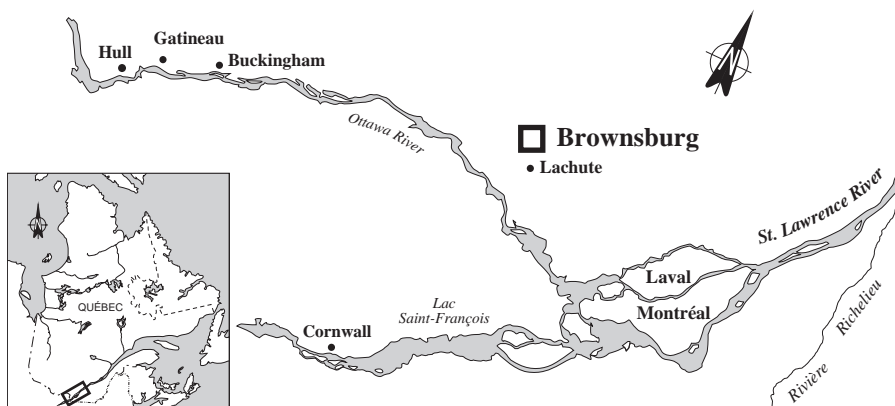


FACT SHEET 54

ICI Canada Inc.

Des Érables Street
Brownsburg Complex
Brownsburg, Quebec
J0V 1A0



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 ICI CANADA INC. plant in Brownsburg is in Group 1, comprising plants that discharge inadequately treated effluent.

The objective for Group 1 is to reduce toxic effluent discharges in targeted plants by 90%.

INDUSTRIAL PLANT

Manufacture of explosives initiating systems

The ICI CANADA INC. plant in Brownsburg manufactures explosives initiating systems and their components. The principal processes are metal shell production, plastic shock tube extrusion, pyrotechnic powder preparation, lead azide manufacture, processing/handling of pyrotechnic powder and explosives, and assembly and packaging of finished products. The main plant occupies about 90 acres and the total site is about 1600 acres. In 1997, the site employed a work force of 455 people, including Production, Research and Development, and Sales.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Aluminum
- Lead
- Lead nitrate
- HMX
- Copper
- Sodium azide
- PETN
- Plastic parts
- Plastic resins
- Corrugated cardboard boxes

FINISHED PRODUCTS

- Detonator assemblies
- Shock tubes
- Pyrotechnic-powder tubes
- Aluminum tubes
- Copper tubes

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Mainly COD

Since there are no data for 1993, the SLV characterization data were used. According to these data, the plant discharged about 132 m³/d of effluent, containing notably:

- 139 kg/d of chemical oxygen demand (COD)
- 24.9 kg/d of total oil and grease (O&G)
- 16.2 kg/d of suspended solids (SS)
- 12 kg/d of biochemical oxygen demand (BOD₅)

RESOURCES AND USES TO PRESERVE

Abundant aquatic life

ICI CANADA INC. had facilities at two sites in Brownsburg (the La Branche site and the Principal site), one on either side of the de l'Ouest River. Since November 1995, however, there has been no manufacturing at the La Branche site. The river upstream of the discharge point attracts tourists. Anglers fish for more than a dozen fish species; the most sought after are brown trout, bass, brook trout, muskellunge and walleye. Aquatic life is also abundant downstream. The mouths of several streams and of the de l'Ouest River are considered favourable sites for spawning of trout and yellow walleye. The lakes upstream of Brownsburg are suitable for water activities such as pleasure boating and line fishing. The first drinking water intake downstream of the discharge point supplies the town of Deux-Montagnes, at the southern end of Lac des 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. There are no environmental discharge objectives for ICI CANADA INC. as the company will send its wastewater to the future municipal treatment plant once it is in operation.

EFFLUENT TREATMENT

Three treatment units

The ICI CANADA INC. facilities include three units for treating industrial effluent. The first, in building 200, removes lead azide and sodium azide in five mixing tanks using sodium nitrite and nitric acid. The water is then channelled to building 532, which also receives effluent loaded with metals, effluent from a maintenance area and effluent generated by the preparation of pyrotechnic powder. The treatment system comprises an agitated storage tank, an oil recovery tank, a three-compartment Thermonic metal-removal unit, a holding tank and three paper filters. A third treatment system, in building 600G, includes a settling tank for water from screening and washing explosive products. Direct cooling water is recirculated. Domestic sewage is released directly into the de l'Ouest River.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Treatment system improvement

A number of manufacturing processes have been discontinued since 1992. The plant has not produced lead styphnate since the end of 1992. The facilities for manufacturing thermalite, safety fuses and connectors were shut down between June and December 1993, and the buildings were dismantled. The chrome plating facility closed in June 1994. The raw materials used to manufacture pyrotechnic powder (barium chromate and lead chromate) have been replaced. The plant stopped making detonating cord in November 1995.

THE ICI CANADA INC. plant improved its wastewater treatment system in 1997 and will make lead removal improvements in 1998. The company continue to search for a system adapted to oil and grease removal which will be in operation in 1999. The company is also studying the possibility of sending industrial effluent and domestic sewage to the future municipal wastewater treatment plant (aerated lagoons).

REGULATORY COMPLIANCE - WATER COMPONENT

No specific regulations

The ICI CANADA INC. plant is not subject to any specific regulations governing industrial effluent. After the connection to the Brownsburg wastewater treatment plant, the company will be subject to the discharge standards established by the MEF and the municipality under a water cleanup program (PAE).

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mainly total 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 SLV 2000 characterization data collected in July 1995 along with the Chimiotox values calculated from them, assuming an effluent flowrate of 132 m³/d. Eleven substances were selected in testing for more than 120. According to these data, total oil and grease dominate the treated effluent, accounting for 64% of the Chimiotox index.

Figure 1 is plotted from 1995 SLV 2000 characterization data. The Chimiotox index calculated from these data was reported unchanged for 1993, 1994 and 1996. In 1997, after some improvements to the treatment system of building 532, the Chimiotox Index dropped to 1821, meaning a 53% reduction. For 1998, the Chimiotox Index is based on metal reduction by the company. Installation in 1999 of an oil and grease treatment system, resulting in a 90% total reduction.

Table 1 *Chimiotox Index (1995) - ICI Canada Inc.**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total oil and grease	24.898	100	2490
Total lead	4.089	314	1284
Total copper	0.183	451	83
Nitrites-nitrates	8.571	5	43
Total iron	1.725	3.3	6
Total aluminum	0.073	11	1
Total cadmium	0.001**	909	1
Total zinc	0.129	9.4	1
Ammonia nitrogen	0.023	0.8	<1
Total phosphorus	0.003**	50	<1
Total manganese	0.006	10	<1

CHIMIOTOX INDEX

3909

* Assuming an effluent flowrate of 132 m³/d (eleven substances selected in testing for more than 120).

** Load calculation based on analytical data which are near methodological detection limits.

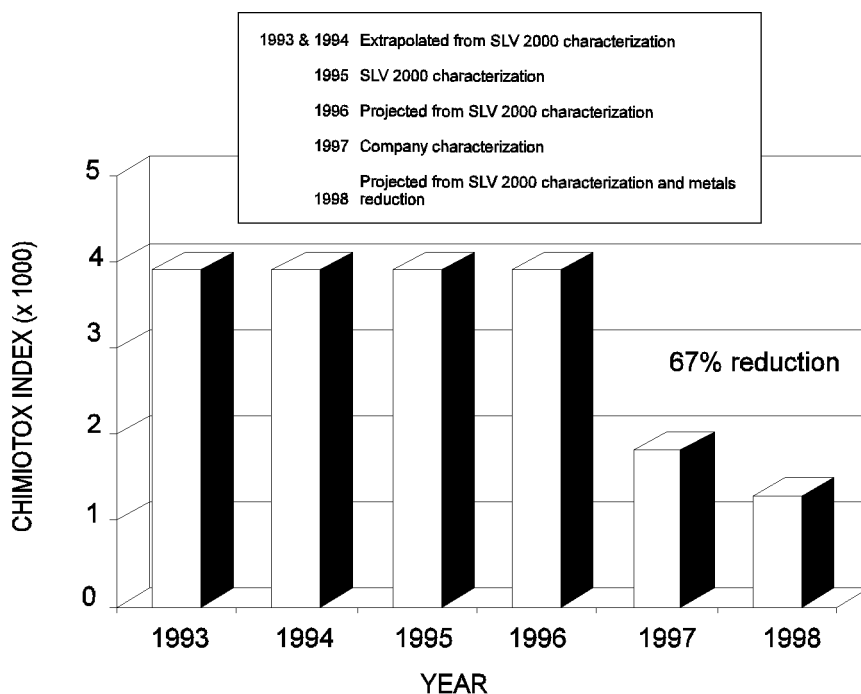


Figure 1 *Chimiotox Index Trends (1993 to 1998)*
ICI Canada Inc.

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 106 priority 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 these eleven persistent bioaccumulative toxic substances was detected in plant effluent during the 1995 SLV 2000 characterization.

PEEP TOXICITY REDUCTION

Low toxicity

The Potential Ecotoxic Effects Probe (PEEP) combines the results of six standardized bioassays measuring the toxic effects of effluent. 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. In the case of the ICI CANADA INC. plant, a series of bioassays of effluent was conducted in 1995; yielding a PEEP index of 3.8, and showing low toxicity for the organisms tested.

REDUCTION IN SUBSTANCES MONITORED

Effluent flowrate and loads stable

According to the company data, in 1995 the plant discharged about 132 m³/d of effluent, containing notably:

- 139 kg/d of chemical oxygen demand (COD)
- 11.7 kg/d of total oil and grease (o&g)
- 5.7 kg/d of suspended solids (ss)
- 12 kg/d of biochemical oxygen demand (BOD₅)

In 1997, oil and grease and suspended solids fell by 47% and 35% respectively due to improvements made to the wastewater treatment system.

KEY POINTS

- **Cleanup measures: facilities closed and raw materials replaced**
- **53% drop in Chimiotox Index resulting from improvements to the treatment system in 1997**
- **Other cleanup measures planned for 1998-1999: additional reduction in oil and grease and metal loads. An additional 14% decrease expected in 1998 and 67% total reduction in the Chimiotox Index**

Information revised January 1998

ADDITIONAL INFORMATION

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