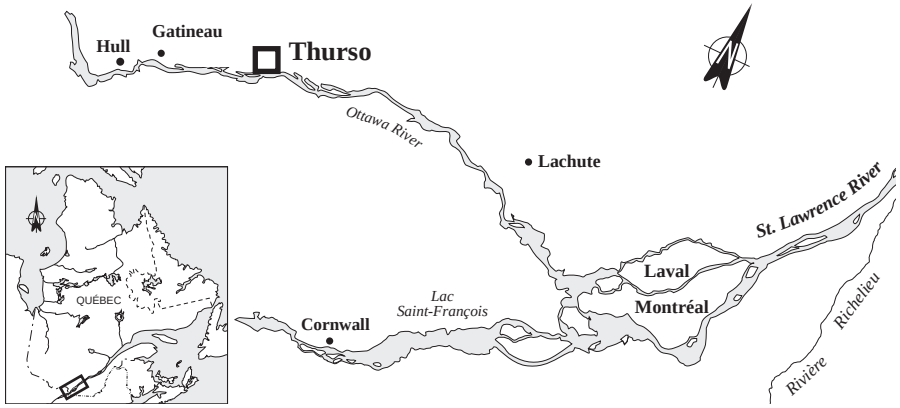
FACT SHEET 99

James Maclaren Industries Inc., Kraft Pulp Division

Route 148 West

Thurso, Quebec

J0X 3B0



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 JAMES MACLAREN INDUSTRIES INC., KRAFT PULP DIVISION mill in Thurso is in Group 3, comprising 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

Kraft pulp mill

The JAMES MACLAREN INDUSTRIES INC., KRAFT PULP DIVISION mill in Thurso produces Kraft pulp from hardwood. The raw material arrives in the form of chips or logs. The logs are dry-debarked and chipped. The chip mixture is screened and cooked in digesters to obtain unbleached pulp. After washing, screening and thickening, the pulp is bleached in five stages. It is then cleaned, dried and prepared for shipping. Chemicals produced in the cooking process are incinerated in a furnace that produces heat for the process. The production capacity of the mill is 580 t/d. In 1995, the plant operates at 113% design capacity and employs a work force of 391.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Hardwood chips (45% maple, 10% beech, 3% ash, 15% poplar, 5% linden, 10% birch)
- Softwood chips (12%)

FINISHED PRODUCT

- Bleached Kraft pulp

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mainly BOD_5

Based on company data, in 1993, the mill discharged 60 280 m^3/d of effluent, containing notably:

- 23 366 kg/d of biochemical oxygen demand (BOD_5)
- 5626 kg/d of suspended solids (SS)

RESOURCES AND USES TO PRESERVE

Many spawning areas

Effluent from the JAMES MACLAREN INDUSTRIES INC., KRAFT PULP DIVISION mill in Thurso is discharged into the Ottawa River between Baie Daragon and Baie Perras, an area used by many species of birds and fishes. The area contains spawning grounds for carp, northern pike, catfish, perch, muskellunge and yellow walleye. The river is the site of commercial, sport and ice fishing. A swampy area downstream from the discharge point contains populations of waterfowl and semi-aquatic mammals. Baie Noire, Baie de la Pentecôte and Baie des Outardes are resting and breeding areas for many species. Waterfowl are hunted in Baie de la Pentecôte and Baie Perras. The first water intake downstream from the mill is in Lac des Deux Montagnes and serves the towns of Vaudreuil and Deux-Montagnes.

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 JAMES MACLAREN INDUSTRIES INC., KRAFT PULP DIVISION will be available by 1997.

EFFLUENT TREATMENT

Secondary treatment

Alkaline and acid effluent are mixed before being sent to the treatment system. Since 1995, this water then flows into a clarifier and is treated in a secondary treatment system using activated sludge. The treated effluent is sampled before being discharged into the Ottawa River. Part of the industrial wastewater is recirculated. Domestic sewage is mixed with industrial wastewater before being treated using activated sludge.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Secondary treatment

Construction of a secondary treatment system and modifications to the primary treatment began in August 1993, once authorization had been obtained. A primary clarifier and a biological activated sludge system were added to the treatment system. The company invested $35.6 million in this work. The changes resulted in a decrease in biochemical oxygen demand and suspended solids. The municipal sewerage system was scheduled to be connected to the plant treatment system in 1996.

REGULATORY COMPLIANCE - WATER COMPONENT

Compliance with effluent standards

The JAMES MACLAREN INDUSTRIES INC., KRAFT PULP DIVISION mill in Thurso is subject to federal and provincial pulp and paper regulations. With the implementation of the secondary treatment system, 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 gives monthly data for the last three months of 1995 (supplied by the company in compliance with the provincial pulp and paper regulation) along with the Chimiotox values estimated from them, assuming an effluent flowrate of 45 000 m^3/d. One exception is the figures for fatty and resin acid loads, which are taken from company data for March and April 1996. According to these data, mineral oil and grease accounted for 48% of the value of the Chimiotox index, followed by dioxins and furans with 41%.

Figure 1 is plotted from characterization data from the industrial wastewater abatement program (PRRI) for 1991, along with monthly company data for October to December 1995. The Chimiotox index estimated from the 1991 PRRI characterization data was applied to the years 1993 and 1994. Projections for 1996 to 1998 are based on company data for the last three months of 1995. The reduction in the Chimiotox index is due to the efficiency of the secondary activated sludge treatment system.

Table 1 ***Chimiotox Index (1995) - James Maclaren Industries Inc., Kraft Pulp Division****

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Mineral oil and grease	38.517	100	3 852
2,3,7,8-T_4CDD equivalent	4.63×10^{-8}	71 428 571 429	3 310
Aluminium total	58.100	11	639
Total copper	0.279	451	126
Total zinc	4.199	9.4	39
Dehydroabietic acid	0.326	77	25
Stearic acid	0.962	19	18
Isopimaric acid	0.439	19	8
Linoleic acid	0.312	19	6
Abietic acid	0.310	19	6
Oleic acid	0.214	19	4
Dichlorodehydroabietic acid	0.171	19	3
Total nickel	0.140	10	1
CHIMIOTOX INDEX			**8 037**

* Assuming an effluent flowrate of 45 000 m^3/d

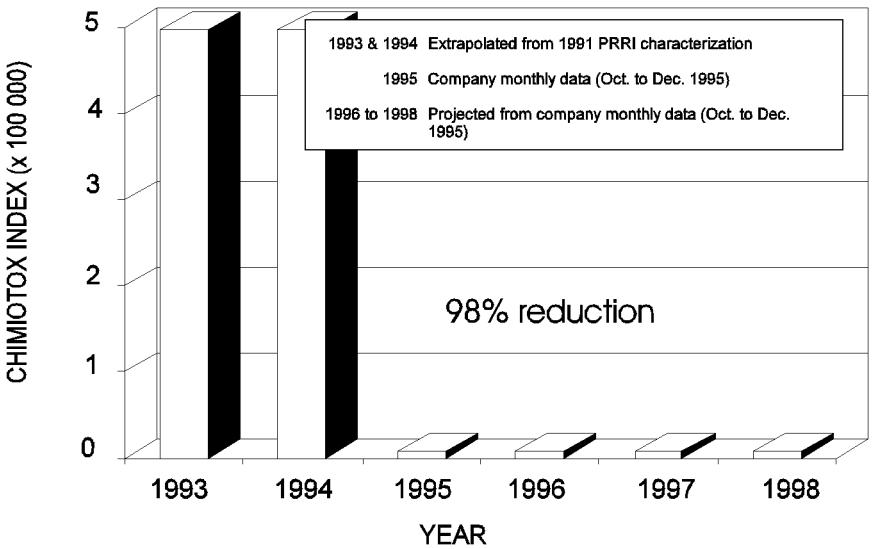


Figure 1 ***Chimiotox Index trends (1993 to 1998) James Maclaren Industries Inc., Kraft Pulp Division***

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 106 priority plants located on 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 effluent self-monitoring program activities of the last quarter of 1995, two of the eleven persistent toxic substances were detected: dioxins and furans. Measured concentrations were below methodological detection limits. The environmental discharge objective for dioxins and furans will be available soon.

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. Implementation of new cleanup measures at JAMES MACLAREN INDUSTRIES INC., KRAFT PULP DIVISION has helped reduce effluent toxicity. Based on company data for the period from October to December 1995, final effluent from the mill is not toxic.

REDUCTION IN SUBSTANCES MONITORED

Major reduction in loads

Based on company data for the last five months of 1995, the mill discharged 51 200 m^3/d of effluent, containing notably:

- 2641 kg/d of suspended solids (SS)
- 624 kg/d of biochemical oxygen demand (BOD_5)

From 1993 to 1995, biochemical oxygen demand dropped by 97%, while the suspended solids load decreased by 53%. Load reduction was mainly due to startup of secondary treatment in 1995.

KEY POINTS

- **98% reduction in Chimiotox index**
- **Startup of secondary treatment in 1995 at a cost of $35.6 million**
- **Municipal sewers treated by company treatment system beginning in 1996**
- **Non-toxic effluent**

Based on December 1995 inventory

ADDITIONAL INFORMATION

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