



CRM of Ukraine Database Supplements

Mineral target:	Bakhtynske deposit
Commodity:	Fluospar

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Mineral: the main mineral is fluorspar (fluorite); associated minerals are feldspar, quartz.

Location: Murovanokurylovetskiy district, Vinnytsia region, near the village Bakhtin, 7.5 km north of the Murovani Kurylivtsi district center. The distance to the nearest Katyuzhany railway station, which is located on the Zhmerinka-Mohyliv-Podilsky main line of the South-Western Railway, is 15.0 km (35 km by road). The area is covered by a dense network of roads, one of which in the direction of Murovani Kurylivtsi - Bar passes through the area of the deposit.

Deposit area: 502.86 ha.

Exploration: The deposit was discovered in 1962 by the "Kyivgeologiya" trust during excavation work in this area. Since 1991, it has been explored by the Pobuzka GRP of the Pivnichgeologiya DRGP. In 2000, the geological exploration work was completed, the final stage of which was the approval of mineral reserves of the DKZ of Ukraine. The work was carried out with the aim of creating its own raw material base for the prospective construction of the mining-beneficiation plant with a capacity of 0.5 million tons of ore per year.

Geological characteristics: In terms of geomorphology, the territory of the works is located within the deeply divided Transnistria and, in turn, is the southeastern part of the Podilsk Highlands, which is what determines its character of the relief, namely the bumpiness of the terrain, strongly cut by river valleys with a depth of cut of up to 50.0 m.

In particular, the area of the Bakhtynske deposit is located at the confluence of a nameless, deeply incised ravine (without a permanent watercourse) with the Terebizh River.

The water network of the district is represented by numerous left tributaries of the Dnister River, namely Zhvan, Terebizh, and Bakhtynka.

According to geological and structural zoning, the work area is located within the southwestern slope of the Ukrainian Shield. From a structural and tectonic point of view, it is confined to the Podilsk tectonic zone - one of the largest marginal structures of the East European platform.

The geological structure of the region includes the covering rocks of the Quaternary system, Neogene (clays, limestones), Cenomanian chalk deposits (marls), Vendian sediments of the Mogiliv-Podilska Suite: Yampil'ski, Lomoziv'ski, Olchedaiv'ski productive layers (feldspar-quartz-fluorite sandstones) and underlying arkose sandstones of the same Olchedaiv'ski layers and the Grushkiv'ska Suite. The basement is represented, for the most part, by Lower Proterozoic granitoids of the Berdychiv'skiy complex.

In particular, the Bakhtynske deposit is composed of stratimorphic quartz-feldspar-fluorite ores, which lie in the upper part of the section of the Olchedaiv'ski sandstones.

In the vertical section of the productive pile, 2 ore bodies are fixed: upper and lower. During the extension of pits, the bodies are often interrupted, and then their surface distribution changes to a curtain-like one.

Ore quartz-feldspar-fluorite bodies, in the cement of which fluorite is present in varying amounts (from a few to 49.4%), have a plate-like shape with clear contacts and are characterized by thickness from the first centimeters to 2.0 m (rarely 5- 8 m)

The thickness of the interlayer of barren sandstones, which separate the ore bodies, varies from 0.5 to 4.0 m.

The depth of the fluoritized sandstones is 21.4 – 115.2 m.

The mineral composition of the ore is as follows: quartz - from 30 to 52% (average content - 4.5%); microcline - up to 25% (average content - 12.5%); plagioclase - from 0.0 to 20% (average content - 4.5%); cement - 20-47% (average content - 36.5%); accessory minerals - garnet, monazite, zircon.

The main mineral of cement is fluorite of purple, less often pale green, honey-yellow color and colorless. Its average content in the ore is about 20%.

In addition to fluorite, regeneration quartz, calcite, hydromicas, and chlorite are present in the cement.

The chemical composition of fluorite ore according to technological research is as follows: SiO₂ - 67.-83.7%; Al₂O₃ - 3.5-7.4%; Fe₂O₃ - 0.05-1.4%; CaO - 1.89-14.9%; K₂O - 2.4-2.93%; Na₂O - 0.23-0.59%; SO₃ - 0.12-0.37%; CO₂ - 0.5-1.77%; CaF₂ - 1.1-19.58%.

Fluorite is observed both in the form of scattered inclusions and in massive aggregates.

According to laboratory studies, fluorite briquettes meet the requirements of GOST for the production of flux and can be used as a deoxidizer in steelmaking. Fluorite concentrate is also suitable for the production of general purpose welding materials.

Selective mining of fluorite bodies is considered to be the most expedient, ensuring the possibility of leaving most of the mined empty rocks in the created space.

The hydrogeological conditions of the development are characterized by the presence of 5 aquifers, the water-bearing ones of which are the Olchedaivski and Grushkivski sandstones.

Research has established that the ores belong to the same technological type. Fluorite, feldspar and quartz are of industrial importance.

Mineral reserves: the balance reserves of fluorite, as the main mineral, are approved under category C₁, under category C₂ - approved by the DKZ of Ukraine (protocol No. 574 dated November 10, 2000) in the following amount (thousand tons):

Ore body	General			Recoverable		
	ore, thousand tons	fluorite thousand tons	con- tents CaF ₂ %	ore, thousand tons	fluorite thousand tons	contents CaF ₂ %
Approved reserves of the main mineral (cat. C ₁)						
Upper	2217.7	322.0	14.52	2085.3	293.1	14.06
Lower	1939.8	267.7	13.80	1826.4	244.2	13.37
Combined	4157.5	589.7	14,18	3911.7	537.3	13.74
Tested reserves of the main mineral (cat. C ₂)						
Upper	8716.9	1137.9	13.05	8195.6	1036.8	12.65
Lower	4993.4	782.9	15.68	4695.1	712.3	15,17
Combined	13710.3	1920.8	14.01	12890.7	1749.1	13.57

In addition to the main useful component (fluorite), the deposit has approved and tested reserves of feldspar and quartz as accompanying minerals suitable for obtaining feldspar and quartz concentrates.

Ore body	Fluorite ore reserves, thousand tons	Approved reserves of associated useful components, thousand tons (cat. C ₁)	
		feldspar, thousand tons	quartz, thousand tons
Upper	2217.7	370.3	1108.9
Lower	1939.8	324.0	969.9
Combined	4157.5	694.3	2078.8
Ore body	Fluorite ore reserves, thousand tons	Tested reserves of associated useful components, thousand tons (cat. C ₂)	
		feldspar, thousand tons	quartz, thousand tons
Upper	8716.9	1455.6	4358.4
Lower	4993.4	833.8	249666.9
Combined	13710.3	2289.4	6855.3

The deposit was not involved in industrial development. The balance reserves of the main and secondary minerals correspond to the approved ones.