

FACT SHEET 93

Désencrage Cascades, division de Rolland inc.

739 Saint-Augustin Ave.

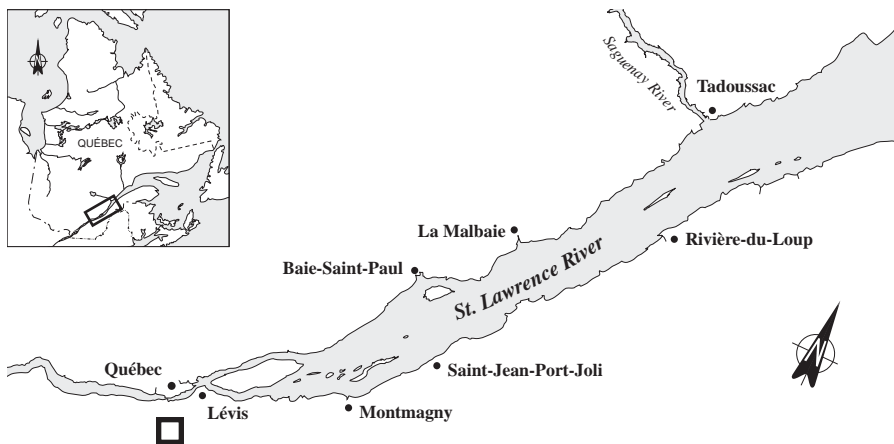
Sainte-Hélène-de-
Breakeyville, Quebec

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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 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 DÉSENCRAGE CASCADES, DIVISION DE ROLLAND INC. mill in Sainte-Hélène-de-Breakeyville is part of Group 3, comprising regulated industrial plants.

The objectives for Group 3 are to assess the toxic waste of regulated plants in terms of environmental objectives and establish corrective measures for optimum reduction of any harmful impact on the receiving environment.



Sainte-Hélène-de-Breakeyville

INDUSTRIAL PLANT

De-inked pulp mill

DÉSENCRAGE CASCADES, DIVISION DE ROLLAND INC., at Sainte-Hélène-de-Breakeyville, was formerly known as DÉSENCRAGE CASCADES (1988) INC. The plant produces de-inked pulp from waste paper and cardboard, which are first pulped and then de-inked by flotation. The pulp is screened and thickened before being baled. In 1995, the plant employs 47 workers.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Paper
- Cardboard

FINISHED PRODUCT

- De-inked pulp

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Suspended solids and biochemical oxygen demand

Based on company data, in 1993 the plant had an effluent discharge of 879 m³/d, containing notably:

- 545 kg/d of suspended solids (ss)
- 305 kg/d of biochemical oxygen demand (BOD₅)

RESOURCES AND USES TO PRESERVE

Varying uses of the environment

Effluent from the DÉSENCRAGE CASCADES, DIVISION DE ROLLAND INC. plant in Sainte-Hélène-de-Breakeyville is discharged into the Chaudière river. The plant is located on the right bank of the river, 10 km from where it meets the St. Lawrence. The river is home to white sucker and common shiner. Sport fishing enthusiasts also fish for speckled trout and perch. Charny and Saint-Rédempteur draw their drinking water about 6 km downstream from Sainte-Hélène-de-Breakeyville. A bicycle path runs along the river at Sainte-Hélène-de-Breakeyville. Further downstream, the Parc des Chutes on the Chaudière river, with a picnic area and hiking trails, is a tourist attraction. There is a marina and other services for pleasure-boats where the Chaudière and the St. Lawrence meet, and this area is used by wind-surfers and pleasure-boaters.

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. The water quality based objectives of DÉSENCRAGE CASCADES, DIVISION DE ROLLAND INC. have been calculated and are available on request.

EFFLUENT TREATMENT

Secondary treatment

The wastewater cleanup system comprises primary treatment and secondary treatment. Primary treatment involves two settling tanks, while secondary treatment consists of a system of activated sludge and flotation. Domestic sewage is discharged to the municipal sewage treatment plant.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Upgrading of secondary treatment system

In 1992, the plant upgraded its production capacity, and in 1994 installed screens to reduce fibre loss and further increase production. The increased production resulted in an increased BOD₅ load in the effluent.

In 1994, the plant installed tertiary screens to reduce discharge of solid residue. To minimize waste and comply with the new provincial standards, the plant modified the secondary treatment system. The aerated pond facility was replaced by an activated-sludge facility combined with a flotation cell to clarify mixed liquor. Settling tanks were replaced by a primary flotation treatment system. The changes were made between 1994 and 1995, at a total cost of nearly a million dollars.

REGULATORY COMPLIANCE - WATER COMPONENT

Compliance with standards

DÉSENCRAGE CASCADES, DIVISION DE ROLLAND INC. is subject to federal and provincial regulations on pulp and paper mills. Changes to the effluent treatment have enabled the company to comply with the latest provincial standards, which came into force on September 30, 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Significant reduction in Chimiotox Index

The Chimiotox index gauges the load of all toxic substances present in industrial effluent, using the toxicity factors assigned to each contaminant. It is used, among other things, to monitor discharge trends over the years (see Figure 1) and determine the toxic contribution of each pollutant (see Table 1).

Table 1 shows monthly company data for the last three months of 1995 under the provincial regulation governing pulp and paper mills, along with Chimiotox index values estimated from them assuming an effluent flowrate of 750 m³/d. Based on these data, total copper makes up 40% of the Chimiotox index, followed by total zinc with 30%, and total aluminum with 20%.

Figure 1 is based on September 1992 industrial effluent abatement reduction program (PRRI) characterization data, along with company monthly data for the last three months of 1995. The Chimiotox index calculated from the PRRI characterization data was used as is for 1993 and 1994. Forecasts for 1996, 1997 and 1998 are based on company data for October, November and December 1995. The Chimiotox index is one of the lowest in SLV 2000.

Table 1 *Chimiotox Index (1995) - Désencrage Cascades, division de Rolland inc.**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total copper	0.008	451	4
Total zinc	0.370	9.4	3
Total aluminum	0.164	11	2
Dehydroabietic acid	0.010	77	1
Total nickel	0.027	10	<1
Linoleic acid	0.001	19	<1
Oleic acid	0.002	19	<1
Abietic acid	0.002	19	<1
Levopimaric acid	0.005	19	<1
CHIMIOTOX INDEX			10

* For an effluent flowrate of 750 m³/d.

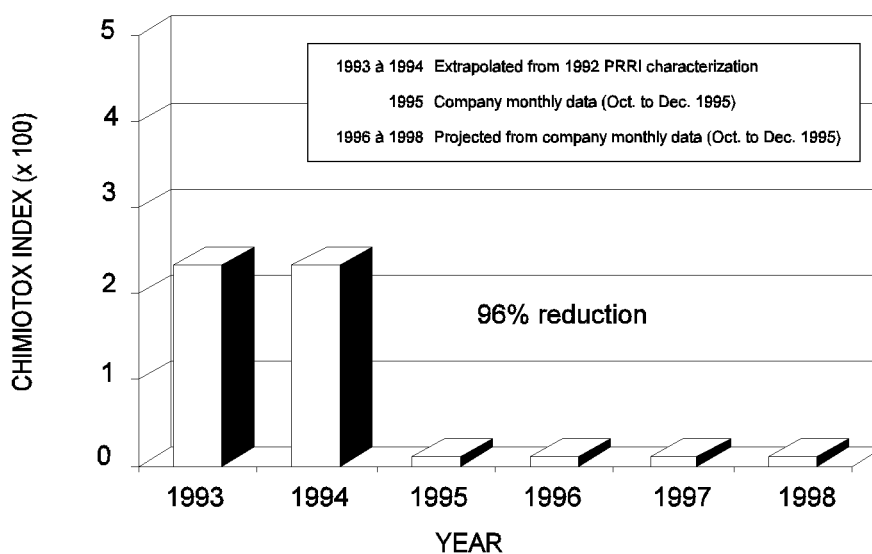


Figure 1 *Chimiotox Index Trends 1993 to 1998
Désencrage Cascades, division de Rolland inc.*

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.

Based on data from the self-regulating effluent monitoring program for the last three months of 1995, none of the eleven persistent bioaccumulative toxic substances were detected in the company's effluent.

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. For DÉSENCRAGE CASCADES, DIVISION DE ROLLAND INC., implementation of new cleanup measures has helped reduce the effluent toxicity. Data for October to December 1995 show that final effluent is not toxic.

REDUCTION IN SUBSTANCES MONITORED

Suspended solids and biochemical oxygen demand reduced

Based on company monthly data, effluent discharge in 1995 was 810 m³/d, containing notably:

- 130 kg/d of suspended solids (ss)
- 118 kg/d of biochemical oxygen demand (BOD₅)

From 1993 to 1995, suspended solid loads decreased by 76% while biochemical oxygen demand decreased by 61%. The load reductions were mainly due to improvements to the water treatment system.

TECHNOLOGICAL DEVELOPMENT

Adaptation of flotation cell

The project dealt with the possibility of using a compact dissolved-air flotation cell to replace both the secondary settling basin in the activated-sludge treatment of de-inked pulp plant effluent and the sedimentation zone in aerated-pond treatment. Performance was compared with that of two other processes. The pilot tests were carried out in the laboratories of the *Université du Québec à Trois-Rivières* (UQTR) Pulp and Paper Research Centre, while plant tests were conducted in the CASCADES GROUP de-inking plants in Breakeyville and Cap-de-la-Madeleine. Following the tests, an industrial-scale flotation unit was installed at the Breakeyville plant. The project was conducted between October 1992 and March 1994, at a cost of close to \$250 000.

KEY POINTS

- Upgrading of wastewater treatment system; a \$1 million investment in 1994 and 1995
- Chimiotox index reduced by 96%
- Chimiotox index one of the lowest in SLV 2000
- Non-toxic effluent

Based on December 1995 inventory

ADDITIONAL INFORMATION

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