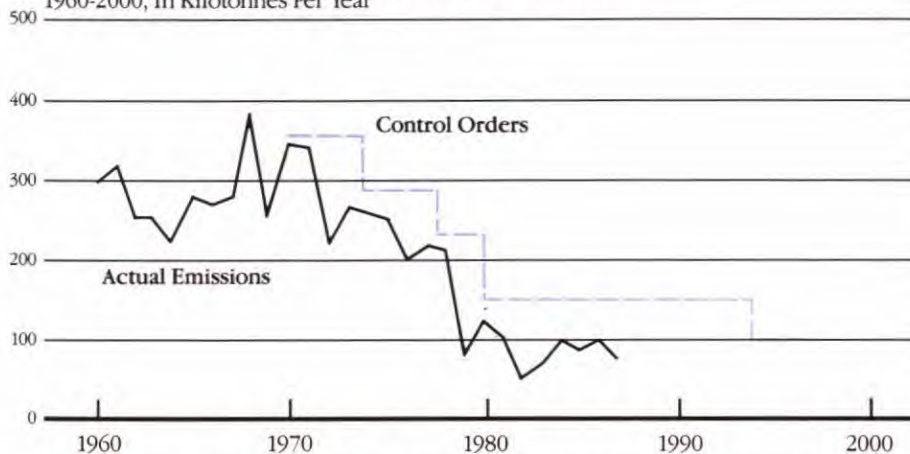


SUDBURY SMELTER'S ANNUAL SO₂ EMISSIONS

1960-2000, In Kilotonnes Per Year



Annual SO₂ emissions from the Falconbridge smelter have always been within Ontario government control orders. If the smelter had been operating at full capacity in 1988, it would have emitted 105 kt SO₂, well below the current limit, and just slightly above the 1994 limit of 100 kt/y.

Sudbury Operations: Continuous Progress in Reducing SO₂ Emissions

At Sudbury, Falconbridge operates a number of relatively small mines producing about 2.6 million tonnes a year of ore, containing just over 2.6 percent nickel plus copper and 12 percent sulphur. This ore is then concentrated and smelted at Sudbury to produce a matte containing approximately 75 percent nickel plus copper, which is then shipped to the corporation's facility in Kristiansand, Norway, for refining.

Falconbridge's smelting operations in Sudbury have been in production since 1930. For the first few decades, nearly 16 tonnes of SO₂ were produced for every tonne of nickel contained in the matte produced by the smelter. Subsequent investments and technical improvements had brought this ratio down to two to one by 1988. Annual emissions of SO₂ have declined from 300,000 tonnes in 1960, to under 100,000 tonnes in 1988, as shown in the accompanying chart. Some of this reduction is the result of operating at below capacity. If the smelter had been operating at its rated capacity of 88 million pounds of nickel per year, it would have emitted 105,000 tonnes of SO₂ in 1988.

Early efforts at reducing SO₂ emissions centred around rejecting the primary sulphur-bearing mineral (pyrrhotite) in Sudbury ores prior to smelting. By the mid-1970s, this approach had resulted in a decrease of more than half of the sulphur contained in the smelter feed. In 1969 a Smelter Environmental Improvement Project was initiated which led to the commissioning of a new smelter in 1978, incorporating new fluid-bed roasters, electric-furnaces and an acid plant. The

installation permitted 50 percent of the sulphur in the smelter feed to be fixed as sulphuric acid, cutting emissions in half.

A continuation of technical improvements made since this complex was commissioned have resulted in further reductions of SO₂ emissions. The long-term target at Sudbury is to decrease sulphur emissions below 75,000 tonnes per year with smelter output at its capacity of 88 million pounds of nickel. A (C)\$ 38-million plan was submitted to the Ontario Ministry of the Environment in 1988 that will allow Sudbury Operations to meet the 1994 SO₂ emission limits of 100,000 tonnes per year when operating at full capacity.

Kidd Creek: Building Environmentally Sound Operations

The metallurgical facilities at Kidd Creek have been built to treat the ores from the major zinc silver ore body that was discovered there in 1964. In April 1972, a zinc plant was commissioned, which has a capacity at present of 130,000 tonnes a year. In July 1981, a copper smelter using the Mitsubishi Continuous Smelting Process was placed into production. This smelter now has a current output capacity of 100,000 tonnes of copper a year.

Pollution control systems were built into the zinc plant, which now captures approximately 98.5 percent of the SO₂ produced. The total emission of SO₂ to the atmosphere from the zinc plant was approximately 2,000 tonnes in 1988. Since start-up, over one million tonnes of zinc metal have been produced by the plant and over 2 million tonnes of SO₂ have been captured and made into sulphuric acid. The acid plant at the copper smelter was commissioned in 1981 and captures 99.5 percent of the SO₂ contained in the off-gas.

Without acid plants at Kidd Creek, the emission of SO₂ into the atmosphere would be on the order of 325,000 tonnes a year. In 1988, the Kidd Creek metallurgical complex produced 500,000 tonnes of sulphuric acid and only emitted 5,000 tonnes of SO₂ into the atmosphere.



Falconbridge's Strathcona mine and mill complex in Onaping, Ontario, in the Sudbury Basin.