

FACT SHEET 74

Montupet Ltd

500 Léger Street

Rivière-Beaudette, Quebec

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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 MONTUPET LTD plant in Rivière-Beaudette is in Group 2, comprising plants whose effluent may contain toxic substances even though treatment programs have already been implemented

The objective for Group 2 is maximum reduction of toxic effluent of targeted plants.

INDUSTRIAL PLANT

Aluminum engine parts production

The MONTUPET LTD plant in Rivière-Beaudette produces aluminum cylinder heads and intake manifolds. Aluminum alloys received in ingot form are melted in natural gas furnaces. The molten metal is then transferred to a casting ladle and sent to holding furnaces. In the moulding operation, metal cores are placed in two metal half-moulds. The moulds are closed and the metal is poured. The part is then removed and placed in a cooling tunnel. Finishing includes decoring, removal of risers, deburring and machining. Quality is monitored at the end of the process. The plant has a rated production capacity of 7000 t/yr. In 1995, the plant works at 100% capacity and employs a work force of 400.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Aluminum
- Silica sand
- Cutting oil
- Hydraulic oil
- Triethylamine
- Liquid nitrogen
- Sulphuric acid
- Phosphoric acid
- Isocure resin
- Phenolic resin
- Metal treatment products
- Zyglopenetrating agent

FINISHED PRODUCTS

- Aluminum cylinder heads
- Aluminum intake manifolds

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

Presence of phosphorus

According to 1995 SLV 2000 characterization data, in 1993 discharged an average of 1237 m³/d of effluent, containing notably:

- 7.6 kg/d of suspended solids (ss)
- 6.9 kg/d of total hydrocarbons
- 4.6 kg/d of total organic carbon (TOC)
- 3.9 kg/d of total phosphorus
- 0.5 kg/d of iron

RESOURCES AND USES TO PRESERVE

A priority area

Effluent from the MONTUPET LTD plant in Rivière-Beaudette is discharged into the storm sewerage system of the municipal industrial park. The storm sewerage system flows into an infiltration pond near the Beaudette River, a tributary of Lake Saint-François. Spawning grounds for walleye and smallmouth bass are located about 3 km upstream from the mouth of the Beaudette River. Fishing season regulations apply to the area. Apart from walleye and bass, a dozen other fish species are found in the river. A dense bird population lives on the lake near the mouth of the Beaudette River, and a number of duck species also use the area during migration and breeding. This wetland environment is a priority protection area.

The Beaudette River and Lake Saint-François are used for many recreational activities. The north shore of the lake contains campgrounds, boat ramps and beaches, while sport fishing, commercial fishing and water sports are practised on the lake. Saint-Zotique takes its drinking water from Lake Saint-François about 6.5 km downstream from the mouth of the Beaudette River.

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 to select treatment methods which best promote environmental protection. The environmental discharge objectives for MONTUPET LTD will be available by 1997.

EFFLUENT TREATMENT

Primary treatment

Effluent passes through a sediment, oil and grease interceptor containing a quicklime contact acid neutralizer. The treated effluent is discharged into the storm sewerage system, which also receives slightly contaminated water which it directs to a sediment interceptor before discharging it into the storm sewerage system of the municipal industrial park. Domestic sewage is carried by the sanitary sewerage system to the wastewater treatment plant of the Rivière-Beaudette municipal industrial park. This facility consists of a septic tank equipped with a septic field.

PREVENTION AND CLEANUP MEASURES IMPLEMENTED

Recovery and regeneration

The MONTUPET LTD plant has been working on its implementation project since 1994. In 1995, the company installed a new machining line along with aluminum chip recovery and moulding sand regeneration measures. Only the recovery process generates additional liquid effluent (200 m³/d of indirect cooling water), which has no impact on effluent quality.

REGULATORY COMPLIANCE - WATER COMPONENT

No specific regulations

Effluents from the MONTUPET LTD plant in Rivière-Beaudette is subject to no specific regulations.

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 data from the characterization carried out in September 1995 for SLV 2000 as well as Chimiotox values based on this data, assuming an effluent flowrate of 1237 m³/d. Seven substances were selected for testing for more than 120. Based on these data, total oil and grease dominates in the treated water, representing 76% of the Chimiotox index, followed by total phosphorus with 22%.

Figure 1 is based on 1995 SLV 2000 characterization data. The Chimiotox index calculated from these data was applied for the entire period between 1993 and 1998. No major changes have been made to the industrial wastewater treatment system.

Table 1 *Chimiotox Index (1995) - Montupet Ltd**

| Substance | Load (kg/d) | Toxic Weighting Factor | Chimiotox Units (CU) |
|----------------------|-------------|------------------------|----------------------|
| Total oil and grease | 6.880 | 100 | 688 |
| Total phosphorus | 3.895 | 50 | 195 |
| Total copper | 0.017 | 451 | 8 |
| Total sulphides | 0.014** | 500 | 7 |
| Total iron | 0.749 | 3.3 | 2 |
| Total manganese | 0.173 | 10 | 2 |
| Nitrites-Nitrates | 0.075** | 5 | <1 |

CHIMIOTOX INDEX

902

* Assuming an effluent flowrate of 1237 m³/d (7 substances selected in testing for over 120)

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

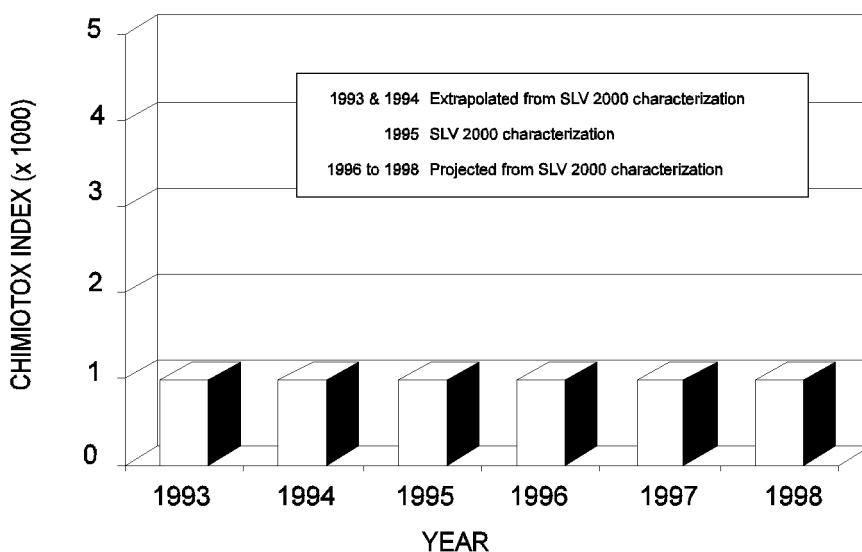


Figure 1 *Chimiotox Index trends (1993 to 1998)*
Montupet Ltd

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 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.

Based on 1995 SLV 2000 characterization data, none of the eleven targeted persistent and bioaccumulative toxic substances was detected in the company's effluent.

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. In the case of the MONTUPET LTD plant, a series of bioassays was conducted in 1995, resulting in a PEEP value of 2.4, and indicating that the effluent toxicity was low.

REDUCTION IN SUBSTANCES MONITORED

Stable effluent loads

According to 1995 SLV 2000 characterization data, the plant discharged 1237 m³/d of effluent, containing notably:

- 7.6 kg/d of suspended solids (ss)
- 6.9 kg/d of total hydrocarbons
- 4.6 kg/d of total organic carbon (TOC)
- 3.9 kg/d of total phosphorus
- 0.5 kg/d of iron

Effluent remained stable from 1993 to 1995 and no major changes were made to the industrial wastewater treatment system.

KEY POINTS

- Recovery of aluminum chips and moulding sand since 1995

Based on December 1995 inventory

ADDITIONAL INFORMATION

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