

PROCESSING PROJECTS

Bystrinsky GOK (Chita Project)



GRK Bystrinskoe (Bystrinsky GOK) is Nornickel's new project for producing copper and gold (as well as iron) concentrates. This is the largest greenfield project in the Russian mining industry, covering ore mining, concentration and shipment of end products to customers. Bystrinsky GOK is the Company's 50.01% subsidiary.

Location

Gazimuro-Zavodsky District, Chita Region, Zabaykalsky Krai.

Project overview

Open-pit mining at the Bystrinskoye Deposit, building the mining and processing plant (MPP) along with all of the associated infrastructure, including a power line, a 227 km Borzya – Gazimursky Zavod rail line, and a camp.

Construction of the open-pit mine and the MPP started in 2013. In 2017, the 220 kV power line were commissioned and a camp for 1,047 people was built. Hot commissioning of the MPP started in October 2017, with the project expected to reach its design capacity by 2021.

Highlights

Ore reserves:

326 mt

Average content:

Cu – 0.7%

Fe₃O₄ (magnetite) – 23%

Au – 0.9 g/t¹

New jobs:

~2 thousand people

¹ According to the Russian classification (A+B+C₁+C₂).

2018

- CAPEX – RUB 10.7 bln (USD 168 mln)
- 7.9 mt of ore mined, 19.4 kt of copper concentrate, 3 t of gold concentrate and 0.4 mt of magnetite concentrate produced. EBITDA – USD 96 mln

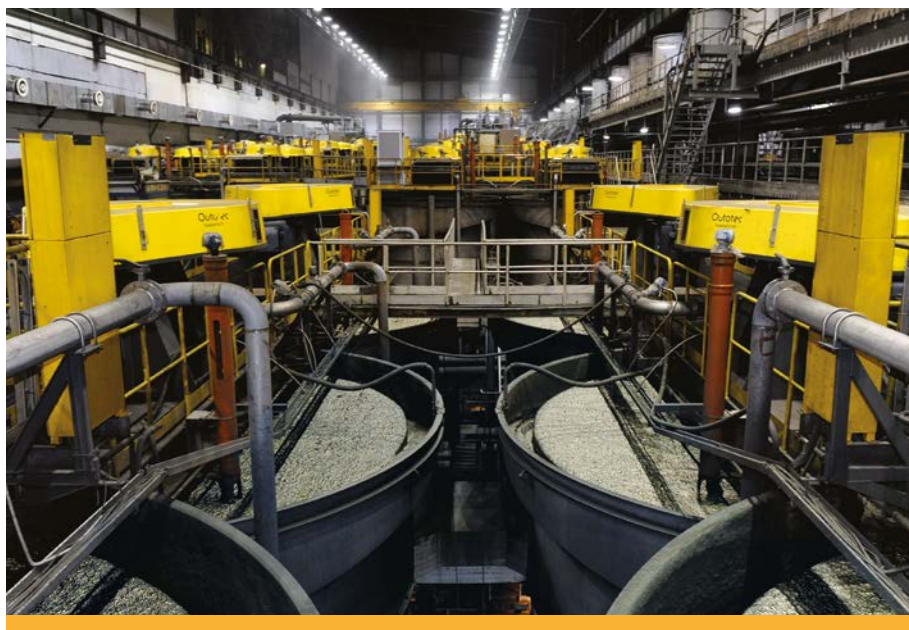
2019

- Increasing ore production to 8.0 mtpa, producing 40–46 kt of copper concentrate, 6.0–6.5 t of gold concentrate and 1.3–1.4 mt of magnetite concentrate.

2020

- The MPP's reaching design capacity with the following annual concentrate volumes:
Cu – 65–70 kt;
Au – 8.5–9.0 t;
Fe₃O₄ (Fe – 66%) – 1.9–2.1 mt

Upgrade of Talnakh Concentrator



Talnakh Concentrator is part of the Company's Polar Division. It processes rich, cupriferous and disseminated ores from the Oktyabrskoye and Talnakhskoye deposits to produce nickel-pyrrhotite and copper concentrates. In 2018, the plant processed 10.4 mt of ore, with nickel recovery in bulk concentrate reaching 83.2% (+1.5% y-o-y).

Location

Norilsk Industrial District, Krasnoyarsk Territory (Polar Division).

Project overview

Ramping up capacity and implementing a more efficient concentration technology.

The upgrade is rolling out in three stages. Stage 1 included reconstructing existing floatation capacities and replacing floatation cells that were beyond their useful lives in order to maintain the concentration

capacity at 7.5 mtpa (completed in 2015). Stage 2 involved the expansion of the main building, reconstruction of the reagent preparation building, and construction of two ball mills 300 cubic metres each and five vertical mills, all of which helped to boost capacity to 10.2 mtpa. This stage also included the building of the first phase of the tailings pit. The project was completed in 2018. Plans for Talnakh Concentrator-3 include capacity ramp-up and implementation of a more efficient concentration technology.

Key Stage 3 parameters

CAPEX:
RUB 40 bn (USD 0.6 bn)

Ramping up capacity:
from 10 mtpa to 18 mtpa

Building the second phase of the tailings pit

Commissioning planned for
2023

2018

- CAPEX – RUB 0.8 bn (USD 12 mln)
- Construction site inspection and preparatory work completed
- Design documentation developed

2019

- Obtain the State Expert Review Board's approval

2020–2022

- Construction and installation works, equipment delivery, pre-commissioning

Development of the South Cluster



The South Cluster is comprised of the Norilsk Concentrator (processing capacity of 9.3 mtpa), the northern part of the Norilsk-1 Deposit that is developed by Zapolyarny Mine through open-pit (Zapolyarny open pit) and underground (Zapolyarnaya mine) mining, as well as tailings pit No. 1 and Lebyazhye tailing pit. Norilsk Concentrator processes all disseminated ores from Zapolyarny Mine and cupriferous and disseminated ores from the Oktyabrskoye and Talnakhskoye deposits. In 2018, the plant processed 6.8 mt of ore, with nickel recovery in bulk concentrate reaching 71.9% (+0.2% y-o-y). Zapolyarny Mine produced 1.7 mt of disseminated ore. In 2017, Nornickel established Medvezhy Ruchey, a subsidiary that operates the assets of the Southern Cluster.

Location

Norilsk Industrial District, Krasnoyarsk Territory (Medvezhy Ruchey).

Project overview

As part of the South Cluster project, ore production will be ramped up to 9 ktpa. This will be done in two stages: first, by expanding the pit (open-pit operations), and then – through underground mining.

Highlights

Project CAPEX until 2022	RUB 45 bn (USD 0.7 bn)	Ore reserves:	165 mt
The project is expected to reach its design capacity starting	2027	Average content:	Ni – 0.2% Cu – 0.3% PGM – 3.9 g/t ¹

2018

- Feasibility study for further project development completed

2019

- Stripping works
- Completion of design documentation drafting

2021–2022

- Ore production launch

¹ According to the Medvezhy Ruchey Mine development project.

Tank-House refurbishment



Tank-House 2 produces cathode nickel as part of Kola MMC's Severonickel Plant, and together with Tank-House 1 made 147 kt of the product in 2018.

Location

Severonickel Plant, Monchegorsk, Murmansk Region (Kola MMC).

Project overview

Tank-House 2 is expected to boost capacity from 120 mtpa to 145 mtpa thanks to upgraded technology and higher recovery.

Tank-House 2 is introducing the technology of nickel electrowinning from chlorine dissolved tube furnace nickel powder, which will help achieve the highest purity of metal.

Highlights

<p>Increasing Tank-House 2 capacity</p> <p>from 120 ktpa to 145 ktpa of nickel</p>	<p>Increasing nickel recovery from converter matte</p> <p>by 1%</p>
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2018

2019

- CAPEX – RUB 10.8 bn (USD 169 mln)
- Gradual capacity commissioning completed, progress – 82%

- Reaching the design capacity and performance targets

Construction of a concentrate shipment facility and separating section at Kola MMC



The project will involve the upgrade of Kola MMC's Concentrator and construction of a concentrate shipment facility. Located in Zapolyarny, the Concentrator produces briquetted copper-nickel concentrate. In 2018, it processed 7.9 mt of ore.

Location

Zapolyarny, Murmansk Region (Kola MMC).

Project overview

Construction of an additional floatation section at the Concentrator for separating high grade and low grade concentrate,

and a concentrate shipment facility with the capacity of 200 kt of dry concentrate. The new arrangement will see low grade concentrate shipped to third parties, while high grade concentrate will be sent for further processing at the Smelting Shop in Nickel.

Highlights

Project CAPEX:

RUB 4.9 bn (USD 85 mln)

Project completion and launch of finished concentrate production slated for **2019**

2018

- CAPEX – RUB 1.1 bn (USD 17 mln)
- Construction of the concentrate shipment facility: Outotec has designed basic engineering and signed a contract for equipment supplies
- Thickeners dismantled and utility systems relocated, construction and installation works started on the shipment facility

2019

- Obtain the State Expert Review Board's approval
- Completion of all construction and installation works
- Launch of finished concentrate production and and plant pre-commissioning