

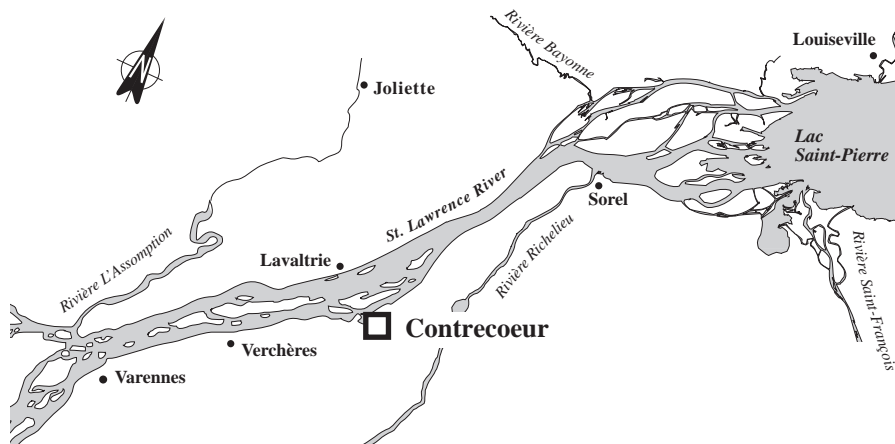
FACT SHEET 81

Stelco McMaster Ltée

2050 route des Acières

Contrecoeur, Quebec

JOL 1C0



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 overall 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 STELCO McMASTER LTÉE plant in Contrecoeur 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

Manufactures steel billets and rolled steel products

The STELCO McMASTER LTÉE plant in Contrecoeur manufactures steel billets and rolled steel products from scrap iron and iron alloys. The scrap iron and alloys are melted in an electric-arc furnace, refined in a ladle furnace, and then continuously cast. The billets are shaped hot and then rolled before packaging. Annual production capacity of the plant has gone from 450 000 t to 590 000 t. In 1997, the plant operated at 77% capacity and employed a work force of 430.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Scrap iron
- Iron alloys
- Lime

FINISHED PRODUCTS

- Steel billets
- Rolled steel products (steel reinforcing bars, special quality bars, railroad elements)
- Rolled steel products used in manufacturing spring flats for recreational vehicles and trucks

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Suspended solids and iron

According to company data, in 1993 the plant discharged 32 700 m³/d of effluent, containing notably:

- 256 kg/d of suspended solids (ss)
- 19 kg/d of iron

A substantial but variable percentage of the ss comes from the influent.

RESOURCES AND USES TO PRESERVE

Important aquatic environment

STELCO McMASTER LTÉE discharges its effluent into the St. Lawrence River immediately upstream of the Contrecoeur harbour (upstream of the Contrecoeur islands on the south side). The current is slow here, and the waters shallow. Many species of fish frequent the nearshore, the channels between the islands (which are a National Wildlife Area) and the waters around them. The islands are also nesting areas for waterfowl and the channels are vast still-water spawning grounds. The Contrecoeur area is popular for pleasure boating, sailing and sport fishing. Brown bullhead, northern pike and muskellunge attract fishermen to the area. In addition to private wharves and the Contrecoeur marina, there is also a federal government wharf here. Contrecoeur draws its drinking water from the river 4.4 km downstream from the plant's discharge point.

ENVIRONMENTAL DISCHARGE OBJECTIVES

Environmental protection

Environmental discharge objectives are established to preserve local resources and uses. These guidelines, expressed as maximum permissible loads and concentrations for effluent released into the environment, are used in choosing treatment methods which best promote environmental protection. Environmental discharge objectives for STELCO McMASTER LTÉE are available on request.

EFFLUENT TREATMENT

Clarification and settling

The industrial wastewater includes direct cooling water from the steel plant and flush water from the scale produced in the rolling plant. The wastewater goes first into settling pits, where the suspended scale is recovered, and then into a settling and cooling pond. Some of the treated water is recirculated; the rest is discharged to a ditch. Indirect cooling water, drainage and runoff water are channelled to the settling pond. Domestic sewage from the different facilities is treated in three activated sludge treatment systems and six septic tanks with tile fields.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Reduced wastewater discharges

In 1994, a study was undertaken to find ways of reducing wastewater discharges. Work was carried out in 1995 and 1996 to, among other things, transport scale; this has resulted in a 32% reduction in the winter wastewater flowrate (8 months). A new settling tank was built to pretreat rolling-plant flush water.

REGULATORY COMPLIANCE - WATER COMPONENT

No specific regulations

The STELCO McMASTER LTÉE plant in Contrecoeur is not subject to any specific regulations governing effluents.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mainly iron

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 (Figure 1) and determine the toxic contribution of each pollutant (Table 1).

Table 1 gives data from the May 1996 SLV 2000 characterization along with the Chimiotox values calculated from them, assuming an effluent flowrate of 22 300 m³/d. Four substances were selected in testing for more than 120. According to these data, iron accounts for 64% of the Chimiotox index.

Figure 1 is plotted from 1996 SLV 2000 characterization data. The Chimiotox index calculated from these data was reported unchanged for 1993 to 1998.

Table 1 *Chimiotox Index (1996) - Stelco-McMaster Ltée**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total iron	53.398	3.3	176
Total nickel	8.445	10	84
Total manganese	0.967	10	10
Total aluminum	0.405	11	4

CHIMIOTOX INDEX

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* Assuming an effluent flowrate of 22 300 m³/d (4 substances selected in testing for more than 120).

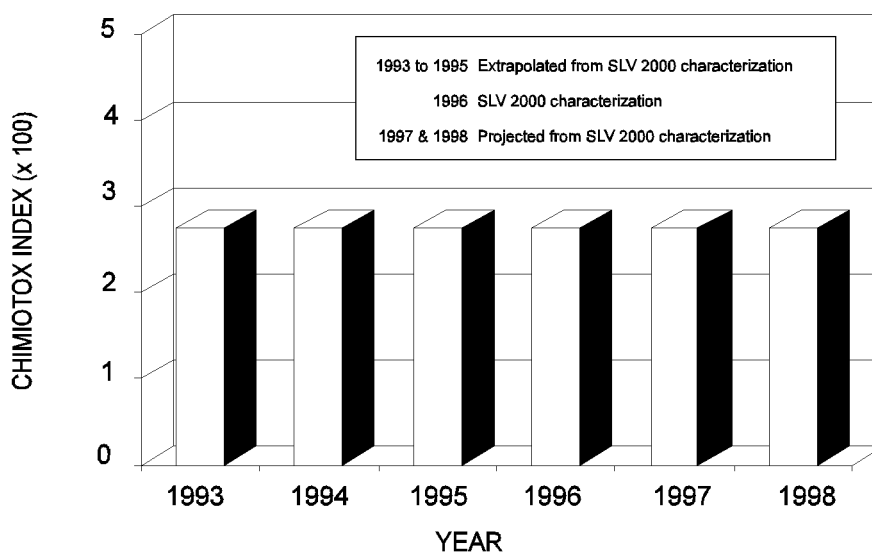


Figure 1 **Chimiotox Index Trends (1993 to 1998)**
Stelco McMaster Ltée

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 priority 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.

Based on 1996 SLV 2000 characterization data, none of the eleven persistent and bioaccumulative substances was detected in the company's effluent.

PEEP TOXICITY REDUCTION

Low toxicity

The Potential Ecotoxic Effects Probe (PEEP) combines the results of six standardized bioassays measuring the toxic effects of effluent. The results are expressed on a logarithmic scale of increasing toxicity ranging from 1 to 10, and are used to monitor discharge trends over the years. In the case of the STELCO MCMMASTER LTÉE plant in Contrecoeur, a series of bioassays was carried out in 1996, yielding a PEEP of less than 2.0, and showing low toxicity for the organisms tested.

REDUCTION IN SUBSTANCES MONITORED

Flowrate and ss reductions

According to company monthly data, in 1997 the plant discharged an estimated 22300 m³/d of effluent, containing notably:

- 156 kg/d of suspended solids (ss)
- 42 kg/d of iron

The effluent flowrate decreased 32%. A substantial proportion of suspended solids and iron loads comes from the influent, the amount varying as a function of time and parameter. Between 1993 and 1997, gross suspended solids loads decreased by 39% while gross iron loads increased by 121%.

KEY POINTS

- Winter flowrate cut by 32% by recycling
- Construction of a new settling pond for rolling-plant flush water
- Increased production capacity

Information updated January 1998

ADDITIONAL INFORMATION

Chimiotox Index and PEEP:

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Published by authority of the Minister of the Environment

© Public Works and Government Services
Canada 1998 Catalogue No. En153-6/81-1998E
ISBN 0-662-26549-1

(Aussi disponible en français sous le titre
Établissements industriels : faits saillants)