The Smelting Process

SUDBURY
INTEGRATED NICKEL
OPERATIONS
A GLENCORE COMPANY

Sudbury Integrated Nickel Operations' Smelter receives concentrates from its own mines as well as feeds from third parties which includes concentrates and other materials bearing nickel and cobalt as well as other pay metals. These feeds are blended into the process at various stages depending on composition. One of the entry points is the Calciner, which was commissioned in 2007 at a cost of $30 million.
The Calciner allows the Smelter to treat complex end-of-life materials such as rechargeable batteries, plating sludges and catalysts in an environmentally sound manner.

The concentrate is fed to roasters where sulphur is removed as SO_2 gas and sent to the sulphuric acid plant for treatment. The roaster product (calcine) is fed to the electric furnace.The furnace produces a matte that contains desirable metals like nickel, copper and cobalt as well as a slag that is stockpiled on site and is managed to strict environmental standards. The furnace matte is then transferred to the converter aisle to further reduce the iron content and concentrate the pay metal content. The final product from the converter aisle is a matte containing 2% iron which will be destined for our refinery in Kristiansand, Norway. Slag from the converter aisle is transported by the Slag Hauler to disposal pits on site.

The Acid Plant was commissioned in 1978 as part of the Smelter Environmental Improvement project. The Acid Plant treats the roaster off-gas, capturing the sulphur dioxide (SO_2) and producing a 93% sulphuric acid (H_2SO_4), which is shipped to customers primarily located in North America.

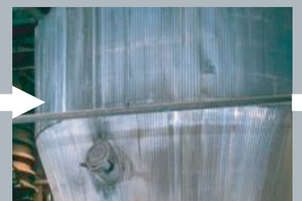

Raglan Concentrator

Dry Concentrate

(transported by ship and railcars via Quebec City)


Raglan Receiving

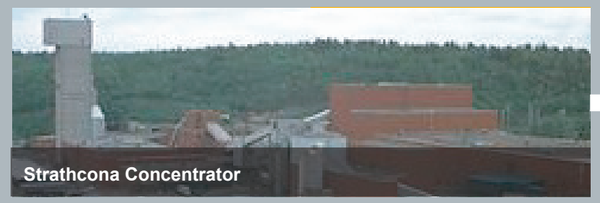

Roaster Feed


Fluid Bed Roasters

Off Gas


Acid Plant

Sulphuric Acid to Market


Strathcona Concentrator

Slurry Concentrate

(transported by trucks)

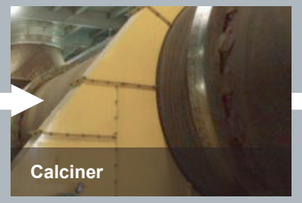

Slurry Receiving


Feed Preparation

Calcine


Custom Feeds Preparation Area

Custom Feeds

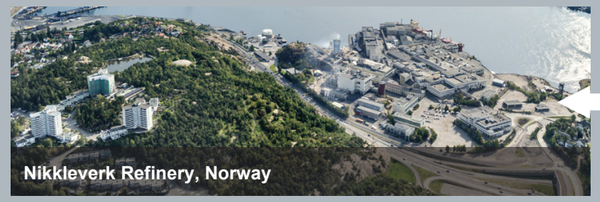

Calciner

Secondary Feeds


Electric Furnace

Granulated Furnace Slag to Dump

Electric Furnace Matte

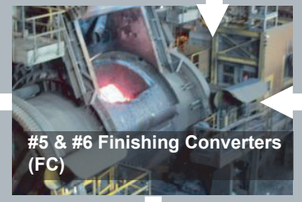

Nikkleverk Refinery, Norway

Granulated Matte

(transported by ship and railcars via Quebec City)


Matte Granulation

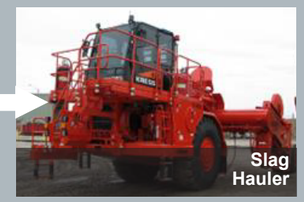
Cast Matte


#5 & #6 Finishing Converters (FC)

HV Matte


#7 & #8 Hybrid Vessels (HV)

Converter Slag to Dump


Slag Hauler

FC Slag