

FACT SHEET 91

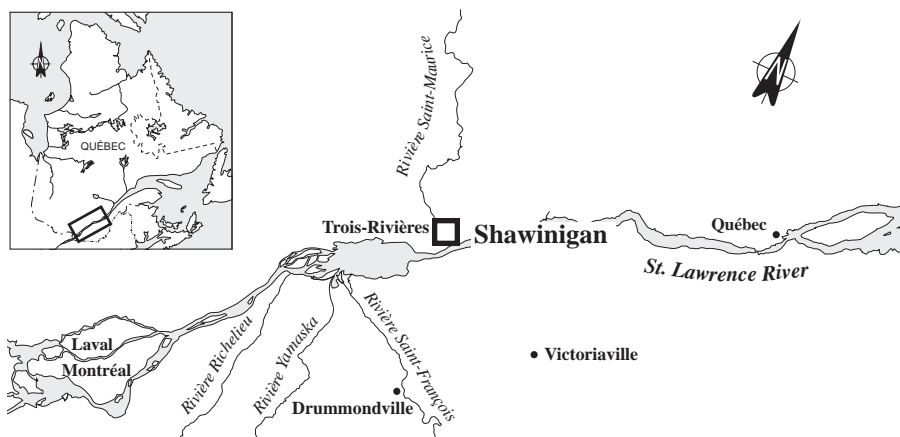
Stone-Consolidated Corporation, Belgo Division

Cascade Avenue
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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 STONE-CONSOLIDATED CORPORATION, BELGO DIVISION mill in Shawinigan is in Group 3, which comprises regulated industrial plants.

The objective for Group 3 is to check toxic discharges of regulated plants against environmental objectives and to establish corrective measures for maximum reduction of deleterious effects on the receiving environment.



INDUSTRIAL PLANT

Newsprint mill

The STONE-CONSOLIDATED CORPORATION, BELGO DIVISION mill produces newsprint. Pulp is made on site from wood chips or recycled paper. Purchased wood chips are washed before they are made into pulp using a thermomechanical process. The pulp is then bleached and thickened before it is fed to the paper machines. Pulp produced from old paper is de-inked, bleached and thickened. Production capacity of the mill is 1012 t/d of newsprint and 220 t/d of de-inked pulp. In 1995, the plant operates at 86% design capacity and employs a work force of 670.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Wood chips
- Old paper

FINISHED PRODUCTS

- De-inked pulp
- Newsprint

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

ss and BOD₅

According to company data, in 1993 the mill discharged 49 766 m³/d of effluent containing notably:

- 15 457 kg/d of biochemical oxygen demand (BOD₅)
- 6439 kg/d of suspended solids (ss)

RESOURCES AND USES TO PRESERVE

Spawning grounds, fishing and navigation

The STONE-CONSOLIDATED CORPORATION, DIVISION BELGO mill in Shawinigan empties its effluent into the Shawinigan River. At the junction of the Shawinigan and Saint-Maurice Rivers, there is a municipal park. Shawinigan Bay, further downstream, is a cottaging area, and the islands in the bay attract swimmers. Fishermen and pleasure boaters use the Saint-Maurice River downstream of the discharge point. The area also harbours spots suitable for spawning of perch, northern pike, walleye, catfish, and suckers, not to mention the lake sturgeon, walleye and suckers spawning grounds downstream of La Gabelle dam. Some 20 species of fish, including walleye, northern pike and smallmouth bass inhabit the waters downstream of Shawinigan. And there are staging areas and nesting sites for waterfowl around Île aux Tourtes, in Shawinigan Bay. Trois-Rivières draws drinking water from the Saint-Maurice River 7 km from the mouth.

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. Environmental discharge objectives for the STONE-CONSOLIDATED CORPORATION, BELGO DIVISION mill will be available by 1997.

EFFLUENT TREATMENT

Clarification and secondary treatment

All contaminated process waters are treated by a secondary treatment system and are then discharged into the Shawinigan River. The chip wash water and the filtrate from the sludge dewatering system are also clarified before secondary treatment. Domestic sewage is treated with the process water.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Sequential bioreactor (SBR)

In 1995, the STONE-CONSOLIDATED CORPORATION, BELGO DIVISION mill introduced a sequential bioreactor (SBR) secondary wastewater treatment system.

REGULATORY COMPLIANCE - WATER COMPONENT

Standards met

The STONE-CONSOLIDATED CORPORATION, BELGO DIVISION mill in Shawinigan is subject to provincial and federal pulp and paper regulations. With the implementation of the environmental measures, the company has complied with the latest provincial standards, which came into force on September 30, 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mainly mineral oil and grease

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 shows monthly data for the last quarter of 1995 along with the Chimiotox values estimated from them assuming an effluent flowrate of 32 008 m³/d. According to these data, supplied by the company in compliance with the provincial pulp and paper regulation, oil and grease account for 68% of the Chimiotox index, and total lead accounts for 20%.

Figure 1 is based on characterization data collected for the industrial effluent abatement program (PRRI) in April 1992 as well as company data for the last quarter of 1995. The Chimiotox index calculated from the 1992 PRRI characterization data was applied to 1993 and 1994. Projections for 1996 to 1998 are based on company data from the last quarter of 1995. The decrease in effluent toxicity is due mainly to the efficiency of the secondary treatment system introduced.

Table 1 *Chimiotox Index (1995) - Stone-Consolidated Corporation, Belgo Division**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Mineral oil and grease	34.369	100	3437
Total lead	3.164	314	993
Total copper	0.329	451	148
Linolenic acid	7.609	19	145
Total aluminum	6.027	11	66
Total zinc	6.433	9.4	60
Oleic acid	2.533	19	48
Dehydroabietic acid	0.480	77	37
Linoleic acid	1.478	19	28
Stearic acid	1.372	19	26
Dichlorostearic acid	1.046	19	20
Total nickel	1.645	10	16
Abietic acid	0.423	19	8
Isopimaric acid	0.073	19	1
Levopimaric acid	0.016	19	<1
Palustric acid	0.013	19	<1
Neobietic acid	0.011	19	<1
Sandaracopimaric acid	0.011	19	<1
Pimaric acid	0.003	19	<1

CHIMIOTOX INDEX

5036

* Assuming an effluent flowrate of 32 008 m³/d

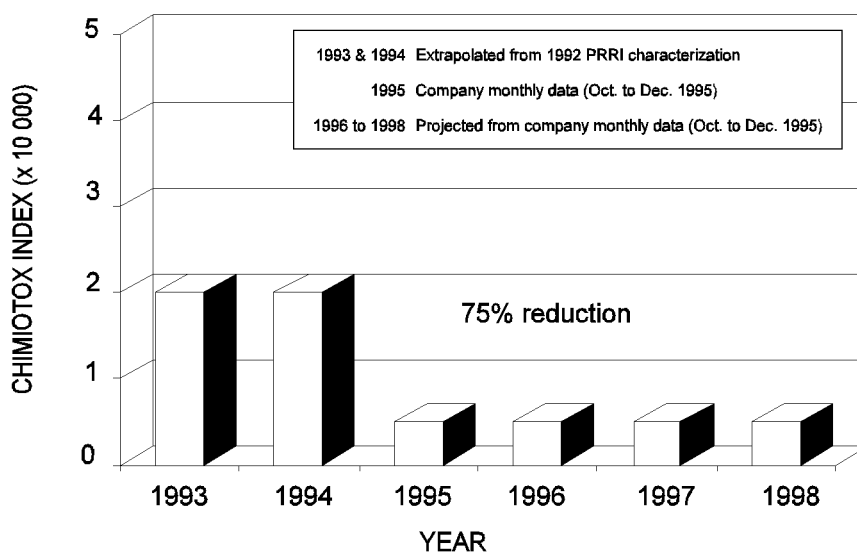


Figure 1 *Chimiotox Index Trends (1993 to 1998)*
Stone-Consolidated Corporation, Belgo Division

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

One long-range objective of SLV 2000 is the virtual elimination of 11 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.

None of the eleven targeted persistent and bioaccumulative toxic substances were detected during the effluent self-monitoring program activities of the last quarter of 1995.

EFFLUENT TOXICITY

Non-toxic effluent

Since September 30, 1995, it has been illegal under the Quebec pulp and paper regulation to release into the environment or a storm sewer a final effluent that is acutely lethal to rainbow trout, as demonstrated by bioassays. New cleanup measures implemented at the STONE-CONSOLIDATED CORPORATION, BELGO DIVISION mill have helped to reduce effluent toxicity. Company data for the last quarter of 1995 indicate that final effluent is not toxic.

REDUCTION IN SUBSTANCES MONITORED

Reduced loads

According to company monthly data for the last quarter of 1995, the mill discharged 32 008 m³/d of effluent containing notably:

- 1007 kg/d of biochemical oxygen demand (BOD₅)
- 863 kg/d of suspended solids (ss)

According to company data, between 1993 and 1995, biochemical oxygen demand dropped 93%, suspended solids 87%, and effluent flowrate 36%. The decreases are due mainly to the SBR secondary treatment system introduced.

KEY POINTS

- 75% drop in Chimiotox index
- A sequential bioreactor secondary treatment system introduced
- Non-toxic effluent

Based on December 1995 inventory

ADDITIONAL INFORMATION

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Published by authority of the Minister of the Environment

© Minister of Supply and Services Canada 1996
Catalogue No. En153-6/91-1996E

ISBN 0-662-23308-5

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