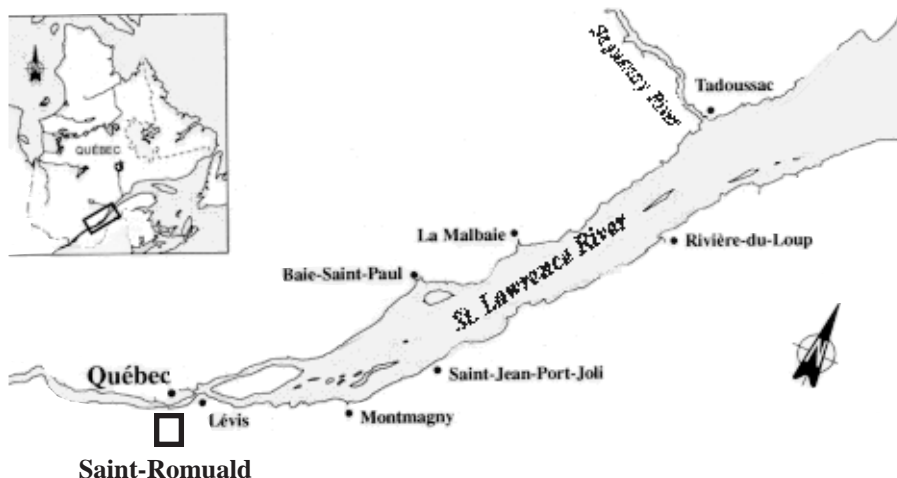


FACT SHEET No. 37

Ultramar Canada Inc.

165 Chemin des Îles
Saint-Romuald, Quebec
G6W 7N1



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 ULTRAMAR CANADA INC. refinery, located in Saint-Romuald, 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

One of Quebec's largest refineries

The ULTRAMAR CANADA INC. refinery in Saint-Romuald has a production capacity of 25 450 m³/d. The separation processes used include crude oil desalting, atmospheric distillation and vacuum distillation. The products are processed and upgraded by isomerization, hydrodesulphurization, cracking, reforming, polymerization and sulphur recovery. In 1995, the refinery operated at 100% of its nominal production capacity and employed a work force of 262.

PRODUCTION

PRINCIPAL RAW MATERIAL

- Crude oil

FINISHED PRODUCTS

- Propane
- Butane
- Liquid fuels (gasoline, fuel oil, diesel, kerosene)
- Bitumen
- Sulphur

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

ss and o&g

According to company data, in 1988 the plant had an average effluent discharge of 10 310 m³/d, containing:

- 699 kg/d of suspended solids (ss)
- 82 kg/d of oil and grease (o&g)
- 17 kg/d of ammonia nitrogen
- 1.4 kg/d of phenols
- 0.9 kg/d of sulphur

RESOURCES AND USES TO PRESERVE

Fish refuge

The ULTRAMAR CANADA INC. refinery in Saint-Romuald discharges its effluent directly into the St. Lawrence. Because of the tides, the impact of those discharges on the receiving water extends over some 15 km, both above and below Saint-Romuald. Not far above the refinery, the confluence of the St. Lawrence and the Etchemin rivers provides refuge for fish (smallmouth bass, longnose sucker and white sucker). Upstream as well, there is a large commercial fishing area in Frechette Cove, near ULTRAMAR CANADA INC.'s wharf. The Saint-Romuald drinking water intake is about 5 km from the refinery. Located a little below there, at Lévis-Lauzon, are the Lévis-Marina and the drinking water intakes for that community. Moreover, Lévis-Point is an area where fish spawn.

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 choosing treatment methods which best promote environmental protection. The water quality based objectives for ULTRAMAR CANADA INC. are available on request.

EFFLUENT TREATMENT

Biological treatment system

In 1995, the ULTRAMAR CANADA INC. refinery in Saint-Romuald discharged 8852 m³/d of treated wastewater into the St. Lawrence. Oily wastewater at the refinery goes to a gravity separator, which segregates the oil, grease and suspended solids. It then flows to a corrugated plates interceptor (CPI) and an air-injection flotation cell, which complete the segregation process. Next, the water is circulated to an aerated lagoon for biological treatment, then a settling basin in which the biological sludge is clarified. The treated wastewater is pumped and tested prior to release into the river. Lightly polluted wastewater undergoes primary treatment in a gravity separator and a flotation cell intended to segregate oil, grease and suspended solids. It is then channeled to the aerated lagoon for biological treatment. Sanitary sewage empties into the Lévis sewerage system.

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

Emphasis on training

In 1993 and 1994, the company provided more than 200 hours of wastewater treatment training to a group of 12 employees (operators, supervisors and technicians). The courses were designed to increase familiarity with the wastewater treatment equipment and thereby reduce the flow of effluents to the natural environment.

REGULATORY COMPLIANCE - WATER COMPONENT

Compliance with standards

The ULTRAMAR CANADA INC. refinery in Saint-Romuald is subject to provincial regulations and federal guidelines with respect to liquid waste from oil refineries. It is in compliance with all relevant standards.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Mostly oil and grease

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 average of Action Plan characterization data gathered in September 1990 and January 1991, as well as the Chimiotox values estimated for an average effluent flow of 9687 m³/d. In testing for more than 120 substances, 14 were found. The figures show a predominance of oil and grease, which make up 69% of the Chimiotox index, followed by total phosphorus (13%) and arsenic (11%).

Figure 1 is plotted from data gathered during the 1990 and 1991 Action Plan characterizations. The Chimiotox indices for 1988, 1989, 1993 and 1994 were extrapolated from those characterization figures and adjusted to reflect monthly company data. The index estimated from the Action Plan characterization figures was carried over unchanged for 1992. From 1988-1995, the Chimiotox index dropped by 42%.

*Table 1 Chimiotox Index (1990-1991) - Ultramar Canada Inc.**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Total Oil and Grease	65.347	100	6 535
Total Phosphorus	23.868	50	1 193
Arsenic	0.019	57 143	1 086
Mercury	0.003	166 667	500
Ammonia Nitrogen	92.235	0.8	74
Selenium	0.126	200	25
Iron	6.818	3	23
Total Phenols	0.104	200	21
Manganese	1.850	10	19
Tetrachloroethylene	0.088	113	10
Nitrites-Nitrates	1.727	5	9
Antimony	1.107	2	2
Zinc	0.115	9	1
Ethylbenzene	0.011	33	<1
CHIMIOTOX INDEX			9 498

* For effluent discharge of 9687 m³/d (14 substances detected in testing for more than 120).

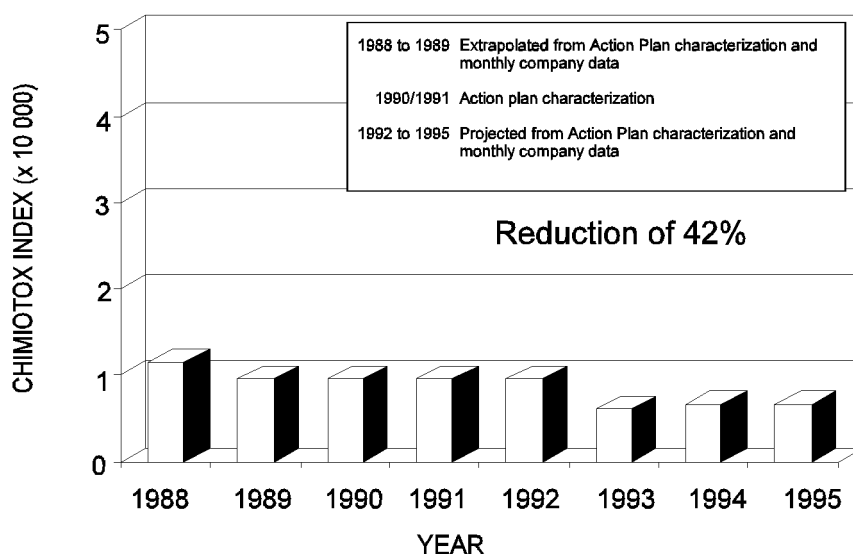


Figure 1 Changes in toxic effluent discharges, 1988-1995 - Ultramar Canada Inc.

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

Mercury detected

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

According to the Action Plan data, in 1990 and 1991 the effluent contained a mercury load of 0.003 kg/d. For the period covered by the 1993-98 action plan, the industry should as a minimum attain the water quality based objectives so as to protect all uses of the receiving environment. In the case of ULTRAMAR CANADA INC., the objectives calculated for mercury are 6×10^{-6} mg/L or 2.84×10^{-3} kg/d.

PEEP TOXICITY REDUCTION

Low toxicity

The Potential Ecotoxic Effects Probe, or PEEP, combines the results of 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. Two series of bioassays were conducted for the ULTRAMAR CANADA INC. refinery in Saint-Romuald. In 1991, a PEEP index of 3.4 was estimated from the averages of the two data series. It was among the lowest of the PEEP indices found for the 50 Action Plan plants.

REDUCTION IN SUBSTANCES MONITORED

Cuts in o&g and ss

According to company data, in 1995 the refinery had an average effluent discharge of 8852 m³/d, containing:

- 161 kg/d of suspended solids (ss)
- 26.9 kg/d of oil and grease (O&G)
- 24.4 kg/d of ammonia nitrogen;
- 0.16 kg/d of phenols
- 0.92 kg/d of sulphides

From 1988-1995, the effluent flow dropped by 14% while loads of oil and grease and suspended solids dropped by 67% and 77% respectively.

KEY POINTS

- 42% reduction in the Chimiotox index
- In 1993-1994, training for wastewater treatment personnel
- Compliance with refinery regulations

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

ADDITIONAL INFORMATION

Chimiotox index and PEEP: Gilles Legault,
Environment Canada (514) 283-3452.

Water quality based objectives:
Francine Richard, MEF (418) 644-3574.

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Environment officer at ULTRAMAR CANADA INC. INC: Pierre Pelletier (418) 835-8110.

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