

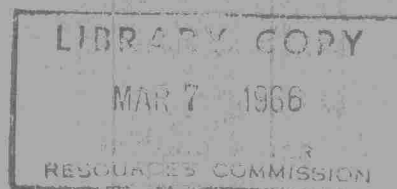


THE
ONTARIO WATER RESOURCES
COMMISSION
INDUSTRIAL WASTE SURVEY
of the
TOWN OF COBOURG

September - November, 1965

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A
REPORT ON
AN INDUSTRIAL WASTES SURVEY
of
THE TOWN OF COBOURG

September - November, 1965

by
Division of Industrial Wastes
ONTARIO WATER RESOURCES COMMISSION



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AN INDUSTRIAL WASTES SURVEY OF

THE TOWN OF COBOURG

September - November, 1965

At the request of the municipality, an industrial wastes survey was carried out in the Town of Cobourg during September of 1965. A similar survey was conducted in May, 1961. The aims of this municipal survey were:

- a) to determine the nature and quantity of industrial wastes discharging to the sanitary sewers, storm sewers, and natural watercourses in the municipality.
- b) to determine whether the waste characteristics of these discharges are within the OWRC recommended objectives for discharge to sanitary sewers, storm sewers, and natural watercourses and,
- c) to indicate, where necessary, the need for pretreatment and/or control measures to bring waste quality within the recommended objectives.

SUMMARY

It is recommended in this report that a number of industries install pretreatment facilities to reduce their waste discharges to the sanitary sewer. This should also reduce some of the daily operating problems presently being experienced at the municipal treatment plant.

The following six industries were found to contribute significantly to sewage plant loading and natural watercourse contamination. Industries that use water only for sanitary purposes are not included in this report. Based on the analytical results of the sampling programme, the following remarks, pertaining to waste quality at various industries, can be made:

1. Curtis Products

This Company discharges wastes to the municipal sanitary sewerage system which contain excessive amounts of chromium, nickel, and copper.

2. General Wire & Cable

Plant No. 1 on William Street has sanitary waste discharging to the Cobourg Creek. (This problem is presently receiving the attention of the Chief Public Health Inspector of the Durham-Northumberland Health Unit.

Plant No. 2 discharges an effluent to an open ditch which contains wastes having a low pH and a high iron content. Wastes containing high concentrations of iron and zinc are also discharged to the sanitary sewer.

3. Winchester-Western

This Company discharges rinse water from copper plating operations to the sanitary sewer containing high concentrations of copper.

4. General Foods

The wastes are high in BOD only. Fine screens installed to treat the rice process wastes have reduced the concentration of suspended solids to within acceptable limits for discharge to the sanitary sewer.

5. Robson-Lang Tannery

The effluents from this tannery contain excessive amounts of suspended solids, BOD, hair, grease, chromium, and varsol. Also, a number of waste streams have a high pH value.

It was recommended in 1961 that the Company implement equipment changes, where necessary, in order to improve effluent quality. However, no changes have been made to date. Therefore, it is recommended that the municipality take the necessary steps to ensure that the Company provides adequate pretreatment facilities to produce a satisfactory effluent for discharge to the sanitary sewer system.

6. United Finish Company Limited

This Company should make changes in the existing holding tanks to eliminate the discharge of the viscous white cellulosic material to the sanitary sewer.

7. Cobourg City Dairy and Fisher Dairy

These Companies discharge their wastes to the sanitary sewerage system and do not pose any problem at this time.

8. Bird Archer, Canadian General Electric and Winchester-Western Plant No. 1

The wastes from these industries do not contribute significantly to sewage plant loading or to natural watercourses contamination.

DETAILS OF SURVEY

All major industries in the Town of Cobourg were surveyed. Prior to setting up a sampling programme at an industry, company personnel were interviewed and a plant tour arranged. At this time, a general inspection was made of the various processes to determine the sources and nature of the wastes. If sampling appeared to be necessary, suitable locations and schedules were determined for the sampling programme.

Water consumption figures for each industry were obtained from the Cobourg Public Utilities Commission. Flow measuring techniques were used in some cases to obtain estimates of specific waste volumes.

During the actual sampling of specific plant wastes, composite or grab samples were taken to determine the nature and quality of the effluent. The samples were collected in 40-ounce bottles and sent to the Ontario Water Resources Commission Laboratory in Toronto to be analyzed for selected waste

characteristics as set down in "Standard Methods for the Examination of Water and Wastewater," twelfth edition.

Sewage Treatment

Sanitary sewage, and a major portion of the industrial waste flows in the Town, are discharged via the sanitary sewerage system to the municipal water pollution control plant. Treatment at this plant consists of primary screening, primary settling, sludge digestion, trickling filtration, final settling and effluent chlorination.

A summary of the operating results for the period from January 1 to September 1, 1965 is given in the following table.

	<u>Average</u>	<u>Maximum</u>	<u>Minimum</u>
Design capacity (mgd)	1.5		
Daily flow (mgd) (March to August)	1.4	2.2	
Influent BOD (ppm)	425.	1040.	140.
Effluent BOD (ppm)	83.	360.	6.
BOD removal efficiency (%)	81		
Influent Suspended Solids (ppm)	760.	3066.	196.
Effluent Suspended Solids (ppm)	85.	88.	14.
Suspended Solids removal efficiency (%)	89		
Influent Chromium concentration (ppm)	11.3	18.	
Influent pH		11.8	6.7

The Cobourg Water Pollution Control Plant is operating at close to its hydraulic capacity as indicated by the average daily flow recorded. However, there are periodic hydraulic overloads during the daytime period. The

BOD and suspended solids concentrations of the influent are considerably greater than the accepted design figures for sanitary sewage flows. This has resulted in numerous operating problems at the plant.

Apart from the BOD and suspended solids consideration, the following constituents in the raw sewage influent have also created operating problems at the plant:

- a) the presence of large pieces of leather which have continually clogged the bar screens.
- b) the presence of hair and fleshings which cause matting on the revolving screen and results in frequent cleaning of this device by plant personnel.
- c) floating grease and varsol which result in periodic operating problems at the plant caused by fouling of mechanical equipment and interference with biological processes.

The above-mentioned operating problems at the municipal plant are the result of the presence of wastes which are characteristic of a tannery effluent. Sampling carried out at the Robson-Lang Tannery indicates that excessive amounts of leather, hair, grease, etc., are being discharged from the tannery.

The following table compares the design waste loadings of the plant with those which are presently being received:

	<u>Design</u>	<u>Present</u>	<u>Overloading (%)</u>
Hydraulic loading (mgd)	1.5	1.4	
BOD loading (lb/day)	3800.	5,950.	57
Suspended Solids loading (lb/day)	3800.	10,600.	179

The above table clearly illustrates that the BOD and suspended solids loadings are considerably greater than the design capacity of the plant.

TABLE I

RECOMMENDED MAXIMUM LIMITS FOR DISCHARGE OF INDUSTRIAL WASTES TO
SANITARY SEWERS, STORM SEWERS AND NATURAL WATERCOURSES

	<u>Sanitary Sewer</u>	<u>Storm Sewer or Natural Watercourses</u>
BOD	300 ppm	20 ppm
Suspended Solids	350 ppm	20 ppm
pH	5.5-9.5	5.5-9.5
Ether Solubles		
a) Animal Origin	100 ppm	A combined value of
b) Mineral Origin	10 ppm	15 ppm
Chromium as Cr	3 ppm	1 ppm
Cyanide as HCN	2 ppm	0.1 ppm
Zinc as Zn	not established	15 ppm
Iron as Fe	" "	17 ppm
Copper as Cu	1 ppm	3 ppm
Cadmium as Cd	not established	1 ppm
Nickel as Ni	" "	1 ppm
Sulphate as SO ₄	" "	1500 ppm
Phenolic Equivalents	50 ppb	20 ppb

TABLE II

SUMMARY OF INDUSTRIES DISCHARGING TO THE MUNICIPAL

SANITARY SEWER AND STORM SEWER

Company	Discharge of Wastewater in GPD		Remarks
	Sanitary Sewer	Storm Sewer or Open Watercourse	
Bird-Archer	2,200		Wastes are mainly cooling and wash-up water, and the quality is satisfactory for continued discharge.
Canadian General Electric	6,000	134,000	The storm sewer effluent consists of uncontaminated cooling water, which is satisfactory for discharge to the creek.
Curtis	35,000		The plating room rinse water was found to have excessive concentrations of nickel, copper and chromium.
General Foods	172,000		Wastewaters are characterized by high concentrations of BOD.
General Wire and Cable Plant #1 - (William St.)	2,500	112,500	The cooling water to the creek is relatively uncontaminated. The plant washrooms which now discharge to the creek should be directed to the sanitary sewer.
Plant #2 - (Prince St.)	10,000	160,000	The pickling room rinse water is discharged to a ditch behind the plant. This waste is characterized by low pH and high concentrations of iron and zinc.

... continued

TABLE II (continued)

Company	Discharge of Wastewater in GPD		Remarks
	Sanitary Sewer	Storm Sewer or Open Watercourse	
Robson-Lang	130,000		The sanitary sewer discharge has excessively high concentrations of BOD, suspended solids, hair and leather pieces.
United Finish	3,900		The plant effluent was characterized by a high concentration of viscous cellulose ester, which could have a clogging effect on the sewers.
Winchester- Western Plant #1	13,000	1,000	The plant effluent on the day of sampling had a high pH value.
Plant #2	4,000		Only source of contamination originates in the copper plating section where a small volume of rinse water becomes contaminated with copper.
Fishers Dairy	11,700		With good housekeeping and in-plant control, the wastes are satisfactory for discharge to the sanitary sewer.
Cobourg City Dairy	5,500		

TABLE III

SUMMARY OF ANALYTICAL RESULTS*

All analysis except pH and phenol reported in ppm

Name	BOD	Susp. Solids	pH at Lab.	Total Chromium as Cr	Nickel as Ni	Copper as Cu	Cyanide as HCN	Iron as Fe	Phenol in ppb	Ether Solubles	Zinc as Zn	Aluminum as Al
Bird-Archer Company Ltd.		110	7.7									
Canadian General Electric	11.	56	7.8						100			
(1)	2.6	7	8.5						4			
Curtis Products		83	8.0	43.	22	1.1	0.5					
General Foods William St.	480.	214	4.4									
Ontario St.	120.	95	6.1									
General Wire and Cable Plant #1	10.	35	4.0					40	35		450	
(1)	1.6	50	7.3						40			1.5
Plant #2 (2)		17	6.8					80	0			

..... continued

TABLE III (continued)

All analysis except pH and phenol reported in ppm												
Name	BOD	Susp. Solids	pH at Lab.	Total Chromium as Cr	Nickel as Ni	Copper as Cu	Cyanide as HCN	Iron as Fe	Phenol in ppb	Ether Solubles	Zinc as Zn	Aluminum as Al
Robson-Lang Tannery												
Plant #1	550.	802	5.9	1.0							136	
Plant #2	1,300.	5,000	11.0	2.0							40	
United Finish Company												
	6,400.	44	6.5								57	
Winchester-Western												
Plant #1	16.	71	11.0					5.5	8		28	
Plant #2	6.	2	8.9			72	0.9					
Cobourg City Dairy												
	14,000.	7,240	5.3	(grab samples)								
Fishers Dairy												
	2,000	456	11.2	(grab samples)								

*All discharges to sanitary sewer except (1) to Cobourg Creek
(2) to storm sewers.

TABLE IV

SUMMARY OF WASTE LOADINGS (\pm 10%) BEING DISCHARGED TO THE SANITARY SEWER

Industry	Flow in GPD	Waste loadings in lb/day									
		BOD	Susp. Solids	Cyanide as HCN	Chromium as Cr	Nickel as Ni	Copper as Cu	Aluminum as Al	Iron as Fe	Ether Solubles	Zinc as Zn
Bird-Archer	2,200	Industrial waste loading not significant									
Canadian General Electric	6,000	Industrial waste loading not significant									
Curtis Products	35,000	2.5	36.	0.5	10.2	6.2	0.3				
General Foods Ontario St.	16,000	19.	15.								
William St.	156,000	750.	334.								
General Wire and Cable Plant #1	2,500	Industrial waste loading not significant									
Plant #2	10,000	3.5	15.						3.		35
Robson-Lang Leather Goods Plant #1	26,000	143.	208.		0.26					35.	
Plant #2	104,000	1350.	5050.		1.7					37.	

..... continued

TABLE V

SUMMARY OF WASTE LOADINGS ($\pm 10\%$) BEING DISCHARGED TO AN OPEN WATERCOURSE OR TO A STORM SEWER

Waste loadings in lb/day

Industry	Flow in GPD	BOD	Susp. Solids	Aluminum as Al	Iron as Fe	Zinc as Zn	Ether Solubles
Canadian General Electric	134,000	4.	10.				
General Wire and Cable Plant #1	112,500	0.8	30.	0.9			
Plant #2	160,000	1.6	90.		160	1.5	
Winchester- Western Plant #1	1,000	0.03	0.13				0.04

BIRD-ARCHER COMPANY LIMITED

This Company, located on Albert Street, was visited on September 17, 1965.

DETAILS OF SURVEY

<u>Personnel Interviewed</u>	- Mr. H. L. Graves, Plant Manager
<u>Number of Employees</u>	- 44
<u>Operating Schedule</u>	- 8 hours per day 5 days per week

Plant Operations

The processing operations at this Company involve formulation of water treatment chemicals. At the end of each week, the mixing area is washed down with water. Inspection of the mixing area late in the week showed no appreciable amounts of solid chemical waste. It was estimated that possibly a few pounds of compound gain access to the sanitary sewer during wash up. These chemical compounds contain phosphates, nitrates and chromates.

Carboys containing phosphoric acid are rinsed out and rinse waters are collected in a holding tank. This acidic waste is neutralized before discharge to the municipal sanitary sewer.

Liquid wastes and cooling waters arising from the operation of an air compressor are discharged to the municipal sanitary sewer.

Analytical Results

All analysis in ppm except pH Date Sampled: September 17, 1965.

Source of Waste	Solids		pH	Acidity as CaCO ₃	Alkalinity as CaCO ₃
	Total	Susp. Diss.			
Effluent from neutralization pit.	2204	110 2094	7.7	-	1120

CONCLUSIONS

The pH of the waste following neutralization is within the acceptable range for discharge to the municipal sanitary sewer.

The wash-up water should not have any adverse affect on the operation of the water pollution control plant as waste losses in the foundation area are small.

CANADIAN GENERAL ELECTRIC COMPANY LIMITED

This Company, located on 755 Division Street, was visited on September 10, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. C. Drury, Plant Engineer
- Mr. E. J. Hurtubise, Superintendent of Utilities

Plant Operation

Plant operation is essentially the same as described in the last survey conducted in 1961. However, production volume has increased.

Production and Operating Data

Production involves injection moulding of plastics and the coating of wire by extrusion with polyvinyl chloride, polyethylene, etc.

Operating schedule - 24 hours per day
6-7 days per week

Number of employees - 250-300

Raw material - polyethylene, polyvinyl chloride, bakelite, etc.

Water Consumption and Distribution

Supply - Cobourg Public Utilities Commission

Quantity - 140,000 gpd (Average over 8 months)

Domestic - 6,000 gpd (Approximately)

Cooling Water - 134,000 gpd

Total - 140,000 gpd

Sources of Waste and Disposal Thereof

All sanitary sewage and condensate from the moulding machines (phenolic wastes) are discharged to the sanitary sewer.

The cooling waters from the injection moulding machines, extruders and cooling baths are discharged to a storm sewer which empties into a creek behind the Company.

Sampling Programme

Six-hour composite samples of (a) the combined cooling waters in the storm sewer and (b) the sanitary sewer were taken. The composite samples were made up of individual samples taken at half-hourly intervals.

Analytical Results

Discharge Location	BOD	Solids			pH	Phenol
		Total	Susp.	Diss.		
Sanitary Sewer	11.	294	56	238	7.8	100
Storm Sewer to Creek	2.6	266	7	259	8.5	4

All concentrations are in parts per million (ppm) except phenol which is expressed in parts per billion (ppb).

DISCUSSION OF RESULTS

The analytical results show that the waste streams sampled are satisfactory for discharge to the sanitary and storm sewers, respectively. A concentration of 100 ppb phenol will be sufficiently diluted in the sanitary sewer system and therefore, should not cause any problems.

CONCLUSIONS

Wastes from this plant should not create any operating problems at the municipal pollution control plant.

CURTIS PRODUCTS LIMITED

This Company, located at 495 Ball Street, was visited on September 10, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. N. Cant, Production Manager

Plant Operations

The Company manufactures office furniture. Operations are divided in four separate sections. These are:

- 1) the metal working shop
- 2) the wood working shop
- 3) the washing booth and painting area
- 4) the plating room.

Metal shop operations consist of cutting, bending, welding and polishing of the metal components. The wood working and the metal working shops are dry operations.

The metal furniture is either painted or plated. Prior to painting, the furniture components are washed and rinsed to remove oxides from the bare metal surfaces, and then dried. All metal furniture which is not painted is plated with protective coatings of copper, nickel, and chromium.

Production and Operating Data

Operating schedule - 16 hours per day
5 days per week

Number of employees - 150 (approximately)

Water Consumption and Distribution

Supply	-	Cobourg P.U.C.
Sanitary	-	3,500 gpd
Process - Plating	-	23,000 gpd
Other	-	8,500 gpd
		<hr/>
Total	-	35,000 gpd

Sources of Liquid Wastes

The major source of contaminated wastewater is from the plating shop, and this waste flow is discharged continuously to the sanitary sewer.

The remaining waste flows result from batch discharges of alkali cleaner solution and electrolytic cleaner solution, recirculated water from paint spray curtains, and water from the washing booth. All these liquid wastes are discharged to the municipal sanitary sewerage system.

Sampling Programme

A six-hour composite sample (20 minute sampling intervals) was taken of the total plating room effluent from 10:00 am to 4:30 pm. In addition, the following grab samples were obtained:

1. the water used in the paint spray curtain.
2. the initial spray water prior to painting.
3. the final spray water prior to painting.
4. the alkali cleaner solution.
5. the electrolytic cleaner solution.
6. the acid dip (not discharged).

CURTIS PRODUCTS - COBOURG

ANALYTICAL RESULTS

Date Sampled: September 15, 1966

All analyses in ppm except pH

Sample No.	5-Day BOD	Solids		pH	Acidity as CaCO ₃	Alkalinity as CaCO ₃	Copper as Cu	Nickel as Ni	Chromium as Cr		Cyanide as HCN	
		Total	Susp.						Diss.	Cr		Cr
1	1200	12,846	889	11,957	9.6	0.0	7,198.	2.2	0.0	3.5	3.0	0.0
2	36	1,606	22	1,584	4.1	616.	0.0	0.1	0.0	130.	60.	0.0
3	70	11,320	210	11,110	5.5	0.0	239.	0.2	1.8	11.	0.	1.7
4	70	125,470	936	124,534	1.0	36,400.	0.0	9.0	150.	0.0	0.0	0.7
5	52	85,476	103	85,373	12.0	0.0	66,080.	17.	0.0	50.	20.	0.0
6	195	76,324	279	76,045	12.0	0.0	60,600.	24.	4.8	4.	3.	0.0
7	-	468	83	383	8.0	0.0	81.	1.1	22.	38.	5.	0.5
8	-	356	26	330	7.6	0.0	79.	1.0	28.	7.	5.	0.0

- 1 Recirculating water in the paint spray booth - grab sample at 11:00 am
- 2 ~~First stage~~ of spray unit - grab sample at 11:00 am
- 3 Rinse water or second stage of spray unit - grab sample at 11:00 am
- 4 Acid dip (not discharged) - grab sample at 11:00 am
- 5 Electrolytic Cleaner Solution - grab sample at 11:00 am
- 6 Spent soap - alkali cleaner solution - grab sample at 11:00 am
- 7 Plating room effluent - composite - 10:00 - 4:30 pm
- 8 Plating room effluent - composite - 1:30 - 4:30 pm

WASTE VOLUMES

On the day of the survey, the volume of rinse waters discharged from the plating room was estimated at 23,000 gpd. Volume estimates and dumping frequencies for the batch discharges are as follows:

Paint spray booth	- 700 gal. every 2 weeks
Initial spray	- 600 gal. once/month
Electrolytic cleaner	- 800 gal. once/month
Alkali cleaner	- 600 gal. once/month.

DISCUSSION OF RESULTS

The analytical results show that the plating room effluent contains high concentrations of nickel and chromium (25 and 23 ppm, respectively), which exceed the objectives recommended in Table I for discharge to a sanitary sewer. The concentrations of copper and cyanide in the plating room effluent, if representative of normal operating conditions, are satisfactory for discharge to the sanitary sewer.

There are a number of other wastes which are dumped on a batch basis at frequencies of up to once per month. Some of these were found to contain high concentrations of chromium (130 ppm in first stage spray unit, and 50 ppm in electrolytic cleaner solution). Other waste solutions have extreme pH values. The recirculated water from the paint spray curtain has a very high concentration of BOD and suspended solids (1200 ppm and 889 ppm, respectively).

CONCLUSIONS AND RECOMMENDATIONS

While the total amount of toxic metal ions discharged to the sanitary sewerage system is low, there are other sources of these contaminants (in par-

ticular, chromium) in the municipality. Therefore, it is recommended that the Company endeavour to study the operation in the plating room in an attempt to reduce, by the implementation of good housekeeping practices, the amounts of nickel and chromium that are being discharged.

Furthermore, the practice of batch dumping of wastes should be discouraged, and it is recommended that, as an alternative, these wastes be discharged slowly over a period of hours. With this practice, these wastes should then be sufficiently diluted with other plant wastes to a level satisfactory for discharge to the sanitary sewerage system. If controlled discharge is not possible, then facilities should be installed to treat these wastes prior to discharge to the sanitary sewer.

Implementation of these recommendations is desirable to prevent retardation of biological activity at the municipal WPCP due to toxic wastes.

GENERAL FOODS LIMITED

General Foods Limited, located at 520 William Street, was visited on September 29, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. H. C. Gibson, Plant Manager

Plant Operations

General Foods manufacture and package cereals, rice, dog foods and such brand name products as "Certo" and "Jello". In general, the manufacturing operations consist of washing, cooking and drying.

Company officials estimate that, at present market demands, the "Minute Rice" and the "Certo" processing operations are carried out 6 and 3 months per year respectively. A new process for the production of a dog food product is scheduled to start in December, 1966.

Production and Operating Data

Operating schedule - 24 hours per day
5-6 days per week

Number of employees - 600

Water Consumption and Distribution

Supply - Cobourg P.U.C.

Water Consumption - 172,000 gpd

Process effluent to: Ontario Street Sanitary Sewer - 16,000 gpd
William Street Sanitary Sewer - 156,000 gpd

Total - 172,000 gpd

Source of Waste

- 1) The following wastewaters are discharged to the Ontario Street sanitary sewer:

Process waste from the "Certo" building first floor.

Process waste from the Gaines dog food area.

Sanitary wastes from the research laboratory.

Cooling water from the air conditioning units.

Cooling water from the air compressors.

- 2) The following wastewaters are discharged to the William Street sanitary sewer:

Sanitary wastes from the "Jello" area.

Sanitary waste from the office area.

Process wastes and wash-up water from the rice and cereal building.

Waste Treatment

The wastewaters from the rice and cereal operations (including the water for wash-up in these areas) are screened with a 20 mesh Sweco Screen prior to discharge to the William Street sanitary sewer.

The wash water from the manufacture of the new dog food product, "Gainesburger," will also be screened to remove meat particles prior to discharge to the Ontario Street sanitary sewer.

Sampling Programme

- 1) Composite samples from the rice and cereal operations (Manhole No. 1) were taken between 10:00 am - 1:30 pm and 1:30 pm - 4:30 pm.
- 2) Composite samples of all plant wastes directed to the William Street sewer (Manhole No. 2) were taken between 10:30 am - 1:30 pm and 1:30 pm - 4:30 pm.

- 3) Composite samples of all plant wastes directed to the Ontario Street sewer (Manhole No. 3) were taken between 10:00 am - 1:30 pm and 1:30 pm - 4:30 pm.
- 4) Composite samples from the storm sewers west of the warehouse (Manholes No. 4 and No. 5) were taken between 1:30 pm - 4:30 pm.

The composite samples were made up by taking equal portions at half-hourly intervals over the given time periods.

Analytical Results

All analyses in ppm except pH and phenol which is in ppb.

Date Sampled: September 14, 1965

Sample No.	5-Day BOD	Solids		pH	Acidity as CaCO ₃	Alkalinity as CaCO ₃	COD	Phenol	
		Total	Susp. Diss.						
1	660	1156	218	938	4.4	368	0.0	1490	-
2	560	732	206	526	4.4	364	0.0	1273	-
3	170	828	112	716	6.3	60	0.0	523	-
4	-	-	-	-	-	-	-	-	0
5	-	-	-	-	-	-	-	-	0
6	980	998	330	668	4.2	288	0.0	1692	-
7	400	642	222	420	4.3	316	0.0	1772	-
8	70	384	79	305	5.9	72	0.0	346	-

- 1 Effluent from rice and cereal operations, Manhole #1 - 10:00 am - 1:30 pm.
- 2 Plant effluent to William Street, Manhole #2 - 10:00 am - 1:30 pm.
- 3 Plant effluent to Ontario Street, Manhole #3 - 10:00 am - 1:30 pm.
- 4 Storm sewer outside the warehouse and shipping area - Manhole #4.
- 5 " " " " " " " " " - Manhole #5.
- 6 Effluent from rice and cereal operations - Manhole #1 - 1:30 pm - 4:30 pm.
- 7 Plant effluent to William Street - Manhole #2 - 1:30 pm - 4:30 pm.
- 8 Plant effluent to Ontario Street - Manhole #3 - 1:30 pm - 4:30 pm.

SUMMARY OF WASTE LOADINGS

<u>Sampling Location</u>	<u>BOD lb/day</u>	<u>Susp. Solids lb/day</u>	<u>COD lb/day</u>
Sanitary Sewer William Street	750.	334.	2,380
Sanitary Sewer Ontario Street	19.2	15.4	70

DISCUSSION OF RESULTS

The analytical results show that the plant wastes being discharged to the William Street sanitary sewer have a high BOD load, and a low pH value. The average BOD of the waste flow was 480 ppm, and the pH was 4.4. Samples of the rice process wastes indicate that this source is the major contributor to the BOD load and to the low pH. The recommended maximum limit for BOD is 350 ppm for discharge to a sanitary sewerage system. The recommended range for pH is between 5.5 and 9.5.

The daily waste load from General foods to the William Street sanitary sewer contains a total of 750 lb BOD when the rice process is in operation. This loading represents 19.8 percent of the design loading and 12.6 percent of the actual loading being received at the municipal WPCP. This waste loading figure was calculated using flow figures measured by means of the salt dilution method.

The average suspended solids concentration of 220 ppm is within the recommended maximum limit of 350 ppm for discharge to a sanitary sewer.

Wastes discharging to the Ontario Street sanitary sewer are within acceptable limits and do not pose any problems at this time.

CONCLUSIONS

The rice process effluent discharging to the sanitary sewerage system is high in BOD, and contributes significantly to the waste loadings at the municipal WPCP. These wastes also have a low pH value.

All other waste constituents were found to be within satisfactory limits for discharge to the sanitary sewer system.

RECOMMENDATIONS

Since the Town of Cobourg is studying an expansion of the present WPCP facilities, it is recommended that proper attention be given, in the design, to accommodate the wastes from General Foods. This type of waste is most effectively treated by biological means in a mixture with domestic sewage. Furthermore, it is recommended that General Foods and the Town of Cobourg meet to discuss the question of the application of surcharge to compensate for the high BOD load contributed by wastes from this industry.

GENERAL WIRE AND CABLE COMPANY LIMITED

This Company, located at 609 William Street, was visited on September 15, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. Reimer, Plant Manager (William Street)
- Mr. Szucks, Plant Manager (George Street)

Plant No. 1 - (William Street)

Plant Operations

This plant manufactures plastic coated wire and cable, and corrugated plastic sheets for construction purposes.

Copper and aluminum wire are drawn to obtain the correct gauge. The drawing operation is carried out in a mixed solution of cutting oil and soap which serves as a cleaner and lubricant. This wire is then extruded with an insulating plastic, such as polyvinyl chloride, to produce the plastic coated wire.

Production and Operating Data

Operating schedule - 24 hours per day
5 days per week

Number of employees - 100 (approx.)

Water Consumption

Source - Cobourg P.U.C.

Domestic - 2,500 gpd

Cooling Water - 112,500 gpd

Total - 115,000 gpd

Sources of Waste and Disposal

The William Street plant utilizes water mainly for cooling and domestic purposes. Cooling water is used in the extruders, injection moulding machines, and in the water bath after the wire drawing procedure. The cooling water and plant sanitary wastes are discharged directly to the Cobourg Creek. The sanitary wastes from the office and laboratory are discharged to the municipal sanitary sewerage system.

Sampling Programme

Grab samples were taken from the four outlet streams to the Cobourg Creek on September 13, 1965.

Analytical Results

All analyses in ppm except pH and phenol Date Sampled: September 13, 1965

Sampling Location	5-Day BOD	Solids			pH	Phenol (ppb)	Copper as Cu	Aluminum as Al
		Total	Susp.	Diss.				
North outlet to Creek	1.6	382	59	323	7.4	-	0.0	1.9
Second outlet to Creek from North	1.0	250	7	243	7.3	16	0.0	0.7
Third outlet to Creek from North	-	-	-	-	-	30	-	-
South outlet to Creek	-	-	-	-	-	80	-	-

DISCUSSION OF RESULTS

The cooling waters are relatively free of contamination. The suggested maximum concentration for phenol in water before discharge to an open watercourse is 20 ppb. The two outfalls at the south end of the plant contain

30 and 80 ppb phenol, respectively. This contamination probably originates in the cooling bath of the wire drawing section.

During the survey, it was suspected that one of the plant washrooms was connected to the storm sewer discharging to the creek. Subsequent sampling and bacteriological examinations confirmed this suspicion.

CONCLUSIONS AND RECOMMENDATIONS

The cooling waters would be suitable for discharge to an open watercourse if the phenol concentrations were lower. It is recommended that the industry study the possibility of eliminating the contact between the cooling water and the wire after drawing.

An employees' washroom was found to be connected to the storm sewer system. This matter was referred to the local health unit for further action.

Plant No. 2 - (Prince Street)

Plant Operations and Sources of Waste

A description of the plant operation and sources of waste can be found in the Industrial Waste Survey report of November, 1964.

Water Consumption and Distribution

Source	-	Cobourg P.U.C.
Domestic	-	1,500 gpd
Process to Sanitary Sewer	-	8,500 gpd
Pickling Room to Ditch	-	160,000 gpd
Total	-	<u>170,000 gpd</u>

Sampling Programme

Composite samples were taken half-hourly from 10:00 am - 4:00 pm of the following flows:

- 1) pickling room effluent
- 2) sanitary waste east manhole
- 3) south manhole which contains the rinse from the galvanizing operation.

Grab samples were also taken of the lime tank, borax tank, and pickling solution.

GENERAL WIRE AND CABLE (PLANT NO. 2)

ANALYTICAL RESULTS

Date Sampled: September 15, 1965.

All analyses in ppm except phenol & pH.

Sample No.	5-Day BOD	Solids		pH	Acidity [†] as CaCO ₃	Alkalinity as CaCO ₃	Iron as Fe	Zinc as Zn	Copper as Cu	Phenol (ppb)	
		Total	Susp. Diss.								
1	280	130,816	1,146	129,670	<1.	146,000.	-	66	4.4	-	-
2	2	13,944	11,250	2,694	12.3	-	3,315.	260	0.0	-	-
3	45	28,974	176	28,798	9.2	0.0	10,630.	25	0.0	-	-
4	-	13,516	362	13,154	<1.	121,000.	0.0	5560	2.	-	-
5	-	796	17	779	6.8	0.0	88.	80	0.0	-	-
6	-	-	-	-	-	-	-	-	-	-	0.0
7	68	762	184	578	8.4	0.0	446.	11	74.	-	120.
8	-	2,952	10	2,942	3.4	1,070.	0.0	44	460.	-	16.
9	9	3,702	20	3,682	2.8	-	-	650	0.0	0.9	-

- 1 Pickling solution - grab sample at 3:00 pm.
- 2 Lime solution - grab sample at 3:00 pm.
- 3 Borax solution - grab sample at 3:00 pm.
- 4 Ditch - grab sample at 3:00 pm.
- 5 Pickling room effluent - composite sample - 10:00 am - 4:00 pm.
- 6 Pickling room effluent - composite sample - 10:00 am - 4:00 pm.
- 7 Sanitary sewer - east manhole - composite - 10:00 am - 4:00 pm.
- 8 Main sanitary sewer - south manhole - composite - 10:00 am - 4:00 pm.
- 9 Storm sewer containing the pickling rinse water at the outfall to the Cobourg Creek - grab at 12:00 noon

Waste Disposal

The spent borax and lime solutions are discharged every six weeks to a ditch, north of the plant. This ditch flows into a storm sewer which empties into Cobourg Creek at a point near the Cobourg WPCP. Spent pickle solution and pickle rinse waters are also discharged to the ditch. An acid reclaiming unit for the spent pickle liquor was not in operation at the time of this survey.

All other wastes are discharged to the sanitary sewer.

SUMMARY OF WASTE LOADINGS

<u>Sampling Location</u>	<u>Loadings in lb/day</u>			
	<u>BOD</u>	<u>Susp. Solids</u>	<u>Iron as Fe</u>	<u>Zinc as Zn</u>
Open Ditch	-	90	160	1.5
Sanitary Sewer	3.5	15	3	35.

The above waste loadings were calculated from the analytical results of the samples taken during the survey, and the following figures:

South sewer	-	8,500 gpd
East sewer	-	1,500 gpd
Open ditch	-	160,000 gpd

The above flow figures were obtained from flow measurements determined during the survey.

DISCUSSION OF RESULTS

The extremely low pH value (<1) of the ditch sample indicates that the spent pickle liquor was dumped just prior to the survey. This is further evidenced by the high concentration of iron (5560 ppm) in the ditch sample and

the low concentration of iron (66 ppm) in the fresh pickling solution. Even after considerable dilution in the storm sewer, this combined waste at the outfall to the creek showed a low pH (2.8) and a high iron concentration (650 ppm).

The presence of these wastes in the open ditch creates a potential health hazard as well as resulting in gross impairment of the aesthetic qualities of the receiving stream. Furthermore, the presence of these wastes in the sewer can result in a gradual deterioration of the concrete sewer pipes due to the low pH condition.

The spent lime solution has a high pH (12.3) and should not be discharged to the ditch.

CONCLUSIONS AND RECOMMENDATIONS

The sampling survey at General Wire and Cable, Plant No. 2, revealed that this plant discharges wastes to an open ditch at the rear of their property containing concentrations of contaminants and exhibiting characteristics well above and outside the limits and ranges set out in Table I of this report.

It is recommended that this industry discharge these wastes to the sanitary sewer system. The wastes, however, should be pretreated to within the pH limits of 5.5 to 9.5. Monitoring equipment should be a prerequisite of any neutralization facility that is installed. Furthermore, it is recommended that the suspended solids in the effluent be maintained below 350 ppm.

ROBSON-LANG LEATHERS LIMITED

This plant, located on Alice Street, was visited on September 21, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. R. Canham, Plant Manager
 - Mr. S. Shavis, Technical Superintendent

Plant Operations and Processes

Plant processes and operating procedures have not altered significantly from those described in the Commission report of June, 1961.

A comparison of production volumes in 1961 and in 1965 is given in the table below.

	<u>1961</u>	<u>1965</u>
Cattle hides (sides per day)	650	1000
Sheep skins (dozen per day)	130	400 while in production.

Briefly, the processes and operations involved in the production of various types of leathers are as follows:

Dehairing

The hides are dehaired in a sulphiding solution for a period of 7 or 8 hours. This process dissolves the hair from the hide and removes the dirt, dung and soluble protein.

Fleshing

After dehairing and washing, the hides pass over rotating knives in the defleshing machine.

Bating

In this operation, the hides are treated in a pancreatic enzyme solution which removes excess lime, undesirable proteins and prepares the hide for tanning.

Pickling

This involves treatment of the hides with a 6 percent solution of sodium chloride and sulphuric acid.

The preceding operations all take place in what is known as the Beam House, while the actual tanning and finishing operations are conducted in the Tan Yard.

Chrome Tanning

After pickling, the hides are tanned in revolving drums containing a trivalent chromium-base tanning liquor. Following chrome tanning, the hides are rinsed and neutralized with sodium bicarbonate in a second series of drums.

Finishing

The hides are then shaved and introduced to the finishing drums. Here the hides are washed with running water, dyed, and treated with oils.

Production and Operating Data

Operating schedule	-	9 hours per day 5 days per week
Number of employees	-	130 (approx.)

Water Consumption and Distribution

Source	-	Cobourg P.U.C.
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Domestic	-	2,000 gpd
Process - Plant No. 1	-	26,000 gpd
Plant No. 2	-	102,000 gpd
		<hr/>
Total	- -	130,000 gpd

The average daily water consumption was calculated from the P.U.C. records over the first 8 months in 1965.

Sources of Waste and Disposal

- a) Plant No. 1 - discharges to the Clare Street Sanitary Sewer
- dumping of the final varsol and brine grease extraction solution
 - condenser water and water separated from the varsol recovery process
 - spent colour and oil mixtures
 - rinse wastes associated with the colouring and tanning operations
- b) Plant No. 2 - discharges to the Alice Street Sanitary Sewer
- water from green hide washing
 - spent soak solutions
 - overflows and rinses from the sulphiding wash
 - the pre-washing and post-washing wastes in connection with the the bating step
 - spent pickle solution
 - spent chrome tanning solutions
 - hose water used in rinsing out empty tanks, floors, etc.

Waste Treatment

The waste treatment facilities at the Company are primarily intended to remove hair and the large particles from the waste flows. There is a vibrating screen in Plant No. 2 intended to achieve this end.

Wastes from Plant No. 1 pass through two tanks which serve as grease separators. Coarse bar screens are mounted in one of these tanks to prevent

large particles gaining access to the sanitary sewer. The grease and varsol extractions are pumped to a holding to a holding tank.

Sampling Programme

Composite samples were composed by taking grab samples every half hour over the given times.

a) Points of Composite Sampling:

1. Plant No. 1 effluent between the hours - 7:00 am - 9:00 am
10:00 am - 12:30 pm
1:00 pm - 3:30 pm
2. Plant No. 2 effluent between the hours - 7:00 am - 9:00 am
10:00 am - 12:30 pm
1:00 pm - 3:30 pm
3. Tanning Room effluent (Plant No. 2) - 8:00 am - 12:00 pm

b) Points of Grab Sampling:

1. Sulphide wash
2. Bate wash
3. Brine wash
4. Spent chrome solution

These samples were submitted to the OWRC Laboratory for analysis.

ROBSON-LANG LEATHERS LIMITED

ANALYTICAL RESULTS

Date Sampled: September 20 & 21, 1965 *

All analyses in ppm except pH.

Sample No.	5-Day BOD	Solids		pH	Acidity as CaCO ₃	Alkalinity as CaCO ₃	Chromium as Cr	Nitrogen Kjeldahl	Ether Solubles	Sulphate as SO ₄	
		Total	Susp.								Diss.
1	90	750	130	620	7.0	0.0	156.	0.8	1.7	29	-
2	78	836	138	698	6.7	0.0	111.	0.8	5.0	40	-
3	80	558	78	480	6.7	0.0	450.	1.0	6.6	42	-
4	1800	14,470	12,378	2,092	12.0	0.0	2960.	2.8	410.	26	-
5	1300	7,818	1,712	6,106	11.9	0.0	2040.	1.0	310.	19	-
6	840	5,334	742	4,592	9.4	0.0	1356.	1.2	160.	60	-
7	600	22,934	1,056	21,878	3.5	1560.	0.0	30.0	94.	394	-
8	9800	80,280	40,128	40,152	12.0	0.0	7160.	0.4	2555.	-	780
9	750	13,182	4,102	9,080	12.2	0.0	3740.	0.1	-	-	100
10	1100	6,484	1,190	5,294	12.2	0.0	2940.	0.04	-	-	87

*Sample Numbers 14, 16 and 17 were sampled September 21, 1965.
All other samples were obtained September 20, 1965.

..... continued

ANALYTICAL RESULTS (continued)

All analyses in ppm except pH

Sample No.	5-Day BOD	Solids		pH	Acidity as CaCO ₃	Alkalinity as CaCO ₃	Chromium as Cr	Nitrogen Kjeldahl	Ether Solubles	Sulphate as SO ₄	
		Total	Susp. Diss.								
11	200	2,380	216	2,164	12.1	0.0	1640.	0.04	-	-	62
12	750	11,894	576	11,318	9.0	0.0	1408.	0.0	-	-	6250
13	400	1,966	530	1,436	11.6	0.0	840.	0.04	-	-	56
14	560	105,404	282	105,122	1.9	1040.	0.0	0.5	-	51	3400
15	280	3,152	1,072	2,080	4.9	0.0	41.	0.8	20.	94	-
16	550	6,654	802	5,852	5.9	0.0	34.	0.0	7.	-	-
17	-	-	-	-	-	-	-	-	-	136	-

1, 2, & 3 Effluent from Plant #1 - 7:00 - 9:00 am, 10:00 - 12:30 pm, and 1:00 - 3:30 pm.
 4, 5, & 6 Effluent from Plant #2 - 7:00 - 9:00 am, 10:00 - 12:30 pm, and 1:00 - 3:30 pm.
 7 Spent chrome solution - grab sample at 8:05 am
 8, 9, 10, & 11 Sulphide wash - grab samples at 7:00 am, 7:30 am, 8:00 am and 8:50 am.
 12 Bate solution (pre-wash) at 7:35 am
 13 Bate solution (post-wash) at 9:00 am
 14 Brine wash - grab sample at 11:15 am
 15 Tanning room effluent - composite - 8:00 am - 12:00 noon
 16 & 17 Effluent from Plant #1 - composite - 7:00 am - 12:00 noon

SUMMARY OF WASTE LOADINGS

The waste loadings discharging to the sanitary sewers (Table II) are calculated from the analytical results of the sampling programme on September 21, 1965 and using an average daily flow of 130,000 gpd.

TABLE II

Source (Total Effluent)	Waste Loading lb/day				
	Flow gpd	BOD	Susp. Solids	Ether Solubles	Chromium
Plant No. 1	26,000	143	208	35	.26
Plant No. 2	104,000	1350	5050	37	1.7

DISCUSSION OF RESULTS

Based on the analytical results of this survey, the suspended solids load discharged by Robson-Lang Tannery to the municipal sewerage system is over 5,000 pounds per day. Hair and fleshings constitute the major portion of the suspended solids.

According to the sewage treatment plant personnel, there are continuous operating problems at the sewage plant as a result of tannery waste discharges. Some of the physical problems are listed below:

- (1) hair clogging of the primary rotating screen.
- (2) hide chunks clogging the screening bars for the raw sludge.
- (3) floating grease and varsol on the surface of the primary settling tank from time to time.

The composite sampling programme on the two sanitary sewers from 7:00 am - 3:30 pm gives representative analytical results for a normal operating day. For example; the sulphiding and bating rinses become less concentra-

ted over the period from 7:00 - 9:00 am. Confirmation of this can be seen from the analytical result sheet sample numbers 8-11 of the sulphiding wash, as the concentrations of suspended solids, BOD, sulphate, and alkalinity were found to decrease at a fairly constant rate.

The rates of flow in the sanitary sewers were estimated by a flow measuring technique on the first day of the two day sampling programme. The tanning operation in Plant No. 2 was not in operation September 20, and, as a result, the plant was re-sampled on September 21 in order to acquire a representative sample for analysis. The sheepskin tanning operation is carried out on a part time basis, so the flow figures were extrapolated from the waste flow measurements of September 20-21 to approximate the rate of flow.

RECOMMENDATIONS AND CONCLUSIONS

The Company's waste discharges to the sanitary sewers are extremely high in BOD and suspended solid concentrations. Some waste streams also have a high pH value. These concentrations are approximately the same as in the previous Commission Report (June, 1961).

As recommended in the previous report (recommendations which have not been adopted), the Company should take the necessary steps to:

- ensure that pH of the waste entering the sewer be maintained within the acceptable range of 5.5 to 9.5.
- eliminate the discharge of hair, hide chunks and fleshings to the municipal sanitary sewerage system.
- make changes in equipment or maintenance procedures to reduce concentrations of oil, grease and varsol lost to the sewerage system.

The Town and Company officials should meet and discuss the existing problems being encountered at the Water Pollution Control Plant, and ways and means of implementing the previous Commission recommendations on pretreatment of the tannery wastes.

UNITED FINISH COMPANY LIMITED

This plant, located on Alice Street, was visited on September, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. Mathews, Plant Manager

Plant Operations

The Company manufactures chemicals for industrial finishing purposes. Operations consist of the emulsification of raw materials in mixing tanks to produce various blends. The blended finishes are then packed and shipped.

Production and Operating Data

Operating schedule	-	8 hours per day 5 days per week
Number of employees	-	10
Raw materials	-	various organic solvents various organic compounds, including nitro-cellulose

Water Consumption and Distribution

Source	-	Cobourg P.U.C.
Domestic	-	300 gpd
Process and wash-up	-	3,600 gpd
Total	-	<u>3,900 gpd</u>

Sources of Waste and Disposal Thereof

Waste flows originate as the result of wash-ups carried out after each blending operation, and a general plant wash-down which follows each day's operation.

All liquid wastes from the plant are directed to a holding tank before being discharged to the municipal sanitary sewer. From the holding tanks, some of the organic wastes are reclaimed for resale purposes.

Sampling Programme

Two grab samples were taken from the sanitary sewer connection which contained the combined discharges from this industry.

Analytical Results

Date Sampled: September 21, 1965. All analyses recorded in ppm except pH.

5-Day BOD	pH	Alkalinity as CaCO ₃	Ether Solubles	COD	Solids			
					Total	Susp.	Diss.	
6400	6.5	98	57	24,542	290	44	246	dried
					192	0	192	ashed
					98	44	54	loss

White Viscous Material on Infrared Analysis

The emulsified material was removed from the wastewater by means of salting out and solvent extraction. The solvent was removed and the residue was examined by infrared spectroscopy. The infrared trace showed the presence of a soap and an ester. Separation gave a component that was a thin film. A melt cast was made of this material and its infrared spectrum obtained. Examination of this spectrum indicated the film was some type of cellulose ester.

DISCUSSION OF RESULTS

Before being discharged to the sanitary sewer, all the industrial wastes enter a settling basin situated outside the plant. On the day of

sampling, the sanitary sewer leading away from the plant was clogging with a white viscous material. An infra-red analysis of this material identified it as some type of cellulose ester. This waste was characterized by a high BOD and some ether soluble content.

CONCLUSIONS AND RECOMMENDATIONS

The Company should make an alteration in the settling basin to eliminate any carry-over of the white viscous material to the sanitary sewer.

WINCHESTER-WESTERN

Plant No. 1

This plant, located on Tremaine Street in Cobourg, was visited on September 17, 1965.

DETAILS OF SURVEY

Personnel Interviewed - Mr. Gillespie, Plant Manager

Plant Operations

This Company manufactures fire arms. Operations involve wood finishing of stocks and metal finishing of gun barrels. The steps involved in the latter operation include:

- (1) pickling with muriatic acid
- (2) degreasing with an "Oakite" cleaner
- (3) treatment of gun barrels with blueing salts
- (4) case hardening of gun barrels by carburizing in a high temperature furnace followed by a cyanide dip.

Production and Operation Data

Operating schedule - 24 hours per day
5 days per week

Number of employees - 170

Water Consumption and Distribution

Source - Cobourg P.U.C.

Domestic - 3,000 gpd

Process - 11,000 gpd

Total - 14,000 gpd

Sources of Waste

- (1) Sanitary sewage.
- (2) Rinse after "Oakite" cleaning.
- (3) Rinse after pickling with muriatic acid.
- (4) Rinse after blueing operation.
- (5) Cooling water.

All liquid wastes except for a small quantity of cooling water are discharged to the municipal sanitary sewer.

Sampling Programme

A sampling programme was conducted at the Company on September 17, 1965. A composite sample of the plant effluent being discharged to the sanitary sewer was composed by taking half-hourly grab samples between 9:00 am - 2:00 pm.

A grab sample of the storm sewer effluent from the Company was also taken at the outfall to Cobourg Creek.

Analytical Results

Date Sampled: September 17, 1965 All analyses in ppm except pH and phenol.

Sample No.	5-Day BOD	Solids			pH	Ether Solubles	Phosphate as PO ₄	Iron as Fe	Phenol (ppb)
		Total	Susp.	Diss.					
1	3.4	250	15	235	7.4	5.2	0.2	0.9	0
2	16.0	622	71	551	11.0	2.8	6.2	5.5	8

1 Effluent to the Cobourg Creek - Grab at 11:30 am.

2 Effluent to the Sanitary Sewer - Composite at 9:00 am - 2:00 pm.

DISCUSSION OF RESULTS

From the analytical results of the plant wastes being discharged to the sanitary sewer, it can be seen that the only objectionable characteristic is the high pH (11). The OWRC recommends that the pH of wastes discharged to sanitary and storm sewers be kept within the range 5.5 to 9.5. Constant exposure of concrete sewer pipe to high pH waste will result in a gradual decomposition of the cement. Other characteristics of wastes from this Company were within recommended limits for discharge to the sanitary sewerage system on the day of the survey.

The cooling water being discharged to Cobourg Creek does not pose any problems at this time.

CONCLUSIONS AND RECOMMENDATIONS

The wastes discharged from Winchester-Western Plant No. 1 are characterized by their high pH. In order to prevent deterioration of the sewers, it is recommended that the wastes be treated to produce an effluent within the pH values of 5.5 to 9.5.

The storm sewer discharge to Cobourg Creek was found to be satisfactory for discharge to an open watercourse.

Plant No. 2

Plant Operation

Ammunition is manufactured at Winchester-Western's Plant No. 2. Steps in production include plating of shell casings, charging of shells and packaging.

Production and Operating Data

Operating schedule	-	8 hours per day 5 days per week
Number of employees	-	15
Raw materials	-	explosives

Water Consumption and Distribution

Source	-	Cobourg P.W.C.
Domestic	-	500 gpd
Process		
- Plating rinse water	-	2,500 gpd
- Cooling water	-	1,000 gpd
		<hr/>
Total	-	4,000 gpd

Sources of Waste and Disposal

Wastes from this plant consist of sanitary wastes and rinse water from the copper plating operation.

All liquid wastes are discharged to the municipal sewerage system for treatment at the Water Pollution Control Plant.

Sampling Programme

A composite sample (made up of half-hour grab samples) was taken from the rinse tank in the copper plating area. This sample was obtained on September 21, 1965 between 9:00 am and 12:00 noon.

Analytical Results

All analyses in ppm except pH

Sample No.	5-Day BOD	Solids			pH	Alkalinity as CaCO ₃	Copper as Cu	Cyanide as HCN
		Total	Susp.	Diss.				
1	6.0	536	2	534	8.9	210	72	0.9

1 Rinse from plating operation to Municipal Sewers

DISCUSSION OF RESULTS

The rinse waters from the copper plating operation contain a high concentration of copper. The volume of water used in this operation (2500 gpd) is very small and is discharged on a continuous basis over an 8-hour operating day. This amount of copper should be sufficiently diluted in the sanitary sewer and, therefore, prevent any problems of toxicity at the WPCP.

Other characteristics of the wastes from this plant were within the OWRC recommended limits for discharge to sanitary sewers on the day of the survey.

CONCLUSIONS

The wastes from this plant are characterized by a high concentration of copper, the source of which is the copper plating operation. These wastes may not pose any problems at this time because they should be sufficiently diluted in the sanitary sewers.

COBOURG CITY DAIRY

This plant is located on Ontario Street in Cobourg.

DETAILS OF SURVEY

Personnel Interviewed - Mr. J. Richardson, Plant Manager

Plant Operation

This plant processes and distributes milk and cream. Pasteurization of milk is carried out in the conventional manner.

Production and Operating Data

Operating schedule - 1 shift/day
6 days/week

Number of employees - 6

Raw materials - milk, cleaning agents

Water Consumption and Distribution

Source - Cobourg P.U.C.

Domestic - 120 gpd

Process - 5,400 gpd

Total - 5,520 gpd

Sources of Waste

- (1) Bottle washing
- (2) Milk spillage
- (3) Pasteurization water
- (4) Sanitary wastes

Waste Treatment and Disposal

All process and sanitary wastes are discharged to the municipal sanitary sewer system.

Sampling Procedure

A three-hour composite was obtained by collecting 6-ounce samples of combined wastes every 30 minutes. The sample was taken on October 1, 1965.

Analytical Results

BOD	All analyses in ppm except pH			pH
	Solids		Diss.	
	Total	Susp.		
14,000	12,974	7240	5734	5.3

DISCUSSION OF RESULTS

The above results are much greater than would be expected from a dairy of this type, and are indicative of poor housekeeping habits (milk spillage, overfilling) which are prevalent in many small dairies. The high solids and BOD values point out the potential danger to the sewage plant inherent in accidental spills and poor in-plant control.

CONCLUSIONS AND RECOMMENDATIONS

The BOD and suspended solids concentrations from this dairy should not have a detrimental effect on the operations at the municipal sewage plant. It is recommended that constant in-plant control and good housekeeping measures be maintained to prevent spills and slugs which could cause potential upsets at the sewage treatment plant.

FISHER'S DAIRY

This Company is located on 38 Covert Street in Cobourg.

DETAILS OF SURVEY

Personnel Interviewed - Mr. H. F. Fisher, Plant Manager

Plant Operations

This Company bottles and distributes milk and cream. Milk is pasteurized in the conventional matter.

Production and Operating Data

Operating schedule	-	1 shift per day 5 days per week
Number of employees	-	10
Raw materials	-	milk, cleansing agents

Water Consumption and Distribution

Source	-	Cobourg P.U.C.
Domestic	-	200 gpd
Process	-	<u>11,500 gpd</u>
Total	-	11,700 gpd

Sources of Waste

- (1) Bottle washing
- (2) Pasteurization water
- (3) Milk spillage
- (4) Sanitary waste

Waste Treatment and Disposal

All sanitary and process wastes are discharged to the municipal sanitary sewerage system.

Sampling Programme

A three-hour composite sample of the plant effluent was obtained by collecting a six-ounce sample every half-hour. The sample was collected on October 1, 1965.

Analytical Results

BOD	All analyses in ppm except pH			pH
	Total	Solids Susp.	Diss.	
2000	2418	456	1962	11.2

DISCUSSION OF RESULTS

The analytical results of the sample taken showed high concentrations of BOD and suspended solids and a high pH value. Since the sampling was conducted over a short three-hour period, the results are not felt to be representative of a dairy of this type. It is suspected that the major source of contamination at the time of sampling resulted from the bottle washing operation. However, these results point out the wide variation that can be expected in the waste discharges from the dairy.

CONCLUSION AND RECOMMENDATION

The waste discharges from this dairy should not have any detrimental effect on the operation of the sewage plant provided that large slugs of wastes are not released to the sewerage system over a short time period. It is recommended that this dairy maintain proper in-plant controls and good housekeeping practices to prevent this from occurring.

ABBREVIATIONS

BOD	-	Biochemical Oxygen Demand
Susp. Solids	-	Suspended Solids
Diss. Solids	-	Dissolved Solids
ppm	-	Parts per million
ppb	-	Parts per billion
gpm	-	Imperial gallons per minute

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