



KHRAPIVSHCHYNA PROSPECTIVE AREA WITH TITANIUM-ZIRCONIUM ORE PROMISING ACCUMULATION

Mineral: titanium ores, zirconium ores.

Type and period of subsoil use: 20-years licenses for exploration, pilot development and production.

Location: Sumy district in Sumy region, on the north-northeastern outskirts of Khrapivshchyna village. It adjacent on northern side to Khrapivshchyna deposits and Bilovodske deposit is located on 4 km to the north. H-07 highway passes through the prospective area.

Plot area: 170 ha.

Geological summary. Upper cretaceous lies at a depth of 58–66 m within the prospective area. It is covered by glauconite-quartz sands of the Eocene and similar sands of the Mezhygorsk assise of the Lower Oligocene with a total thickness of 31–37 m. on which the Berets assise of the Upper Oligocene. It is overlain by the motley clays of the Neogene or directly by the Quaternary loams. Beretskaya assise consists of lower and upper subsuites. The lower (snake) subsuite is represented by quartz sands, usually with significant impurities of glauconite and layers of green leafy clays. Absolute marks of the sole of the subsuite range from +189 to 195 m, its thickness is 6.5m-13.6m, on average - 9.8 m. The upper subsuite, to which the ore-bearing stratum is confined, is composed of light gray and white sands, often in the upper contact and in layers throughout the stratum of brick-red, orange, and yellow colors. Sand by the granulometric composition is very fine-grained to siltstones, sometimes containing low-thickness layers of larger sand. There are very thin dark layers, which are enriched with ore minerals. During geological survey at a scale of 1: 50000 14 wells were drilled, 10 out of them (##34, 187, 188, 222, 325, 327, 328, 334, 336, 338) opened the ore sands of Upper Oberec subsuites and rest of wells of the Verkhnoberetsky deposits were completely or mostly blurred. The distance between the wells is from 350m to 800m. The ore-bearing horizon is confined to the upper part of the Siva subsuite and is not flooded. The zircon content in 9 wells is more than 4 kg/m³ (from 4.01 to 15 kg/m³) and only in 1 - #328 is reduced to 2.67 kg/m³. The average thickness of the mineral is 5.6 m, the opening - 13.0 m, the weighted average zircon content for the whole prospective area - 7.8 kg/m³, rutile 9.9 kg/m³, conditional ilmenite 63 kg/m³, opening coefficient 2.3 . With a thickness of 4.3 m the content of zircon increases to 8.6 kg/m³, rutile - to 10.7 kg/m³. Light gray and white varieties of sand meet the requirements for marshal of the 2nd grade.

Resources/reserves assessment. The promising accumulation was found during a geological survey at a scale of 1: 50,000 in Sumy (letters M-36-34-B, G and M-36-46-A, B) by the Kharkiv geological exploration expedition in 1969–1972. In 1992, the promising accumulation was further examined and identified as one of the most perspective. Khrapivshchyna promising accumulation is part of the Korchakiv ore field. The prospective area is recommended for greenfield exploration.

http://geoinf.kiev.ua/wp/geologichni-zviti.php?rep=fnd_shifr.rdf&schifr=34376

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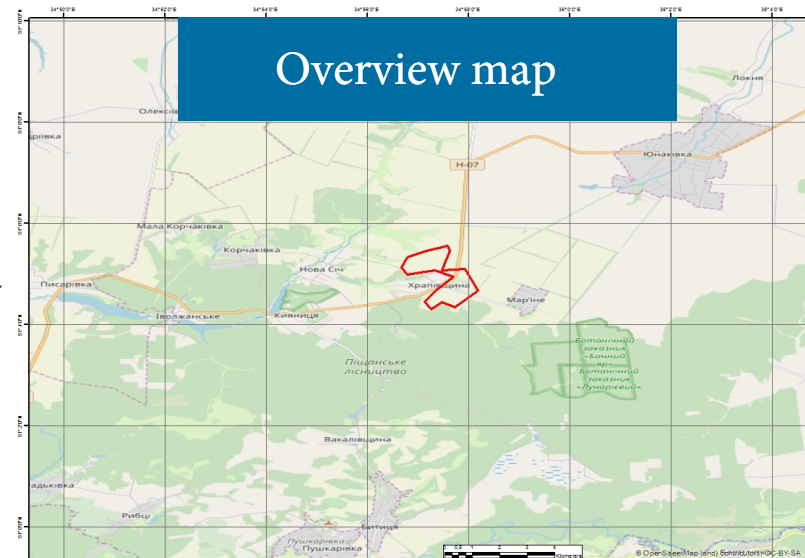
Resources/reserves assessment. Forecast resources of titanium-zirconium ores by category P2 were pre-calculated. Resource information has limited access.

Minimum work program

Provided by Mining terms Model agreements and defined in "Work Program" annex.

Model agreements are listed at the link:

<https://www.geo.gov.ua/primirni-ugodi-pro-umovi-koristuvannya-nadrami/>



NN	latitude	Pulkovo42	longitude	Pulkovo42	latitude	WGS84	longitude	WGS84
1	51° 5' 20,672" N		34° 56' 53,229" E		51° 5' 20,124" N		34° 56' 46,930" E	
2	51° 5' 27,480" N		34° 57' 13,522" E		51° 5' 26,932" N		34° 57' 7,223" E	
3	51° 5' 33,560" N		34° 57' 41,712" E		51° 5' 33,013" N		34° 57' 35,413" E	
4	51° 5' 28,149" N		34° 57' 44,539" E		51° 5' 27,602" N		34° 57' 38,240" E	
5	51° 5' 4,593" N		34° 57' 34,901" E		51° 5' 4,045" N		34° 57' 28,603" E	
6	51° 5' 6,520" N		34° 58' 1,884" E		51° 5' 5,972" N		34° 57' 55,586" E	
7	51° 4' 40,822" N		34° 58' 17,730" E		51° 4' 40,274" N		34° 58' 11,433" E	
8	51° 4' 20,779" N		34° 57' 50,180" E		51° 4' 20,230" N		34° 57' 43,884" E	
9	51° 4' 27,331" N		34° 57' 35,114" E		51° 4' 26,783" N		34° 57' 28,817" E	
10	51° 4' 18,765" N		34° 57' 22,051" E		51° 4' 18,217" N		34° 57' 15,754" E	
11	51° 4' 27,760" N		34° 57' 14,556" E		51° 4' 27,211" N		34° 57' 8,259" E	
12	51° 4' 42,321" N		34° 57' 29,547" E		51° 4' 41,773" N		34° 57' 23,249" E	
13	51° 4' 56,821" N		34° 57' 48,189" E		51° 4' 56,273" N		34° 57' 41,891" E	
14	51° 5' 4,593" N		34° 57' 26,978" E		51° 5' 4,045" N		34° 57' 20,680" E	
15	51° 5' 2,666" N		34° 57' 8,989" E		51° 5' 2,118" N		34° 57' 2,691" E	
16	51° 4' 59,966" N		34° 56' 53,872" E		51° 4' 59,418" N		34° 56' 47,573" E	
17	51° 5' 8,551" N		34° 56' 46,750" E		51° 5' 8,002" N		34° 56' 40,451" E	