

CRM of Ukraine Database Supplements

Mineral target:	Mariupolske deposit
Commodity:	Graphite

Version: 17 April 2024

Project	101075609 — GSEU — HORIZON-CL5-2021-D3-02
Supplement Data	
Supplement number:	MO.400022
Dissemination level:	Public
Supplement type:	Description
Work package:	WP2: Critical Raw Materials, the International Centre of Excellence and United Nations Framework Classification (CRM-ICE-UNFC)
Lead WP/ Supplement beneficiary:	[EGS]

Supplement status	
Endorsed (WP leader):	Guillaume Bertrand, BRGM
Supervised	Boris Malyuk, BRGM/GIU
Approved (Metadata Coordinator):	Oleksiy Likhosherstov, GIU
Author(s):	Affiliation:
Nataliya Kovalenko	GIU
Stella Shekhunova	IGS
Vitaliy Sukach	IGMOF
Maria Kurylo	UAG

Location: Donetsk region, Mariupol district, at a distance of 10-12 km from the city of Mariupol.

Study: Mariupolske deposit (formerly Zhdanivske) is known since 1904 and was developed underground until 1917. In 1946-1949, geological exploration work was carried out with the aim of identifying a new raw material base of crystalline graphite for the Zhdanivskiy graphite plant. In 1946-1954, reserves were reassessed in previously explored areas and a new area was opened. The explored deposit (Nova section) is separated from the previously known and mostly developed Starokrymske deposit. Reserves in the section Nova of the Mariupolske deposit were approved by the decision of the State Committee of the USSR No. 201 of 12.14.1954.

Geological characteristics: the Mariupolske deposit is located in the eastern part of the Azov megablock of the Ukrainian Shield, and is characterized by a two-floor structure. The lower structural floor is the Precambrian crystalline basement. The upper one is a platform cover made up of sediments of the Mesozoic-Cenozoic age.

Graphite-bearing rocks are represented by biotite-chlorite, biotite-amphibole, garnet-biotite and biotite-pyroxene gneisses of the Temryukska Suite of the Central Pryazovska Series, interspersed with amphibolites, quartzites and carbonate rocks and cut by subalkaline granitoids and syenites of the South Kalchitskiy Complex. Within the boundaries of the Nova site, six ore bands were found, stretched in the northwest direction, and separated by granite intrusions. Only three of them are of industrial importance - IV, V, VI. They consist of graphite-bearing rocks with industrial graphite content and associated layers with non-industrial graphitization and barren rocks. The thickness of the bands varies between 20-100 m, their length is 150-700 m. Industrial graphitization is traced to a depth of 65-89 m.

The thickness of overburden rocks, represented by ancient alluvial sediments, varies from 0.5 to 7 m within IV and V ore bands, which were planned to be developed in an open-pit way, and increases to 30-35 m in the rest of the area.

The ore-bearing zone is traced for 950 m with a width of up to 250 m. The content of graphite in the ore varies within the ore bands both along the strike and along the dip. The average graphite content in industrial ores is 4.3% for the IV strip, 3.82% for the V strip, and 3.35% for the VI strip.

The V strip is explored in the most detail, which makes it possible to identify reserves of industrial categories within its limits. The largest VI strip has remained unexplored.

To calculate the reserves in the deposit, industrial ores with a weighted average graphite content of 2.5% and 1.8% graphite were selected, and non-industrial (off-balance) ores with a graphite content of less than 2.5%, but not lower than 1.5% and 1.0%

Graphite is flaky. According to the results of experimental beneficiation, it was established that ores are well beneficiated by the flotation scheme.

The deposit is recommended for development.

Assessment of resources/reserves: The reserves are approved by the DKZ of the USSR (protocol No. 201 dated 14.12.1954) in quantity by category (thousand tons):

graphite ore / graphite by categories A+B+C1 – 3440.0 /135.0; C2 – 1347 /41.0; protection pillar C1 – 684.0/27.0; C2 – 242.0/9.0; off-balance - 771.0/13.0.