



About the asset

The Nornickel Group boasts a unique resource base unrivalled in terms of the number of valuable minerals and the high content of key metals such as nickel, copper, and platinum group metals (PGM). Located on the Taimyr Peninsula, the Company's key production site has over 2 bt of ore in resources, which is sufficient to maintain current production levels for over 80 years.

Nornickel develops the **Talnakh** and **Norilsk** Ore Clusters in the Norilsk Industrial District. In 2018, the total amount of ore mined in these areas was 17.3 mt, or approximately 50% of the Nornickel Group's overall production volumes.

The key production assets responsible for mining and processing are Polar Division and Bear Creek. Polar Division develops the Talnakh Ore Cluster, which includes the Oktyabrskoye and Talnakhskoye copper-nickel deposits of rich, cupriferous and disseminated ores, while Bear Creek produces ore from the Norilsk Ore Cluster.

PRODUCTION

at Polar Division and Beer Creek in 2018

17.3
mt of ore

Talnakh Ore Cluster

The Talnakh Ore Cluster is located in the Norilsk Industrial District, on the right bank of the Norilskaya River. It includes the Oktyabrskoye and Talnakhskoye copper-nickel deposits, the largest of their kind, which are situated on the north-western margin of the Siberian Craton. In the early 1960s, multiple bodies of copper, cupriferous and disseminated ores were discovered in this area. Nornickel is still mining non-ferrous and noble metals from the outstanding amounts of highest-quality reserves of the Talnakh Ore Cluster.

The Company conducts ongoing geological exploration at the Talnakh Ore Cluster deposits in order to increase the reserves of rich and cupriferous ores through operational exploration and follow-up exploration of deep horizons and flanks.

In 2018, as part of the Follow-Up Exploration at the Oktyabrskoye Deposit project, Nornickel performed geological exploration from surface, with a number of wells having opened up rich ores outside the boundaries of the approved reserves, marking an increase in the quantity of reserves of the Severnaya 3 lens and Severnaya 4 rich ore deposits. There was no quantification of the increase done in 2018; the works under the project are ongoing.

MINERAL RESOURCE BASE

Measured and indicated mineral resources

1,561.6
mt of ore

11.5
mt
of Ni

21.9
mt
of Cu

7.4

kt of PGM
(236.7 m oz t)

Norilsk Ore Cluster

In the Norilsk Ore Cluster, Nor Nickel has been developing sulphide disseminated ores in the northern part of the Norilsk-1 Deposit since the 1930s. Nor Nickel's geological exploration led to an increase in the deposit's reserves to 150 mt of ore, making it possible to proceed with open-pit and underground mining in the northern part of the deposit until 2050.

The deposit development project was called Southern Cluster. To support this project, including by way of attracting new investments, in 2017, Nor Nickel established Bear Creek, a standalone subsidiary that operates the assets of the Southern Cluster, holds the development licence and owns part of Polar Division's assets. Bear Creek oversees operations at Zapolyarny Mine (open-pit and underground mining), Tailing Dam No. 1, Lebyazhye tailing dam and Norilsk Concentrator. As part of the Southern Cluster project, ore production will be ramped up to 9 mtpa. After reaching its target capacity, the project will annually yield over 20 tonnes of PGM.

Tapping into the Taimyr ore reserves will be facilitated by the development of several other deposits in the Norilsk Industrial District, which [Nor Nickel plans to pursue in partnership with Russian Platinum](#). For example, the Company eyes the development of the Maslovskoye Deposit, one of the world's largest deposits of platinum-copper-nickel sulphide ores located 12 km south of Norilsk-1. The licence for its development is held by Nor Nickel. To top it off, the Chernogorskoye Deposit and the southern part of the Norilsk-1 Deposit will be developed under licences held by Russian Platinum.

MINERAL RESOURCE BASE

Measured and indicated mineral resources

147.0

mt of ore

0.4

mt
of Ni

0.6

mt
of Cu

0.8

kt of PGM
(25.6 m oz t)

2018 highlight

Polar Division and Bear Creek accounted for 75% and 37% of the Group's total copper and PGM end products, respectively.

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Geological exploration

Nornickel conducts ongoing geological exploration at the Talnakh Ore Cluster deposits in order to increase the reserves of rich and cupriferous ores through operational exploration and follow-up exploration of deep horizons and flanks. In 2018, as part of the Follow-Up Exploration at the Oktyabrskoye Deposit project, a number of wells opened up rich ores, marking an increase in the quantity of reserves of the Severnaya 3 lens and Severnaya 4 rich ore deposits.

The northern part of the Norilsk-1 Deposit was not explored in 2018.



Mining assets

The Talnakhskiye and Oktyabrskoye Deposits are developed by Taimyrsky, Oktyabrsky, Komsomolsky, Skalisty and Mayak Mines. Polar Division uses simulation modelling for underground mining planning.

The Norilsk-1 Deposit (Bear Creek) is developed by Zapolyarny Mine through open-pit and underground mining.



Concentration facilities

All ore produced is enriched at Talnakh and Norilsk Concentrators. Talnakh Concentrator processes rich, cupriferous and disseminated ores from the Oktyabrskoye and Talnakhskiye Deposits to produce nickel-pyrrhotite and copper concentrates and metal bearing products. In 2018, the Company resolved to ramp up capacity at Talnakh Concentrator from 10.2 to 18 mtpa.

Norilsk Concentrator processes all disseminated ores from the Norilsk-1 Deposit, cupriferous and disseminated ores from the Oktyabrskoye and Talnakhskiye Deposits, and Copper Plant's low-grade ores to produce nickel and copper concentrates.



Smelting facilities

As part of its large-scale reconfiguration programme, the Company shut down Nickel Plant, making Kola MMC its new nickel refining hub. Polar Division focuses on the production of converter matte (semi-product sent to Kola MMC), as well as copper cathodes and sulphur.

Thickened concentrates are hydrotransported from Talnakh and Norilsk Concentrators to Nadezhda Metallurgical Plant and Copper Plant. Nadezhda Metallurgical Plant processes nickel-pyrrhotite concentrate and metal bearing products from Talnakh Concentrator, nickel concentrate from Norilsk Concentrator and pyrrhotite concentrate, while also producing converter matte and elemental sulphur.

Copper Plant processes all copper concentrate from both concentrators and handles third-party feedstock to obtain saleable copper cathodes. It also produces elemental sulphur and sulphuric acid for the production needs of Polar Division.

Copper Plant processes slime from the Copper Tankhouse to produce concentrates of precious metals and technical selenium. Precious metals from Polar Division and Kola MMC are refined at Gulidov Krasnoyarsk Non-Ferrous Metals Plant (Krasnoyarsk Territory) under a tolling agreement.

