FACT SHEET 68

Général Motors du Canada Ltée

2500 Grande-Allée Street

Boisbriand, Quebec

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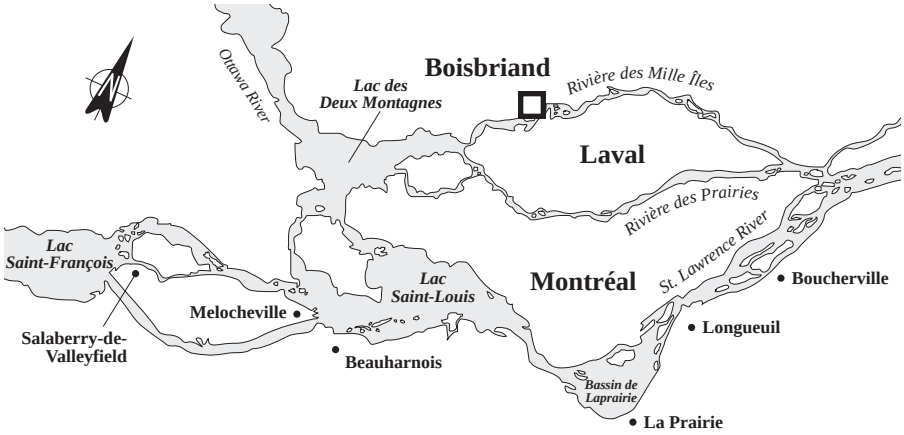

A list of 106 industrial plants has been established under St. Lawrence Vision 2000 (SLV 2000), the second phase of the St. Lawrence Action Plan, launched in 1988. The general objective is to reduce toxic effluent and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each with a specific objective. The GÉNÉRAL MOTORS DU CANADA LTÉE plant in Boisbriand is in Group 2, which comprises plants that have already implemented treatment programs but whose effluent may contain toxic substances.

The objective for Group 2 is maximum reduction of toxic effluent of targeted plants.

INDUSTRIAL PLANT

Automobiles assembled

The GÉNÉRAL MOTORS DU CANADA LTÉE plant in Boisbriand assembles cars. The bodies are first assembled and submitted to a high-presure cleaning process in an alkaline solution to remove oil, sealants and dust. Surface preparation includes phosphatizing, to prepare the metal to receive an anticorrosion coating by electrodeposition, followed by baking, sanding, application of sealant and shockproof coating, electrostatic application of primer (application, drying and baking), as well as the addition of outer plastic components (application, masking and damp sanding). The body is then coated with a water dispersion enamel and a polyurethane-base gloss. The electric system and the components of the passenger cell (seats, rug, etc.) are then added before the final assembly stage is carried out. The transmission and gear system is assembled and the wheels are aligned. The motor is then tuned and the liquids are added. Before the cars are sent out, they are subjected to tightness tests and quality control procedures. Until the 1st of October 1995, the plant employed a work force of 3200; the number of workers dropped to 1800 when the night shift was stopped.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Metal parts
- Alkaline cleaners
- Nitric acid solutions
- Nickel salts
- Acids (phosphoric, hydrochloric, chromic, acetic and lactic)
- Phenolic and vinyl resins
- Resin solutions (epoxy and urethane)
- Inorganic pigments
- Sealers
- Lubricating oils
- Gasoline
- Antifreeze
- SUVA coolants
- Zinc phosphate
- Sodium nitrite
- Sodium hydroxide solution
- Paint paste
- Neutralizers
- Biocides and disinfectants
- Urea formaldehyde resin
- Butylcellosalve
- Surfactants

FINISHED PRODUCT

- Cars (Camaro and Firebird)

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mainly COD

According to company data, in 1993 the plant discharged 835 m^3/d of effluent containing notably:

- 286 kg/d of chemical oxygen demand (COD)
- 42 kg/d of suspended solids (SS)
- 17.4 kg/d of biochemical oxygen demand (BOD_5)
- 16.7 kg/d of nitrites and nitrates
- 1.7 kg/d of oil and grease (O&G)
- 0.69 kg/d of metals (nickel, iron, copper, zinc, chromium, lead, and titanium)

RESOURCES AND USES TO PRESERVE

Live-bait fishing

The GÉNÉRAL MOTORS DU CANADA LTÉE plant in Boisbriand is in the drainage basin of the Cachée River. The plant grounds are drained by Delisle and Juteau creeks, tributaries of this river. The area downstream from the discharge point is home to many species of live bait as well as muskrats and birds. Five species of minnow inhabit the area: white sucker, mud minnow, brook stickleback, creek chub, and blackhead minnow. The minnows are important because they are harvested as live bait and sold in the Montreal area; and they are also prey for certain fish that attract sport fishermen. There are also mallards in the region. Rosemère, Bois-des-Fillions, Lorraine, and part of Terrebonne draw drinking water from the Milles-Îles River downstream from the mouth of the Cachée River.

ENVIRONMENTAL DISCHARGE OBJECTIVES

Environmental protection

Environmental discharge objectives are established to preserve local resources and uses. Expressed as maximum permissible loads and concentrations for effluent released into the environment, these guidelines are used to select treatment methods which best promote environmental protection. Discharge objectives for the GÉNÉRAL MOTORS DU CANADA LTÉE plant will be available by 1997.

EFFLUENT TREATMENT

Physico-chemical treatment

Wastewater from cleaning and preparing car body surfaces as well as some of the industrial wastewater is treated physico-chemically. The treatment system comprises a storage basin, an emergency basin, four heavy metal electrodeposition cells, a lamellar clarifier that eliminates metal hydroxides, an alum addition system to precipitate phosphates, a lamellar clarifier to eliminate phosphates, two sand filters, and two filter presses. Industrial wastewater comprising anolyte solution and effluents from deglazing and tightness testing is combined with domestic sewage and discharged to the Boisbriand public sewerage system. Wastewater from the cafeterias is passed through oil separators before joining the rest of the domestic sewage. Wastewater from regenerating demineralization resins is neutralized and then discharged into the stormwater system together with roof drainage, surface water and runoff water.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Raw material substitution

The plant process was modified in 1994. A certificate of authorization to substitute three chemicals used in the phosphatizing operations was issued in April 1994; the purpose of the change was to reduce biochemical oxygen demand at source.

REGULATORY COMPLIANCE - WATER COMPONENT

Sewer discharge standards

The GÉNÉRAL MOTORS DU CANADA LTÉE plant is subject to standards for discharges to the Boisbriand sewerage system. In 1995, plant effluent contained 76 mg/L of biochemical oxygen demand; the standard the company must meet is 30 mg/L. The new chemicals used in the phosphatizing line did not reduce biochemical oxygen demand as expected. In 1995, possible segregation and treatment solutions for reducing biochemical oxygen demand in industrial effluent were studied. The company is now studying the technical and economic feasibility of the solutions suggested by the study.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Characterization planned for 1996

The Chimiotox index gauges the load of all toxic substances in industrial effluent using toxicity factors assigned to each contaminant. It is used, among other things, to monitor discharge trends over the years and determine the toxic contribution of each pollutant.

Since no exhaustive characterization of effluent from the GÉNÉRAL MOTORS DU CANADA LTÉE plant in Boisbriand has been made, there are not enough data to estimate the Chimiotox index. Effluent characterization is planned for 1996.

Table 1 ***Chimiotox Index - Général Motors du Canada Ltée***

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Since no exhaustive characterization of effluent from the GÉNÉRAL MOTORS DU CANADA LTÉE plant in Boisbriand has been made, there are not enough data to calculate the Chimiotox index. Effluent characterization is planned for 1996; the results can then be used to calculate the Chimiotox index.			
CHIMIOTOX INDEX			**N/A**

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

One long-range objective of SLV 2000 is the virtual elimination of eleven persistent and bioaccumulative toxic substances from the effluent of the 106 targeted plants along the St. Lawrence and its tributaries. The targeted substances are those designated by the International Joint Commission in August 1993: PCBs, DDT, dieldrin, toxaphene, dioxins, furans, mirex, mercury, lead alkyls, benzo(*a*)pyrene and hexachlorobenzene. To reach this objective, Protection has fixed the environmental discharge objectives set for applicable substances as its target by the end of SLV 2000 in 1998, thereby ensuring that all uses of the receiving environment are protected.

The 1996 characterization will show if effluent from the GÉNÉRAL MOTORS DU CANADA LTÉE plant contains any of these persistent toxic substances.

PEEP TOXICITY REDUCTION

Bioassays in 1996

The Potential Ecotoxic Effects Probe, or PEEP, combines the results of six standardized bioassays measuring the toxic effects of effluent. The results are expressed on a logarithmic scale (1 to 10) of increasing toxicity and are used to monitor discharge trends over the years. A series of bioassays of effluent from the GÉNÉRAL MOTORS DU CANADA LTÉE will be conducted during the characterization planned for 1996.

REDUCTION IN SUBSTANCES MONITORED

Process changes

According to company data, in 1995 (before October 2) the plant discharged 1356 m^3/d of effluent, containing notably:

- 440 kg/d of chemical oxygen demand (COD)
- 103 kg/d of biochemical oxygen demand (BOD_5)
- 11.3 kg/d of oil and grease (O&G)
- 8.3 kg/d of suspended solids (SS)
- 1.37 kg/d of metals (nickel, iron, copper, zinc, chromium, lead, and titanium)
- 1.13 kg/d of nitrites and nitrates

Changes to the plant process between 1993 and 1995 caused an increase in chemical oxygen demand, oil and grease, biochemical oxygen demand, and effluent discharge. The company is now looking at ways to reduce biochemical oxygen demand at source. On the other hand, suspended solids dropped 80%, and nitrites and nitrates 93%.

KEY POINTS

- **Measures taken under a certificate of authorization (April 1994) to reduce BOD_5 at source**
- **Segregation and treatment solutions for reducing BOD_5 studied in 1995**

Based on December 1995 inventory

ADDITIONAL INFORMATION

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Catalogue No. En153-6/68-1996E
ISBN 0-662-23329-8
(Aussi disponible en français sous le titre *Établissements industriels : faits saillants*)