

FACT SHEET No. 25

Atlas Stainless Steels, Division of Sammi-Atlas Inc.

1640 Marie-Victorin Road
Tracy, Quebec
J3R 4R4



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 ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC. plant, located in Tracy, 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

Scrap recycling

The ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC. plant in Tracy makes stainless-steel sheets, coils and slabs from scrap and ferrous alloys. The raw materials are heated to fusion in an electric arc furnace. The metal undergoes vacuum decarburization, followed by continuous slab casting. Hot and cold mills roll the steel to the desired gauges. Although the hot mill is the chief source of oil and grease, it operates only one day a week. The plant also comprises annealing, pickling, shearing, grinding, polishing and cutting shops. In 1995, it had an annual production capacity of 124 000 t and operated at 77% of capacity with a work force of 680.

PRODUCTION

PRINCIPAL RAW MATERIALS

- Scrap
- Ferro-alloys: chromium, nickel, manganese, molybdenum
- Lime
- Dolomite

FINISHED PRODUCTS

- Stainless-steel rolled sections (sheets, coils)
- Stainless-steel slabs

TREATMENT MEASURES

INITIAL EFFLUENT VALUES

ss and o&g

Figures for 1988 were derived from the 1992 Action Plan characterization data adjusted for 1988 production volume.

Since the production shops operate on varying schedules during a typical week (the hot mill runs only one day out of seven, for example), the loads reported here are weighted averages. Thus, the average effluent discharge for 1988 was estimated at 60 811 m³/d, containing:

- 1596 kg/d of suspended solids (ss)
- 357 kg/d of oil and grease (o&g)
- 80 kg/d of chromium

RESOURCES AND USES TO PRESERVE

Recreational facilities

The ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC. plant, located at the edge of Tracy, discharges its wastewater into the St. Lawrence River, 120 m from the shore. The aquatic environment between the plant and the mouth of the Richelieu River has been damaged by the industrial effluents released in the region. The riverbanks downstream have been developed for recreational uses and include such facilities and amenities as public beaches, parks, campgrounds and river cruises. Some wharves at Saint-Joseph-de-Sorel and Sainte-Anne-de-Sorel have ramps from which boaters launch their craft. Notre-Dame-de-Pierreville is a spot favoured by both recreational and commercial fishermen. The area has large fish spawning grounds (Northern pike, Yellow perch, Lake sturgeon) and communities of rare vascular plants. The Sorel islands and channels provide nesting and staging areas for migratory waterfowl (Canada geese, dabbling ducks), whose presence attracts hunters to those spots.

Effluent from ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ALTAS INC. does not mix with the channel water to any great extent, but instead disperses south of the shipping channel.

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 ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC. are available on request.

EFFLUENT TREATMENT

Upgraded treatment systems

The industrial wastewater is circulated to catch basins for separating particulates from the effluent. Two different systems are used to treat wastewater from the hot mill and the vacuum decarburization section. A third treatment system is in operation at the annealing and pickling shop (acid water and quench water). Wastewater from the hot mill is channelled to an API separator, where floating oils are skimmed off. Oil recovery is facilitated by polymer flooding of the tank. The API effluent flows to a lamellar clarifier and then a filter. The dry-filtration system added to the vacuum decarburizer has eliminated suspended-solids contamination of the wastewater from that unit. Sanitary sewage empties into the Sorel wastewater treatment plant (aerated lagoons).

PREVENTION AND CLEANUP SYSTEMS IMPLEMENTED

Extensive treatment measures

In 1993 and 1994, the plant implemented treatment measures to reduce the pollutant content (ss and o&g) of the effluent. These measures included installation of a polymer injection unit at the hot mill (June 1993), a dust collector in the vacuum decarburization section (August 1994) and a wastewater treatment system for the API separator (September 1994).

In 1994, the plant reduced withdrawals by about 5000 m³/d by modifying the water rinsing system and upgrading the wet scrubbers in the annealing and pickling shops.

In June 1995, it introduced a physico-chemical treatment system for acid water and quench water. That should make for a substantial decrease in the loads of most pollutants. The overall cost of these projects is estimated at \$14 million.

REGULATORY COMPLIANCE - WATER COMPONENT

Agreement in principle for 1995

The Tracy plant entered into a wastewater treatment program (PAE) in July 1988. The objectives of the original program were revised subsequent to acquisition of the facility by a new owner (SAMMI-ATLAS INC.) in August 1993 and start-up of a project to boost production capacity by 300% between 1991 and 1997. Under an agreement in principle with the Ministère de l'Environnement et de la Faune du Québec (MEF), the company agreed to treatment measures aimed at meeting the new program objectives for 1995.

POLLUTION ABATEMENT

CHIMIOTOX INDEX ABATEMENT OF TOXIC POLLUTION

Chromium and o&g

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 1992, as well as the Chimiotox values estimated from those figures, for a weighted effluent flow of 60 811 m³/d. The 1992 results were weighted to account for operation of the hot mill (chief source of oil and grease) only one day a week. In testing for more than 120 substances, 17 were found. The figures show a predominance of chromium in the treated wastewater. Chromium makes up 45% of the Chimiotox index, followed by oil and grease (41%), arsenic (6%) and copper (4%).

Figure 1 is plotted from the 1992 characterization data, which were used to extrapolate Chimiotox indices for the period 1988-1991. For 1993 and 1994, the 1992 characterization results were adjusted to reflect monthly company data for oil and grease. The 1995 Chimiotox index was extrapolated from the 1993 and 1994 data, factoring in the efficiency of the physico-chemical treatment in operation since September 1995. The new system is expected to lower the Chimiotox index by 85% for the period 1988-1995.

Table 1 *Chimiotox Index (1992) - Atlas Stainless Steels, Division of Sammi-Atlas Inc.**

Substance	Load (kg/d)	Toxic Weighting Factor	Chimiotox Units (CU)
Chromium	77.486	500	38 743
Total Oil and Grease	356.257	100	35 626
Arsenic	0.084	57 143	4 784
Copper	8.771	424	3 719
Iron	586.429	3	1 759
Manganese	70.057	10	701
Nickel	62.571	10	626
Total Phosphorus	5.160	50	258
Nitrites-Nitrates	21.857	5	109
Bis-(2-ethylhexyl)phthalate	0.055	1 667	92
Zinc	5.100	9	46
Aluminum	2.914	11	32
1,1,1-trichloroethane	1.000	9	9
Molybdenum	2.429	1	2
Tetrachloroethylene	0.022	113	2
o-Xylene	0.004	25	<1
Trichloroethylene	0.008	12	<1

CHIMIOTOX INDEX

86 508

* For effluent discharge of 60 811 m³/d (17 substances detected in testing for more than 120).

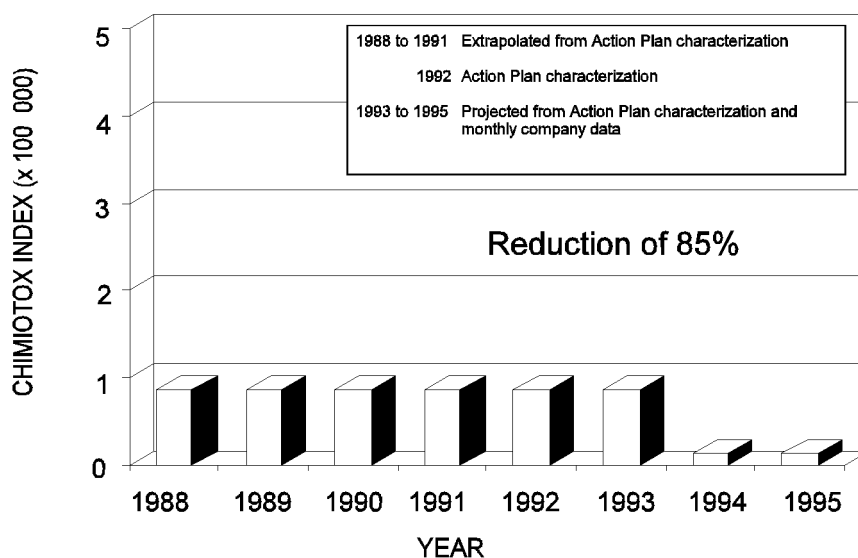


Figure 1 *Changes in toxic effluent discharges, 1988 - 1995 - Atlas Stainless Steels, Division of Sammi-Atlas Inc.*

VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES

No persistent toxic substances

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.

None of the targeted substances was detected during the 1992 Action Plan characterization study.

PEEP TOXICITY REDUCTION

High 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 ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC. plant in Tracy. The 1992 PEEP index was estimated at 6.6. It was among the highest of the PEEP indices found for the 50 Action Plan plants.

REDUCTION IN SUBSTANCES MONITORED

Larger loads

To establish figures for 1994, the 1992 characterization data were adjusted to reflect the efficiency of the new polymer flooding system in the hot mill. Given the varying schedules of the production shops (the hot mill, for one) during a typical week, the loads reported here are weighted

averages. Thus, the average effluent discharge for 1995 was estimated at 40 592 m³/d, containing:

- 3758 kg/d of sulphates
- 231 kg/d of suspended solids (ss)
- 31 kg/d of oil and grease (o&g)
- 29 kg/d of fluorides
- 0.6 kg/d of nickel
- 0.5 kg/d of chromium
- 0.4 kg/d of copper

Data from ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC. for the period 1988-1993 show an increase in the loads of some substances, but a drop in o&g owing to the 1993 installation of a polymer injection system in the hot mill. The 34% production gain between 1988 and 1992 accounts for the increased concentrations of pollutants in the effluent. The 1995 start-up of a physicochemical treatment system and other cleanup measures have further reduced pollutant loads in the effluent. Suspended solids have decreased by 85%, oil and grease by 91%, and chromium and nickel by 99%.

KEY POINTS

- 85% reduction in the Chimiotox index
- In 1993 and 1994, changes in the processes and the wastewater treatment system
- In June 1995, start-up of a physico-chemical treatment system
- \$14 million investment

ADDITIONAL INFORMATION

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

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

Records officers at the Ministère de l'Environnement et de la Faune du Québec (MEF): Ana Lopez and Luc St-Martin (514) 928-7607.

Environment officer at ATLAS STAINLESS STEELS, DIVISION OF SAMMI-ATLAS INC.: Marcel Martellini (514) 746-5274.

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

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