FACT SHEET 87

Cascades inc., Div. Joliette

260 Saint-Thomas Street Joliette, Quebec J6E 3P7

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 CASCADES INC., DIV. JOLIETTE mill in Joliette is in Group 3, which comprises regulated industrial plants.

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



INDUSTRIAL PLANT

Manufactures paperboard

The CASCADES INC., DIV. JOLIETTE mill manufactures paperboard from old paper, old paperboard, wood chips and rags. The pulp is refined and then fed to the paper machine. In 1995, the plant employs a work force of 55.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Old paper, paperboard and rags
- Softwood chips

FINISHED PRODUCTS

- Felt liner
- Paperboard

INITIAL EFFLUENT VALUES

ss and BOD_5

According to company data, in 1993 the mill discharged 1001 m^{3}/d of effluent containing notably:

- 338 kg/d of biochemical oxygen demand (BOD₅)
- 228 kg/d of suspended solids (ss)

RESOURCES AND USES TO PRESERVE

Spawning and rearing areas

The CASCADES INC., DIV. JOLIETTE mill empties its effluent into L'Assomption River 800 metres from the plant. There are quite a few spawning and rearing areas (lake sturgeon, yellow walleye and sucker) 4 km downstream of the discharge point. The lake sturgeon spawning ground is one of four spawning areas that provide recruits for the lake sturgeon populations between Lakes Saint-Pierre and Saint-Louis. Sports fishermen use the area downstream of Joliette. The L'Assomption drinking water intake is 50 km downstream of the mill's discharge point.

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. There are no environmental discharge objectives for the CASCADES INC., DIV. JOLIETTE mill because its effluent will be treated at the municipal wastewater treatment plant.

EFFLUENT TREATMENT

Primary treatment

Industrial wastewater first passes through a screen where it is separated by gravity. It then undergoes primary treatment by flotation and microfiltration before discharge into L'Assomption River.

PREVENTION AND CLEANUP MEASURES

Recycling and water consumption reduction

In 1994, the company launched a program to upgrade the mill, including broke and industrial wastewater management systems. The program was authorized by the Ministère de l'Environnement et de la Faune (MEF) on July 10, 1995; the main goal was to maximize water recirculation. The water treatment facilities were installed to promote energy conservation and reduce water consumption. In addition, recovered fibre is now reintroduced into the process. The mill now operates seven days a week. Effluent will be discharged to municipal sewers starting in February 1996. The Joliette wastewater treatment plant, however, will not open until 1999.

REGULATORY COMPLIANCE -WATER COMPONENT

Effluent meets standards

The CASCADES INC., DIV. JOLIETTE mill is subject to federal and provincial 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

Low Chimiotox index

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 characterization data collected in 1995 for the industrial effluent abatement program (PRRI) along with the Chimiotox values estimated from them assuming an effluent flowrate of 964 m³/d. According to these data, total oil and grease accounts for 30% of the Chimiotox index and total arsenic accounts for 26%.

Figure 1 is based on the 1995 PRRI characterization data. The Chimiotox index calculated from these data was applied to the entire period between 1993 and 1998. All mill effluent will be channeled to municipal sewers starting in 1996, but the municipal wastewater treatment plant will come on stream only in 1999. The effect of the new process-water recirculation measures on the Chimiotox index does not appear on Figure 1, because their role in improving the quality of the final effluent could not be gauged from the data available. However it can be gauged with ss loads and BOD₅.

Table 1 Chimiotox Index (1995) - Cascades inc., Div. Joliette*

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total oil and grease	0.621	100	62
Total arsenic	0.001	57 143	55
Total phosphorous	0.433	50	22
Guaiacol	0.400	200	12
Dehydroabietic acid	0.002	77	12
Total copper	0.023	451	10
Total aluminum	0.833	11	9
Oleic acid	0.269	19	5
Total iron	0.572	3.3	2
Catechol	0.009	200	2
Linoleic acid	0.124	19	2
Nitrites-nitrates	0.124	5	- 1
Total manganese	0.079	10	1
Total vanadium	0.010	71	1
Total zinc	0.054	9.4	1
Stearic acid	0.055	19	1
Abietic acid	0.060	19	1
Isopimaric acid	0.011	19	<1
Levopimaric acid	0.001	19	<1
Neoabietic acid	0.001	19	<1
Palustric acid	0.003	19	<1
Pimaric acid	0.014	19	<1
Sandaracopimaric acid	0.003	19	<1

CHIMIOTOX INDEX

205

* Assuming an effluent flowrate of 964 m3/d



Figure 1 Chimiotox Index trends (1993 to 1998) Cascades inc., Div. Joliette

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.

None of the eleven targeted persistent toxic substances were detected during the 1995 PRRI characterization in company effluent.

EFFLUENT TOXICITY

Effluent channelled to municipal sewer system

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. The CASCADES INC., DIV. JOLIETTE mill will not be subject to this regulation when its effluent will be channeled to the municipal sewerage system starting in 1996.

REDUCTION IN SUBSTANCES MONITORED

Loads reduced

According to company data, during the last four months of 1995 the mill discharged $665 \text{ m}^3/\text{d}$ of effluent containing notably:

- 216 kg/d of biochemical oxygen demand (BOD₅)
- 35 kg/d of suspended solids (ss)

Between 1993 and 1995, suspended solids loads dropped 85% and biochemical oxygen demand 36%. Effluent flowrate decreased 34%. These declines in loads and flowrate stem from the cleanup measures implemented as part of the mill upgrading program.

TECHNOLOGICAL DEVELOPMENT

Validation of an environmental decision-making process

An environmental decision-making process promoting integration of environmental, technical and economic considerations is being tested at the CASCADES INC., DIV. JOLIETTE mill. The process fosters a preventive approach that can minimize costs and lead to better sizing of treatment equipment. Benefits are quantified by taking into account savings on raw materials, for example, or the costs of disposing of waste no longer generated and improved energy efficiency. The project ends in September 1996.

KEY POINTS

- Mill upgrading program undertaken in 1994, including important measures to recirculate water, recycle fibre and conserve energy
- Industrial wastewater to be treated at municipal wastewater treatment plant starting in 1999

Based on December 1995 inventory

ADDITIONAL INFORMATION

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