 0.7               | *.0              | *.0               | *.0               | *.0               | *.0               | *.0               |
| COLIFORM M.P.N./100ML.   | *00000.           | 27.              | 2400. +           | 20.               | 1800. +           | 2100.             | 13000.            |
| MPN OF E COLI/100ML.     | *00000.           | 2.               | 39.               | 20.               | 2.                | 280.              | 2000.             |
| STANDARD PLATE COUNT/ML  | *00000            | 45000            | 14000             | 7500              | 17000             | 700               | 11000             |

\* DENOTES DATA NOT AVAILABLE

| DAY<br>MONTH<br>YEAR     | 17<br>DEC<br>1968 | 15<br>JAN<br>1969 | 5<br>FEB<br>1969 | 26<br>FEB<br>1969 | 19<br>MAR<br>1969 |
|--------------------------|-------------------|-------------------|------------------|-------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                 | G                 | G                | G                 | G                 |
| INITIAL SAMPLING TIME    | 1030              | 1100              | 1030             | 1145              | 1000              |
| TEMPERATURE, DEG. CENT.  | 0.0               | 0.0               | 0.0              | 0.0               | 0.0               |
| BAROMETRIC PRES. IN. HG  | 27.75             | *0.00             | 27.90            | *0.00             | 27.80             |
| DISSOLVED OXYGEN, MG/L   | 9.8               | 10.1              | 9.5              | 9.1               | 10.4              |
| PERCENT SATURATION       | 72.               | *00.              | 70.              | *00.              | 77.               |
| BIOCHEM. OX. DEMAND MG/L | 3.6               | 2.6               | 1.1              | 1.3               | 3.2               |
| HYDROGEN ION CONC., PH   | 8.3               | 8.0               | 7.9              | 8.3               | 8.5               |
| ALKALINITY MG/L          | 177               | 165               | 153              | 161               | 155               |
| THRESHOLD ODOR NO., TYPE | 4 M               | 8 M               | 4 C              | 8 M               | 8 C               |
| TOTAL SOLIDS MG/L        | 414               | 278               | 308              | 274               | 306               |
| IGNITION LOSS MG/L       | 102               | 44                | 74               | 56                | 86                |
| TURBIDITY AS SiO2 MG/L   | 20                | 33                | 11               | 9                 | 20                |
| CHLORIDES MG/L           | 19                | 8                 | 6                | 10                | 20                |
| AMMONIA NITROGEN MG/L    | 3.2               | 1.6               | 1.0              | 2.9               | 2.2               |
| NITRATE NITROGEN MG/L    | 0.2               | 0.4               | 0.2              | 0.2               | 0.2               |
| SULFATES AS SO4 MG/L     | 76                | 72                | 60               | 82                | 78                |
| PHOSPHATES AS PO4 MG/L   | 0.9               | 0.9               | 0.4              | 0.8               | 0.8               |
| PHENOLS PPB              | 1                 | 1                 | 1                | 1                 | 3                 |
| OILS & GREASES MG/L      | *.0               | *.0               | 3.6              | 7.2               | 2.1               |
| COLIFORM M.P.N./100ML.   | 13.               | 17.               | 3900.            | 49.               | 3500.             |
| MPN OF E COLI/100ML.     | 5.                | 0.                | 800.             | 0.                | 3500.             |
| STANDARD PLATE COUNT/ML  | 760               | 1200              | 300              | 60                | 25000             |

\* DENOTES DATA NOT AVAILABLE

## NS7 NORTH SASKATCHEWAN RIVER AT WASKATENAU

1968-69

|                         | AVERAGE | MAXIMUM | MINIMUM | MEDIAN |
|-------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 10.48   | 12.60   | 7.50    | 10.10  |
| BOD MG/L                | 1.95    | 3.60    | 0.90    | 1.50   |
| HYDROGEN ION CONC.,PH   | 8.23    | 8.80    | 7.70    | 8.30   |
| ALKALINITY MG/L         | 157.75  | 182.00  | 135.00  | 155.00 |
| TOTAL RESIDUE MG/L      | 318.50  | 450.00  | 234.00  | 284.00 |
| INGITION LOSS MG/L      | 87.00   | 182.00  | 44.00   | 80.00  |
| TURBIDITY AS SiO2 MG/L  | 25.00   | 136.00  | 8.00    | 12.00  |
| CHLORIDES MG/L          | 10.08   | 20.00   | 1.00    | 9.00   |
| AMMONIA NITROGEN MG/L   | 1.54    | 3.20    | 0.40    | 1.10   |
| SULFATES AS SO4 MG/L    | 67.50   | 82.00   | 34.00   | 72.00  |
| NITRATE NITROGEN MG/L   | 0.23    | 0.50    | 0.00    | 0.20   |
| TOTAL PHOS. AS PO4 MG/L | 0.64    | 0.90    | 0.20    | 0.80   |
| PHENOLS PPB             | 1.83    | 5.00    | 0.00    | 1.00   |
| OILS AND GREASES MG/L   | 3.40    | 7.20    | 0.70    | 2.10   |
| COLIFORM M.P.N./100ML.  |         | 13000.  | 13.00   |        |
| M.P.N. OF E COLI/100ML  | 604.30  | 3500.00 | 0.00    | 20.00  |
| STANDARD PLATE COUNT/ML | 11138.  | 45000.  | 60.     | 7500.  |

NS8 NORTH SASKATCHEWAN RIVER AT DUVERNAY BRIDGE

1968-69

| DAY<br>MONTH<br>YEAR     | 25<br>JUL<br>1968 | 2<br>OCT<br>1968 | 17<br>OCT<br>1968 | 14<br>NOV<br>1968 | 27<br>NOV<br>1968 | 12<br>DEC<br>1968 | 15<br>JAN<br>1969 |
|--------------------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                 | G                | G                 | G                 | G                 | G                 | G                 |
| INITIAL SAMPLING TIME    | 1000              | 900              | 1215              | 1300              | 1030              | 1100              | 1200              |
| TEMPERATURE, DEG.CENT.   | 15.5              | 9.0              | 21.0              | 0.0               | 0.5               | 0.0               | 0.0               |
| BAROMETRIC PRES. IN.HG   | 28.41             | 28.32            | 28.30             | 28.10             | 28.20             | *0.00             | 28.42             |
| DISSOLVED OXYGEN, MG/L   | 8.0               | 11.4             | 13.6              | 13.3              | 10.7              | 10.2              | 10.6              |
| PERCENT SATURATION       | 83.               | 104.             | 160.              | 97.               | 79.               | *00.              | 75.               |
| BIOCHEM. OX. DEMAND MG/L | 1.6               | 2.3              | 2.3               | 1.3               | 1.1               | 1.9               | 0.8               |
| HYDROGEN ION CONC.,PH    | 7.7               | 8.3              | 8.7               | 8.0               | 8.2               | 8.2               | 8.1               |
| ALKALINITY MG/L          | 127               | 143              | 146               | 168               | 180               | 191               | 168               |
| THRESHOLD ODUK NO.,TYPE  | 8 C               | 4 C              | 8 M               | 8 C               | 4 M               | 4 C               | 8 C               |
| TOTAL SOLIDS MG/L        | 930               | 204              | 264               | 352               | 304               | 340               | 320               |
| IGNITION LOSS MG/L       | 412               | 72               | 102               | 48                | 40                | 74                | 52                |
| TURBIDITY AS SiO2 MG/L   | 170               | 28               | 4                 | 11                | 34                | 11                | 11                |
| CHLORIDES MG/L           | 72                | 9                | 10                | 23                | 17                | 12                | 20                |
| AMMONIA NITROGEN MG/L    | 0.1               | 1.1              | 0.8               | 4.6               | 2.5               | 0.3               | 2.0               |
| NITRATE NITROGEN MG/L    | 0.3               | 0.4              | 0.3               | 0.1               | 0.4               | 0.6               | 0.3               |
| SULFATES AS SO4 MG/L     | 38                | 58               | 54                | 80                | 80                | 82                | 76                |
| PHOSPHATES AS PO4 MG/L   | 0.7               | 0.3              | 0.4               | 0.4               | 2.0               | 0.6               | 0.7               |
| PHENOLS PPB              | 1                 | 1                | 5                 | 4                 | 1                 | 3                 | 4                 |
| OILS & GREASES MG/L      | 1.3               | *.0              | *.0               | *.0               | *.0               | *.0               | *.0               |
| COLIFORM M.P.N./100ML.   | 1600.             | 33.              | 8.                | 5.                | 70.*00000.        |                   | 0.                |
| MPN OF E COLI/100ML.     | 32.               | 7.               | 5.                | 2.                | 9.*00000.         |                   | 0.                |
| STANDARD PLATE COUNT/ML  | 23000             | 1000             | 5000              | 900               | 500               | *00000            | 3300              |

\* DENOTES DATA NOT AVAILABLE

| DAY<br>MONTH<br>YEAR     | 5<br>FEB<br>1969 | 26<br>FEB<br>1969 | 19<br>MAR<br>1969 |
|--------------------------|------------------|-------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                | G                 | G                 |
| INITIAL SAMPLING TIME    | 1045             | 930               | 930               |
| TEMPERATURE, DEG.CENT.   | 0.0              | 0.0               | 0.0               |
| BAROMETRIC PRES. IN.HG   | 27.78            | 28.00             | 28.00             |
| DISSOLVED OXYGEN, MG/L   | 8.6              | 7.8               | 8.1               |
| PERCENT SATURATION       | 63.              | 57.               | 59.               |
| BIOCHEM. OX. DEMAND MG/L | 0.9              | 2.3               | 1.3               |
| HYDROGEN ION CONC.,PH    | 8.0              | 9.0               | 8.2               |
| ALKALINITY MG/L          | 163              | 191               | 158               |
| THRESHOLD ODUK NO.,TYPE  | 8 C              | 8 M               | 8 C               |
| TOTAL SOLIDS MG/L        | 308              | 320               | 478               |
| IGNITION LOSS MG/L       | 54               | 62                | 172               |
| TURBIDITY AS SiO2 MG/L   | 4                | 6                 | 5                 |
| CHLORIDES MG/L           | 20               | 22                | 19                |
| AMMONIA NITROGEN MG/L    | 1.8              | 1.8               | 0.6               |
| NITRATE NITROGEN MG/L    | 0.1              | 0.2               | 0.3               |
| SULFATES AS SO4 MG/L     | 68               | 70                | 76                |
| PHOSPHATES AS PO4 MG/L   | 0.6              | 0.8               | 0.8               |
| PHENOLS PPB              | 1                | *0                | 1                 |
| OILS & GREASES MG/L      | 4.2              | 1.8               | 0.8               |
| COLIFORM M.P.N./100ML.   | 0.               | 0.                | 0.                |
| MPN OF E COLI/100ML.     | 0.               | 0.                | 0.                |
| STANDARD PLATE COUNT/ML  | 10               | 10                | 42000             |

\* DENOTES DATA NOT AVAILABLE

## NS8 NORTH SASKATCHEWAN RIVER AT DUVERNAY BRIDGE

1968-69

|                         | AVERAGE | MAXIMUM | MINIMUM | MEDIAN |
|-------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 10.23   | 13.60   | 7.80    | 10.20  |
| BOD MG/L                | 1.58    | 2.30    | 0.80    | 1.30   |
| HYDROGEN ION CONC., PH  | 8.24    | 9.00    | 7.70    | 8.20   |
| ALKALINITY MG/L         | 163.50  | 191.00  | 127.00  | 163.00 |
| TOTAL RESIDUE MG/L      | 382.00  | 930.00  | 204.00  | 352.00 |
| INGITION LOSS MG/L      | 108.80  | 412.00  | 40.00   | 62.00  |
| TURBIDITY AS SI02 MG/L  | 28.40   | 170.00  | 4.00    | 11.00  |
| CHLORIDES MG/L          | 22.40   | 72.00   | 9.00    | 19.00  |
| AMMONIA NITROGEN MG/L   | 1.56    | 4.60    | 0.10    | 1.10   |
| SULFATES AS SO4 MG/L    | 68.20   | 82.00   | 38.00   | 70.00  |
| NITRATE NITROGEN MG/L   | 0.30    | 0.60    | 0.10    | 0.30   |
| TOTAL PHOS. AS PO4 MG/L | 0.73    | 2.00    | 0.30    | 0.60   |
| PHENOLS PPB             | 2.33    | 5.00    | 1.00    | 1.00   |
| OILS AND GREASES MG/L   | 2.03    | 4.20    | 0.80    | 1.30   |
| COLIFORM M.P.N./100ML.  | 190.59  | 1600.00 | 0.00    | 4.50   |
| M.P.N. OF E COLI/100ML  | 6.06    | 32.00   | 0.00    | 2.00   |
| STANDARD PLATE COUNT/ML | 38313.  | 230000. | 10.     | 9000.  |

NS9 NORTH SASKATCHEWAN RIVER AT ELK POINT BRIDGE

1968-69

| DAY                      | 25     | 2      | 17    | 14    | 27        | 12      | 15    |
|--------------------------|--------|--------|-------|-------|-----------|---------|-------|
| MONTH                    | JUL    | OCT    | OCT   | NOV   | NOV       | DEC     | JAN   |
| YEAR                     | 1968   | 1968   | 1968  | 1968  | 1968      | 1958    | 1969  |
| COMPOSITE OR GRAB SAMPLE | G      | G      | G     | G     | G         | G       | G     |
| INITIAL SAMPLING TIME    | 1330   | 1100   | 1300  | 930   | 1215      | 1300    | 1330  |
| TEMPERATURE, DEG.CENT.   | 17.0   | 11.0   | 4.0   | 0.0   | 0.5       | 0.0     | 0.0   |
| BAROMETRIC PRES. IN.HG   | 28.50  | 28.49  | 28.00 | 28.25 | 28.25     | *0.00   | 28.60 |
| DISSOLVED OXYGEN, MG/L   | 8.1    | 12.0   | 12.7  | 12.8  | 11.8      | 9.6     | 9.2   |
| PERCENT SATURATION       | 88.    | 114.   | 104.  | 93.   | 87.       | *00.    | 66.   |
| BIOCHEM. OX. DEMAND MG/L | 1.6    | 2.4    | 1.7   | 1.0   | 0.8       | 1.0     | 0.6   |
| HYDROGEN ION CONC.,PH    | 7.7    | 8.4    | 8.6   | 8.1   | 8.3       | 8.2     | 8.1   |
| ALKALINITY MG/L          | 115    | 147    | 143   | 167   | 191       | 189     | 176   |
| THRESHOLD ODOR NO.,TYPE  | 8 M    | 8 C    | 8 M   | 4 M   | 4 M       | 4 M     | 16 C  |
| TOTAL SOLIDS MG/L        | 264    | 248    | 238   | 314   | 304       | 330     | 320   |
| IGNITION LOSS MG/L       | 36     | 104    | 18    | 34    | 34        | 76      | 118   |
| TURBIDITY AS SiO2 MG/L   | 110    | 8      | 7     | 8     | 22        | 9       | 18    |
| CHLORIDES MG/L           | 82     | 17     | 12    | 19    | 18        | 35      | 27    |
| AMMONIA NITROGEN MG/L    | 0.1    | 1.4    | 0.7   | 1.5   | 2.8       | 0.2     | 2.9   |
| NITRATE NITROGEN MG/L    | 0.3    | 0.4    | 0.3   | 0.3   | 0.5       | 0.8     | 0.4   |
| SULFATES AS SO4 MG/L     | 40     | 56     | 54    | 80    | 76        | 80      | 76    |
| PHOSPHATES AS PO4 MG/L   | 0.5    | 0.3    | 0.4   | 0.2   | 0.4       | 0.6     | 0.9   |
| PHENOLS PPB              | 5      | 7      | 1     | 2     | 4         | *0      | 5     |
| OILS & GREASES MG/L      | 0.2    | *.0    | *.0   | *.0   | *.0       | *.0     | *.0   |
| COLIFORM M.P.N./100ML.   | 1600.  | 4.     | 4.    | 4.    | 5.*00000. | *00000. | 0.    |
| MPN OF E COLI/100ML.     | 22.    | 0.     | 4.    | 2.    | 0.*00000. | *00000. | 0.    |
| STANDARD PLATE COUNT/ML  | 210000 | 120000 | 70000 | 18000 | 700       | *00000  | 9500  |

\* DENOTES DATA NOT AVAILABLE

| DAY                      | 5     | 26    | 19    |
|--------------------------|-------|-------|-------|
| MONTH                    | FEB   | FEB   | MAR   |
| YEAR                     | 1969  | 1969  | 1969  |
| COMPOSITE OR GRAB SAMPLE | G     | G     | G     |
| INITIAL SAMPLING TIME    | 1230  | 1145  | 1145  |
| TEMPERATURE, DEG.CENT.   | 0.0   | 0.0   | 0.0   |
| BAROMETRIC PRES. IN.HG   | 27.89 | 28.15 | 28.10 |
| DISSOLVED OXYGEN, MG/L   | 7.7   | 6.8   | 8.0   |
| PERCENT SATURATION       | 57.   | 50.   | 58.   |
| BIOCHEM. OX. DEMAND MG/L | 0.9   | 1.3   | 1.4   |
| HYDROGEN ION CONC.,PH    | 8.3   | 8.9   | 8.3   |
| ALKALINITY MG/L          | 165   | 177   | 165   |
| THRESHOLD ODOR NO.,TYPE  | 8 C   | 4 M   | 8 C   |
| TOTAL SOLIDS MG/L        | 324   | 322   | 350   |
| IGNITION LOSS MG/L       | 38    | 88    | 82    |
| TURBIDITY AS SiO2 MG/L   | 9     | 6     | 4     |
| CHLORIDES MG/L           | 32    | 22    | 25    |
| AMMONIA NITROGEN MG/L    | 3.0   | 1.4   | 0.7   |
| NITRATE NITROGEN MG/L    | 0.3   | 0.3   | 0.4   |
| SULFATES AS SO4 MG/L     | 66    | 74    | 78    |
| PHOSPHATES AS PO4 MG/L   | 0.7   | 0.9   | 0.8   |
| PHENOLS PPB              | 4     | *0    | 3     |
| OILS & GREASES MG/L      | 3.6   | 2.0   | 0.4   |
| COLIFORM M.P.N./100ML.   | 0.    | 49.   | 0.    |
| MPN OF E COLI/100ML.     | 0.    | 5.    | 0.    |
| STANDARD PLATE COUNT/ML  | 30    | 50    | 5800  |

\* DENOTES DATA NOT AVAILABLE



## NS9 NORTH SASKATCHEWAN RIVER AT ELK POINT BRIDGE

1968-69

|                                     | AVERAGE | MAXIMUM | MINIMUM | MEDIAN |
|-------------------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L               | 9.87    | 12.80   | 6.80    | 9.20   |
| BOD MG/L                            | 1.27    | 2.40    | 0.60    | 1.00   |
| HYDROGEN ION CONC., PH              | 8.29    | 8.90    | 7.70    | 8.30   |
| ALKALINITY MG/L                     | 163.50  | 191.00  | 115.00  | 165.00 |
| TOTAL RESIDUE MG/L                  | 306.40  | 380.00  | 238.00  | 314.00 |
| FIXATION LOSS MG/L                  | 62.80   | 118.00  | 18.00   | 38.00  |
| TURBIDITY AS SiO <sub>2</sub> MG/L  | 20.10   | 110.00  | 4.00    | 8.00   |
| CHLORIDES MG/L                      | 28.90   | 82.00   | 12.00   | 22.00  |
| AMMONIA NITROGEN MG/L               | 1.47    | 3.00    | 0.10    | 1.40   |
| SULFATES AS SO <sub>4</sub> MG/L    | 68.00   | 80.00   | 40.00   | 74.00  |
| NITRATE NITROGEN MG/L               | 0.40    | 0.80    | 0.30    | 0.30   |
| TOTAL PHOS. AS PO <sub>4</sub> MG/L | 0.57    | 0.90    | 0.20    | 0.50   |
| PHENOLS PPB                         | 3.88    | 7.00    | 1.00    | 4.00   |
| OILS AND GREASES MG/L               | 1.55    | 3.60    | 0.20    | 0.40   |
| COLIFORM M.P.N./100ML.              | 185.03  | 1600.00 | 0.00    | 4.00   |
| M.P.N. OF E COLI/100ML              | 3.61    | 22.00   | 0.00    | 0.00   |
| STANDARD PLATE COUNT/ML             | 48231.  | 210000. | 30.     | 9500.  |

N11 NORTH SASKATCHEWAN RIVER AT LLOYDMINSTER FERRY

1968-69

| DAY<br>MONTH<br>YEAR     | 25<br>JUL<br>1968 | 2<br>OCT<br>1968 | 17<br>OCT<br>1968 | 14<br>NOV<br>1968 | 27<br>NOV<br>1968 | 12<br>DEC<br>1958 | 15<br>JAN<br>1969 |
|--------------------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                 | G                | G                 | G                 | G                 | G                 | G                 |
| INITIAL SAMPLING TIME    | 1230              | 1300             | 800               | 730               | 1530              | 1400              | 1530              |
| TEMPERATURE, DEG. CENT.  | 17.5              | 9.0              | 3.0               | 0.0               | 0.0               | 0.0               | 0.0               |
| BAROMETRIC PRES. IN. HG  | 28.42             | 28.48            | 28.20             | 28.25             | 28.40             | *0.00             | 28.60             |
| DISSOLVED OXYGEN, MG/L   | 7.8               | 12.1             | 12.5              | 13.2              | 12.1              | 9.8               | 8.0               |
| PERCENT SATURATION       | 86.               | 110.             | 98.               | 96.               | 87.               | *00.              | 57.               |
| BIOCHEM. OX. DEMAND MG/L | 2.1               | 1.5              | 1.0               | 0.9               | 1.1               | 1.2               | 0.9               |
| HYDROGEN ION CONC., PH   | 7.8               | 8.5              | 8.5               | 8.0               | 8.2               | 8.1               | 8.3               |
| ALKALINITY MG/L          | 115               | 142              | 139               | 166               | 196               | 192               | 174               |
| THRESHOLD ODOR NO., TYPE | 8 M               | 8 C              | 8 M               | 4 M               | 4 M               | 8 M               | 10 C              |
| TOTAL SOLIDS MG/L        | 344               | 254              | 262               | 324               | 292               | 416               | 326               |
| IGNITION LOSS MG/L       | 100               | 110              | 40                | 92                | 54                | 107               | 122               |
| TURBIDITY AS SiO2 MG/L   | 132               | 19               | 7                 | 8                 | 16                | 10                | 18                |
| TOTAL HARDNESS MG/L      | 128               | 164              | 150               | 254               | 186               | 230               | 220               |
| CHLORIDES MG/L           | 70                | 9                | 12                | 19                | 29                | 29                | 31                |
| AMMONIA NITROGEN MG/L    | 0.1               | 1.1              | 0.5               | 1.0               | 2.0               | 0.2               | 5.0               |
| NITRATE NITROGEN MG/L    | 0.6               | 0.5              | 0.2               | 0.3               | 0.6               | 0.8               | 0.3               |
| SULFATES AS SO4 MG/L     | 40                | 56               | 58                | 76                | 54                | 80                | 78                |
| PHOSPHATES AS PO4 MG/L   | 0.7               | 0.3              | 0.3               | 0.2               | 0.5               | 0.6               | 0.9               |
| PHENOLS PPB              | 3                 | 0                | 2                 | 3                 | 4                 | 3                 | 0                 |
| OILS & GREASES MG/L      | 0.4               | 0.5              | 1.6               | 0.3               | 0.7               | 1.7               | 0.8               |
| FLUORIDES MG/L           | 0.13              | 0.19             | 0.21              | 0.45              | 0.29              | 0.20              | 0.18              |
| COLIFORM M.P.N./100ML.   | 920.              | 2.               | 8.                | 2.                | 0.                | 0.                | 0.                |
| MPN OF E COLI/100ML.     | 5.                | 0.               | 2.                | 0.                | 0.                | 0.                | 0.                |
| STANDARD PLATE COUNT/ML  | 26000             | 11000            | 8000              | 25000             | 150               | *00000            | 13000             |
| RIVER DISCHARGE C.F.S.   | 16900.            | 4260.            | 5620.             | 2450.             | 2750.             | 2080.             | 3580.             |
| DETERGENTS               |                   | 0.03             |                   | 0.02              |                   | 0.15              | 0.12              |

\* DENOTES DATA NOT AVAILABLE

| DAY<br>MONTH<br>YEAR     | 5<br>FEB<br>1969 | 26<br>FEB<br>1969 | 19<br>MAR<br>1969 |
|--------------------------|------------------|-------------------|-------------------|
| COMPOSITE OR GRAB SAMPLE | G                | G                 | G                 |
| INITIAL SAMPLING TIME    | 1345             | 1330              | 1330              |
| TEMPERATURE, DEG. CENT.  | 0.0              | 0.0               | 0.0               |
| BAROMETRIC PRES. IN. HG  | 27.95            | 28.20             | 28.19             |
| DISSOLVED OXYGEN, MG/L   | 7.3              | 5.5               | 8.1               |
| PERCENT SATURATION       | 54.              | 40.               | 59.               |
| BIOCHEM. OX. DEMAND MG/L | 1.1              | 1.2               | 0.7               |
| HYDROGEN ION CONC., PH   | 8.2              | 8.9               | 8.3               |
| ALKALINITY MG/L          | 168              | 186               | 170               |
| THRESHOLD ODOR NO., TYPE | 8 C              | 4 C               | 8 M               |
| TOTAL SOLIDS MG/L        | 302              | 326               | 382               |
| IGNITION LOSS MG/L       | 58               | 94                | 106               |
| TURBIDITY AS SiO2 MG/L   | 6                | 6                 | 4                 |
| TOTAL HARDNESS MG/L      | 186              | 196               | 198               |
| CHLORIDES MG/L           | 26               | 30                | 36                |
| AMMONIA NITROGEN MG/L    | 3.9              | 1.2               | 3.0               |
| NITRATE NITROGEN MG/L    | 0.2              | 0.3               | 0.4               |
| SULFATES AS SO4 MG/L     | 64               | 70                | 82                |
| PHOSPHATES AS PO4 MG/L   | 0.8              | 0.8               | 0.7               |
| PHENOLS PPB              | 1                | *0                | 3                 |
| OILS & GREASES MG/L      | 5.2              | 1.6               | 0.5               |
| FLUORIDES MG/L           | 0.18             | 0.19              | 0.19              |
| COLIFORM M.P.N./100ML.   | 0.               | 2.                | 0.                |
| MPN OF E COLI/100ML.     | 0.               | 2.                | 0.                |
| STANDARD PLATE COUNT/ML  | 10               | 10                | 5500              |
| RIVER DISCHARGE C.F.S.   | 3400.            | 1800.             | 2900.             |
| DETERGENTS               | 0.04             | 0.06              | .013              |

\* DENOTES DATA NOT AVAILABLE

111 NORTH SASKATCHEWAN RIVER AT LLOYDMINSTER FERRY

1968-69

|                         | AVERAGE | MAXIMUM | MINIMUM | MEDIAN |
|-------------------------|---------|---------|---------|--------|
| DISSOLVED OXYGEN MG/L   | 9.64    | 13.20   | 5.50    | 8.10   |
| BOD MG/L                | 1.17    | 2.10    | 0.70    | 1.10   |
| HYDROGEN ION CONC., PH  | 8.28    | 8.90    | 7.80    | 8.20   |
| ALKALINITY MG/L         | 164.80  | 196.00  | 115.00  | 168.00 |
| TOTAL RESIDUE MG/L      | 322.80  | 416.00  | 254.00  | 324.00 |
| COAGULATION LOSS MG/L   | 87.80   | 122.00  | 40.00   | 74.00  |
| TURBIDITY AS SiO2 MG/L  | 22.60   | 132.00  | 4.00    | 8.00   |
| TOTAL HARDNESS MG/L     | 191.20  | 254.00  | 128.00  | 186.00 |
| CHLORIDES MG/L          | 29.10   | 70.00   | 9.00    | 29.00  |
| AMMONIA NITROGEN MG/L   | 1.80    | 5.00    | 0.10    | 1.10   |
| SULFATES AS SO4 MG/L    | 65.80   | 82.00   | 40.00   | 64.00  |
| NITRATE NITROGEN MG/L   | 0.42    | 0.80    | 0.20    | 0.30   |
| TOTAL PHOS. AS PO4 MG/L | 0.58    | 0.90    | 0.20    | 0.60   |
| PHENOLS PPB             | 2.11    | 4.00    | 0.00    | 3.00   |
| OILS AND GREASES MG/L   | 1.33    | 5.20    | 0.30    | 0.70   |
| FLUORIDES MG/L          | 0.22    | 0.45    | 0.13    | 0.19   |
| COLIFORM M.P.N./100ML.  | 93.36   | 920.00  | 0.00    | 0.00   |
| M.P.N. OF E COLI/100ML  | 0.83    | 4.50    | 0.00    | 0.00   |
| STANDARD PLATE COUNT/ML | 35852.  | 260000. | 10.     | 8000.  |

INSECTICIDE AND HERBICIDE ANALYSIS

NORTH SASKATCHEWAN RIVER

|                                   | LINDBERGH<br>Nov. 13/68 | LINDBERGH<br>Nov. 20/68 | VINCA<br>Feb. 14/69 |
|-----------------------------------|-------------------------|-------------------------|---------------------|
| Lindane p.p.b.                    | <.1                     | <.1                     | <.1                 |
| Endrin p.p.b.                     | <.1                     | <.1                     | <.1                 |
| Heptachlor p.p.b.                 | <.1                     | <.1                     | <.1                 |
| Heptachlor Epoxide p.p.b.         | <.1                     | <.1                     | <.1                 |
| Aldrin p.p.b.                     | <.1                     | <.1                     | <.1                 |
| DDT p.p.b.                        | <.1                     | <.1                     | <.1                 |
| Methoxychlor                      | <.1                     | <.1                     | <.1                 |
| 2,4-D Acid p.p.b.                 | < 1                     | < 1                     | < 1                 |
| 2,4,5-T Acid p.p.b.               | < 1                     | < 1                     | < 1                 |
| Silvex p.p.b.                     | < 1                     | < 1                     | < 1                 |
| 2,4-D Ethyl ester p.p.b.          | < 1                     | < 1                     | < 1                 |
| 2,4-D N-butyl ester p.p.b.        | < 1                     | < 1                     | < 1                 |
| 2,4-D Butoxy ethanol ester p.p.b. | < 1                     | < 1                     | < 1                 |
| 2,4-D Iso-octyl ester p.p.b.      | < 1                     | < 1                     | < 1                 |
| 2,4,5-T N-butyl ester p.p.b.      | < 1                     | < 1                     | < 1                 |
| 2,4,5-T Iso-octyl ester p.p.b.    | < 1                     | < 1                     | < 1                 |

Chosen conditions of Analysis are such that the lower  
detection limits for Pesticides is 0.1 p.p.b. and  
Herbicide esters and acids 1.0 p.p.b.

CARBON CHLOROFORM EXTRACTABLES

DEVON

February 28, 1969

|  |            |
|--|------------|
| Volume through filter                          | 128.5 gal. |
| Weight of $\text{CHCl}_3$ , extract less blank | 35.8 mg    |
| Weight of Blank                                | 193.3 mg   |
| Chloroform extractable                         | 61 ppb     |

VINCA FERRY

February 28, 1969

|   |          |
|---|----------|
| Volume through filter                       | 138 gal. |
| Weight $\text{CHCl}_3$ , extract less blank | 403.8 mg |
| Weight of Blank                             | 193.3 mg |
| Chloroform extractable                      | 644 ppb  |

March 6, 1969

|  |          |
|--|----------|
| Volume through filter                          | 115 gal. |
| Weight of $\text{CHCl}_3$ , extract less blank | 569.7 mg |
| Weight of Blank                                | 193.3 mg |
| Chloroform extractable                         | 1.1 ppm  |

A P P E N D I X    B

INDEX FOR APPENDIX B

NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

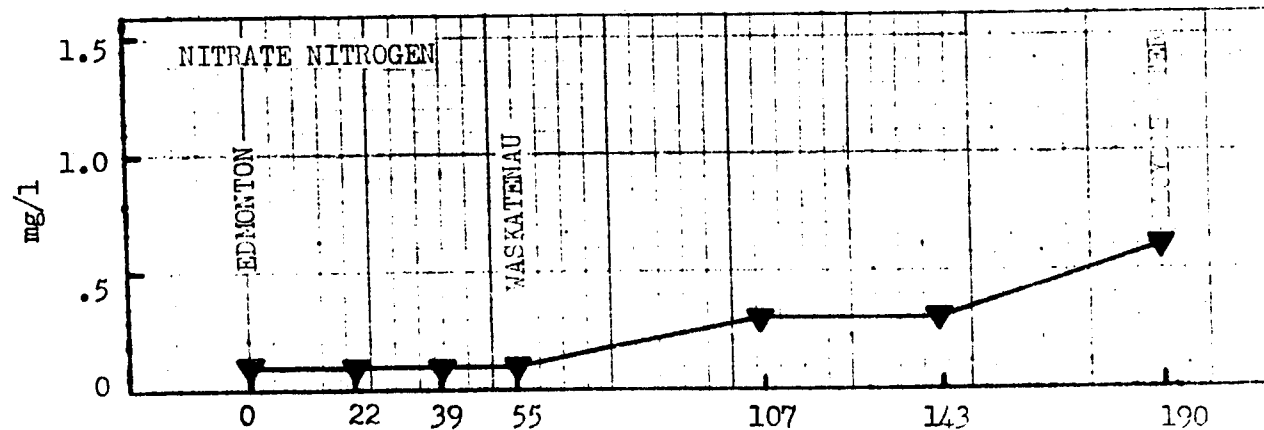
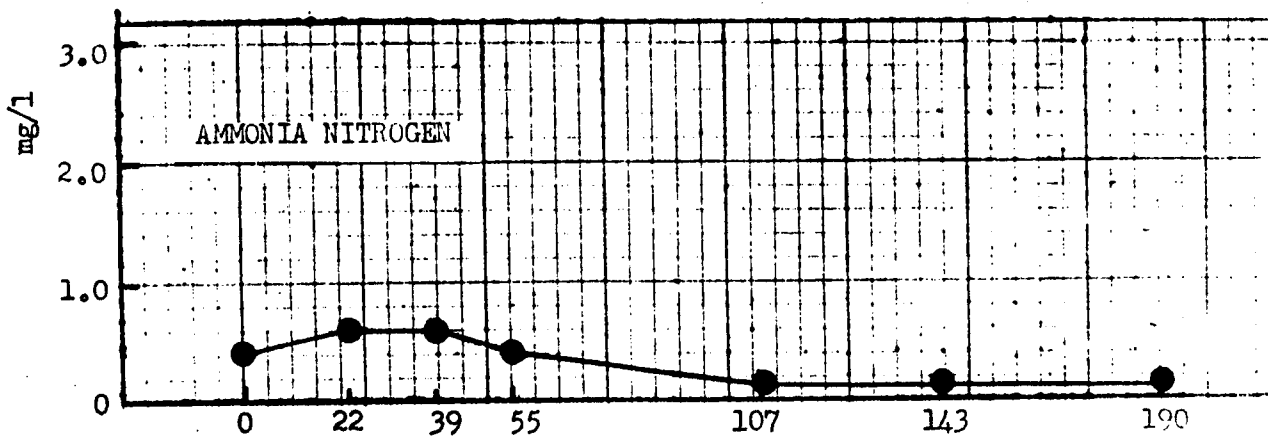
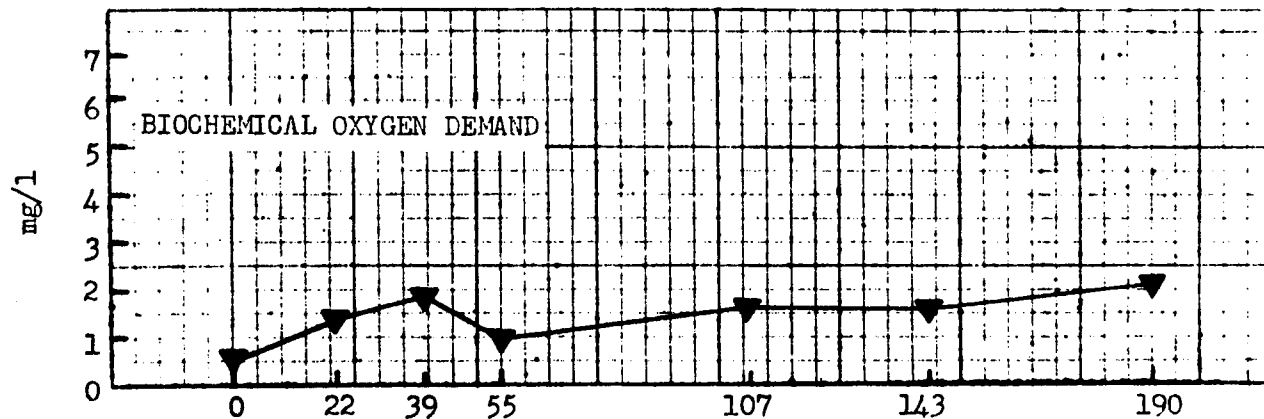
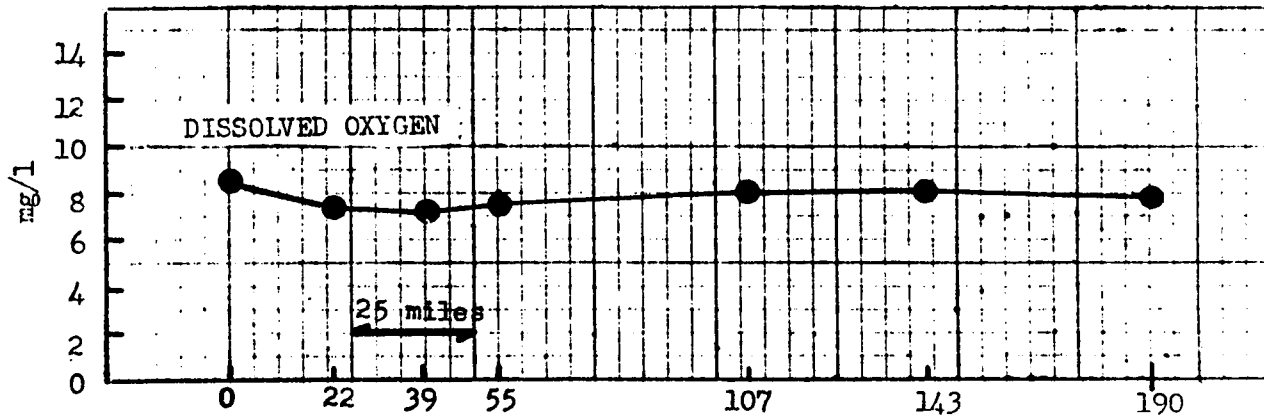
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|--|------|
| Dissolved Oxygen, Biochemical Oxygen Demand, Ammonia and Nitrate Nitrogen for July 25, 1968 --         | B-1  |
| Phenolics, Coliforms, E. Coli, Standard Plate Count for July 25, 1968 -                                | B-2  |
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|   |      |
|---|------|
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NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

JULY 25, 1968

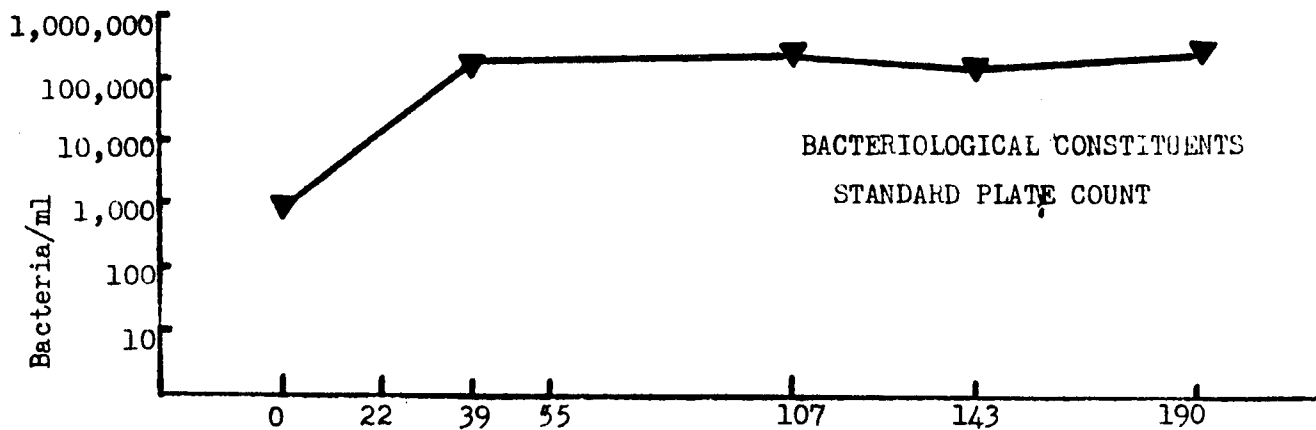
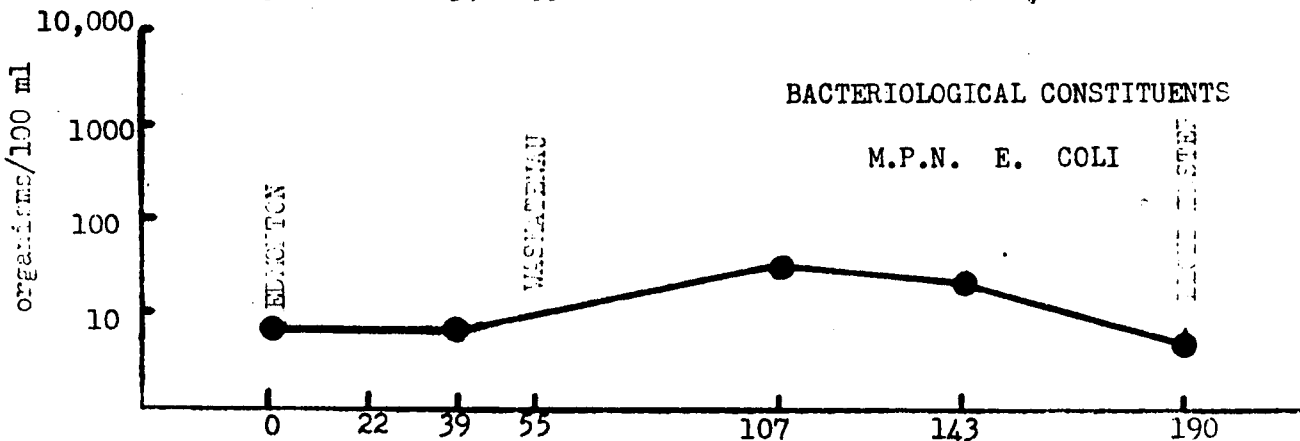
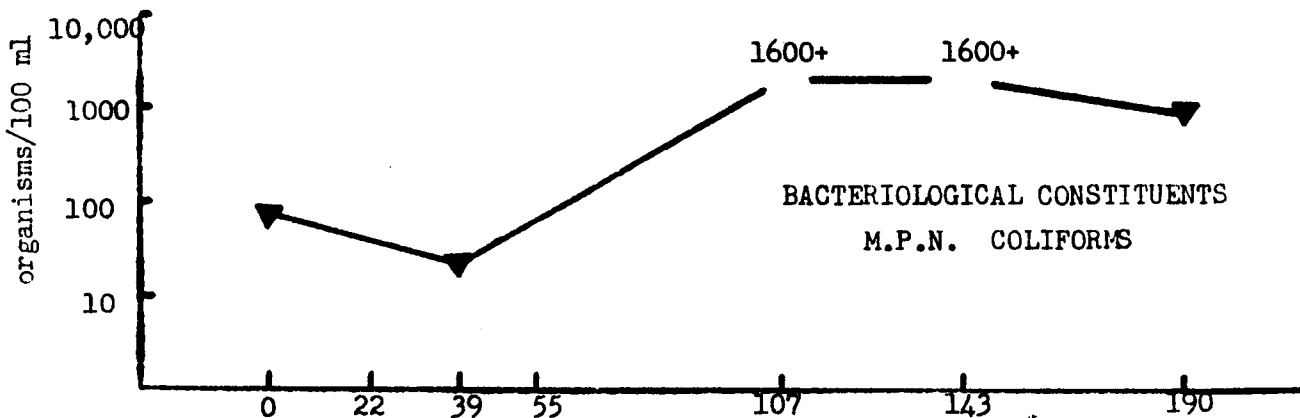
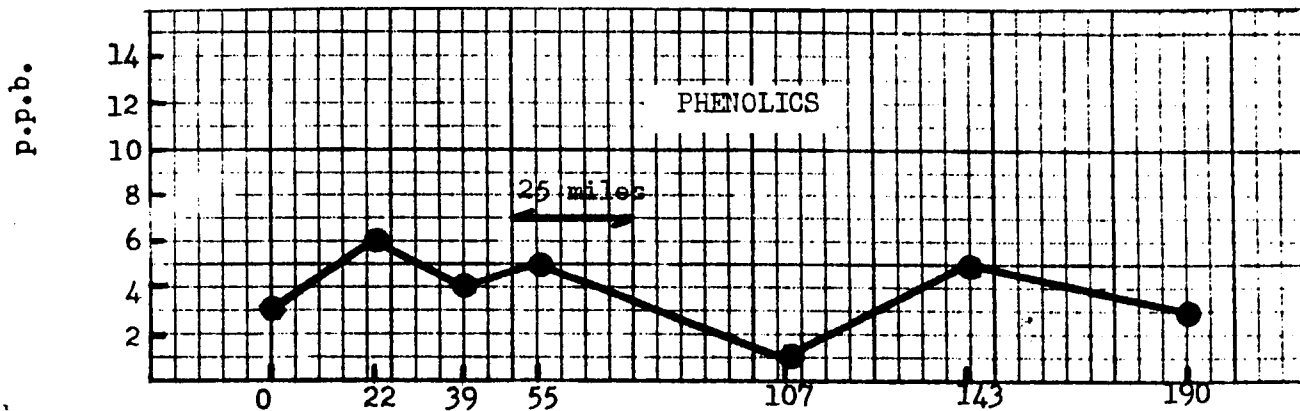


MILES DOWNSTREAM FROM EDMONTON

B - 1

18200 - - - - - RIVER DISCHARGE C.F.S. - - - - - 16900

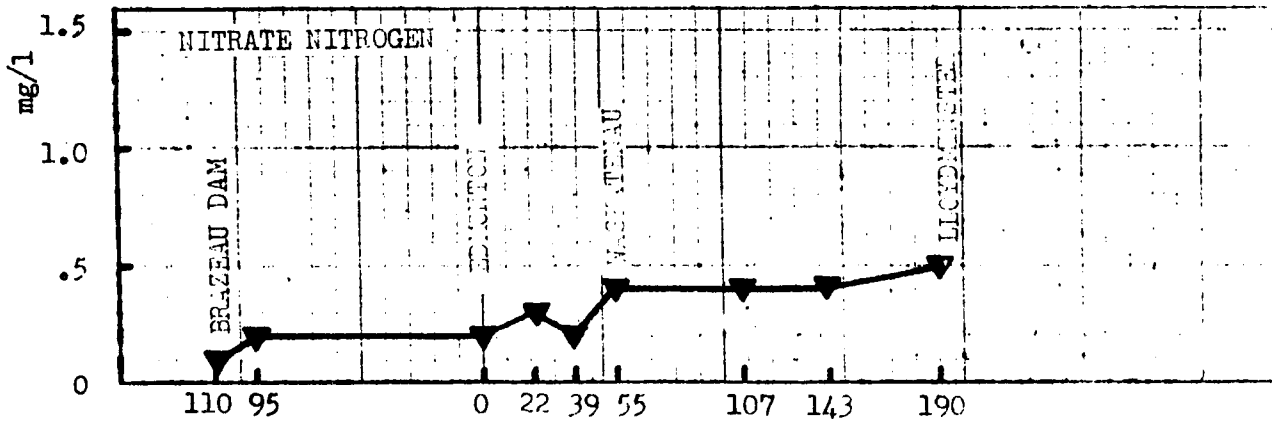
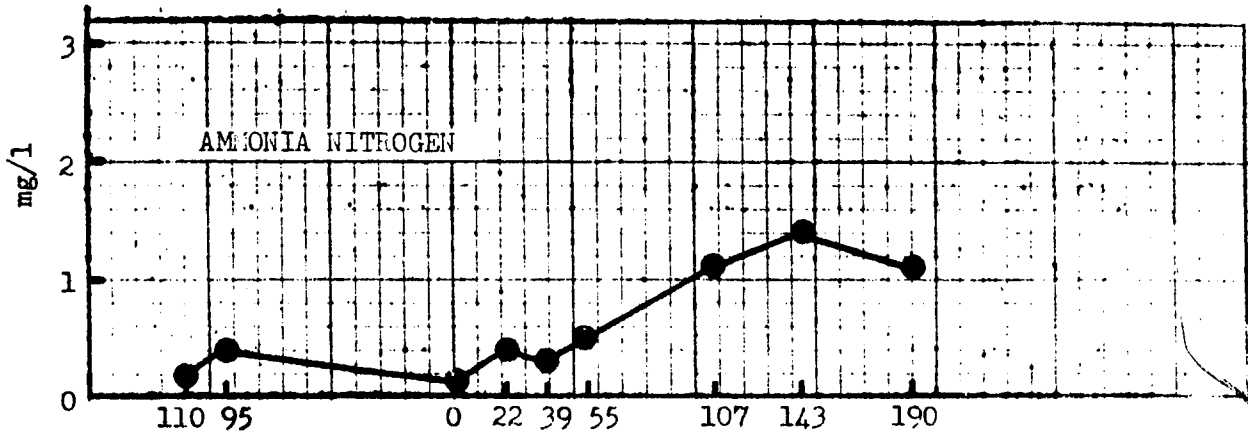
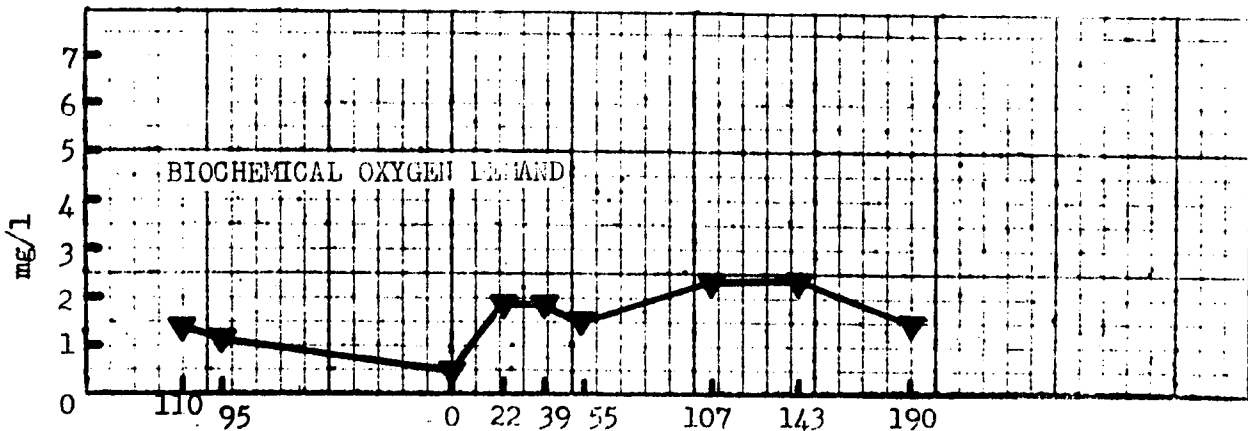
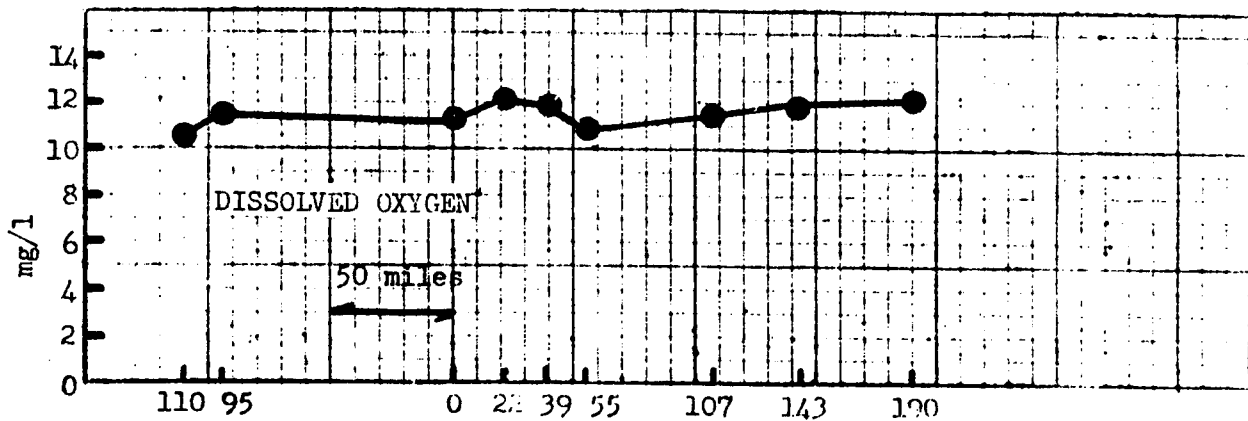
NORTH SASKATCHEWAN RIVER SAMPLING RESULTS  
JULY 25, 1968



RIVER DISTANCE FROM EDMONTON (MILES)

NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

OCTOBER 2 - 3, 1968



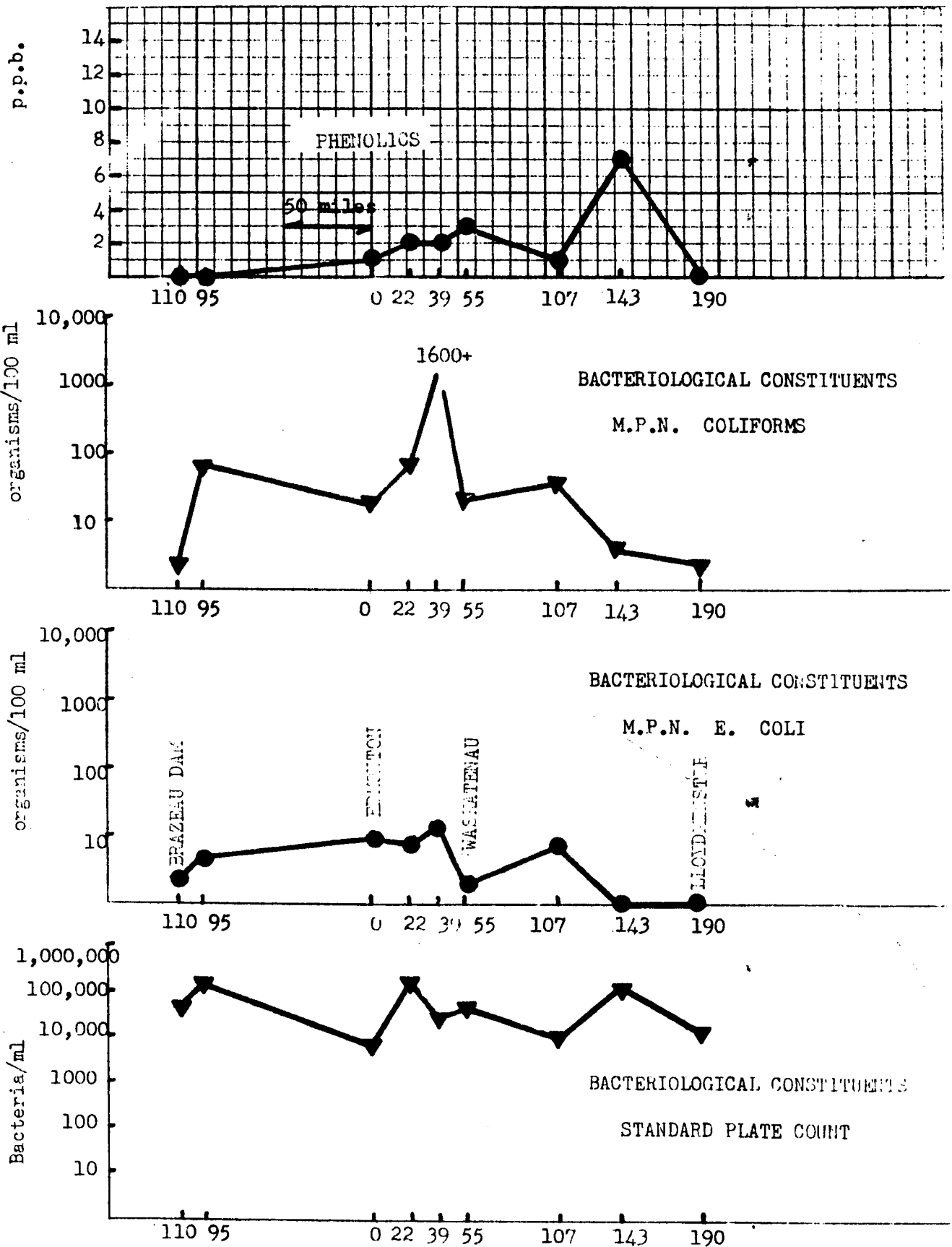
MILES DOWNSTREAM FROM EDMONTON

101

230 - - - - - 4580 - - - - - River Discharge cfs -4210

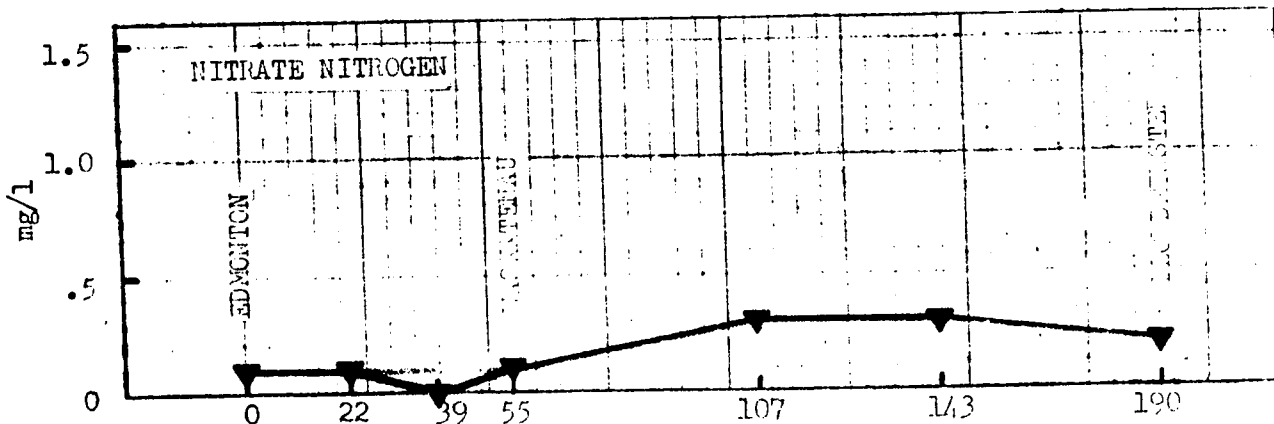
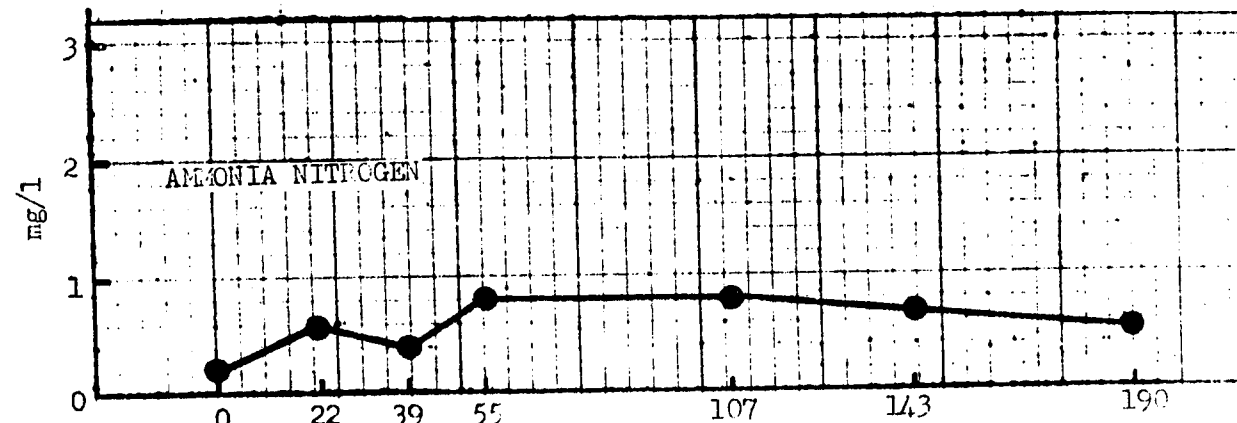
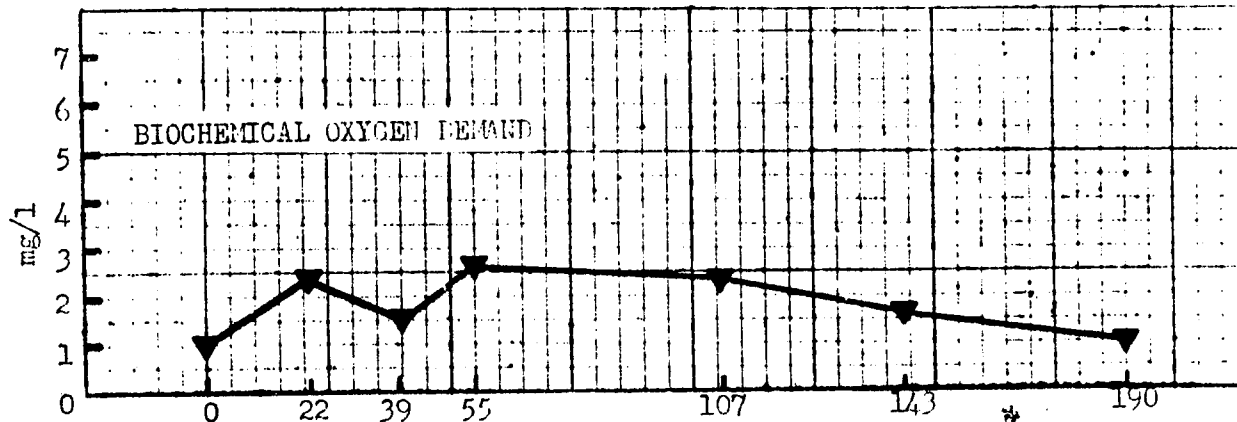
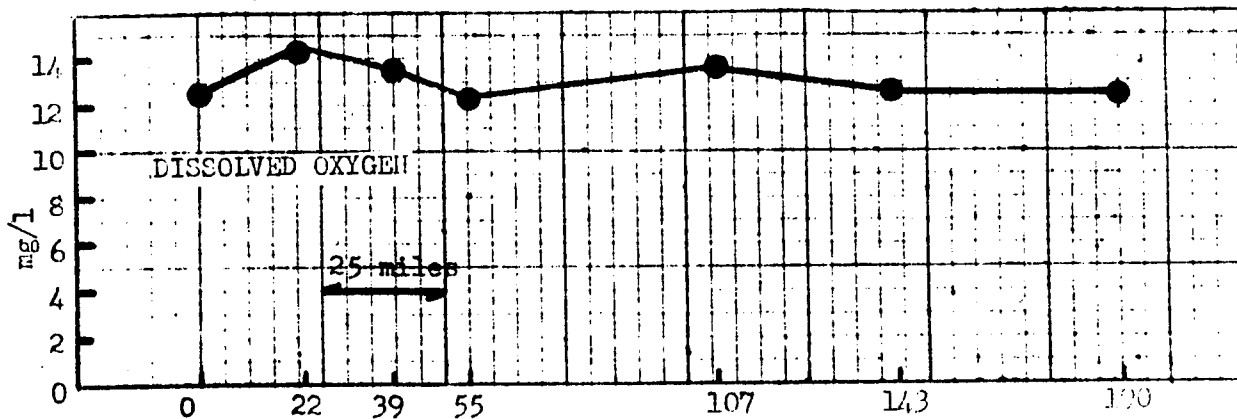
NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

OCTOBER 2 - 3, 1968



RIVER DISTANCE DOWNSTREAM FROM EDMONTON (MILES)

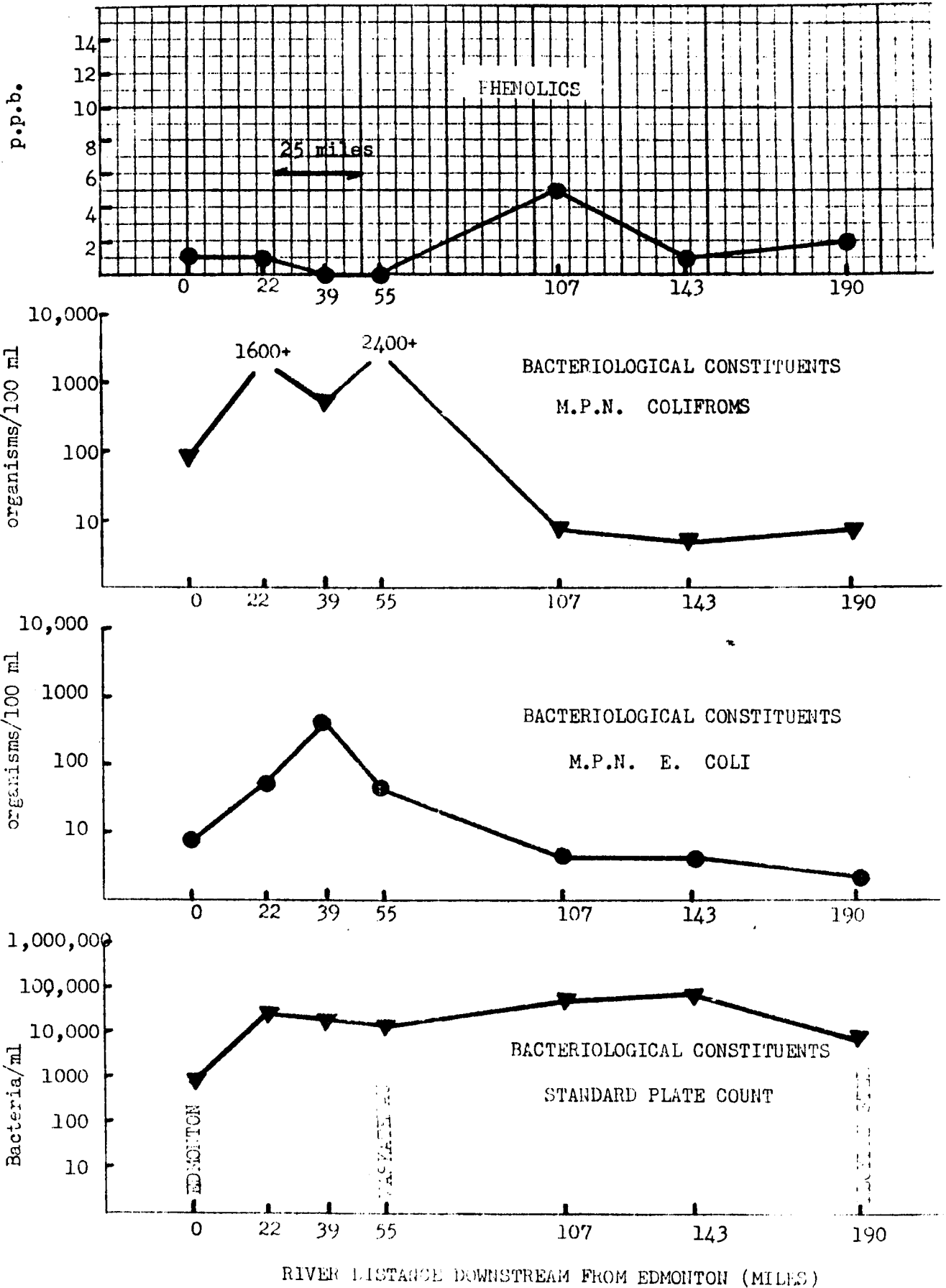
NORTH SASKATCHEWAN RIVER SAMPLING RESULTS  
OCTOBER 16-17, 1968



MILES DOWNSTREAM FROM EDMONTON

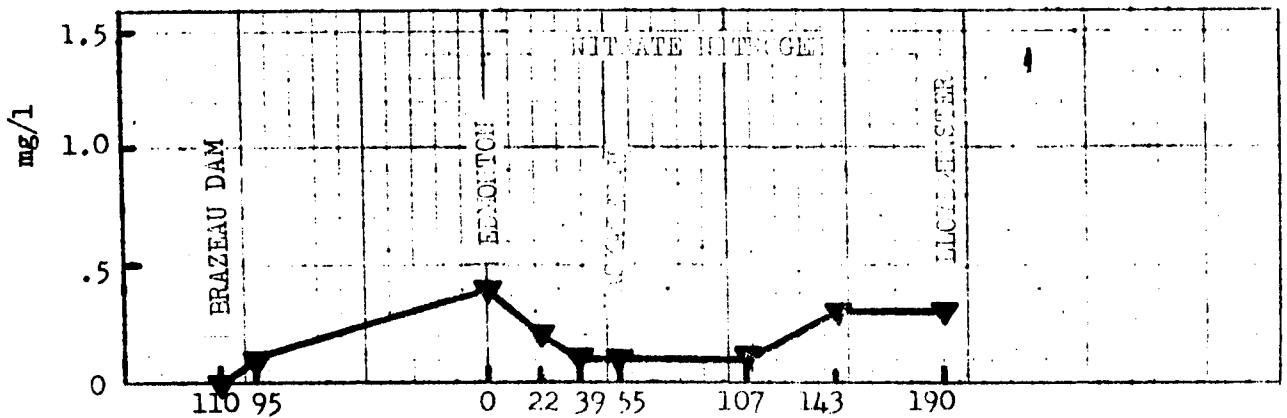
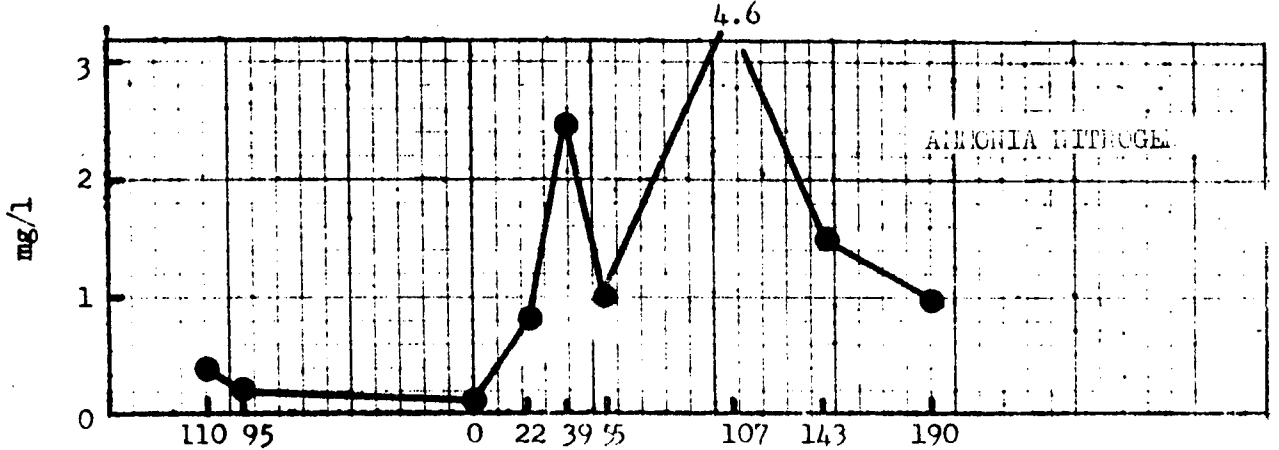
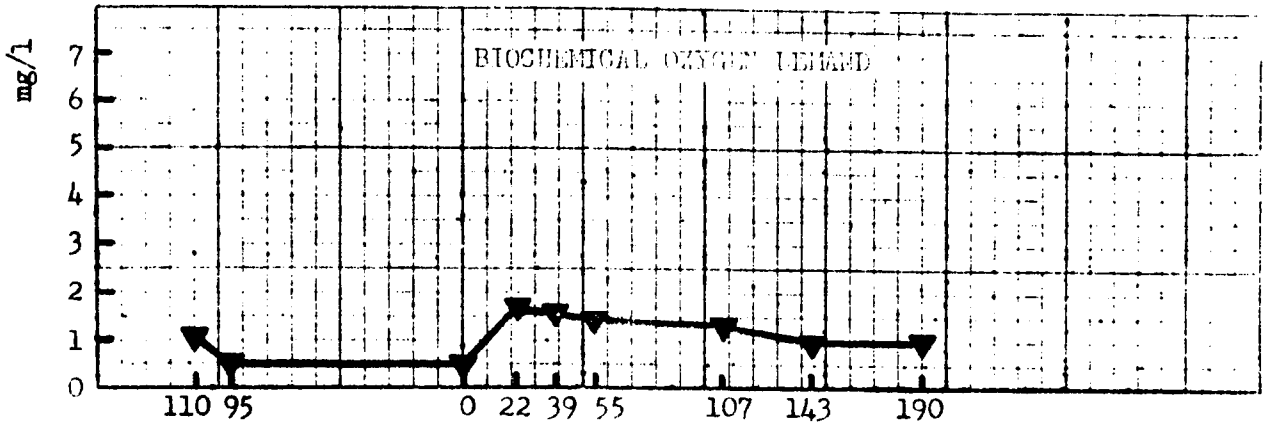
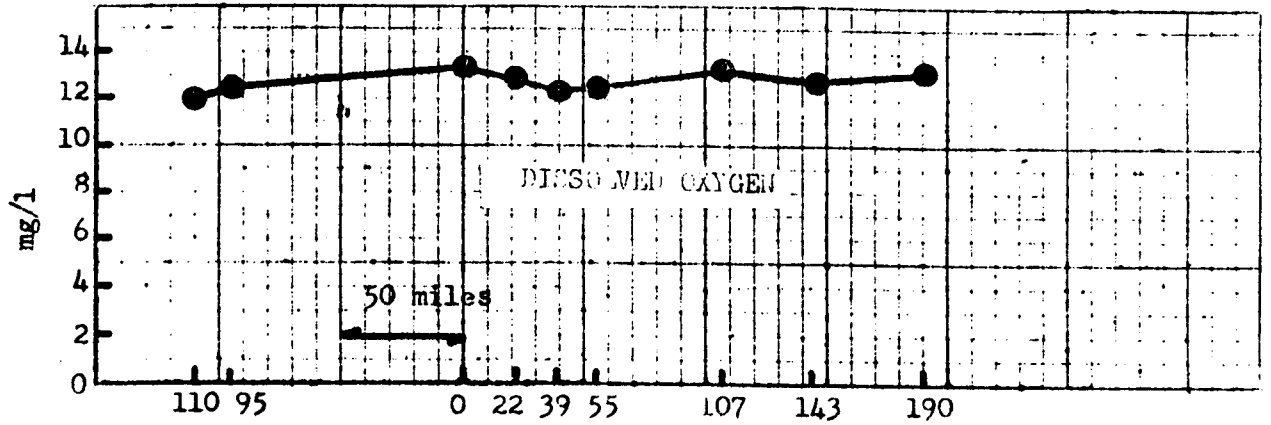
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NORTH SASKATCHEWAN RIVER SAMPLING RESULTS  
OCTOBER 16 - 17, 1968



NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

NOVEMBER 13 - 14, 1968



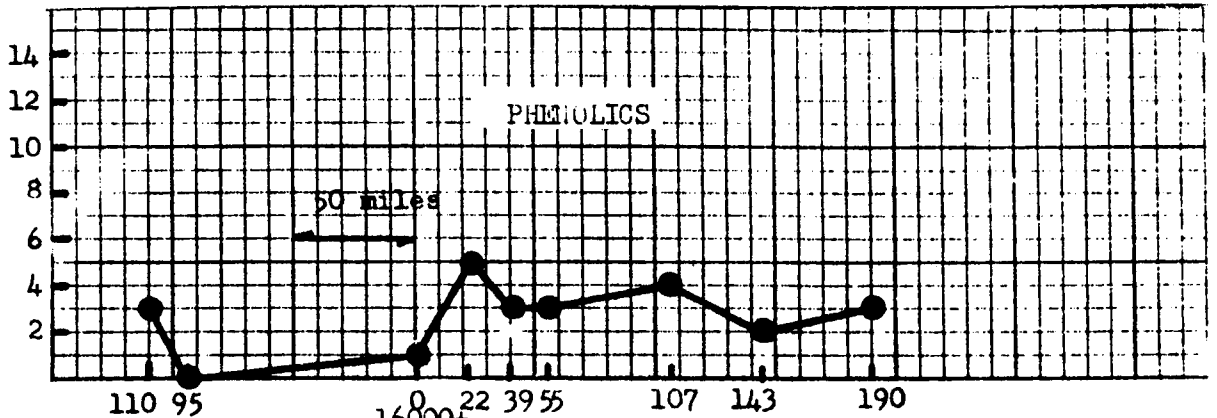
MILES DOWNSTREAM FROM EDMONTON

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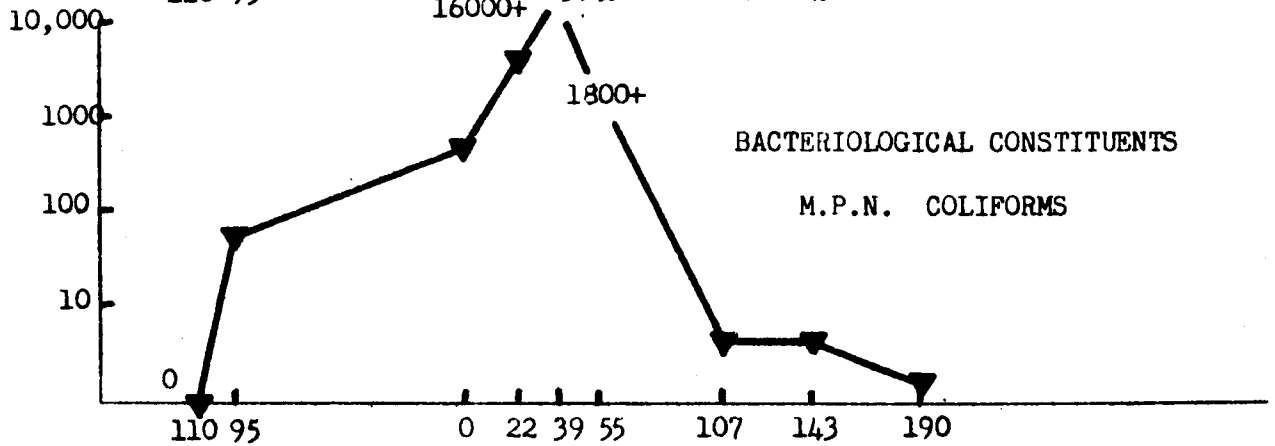
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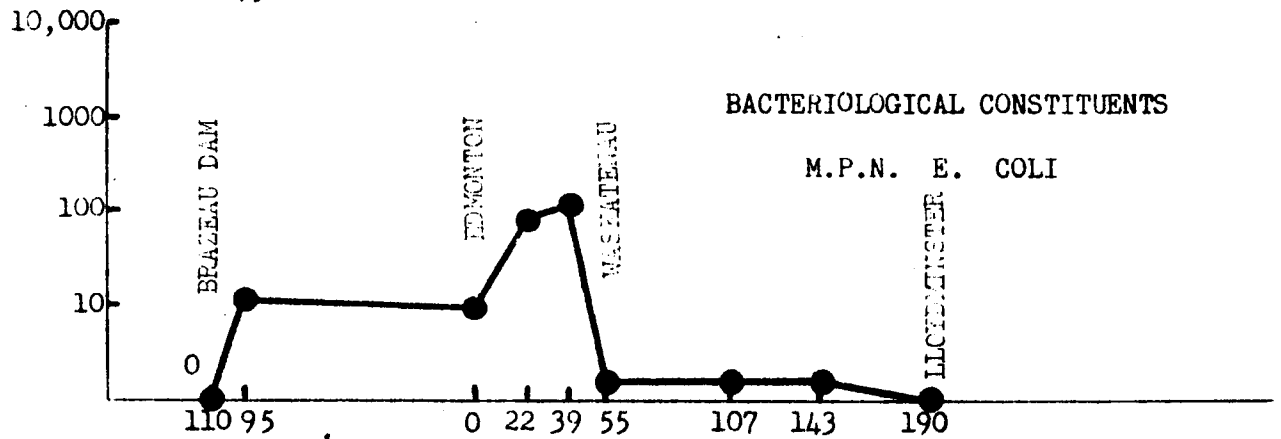
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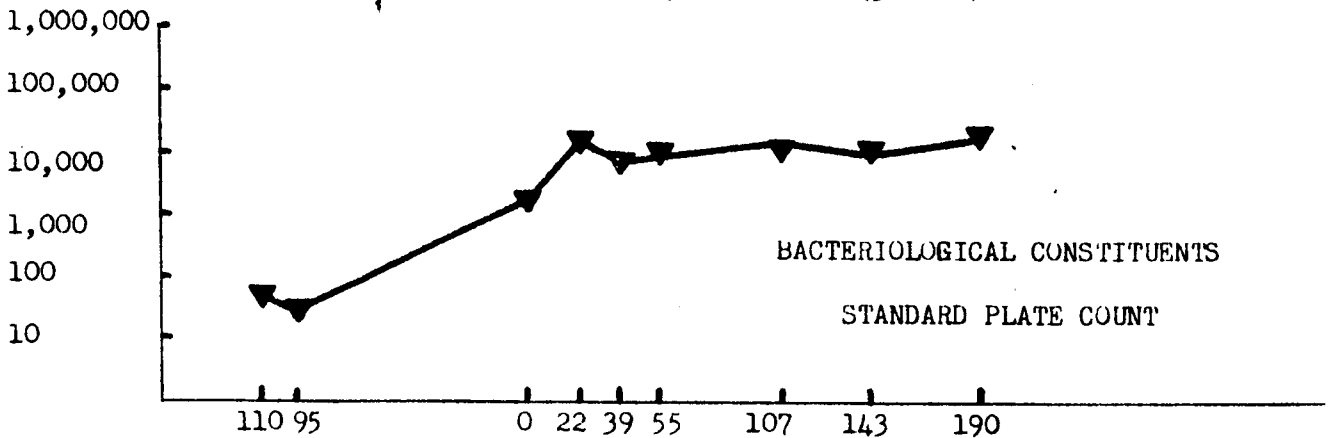
organisms/100 ml



organisms/100 ml

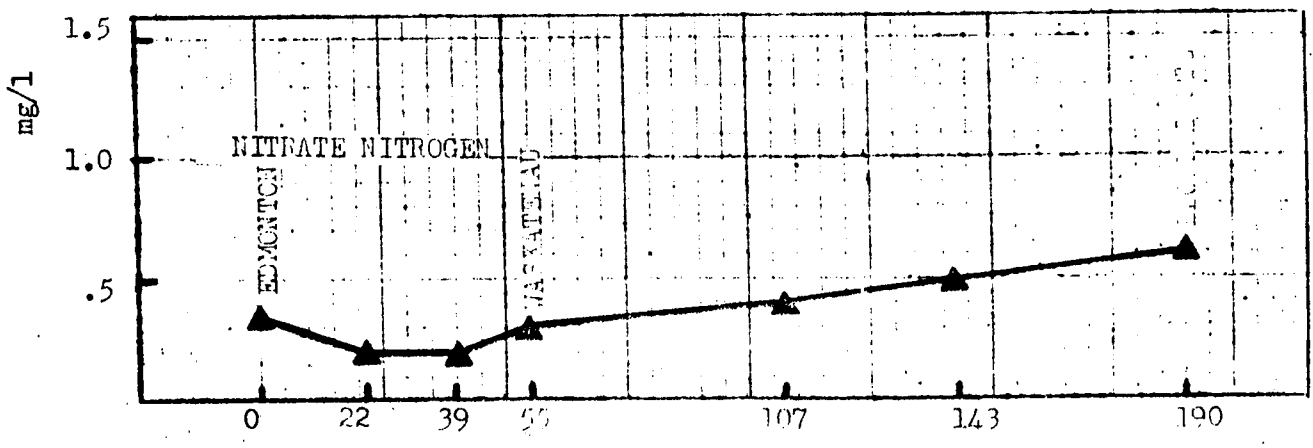
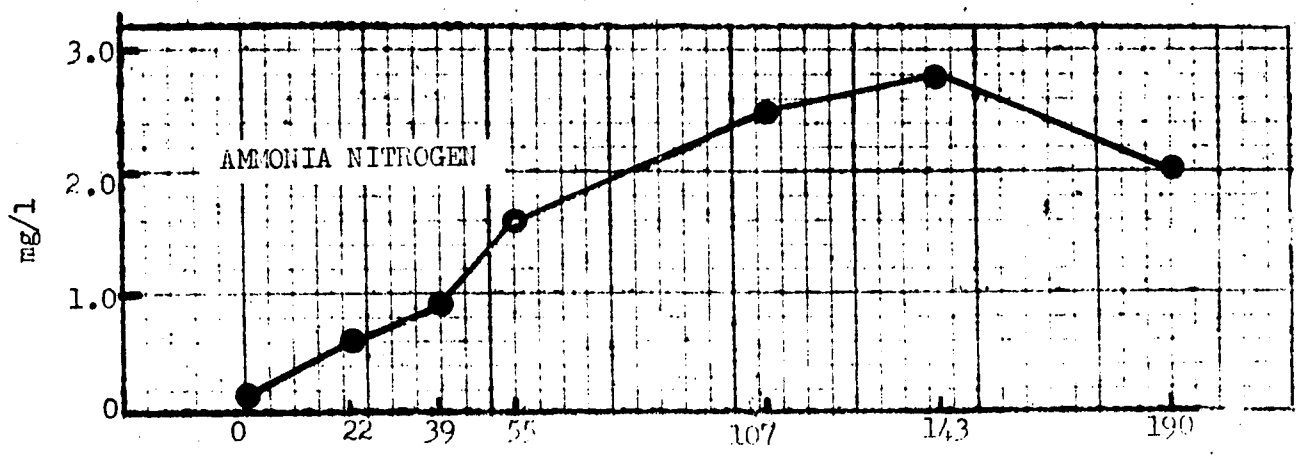
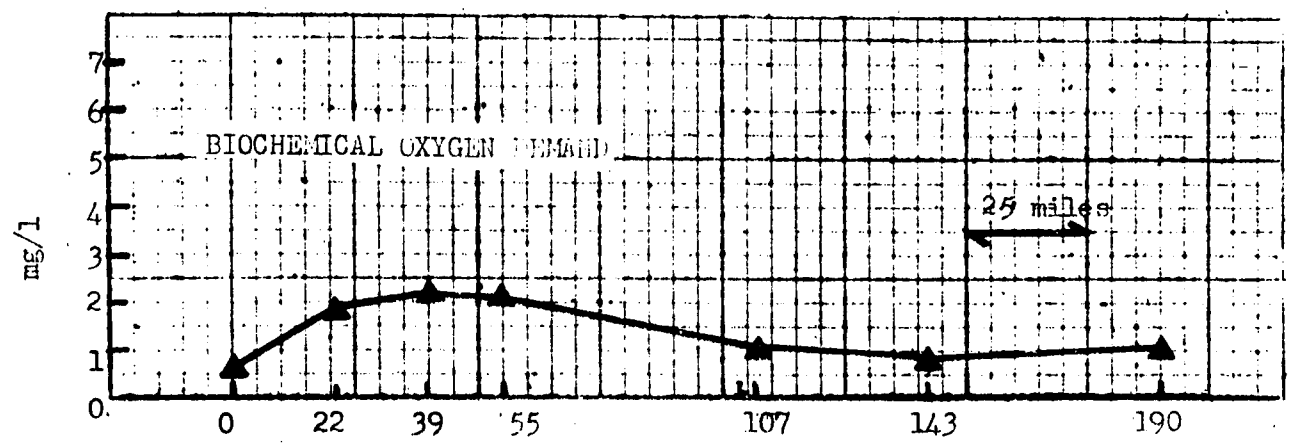
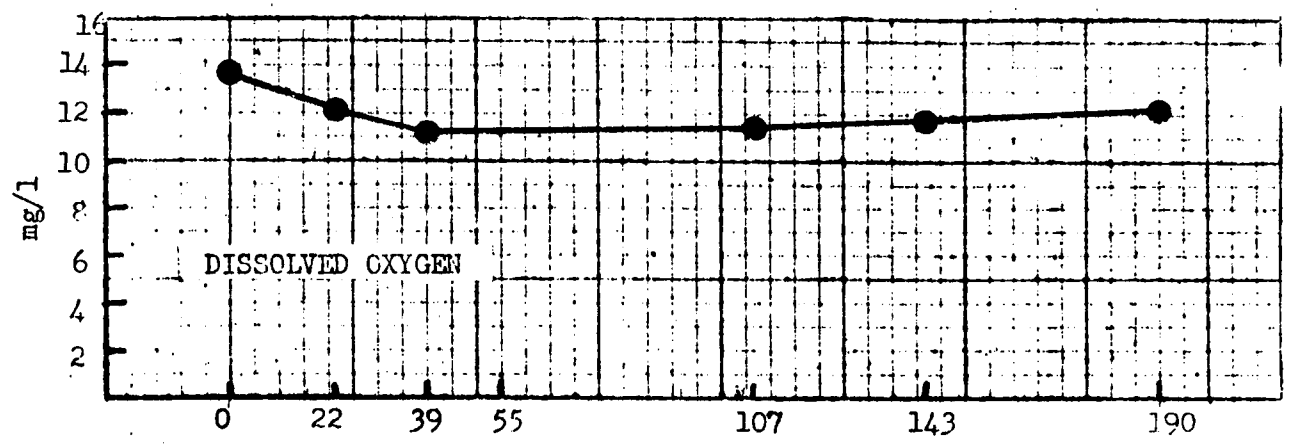


Bacteria/ml





NORTH SASKATCHEWAN RIVER SAMPLING RESULTS  
Nov. 27 - 28, 1968

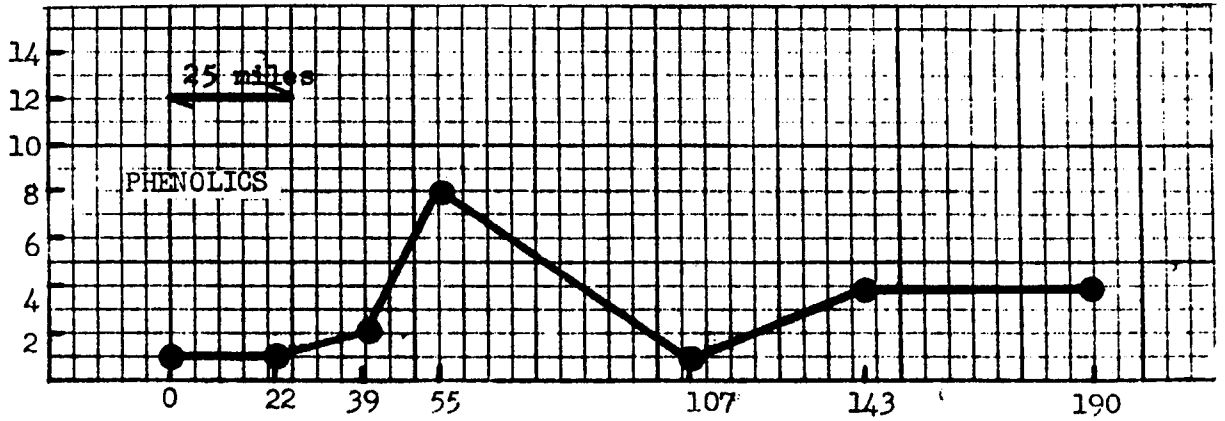


MILES DOWNSTREAM FROM EDMONTON

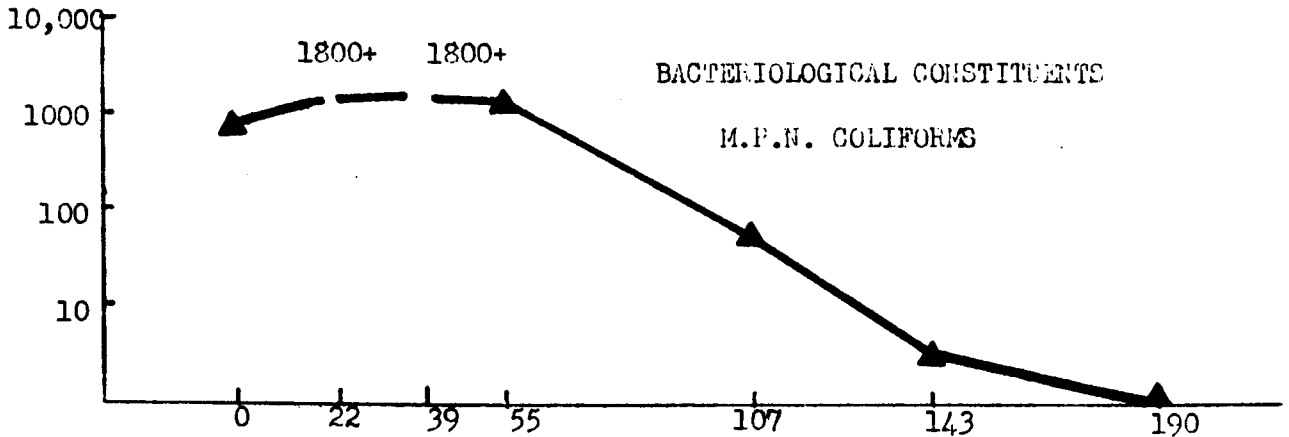
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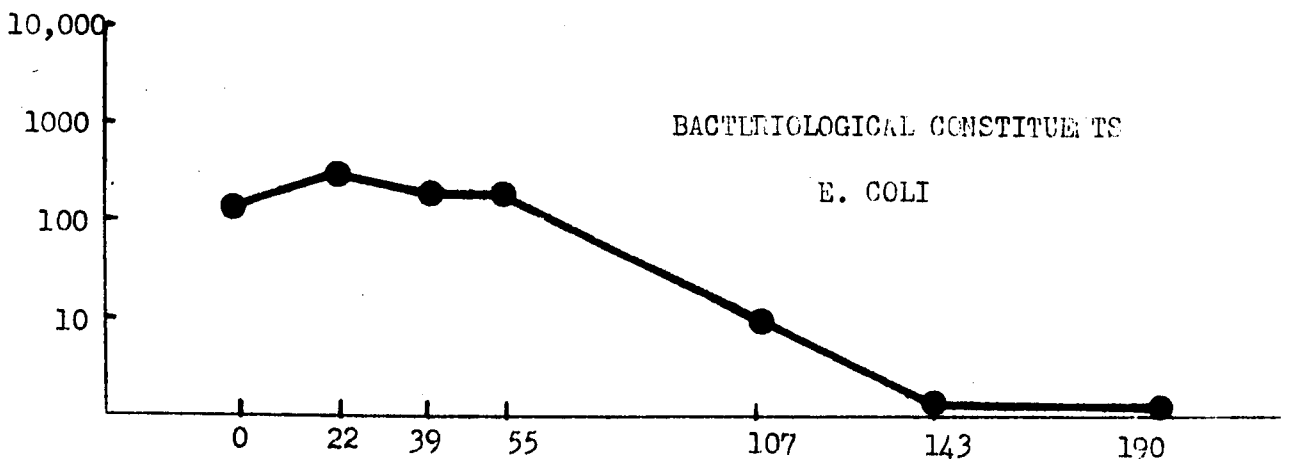
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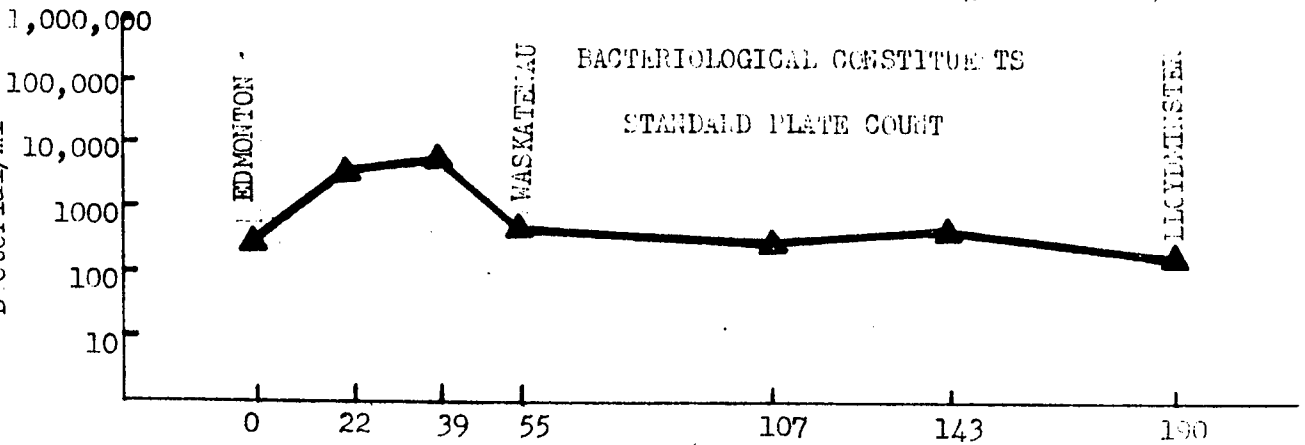
organisms/100 ml



organisms/100 ml



Bacterial/ml

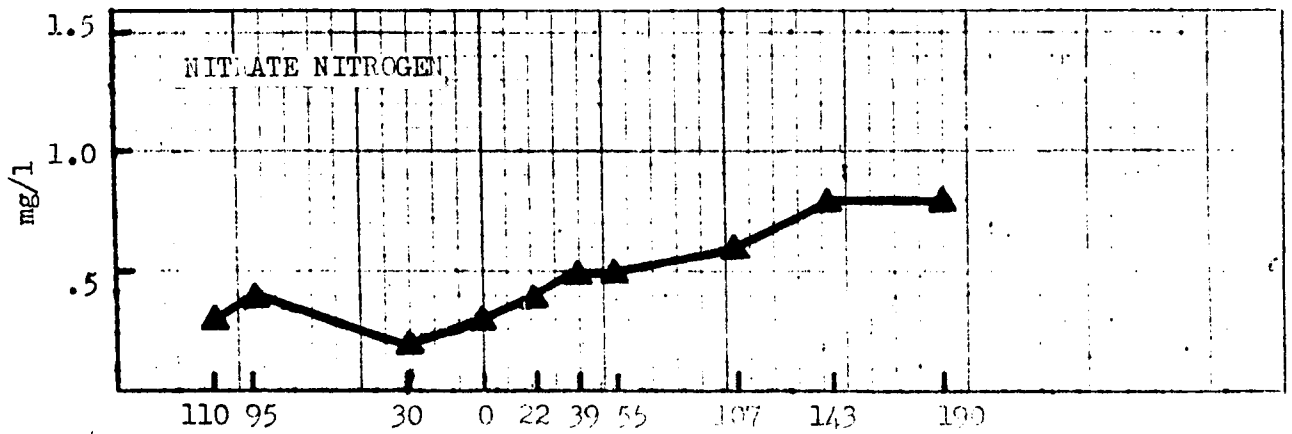
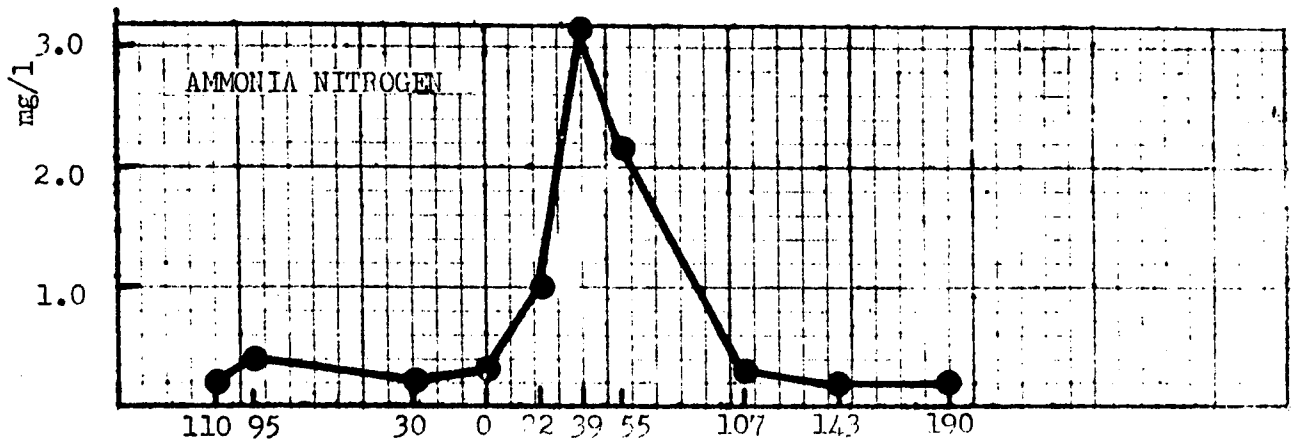
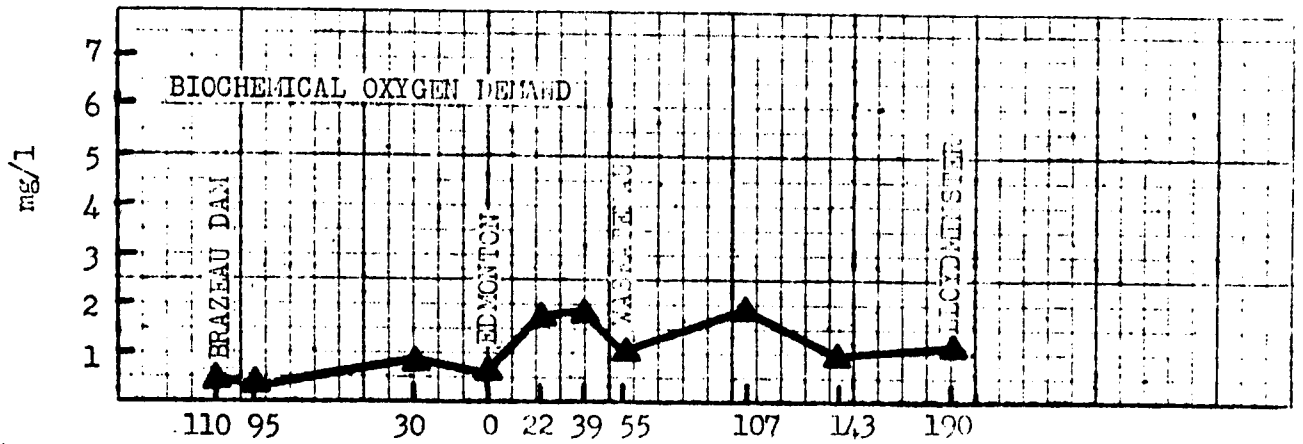
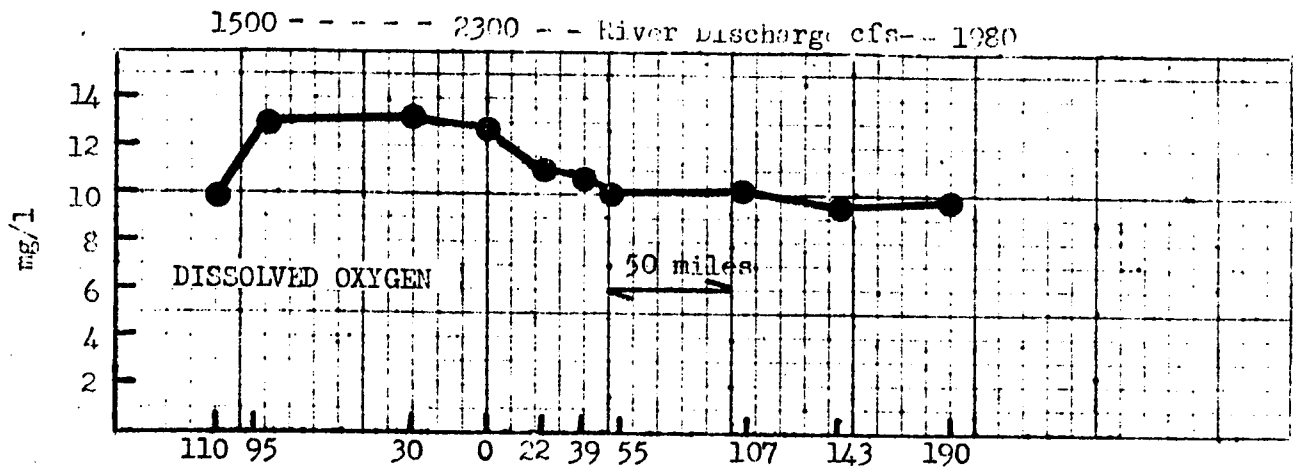


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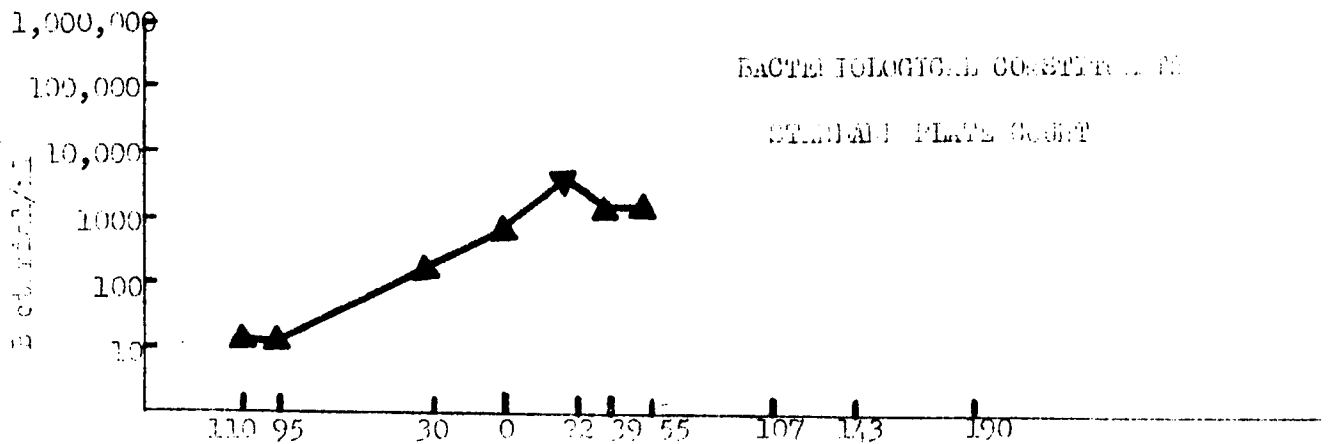
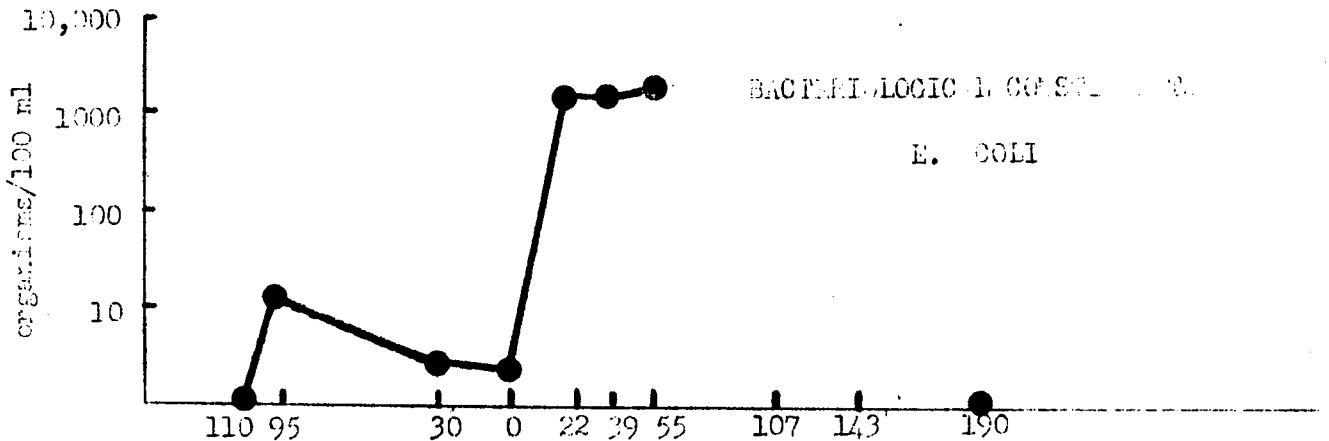
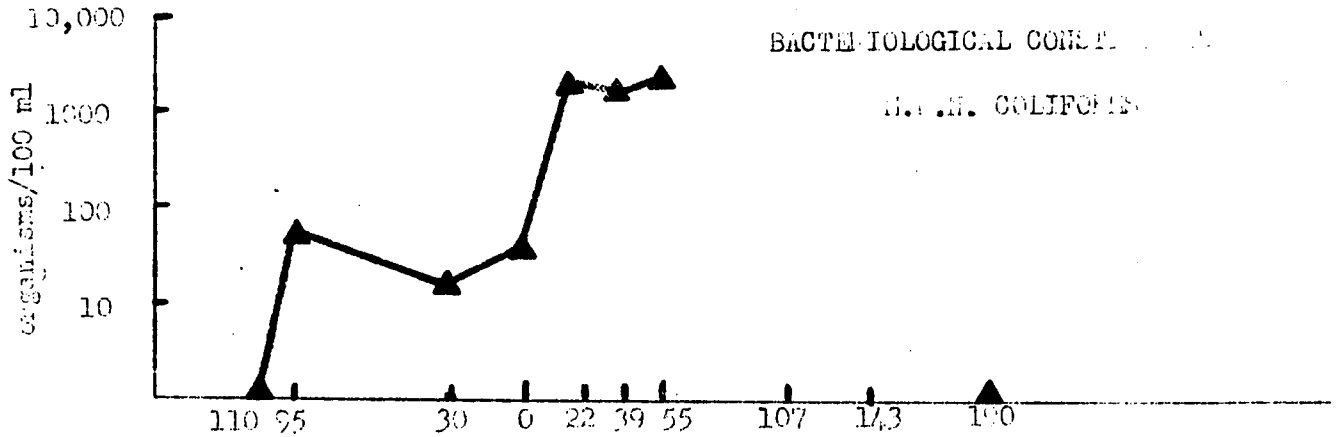
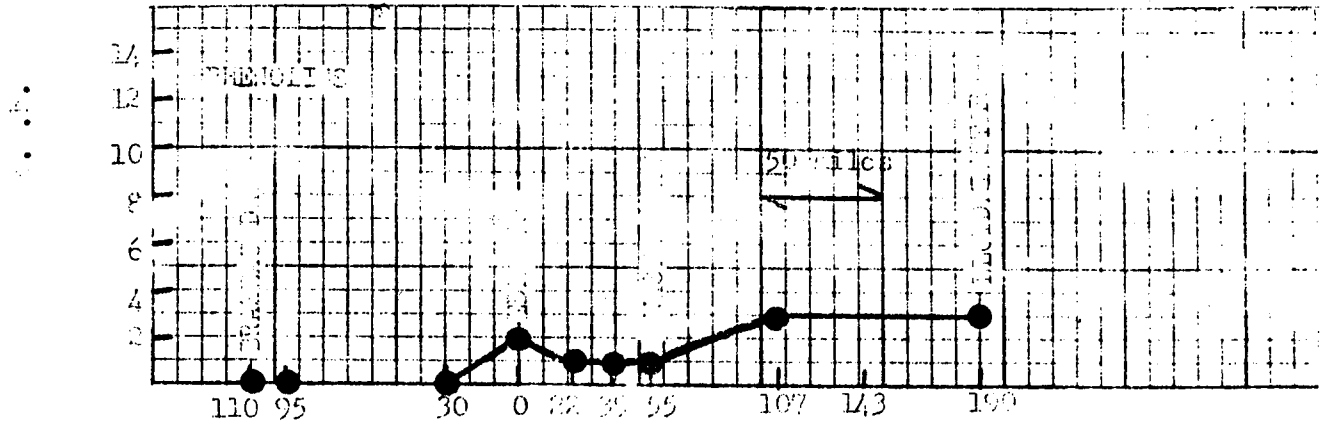
Nov. 27 - 28, 1968

NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

Dec. 11, 12, 13, 1968

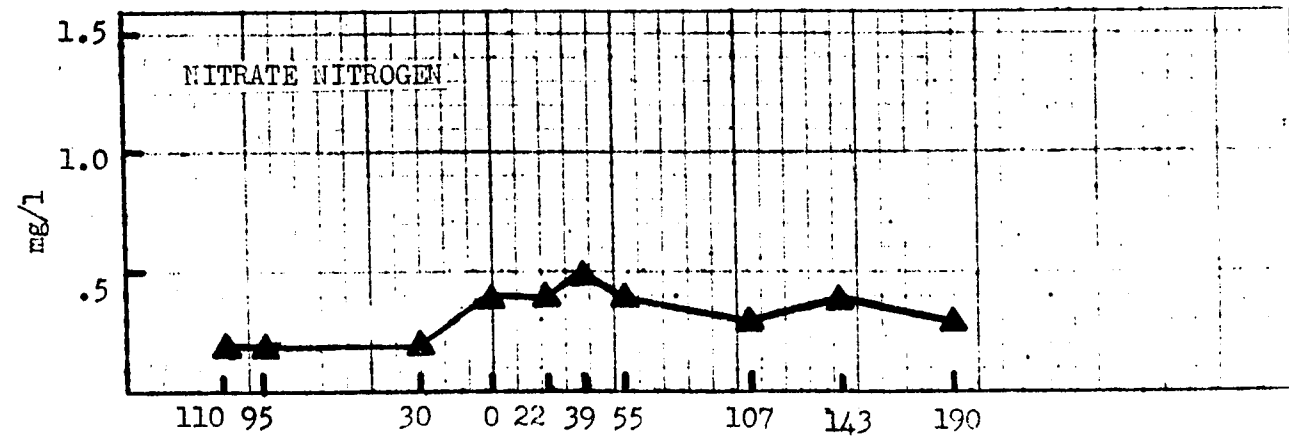
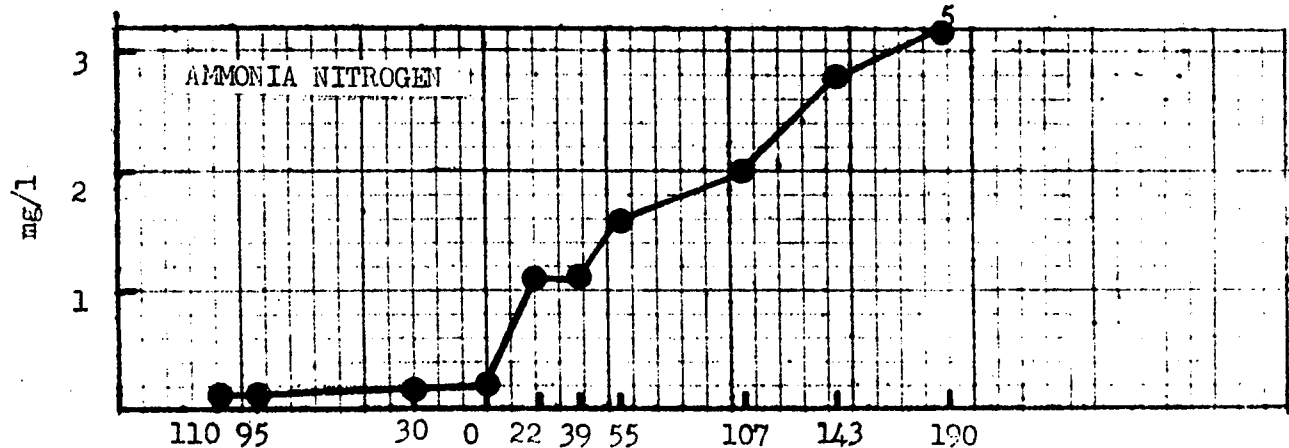
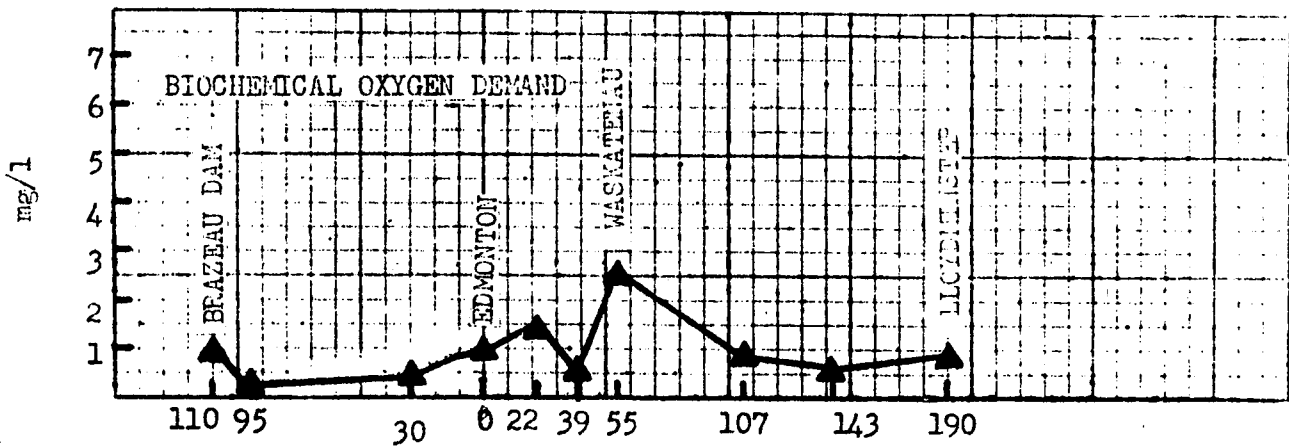
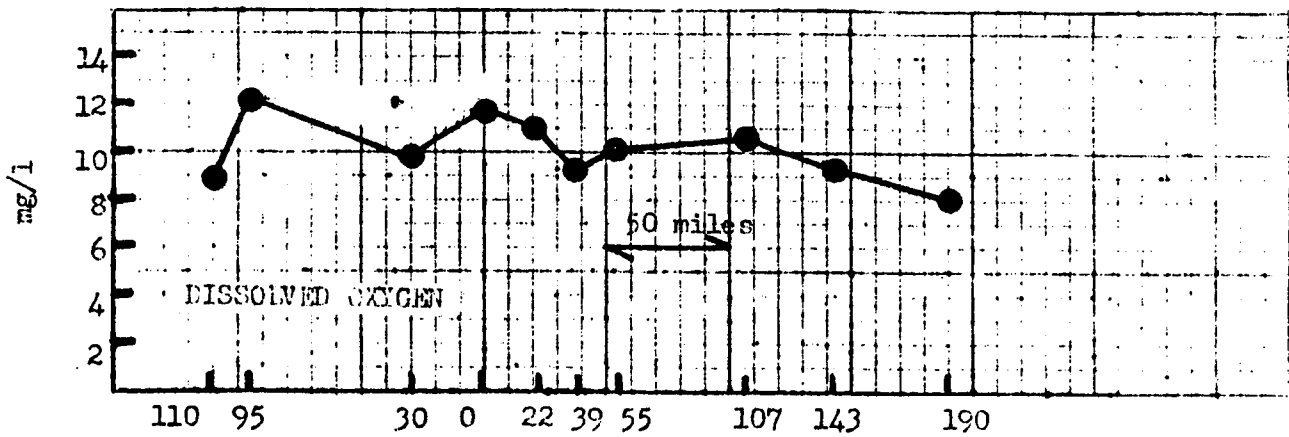


MILES DOWNSTREAM FROM EDMONTON



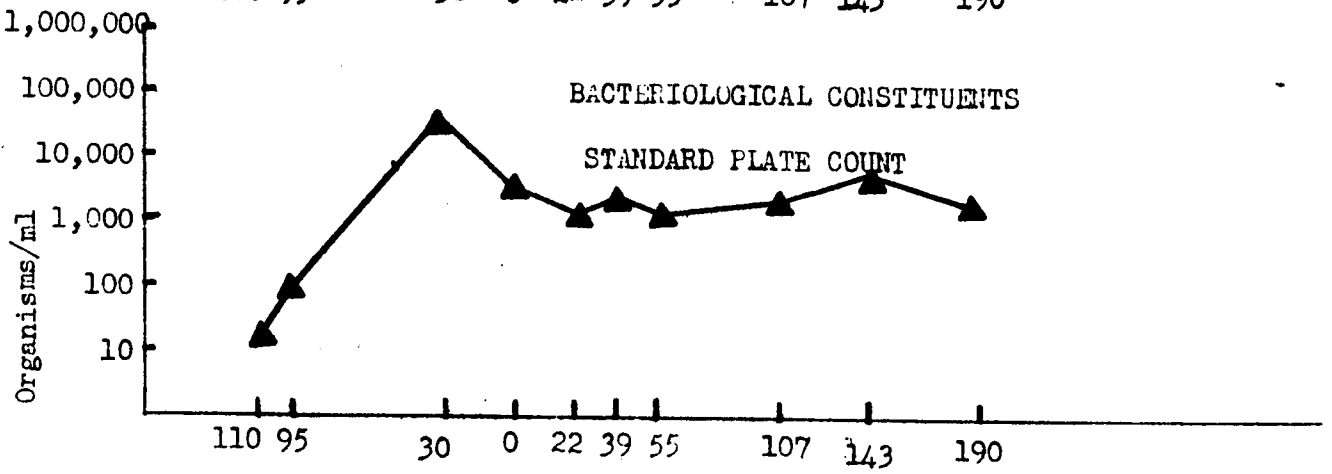
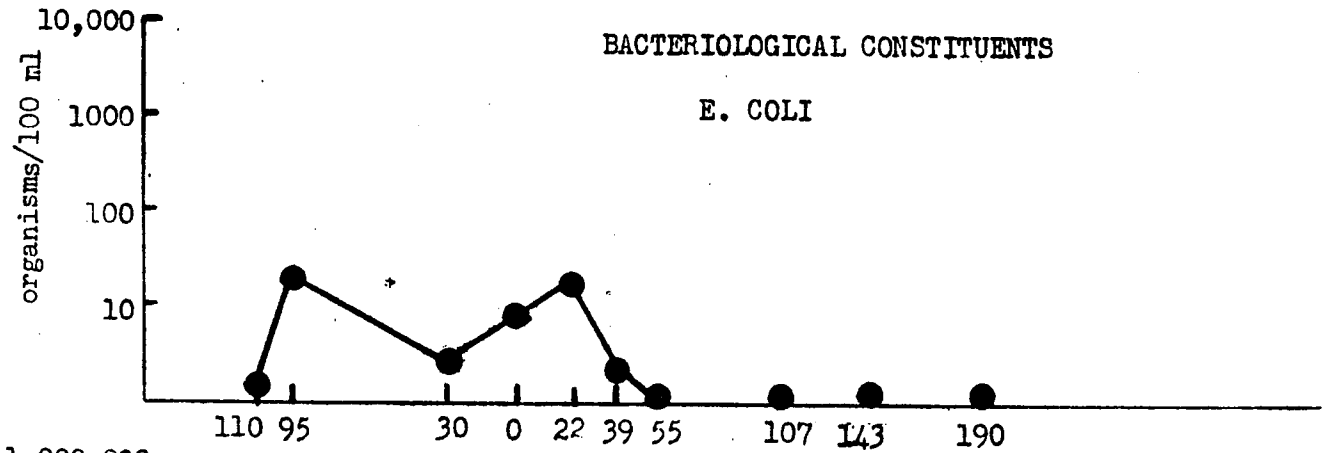
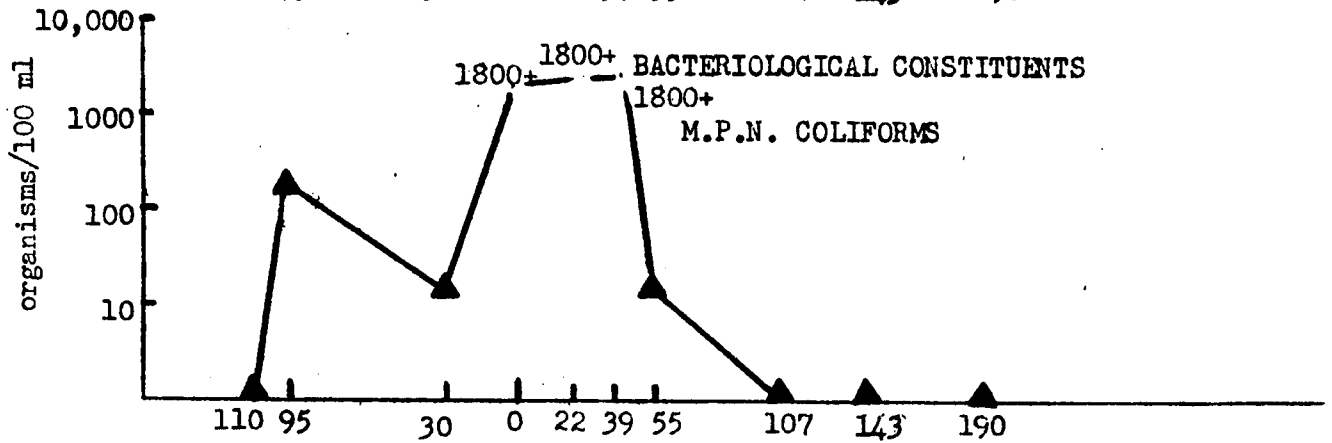
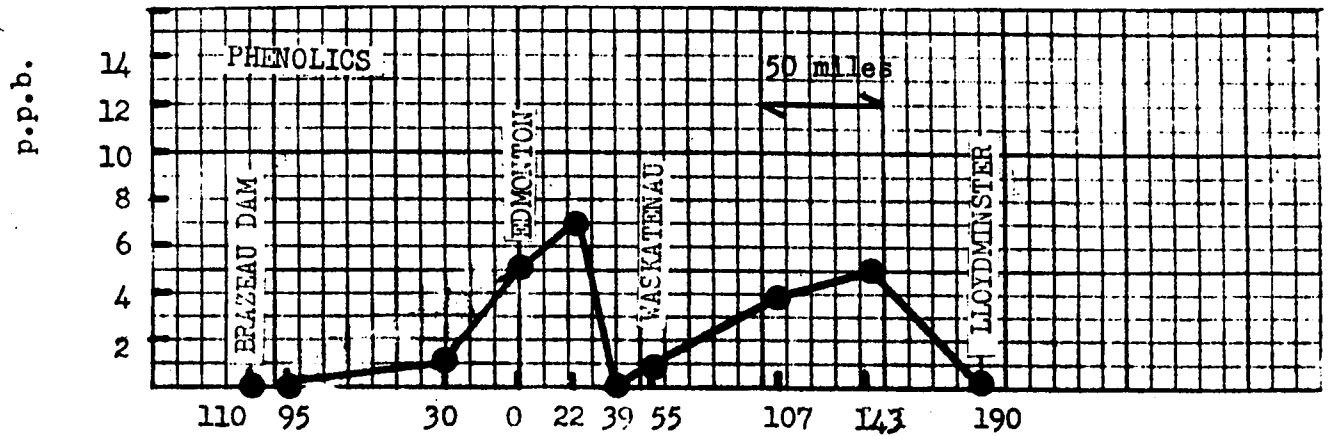
NORTH SACKATCHEWAN RIVER WATER QUALITY SURVEY RESULTS

Jan. 14-15, 1969



RIVER MILES FROM EDMONTON

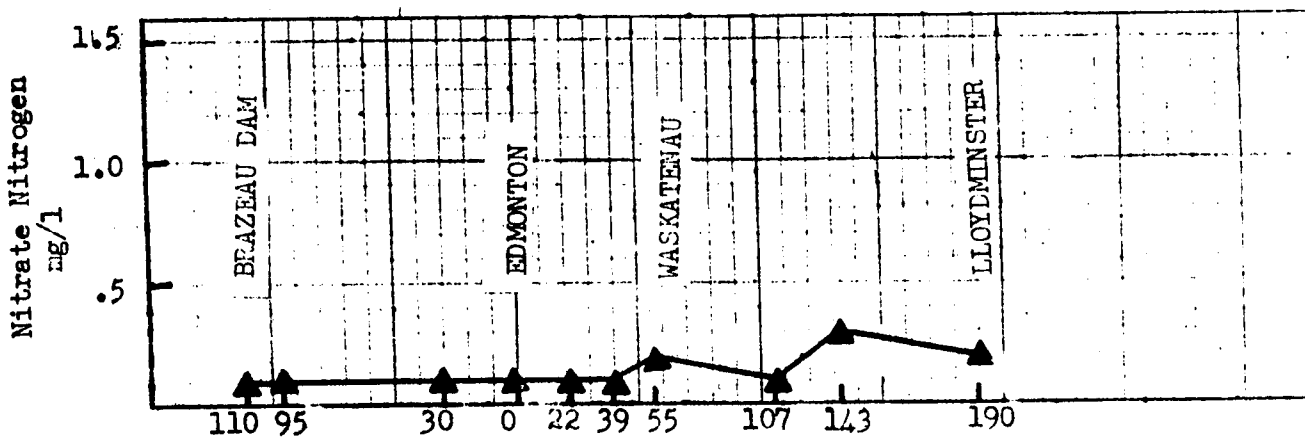
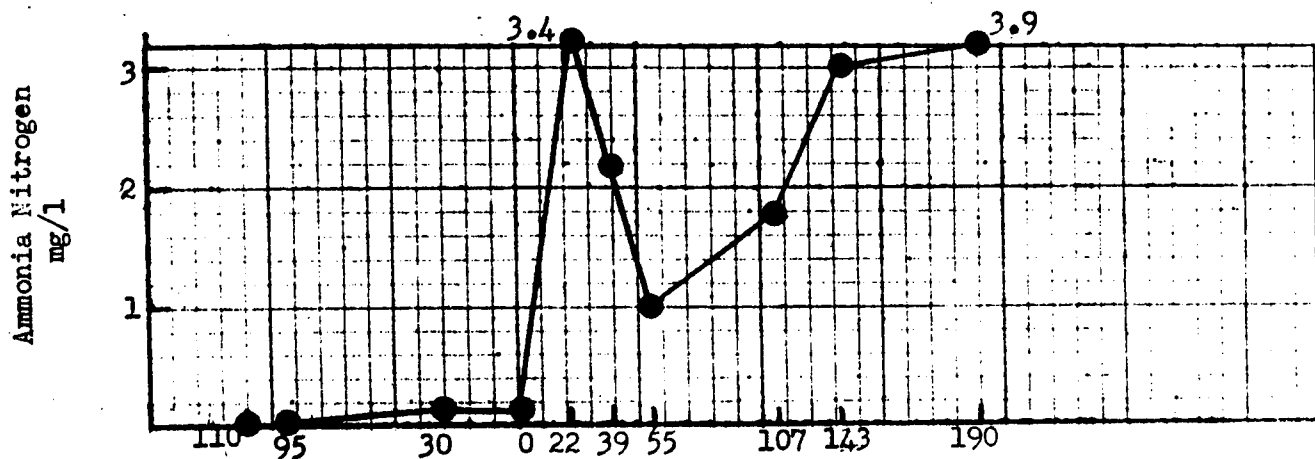
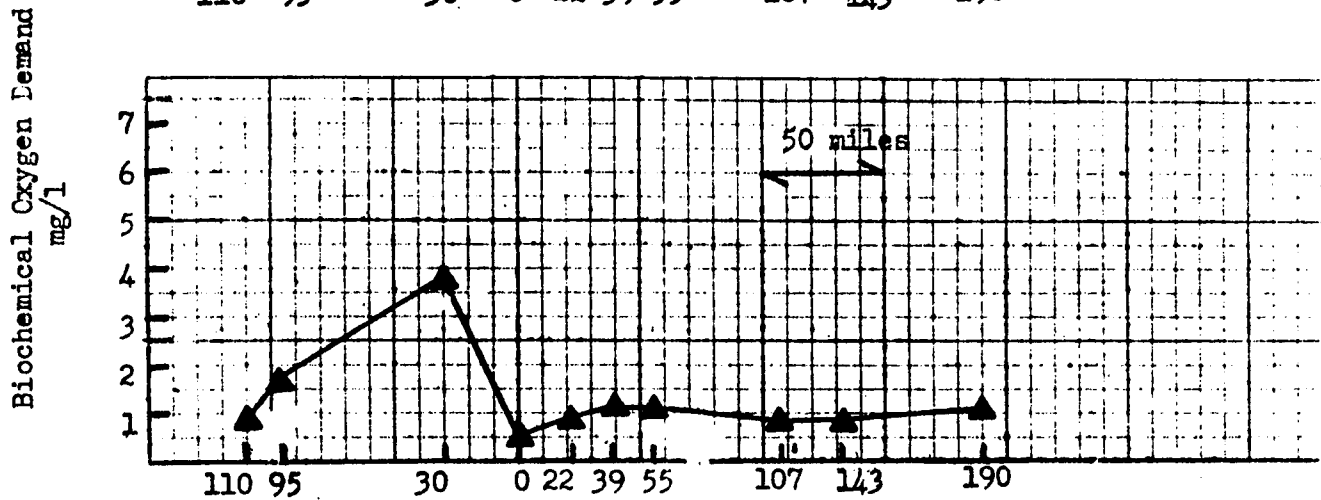
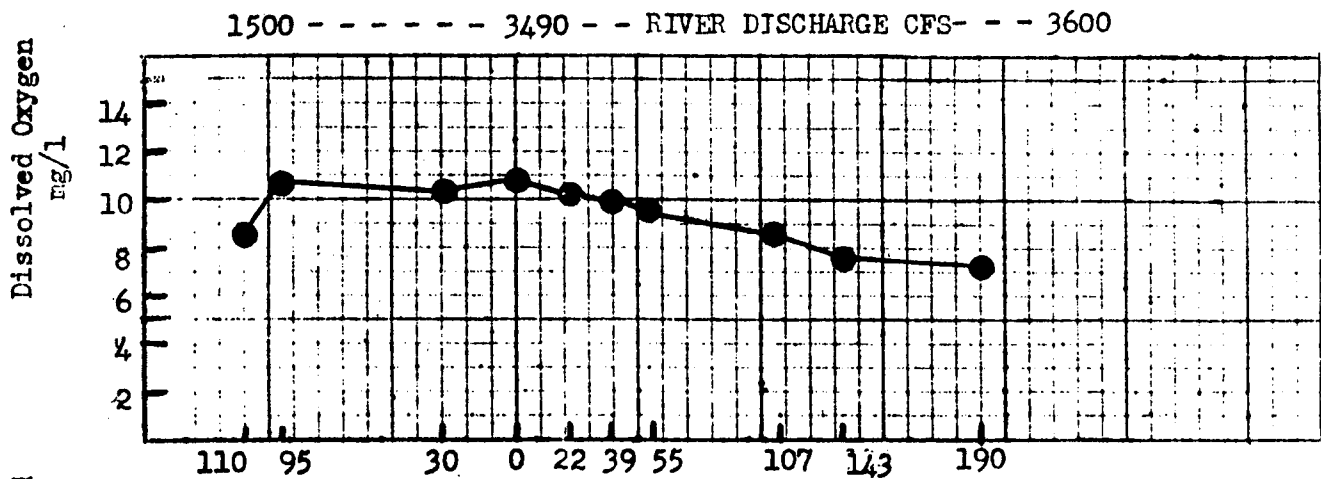
2200- - - - -3500- -River Discharge cfs - - 3580



NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

Jan. 14-15, 1969

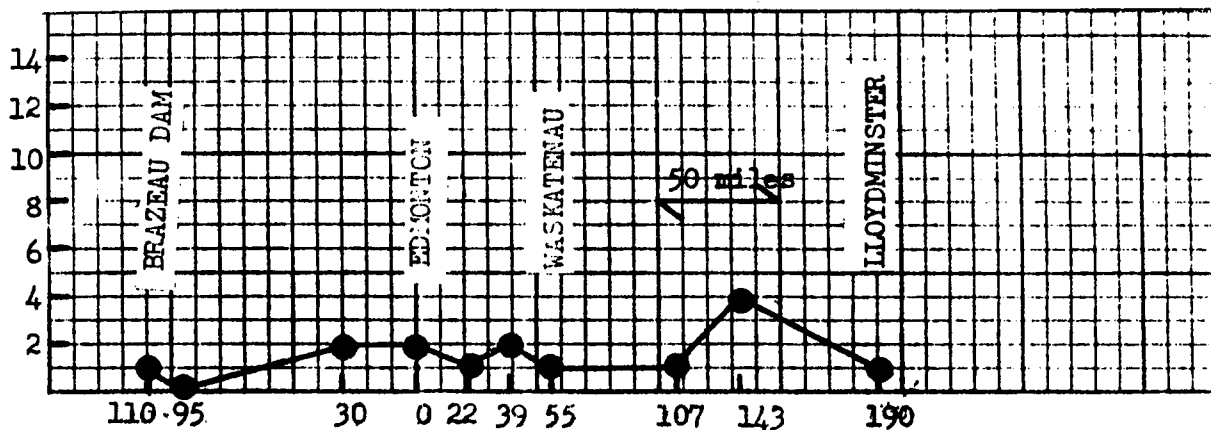
NORTH SASKATCHEWAN RIVER SAMPLING RESULTS  
 FEB. 4, 5, 6, 1969



RIVER MILES DOWNSTREAM FROM EDMONTON

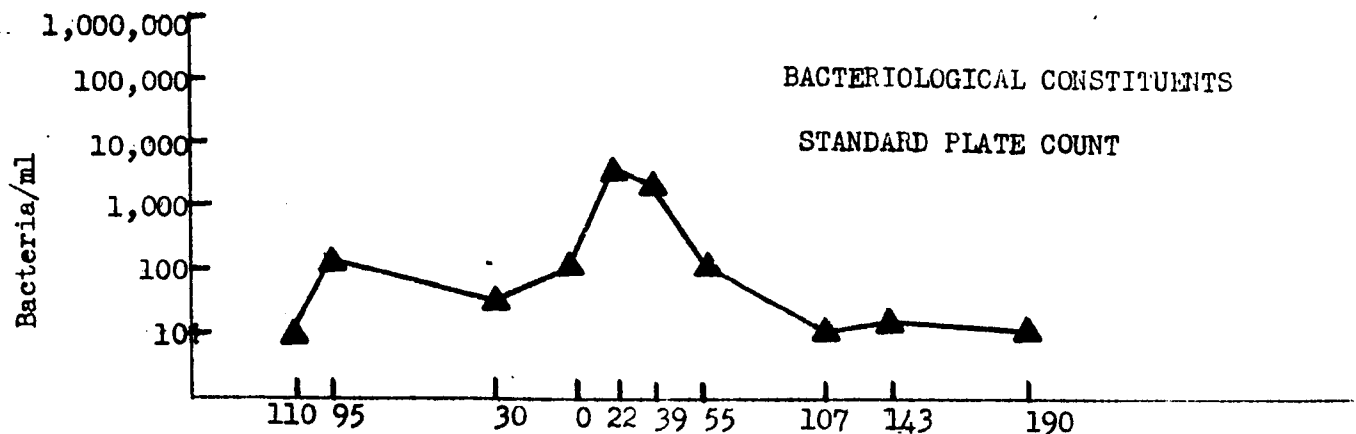
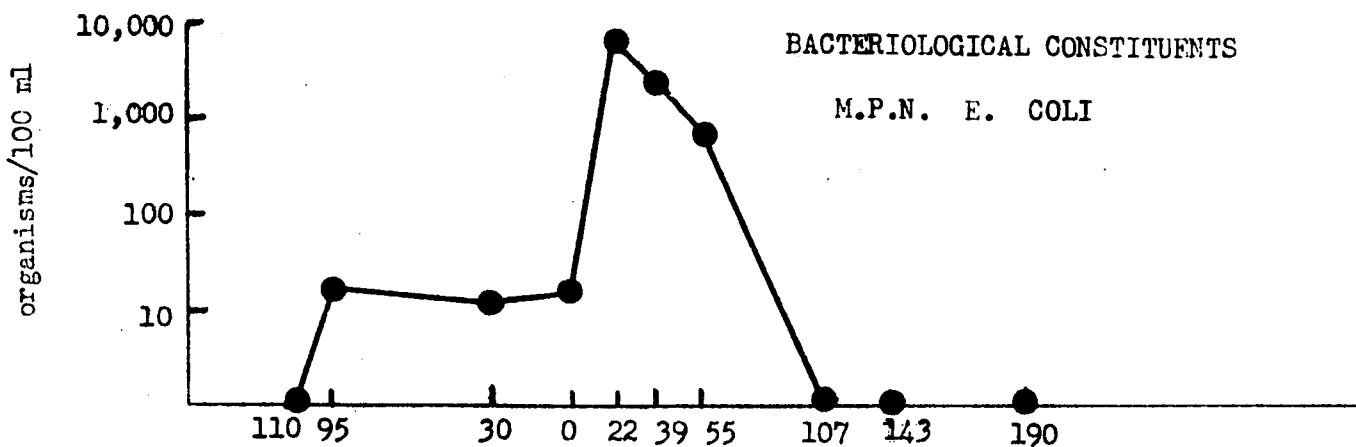
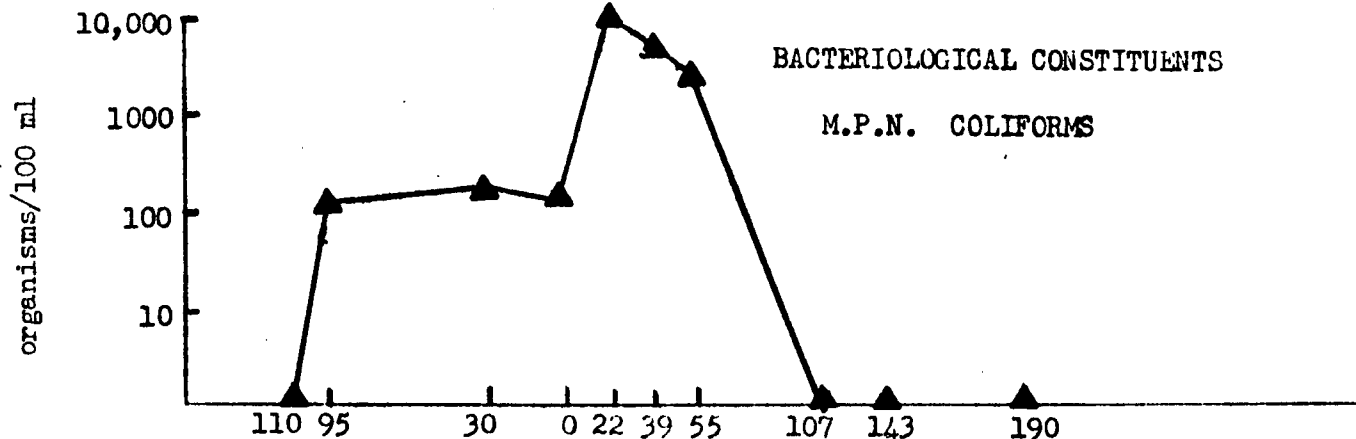
1500 - - - - -3490- -RIVER DISCHARGE CFS- - 3600

Phenols p.p.b.



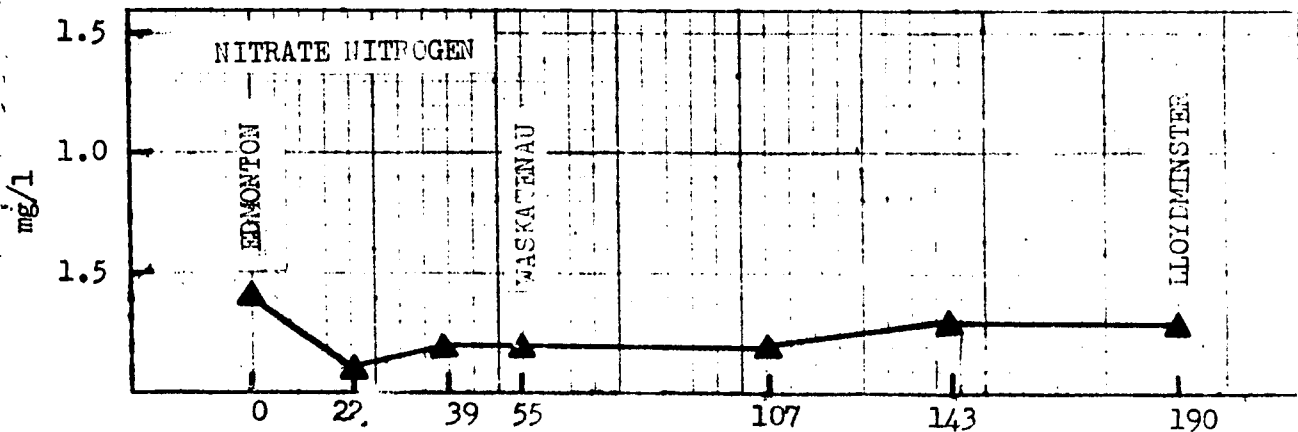
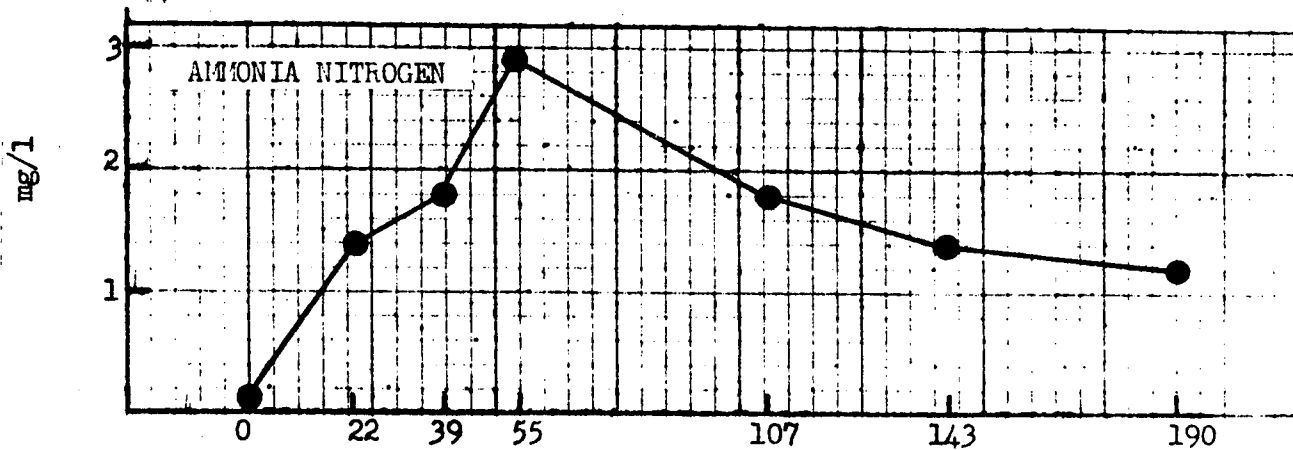
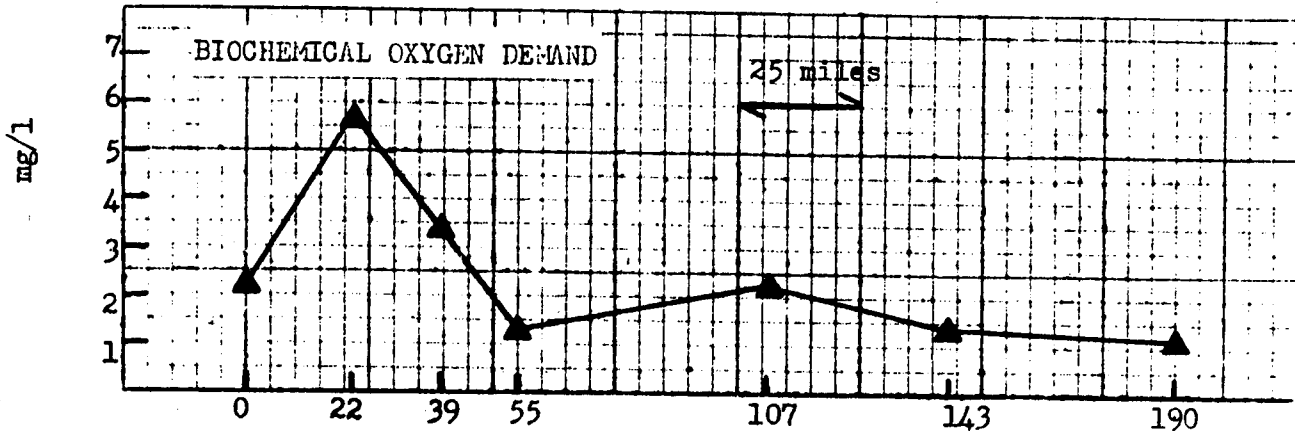
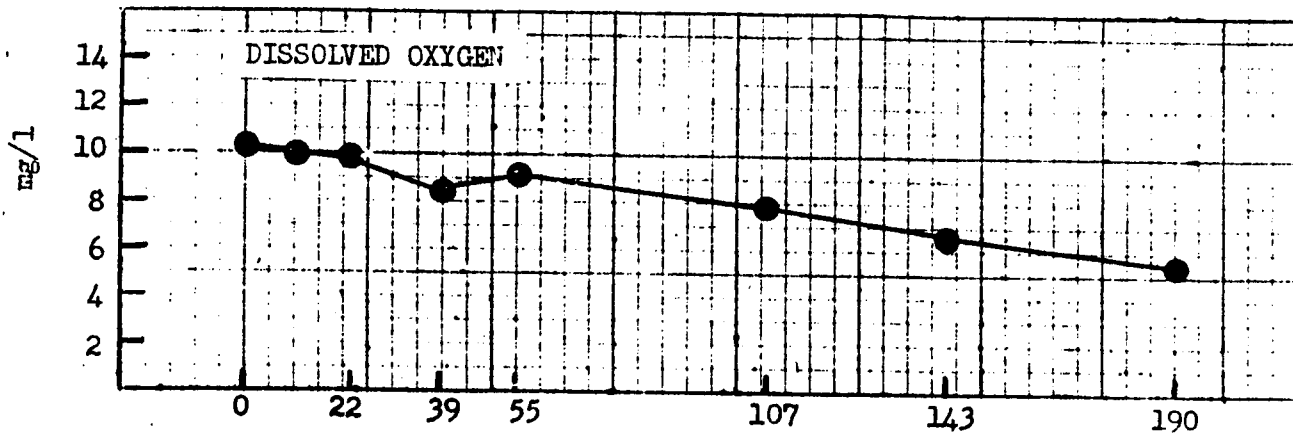
NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

FEB. 4,5,6, 1969





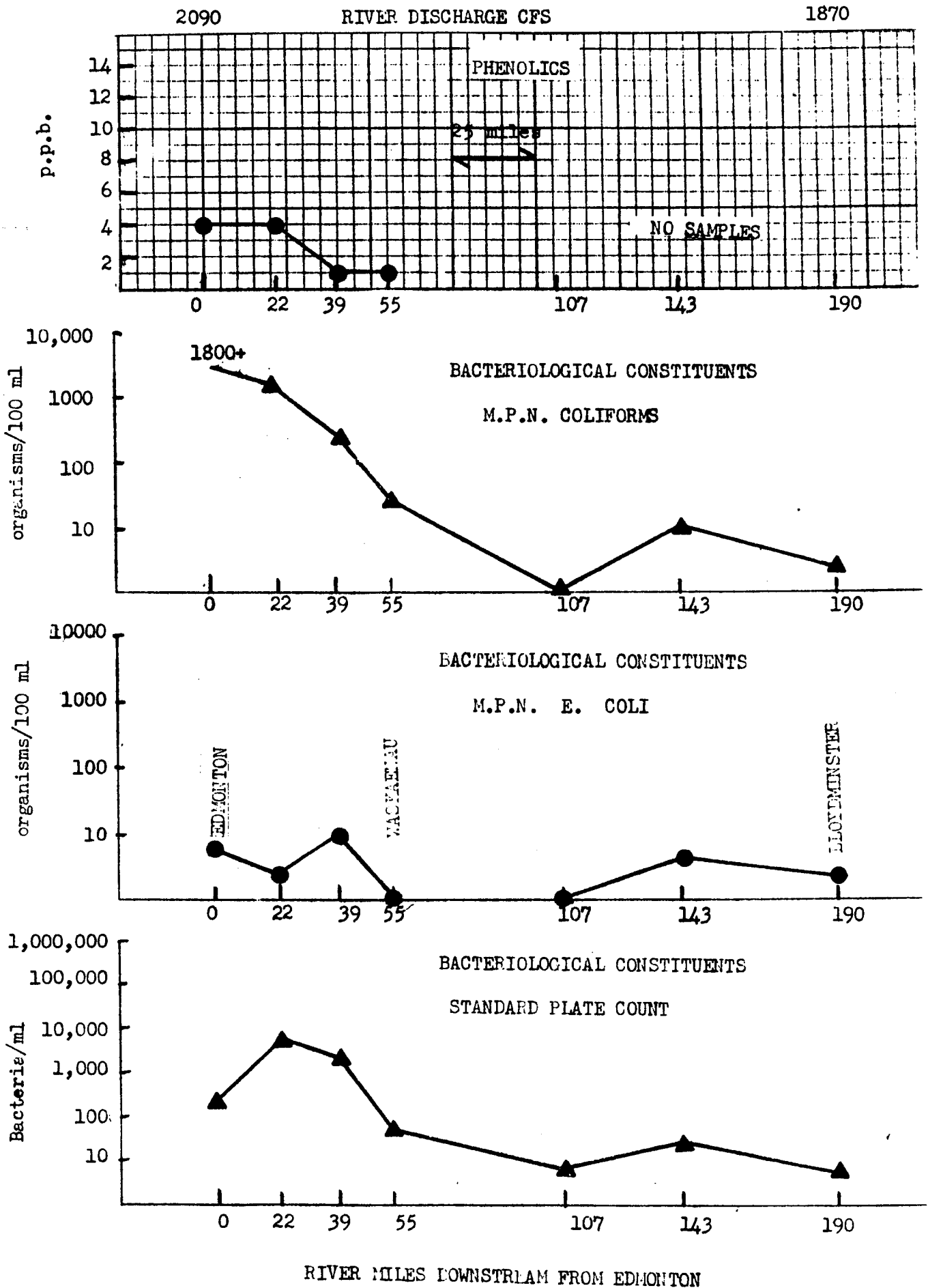
NORTH SAKATCHEWAN RIVER SAMPLING RESULTS FEB. 26, 1969



RIVER MILES DOWNSTREAM FROM EDMONTON

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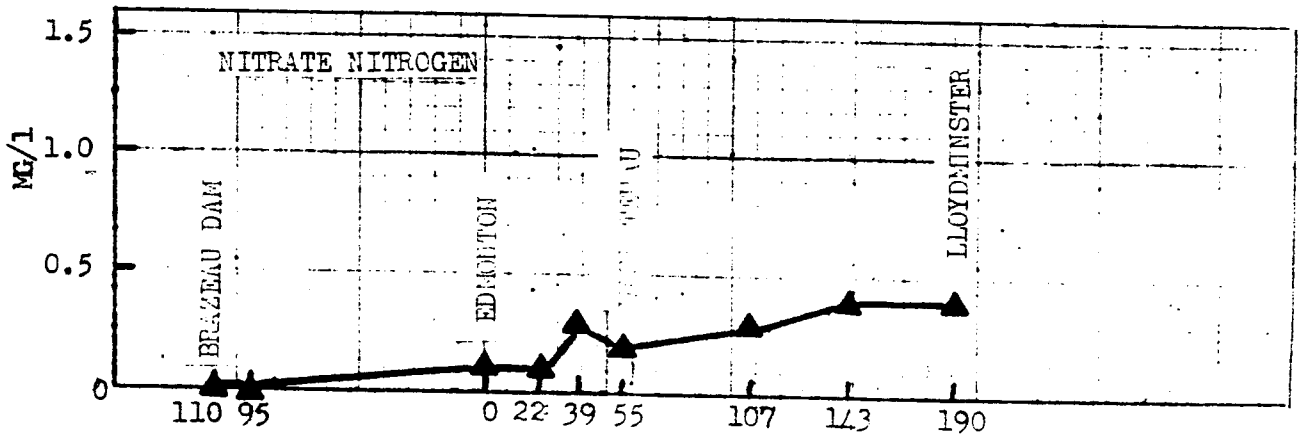
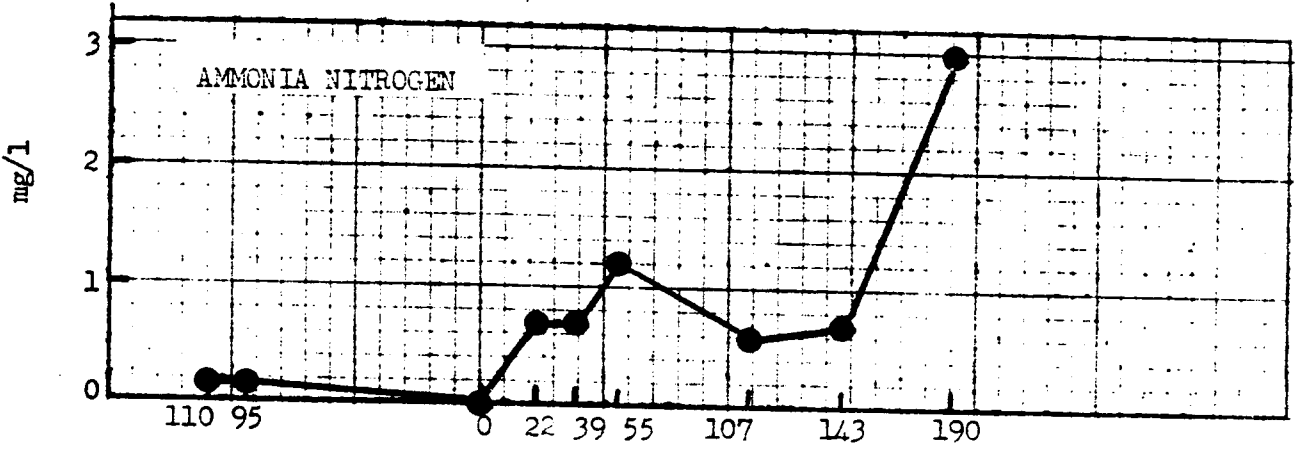
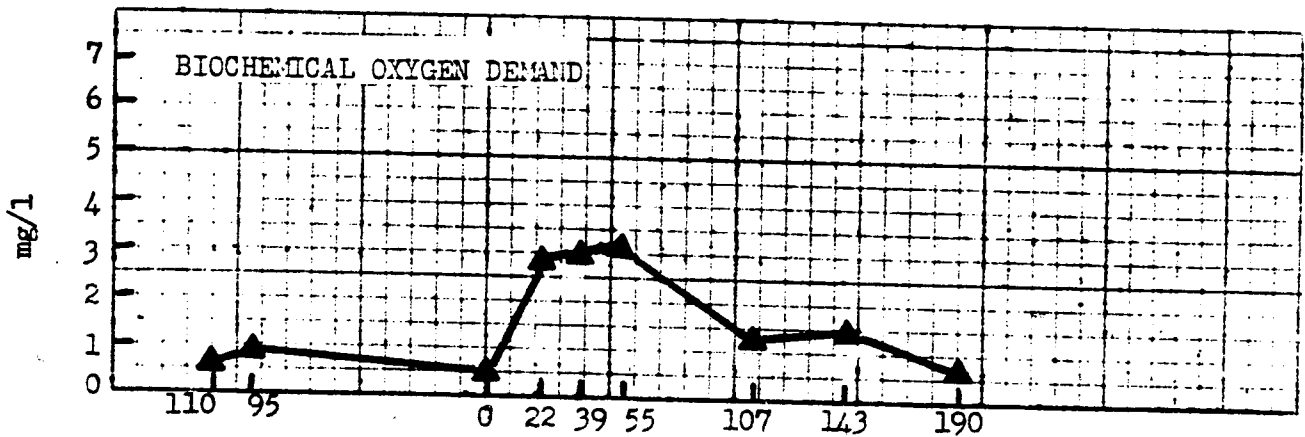
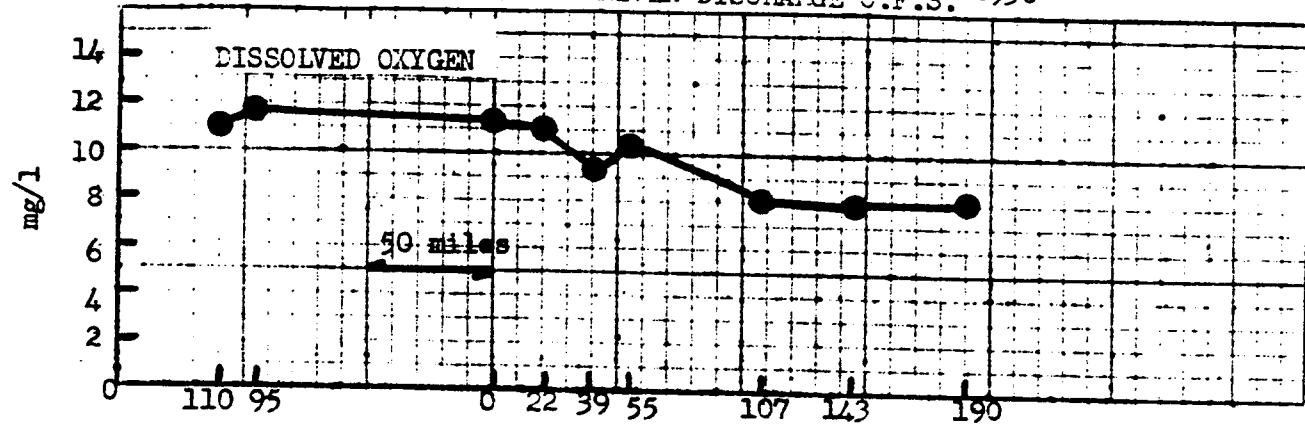
FEB. 26, 1969



1490 - - - - - 2340 - RIVER DISCHARGE C.F.S. - 1930

NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

March 19, 1969



MILES DOWNSTREAM FROM EDMONTON

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NORTH SASKATCHEWAN RIVER SAMPLING RESULTS

March 19, 1969

