

FACT SHEET No. 19

Commercial Alcohols Limited

2801 Marie-Victorin Road

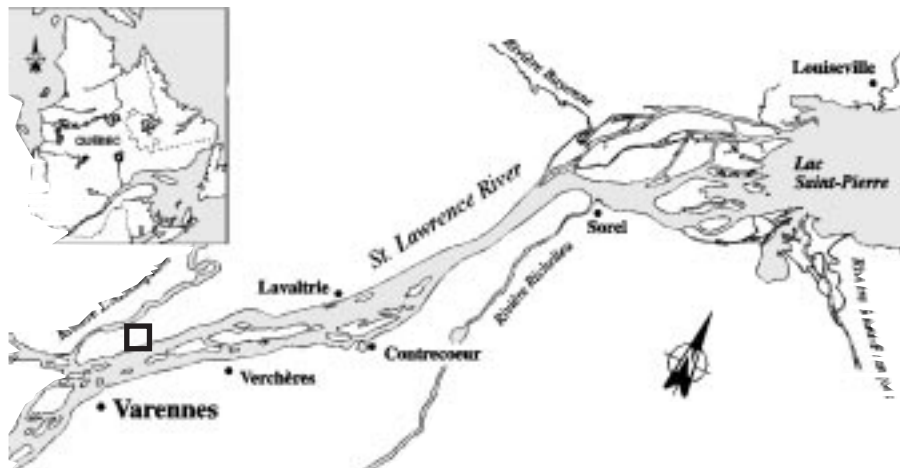
Varenes, Quebec

J3X 1S8

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 liquid toxic waste and virtually eliminate discharges of persistent toxic substances.

The 106 industrial plants designated under SLV 2000 are divided into four groups, each of which has been given a specific objective. The COMMERCIAL ALCOHOLS LIMITED plant, located in Varenes, is part of Group 4, comprising the 50 plants targeted under the St. Lawrence Action Plan.

The objective set for Group 4 is to pursue cleanup efforts and perform environmental monitoring to achieve a 90% reduction in liquid toxic waste. Between 1988 and 1995, the 50 plants reduced their toxic effluent discharges by 96%.



INDUSTRIAL PLANT

Ethyl alcohol manufactured until June 1991

The COMMERCIAL ALCOHOLS LIMITED plant in Varenes, which is now closed, manufactured ethyl alcohol by hydration of gaseous ethylene in the presence of a catalyst (phosphoric acid). Although production ceased in May 1991, barrelling continued until September 1991, and bulk shipping until summer 1992.

Before shutting down, the facility had an annual production capacity of 55 000 t and 65 permanent employees.

PRODUCTION

Prior to shutdown

PRINCIPAL RAW MATERIALS

- Gaseous ethylene
- Phosphoric acid (catalyst)

FINISHED PRODUCT

- Industrial ethyl alcohol

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mostly COD and SS

According to company data, in 1988 the effluent discharge was 861 m³/d, containing:

- 172 kg/d of chemical oxygen demand (COD)
- 102 kg/d of suspended solids (SS)
- 41 kg/d of biochemical oxygen demand (BOD₅)

RESOURCES AND USES TO PRESERVE

Commercial fishing area

Before closing, the COMMERCIAL ALCOHOLS LIMITED plant discharged its wastewater into De la Commune Brook, which flows into the St. Lawrence River. The stretch of the river between Montreal and Lake Saint-Pierre is a prime habitat for Lake sturgeon, an important species for the local commercial fishery. Cap Saint-Michel Bay, into which Commune Brook empties, serves as a nursery area for the Lake sturgeon populations that inhabit the sector between Lake Saint-Louis and Lake Saint-Pierre. The Verchères islands are located about 5 km below the confluence with Commune Brook, on the north side of the shipping channel. The marshes and weed beds there provide nesting sites as well as staging and feeding areas for waterfowl during migration. Spawning grounds for a variety of fish species are found in the region, which is also the site of many cottages. There are also some nesting and staging areas on the south shore of the river, between Varennes and Verchères. Below Commune Brook, the riverbank is occupied mainly by heavy industry and housing. The municipality of Verchères draws its drinking water from the St. Lawrence, at a spot about 10 km downstream from the Varennes industrial sector.

WATER QUALITY BASED OBJECTIVES

Environmental protection

Water quality based 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 treatment methods which best promote environmental protection. COMMERCIAL ALCOHOLS LIMITED completely ceased operations in the summer of 1992.

EFFLUENT TREATMENT

Neutralization of effluent

Before closing, the plant had been discharging effluent into the St. Lawrence at a rate of about 900 m³/d. Industrial wastewater, storm water and sanitary sewage, which had previously undergone activated-sludge pre-treatment, were neutralized and then channelled into a retention basin. The wash water from the barrels was neutralized and then settled in tanks. The effluents were mixed at the metering station prior to discharge into the river.

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

Automated neutralization process

In December 1989, the company submitted a proposal for a wastewater treatment program (PAE) aimed at controlling pH, suspended solids (SS), biochemical oxygen demand (BOD₅) and phosphates (PO₄). In 1990 and 1991, an overflow basin was built near the loading dock. The neutralization process for liquid effluent was fully automated in February 1991.

REGULATORY COMPLIANCE - WATER COMPONENT

Wastewater treatment project abandoned

The wastewater treatment program that COMMERCIAL ALCOHOLS LIMITED proposed in December 1989 had not been signed by the time the plant closed in 1991. After the plant shut down, no further effluent discharges occurred.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mostly phthalates

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

Table 1 gives the Action Plan characterization data gathered in 1990, as well as the Chimiotox values estimated from those figures, for an effluent flow of 901 m³/d. In testing for more than 120 substances, 12 were found. The figures show a predominance of total phthalates in the treated wastewater. Total phthalates made up 91% of the Chimiotox index, followed by total phosphorus (5%).

Figure 1 is plotted from the 1990 characterization data. The Chimiotox values for 1988 and 1989 were estimated from the 1990 Action Plan characterization data, factoring in the monthly company figures. The 55% drop in the Chimiotox index between 1989 and 1990 is explained by the changes made to the treatment system in 1990. Given that production stopped completely in 1991 and the plant closed in 1992, the index decreased 100% between 1988 and 1992.

Table 1 *Chimiotox Index (1990) - Commercial Alcohols Limited**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total Phthalates	5.131	5 000	25 655
Total Phosphorus	29.340	50	1 467
Arsenic	0.010	57 143	571
Total Oil and Grease	3.430	100	343
Copper	0.030	424	13
Iron	0.450	3	2
Antimony	0.340	2	1
Chloroform	0.006	64	<1
Zinc	0.030	9	<1
Ammonia Nitrogen	0.290	0.8	<1
Acetone	0.101	2	<1
1,1,-Trichloroethane	0.012	9	<1
CHIMIOTOX INDEX			28 052

* For effluent discharge of 901 m³/d (12 substances detected in testing for more than 120).

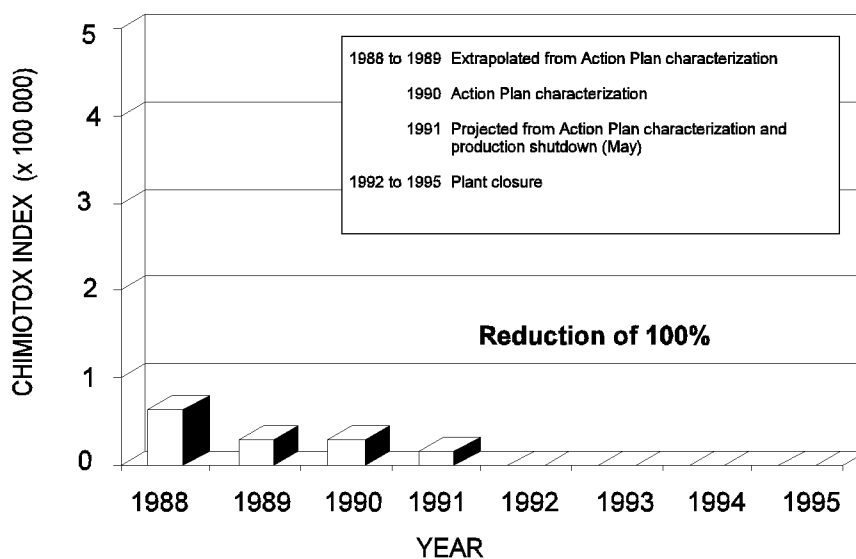


Figure 1 *Changes in toxic effluent discharges, 1988-1995 - Commercial Alcohols Limited*

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

No toxic substances detected

One long-range objective of SLV 2000 is the virtual elimination of 11 persistent bioaccumulative toxic substances from 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 alkyl, benzo(a)pyrene and hexachlorobenzene.

No persistent toxic substances were detected when the Action Plan analyses were conducted in 1990.

PEEP TOXICITY REDUCTION

Low toxicity

The Potential Ecotoxic Effects Probe, or PEEP, combines results from 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. One series of bioassays was conducted for the COMMERCIAL ALCOHOLS LIMITED plant in Varennes. The 1991 PEEP index was estimated at 1.8, among the lowest of the PEEP indices found for the 50 plants.

REDUCTION IN SUBSTANCES MONITORED

Shutdown of plant

Given that production ceased in 1991 and the plant closed for good in 1992, effluent discharges decreased by 100% as of 1992. However, before the facility closed, COD had already decreased by 55% and SS by 87% as a result of improvements made to the wastewater treatment system in 1990.

KEY POINTS

- **87% reduction in SS and 55% in COD between 1988 and 1990**
- **Production stopped in May 1991 and the plant closed for good in summer 1992**
- **PAE proposal in 1989**

Based on the December 1995 inventory.
Information reviewed by Gilles Legault, SLV 2000

ADDITIONAL INFORMATION

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