

Mineral deposits of Serbia

Ore deposit database



Republic of Serbia
Ministry of
Mining and Energy

PbZn Lead + Zinc (metal)

Ore type: Ore in which the element forms a distinct mineral phase

<i>Past production:</i>	- t	<i>Average grade:</i>	-
<i>Reserve:</i>	- t	<i>Average grade:</i>	-
<i>Resource:</i>	- t	<i>Average grade:</i>	-

Environment

Acid generation potential with respect to sulfides minerals.

Comments

Coordinates of the "Carte Métallogénique de l'Europe " 22.3333 - 42.55 ???

Geological references

Topalovic D. and Simic M. - (2000) - The geological, structural and metallogenical features of the Ajducko Brdo - Golija ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 435-442

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-125

Ajvalija

General data

Deposit name(s): Ajvalija **Identifier:** YUG-00178

Commodities: **Pb** 215 000 t **Class** B **Status:** Dormant deposit

Zn 358 000 t **Class** B

Ag 242 t **Class** D

Au 0 t **Class** N/A

Company: TREPCA Mining and Metallurgical Complex

Longitude: 21.201 **Latitude:** 42.622 **District:** Kosovo

Geology**Ore deposit type (geology)**

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Discordant envelope of disseminated ore

Mineralization Age: Tertiary**Ore mineralogy**

Sphalerite
Galena
Pyrite
Marcasite
Magnetite
Pyrrhotite
Chalcopyrite
Arsenopyrite
Grey copper
Gold
Cubanite
Stannite
Bourmonite

Host rock mineralogy

Quartz
Siderite
Rhodochrosite (Dialoqite)
Barite
Calcite

Host rocks Age:**Host rock lithology**

Limestone
Quartz-sericite schist

Economy**Exploitation type**

Underground mining

Ag **Silver (metal)****Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem

Past production:	171 t	Average grade:	65 g/t
Reserve:	71 t	Average grade:	70 g/t
Resource:	- t	Average grade:	- g/t

Pb **Lead (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	130000 t	Average grade:	5 %
Reserve:	85000 t	Average grade:	8.4 %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)*Ore type:* Ore in which the element forms a distinct mineral phase

<i>Past production:</i>	191000 t	<i>Average grade:</i>	7.3 %
<i>Reserve:</i>	167000 t	<i>Average grade:</i>	16.4 %
<i>Resource:</i>	- t	<i>Average grade:</i>	- %

Au Gold (metal)*Ore type:* Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

<i>Past production:</i>	- t	<i>Average grade:</i>	0.8 g/t
<i>Reserve:</i>	- t	<i>Average grade:</i>	- g/t
<i>Resource:</i>	- t	<i>Average grade:</i>	- g/t

Environment

High acid generation potential due to the sulfides and sulfosalts minerals contained in the ore.

The Acid Rock Drainage may partly be reduced by acid-consuming minerals contained in the gangue mineralogy.

As may be released into the environment with some expected concentrations in the stream sediments.

The existence of an ore processing plant at Gracanica has generated large tailings disposals (15-18Mt) that can be a source of groundwater and surface water contamination.

Comments

The ore lenses contain 6-7% Zn, 4-5% Pb and 70-100 g/t Ag.

Massive ore bodies are estimated 7-8% Pb, 15% Zn, 100 g/t Ag, 0.8 g/t Au, 1-2% As and 0.2 % Cu (Schumacher F. - 1954)

ITT/UNMIK Mission (12/2000) : Past production (1952-1998) : 2,622,000 t @ 5.0% Pb, 7.3% Zn and 65 g/t Ag. Resources : 1,017,000 t @ 8.4% Pb, 16.4% Zn and 70 g/t Ag. The mine is flooded up to Level 8A (320 m).

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Kliscic M. - (1995) - Deposits of lead and zinc in the ore field Ajvalija - Kisnica. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references**Other references**

Aleksinac

General data

Deposit name(s): Aleksinac **Identifier:** YUG-00138

Commodities: Bitum 391 000 000 t **Class** A **Status:** Old industrial mine, abandoned deposit
 Coal 0 t **Class** N/A

Company: Rudarsko Industrijski Kombinat Aleksinacki Rudnik

Longitude: 21.683 **Latitude:** 43.577 **District:** Nisavski

Geology**Ore deposit type (geology)**

Coal deposits
 Oil shales, bituminous sandstones and limestones: oil, (S)

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene

Host rocks **Age:** Miocene

Hostrock formation names

Aleksinac Tertiary Basin

Host rock lithology

Carbon-bearing rock s.l.
 Medium- to fine-grained detrital sediment
 Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Economy**Exploitation type**

Room and pillar mining, room and pillar working (flat, inclined, step)

Coal Coal, lignite (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Bitum Bituminous rocks (tons of oil)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	2391000000 t	Average grade:	10 %

Environment

Potential acid rock drainage with respect of the sulfides content.
 Suspended matter in mine water discharge.
 Landform instability (collapses) created during and after mining operations.

Comments

Resources of oil shale : 2,391 Mt @ 10% oil, 332 Mt @ 14.5% oil up to 300 m of depth.

In 1981, the brown coal was mined by underground methods with an annual output of about 200,000 t/y.

The coal mined in the main seam contains up to 20% of moisture, about 10% of ash, 3% of sulphur. Its heating value is 16,000 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Perisic M, Radenkovic C, and Urosevic P. - (1979) - Possibilities of oil shale exploitation in Serbia. - World Mining Congress, 10, 1, p. 1-11.

Other references

Alin Do

General data

Deposit name(s): Alin Do **Identifier:** YUG-00072
Aldinac

Commodities:

Ag	0 t	Class N/A	Status: Deposit or prospect of unknown status
Au	0 t	Class N/A	
Bi	0 t	Class N/A	
Cu	0 t	Class N/A	

Company:

Longitude: 22.472 **Latitude:** 43.524 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to basic-ultrabasic magmatic rocks
 Alluvial-eluvial placers: Au, Pt, Sn,Ti, REE, diamond, gemstones, (Zr, etc.)

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age:**Ore mineralogy**

Wolframite
 Scheelite
 Arsenopyrite
 Pyrrhotite
 Pyrite
 Chalcopyrite
 Bismuthinite
 Sphalerite
 Galena
 Stibnite

Host rock mineralogy

Siderite
 Quartz
 Calcite

Host rocks Age:**Hostrock formation names**

Hydrothermally altered gabbro

Host rock lithology

Gabbro

Economy**Exploitation type**

Mining method unknown

Bi Bismuth (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Cu Copper (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Ag Silver (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Au Gold (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

The potential acid mine drainage generated is partly buffered by the calcite of the gangue mineralogy which is an acid-consuming mineral.

Presence of As which is highly mobile in low and high pH environments and which can be accumulated in stream sediments nearby the ore deposit.

Existence of CN or Hg associated with the gold mineral processing ?

Comments

The massive ore contains 4% Bi, 4% Cu, 120 g/t Ag and 24 g/t Au, as well as 3.7% Pb, 2.8% Zn and 1.2% Sb (Jankovic - 1982).

Work on alluvials in the Knjazhevac region suggests a grade of at least 0.025 g/m³ Au.

Geological references

Anonymous. - (1983) - Production of gold-bearing sands studied. - World Mining, 36, (3), p. 72. 1983.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-082

Avala

General data

Deposit name(s): **Avala** **Identifier:** **YUG-00048**
Crveni Breg

Commodities:

Pb	9 000 t	<i>Class</i>	D	<i>Status:</i> Old industrial mine, abandoned deposit
Zn	5 000 t	<i>Class</i>	D	
Ag	22 t	<i>Class</i>	E	
Cu	300 t	<i>Class</i>	E	

Company:

Longitude: 20.516 **Latitude:** 44.659 **District:** Beograd

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization **Age:** Miocene**Ore mineralogy**Galena
Sphalerite
Chalcopyrite
Arsenopyrite
Pyrite**Host rock mineralogy**Calcite
Quartz
Axinite
Epidote**Hydrothermal alteration**Silicification
Skarn formation**Host rocks** **Age:** Cretaceous**Hostrock formation names**Lower Cretaceous sediments
Andesite Intrusions of Miocene**Host rock lithology**Limestone
Sandstone
Andesite
Rhyodacite**Economy****Exploitation type**

Underground mining

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	300 t	Average grade:	0.3 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Ag **Silver (metal)****Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem

Past production:	22 t	Average grade:	220 g/t
Reserve:	- t	Average grade:	- g/t
Resource:	- t	Average grade:	- g/t

Pb **Lead (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	9000 t	Average grade:	9 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)*Ore type:* Ore in which the element forms a distinct mineral phase

<i>Past production:</i>	5000 t	<i>Average grade:</i>	5 %
<i>Reserve:</i>	- t	<i>Average grade:</i>	- %
<i>Resource:</i>	- t	<i>Average grade:</i>	- %

Environment

The oxydation of the primary ore mineralogy mainly composed of sulfides leads to the production of Acid Mine Drainage and highly soluble metal-sulfate-salt minerals that releases contaminants potentially affecting surface water, groundwater, soils and stream sediments.

The gangue mineralogy comprising some calcium carbonates may partly buffer the acid mine drainage production and thus control the mobility of metals.

Comments

Prior 1940, a German company mined about 100,000 t of ore with 9% Pb, 5% Zn, 2% As, 0.3% Cu and 220 g/t Ag (Schumacher - 1954)

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Schumacher F. - (1954) - The ore deposits of Jugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references**Other references***Other data bases*

Carte Métallogénique de l'Europe 26-048

Ba

General data

Deposit name(s): Ba **Identifier:** YUG-00183
Commodities: Ni 38 750 t **Class:** C **Status:** Deposit of unknown status
Company:
Longitude: 20.204 **Latitude:** 44.163 **District:** Kolubarski

Geology**Ore deposit type (geology)**

Residually enriched ore deposits: Fe, Mn, Ni-Co, Au, Pt, P, U, corundum, etc.
 Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.

Ore deposit shape

Secondary cavity- or fracture-filling orebody
 Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Garnierite
 Goethite
 Pyrite
 Nontronite

Host rock mineralogy

Calcite
 Clay
 Silica

Host rocks Age:**Host rock lithology**

Limestone
 Serpentinite
 Peridotite

Economy**Exploitation type**

Mining method unknown

Ni Nickel (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	38750 t	Average grade:	1.55 %

Environment

Acid generation potential due to the presence of pyrite.
 Possible contamination of drainage waters by high content of suspended matter (clay minerals), and by dissolved metals such as Ni, and Fe.

Comments

Sumadija Ore District (Boev and Jankovic - 1996) : 2 orebodies : Rujevack (0.5 Mt @ 1.75% Ni) and Rujevacki Potok (2 Mt @ 1.5% Ni)

Geological references

Boev B. and Jankovic S. - (1996) - Nickel and nickeliferous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Other references

Badovac

General data

Deposit name(s): Badovac **Identifier:** YUG-00188

Commodities: Pb 192 000 t **Class** B **Status:** Dormant deposit
 Zn 134 000 t **Class** C
 Ag 267 t **Class** D

Company: TREPCA Mining and Metallurgical Complex

Longitude: 21.230 **Latitude:** 42.597 **District:** Kosovo

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)
 Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Field of discordant lodes (n*km², n*ha)

Mineralization **Age:** Tertiary

Ore mineralogy

Galena
 Sphalerite
 Pyrite

Host rocks **Age:**

Hostrock formation names

Contact serpentinite/schist and/or andesite

Host rock lithology

Serpentinite
 Schist (s.l.), phyllite
 Dacite
 Andesite
 Listwaenite

Economy**Exploitation type**

Underground mining

Pb Lead (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	49000 t	Average grade:	3.4 %
Reserve:	- t	Average grade:	- %
Resource:	143000 t	Average grade:	5.4 %

Zn Zinc (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	38000 t	Average grade:	2.6 %
Reserve:	- t	Average grade:	- %
Resource:	96000 t	Average grade:	3.6 %

Ag Silver (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	70 t	Average grade:	47 g/t
Reserve:	- t	Average grade:	- g/t
Resource:	197 t	Average grade:	75 g/t

Environment

High acid generation potential due to the sulfides contained in the ore.

This Acid Rock Drainage may be reduced by the acid-consuming minerals of the host rocks (listwaenites e.g).

Expected dissolved contents of Zn and Pb in drainage waters with some concentrations in stream sediments.

The existence of an ore processing plant at Gracanica has generated large tailings disposals (15-18Mt) that can be a source of groundwater and surface water contamination.

Comments

ITT/UNMIK Mission (12/2000) : Past production (1961-1998) : 1,468,000 t @ 3.4% Pb, 2.6% Zn and 47 g/t Ag.

Potential resources : 2,633,000 t @ 5.4% Pb, 3.6% Zn and 75 g/t Ag (categories B+C1)

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Klisic M. - (1995) - Deposits of lead and zinc in the ore field Ajvalija - Kisnica. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Economic references

Other references

Bancarevo

General data

Deposit name(s): **Bancarevo** *Identifier:* **YUG-00079**
Donja Studena

Commodities: **Cu** 0 t *Class* **N/A** *Status:* Deposit or prospect of unknown status

Company:

Longitude: 22.102 *Latitude:* 43.246 *District:* Pirotski

Geology*Ore deposit type (geology)*

Red Bed (sandstone) hosted base metal deposits: Cu, Pb-Zn-Ag, F-Ba
 Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization *Age:**Ore mineralogy*

Chalcocite
 Chalcopyrite
 Azurite
 Malachite
 Bornite
 Enargite

Host rocks *Age:* Permian

Host rock lithology

Sandstone

Economy*Exploitation type*

Unworked

Cu **Copper (metal)**

Ore type: Ore of indeterminate nature

<i>Past production:</i>	- t	<i>Average grade:</i>	-
<i>Reserve:</i>	- t	<i>Average grade:</i>	-
<i>Resource:</i>	- t	<i>Average grade:</i>	-

Environment

Presence of sulfide minerals assemblage that can generate Acid Mine Drainage production.

Comments**Geological references****Economic references****Other references***Other data bases*

Carte Métallogénique de l'Europe 26-098

Bare

General data

Deposit name(s): Bare **Identifier:** YUG-00155
Vrbica

Commodities: Kln 23 000 000 t **Class** B **Status:** Deposit of unknown status

Company:

Longitude: 20.500 **Latitude:** 44.325 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Supergene industrial rock and mineral deposits: clays, kaolin, silica sand, etc.

Ore deposit shape

Tabular-shaped orebody of secondary origin

Mineralization **Age:** Paleogene (Lower/Early Tertiary)**Ore mineralogy**Kaolinite
Halloysite
Illite
Vermiculite**Host rock mineralogy**Quartz
Feldspar**Host rocks** **Age:** Lower/Early Jurassic (Lias)**Hostrock formation names**

Bukulja granite

Host rock lithology

Granite (s.l.)

Economy**Exploitation type**

Surface mining

Kln **Kaolin (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	23000000 t	Average grade:	23 %

Environment

Potential contamination of drainage water by suspended matter and clay minerals.
 Geomorphic modifications in the landscape.

Comments**Geological references**

Maksimovic Z and Nikolic D. - (1978) - The primary kaolin deposits of Yugoslavia. - Schriftenreihe fuer Geologische Wissenschaften, 74, 11, p. 179-196.

Simic V. and Jovic V. - (1997) - Genetic types of kaolin and kaolinite clay deposits in Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 197-201

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references**Other references**

Barosevac

General data

Deposit name(s): Barosevac **Identifier:** YUG-00152
Commodities: Dtm 0 t **Class:** N/A **Status:** Unexploited deposit
Company: Rudnici lignita BASEN KOLUBARA - EPS
Longitude: 20.377 **Latitude:** 44.405 **District:** City of Beograd

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age: Pontian

Ore mineralogy

Silica

Host rocks Age: Pontian

Hostrock formation names

Kolubara Coal Basin

Host rock lithology

Medium- to fine-grained detrital sediment
Diatomite

Economy**Exploitation type**

Unworked

Dtm Diatomite (kieselguhr) (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature.

Comments

Kolubara Coal Basin, diatomite never recovered.

Geological references

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references**Other references**

Bela Stena

General data

Deposit name(s): Bela Stena **Identifier:** YUG-00073
Commodities: Mg 4 000 000 t **Class** C **Status:** Old industrial mine, exhausted deposit
Company: Magnohrom - Fabrika Magnezijuma Bela Stena
Longitude: 20.624 **Latitude:** 43.374 **District:** Raski

Geology**Ore deposit type (gitology)**

Lacustrine deposits (sebkha, salar, alkaline lake): Li, B, (Na, Mg, Ca, nitrates, sulphates, etc.)

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene**Ore mineralogy**

Magnesite (Giobertite)

Host rock mineralogy

Dolomite

Clay

Host rocks **Age:** Miocene**Hostrock formation names**

Jarando Miocene basin

Host rock lithology

Varved lacustrine sediment

Carbonaceous rock: clay, sandstone, etc.

Economy**Exploitation type**

Surface mining

Mg **Magnesium, magnesite (MgCO₃)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	4000000 t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Erosion of earthen materials exposed at the site may cause significant loadings of sediments to nearby waterbodies and the source of degradation of surface water quality.

CommentsProduction of more than 4 Mt of high-grade magnesite. The ore lens was up to 95 m thick and 250 m long. The ore contain 44% MgO, 1.5% SiO₂, 2-6% CaO and is enriched in boron.**Geological references**

- Dedic L., Mozina A., Radulovic P., Joksimovic D. and Jovovic M. - (1995) - Non metallic sources deposit of the Kopaonik area. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.
- Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.
- Jankovic S and Petkovic M. - (1980) - The main lead, zinc and copper deposits of Yugoslavia; excursion No. 202 C. - Yugoslavia; outline of Yugoslavian geology; Excursion 201 A-202 C. Grubic A (Ed), Int. Geol. p. 75-94.
- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral. Soc. p. 143-202.
- Jankovic S. - (1984) - Major metallogenetic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Joksimovic D., Anicic S., Stefanovska D. and Seke L. - (1995) - Potential from mineral sources of neogene basin Jarandol. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.

Karamata S, Obradovic J, Vasic N. - (1984) - Sedimentary magnesite deposits in the Dinaride ophiolite belt. - International Geological Congress, Abstracts - Congrès Géologique Internationale, Résumés, p. 86-86.

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Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-087

Belacevac

General data

Deposit name(s): Belacevac **Identifier:** YUG-00035
Commodities: Coal 000 000 000 t **Class:** B **Status:** Producing industrial mine
Company: Elektroprivreda Kosova
Longitude: 21.034 **Latitude:** 42.631 **District:** Kosovo

Geology**Ore deposit type (geology)**

Lignite deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Pliocene**Host rocks** **Age:** Pliocene**Hostrock formation names**

Kosovo Coal Basin

Host rock lithology

Medium- to fine-grained detrital sediment

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Economy**Exploitation type**

Open cast (open pit) mining

Bucket wheel dredging

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	79500000 t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	5920500000 t	Average grade:	-

Environment

Acid rock drainage due to the presence of iron sulphur minerals.

Landforms instability created during mining operations and suspended matter in mine water discharge.

Trace metals content may exist (PGE, radionuclides ?).

Comments

In 1964, 2.2 Mt were mined. In 1970, Dobro Selo and Belacevac produced 3.9 Mt. In 1990, 6.2 Mt were mined from these 2 deposits of the North Kosovo Basin.

The Kosovo Basin (North and South) contains approximately 12 billion tons of Pliocene lignite. Kosovo coal is of the poorly consolidated lignite type. It has a 45% moisture content, of which 15% hydromoiature, an average of about 15% ash and 1% sulphur. Its heating value is about 8,000 kJ/kg.

Electric Power Industry of Serbia - Report 1998 :

The Kosovo-Metohija coal basin covers an area of about 250 km². The average coal layer thickness is 41 m and may reach 100 m. It contains 12 billion tons of lignite, only 2.65% has been excavated.

Geological references

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Economic references

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- Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.
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- Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Other references

Beli Kamen

General data

Deposit name(s): **Beli Kamen** **Identifier:** **YUG-00037**
Kosovska Kamenica

Commodities: **Mg** 0 t **Class** **N/A** **Status:** Deposit of unknown status
Tlc 0 t **Class** **N/A**

Company: Rudnik i Industrija Magnezita Strezovce - Kosovska

Longitude: 21.585 **Latitude:** 42.595 **District:** Kosovo

Geology**Ore deposit type (geology)**

Evaporite-related industrial rocks and minerals: attapulgit, gypsum, anhydrite, magnesite, sulphur

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene**Ore mineralogy**

Magnesite (Giobertite)

Talc

Host rocks **Age:** Miocene**Host rock lithology**

Marl

Dolomitic limestone

Economy**Exploitation type**

Surface mining

Mg **Magnesium, magnesite (MgCO₃)****Ore type:** Carbonates, phosphates, sulphates and insoluble primary halides (fluorite, barite, etc.)**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Tlc** **Talc (substance)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

Emission of particulate matters in the form of fugitive dust.

Comments

In 1982, current output was 300,000 t of raw run of mine magnesite.

Several lenses, contains 30,000 to 1Mt of magnesite

The ore contains 45% MgO, 0.5-2.0% SiO₂ and 0.5-2.5% CaO (Jankovic - 1982)

Other name : Strezovce

Geological references

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

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Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Beljanica

General data

Deposit name(s): Beljanica **Identifier:** YUG-00062

Commodities: Fe 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 21.783 **Latitude:** 44.050 **District:** Pomoravski

Geology**Ore deposit type (geology)**

Fe and Mn sedimentary deposits: Fe, Mn

Unspecified volcano-sedimentary and sedimentary-exhalative deposits

Ore deposit shape

Stratabound bed (single or multi-layered)

Mineralization Age:**Ore mineralogy**

Hematite

Magnetite

Siderite

Fe-Chlorite

Host rocks Age:**Economy****Exploitation type**

Unworked

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Particulate and colloidal iron and manganese compounds in discharge water.

Comments**Geological references**

Antonijevic I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-062

Belo Brdo

General data

Deposit name(s): **Belo Brdo** **Identifier:** **YUG-00075**
Kopaonik

Commodities: **Pb** 254 000 t **Class** **B** **Status:** Dormant deposit
Zn 208 000 t **Class** **B**
Ag 387 t **Class** **D**
Au 0 t **Class** **N/A**

Company: TREPCA Mining and Metallurgical Complex

Longitude: 20.843 **Latitude:** 43.230 **District:** Kosovo

Geology

Ore deposit type (geology)
Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape
Breccia-pipe, funnel, chimney, column, brecciated dyke

Mineralization **Age:** Neogene (Miocene to Pliocene)

Ore mineralogy	Host rock mineralogy	Hydrothermal alteration
Galena	Garnet	Skarn formation
Sphalerite	Epidote	
Pyrite	Hedenbergite	
Arsenopyrite	Wollastonite	
Chalcopyrite	Scapolite	
Pyrrhotite	Actinolite	
Grey copper		
Proustite		
Pyrargyrite		
Bismuth		
Gold		

Host rocks **Age:** Cretaceous

Hostrock formation names	Host rock lithology
Contact limestone - quartz-latite	Limestone
	Latite
	Skarn

Economy

Exploitation type
Underground mining

Ag **Silver (metal)**

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	292 t	Average grade:	76 g/t
Reserve:	95 t	Average grade:	75 g/t
Resource:	- t	Average grade:	- g/t

Au **Gold (metal)**

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Pb	Lead (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	203000 t	<i>Average grade:</i> 5.3 %
	<i>Reserve:</i>	51000 t	<i>Average grade:</i> 4 %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %
Zn	Zinc (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	152000 t	<i>Average grade:</i> 3.9 %
	<i>Reserve:</i>	56000 t	<i>Average grade:</i> 4.4 %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

Presence of As which is highly mobile in low and high pH environments and which can be accumulated in stream sediments nearby the ore deposit.

The ore processing plant located in Lepocavic has generated large amounts of tailings (8 Mt).

Comments

In 1981, the annual output was 100,000 t of ore containing 8 % PbZn.

The mine started before the 2nd WW, so far , over 2.2 Mt of ore containing 12% PbZn have been mined.

Mining Magazine 04/1981 : a new PbZn mine is expected to begin production in the Mt Kopaonik. It will also produce Au, Ag and Cd. Expected production is 5,625 t/y Zn, 2,269 t/y Pb, 3 t/y Ag, 82.5 kg/y Au and 31 t/y Cd : Belo Brdo ???

High grade PbZn ore contains up to 1 g/t Au, 10-50 g/t Ag, 6-12% Zn and 3-5% Pb.

Skarn mineralization contains 2.7 g/t Au, 16 g/t Ag and 0.5% Pb. Pyrite concentrate contains up to 30 g/t Au.

Mission ITT/UNMIK (12/2000) : Past production (1937-2000) : 3,848,000 t @ 5.3% Pb, 3.9% Zn and 76 g/t Ag. Resources : 1,265,000 t @ 4.0% Pb, 4.4% Zn and 75 g/t Ag.

Geological references

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Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijskim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

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Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-092

Beocin

General data

Deposit name(s): Beocin **Identifier:** YUG-00222

Commodities: LstC 0 t **Class:** N/A **Status:** Producing industrial mine

Company: Beocinska fabrika cementa a.d.

Longitude: 19.725 **Latitude:** 45.187 **District:** Juzno-backi

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age:

Host rocks Age: Miocene

Host rock lithology

Marl
Limestone

Economy**Exploitation type**

Surface mining

LstC Cement limestone (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Dust production and fallout.
Geomorphic modifications in the landscape (quarry).

Comments

Production 1990 : 1,206 kt

Geological references

Ilich M. - (1991) - Yugoslavian cement. Raw materials and production - Industrial Minerals, november 1991, pp. 59-61

Economic references**Other references**

Blagodat

General data

Deposit name(s): Blagodat **Identifier:** YUG-00094

Commodities: **Pb** 138 000 t **Class** B **Status:** Producing industrial mine
Zn 118 000 t **Class** C
Cu 8 800 t **Class** E

Company: Rudnik i Flotacija Olova i Cinka Blagodat

Longitude: 22.252 **Latitude:** 42.524 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Atypical volcano-sedimentary and sedimentary-exhalative ore deposits: metamorphosed VMS or Sedex deposits, etc.

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Stratabound envelope of disseminated ore

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Cenozoic**Ore mineralogy**

Sphalerite
Galena
Pyrite
Pyrrhotite
Cubanite
Chalcopyrite
Grey copper
Arsenopyrite
Gold
Loellingite
Magnetite

Host rock mineralogy

Diopside
Hedenbergite
Epidote

Hydrothermal alteration

Skarn formation

Host rocks **Age:****Hostrock formation names**

Surdulica granitic massif

Host rock lithology

Gneiss (s.l.)
Chloritic schist, chlorite schist of sedimentary origin
Dacite
Andesite
Granodiorite
Marble, cipolin (crystalline limestone)

Economy**Exploitation type**

Room and pillar mining, room and pillar working (flat, inclined, step)

Sublevel caving

Pb **Lead (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	138000 t	Average grade:	2.35 %
Reserve:	- t	Average grade:	4.34 %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)*Ore type:* Ore in which the element forms a distinct mineral phase

<i>Past production:</i>	118000 t	<i>Average grade:</i>	2 %
<i>Reserve:</i>	- t	<i>Average grade:</i>	4.45 %
<i>Resource:</i>	- t	<i>Average grade:</i>	- %

Cu Copper (metal)*Ore type:* Ore in which the element forms a distinct mineral phase

<i>Past production:</i>	8800 t	<i>Average grade:</i>	0.15 %
<i>Reserve:</i>	- t	<i>Average grade:</i>	0.15 %
<i>Resource:</i>	- t	<i>Average grade:</i>	- %

Environment

The ore content in sulfides (Pb, Zn and Iron) generate acid and dissolved metals during oxidation. Mine waters draining such deposit are acidic and metal-rich due to the lack of acid-neutralizing capacity of the altered igneous host rock and the lack of reactivity of the calc-silicate minerals of the gangue. Acid generation and drainage can affect both surface and groundwater.

Presence of As that can be released into the environment by arsenopyrite when oxydized.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

The mine was started up in 10/1974

Annual ore output was about 300,000 t/y and processing yields about 9,600 t of Pb concentrate and 12,670 t of Zn concentrate, that meaning a ore-grade of about 2.35% Pb and 2.00 % Zn.

The ore is also with Ag and Cd.

The massive ore contains 3-7% Pb and 6-13% Zn.

Grade of the reserves : 4.34% Pb, 4.45% Zn and 0.15% Cu (Simic - 1997)

Between 1988-1991, the annual output was 235,000 t of ore

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Simic M. - (1997) - Geological-structural features of the Besna Kobila Zone in SE Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 185-195

Struel I. - (1981) - Die schichtgebundenen Blei-Zink-Lagerstaetten Jugoslawiens Translated Title: The stratiform lead-zinc deposits of Yugoslavia. - Mitteilungen der Oesterreichischen Geologischen Gesellschaft, 74-75, p. 307-322.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references**Other data bases**

Carte Métallogénique de l'Europe 26-136

Blagojev Kamen

General data

Deposit name(s): Blagojev Kamen
Neresnica

Identifier: YUG-00056

Commodities: Ag 0 t Class N/A Status: Deposit of unknown status
Au 0 t Class N/A
W 0 t Class N/A

Company:

Longitude: 21.818 **Latitude:** 44.457 **District:** Branicevski

Geology**Ore deposit type (geology)**

Granitic and peri-granitic veins and stockworks (greisen): Sn-W, (Cu, Bi, Sb, base metals)

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age:**Ore mineralogy**Gold
Scheelite
Pyrite
Galena
Sphalerite
Chalcopyrite
Pyrrhotite
Grey copper
Pyrargyrite**Host rock mineralogy**Quartz
Ankerite**Hydrothermal alteration**

Pyritization

Host rocks Age: Precambrian**Hostrock formation names**Mafic volcano-sedimentary sequence
Precambrian Greenstone Series**Host rock lithology**Chlorite schist and chloritic schist of igneous origin
Metavolcaniclastic (meta-volcano-sedimentary) rock s.l**Economy****Exploitation type**

Underground mining

Au Gold (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

W Wolfram (WO3)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Ag Silver (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

The oxydation of the primary ore mineralogy mainly composed of sulfides, generates Acid Mine Drainage and readily soluble sulfate minerals which can affect both surface and groundwater, as well as stream sediments.
Existence of CN or Hg associated with the gold mineral processing ?

Comments

Quartz veins are the source of gold alluvial placers along Pek river. In the veins, gold values range from traces to 30 g/t (average 10 g/t), WO₃ contents are variable, mostly 0.2-2.0%.

Blagojev Kamen was in operation up to 1963, producing gold and scheelite. The veins are usually 0.2-1.1 m thick and up to 100-200 m long (Jankovic - 1982).
Deposits names : Brodica, Badalan, etc.

Geological references

Jankovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babes Bolyai, Geologia. 40, (1), p. 85-102.

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Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32

Schumacher F. - (1954) - The ore deposits of Jugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-056

Bobija

General data

Deposit name(s): Bobija **Identifier:** YUG-00151

Commodities: PbZn 200 000 t **Class** B **Status:** Deposit of unknown status
 Brt 300 000 t **Class** C

Company:

Longitude: 19.533 **Latitude:** 44.192 **District:** Macvanski

Geology**Ore deposit type (geology)**

Carbonate-hosted stratabound and vein Ba or F deposits (MVT): Ba, F, (Pb, Zn)
 Sedimentary-exhalative to volcano-sedimentary Mn or Ba: Mn, Ba

Ore deposit shape

Concordant to subconcordant mass, lens or pod of massive to submassive ore

Mineralization **Age:** Middle Triassic (Muschelkalk)

Ore mineralogy

Pyrite
 Galena
 Sphalerite

Host rock mineralogy

Barite
 Siderite

Host rocks **Age:** Middle Triassic (Muschelkalk)

Economy**Exploitation type**

Unworked

Brt **Barite (BaSO4)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	300000 t	Average grade:	67.5 %

PbZn **Lead + Zinc (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	200000 t	Average grade:	10 %
Resource:	- t	Average grade:	- %

Environment

May have acid generation potential due to the sulfidic content of the ore.
 This Acid Rock Drainage can be buffered by the geological context and the presence of carbonates.

Comments**Geological references**

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Economic references

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Other references

Bogovina

General data

Deposit name(s): Bogovina **Identifier:** YUG-00227
Commodities: Coal 0 t **Class:** N/A **Status:** Producing small-scale mine
Company: Rudnik mrkog uglja BOGOVINA - EPS
Longitude: 21.956 **Latitude:** 43.892 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Oligocene (Middle Tertiary)**Host rocks** **Age:** Oligocene (Middle Tertiary)**Host rock lithology**

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Coarse-grained detrital rock s.s.

Medium- to fine-grained detrital sediment

Economy**Exploitation type**

Underground mining

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential Acid Rock Drainage generation due to the presence of possible sulfides minerals.
 Suspended matter in mine discharge.
 Colliery spoil heaps erosion, instability and combustion.

Comments

2 coal seams separated by about 10 m.

Bogovina coal contains up to 20% of moisture, up to 10% of ash and up to 2% of sulphur. Its heating value is about 17,000 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Other references

Bor

General data**Deposit name(s):** Bor**Identifier:** YUG-00061

Commodities:	Au 160 t	Class	B
	Cu 3 000 000 t	Class	B
	Ag 600 t	Class	C
	Pttd 0 t	Class	N/A

Status: Old industrial mine, exhausted deposit**Company:** Rudarsko Topioninarski Basen BOR**Longitude:** 22.094 **Latitude:** 44.095**District:** Borski**Geology****Ore deposit type (geology)**

High-sulphidation epithermal massive-energite (gold) sulphide deposits: Cu, (As, Au)
 Porphyry Cu-Mo and Mo deposits: Cu, Mo, (W, U, Re)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore
 Concordant to subconcordant stockwork (veinlets network) envelope
 Stratabound envelope of disseminated ore

Mineralization Age: Upper/Late Cretaceous**Ore mineralogy**

Enargite
 Pyrite
 Chalcocopyrite
 Bornite
 Chalcocite
 Covellite
 Molybdenite
 Magnetite
 Pyrrhotite
 Galena
 Sphalerite
 Grey copper

Host rock mineralogy

Quartz
 Barite
 Pyrophyllite
 Diaspore
 Alunite
 Anhydrite
 Sulphur

Hydrothermal alteration

Silicification
 Advanced argillic alteration
 Sericitization
 Chloritization
 Carbonatization

Host rocks Age: Upper/Late Cretaceous**Hostrock formation names**

Timok andesite complex

Host rock lithology

Andesite
 Volcaniclastic rocks: pyroclastic rocks,
 volcaniclastic (volcano-detrital,
 volcano-sedimentary) rocks

Economy**Exploitation type**

Surface mining
 Underground mining

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	3000000 t	Average grade:	1.5 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Au	Gold (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem	
	<i>Past production:</i>	160 t	<i>Average grade:</i> 3.2 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t
Ag	Silver (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem	
	<i>Past production:</i>	600 t	<i>Average grade:</i> 10.3 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t
Pltd	Platinoids, group (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

Extreme Acid Mine Drainage production due to the sulfides and sulfosalts assemblages. This AMD is enhanced by the types of hydrothermal alteration (argillic, sericitic..) that greatly increase acid-generating capacity. Presence of As released by enargite. This element tends to be accumulated in the stream sediments of the water drainage downstream the ore deposit and may cause acute environmental and health problems. Potential damages may arise from both extraction/beneficiation operations and smelting facilities. Most of the releases occurring from those operations involve inadequate containment of tailings, waste rocks, metallurgical slags, process water, waste water, acid mine drainage and storm water.

Comments

The ore contained 1-2 % Cu, up to 5 g/t Au, up to 10 g/t Ag and significant amounts of Ge, Se, Ni and minor amounts of Pt.

The deposit contains 13 known orebodies : Tilva Ros, Coka Dulkan, Tilva Mika, Kamenjar, Tilva Ronton, Sistek, etc.

At the top of the system, Tilva Ros orebody contained gold in a highly silicified cap (1.8 to 18.9 g/t, average at 2.3 g/t Au, 10.55 g/t Ag and 0.04% Cu for reserves as 8.2 Mt)

The massive copper ore zone contains 2.6 - 3.75 g/t Au, 9.8 to 10.9 g/t Ag and 5.6-7.4 % Cu. Past production and current reserves indicate that the massive copper ore contained 160 t of Au, 600 t of Ag and 3 Mt of Cu.

Data in Laznicka P. (1985) p 974 2.75 Mt Cu (1%), 190 t Au and 1,000 t Ag

In 1981, Bor was still operating at a rate of 4 Mt/y of ore (35,000 t/y Cu).

Geological references

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- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
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Economic references

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Other references

Other data bases

Carte Métallogénique de l'Europe 26-061

Boranja

General data

Deposit name(s): Boranja **Identifier:** YUG-00098
Commodities: Fe 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 19.201 **Latitude:** 44.390 **District:** Macvanski

Geology**Ore deposit type (geology)**

Fe (magnetite) skarns: Fe, (Co)

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Mineralization Age: Cenozoic**Ore mineralogy**Magnetite
Pyrrhotite
Molybdenite
Scheelite
Bismuthinite**Hydrothermal alteration**

Skarn formation

Host rocks Age:**Hostrock formation names**

Boranja granodiorite Massif

Host rock lithologyGranodiorite
Skarn
Marble, cipolin (crystalline limestone)**Economy****Exploitation type**

Mining method unknown

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Moderate acid generation potential due to the presence of Pyrrhotite.

Comments

Name of several deposits around Boranja granodiorite and including several ore deposits and occurrences : Majdan, Duge Njive, etc.

Geological references

- Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.
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- Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Other references

Other data bases

The Iron Ore Deposits of Europe - 1978 YU02

Borska Reka

General data

Deposit name(s): Borska Reka **Identifier:** YUG-00134

Commodities: Au 139 t **Class** B **Status:** Dormant deposit
 Cu 3 665 000 t **Class** B
 Ag 1 136 t **Class** C

Company: Rudarsko Topioninarski Basen BOR

Longitude: 22.088 **Latitude:** 44.082 **District:** Borski

Geology**Ore deposit type (geology)**

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)

Ore deposit shape

Stratabound envelope of disseminated ore

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age: Upper/Late Cretaceous**Ore mineralogy**

Chalcopyrite

Pyrite

Magnetite

Telluride

Molybdenite

Chalcocite

Covellite

Bornite

Hydrothermal alteration

Potassic alteration

Sericitization

Silicification

Chloritization

Host rocks Age: Upper/Late Cretaceous**Hostrock formation names**

Timok andesite complex

Host rock lithology

Andesite

Economy**Exploitation type**

Underground mining

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** - %**Reserve:** - t **Average grade:** - %**Resource:** 3665000 t **Average grade:** 0.62 %**Au Gold (metal)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** - g/t**Reserve:** - t **Average grade:** - g/t**Resource:** 139 t **Average grade:** 0.24 g/t**Ag Silver (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** - g/t**Reserve:** - t **Average grade:** - g/t**Resource:** 1136 t **Average grade:** 1.92 g/t**Environment**

Extreme Acid Mine Drainage production due to the sulfides assemblages and the large alteration halos.

This AMD is enhanced by the types of hydrothermal alteration (argillic, sericitic..) that greatly increase acid-generating

capacity.

Produced mine waters or drainage waters tend to have a high base metal content particularly enriched in Cu and Tl.

Comments

Downdip extension of Bor deposit

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babeş Bolyai, Geologia. 40, (1), p. 85-102.

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Economic references

Lewis A. - (1983) - Yugoslavia's "RTB Bor" copper combine; Europe's largest copper producer eliminates concentrate imports as the new Veliki Krivelj complex reaches capacity. - E&M J, 184, (10), p. 70-74.

Other references

Braneshci

General data

Deposit name(s): Braneshci
Identifier: YUG-00171
Branesko Polje

Commodities: Mg 0 t **Class** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 19.707 **Latitude:** 43.779 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Lacustrine deposits (sebkha, salar, alkaline lake): Li, B, (Na, Mg, Ca, nitrates, sulphates, etc.)

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Cenozoic

Ore mineralogy

Magnesite (Gibbsite)

Dolomite

Host rocks **Age:**

Hostrock formation names

Tertiary lacustrine sediments

Host rock lithology

Varved lacustrine sediment

Biochemical deposit s.l.

Economy**Exploitation type**

Unworked

Mg **Magnesium, magnesite (MgCO₃)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage waters by suspended matter.

Comments**Geological references**

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.

Economic references**Other references**

Brasina

General data

Deposit name(s): Brasina **Identifier:** YUG-00157
Commodities: Sb 0 t **Class** N/A **Status:** Deposit of unknown status
Company:
Longitude: 19.195 **Latitude:** 44.491 **District:** Macvanski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives
 Vein and disseminated Sb deposits: Sb, Hg, As, (Au, Tl)

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Cenozoic

Ore mineralogy

Stibnite
 Pyrite
 Chalcopyrite
 Galena

Host rock mineralogy

Quartz
 Chalcedony
 Calcite

Hydrothermal alteration

Silicification

Host rocks **Age:**

Economy**Exploitation type**

Mining method unknown

Sb **Antimony (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals contained in the ore.
 Expected dissolved content of Cu and Sb in drainage waters.

Comments**Geological references**

Durickovic A. - (1982) - Metalogenija rudnog polja Brasina-Zajaca-Stolice-Dobri Potok Translated Title: Metallogeny of the Brasina mining field, Zajaca, Stolice, Dobri Potok. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 40, p. 17-53.
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Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Brdjani

General data

Deposit name(s): Brdjani **Identifier:** YUG-00054
 Bela Kamen
 Beli Kamen (Brdjani)

Commodities: Mg 0 t **Class** N/A **Status:** Deposit of unknown status

Company: Rudnici Magnezita Sumadija - Cacak

Longitude: 20.225 **Latitude:** 44.000 **District:** Moravicki

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Miocene**Ore mineralogy**Magnesite (Gibbsite)
Dolomite**Host rock mineralogy**Quartz
Silica
Chalcedony**Host rocks** **Age:****Hostrock formation names**

Maljen and Suvobor Ultramafic Massif

Host rock lithologyBasic to ultrabasic rock s.l.
Serpentinite**Economy****Exploitation type**

Surface mining

Mg **Magnesium, magnesite (MgCO₃)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Erosion of earthen materials exposed at the site may cause significant loadings of sediments to nearby waterbodies and the source of degradation of surface water quality.

Comments**Geological references**

- Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.
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Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Other data bases

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Brezak

General data

Deposit name(s): Brezak **Identifier:** YUG-00046
Commodities: Mg 0 t **Class:** N/A **Status:** Deposit of unknown status
Company: Rudnici Magnezita Sumadija Cacak
Longitude: 20.100 **Latitude:** 44.140 **District:** Kolubarski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age:**Ore mineralogy**

Magnesite (Gibbsite)

Host rocks Age:**Hostrock formation names**

Maljen and Suvobor Ultrabasic Massifs

Host rock lithology

Basic to ultrabasic rock s.l.

Economy**Exploitation type**

Underground mining

Mg Magnesium, magnesite (MgCO₃)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature is known with this type of ore deposit.

Comments

Magnesite mining has been carried out since 1927.

The length of ore veins ranges from 100 to 1,500 m, thickness between 1 and 10 m.

Average annual output is 120,000 t of high grade magnesite concentrate.

Geological references

Dedic L and Pavlovic Z. - (1980) - Pojave talkista u produkcju Crnog vrha (zapadna Srbija) Translated Title: Talc-schist occurrences in Crni vrh area; West Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 38-39, p. 37-43.

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

Lapcevic I. - (1982) - Pojave magnezita mrezastog tipa kod Razane u Zapadnoj Sroiji Translated Title: Netted type magnesite occurrences at Razana in West Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 40, p. 55-72.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references**Other data bases**

Carte Métallogénique de l'Europe 26-046

Brezna

General data

Deposit name(s): Brezna **Identifier:** YUG-00069
Commodities: Cr 0 t **Class:** N/A **Status:** Group of mineral occurrences
Company:
Longitude: 19.583 **Latitude:** 43.583 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Ophiolite-hosted ore deposits: Cr, (PGE)

Ore deposit shape

Pod, pod-shaped body

Mineralization Age:**Ore mineralogy**

Chromite

Host rocks Age:**Hostrock formation names**

Zlatibor Peridotites Massif

Host rock lithology

Dunite

Economy**Exploitation type**

Mining method unknown

Cr Chrome (Cr₂O₃)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature.

Comments

2 Brezna : 20.6832/43.5643 or 20.2571/44.0564 ???

Zlatibor district : more than 80 occurrences of chromite, of massive type-ore, several hundred tons of reserve

Geological references**Economic references****Other references****Other data bases**

Carte Métallogénique de l'Europe 26-079

Brezovica

General data

Deposit name(s): Brezovica **Identifier:** YUG-00090
 Ostrovica

Commodities: Cr 350 000 t **Class** D **Status:** Deposit or prospect of unknown status

Company:

Longitude: 21.012 **Latitude:** 42.244 **District:** Kosovo

Geology

Ore deposit type (geology)
 Ophiolite-hosted ore deposits: Cr, (PGE)

Ore deposit shape
 Concordant to subconcordant mass, lens or pod of massive to submassive ore

Mineralization Age:

Ore mineralogy
 Chromite

Host rocks Age:

Host rock lithology
 Peridotite
 Dunite

Economy

Exploitation type
 Mining method unknown

Cr Chrome (Cr₂O₃)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	350000 t	Average grade:	43 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

No specific environmental signature according to the data available.

Comments

Extracted : 350.000 t at 43% Cr₂O₃

Geological references

Obradovic LJ. - (1986) - Short review of the chemistry of chromites from Brezovica, Yugoslavia. - Chromites. Theophrastus Publ S.A., Athens. p. 91-105.

Economic references**Other references**

Other data bases
 Carte Métallogénique de l'Europe 26-132

Bujanovac

General data

Deposit name(s): Bujanovac **Identifier:** YUG-00092
 Ogoska Reka
 Trnovac

Commodities: Kln 5 625 000 t **Class** C **Status:** Deposit of unknown status
 Sb 0 t **Class** N/A

Company:

Longitude: 21.744 **Latitude:** 42.477 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Vein and disseminated Sb deposits: Sb, Hg, As, (Au, Tl)
 Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)
 Discordant envelope of disseminated ore

Mineralization **Age:** Cenozoic

Ore mineralogy	Host rock mineralogy	Hydrothermal alteration
Stibnite	Quartz	Kaolinization
Pyrite	Calcite	Silicification
Marcasite	Chalcedony	
Galena	Opal	
Sphalerite	Barite	
Bravoite	Montmorillonite	
Realgar	Illite	
Orpiment	Kaolinite	
Cinnabar		

Host rocks **Age:**

Hostrock formation names
 Bujanovac granite massif

Host rock lithology
 Granite (s.l.)
 Schist/shale

Economy**Exploitation type**

Mining method unknown

Sb **Antimony (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Kln **Kaolin (substance)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	5625000 t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals and the ore composition.
 Due to the presence of cinabar and realgar/orpiment in the ore, Arsenic and Mercury , two toxic elements for human health can be present in drainage water at a high content .

Comments

Other name : Gornji Vrtogos (Simic and al - 1997).

The thickness of kaolinized zones varies from 0.5 to 25 m, with the lens of over 1500 m and their vertical stretch of over 200 m;

Geological references

Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.

Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Maksimovic Z and Nikolic D. - (1978) - The primary kaolin deposits of Yugoslavia. - Schriftenreihe fuer Geologische Wissenschaften, 74, 11, p. 179-196.

Simic V. and Jovic V. - (1997) - Genetic types of kaolin and kaolinite clay deposits in Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 197-201

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-134

Bukulja

General data

Deposit name(s): Bukulja **Identifier:** YUG-00050
Commodities: U 0 t **Class:** N/A **Status:** Dormant deposit
Company:
Longitude: 20.535 **Latitude:** 44.298 **District:** Kolubarski

Geology**Ore deposit type (gitology)**

Sedimentary uranium deposits: U, (V, Mo, Ni, Cu, Zn, Pb, As)
 Shear-zone related mesothermal uranium deposits: U, (Fe, Cu, Pb, Zn, Se)

Ore deposit shape

Stratiform envelope of disseminated ore
 Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age:**Ore mineralogy**

Autunite
 Uraninite
 Hematite
 Galena
 Sphalerite
 Pyrrhotite
 Pyrite

Hydrothermal alteration

Kaolinization
 Sericitization
 Pyritization
 Chloritization
 Silicification

Host rocks **Age:** Cenozoic

Hostrock formation names

Tertiary sediments
 Granite

Host rock lithology

Granite (s.l.)
 Detrital rock s.l.

Economy**Exploitation type**

Unworked

U Uranium (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential production of Acid Rock Drainage and associated metals (Fe, Zn, Pb..).
 The hydrothermal alteration tends to increase acid -generating capacity.
 Presence of radioactive elements leads to the emission of Radon and Gamma radiations.

Comments

The uranium content ranges from 0.03 to 0.08% U₃O₈.

Geological references

- Anonymous. - (1980) - World Uranium - Geology and Resource Potential. - IUREP. Miller Freeman Publications, San Francisco. 524 p.
- Antonovic A. - (1992) - Usporedna analiza odredivanja sadrzaja urana raznim radiometrijskim metodama u lezistu Cigankulja (Bukulja) Translated Title: Comparative study of uranium analyses by various radiometric methods in the Cigankulja (Bukulja) ore deposit. - Radovi Geoinstitut, 27, p. 235-250.
- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

- Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67
- Jelenkovic R., Jankovic S. and Serafimovski T. - (1997) - Prognosis Map of the Besna Kobila Mo-Pb-Zn-W Metallogenetic Zone - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 159-167
- Jelenkovic R., Serafimovski T. and Lazarov P. - (1997) - Uranium Mineralization in the Serbo-Macedonian Massif and the Vardar Zone : Types and Distribution Pattern - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 149-157
- Klajn D. - (1983) - Uranium hydrothermal mineralization in the Borac-Rudnik Area (Sumadija); possible relation with buried stratiform ore deposits. - Anuarul Institutului de Geologie si Geofizica = Annuaire de l'Institut de Geologie et de Geophysique, 61, p. 199-204.
- Mihajlovic K. - (1978) - Aluvijalno leziste kasiterita - Cigankulja Translated Title: The alluvial cassiterite deposit in Cigankulja. - IX Kongres Geologa Jugoslavije. Sarajevo, Yugoslavia. 1978. p. 620-624.

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-050

Car Sedlar

General data

Deposit name(s): Car Sedlar **Identifier:** YUG-00086
Commodities: Fe 190 000 t **Class** E **Status:** Deposit of unknown status
Company:
Longitude: 21.744 **Latitude:** 42.604 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Banded iron formations (BIF "Superior Fe"): Fe
 Atypical volcano-sedimentary and sedimentary-exhalative ore deposits: metamorphosed VMS or Sedex deposits, etc.

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization Age: Precambrian

Ore mineralogy

Magnetite
 Hematite
 Pyrrhotite
 Pyrite
 Chalcopyrite
 Galena

Host rocks Age:

Host rock lithology

Amphibolite (s.l.)
 Ferriferous quartzite, Banded Iron
 Formation (BIF), itabirite

Economy**Exploitation type**

Mining method unknown

Fe Iron (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	10000 t	Average grade:	- %
Reserve:	180000 t	Average grade:	50 %
Resource:	- t	Average grade:	- %

Environment

Sulfide facies ores may pose a potential source of acid rock drainage.

Comments

Crude ore contains 45-55% Fe, 10% SiO₂, 4 % CaO, 0.3% Mn, 0.5% P and 2-3% S (Jankovic - 1982)

Geological references

Antonijevic I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-121
The Iron Ore Deposits of Europe - 1978 YU03

Cerovo

General data

Deposit name(s): Cerovo **Identifier:** YUG-00124

Commodities: Cu 1 010 000 t **Class** B **Status:** Industrial project under development
 Au 32 t **Class** C

Company: Rudarsko Topioninarski Basen BOR

Longitude: 22.038 **Latitude:** 44.178 **District:** Borski

Geology**Ore deposit type (geology)**

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)

Ore deposit shape

Discordant envelope of disseminated ore

Mineralization Age:**Ore mineralogy**Pyrite
Chalcopyrite
Chalcocite**Hydrothermal alteration**Silicification
Propylitization**Host rocks** **Age:** Upper/Late Cretaceous**Host rock lithology**Andesite
Pyroclastic rocks s.l.
Diorite
Quartz diorite**Economy****Exploitation type**

Surface mining

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	1010000 t	Average grade:	0.32 %

Au Gold (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	- g/t
Reserve:	- t	Average grade:	- g/t
Resource:	32 t	Average grade:	0.1 g/t

Environment

Extreme Acid Rock Drainage production due to the sulfidic composition of the primary ore, the widespread alteration halos and its mineral assemblage.

Potential release of Cu and others metals into the drainage water.

Comments

Cerovo, Drenovo and Cementacija deposits

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - *Studia Universitatis Babeş Bolyai, Geologia*. 40, (1), p. 85-102.

Jankovic S, Terzic M, Aleksic D, Karamata S, Spasov T, Jovanovic M, Milicic M, Miskovic V, Grubic A, and Antonijevic I. - (1980) - Metallogenic features of copper deposits in the volcano- intrusive complexes of the Bor District, Yugoslavia. - *Special Publication of the Society for Geology Applied to Mineral Deposits*, 1, p. 42-49.

Jankovic S. - (1990) - Types of copper deposits related to volcanic environment in the Bor District, Yugoslavia. - *Geol. Rundsch*, 79, (2), p. 467-478.

Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - *Mineralium Deposita*, 32, pp. 452-458

Kozelj D. - (1996) - Metallogenic characteristics of copper ore deposit "Cementation", Bor, Yugoslavia. - *International Geological Congress, Abstracts - Congrès Géologique Internationale, Résumés*, 30, 2, p. 619-619.

Economic references

Salatic D. - (1999) - Mineral potential and its valorisation in Yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Other references

Cigankulja

General data

Deposit name(s): Cigankulja **Identifier:** YUG-00220
Commodities: Sn 0 t **Class:** N/A **Status:** Dormant deposit
Company:
Longitude: 20.414 **Latitude:** 44.299 **District:** Kolubarski

Geology**Ore deposit type (geology)**

Alluvial-eluvial placers: Au, Pt, Sn, Ti, REE, diamond, gemstones, (Zr, etc.)

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**Cassiterite
Ilmenite
Magnetite
Zircon
Rutile**Host rocks** Age: Quaternary**Host rock lithology**

Alluvium s.l.

Economy**Exploitation type**

Unworked

Sn Tin (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of surface water by suspended matter (high turbidity) that can affect water ecosystems. Geomorphic modifications of water bodies.

Comments**Geological references**

Mihajlovic K. - (1978) - Aluvijalno leziste kasiterita - Cigankulja Translated Title: The alluvial cassiterite deposit in Cigankulja. - IX Kongres Geologa Jugoslavije. Sarajevo, Yugoslavia. 1978. p. 620-624.

Economic references**Other references**

Cikatovo

General data

Deposit name(s): Cikatovo **Identifier:** YUG-00027

Commodities: Ni 287 800 t **Class** B **Status:** Dormant deposit
 Co 0 t **Class** N/A

Company: Ferronikeli

Longitude: 20.903 **Latitude:** 42.656 **District:** Kosovo

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.

Ore deposit shape

Cap, blanket, crust

Mineralization Age:**Ore mineralogy**Saponite
Nontronite
Garnierite
Goethite
Goethite
Wad
Psilomelane**Host rock mineralogy**Opal
Serpentine
Dolomite
Quartz
Chalcedony**Host rocks Age:****Hostrock formation names**

Dobrosevac harzburgite

Host rock lithologyBasic to ultrabasic rock s.l.
Harzburgite**Economy****Exploitation type**

Surface mining

Ni Nickel (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	170300 t	Average grade:	1.31 %
Reserve:	117500 t	Average grade:	1.175 %
Resource:	- t	Average grade:	- %

Co Cobalt (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	0.07 %
Resource:	- t	Average grade:	- %

Environment

The main potential environmental problems are related to :

- the clay minerals assemblage existing in a lateritic context. Trough erosion of exposed mining areas, those assemblages generate high suspended solids content in surface water that can produce many impacts associated with surface waters, groundwater and terrestrial ecosystems;
- the dissolved metals (Ni, Co and Fe, Mn) that migrate from old mining operations to local ground and surface water.

Comments

In 1982, Glavica and Cikatovo started in production for the Glogovac smelting plant
 The combined reserves were estimated in 1978 to be 26.7 Mt averaging 1.2 - 1.5% Ni
 The combined annual output was planned to be 983,000 t of dry ore containing 1.32% Ni and 0.07% Co.

Located in the Dobrosevac Ore Field (Boev and Jankovic - 1996) :

Discovered in 1967. 2 orebodies : Suka and Duskaja

At the beginning of exploitation, the probable and possible reserves amounted to 13 Mt @ 1.31% Ni and 0.07% Co. Most of the ore reserves are mined out but new ones have been discovered. In 1988, the ore reserves amounted to 10 Mt @ 1.15-1.20% Ni.

Geological references

Boev B. and Jankovic S. - (1996) - Nickel and nikeliferous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Mitrovic M and Misirlic M. - (1978) - Prilog utvrdivanju mineralnog sastava niklonosne rude iz Golesa i Cikatova, SAP Kosovo
Translated Title: The determination of nickel-bearing ore mineral composition from Goles and Cikatovo; SAP Kosovo. - Rudarski Glasnik, 1, p. 31-46.

Ruppert L, Finkelman R, Boti E, Milosavljevic M, Tewalt S, Simon N, and Dulong F. - (1996) - Origin and significance of high nickel and chromium concentrations in Pliocene lignite of the Kosovo Basin, Serbia. - International Journal of Coal Geology, 29, (4), p. 235-258.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Other references

Coka Kuruga

General data

Deposit name(s): Coka Kuruga **Identifier:** YUG-00200

Commodities: Au 2 t **Class** D **Status:** Deposit of unknown status
 Cu 13 000 t **Class** D

Company: Rudarsko Topioninarski Basen BOR

Longitude: 21.981 **Latitude:** 44.230 **District:** Borski

Geology

Ore deposit type (geology)
 High-sulphidation epithermal massive-enargite (gold) sulphide deposits: Cu, (As, Au)

Ore deposit shape
 Atypical, unspecified or ill-defined form

Mineralization **Age:** Upper/Late Cretaceous

Host rocks **Age:** Upper/Late Cretaceous

Hostrock formation names
 Bor magmatic Complex

Economy

Exploitation type
 Mining method unknown

Cu Copper (metal)
Ore type: Ore of indeterminate nature

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	-	%
Resource:	13000	t	Average grade:	0.9	%

Au Gold (metal)
Ore type: Ore of indeterminate nature

Past production:	-	t	Average grade:	-	g/t
Reserve:	-	t	Average grade:	-	g/t
Resource:	1.5	t	Average grade:	1	g/t

Environment

No data available.

Comments**Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Coka Marin

General data

Deposit name(s): Coka Marin **Identifier:** YUG-00135

Commodities:

Au	10 t	Class	C	Status: Dormant deposit
PbZn	33 000 t	Class	C	
Cu	25 000 t	Class	D	
Ag	96 t	Class	E	

Company: Rudarsko Topioninarski Basen BOR

Longitude: 22.013 **Latitude:** 44.284 **District:** Borski

Geology**Ore deposit type (geology)**

Volcanogenic massive sulphides (VMS) deposits: Cu, Pb, Zn +/- Au-Ag, (Sn, S, As, Cd, Bi, etc.)

High-sulphidation epithermal massive-enargite (gold) sulphide deposits: Cu, (As, Au)

Ore deposit shape

Stratabound envelope of disseminated ore

Subconcordant or stratabound mass or lens of massive to submassive ore

Concordant to subconcordant stockwork (veinlets network) envelope

Mineralization **Age:** Upper/Late Cretaceous**Ore mineralogy**

Pyrite
Pyrrhotite
Marcasite
Enargite
Luzonite
Chalcopyrite
Bornite
Sphalerite
Galena
Grey copper
Gold
Stannite
Cassiterite
Bravoite

Host rock mineralogy

Quartz
Barite
Anhydrite
Siderite
Calcite
Fluorite

Hydrothermal alteration

Pyritization
Advanced argillic alteration
Chloritization
Silicification

Host rocks **Age:** Upper/Late Cretaceous**Hostrock formation names**

Upper Cretaceous Andesite-dacite
volcanics

Host rock lithology

Volcaniclastic rocks s.l. (volcano-sedimentary, volcano-detrital, containing volcanogenic constituents: lithic fragments, lapilli, groundmass or cement)
Andesite
Undifferentiated volcanic breccia

Economy**Exploitation type**

Mining method unknown

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	-	%
Resource:	25000	t	Average grade:	1.04	%

Au	Gold (metal)	<i>Ore type:</i> Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	- t	<i>Average grade:</i> - g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	10 t	<i>Average grade:</i> 4.2 g/t
PbZn	Lead + Zinc (metal)	<i>Ore type:</i> Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> - %
	<i>Reserve:</i>	- t	<i>Average grade:</i> - %
	<i>Resource:</i>	33000 t	<i>Average grade:</i> 11.7 %
Ag	Silver (metal)	<i>Ore type:</i> Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	- t	<i>Average grade:</i> - g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	96 t	<i>Average grade:</i> 40 g/t

Environment

High acid generation potential due to the sulfides minerals content and the hydrothermal alteration halos (pyritization and advanced argillic alteration).

Potential dissolved contents of Fe, Mn, Zn et Cu in drainage and groundwater with possible concentration of released As into stream sediments.

Comments

Massive ore contains 1-3% Cu, 5-8% Zn and up to 1% Pb. The gold content ranges between 5 and 10 g/t, locally over 20 g/t.

The Cu concentrate contains 7.7 g/t Au, 352 g/t Ag, 23 g/t Pt, 252 g/t Te, 186 g/t Ge, 78 g/t Ga, 50 g/t Mo, 203 g/t Sn and 1,000 g/t Se.

Resources Copper ore : 2.1 Mt @ 0.9% Cu, 2.9 g/t Au and 19 g/t Ag

Resources PbZn ore : 0.3 Mt @ 2.1% Cu, 3.2% Pb, 8.5% Zn, 15.8 g/t Au and 200 g/t Ag

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babeş Bolyai, Geologia. 40, (1), p. 85-102.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1990) - Types of copper deposits related to volcanic environment in the Bor District, Yugoslavia. - Geol. Rundsch, 79, (2), p. 467-478.

Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32

Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references

Other references

Crna Trava

General data

Deposit name(s): Crna Trava **Identifier:** YUG-00107
Vlasina

Commodities: Fe 20 125 000 t **Class** C **Status:** Deposit of unknown status

Company:

Longitude: 22.328 **Latitude:** 42.740 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Unspecified volcano-sedimentary and sedimentary-exhalative deposits
 Fe and Mn sedimentary deposits: Fe, Mn

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Precambrian

Ore mineralogy

Magnetite
 Hematite

Host rocks **Age:** Precambrian

Hostrock formation names

Greenschists of Crna Trava

Host rock lithology

Greenschist (s.l.)

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	125000 t	Average grade:	55.87 %
Reserve:	- t	Average grade:	- %
Resource:	20000000 t	Average grade:	- %

Environment

Particulate and colloidal iron compounds in discharge water.

Comments**Geological references**

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Antonijević I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Janković S., Serafimovski T., Jelenković R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Economic references**Other references****Other data bases**

The Iron Ore Deposits of Europe - 1978 YU27

Crnac

General data

Deposit name(s): Crnac **Identifier:** YUG-00112
Plakaonica

Commodities: **Pb** 204 000 t **Class** B **Status:** Dormant deposit
Zn 89 000 t **Class** C
Ag 279 t **Class** D

Company: TREPCA Mining and Metallurgical Complex

Longitude: 20.693 **Latitude:** 43.083 **District:** Kosovo

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)

Ore deposit shapeField of discordant lodes (n*km², n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**Galena
Sphalerite
Pyrite
Arsenopyrite
Chalcopyrite
Grey copper
Pyrrhotite**Host rock mineralogy**Quartz
Calcite
Rhodochrosite (Dialoqite)**Hydrothermal alteration**Silicification
Kaolinization**Host rocks** **Age:****Hostrock formation names**Amphibolite-quartzlatite contact
Gabbro-amphibolite contact**Host rock lithology**Amphibolite (s.l.)
Gabbro
Serpentinite
Latite**Economy****Exploitation type**

Sublevel stoping

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	89000 t	Average grade:	4.3 %
Reserve:	115000 t	Average grade:	8.1 %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	44000 t	Average grade:	2.2 %
Reserve:	45000 t	Average grade:	3.2 %
Resource:	- t	Average grade:	- %

Ag Silver (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	109 t	Average grade:	53 g/t
Reserve:	170 t	Average grade:	120 g/t
Resource:	- t	Average grade:	- g/t

Environment

High acid generation potential due to the sulfidic composition of the primary ore (highly reactive sulfides) and the hydrothermal alteration type that increases the acid generation capacity of the orebody.
Release of dissolved base metals (Pb, Zn,...) into the environment as well as As that can accumulate in the stream sediments.

The ore processing plant located in Lepocavic has generated large amounts of tailings (8 Mt).

Comments

In 1981, the Crnac mine produced 60,000 t @ 7% Pb and 2% Zn, by sub-level open stoping. Output should reach 150,000 t/y by 1983.

ITT/UNMIK Mission (12/2000) : Past production (1967-2000) : 2,060,000 t @ 4.3% Pb, 2.2% Zn and 53 g/t Ag. Resources : 1,415,000 t @ 8.1% Pb, 3.2% Zn and 120 g/t Ag.

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Miletic G. - (1995) - The structure of lead and zinc deposit Crnac. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.

Nikolic D, Cvetkovic L, and Duric S. - (1978) - Sferit iz Pb - Zn leziste Crnac Translated Title: Sphalerite from the Crnac Pb-Zn mine. - IX Kongres Geologa Jugoslavije. Sarajevo, Yugoslavia. 1978. p. 409-415.

Novovic T. - (1979) - Marusic Pb-Zn pojava na Kopaoniku Translated Title: Marusic Pb- Zn occurrence at Kopaonik. - Glasnik Prirodnjackog Muzeja u Beogradu, Serija A: Mineralogija, Geologija, Paleontologija, 34, p. 59-64.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Crni Vrh

General data

Deposit name(s): Crni Vrh **Identifier:** YUG-00064
Commodities: Sb 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 21.094 **Latitude:** 44.009 **District:** Pomoravski

Geology**Ore deposit type (geology)**

Vein and disseminated Sb deposits: Sb, Hg, As, (Au, Tl)

Ore deposit shape

Concordant to subconcordant stockwork (veinlets network) envelope

Mineralization **Age:** Cenozoic**Ore mineralogy**

Stibnite

Host rock mineralogy

Quartz

Hydrothermal alteration

Silicification

Host rocks **Age:****Hostrock formation names**Silicified marble
Crystalline schists**Host rock lithology**Undifferentiated metamorphic rock
Marble, cipolin (crystalline limestone)**Economy****Exploitation type**

Mining method unknown

Sb **Antimony (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment**Comments****Geological references**

Herrington R.J., Jankovic S. and Kozelj D. - (1998) - The Bor and Majdanpek copper-gold deposits in the context of the Bor Metallogenic Zone (Serbia, Yugoslavia) - MDSG 98 Programme at St Andrews Scotland 13th-15th December 1998, 10 p.

Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-071

Deli Jovan

General data

Deposit name(s): Deli Jovan **Identifier:** YUG-00175
 Rusman

Commodities: Au 0 t **Class** N/A **Status:** Old mine workings

Company:

Longitude: 22.281 **Latitude:** 44.124 **District:** Zajecarski

Geology**Ore deposit type (gitology)**

Fault-related syn- to late-orogenic ore deposits : Au, Zn, As, Sb, Cu, Ni, Co

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization **Age:** Paleozoic (Primary)**Ore mineralogy**Pyrite
Gold
Galena
Chalcopyrite**Host rock mineralogy**

Quartz

Host rocks **Age:****Host rock lithology**Undifferentiated metamorphic rock
Foid-bearing gabbro, foid gabbro**Economy****Exploitation type**

Underground mining

Au **Gold (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential Acid Rock Drainage due to the sulfides minerals.

Expected dissolved metals in the drainage water.

No information regarding the gold processing and the reagents used (CN, Hg ?).

Comments

Quartz veins are 0.1 to 2-33 m wide, length up to 200 m, vertical extent does not exceed 150 m.

Gindusa deposit : 50-80 g/t Au, St Ana at Rusman : 15 g/t Au

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Economic references**Other references**

Deva

General data

Deposit name(s): Deva **Identifier:** YUG-00029

Commodities: Cr 132 000 t **Class** E **Status:** Old industrial mine, exhausted deposit

Company: Deva - Ro Rudnik Hroma

Longitude: 20.335 **Latitude:** 42.330 **District:** Kosovo

Geology**Ore deposit type (geology)**

Chromitite deposits in layered basic-ultrabasic complexes: Cr

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Chromite

Host rocks Age:**Hostrock formation names**

Djakovo serpentine massif

Host rock lithology

Serpentine

Harzburgite

Dunite

Economy**Exploitation type**

Mining method unknown

Cr Chrome (Cr₂O₃)**Ore type:** Primary oxide ore (ilmenite, wolframite, pitchblende, chromite, pyrochlore, etc.)

Past production:	132000 t	Average grade:	44 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

No specific environmental signature is known with this type of ore deposit.

Comments

In 1982, mining has currently been suspended due to the low grade of the deposit. In 1978, its reserves were estimated at 300,000 t @ 44% Cr₂O₃.

Geological references

Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Silk MH. - (1988) - World Chromite resources and ferrochromium production. - MINTEK - Special Publication. Council for Mineral Technology, 149 p.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references**Other data bases**

Carte Métallogénique de l'Europe 26-131

Djavalja Varos

General data

Deposit name(s): Djavalja Varos

Identifier: YUG-00118

Commodities: Au 0 t *Class* N/A
 Cu 0 t *Class* N/A
 PbZn 0 t *Class* N/A

Status: Deposit or prospect of unknown status

Company:

Longitude: 21.425 **Latitude:** 43.034

District: Topolicki

Geology

Ore deposit type (geology)

Low-sulphidation (adularia - sericite) epithermal deposits: Au, Ag, Pb, Zn, Cu, Sb, (Hg, As, Mn, Tl)

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)

Ore deposit shape

Field of discordant lodes (n*km², n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Neogene (Miocene to Pliocene)

Ore mineralogy

Pyrite
 Galena
 Sphalerite
 Chalcopyrite
 Tetrahedrite
 Cerussite
 Azurite
 Malachite
 Covellite
 Goethite

Host rock mineralogy

Quartz

Hydrothermal alteration

Silicification
 Pyritization
 Argillic alteration

Host rocks **Age:** Neogene (Miocene to Pliocene)

Hostrock formation names

Djavalja Varos Caldera
 Lece Volcanogenic Complex

Host rock lithology

Andesite
 Pyroclastic rocks s.l.

Economy

Exploitation type

Unworked

Au Gold (metal)

Ore type: Ore of indeterminate nature

Past production:	-	Average grade:	-
Reserve:	-	Average grade:	-
Resource:	-	Average grade:	-

Cu Copper (metal)

Ore type: Ore of indeterminate nature

Past production:	-	Average grade:	-
Reserve:	-	Average grade:	-
Resource:	-	Average grade:	-

PbZn Lead + Zinc (metal)

Ore type: Ore of indeterminate nature

Past production:	-	Average grade:	-
Reserve:	-	Average grade:	-
Resource:	-	Average grade:	-

Environment

High acid generation potential due to the sulfidic composition of the primary ore.
The hydrothermal alteration types (silica, argillic and pyritisation) tends to increase the acid-generating capacity of the host-rocks.
Moreover, the presence of sulfosalts (like tetrahedrite) tends to release, when oxydized, elements like As into the environment.

Comments

Geological references

- Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - *Studia Universitatis Babes Bolyai, Geologia*. 40, (1), p. 85-102.
- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - *Mining of Yugoslavia*. 11th World Mining Congress, Beograd. p. 24-45.
- Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - *Earth Science (Paris) = Sciences de la Terre (Paris)*, 17, p. 385-394.
- Pesut D. - (1976) - Geology, tectonics and metallogeny of Lece Massif. - *Rasprave Zavoda za Geoloska i Geofizicka Istrazivanja*, 14, 59 p.
- Popovic R. - (2000) - Distribution of base and precious metals in the Lece volcano-intrusive massif (Vardar Zone) - *Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone"*. The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 443-452

Economic references

Other references

Dobro Selo

General data

Deposit name(s): Dobro Selo **Identifier:** YUG-00034
Commodities: Coal 000 000 000 t **Class** B **Status:** Producing industrial mine
Company: Elektroprivreda Kosova
Longitude: 21.061 **Latitude:** 42.676 **District:** Kosovo

Geology**Ore deposit type (geology)**

Lignite deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Pliocene**Host rocks** **Age:** Pliocene**Hostrock formation names**

Kosovo Coal Basin

Host rock lithology

Medium- to fine-grained detrital sediment

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Economy**Exploitation type**

Open cast (open pit) mining

Bucket wheel dredging

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	79500000 t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	5920500000 t	Average grade:	-

Environment

Acid rock drainage due to the presence of iron sulphur minerals.

Landforms instability created during mining operations and suspended matter in mine water discharge.

Trace metals content may exist (PGE, radionuclides ?).

Comments

In 1964, 2.2 Mt were mined. In 1970, Dobro Selo and Belacevac produced 3.9 Mt. In 1990, 6.2 Mt were mined from these 2 deposits of the North Kosovo Basin.

The Kosovo Basin (North and South) contains approximately 12 billion tons of Pliocene lignite. Kosovo coal is of the poorly consolidated lignite type. It has a 45% moisture content, of which 15% hydromoiature, an average of about 15% ash and 1% sulphur. Its heating value is about 8,000 kJ/kg.

Electric Power Industry of Serbia - Report 1998 :

The Kosovo-Metohija coal basin covers an area of about 250 km². The average coal layer thickness is 41 m and may reach 100 m. It contains 12 billion tons of lignite, only 2.65% has been excavated.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Nikolic P. and Dimitrijevic D. - (1990) - Ugalj Jugoslavije : Geologija i proizvodno razvojni potencijali lezista i rudnika uglja - Coal of Yugoslavia - Beograd : Pronalazastvo, 1990, 464 p.

Ruppert L, Finkelman R, Boti E, Milosavljevic M, Tewalt S, Simon N, and Dulong F. - (1996) - Origin and significance of high nickel and chromium concentrations in Pliocene lignite of the Kosovo Basin, Serbia. - International Journal of Coal Geology, 29, (4), p. 235-258.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Jugoslavija za Rudarstvo. - 11th World Mining Congress, Beograd. 172 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Other references

Donja Ljubata

General data

Deposit name(s): Donja Ljubata **Identifier:** YUG-00196
Commodities: Gr 200 000 t **Class:** C **Status:** Deposit of unknown status
Company:
Longitude: 22.409 **Latitude:** 42.465 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to metamorphic rocks: andalusite group, wollastonite, graphite, etc.

Ore deposit shape

Concordant to subconcordant envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Graphite

Host rocks Age: Paleozoic (Primary)**Host rock lithology**

Schist (s.l.), phyllite

Economy**Exploitation type**

Unworked

Gr Graphite (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	200000 t	Average grade:	-

Environment

Possible contamination of surface waters by suspended matter.

Comments

The graphite lenses contain 3-40% C, they are irregularly scattered within a zone 3 km long and 0.5 km wide (Jankovic - 1982)

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Donje Karacevo**General data**

Deposit name(s): Donje Karacevo **Identifier:** YUG-00038
Commodities: Bnt 1 380 000 t **Class:** C **Status:** Deposit of unknown status
Company:
Longitude: 21.717 **Latitude:** 42.567 **District:** Kosovo

Geology**Ore deposit type (gitology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age: Neogene (Miocene to Pliocene)

Ore mineralogy

Bentonite

Host rocks Age: Neogene (Miocene to Pliocene)

Host rock lithology

Clay, claystone

Volcaniclastic tuff s.l. (tuffaceous sandstone)

Economy**Exploitation type**

Mining method unknown

Bnt Bentonite (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	180000 t	Average grade:	-
Reserve:	1200000 t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Contribution of surface water degradation with a high content in suspended solids (clay minerals).

Comments

The bentonite contains 60.3% SiO₂ and 17.7% Al₂O₃.

The mine has been in operation since 1958 with an output between 5,000 and 10,000 t/y.

In 1982, the reserves of bentonite were 1.2 Mt

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Panicj B. - (1980) - Bentonitsko lezhishte Donje Karacevo (Kosovska Kamenitsa) Translated Title: The Donje Karacevo bentonite deposit near Kamenica Kosovska. - Zapisnici Srpsko Geolosko Drustvo, 1979, p. 165-174.

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references**Other references**

Donje Nevlje

General data

Deposit name(s): Donje Nevlje
Borovo **Identifier:** YUG-00084

Commodities: Cu 0 t **Class** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 22.752 **Latitude:** 42.957 **District:** Pirotski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives
 Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Upper/Late Cretaceous

Ore mineralogy

Pyrite
 Chalcopyrite
 Magnetite
 Sphalerite

Host rock mineralogy

Garnet
 Vesuvianite
 Epidote
 Chlorite

Hydrothermal alteration

Skarn formation

Host rocks **Age:** Upper/Late Cretaceous

Host rock lithology

Andesite
 Pyroclastic rocks s.l.
 Limestone

Economy**Exploitation type**

Unworked

Cu **Copper (metal)**

Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential with respect to sulfides minerals.

Comments

Content of Cu less than 0.15%

Geological references**Economic references****Other references****Other data bases**

Carte Métallogénique de l'Europe 26-109

Draglica

General data

Deposit name(s): Draglica **Identifier:** YUG-00170
Commodities: Mg 0 t **Class:** N/A **Status:** Old industrial mine, exhausted deposit
Company:
Longitude: 19.721 **Latitude:** 43.585 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks
 Supergene ore deposits

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age:**Ore mineralogy**

Magnesite (Gibbertite)

Host rocks Age:**Hostrock formation names**

Zlatibor Ultramafic Massif

Host rock lithology

Serpentine
 Basic to ultrabasic rock s.l.

Economy**Exploitation type**

Unworked

Mg Magnesium, magnesite (MgCO₃)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage waters by suspended matter.

Comments**Geological references**

- Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.
 Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.
 Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references**

Draznja

General data

Deposit name(s):	Draznja	Identifier:	YUG-00190
Commodities:	Pb 115 730 t	Class	B
	Zn 203 476 t	Class	B
	Ag 213 t	Class	D
	Au 0 t	Class	N/A
Company:		Status:	Dormant deposit
Longitude:	21.317	Latitude:	42.845
		District:	Kosovo

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)
Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Tertiary

Ore mineralogy

Pyrite
Galena
Sphalerite
Psilomelane
Pyrolusite (Polianite)
Iron Oxydes(unspecified)

Host rock mineralogy

Carbonates
Rhodochrosite (Dialoqite)
Silica

Hydrothermal alteration

Silicification
Carbonatization

Host rocks **Age:**

Hostrock formation names

Veles Series

Host rock lithology

Marble, cipolin (crystalline limestone)
Serpentinite
Flysch and fine- to medium-grained
volcaniclastic (volcano-sedimentary)
turbidite
Andesite
Listwaenite

Economy**Exploitation type**

Unworked

Pb Lead (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	115730 t	Average grade:	2.44 %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	203476 t	Average grade:	4.29 %
Resource:	- t	Average grade:	- %

Ag Silver (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem

<i>Past production:</i>	- t	<i>Average grade:</i>	- g/t
<i>Reserve:</i>	213 t	<i>Average grade:</i>	45 g/t
<i>Resource:</i>	- t	<i>Average grade:</i>	- g/t

Au Gold (metal)

Ore type: Ore of indeterminate nature

<i>Past production:</i>	- t	<i>Average grade:</i>	-
<i>Reserve:</i>	- t	<i>Average grade:</i>	-
<i>Resource:</i>	- t	<i>Average grade:</i>	-

Environment

Acid generation potential due to the sulfides minerals.

This Acid Rock Drainage may be reduced by acid-consuming minerals contained in the gangue as well as in the host rocks.

Expected dissolved contents of Pb, Zn and Mn in the drainage waters.

Comments

2 orebodies :

Orebody 1, vein-lenticular, 125 m long and 15 m thick of massive ore with Mn-Fe carbonates grading around 7% PbZn.

Orebody 2, with irregular horseshoe shape, indicated reserves are 4,743,027 t @ 2.44% Pb, 4.29% Zn, 45 g/t Ag and with a low gold content, max 0.14 g/t.

Geological references

Barjaktarevic D. - (1995) - Polymetallic mineral phenomenon of Glama silver near by Gnjilane. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Popovic R. - (2000) - Distribution of base and precious metals in the Lece volcano-intrusive massif (Vardar Zone) - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Department of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 443-452

Simic M. - (2000) - Metallogeny of the Draznja-Propastica-Novo Brdo ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Department of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 409-424

Economic references**Other references**

Drenovac

General data

Deposit name(s): Drenovac **Identifier:** YUG-00040
Commodities: Gran 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.659 **Latitude:** 42.438 **District:** Kosovo

Geology**Ore deposit type (geology)**

Slates, marble and ornamental-stone deposits

Ore deposit shape

Concordant to subconcordant mass, lens or pod of massive to submassive ore

Mineralization Age:**Host rocks Age:****Hostrock formation names**

Orahovac Ultrabasic Massif

Host rock lithology

Spinel-, garnet-, or plagioclase-bearing lherzolite

Economy**Exploitation type**

Unworked

Gran Granite, syenite, etc., ornamental (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature is known with this type of ore deposit.

Comments

Ornamental stone deposit (Lherzolite), explored by boring, shallow pits and trenches.
 Deposit of very high-quality.

Geological references

Ilic M. - (1975) - Leziste ukrasnog kamena kraj sela Drenovca (Orahovacki ultrabazitski masiv) Translated Title: Ornamental stone deposit near Drenovac village; Orahovac ultrabasic massif. - Zbornik Radova Rudarskog Geoloskog Fakulteta, Universitet u Beogradu, 18, p. 103-112.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references**

Dubovac

General data

Deposit name(s): Dubovac **Identifier:** YUG-00085
Commodities: Mg 0 t *Class* N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.883 **Latitude:** 42.786 **District:** Kosovo

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shapeField of discordant lodes (n*km², n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:****Ore mineralogy**

Magnesite (Gibbsite)

Host rock mineralogy

Dolomite

Quartz

Chalcedony

Calcite

Host rocks **Age:****Hostrock formation names**

Serpentinite massif of Dubovac

Host rock lithology

Serpentinite

Economy**Exploitation type**

Unworked

Mg **Magnesium, magnesite (MgCO₃)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment**Comments**Average grade : 45.02% MgO, 2.12% SiO₂, 1.30% CaO**Geological references**

Shkerlj J. - (1979) - Magnezitska lezhishta Dubovtsa Translated Title: Magnesite deposits of Dubovaca. - Geoloski Anali Balkanskoga Poluostrva, 43-44, p. 333-358.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-118

Dumitru Potok

General data

Deposit name(s): Dumitru Potok Valja Potok	Identifier: YUG-00123
Commodities: Cu 1 580 000 t Class: B	Status: Dormant deposit
Company: Rudarsko Topioninarski Basen BOR	
Longitude: 21.931 Latitude: 44.201	District: Branicevski

Geology**Ore deposit type (geology)**

Porphyry copper deposits: Cu, (Mo, Se, Au, Ag)

Ore deposit shape

Discordant envelope of disseminated ore

Mineralization **Age:** Upper/Late Cretaceous**Ore mineralogy**Chalcopyrite
Pyrite
Magnetite
Molybdenite
Galena
Sphalerite**Hydrothermal alteration**Silicification
Argillic alteration
Biotitization**Host rocks** **Age:** Upper/Late Cretaceous**Hostrock formation names**Senonian andesite
Intrusive Complexes**Host rock lithology**Andesite
Quartz diorite
Pyroclastic rocks s.l.
Monzodiorite**Economy****Exploitation type**

Unworked

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	1580000 t	Average grade:	0.2 %

Environment

Extreme Acid Rock Drainage production due to the sulfidic composition of the primary ore, the widespread alteration halos and its mineral assemblage.

Release of Cu and others metals into the drainage water.

Comments

Low grade porphyry copper : 0.2 to 0.3% Cu

Resources Dumitri Potok : 291 Mt @ 0.2 % Cu and Valja Srtz : 485 Mt @ 0.2% Cu

Geological references

Jankovic S, Terzic M, Aleksic D, Karamata S, Spasov T, Jovanovic M, Milicic M, Miskovic V, Grubic A, and Antonijevic I. - (1980) - Metallogenic features of copper deposits in the volcano- intrusive complexes of the Bor District, Yugoslavia. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 42-49.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1990) - Types of copper deposits related to volcanic environment in the Bor District, Yugoslavia. - Geol. Rundsch, 79, (2), p. 467-478.

Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references

Other references

Elemir

General data

Deposit name(s):	Elemir	Identifier:	YUG-00233
Commodities:	Petr 0 m3 Class N/A	Status:	Producing deposit
Company:			
Longitude:	20.279	Latitude:	45.422
		District:	

Geology

Ore deposit type (geology)

Oil deposits: oil, (S)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:**

Host rocks **Age:**

Economy

Exploitation type

Mining method unknown

Petr **Petroleum (substance)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- m3	Average grade:	-
Reserve:	- m3	Average grade:	-
Resource:	- m3	Average grade:	-

Environment

Potential contamination of surface waters, soils and sediments by hydrocarbons and oil products.

Comments

Geological references

Economic references

Other references

Fruska Gora

General data*Deposit name(s):* **Fruska Gora***Identifier:* **YUG-00042***Commodities:* **PbZn** 0 t *Class* **N/A***Status:* Primary occurrence of unknown status*Company:**Longitude:* 19.783 *Latitude:* 45.200*District:* Vojvodina**Geology***Ore deposit type (geology)*

Unspecified ore deposit type

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Host rocks* *Age:***Economy***Exploitation type*

Mining method unknown

PbZn Lead + Zinc (metal)*Ore type:* Ore of indeterminate nature*Past production:* - t*Average grade:* -*Reserve:* - t*Average grade:* -*Resource:* - t*Average grade:* -**Environment**

No specific environmental signature is known with this type of ore deposit.

Comments**Geological references****Economic references****Other references***Other data bases*

Carte Métallogénique de l'Europe 26-017

Gamzigrad

General data

Deposit name(s): Gamzigrad
Metovnica
Zajecar

Identifier: YUG-00108

Commodities: Fe 2 000 000 t **Class:** D **Status:** Deposit of unknown status

Company:

Longitude: 22.167 **Latitude:** 43.900 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Stratabound bed (single or multi-layered)

Mineralization **Age:** Cenomanian**Ore mineralogy**

Goethite

Iron Oxydes(unspecified)

Host rocks **Age:** Cenomanian**Hostrock formation names**

Cenomanian

Host rock lithology

Medium- to fine-grained detrital rock

Volcaniclastic rocks: pyroclastic rocks,
volcaniclastic (volcano-detrital,
volcano-sedimentary) rocks**Economy****Exploitation type**

Mining method unknown

Fe **Iron (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	-	%
Resource:	2000000	t	Average grade:	33.5	%

Environment

Drainage water with suspended solids content enriched in Fe/Mn.

CommentsSeveral million tons of limonitic ore with 26-41% Fe, 0.75% P, 0.03% S, 15-24% SiO₂, 6-9.5% Al₂O₃ and 15-17% CaO (Jankovic - 1982).**Geological references**

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references****Other data bases**

The Iron Ore Deposits of Europe - 1978 YU29

Glama

General data

Deposit name(s): Glama **Identifier:** YUG-00213

Commodities: Ag 0 t **Class** N/A **Status:** Primary occurrence of unknown status

Au 0 t **Class** N/A

PbZn 0 t **Class** N/A

Company:

Longitude: 21.457 **Latitude:** 42.490 **District:** Kosovo

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Mineralization Age:**Ore mineralogy**

Iron Oxydes(unspecified)

Host rocks Age: Jurassic**Host rock lithology**

Limestone

Ultrabasic rock

Economy**Exploitation type**

Unworked

PbZn Lead + Zinc (metal)**Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Ag Silver (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Au Gold (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

Few data available.

Comments

Old workings, 6 chip-samples with gold content between 3.6 and 23.8 g/t.

Geological references

Barjaktarevic D. - (1995) - Polymetallic mineral phenomenon of Glama silver near by Gnjilane. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Economic references

Other references

Glavica

General data

Deposit name(s): Glavica **Identifier:** YUG-00026
Goles Ni

Commodities: Ni 99 750 t **Class** C **Status:** Old industrial mine, exhausted deposit
 Co 0 t **Class** N/A

Company: Ferronikeli

Longitude: 20.982 **Latitude:** 42.556 **District:** Kosovo

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.

Ore deposit shape

Cap, blanket, crust

Mineralization Age:**Ore mineralogy**Saponite
Nontronite
Garnierite
Goethite
Goethite
Psilomelane
Wad**Host rock mineralogy**Opal
Quartz**Host rocks Age:****Hostrock formation names**Golesh Ultramafic Mass
Goles peridotite complex**Host rock lithology**Basic to ultrabasic rock s.l.
Peridotite
Harzburgite
Serpentinite**Economy****Exploitation type**

Surface mining

Ni Nickel (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	99750 t	Average grade:	1.33 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Co Cobalt (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	0.07 %
Resource:	- t	Average grade:	- %

Environment

The main potential environmental problems are related to :

- the clay minerals assemblage existing in a lateritic context. Trough erosion of exposed mining areas, those assemblages generate high suspended solids content in surface water that can produce many impacts associated with surface waters, groundwater and terrestrial ecosystems;
- the dissolved metals (Ni, Co and Fe, Mn) that migrate from old mining operations to local ground and surface water.

Comments

In 1982, Glavica and Cikatovo started in production for the Glogovac smelting plant. The combined reserves were estimated in 1978 to be 26.7 Mt averaging 1.2-1.5% Ni. The combined annual output was planned to be 983,000 t of dry ore containing 1.32% Ni and 0.07% Co.

Located in the Drenica Ore Field (Boev and Jankovic - 1996) : Ore reserves of probable and possible categories amounted to 7.5 Mt @ 1.33% Ni. Today ore reserves are depleted. Other occurrences are known in the Goles peridotite complex but they are not explored in detail (Medvetce, Mirjacici and Stankovac).

Geological references

- Boev B. and Jankovic S. - (1996) - Nickel and nikeliferous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.
- Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.
- Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67
- Mitrovic M and Misirlic M. - (1978) - Prilog utvrdivanju mineralnog sastava niklonosne rude iz Golesa i Cikatova, SAP Kosovo Translated Title: The determination of nickel-bearing ore mineral composition from Goles and Cikatovo; SAP Kosovo. - Rudarski Glasnik, 1, p. 31-46.
- Petrov VP, Vakanjac B, Jaksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.
- Ruppert L, Finkelman R, Boti E, Milosavljevic M, Tewalt S, Simon N, and Dulong F. - (1996) - Origin and significance of high nickel and chromium concentrations in Pliocene lignite of the Kosovo Basin, Serbia. - International Journal of Coal Geology, 29, (4), p. 235-258.

Economic references

- Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.
- Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.
- Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-116

Golija

General data

Deposit name(s): Golija
Jurija

Commodities: W 0 t **Class** N/A **Status:** Group of mineral occurrences

Company:

Longitude: 20.322 **Latitude:** 43.290 **District:** Moravicki

Identifier: YUG-00179

Geology**Ore deposit type (geology)**

Unspecified syn- to late orogenic ore deposits
W (scheelite) - Mo skarns: W, (Mo)

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)
Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age:**Ore mineralogy**

Pyrrhotite
Scheelite
Arsenopyrite
Pyrite
Sphalerite
Galena

Host rock mineralogy

Quartz

Host rocks Age:**Economy****Exploitation type**

Unworked

W Wolfram (WO3)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	0.4 %
Resource:	- t	Average grade:	- %

Environment

High acid generation potential due to the sulfides minerals contained in the ore.
Dissolved base metals and As may be released into the environment with some expected concentrations in the stream sediments.

Comments**Geological references**

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Gorance

General data

Deposit name(s): Gorance **Identifier:** YUG-00033
Commodities: Cr 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 21.239 **Latitude:** 42.120 **District:** Kosovo

Geology**Ore deposit type (gitology)**

Podiform chromite deposits: Cr

Ore deposit shape

Pod, pod-shaped body

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Chromite

Host rocks Age:**Hostrock formation names**

Lyuboten ultramafic Massif

Host rock lithology

Basic to ultrabasic rock s.l.

Dunite

Harzburgite

Economy**Exploitation type**

Mining method unknown

Cr Chrome (Cr₂O₃)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature.

Comments

Border Macedonia and Serbia, must be in Macedonia. Check the coordinates

Geological references

Holub M. - (1976) - Some regularities of the distribution of chromite deposits in the Lyuboten Massif, UR Macedonia, Yugoslavia. - Acta Universitatis Carolinae, Geologica. 1976, (2), p. 91-103.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Silk MH. - (1988) - World Chromite resources and ferrochromium production. - MINTEK - Special Publication. Council for Mineral Technology, 149 p.

Economic references**Other references**

Goveda Glava

General data

<i>Deposit name(s):</i>	Goveda Glava	<i>Identifier:</i>	YUG-00131
<i>Commodities:</i>	Cu 0 t <i>Class</i> N/A	<i>Status:</i>	Deposit or prospect of unknown status
<i>Company:</i>			
<i>Longitude:</i>	19.771	<i>Latitude:</i>	44.126
		<i>District:</i>	

Geology*Ore deposit type (geology)*

Unspecified ore deposits related to basic-ultrabasic magmatic rocks
 Volcanogenic massive and disseminated Cu-Au sulphide deposits: Cu, Au, (Zn, Co, Mo, Bi)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Ore mineralogy*

Pyrite

Host rocks *Age:***Economy***Exploitation type*

Mining method unknown

Cu **Copper (metal)**

Ore type: Ore of indeterminate nature

<i>Past production:</i>	- t	<i>Average grade:</i>	-
<i>Reserve:</i>	- t	<i>Average grade:</i>	-
<i>Resource:</i>	- t	<i>Average grade:</i>	-

Environment

Too few data available.

Comments**Geological references**

Jankovic S and Putnik S. - (1980) - Copper deposits in the Southeastern Europe connected with the ophiolite complexes. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects, Belgrade. p. 117-123.
 Putnik S. - (1981) - Metalogenia bakra jurske dijabaz-roznacke formacije - Metallogenesis of copper in jurassic diabase-chert formation - Geoinstitut. Beograd, 1981. Monographs, vol. 6, 117 p., 2 plates.

Economic references**Other references**

Grebnik**General data**

Deposit name(s): Grebnik **Identifier:** YUG-00028
Commodities: Al 2 000 000 t **Class:** D **Status:** Old industrial mine, exhausted deposit
Company: Ro Rudnik Boksita Kosovo - Klina
Longitude: 20.601 **Latitude:** 42.557 **District:** Kosovo

Geology**Ore deposit type (geology)**

Bauxite and Al-rich rocks deposits (karst, laterite and Tikhvinsk types): Al, (Fe, Ga)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization Age: Upper/Late Cretaceous**Ore mineralogy**

Diaspore

Host rocks Age: Upper/Late Cretaceous**Host rock lithology**

Limestone

Economy**Exploitation type**

Surface mining

Al Aluminium (Bauxite ore)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	2000000 t	Average grade:	47 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

Existence of a clay minerals assemblage belonging to a lateritic profile.

Through erosion of exposed mining areas, those assemblages generate high suspended solids content in surface water that can produce many impacts associated with surface waters, groundwater and terrestrial ecosystems.

Comments

Mined since 1966, reached a maximum production level of 200,000 t/y. In 1982, depleted reserves and falling grades reduced this level to about 80,000 t/y.

Other name Klina.

Geological references

Maksimovic Z. - (1976) - Genesis of some Mediterranean karstic bauxite deposits. - Comite International pour l'Etude des Bauxites, des Oxydes et des Hydroxydes d'Aluminium, Travaux (Academie Yougoslave des Sciences et des Arts), Zagreb.. 13, p. 1-14.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references**Other data bases**

Carte Métallogénique de l'Europe 26-120

Guberevac**General data**

Deposit name(s): Guberevac **Identifier:** YUG-00099
Commodities: Fe 250 000 t **Class:** E **Status:** Deposit or prospect of unknown status
Company:
Longitude: 20.766 **Latitude:** 43.835 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.
 Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Cap, blanket, crust
 Stratabound envelope of disseminated ore

Mineralization **Age:** Lower/Early Cretaceous

Ore mineralogy

Chamosite
 Hematite
 Goethite

Host rocks **Age:** Lower/Early Cretaceous

Hostrock formation names

Gault sediments

Host rock lithology

Conglomerate
 Sandstone

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	250000 t	Average grade:	36.5 %

Environment

Potential particulate and colloidal iron compounds in drainage water.

Comments

The ore contains 35-37% Fe, 1.3-2% Cr, 0.5-1.5% Ni, 15-25% SiO₂, 1.5% Mn.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.
 Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 1:2,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst. Geowiss. p. 411-418.
 Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references****Other data bases**

The Iron Ore Deposits of Europe - 1978 YU05

Ibarski Rudnici**General data**

Deposit name(s): Ibarski Rudnici **Identifier:** YUG-00139
Jarando

Commodities: Coal 0 t **Class** N/A **Status:** Producing small-scale mine

Company: Rudnik kamenog uglja IBARSKI RUDNICI - EPS

Longitude: 20.635 **Latitude:** 43.396 **District:** Raski

Geology**Ore deposit type (geology)**

Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene**Host rocks** **Age:** Miocene**Hostrock formation names**

Ibar Tertiary coal basin

Host rock lithology

Coal (anthracite, graphite)

Detrital rock s.l.

Economy**Exploitation type**

Underground mining

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential acid rock drainage with respect of the sulfides content.

Suspended matter in mine water discharge.

Landform instability (collapses) created during and after mining operations.

Comments

In 1981, output of 250,000 t/y.

Coal mined in the Ibar basin is considerably metamorphosed by contact-thermal changes of andesite effusions.

The average sulphur content is 5 to 6% and the heating value is about 26,000 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Tsvetichanin R. - (1976) - Petrography of coals in Yugoslav deposits of various ages. - Lithology and Mineral Resources, 11, (1), p. 120-126.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Iverak

General data

Deposit name(s): Iverak **Identifier:** YUG-00043

Commodities: Sn t **Class** N/A **Status:** Deposit of unknown status
 U 0 t **Class** N/A

Company:

Longitude: 19.456 **Latitude:** 44.586 **District:** Macvanski

Geology**Ore deposit type (geology)**

Alluvial-eluvial placers: Au, Pt, Sn,Ti, REE, diamond, gemstones, (Zr, etc.)

Sedimentary uranium deposits: U, (V, Mo, Ni, Cu, Zn, Pb, As)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age:**Ore mineralogy**

Cassiterite

Columbo-tantalite

Host rocks Age: Cenozoic**Hostrock formation names**

Tertiary clastic sediments

Host rock lithology

Detrital rock s.l.

Alluvium s.l.

Economy**Exploitation type**

Unworked

U Uranium (metal)**Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Sn Tin (metal)****Environment**

Modification of waterbeds by alluvial extraction.

Degradation of the surface water quality by suspended matters and high turbidity.

Comments

Deposit of Sn but also U deposit in some reports.

Geological references

Anonymous. - (1980) - World Uranium - Geology and Resource Potential. - IUREP. Miller Freeman Publications, San Francisco. 524 p.

Jelenkovic R., Serafimovski T. and Lazarov P. - (1997) - Uranium Mineralization in the Serbo-Macedonian Massif and the Vardar Zone : Types and Distribution Pattern - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 149-157

Economic references**Other references****Other data bases**

Ore Minerals Database (YUG) - 00043

Carte Métallogénique de l'Europe

26-041

Jaram

General data

Deposit name(s): Jaram **Identifier:** YUG-00156
Duboka

Commodities: Wol 0 t **Class** N/A **Status:** Dormant deposit

Company:

Longitude: 20.830 **Latitude:** 43.282 **District:** Rasinski

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to metamorphic rocks: andalusite group, wollastonite, graphite, etc.

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Mineralization Age:**Ore mineralogy**

Wollastonite

Host rock mineralogy

Vesuvianite

Quartz

Calcite

Epidote

Garnet

Diopside

Magnetite

Hydrothermal alteration

Skarn formation

Host rocks**Age:****Hostrock formation names**

Kopaonik granodioritic massif

Host rock lithology

Undifferentiated metamorphic rock

Granodiorite

Economy**Exploitation type**

Unworked

Wol Wollastonite (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	67.5 %
Resource:	- t	Average grade:	- %

Environment

No specific environmental signature.

Comments

The ore contains 60-75% of wollastonite, 2-16% of carbonates and 4-12% of quartz.

Technological tests have produced satisfactory market-grade wollastonite concentrations.

The ore contains 48-52% SiO₂, 0.5-0.7% Fe₂O₃, 39.5-43.4% CaO and 0.9-2.8% CO₂

Geological references

Dedic L., Mozina A., Radulovic P., Joksimovic D. and Jovovic M. - (1995) - Non metallic sources deposit of the Kopaonik area. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Other references

Jastrebac

General data

Deposit name(s): Jastrebac **Identifier:** YUG-00165
Commodities: Au 0 t **Class:** N/A **Status:** Primary occurrence of unknown status
Company:
Longitude: 21.433 **Latitude:** 43.400 **District:** Topolicki

Geology

Ore deposit type (geology)

Unspecified syn- to late orogenic ore deposits

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization **Age:**

Host rocks **Age:**

Host rock lithology

Undifferentiated metamorphic rock

Economy

Exploitation type

Unworked

Au **Gold (metal)**

Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No data available.

Comments

Geological references

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Vujanovic V and Teofilovic M. - (1977) - Zlatonosno podrucje regiona Prokuplja Translated Title: The gold- bearing Prokuplje area. - Glasnik Prirodnjackog Muzeja u Beogradu, Serija A: Mineralogija, Geologija, Paleontologija, 32, p. 27-30.

Economic references

Other references

Jovac 1

General data

Deposit name(s): Jovac 1 **Identifier:** YUG-00065
Commodities: Mica 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company:
Longitude: 21.311 **Latitude:** 43.892 **District:** Pomoravski

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to sedimentary or metamorphic rocks

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:****Host rocks** **Age:****Economy****Exploitation type**

Mining method unknown

Mica **Mica, sheet (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

The exposed waste rocks to water runoff may be the source of environmental problems due to the high content of suspended matter in surface water.

Comments**Geological references****Economic references****Other references****Other data bases**

Carte Métallogénique de l'Europe 26-072

Jovac 2

General data*Deposit name(s):* **Jovac 2***Identifier:* **YUG-00066***Commodities:* **Cu** 0 t *Class* **N/A***Status:* Deposit or prospect of unknown status*Company:**Longitude:* 21.683 *Latitude:* 43.750*District:***Geology***Ore deposit type (geology)*

Unspecified ore deposit type

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Host rocks* *Age:***Economy***Exploitation type*

Mining method unknown

Cu **Copper (metal)***Ore type:* Ore of indeterminate nature*Past production:* - t*Average grade:* -*Reserve:* - t*Average grade:* -*Resource:* - t*Average grade:* -**Environment****Comments****Geological references****Economic references****Other references***Other data bases*

Carte Métallogénique de l'Europe 26-073

Kalna

General data

Deposit name(s): Kalna **Identifier:** YUG-00096
Commodities: U 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 22.526 **Latitude:** 43.424 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Shear-zone related mesothermal uranium deposits: U, (Fe, Cu, Pb, Zn, Se)

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age:**Ore mineralogy**

Uraninite
 Pyrite
 Galena
 Chalcopyrite
 Pyrrhotite
 Arsenopyrite

Host rock mineralogy

Niter
 Quartz
 Chalcedony
 Barite
 Strontianite

Hydrothermal alteration

Sericitization
 Chloritization
 Argillic alteration

Host rocks Age:**Hostrock formation names**

Janja granite

Host rock lithology

Granite (s.l.)

Economy**Exploitation type**

Underground mining

U Uranium (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generating potential due to the sulfide minerals composition of the ore.

Radioactive elements (U, Th..) in drainage waters and potential emission of Radon and gamma radiations.

Presence of arsenopyrite that can release As into the environment and in particular into the stream sediments.

Comments

First Uranium mine of Yugoslavia, in experimental operation until 1961

Geological references

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-164

Kaltrina

General data

Deposit name(s): Kaltrina
Plavica

Commodities: **Pb** 57 376 t **Class** C **Status:** Unexploited deposit
Zn 63 000 t **Class** C
Ag 181 t **Class** D

Company: TREPCA Mining and Metallurgical Complex

Longitude: 21.442 **Latitude:** 42.608 **District:** Kosovo

Identifier: YUG-00185

Geology**Ore deposit type (geology)**

Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Tertiary**Ore mineralogy**Galena
Sphalerite
Pyrite**Hydrothermal alteration**

Skarn formation

Host rocks **Age:****Host rock lithology**Marble, cipolin (crystalline limestone)
Schist (s.l.), phyllite**Economy****Exploitation type**

Unworked

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	57376 t	Average grade:	4.4 %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	63000 t	Average grade:	4.5 %
Resource:	- t	Average grade:	- %

Ag Silver (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	- g/t
Reserve:	181 t	Average grade:	129 g/t
Resource:	- t	Average grade:	- g/t

Environment

High acid generation potential due to the sulfides minerals contained in the ore.

The Acid Rock Drainage may partly be reduced by acid-consuming minerals contained in the gangue mineralogy or in the host rocks, but in general calc-silicate skarn minerals show low neutralizing reactivity with acid waters.

Comments

Reserves supported by 4 drill-holes and underground workings : 1,304,000 t @ 4.4% Pb, 4.5% Zn and 129 g/t Ag.

Geological references

Simic M. - (2000) - Metallogeny of the Draznja-Propastica-Novo Brdo ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 409-424

Economic references

Other references

Kaludjer

General data

Deposit name(s): Kaludjer **Identifier:** YUG-00189

Commodities: Pb 5 760 t **Class** D **Status:** Deposit of unknown status

Zn 11 200 t **Class** D

Company: TREPCA Mining and Metallurgical Complex

Longitude: 20.699 **Latitude:** 43.090 **District:** Kosovo

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Tertiary**Host rocks** **Age:****Hostrock formation names**Thrust contact between
amphibolite/serpentinite**Host rock lithology**Amphibolite (s.l.)
Serpentinite**Economy****Exploitation type**

Surface mining

Pb **Lead (metal)****Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	5760 t	Average grade:	1.8 %

Zn **Zinc (metal)****Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	11200 t	Average grade:	3.5 %

Environment

No data available.

Comments**Geological references**

Miletic G. - (1995) - The structure of lead and zinc deposit Crnac. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.

Economic references**Other references**

Karacevo

General data

Deposit name(s): Karacevo **Identifier:** YUG-00036
Commodities: Kln 3 450 000 t **Class** C **Status:** Deposit of unknown status
Company: Rudnik Kaolina Karacevo
Longitude: 21.732 **Latitude:** 42.565 **District:** Kosovo

Geology**Ore deposit type (gitology)**

Supergene industrial rock and mineral deposits: clays, kaolin, silica sand, etc.

Ore deposit shape

Tabular-shaped mass or lens

Mineralization **Age:** Cenozoic**Ore mineralogy**Kaolinite
Illite
Halloysite
Montmorillonite**Host rock mineralogy**Feldspar
Quartz**Host rocks** **Age:** Paleozoic (Primary)**Hostrock formation names**

Late Hercynian granodiorite

Host rock lithology

Granodiorite

Economy**Exploitation type**

Surface mining

Kln **Kaolin (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	250000 t	Average grade:	-
Reserve:	3200000 t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

High turbidity and suspended matter in surface water.
 Landforms instability created during mining operations.

Comments

Has been worked since 1965 with an output of 23,000 - 28,000 t/y of kaolin.
 In 1982, the mine output will reach 200,000 t/y of raw material.
 In 1975, the reserves were estimated at 3.2 Mt.

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
 Maksimovic Z and Nikolic D. - (1978) - The primary kaolin deposits of Yugoslavia. - Schriftenreihe fuer Geologische Wissenschaften, 74, 11, p. 179-196.
 Simic V. and Jovic V. - (1997) - Genetic types of kaolin and kaolinite clay deposits in Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 197-201

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Karadak

General data

Deposit name(s): Karadak **Identifier:** YUG-00215
Commodities: PbZn 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.691 **Latitude:** 43.248 **District:** Raski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata
 Stratabound envelope of disseminated ore

Mineralization **Age:** Cenozoic

Ore mineralogy

Pyrite
 Marcasite
 Sphalerite
 Galena
 Arsenopyrite
 Chalcopyrite
 Bourmonite
 Tetrahedrite
 Enargite
 Boulangerite
 Antimonite
 Iron Oxydes(unspecified)
 Cerussite
 Covellite

Host rock mineralogy

Quartz
 Carbonates
 Clay

Hydrothermal alteration

Kaolinization

Host rocks **Age:**

Host rock lithology

Andesite
 Pyroclastic rocks s.l.

Economy**Exploitation type**

Unworked

PbZn Lead + Zinc (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential Acid Rock Drainage production due to the sulfides and sulfosalts minerals present in the ore.
 Expected dissolved and particulate contents of base metals and As in the drainage waters.
 Presence of acid-consuming minerals in the gangue that could reduce the Acid Rock Drainage production.
 Possible contamination of surface water by suspended matter.

Comments**Geological references**

Radulovic B. - (1992) - Leziste cinka i olova karadak Translated Title: The Karadek zinc and lead deposit. - Radovi Geoinstitut, 27,

p. 169-180.

Radulovic B. and Savic R. - (1995) - Deposits and the potential of base and precious metals in the ore field Raska. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Economic references

Other references

Karamanica

General data

Deposit name(s): Karamanica **Identifier:** YUG-00202

Commodities: Pb 42 900 t **Class** C **Status:** Deposit of unknown status
 Zn 57 350 t **Class** C

Company:

Longitude: 22.348 **Latitude:** 42.377 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Oligocene (Middle Tertiary)**Host rocks** **Age:** Oligocene (Middle Tertiary)**Host rock lithology**

Undifferentiated metamorphic rock

Granite (s.l.)

Gneiss (s.l.)

Economy**Exploitation type**

Unworked

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** - %**Reserve:** 42900 t **Average grade:** 1.16 %**Resource:** - t **Average grade:** - %**Zn Zinc (metal)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** - %**Reserve:** 57350 t **Average grade:** 1.55 %**Resource:** - t **Average grade:** - %**Environment**

No data available on ore and gangue mineralogy as well as on wall rock alteration.

Comments

The Podvirovi mineralization is the richest one : 2.62% Pb, 2.72% Zn, 21 g/t Ag and 193 g/t Cd (Simic - 1997).

Reserves : 3.7 Mt @ 1.16% Pb, 1.55% Zn.

Geological references

Simic M. - (1997) - Geological-structural features of the Besna Kobilja Zone in SE Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 185-195

Economic references

Other references**Katalenac****General data**

Deposit name(s): Katalenac **Identifier:** YUG-00226
Commodities: Silc 0 t **Class:** N/A **Status:** Producing industrial mine
Company:
Longitude: 22.009 **Latitude:** 42.562 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Volcanic-hosted industrial rock and mineral deposits: bentonite, diatomite, kaolinite, pumice, opal, chalcedony, zeolite, vermiculite, perlite, etc.

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age: Neogene (Miocene to Pliocene)

Ore mineralogy

Zeolite

Host rocks Age: Neogene (Miocene to Pliocene)

Host rock lithology

Vitric tuff

Economy**Exploitation type**

Surface mining

Silc Silica, silica sand (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Dust production and fallout (Si).
 Geomorphic modifications in the landscape (quarry).

Comments**Geological references**

Ilich M. - (1991) - Yugoslavian cement. Raw materials and production - Industrial Minerals, november 1991, pp. 59-61

Economic references**Other references**

Kiseli Potok

General data

Deposit name(s): Kiseli Potok **Identifier:** YUG-00186

Commodities: Pb 60 000 t **Class** C **Status:** Unexploited deposit
 Zn 50 000 t **Class** C
 Ag 160 t **Class** D

Company: TREPCA Mining and Metallurgical Complex

Longitude: 21.427 **Latitude:** 42.608 **District:** Kosovo

Geology

Ore deposit type (geology)
 Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape
 Atypical, unspecified or ill-defined form

Mineralization **Age:**

Host rocks **Age:**

Economy

Exploitation type
 Unworked

Pb	Lead (metal)	Ore type: Ore of indeterminate nature	
		Past production: - t	Average grade: - %
		Reserve: - t	Average grade: - %
		Resource: 60000 t	Average grade: 3 %
Zn	Zinc (metal)	Ore type: Ore of indeterminate nature	
		Past production: - t	Average grade: - %
		Reserve: - t	Average grade: - %
		Resource: 50000 t	Average grade: 2.5 %
Ag	Silver (metal)	Ore type: Ore of indeterminate nature	
		Past production: - t	Average grade: - g/t
		Reserve: - t	Average grade: - g/t
		Resource: 160 t	Average grade: 80 g/t

Environment

No data available.

Comments

Resources of 2 Mt @ 3.0% Pb, 2.5% Zn, 80 g/t Ag and 40% Fe₂S.

Geological references

Simic M. - (2000) - Metallogeny of the Draznja-Propastica-Novo Brdo ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 409-424

Economic references

Other references

Kisnica

General data

Deposit name(s): Kisnica **Identifier:** YUG-00025

Commodities: **Pb** 396 000 t **Class** B **Status:** Dormant deposit

Ag 532 t **Class** C

Zn 122 000 t **Class** C

Au 0 t **Class** N/A

Company: TREPCA Mining and Metallurgical Complex

Longitude: 21.237 **Latitude:** 42.598 **District:** Kosovo

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Field of discordant lodes (n*km², n*ha)**Mineralization** **Age:** Miocene**Ore mineralogy**

Sphalerite
Galena
Pyrite
Pyrrhotite
Magnetite
Chalcopyrite
Cubanite
Valleriite
Stannite
Arsenopyrite
Grey copper
Gold
Bourmonite
Loellingite
Stibnite
Pyrargyrite
Boulangerite
Covellite
Marcasite

Host rock mineralogy

Siderite
Quartz
Rhodochrosite (Dialoqite)
Barite
Chalcedony

Host rocks **Age:****Hostrock formation names**

Contact serpentinite-Cretaceous flysh

Host rock lithology

Serpentinite
Andesite
Schist/shale

Economy**Exploitation type**

Surface mining
Underground mining

Pb **Lead (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	270000 t	Average grade:	2.63 %
Reserve:	126000 t	Average grade:	4.9 %
Resource:	- t	Average grade:	- %

Au	Gold (metal)			
		<i>Ore type:</i> Ore of indeterminate nature		
	<i>Past production:</i>	- t	<i>Average grade:</i>	-
	<i>Reserve:</i>	- t	<i>Average grade:</i>	-
	<i>Resource:</i>	- t	<i>Average grade:</i>	-
Ag	Silver (metal)			
		<i>Ore type:</i> Ore of indeterminate nature		
	<i>Past production:</i>	390 t	<i>Average grade:</i>	38 g/t
	<i>Reserve:</i>	142 t	<i>Average grade:</i>	55 g/t
	<i>Resource:</i>	- t	<i>Average grade:</i>	- g/t
Zn	Zinc (metal)			
		<i>Ore type:</i> Ore in which the element forms a distinct mineral phase		
	<i>Past production:</i>	90000 t	<i>Average grade:</i>	0.88 %
	<i>Reserve:</i>	32000 t	<i>Average grade:</i>	1.2 %
	<i>Resource:</i>	- t	<i>Average grade:</i>	- %

Environment

The primary ore mineralogy is mainly composed of sulfides (lead and zinc + iron sulfides) that may generate acid and dissolved metals during oxidation leading to the potential contamination of drainage water and stream sediments (Acid Mine Drainage).

Presence of arsenopyrite and Loellingite that can liberate As into the environment and lead to its accumulation in stream sediments downstream of the ore-deposits.

The existence of an ore processing plant at Gracanica has generated large tailings disposals (15-18Mt) that can be a source of groundwater and surface water contamination.

Comments

The lenses average 5% Pb and 1.5% Zn, the stockwork 2.4% Pb and 1.2% Zn.

ITT/UNMIK Mission (12/2000) : Past production (1962-1998) by underground mine : 3,562,000 t @ 4.08% Pb, 1.02% Zn, 53 g/t Ag.

Past Production (1969-1992) by open pit : 6,721,000 t @ 1.85% Pb, 0.81% Zn and 30 g/t Ag.

Reserves of the underground mine : 2,581,000 t @ 4.9% Pb, 1.2% Zn and 55 g/t Ag.

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Klasic M. - (1995) - Deposits of lead and zinc in the ore field Ajvalija - Kisnica. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-112

Kizevak

General data

Deposit name(s): Kizevak **Identifier:** YUG-00212

Commodities: Pb 48 000 t **Class** C **Status:** Producing industrial mine
 Zn 106 800 t **Class** C

Company:

Longitude: 20.701 **Latitude:** 43.291 **District:** Raski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age: Cenozoic**Ore mineralogy**

Pyrite
 Arsenopyrite
 Sphalerite
 Galena
 Boulangerite
 Antimonite
 Chalcopyrite
 Marcasite

Hydrothermal alteration

Kaolinization
 Propylitization

Host rocks Age:**Host rock lithology**

Andesite
 Pyroclastic rocks s.l.

Economy**Exploitation type**

Surface mining

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	48000 t	Average grade:	2.14 %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	106800 t	Average grade:	4.76 %
Resource:	- t	Average grade:	- %

Environment

Acid generation potential due to the sulfides and sulfosalts minerals contained in the ore.

Expected high dissolved and particulate contents of Fe, Cu and As in drainage waters with possible concentrations in stream sediments.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

Reserves : 2,244 kt @ 2.14% Pb and 4.76% Zn

Geological references

Radulovic B and Grabeljskek V. - (1978) - Geoloski prikaz novopronadenih lezista olova i cinka Sastavci i Kizevak potok na Kopaoniku Translated Title: Report on exploration of new lead-zinc deposits at Sastavci and Kizevak, Kopaonik region. - Radovi Instituta za Geolosko Rudarska Istrazivanja i Ispitivanja Nuklearnih i Drugih Mineralnih Sirovina, 18, (12), p. 93-104.

Radulovic B. - (1992) - Leziste cinka i olova karadak Translated Title: The Karadek zinc and lead deposit. - Radovi Geoinstitut, 27, p. 169-180.

Radulovic B. and Savic R. - (1995) - Deposits and the potential of base and precious metals in the ore field Raska. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.

Economic references

Other references

Kolubara

General data

Deposit name(s): Kolubara **Identifier:** YUG-00141
Lazarevac

Commodities: Coal 815 947 000 t **Class** B **Status:** Producing industrial mine

Company: Rudnici lignita BASEN KOLUBARA - EPS

Longitude: 20.303 **Latitude:** 44.461 **District:** City of Beograd

Geology**Ore deposit type (geology)**

Lignite deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Pontian**Host rocks** **Age:** Pontian**Hostrock formation names**

Kolubara Coal Basin

Host rock lithology

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Medium- to fine-grained detrital sediment

Economy**Exploitation type**

Open cast (open pit) mining

Bucket wheel dredging

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** 615947000 t **Average grade:** -**Reserve:** 2200000000 t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

Potential acid rock drainage with respect of the sulfides content.

Suspended matter in mine water discharge.

Large geomorphic modifications of the landscape (pits, gullies, spoil heaps...) has taken place in this area since 1945.

Landform instability (collapses) created during and after mining operations.

Comments

Opencast mining started in 1950. In 1981, current output was about 20,000,000 t/y from 3 openpits : Field B, Field D and Tamnava. In 1983, the resources were estimated at about 3,568 Mt.

Kolubara coal is of the lignite type. It contains about 47% of moisture and 12% of ash. The heating value is about 7,500 kJ/kg.

Electric Power Industry of Serbia - Report 1998 :

Kolubara cover an area of 600 km² and comprises 4 open-pits : Field B, Field D, Tamnava-East and Tamnava-West. The mining equipment installed at these 4 mines is capable of producing 27.5 Mt of coal and removing 49.5 Mm³ of overburden a year.

Electric Power Industry of Serbia - Report 1999 :

In 1999, open-pit mines "Kolubara" produced the amount of 22,683,000 t of coal.

The total production between 1945-2000 was 615.9 Mt of coal and 1,283 Mm³ of overburden (striping ratio of 2.08). The remaining lignite reserves amount 2,200 Mt.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Janke G, Cvetkovic O, and Glumicic T. - (1997) - Determination of different forms of sulphur in Yugoslav soft brown coals. - European Coal Geology and Technology. Gayer R and Pesek J (Eds), Geological Society of London, London. p. 269-272.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Jugoslavija za Rudarstvo. - 11th World Mining Congress, Beograd. 172 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Dimitrijevic D. - (1983) - Kolubarski ugljeni basen i njegovi resursi u pogledu dobijanja produkata vecje toplotne vrednosti
Translated Title: Kolubara coal basin and its resources from the aspect of increasing the thermal efficiency. - Geoloski Anali Balkanskoga Poluostrva, 46, p. 333-351.

Dimitrijevic D. - (1993) - Kolubarski ligniti u proizvodnji metalurshkog koksa
Translated Title: Kolubara lignite in production of metallurgical coke. - Geoloski Anali Balkanskoga Poluostrva, 57, (2), p. 357-367.

Mitrovic M. - (1981) - Mogucnosti ciscenja lignita kolubara pre sagorevanja u termoelektrani
Translated Title: Possibilities of purifying the Kolubara lignite before combustion in energy-producing stations. - Rudarski Glasnik, 2, p. 34-44.

Other references

Koporic

General data**Deposit name(s):** Koporic**Identifier:** YUG-00077

Commodities: **Pb** 50 000 t **Class** C
Zn 19 000 t **Class** D
Ag 58 t **Class** E

Status: Old industrial mine, abandoned deposit**Company:** TREPCA Mining and Metallurgical Complex**Longitude:** 20.858 **Latitude:** 43.144**District:** Kosovo**Geology****Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**Galena
Sphalerite**Hydrothermal alteration**

Silicification

Host rocks **Age:** Neogene (Miocene to Pliocene)**Hostrock formation names**

Serpentinite - Upper cretaceous flysch

Host rock lithologyDacite
Andesite
Serpentinite**Economy****Exploitation type**

Surface mining

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	50000 t	Average grade:	2.2 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	19000 t	Average grade:	0.8 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Ag Silver (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem

Past production:	58 t	Average grade:	26 g/t
Reserve:	- t	Average grade:	- g/t
Resource:	- t	Average grade:	- g/t

Environment

Moderate production of Acid mine drainage with associated dissolved base metals in surface waters.
The ore processing plant located in Lepocavic has generated large amounts of tailings (8 Mt).

Comments

In 1982, the Koporic openpit was the largest mine of Kapaonik Mining Company, with a current output of 160,000 t/y. The ore has always been low-grade, with 2% Pb and 1% Zn. The mineralized zone is a silica mass, presence of gold ?

ITT/UNMIK Mission (12/2000) : Past production (1972-1998) : 2,269,000 t @ 2.2% Pb, 0.8% Zn and 26 g/t Ag.

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Jankovic N and Jankovic T. - (1976) - Strukturno-litološke karakteristike lezista Koporic i njihov uticaj na proces orudnjenja
Translated Title: The structural- lithologic characteristics of the Koporic Deposit and their influence on ore mineralization. - Jugoslovanski Geoloski Kongres, 8, (5), p. 79-86.

Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije
Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Struel I. - (1981) - Die schichtgebundenen Blei-Zink-Lagerstaetten Jugoslawiens
Translated Title: The stratiform lead-zinc deposits of Yugoslavia. - Mitteilungen der Oesterreichischen Geologischen Gesellschaft, 74-75, p. 307-322.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-095

Korlace

General data

Deposit name(s): Korlace **Identifier:** YUG-00116
Commodities: Asb 0 t **Class:** N/A **Status:** Producing industrial mine
Company: Jugoazbest Korlace
Longitude: 20.694 **Latitude:** 43.365 **District:** Raski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age:**Ore mineralogy**

Chrysotile (Clino-, Ortho-, Par

Hydrothermal alterationCarbonatization
Silicification**Host rocks Age:****Hostrock formation names**

Kopaonik ultramafite mass

Host rock lithologySerpentinite
Spinel-, garnet-, or plagioclase-bearing
Iherzolite
Harzburgite**Economy****Exploitation type**

Surface mining

Asb Asbestos (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	2.78 %
Resource:	- t	Average grade:	- %

Environment

Emission of particulate matters in the form of fugitive dust.

The dust mainly composed of fibrous minerals can be inhaled by people and thus may induce illnesses.

Comments

By 1981, approximate output was 12,000 t/y of asbestos fibre.

Geological references

Dedic L., Mozina A., Radulovic P., Joksimovic D. and Jovovic M. - (1995) - Non metallic sources deposit of the Kopaonik area. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Tanasijevic D. - (1981) - Dorpinos izboru obima proizvodnje u rudniku azbesta korlace Translated Title: The choice of the rate of production for the Korlace asbestos mine. - Rudarski Glasnik, 2, p. 11-17.

Other references**Kosjeric****General data**

Deposit name(s): Kosjeric **Identifier:** YUG-00224
Commodities: LstC 0 t **Class:** N/A **Status:** Producing industrial mine
Company: D.P. Fabrika Cementa KOSJERIC
Longitude: 19.938 **Latitude:** 43.991 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age:

Host rocks Age: Upper/Late Cretaceous

Host rock lithology

Limestone
Marl

Economy**Exploitation type**

Surface mining

LstC Cement limestone (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Dust production and fallout.

Geomorphic modifications in the landscape (quarry).

Comments

Production 1990 : 456 kt

Annual production : 442 kt (1999)

Geological references

Ilich M. - (1991) - Yugoslavian cement. Raw materials and production - Industrial Minerals, november 1991, pp. 59-61

Economic references**Other references**

Kosmaj Babe

General data

Deposit name(s): Kosmaj Babe **Identifier:** YUG-00049

Commodities: Pb 269 618 t **Class** B **Status:** Dormant deposit
 Zn 136 500 t **Class** C
 Cu 19 500 t **Class** D

Company:

Longitude: 20.576 **Latitude:** 44.469 **District:** Beograd

Geology

Ore deposit type (geology)
 Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape
 Atypical, unspecified or ill-defined form

Mineralization **Age:**

Host rocks **Age:**

Economy

Exploitation type
 Unworked

Pb Lead (metal)
Ore type: Ore of indeterminate nature

Past production:	3118 t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	266500 t	Average grade:	4.1 %

Zn Zinc (metal)
Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	136500 t	Average grade:	2.1 %

Cu Copper (metal)
Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	19500 t	Average grade:	0.3 %

Environment**Comments**

Old slags which produced 3118 t Pb.
 Resources of 6.5 Mt @ 4.1% Pb, 2.1% Zn, 0.3% Cu with Ag, Cd and Bi.

Geological references

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-049

Kostolac

General data

Deposit name(s): Kostolac **Identifier:** YUG-00142
Commodities: Coal 809 091 000 t **Class:** C **Status:** Producing industrial mine
Company: Rudnici lignita BASEN KOSTOLAC - EPS
Longitude: 21.203 **Latitude:** 44.721 **District:** Branicevski

Geology**Ore deposit type (geology)**

Lignite deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Pliocene**Host rocks** **Age:** Pliocene**Hostrock formation names**

Kostolac Coal Basin

Host rock lithology

Medium- to fine-grained detrital sediment

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Economy**Exploitation type**

Open cast (open pit) mining

Bucket wheel dredging

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** 109091000 t **Average grade:** -**Reserve:** 700000000 t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

Potential acid rock drainage with respect of the sulfides content.

Suspended matter in mine water discharge.

Large geomorphic modifications of the landscape (pits, gullies, spoil heaps...) has been created since the beginning of the mining period.

Landform instability (collapses) created during and after mining operations may exist.

CommentsCoal reserves were explored and proved in the areas of Kostolac, Drmno, Klenovnik, Cirikovac and Poljana (100 km²)

Grade properties of the main coal seam are :

moisture 40 to 43%, ash 6.57 to 16.16%, sulphur 1.73 to 2.52%, combustibility 43 to 53, Gross heating value 11,600 to 14,000 kJ, Net heating value 10,000 to 12,300 kJ.

In 1981, output was about 3,200,000 t/y.

Opening of new operations was planned for a total output of 6,600,000 t/y

Electric Power Industry of Serbia - Report 1998 :

Kostolac comprises 3 open-pits : Klenovnik, Cirikovac and Drmno. The mining equipment installed at these 3 mines is capable of producing 9.2 Mt of coal and removing 30 Mm³ of overburden a year.

Electric Power Industry of Serbia - Report 1999 :

In 1999, open-pit mines "Kostolac" produced the amount of 5,734,032 t of coal.

The total production between 1945-2000 was 109.1 Mt of coal and 365 Mm³ of overburden (striping ratio of 3.35). The remaining lignite reserves amount 700 Mt.

Geological references

- Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.
Jankes G, Cvetkovic O, and Glumicic T. - (1997) - Determination of different forms of sulphur in Yugoslav soft brown coals. - European Coal Geology and Technology. Gayer R and Pesek J (Eds), Geological Society of London, London. p. 269-272.

Economic references

- Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.
Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.
Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Kotlenic

General data

Deposit name(s): Kotlenic **Identifier:** YUG-00162

Commodities: PbZn 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 20.773 **Latitude:** 43.783 **District:** Raski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization **Age:****Host rocks** **Age:****Economy****Exploitation type**

Mining method unknown

PbZn **Lead + Zinc (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

No data available.

Comments**Geological references**

Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tercijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Kozje Brdo

General data

Deposit name(s): Kozje Brdo **Identifier:** YUG-00211
Commodities: Agt 0 t **Class:** N/A **Status:** Dormant deposit
Company:
Longitude: 19.752 **Latitude:** 45.149 **District:** Sremski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age:**Ore mineralogy**

Chalcedony

Agate

Host rock mineralogy

Magnesite (Gibbsite)

Dolomite

Ankerite

Calcite

Silica

Host rocks Age:**Hostrock formation names**

Fruska Gora ultrabasic massif

Host rock lithology

Ultrabasic rock

Serpentine

Listwaenite

Economy**Exploitation type**

Unworked

Agt Agata, chalcedony, jasper (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Possible contamination of surface water by suspended matter.

Comments**Geological references**

Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.

Economic references**Other references**

Kram

General data**Deposit name(s):** Kram**Identifier:** YUG-00173

Commodities: Au 0 t *Class* N/A
 Cu 0 t *Class* N/A

Status: Primary occurrence of unknown status**Company:****Longitude:** 19.302 **Latitude:** 44.311**District:** Macvanski**Geology****Ore deposit type (geology)**

Cu skarns: Cu, (Au)

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Mineralization **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**

Chalcopyrite
 Pyrrhotite
 Arsenopyrite
 Pyrite
 Galena
 Scheelite
 Bismuthinite
 Tellurobismuthite
 Sphalerite
 Silver
 Grey copper

Host rock mineralogy

Grossular
 Andradite
 Pyroxene
 Epidote
 Wollastonite
 Chlorite
 Quartz
 Calcite

Hydrothermal alteration

Skarn formation

Host rocks **Age:** Triassic**Hostrock formation names**

Neogene granodiorite - Triassic limestone

Host rock lithology

Granodiorite
 Limestone
 Skarn

Economy**Exploitation type**

Mining method unknown

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Au **Gold (metal)****Ore type:** Ore in which the native element forms inclusions (sulphides, etc.)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

High acid generation potential due to the sulfides minerals contained in the primary ore.

The Acid Rock Drainage produced may be partly buffered by the limestone and the skarn formation of the host lithology.

Expected dissolved contents of Cu, Zn and Pb as well as As in the drainage waters with possible concentrations of those metals in the stream sediments.

Comments

Small size deposit, with gold content up to 3 g/t
Other name : Duge Njive ?

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Economic references

Other references

Kremna

General data

Deposit name(s): Kremna **Identifier:** YUG-00172
Commodities: Mg 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company:
Longitude: 19.578 **Latitude:** 43.840 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Lacustrine deposits (sebkha, salar, alkaline lake): Li, B, (Na, Mg, Ca, nitrates, sulphates, etc.)

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age:**Ore mineralogy**

Magnesite (Gibbsite)
 Dolomite
 Clay

Host rocks Age:**Hostrock formation names**

Tertiary lacustrine sediments

Host rock lithology

Biochemical deposit s.l.
 Varved lacustrine sediment

Economy**Exploitation type**

Unworked

Mg Magnesium, magnesite (MgCO₃)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage waters by suspended matter.

Comments**Geological references**

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.

Economic references**Other references**

Krupanj

General data

Deposit name(s): Krupanj **Identifier:** YUG-00153

Commodities: **Fl** 66 250 t **Class** D **Status:** Deposit of unknown status
Sb 0 t **Class** N/A

Company:

Longitude: 19.377 **Latitude:** 44.373 **District:** Macvanski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization **Age:** Cenozoic**Ore mineralogy**

Fluorite
 Stibnite
 Galena
 Sphalerite
 Tetrahedrite
 Chalcopyrite
 Pyrite

Host rock mineralogy

Quartz
 Calcite

Host rocks **Age:** Cenozoic**Host rock lithology**

Limestone

Economy**Exploitation type**

Underground mining

Sb Antimony (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Fl Fluorite (CaF2)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	66250 t	Average grade:	31.45 %
Resource:	- t	Average grade:	- %

Environment

Acid generation potential with respect to sulfides minerals.

This Acid Rock Drainage can partly be buffered by the calcite contained within the gangue mineralogy.

Comments

Deposits of Tolisavac and Ravnaja, partly exploited since 1959.

Ravnaja : 195 kt @ 31.7% CaF2 and 2.2% Pb.

Kuciste : 15.6 kt @ 28.4% CaF2 and 0.5% Pb.

Output of 50,000 t/y of CaF2 ore.

Geological references

- Durickovic A. - (1982) - Metalogenija rudnog polja Brasina-Zajaca-Stolice-Dobri Potok Translated Title: Metallogeny of the Brasina mining field, Zajaca, Stolice, Dobri Potok. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 40, p. 17-53.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

- Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Kucajna

General data

Deposit name(s): **Kucajna** **Identifier:** **YUG-00057**

Commodities: **Ag** 0 t **Class** **N/A** **Status:** Deposit of unknown status
Au 0 t **Class** **N/A**
PbZn 0 t **Class** **N/A**

Company:

Longitude: 21.667 **Latitude:** 44.436 **District:** Branicevski

Geology**Ore deposit type (geology)**

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Discordant envelope of disseminated ore

Mineralization **Age:** Upper/Late Cretaceous**Ore mineralogy****Host rock mineralogy**

Galena	Quartz
Sphalerite	Calcite
Silver	
Argentite	
Pyrargyrite	
Polybasite	
Pyrite	
Grey copper	
Bournonite	
Boulangerite	
Jamesonite	
Chalcopyrite	
Arsenopyrite	
Bornite	
Dyscrasite	
Berthierite	
Chalcostibite	
Gold	

Host rocks **Age:** Upper/Late Cretaceous**Hostrock formation names**

Jurassic-Cretaceous limestone
Laramian dacite-andesitic volcanics

Host rock lithology

Limestone
Dacite
Andesite

Economy**Exploitation type**

Mining method unknown

PbZn Lead + Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Au	Gold (metal)		
		<i>Ore type:</i> Primary sulphide ore (complex-sulphides, arsenides, sulphosalts, etc.)	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -
Ag	Silver (metal)		
		<i>Ore type:</i> Primary sulphide ore (complex-sulphides, arsenides, sulphosalts, etc.)	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

The potential acid mine drainage generated is buffered by the gangue mineralogy (carbonates) which are acid-consuming minerals. The host rock assemblage (limestone) which alters to calc-silicates decrease acid-buffering capacity.

Presence of arsenopyrite whose oxydation may release As into the natural environment with in particular accumulation in the stream sediments.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

Massive ore contains up to 50% Pb-Zn, 0.2% Ag and 15-20 g/t Au (Jankovic - 1982)

Geological references

Jankovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babes Bolyai, Geologia. 40, (1), p. 85-102.

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-057

Kutlovo

General data

Deposit name(s): Kutlovo **Identifier:** YUG-00100

Commodities: Fe 0 t **Class** N/A **Status:** Deposit of unknown status
Mn 0 t **Class** N/A

Company:

Longitude: 20.752 **Latitude:** 44.045 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.
Fe and Mn sedimentary deposits: Fe, Mn

Ore deposit shape

Cap, blanket, crust
Stratabound envelope of disseminated ore

Mineralization **Age:** Lower/Early Cretaceous

Ore mineralogy

Chamosite
Hematite
Goethite

Host rocks **Age:** Lower/Early Cretaceous

Hostrock formation names

Gault sediments

Host rock lithology

Conglomerate
Sandstone

Economy**Exploitation type**

Mining method unknown

Fe Iron (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Mn Manganese (metal)

Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential particulate and colloidal iron compounds in drainage water.

Comments**Geological references**

- Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.
- Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Other references

Other data bases

The Iron Ore Deposits of Europe - 1978 YU07

Lajkovaca

General data**Deposit name(s):** Lajkovaca**Identifier:** YUG-00127

Commodities: Cu 24 600 t **Class** D
 Au 0 t **Class** N/A

Status: Deposit or prospect of unknown status**Company:****Longitude:** 19.849 **Latitude:** 44.135**District:** Kolubarski**Geology****Ore deposit type (geology)**

Volcanogenic massive and disseminated Cu-Au sulphide deposits: Cu, Au, (Zn, Co, Mo, Bi)

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Stratabound envelope of disseminated ore

Mineralization **Age:** Jurassic**Ore mineralogy**

Pyrite
 Chalcopyrite
 Chalcocite
 Covellite
 Iron Oxydes(unspecified)

Host rock mineralogy

Epidote

Hydrothermal alteration

Silicification
 Chloritization
 Carbonatization
 Epidotitization
 Albitization

Host rocks **Age:** Jurassic**Hostrock formation names**

Diabase - Ophiolite Complexe

Host rock lithology

Dolerite, diabase
 Gabbro

Economy**Exploitation type**

Mining method unknown

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	24600 t	Average grade:	0.82 %
Resource:	- t	Average grade:	- %

Au **Gold (metal)****Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

High acid generation potential due to the sulfide content of the primary ore body.

This Acid Rock Drainage can be enhanced or reduced by the various mineral assemblages forming the hydrothermal alteration halo.

Comments

Western Serbia. Average in Cu : 1-2%, Au usually less than 1 g/t.

Reserves of C1 category : 3 Mt @ 0.82% Cu

Other occurrences of the area : Beli Potok, Rechitsa (145,000 t @ 1.21% Cu), Markov Potok

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic

Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Putnik S. - (1980) - Copper deposits in the Southeastern Europe connected with the ophiolite complexes. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects, Belgrade. p. 117-123.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Putnik S. - (1981) - Metalogenia bakra jurske dijabaz-roznacke formacije - Metallogenesis of copper in jurassic diabase-chert formation - Geoinstitut. Beograd, 1981. Monographs, vol. 6, 117 p., 2 plates.

Economic references

Other references

Lebare

General data

Deposit name(s): Lebare **Identifier:** YUG-00167
Commodities: PbZn 0 t **Class:** N/A **Status:** Group of mineral occurrences
Company:
Longitude: 20.769 **Latitude:** 43.237 **District:** Kosovo

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Unspecified ore deposits related to basic-ultrabasic magmatic rocks

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age:**Ore mineralogy**

Pyrrhotite
 Arsenopyrite
 Chalcopyrite
 Sphalerite
 Galena
 Marcasite
 Grey copper
 Tetrahedrite
 Psilomelane

Hydrothermal alteration

Silicification

Host rocks Age:**Hostrock formation names**

Silicified serpentinite - Hydroquartzite

Host rock lithology

Serpentinite
 Andesite

Economy**Exploitation type**

Unworked

PbZn Lead + Zinc (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals contained in the ore.

Expected dissolved contents of Fe, Cu, Zn and Pb in drainage waters.

As may be released from the arsenopyrite and the sulfosalt into the surface water with expected concentrations in stream sediments.

Comments

Presence of "hydroquartzites" - gold ??

Geological references

Novovic T. - (1977) - Sulfidne Pb-Zn pojave u Lebaru (Kopaonik) Translated Title: Sulfide lead-zinc occurrences in Lebare, Kopaonik. - Glasnik Prirodnjackog Muzeja u Beogradu, Serija A: Mineralogija, Geologija, Paleontologija, 32, p. 21-25.

Economic references

Other references

Lece

General data

Deposit name(s): Lece	Identifier: YUG-00083
Commodities: Pb 39 000 t <i>Class</i> C	Status: Deposit of unknown status
Zn 58 000 t <i>Class</i> C	
Au 10 t <i>Class</i> D	
Ag 39 t <i>Class</i> E	
Company:	
Longitude: 21.535 Latitude: 42.928	District: Jablanicki

Geology**Ore deposit type (geology)**

Low-sulphidation (adularia - sericite) epithermal deposits: Au, Ag, Pb, Zn, Cu, Sb, (Hg, As, Mn, Tl)

Ore deposit shape

Breccia-pipe, funnel, chimney, column, brecciated dyke
Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata
Discordant envelope of disseminated ore

Mineralization **Age:** Neogene (Miocene to Pliocene)

Ore mineralogy	Host rock mineralogy	Hydrothermal alteration
Pyrite	Quartz	Adularization
Marcasite	Agate	Silicification
Sphalerite	Siderite	Sericitization
Galena	Sericite	Kaolinization
Gold	Chalcedony	
Chalcopyrite	Opal	
Enargite	Calcite	
Grey copper	Amethyst	
Stibnite	Ankerite	
Hematite		

Host rocks **Age:** Neogene (Miocene to Pliocene)

Hostrock formation names

Gajtan and Tulare calderas
Andesitic Volcanic Complex

Host rock lithology

Volcaniclastic rocks: pyroclastic rocks,
volcaniclastic (volcano-detrital,
volcano-sedimentary) rocks
Andesite
Dacite
Latite

Economy**Exploitation type**

Underground mining

Au Gold (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	9.5 t	Average grade:	4.11 g/t
Reserve:	- t	Average grade:	- g/t
Resource:	- t	Average grade:	- g/t

Ag Silver (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	39 t	Average grade:	16.91 g/t
Reserve:	- t	Average grade:	- g/t
Resource:	- t	Average grade:	- g/t

Pb	Lead (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	39000 t	<i>Average grade:</i> 1.7 %
	<i>Reserve:</i>	- t	<i>Average grade:</i> - %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %
Zn	Zinc (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	58000 t	<i>Average grade:</i> 2.5 %
	<i>Reserve:</i>	- t	<i>Average grade:</i> - %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %

Environment

The sulfidic composition of the primary ore mineralogy as well as the large alteration halos when oxydized, generate acidic waters and release dissolved metals into the environment.

The presence of Cu sulfosalts containing As may generate arsenic-rich mine water composition. Most of those elements can contaminate surface and groundwater, soils and stream sediments.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Existence of CN or Hg associated with the gold mineral processing ?

Comments

Uppermost level : gold values range from trace to several g/t, 2 g/t average. Vertical extension 30 to over 100 m.

PbZn mineralisation beneath Au mineralization, with a vertical extension of 100 to 250 m. The ore contains 2.8% Pb, 6% Zn, 6 g/t Au and 16 g/t Ag.

Downward extension with only PbZn mineralization and minor Au content.

Bottom characterized by minor content of PbZn, up to 0.3% Cu and traces of Au.

Production 1953-1959 : 470,000 t @ 1.95% Pb, 4.5% Zn, 6 g/t Au and 19 g/t Ag.

Production 1953-1983 : 2,320,209 t @ 1.7% Pb, 2.5% Zn, 4.11 g/t Au and 16.91 g/t Ag (Popovic - 2000)

Geological references

Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babeş Bolyai, Geologia. 40, (1), p. 85-102.

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S, Petkovic M, Tomson IN, and Kravcov V. - (1980) - Porphyry copper deposits in the Serbo-Macedonian Province, southeastern Europe. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 96-102.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Pesut D. - (1976) - Geology, tectonics and metallogeny of Lece Massif. - Rasprave Zavoda za Geoloska i Geofizicka Istrazivanja, 14, 59 p.

Popovic R. - (1992) - Precious metals in the Kopaonik and surrounding area central Serbia (Yugoslavia). - International Geological Congress, Abstracts - Congrès Géologique Internationale, Résumés, 29, p. 186-187.

Popovic R. - (2000) - Distribution of base and precious metals in the Lece volcano-intrusive massif (Vardar Zone) - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 443-452

Schumacher F. - (1954) - The ore deposits of Jugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Vujanovic V. - (1976) - Prilog poznavanju geneze sulfidnog lezhishta Letse Translated Title: Genesis of the Lece sulfide deposits, Serbia. - Zapisnici Srpsko Geolosko Društvo, 1975-1976, p. 209-215.

Economic references

Other references*Other data bases*

Carte Métallogénique de l'Europe 26-108

Leskova Glava**General data***Deposit name(s):* **Leskova Glava***Identifier:* **YUG-00161***Commodities:* **PbZn** 0 t *Class* **N/A***Status:* Deposit or prospect of unknown status*Company:**Longitude:* 20.714 *Latitude:* 43.000*District:* Kosovo**Geology***Ore deposit type (geology)*

Atypical or unspecified ore deposits associated with acid and alkaline plutonic rocks

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Host rocks* *Age:***Economy***Exploitation type*

Unworked

PbZn **Lead + Zinc (metal)***Ore type:* Ore of indeterminate nature*Past production:* - t*Average grade:* -*Reserve:* - t*Average grade:* -*Resource:* - t*Average grade:* -**Environment**

No data available.

Comments

S of Crnac

Geological references

Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Lipa

General data

Deposit name(s): Lipa **Identifier:** YUG-00122

Commodities: Cu 11 000 t **Class** D **Status:** Old industrial mine, exhausted deposit

Company: Rudarsko Topioninarski Basen BOR

Longitude: 21.962 **Latitude:** 44.190 **District:** Borski

Geology**Ore deposit type (geology)**

High-sulphidation epithermal massive-enargite (gold) sulphide deposits: Cu, (As, Au)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization Age:**Ore mineralogy**Pyrite
Enargite
Stibioluzonite**Host rock mineralogy**Chalcedony
Barite
Kaolinite
Alunite
Diaspore**Hydrothermal alteration**Kaolinization
Advanced argillic alteration
Silicification**Host rocks Age:****Economy****Exploitation type**

Mining method unknown

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	11000 t	Average grade:	1.1 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

High acid generation potential due to the sulfidic composition of the primary ore.
The widespread hydrothermal alteration types (silica, advanced argillic) tends to increase acid-generating capacity of the rocks.
Potential release of Cu and others metals into the drainage waters.

Comments**Geological references**

- Jankovic S, Terzic M, Aleksic D, Karamata S, Spasov T, Jovanovic M, Milicic M, Miskovic V, Grubic A, and Antonijevic I. - (1980) - Metallogenic features of copper deposits in the volcano- intrusive complexes of the Bor District, Yugoslavia. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 42-49.
- Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458
- Serafimovski T., Kozelj D. and Jelenkovic R. - (2000) - The morphogenetic types of the epithermal gold mineralization in Serbia and Macedonia - Metallogeny 2000, Review and perspectives - Symposium in honor of the retirement of Bernard Poty, Nancy (France), University Henri Poincare - Nancy 1. pp.151-152.
- Sillitoe RH. - (1980) - The carpathian-Balkan porphyry copper belt. A cordilleran perspective. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects N° 169 and 63, Belgrade. p. 26-35.

Economic references

Other references**Lipljan****General data**

Deposit name(s): Lipljan **Identifier:** YUG-00041
 Muhadjer Babus

Commodities: LstL 0 t **Class:** N/A **Status:** Deposit of unknown status

Company:

Longitude: 21.128 **Latitude:** 42.521 **District:** Kosovo

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.
 Slates, marble and ornamental-stone deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age:

Host rocks Age: Triassic

Hostrock formation names

Kacanik-Veles Formation

Host rock lithology

Undifferentiated metamorphic rock
 Marble, cipolin (crystalline limestone)

Economy**Exploitation type**

Mining method unknown

LstL Limestone for lime (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature is known with this type of ore deposit.

Comments**Geological references**

Rubezanin D. - (1978) - Leziste dolomitnih mermera Muhadjer Babus kod Lipljanja (Kosovo) Translated Title: The Muhadjer Babus dolomitic marble deposit near Lipljan, Kosovo Province. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 35-36, p. 19-33.

Economic references**Other references**

Lipnica

General data

Deposit name(s): Lipnica **Identifier:** YUG-00154

Commodities: Gp 0 t **Class** N/A **Status:** Producing industrial mine

Company: Fabrica cementa NOVI POPOVAC

Longitude: 20.825 **Latitude:** 43.905 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Evaporite-related industrial rocks and minerals: attapulgitite, gypsum, anhydrite, magnesite, sulphur
Unspecified volcano-sedimentary and sedimentary-exhalative deposits

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization Age:**Ore mineralogy**

Gypsum
Anhydrite
Calcite

Host rocks Age: Upper/Late Jurassic (Malm)**Hostrock formation names**

Diabase Chert Formation

Host rock lithology

Coarse turbidite, mass-flow deposit
Volcaniclastic sandstone
Medium- to fine-grained detrital rock
Dolerite, diabase

Economy**Exploitation type**

Surface mining

Gp Gypsum, anhydrite (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage water by suspended matter and salts.
Geomorphic modifications in the landscape.

Comments

The deposit has been exploited for more than 60 years, and the ore used in the cement industry as retarders.

Geological references

- Ilic M. - (1995) - Calcium sulphate deposits of the Gruza area: a new view about their origin - Geol. Soc. Greece, Sp. Publ., N° 4, 1995, Proceedings of the XV Congress of the Carpatho-Balkan Geological Association, September 1995, Athens Greece, pp 734-736
- Ilich M. - (1991) - Yugoslavian cement. Raw materials and production - Industrial Minerals, november 1991, pp. 59-61
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Marovic M and Markovic S. - (1978) - On the structural features and origin of gypsum and anhydrite in the Lipnica Mine near Kragujevac. - Geoloski Anali Balkanskoga Poluostrva.(42), p. 91-102.
- Nikolic D, Poharc V, and Logar M. - (1978) - Mineralogija lezista gipsa i anhidrita - Lipnica Translated Title: Mineralogical study of the Lipnica gypsum and anhydrite mine, Serbia. - IX Kongres Geologa Jugoslavije. Sarajevo, Yugoslavia. 1978. p. 443-452.
- Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Other references

Lipovac

General data

Deposit name(s): Lipovac **Identifier:** YUG-00051

Commodities: Cr 0 t *Class* N/A **Status:** Dormant deposit

Fe 0 t *Class* N/A

Ni 0 t *Class* N/A

Company:

Longitude: 20.621 **Latitude:** 44.257 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Gabbro-norite hosted deposits of disseminated titanomagnetite: Fe, Ti, (V, P)

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Magnetite

Chromite

Spinel

Millerite

Pyrrhotite

Pentlandite

Chalcopyrite

Bravoite

Host rocks Age:**Host rock lithology**

Basic to ultrabasic rock s.l.

Peridotite

Serpentinite

Harzburgite

Economy**Exploitation type**

Unworked

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	42.5	%
Resource:	-	t	Average grade:	-	%

Cr Chrome (Cr₂O₃)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	3	%
Resource:	-	t	Average grade:	-	%

Ni Nickel (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	1	%
Resource:	-	t	Average grade:	-	%

Environment

The oxydation of the sulfide minerals associated with the magnetite leads to the production of Acid Mine Drainage and the release of contaminants (readily soluble salts and metals) into the environment.

The presence of chromite in a laterite-related ore deposit, may generate hexavalent Chromium in the environment.

This element is highly toxic for the humans and the ecosystems and can be bioaccumulated in the food chain.

Comments

The massive ore contains 40-45% Fe, up to 2.7-3.4% Cr and up to 1% Ni+Co (Jankovic -1982) - PGE ?

Data in Laznicka P. (1985) p 175

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt fur Geowissenschaften und Rohstoffe, Hannover. 386 p.

Boev B. and Jankovic S. - (1996) - Nickel and nikeliferous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Jankovic S and Putnik S. - (1980) - Copper deposits in the Southeastern Europe connected with the ophiolite complexes. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects, Belgrade. p. 117-123.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-051

The Iron Ore Deposits of Europe - 1978 YU08

Lisa

General data

Deposit name(s): Lisa **Identifier:** YUG-00070
Commodities: Sb 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.259 **Latitude:** 43.650 **District:** Moravicki

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Discordant envelope of disseminated ore

Mineralization Age: Cenozoic**Ore mineralogy**Stibnite
Pyrite
Bravoite
Valentinite
Senarmontite**Hydrothermal alteration**

Silicification

Host rocks Age: Upper/Late Cretaceous**Hostrock formation names**Silicified limestone
Upper Cretaceous marl**Host rock lithology**Limestone
Marl**Economy****Exploitation type**

Mining method unknown

Sb **Antimony (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Presence of pyrite in the associated minerals that may generate Acid Mining Drainage.

Comments

Golija district

Geological references

Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Topalovic D. and Simic M. - (2000) - The geological, structural and metallogenical features of the Ajducko Brdo - Golija ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 435-442

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe

26-080

Lisina

General data

Deposit name(s): Lisina **Identifier:** YUG-00097
Bossiljgrad

Commodities: Phos 4 600 000 t **Class** D **Status:** Dormant deposit

Company:

Longitude: 22.451 **Latitude:** 42.527 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Sedimentary phosphate deposits: P, (U)

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Ordovician**Ore mineralogy**

Apatite

Host rock mineralogyQuartz
Sericite
Calcite
Biotite**Host rocks** **Age:** Lower/Early Ordovician (Arenig-Tremadocian)**Hostrock formation names**

Metamorphosed phosphatic sandstone

Host rock lithologyQuartzite, quartzose sandstone
Sericitic schist, sericite schist of igneous origin**Economy****Exploitation type**

Unworked

Phos **Phosphate (P2O5)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	4600000 t	Average grade:	11.5 %

Environment

No specific environmental signature according to the data available.

Comments

Resources of about 40 Mt @ 10-13% P2O5, beneficiation tests have shown that the ore can provide a phosphate concentrate nearly 33% P2O5.

The apatite is intergrown or coated with carbonate.

The phosphorite bed is 16-32 m thick, containing 2-19 % P2O5, but average is 10-12% P2O5 (Jankovic and al - 1997)

Geological references

Anonymous. - (1987) - World Survey of Phosphate Deposits. - The British Sulphur Corporation Limited, London. 274 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Simic M. - (1997) - Geological-structural features of the Besna Kobilja Zone in SE Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 185-195

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-165

Liska

General data

Deposit name(s): Liska
Chave
Kriva Strana
Zlatibor

Identifier: YUG-00063

Commodities: Mg 740 000 t **Class** D **Status:** Deposit of unknown status

Company: Radna Organizacija Rudnik Magnezita Magnezit

Longitude: 19.634 **Latitude:** 43.694 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization **Age:** Cenozoic**Ore mineralogy**

Magnesite (Gibbsite)

Host rocks **Age:****Hostrock formation names**

Zlatibor Massif

Host rock lithology

Basic to ultrabasic rock s.l.

Peridotite

Serpentinite

Economy**Exploitation type**

Underground mining

Surface mining

Mg **Magnesium, magnesite (MgCO₃)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	740000 t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Erosion of earthen materials exposed at the site may cause significant loadings of sediments to nearby waterbodies and the source of degradation of surface water quality.

Comments

The mine was established in 1956.
1956-1970, current output of 20,000 t/y of ore,
1970-1981, current output of 40,000 t/y.

Geological references

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultrabasic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

Ilic M, Rubezanin D, and Cicic S. - (1978) - O genezi magnezitskih lezista zlatiborskog ultrabazitskog masiva Translated Title: The genesis of magnesite deposits of the Zlatibor ultrabasic massif, western Serbia In: Zbornik radova Translated Title: Proceedings of the 9th Geologic Congress of Yugoslavia - IX Kongres Geologa Jugoslavije. Sarajevo, Yugoslavia. 1978. p. 539-554.

Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-070

Lubnica

General data

Deposit name(s): Lubnica **Identifier:** YUG-00228
Commodities: Coal 0 t **Class:** N/A **Status:** Producing small-scale mine
Company: Rudnik lignita LUBNICA
Longitude: 22.188 **Latitude:** 43.862 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Lignite deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age: Miocene**Host rocks Age:** Miocene**Hostrock formation names**

Timok Coal Basin

Host rock lithology

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Coarse-grained detrital rock s.s.

Medium- to fine-grained detrital sediment

Economy**Exploitation type**

Underground mining

Coal Coal, lignite (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential Acid Rock Drainage generation due to the presence of possible sulfides minerals.
 Suspended matter in mine discharge.
 Colliery spoil heaps erosion, instability and combustion.

Comments

The lignite mined contains up to 35% of moisture, about 14% of ash. Its heating value is about 12,000 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Other references

Mackatica

General data

Deposit name(s): Mackatica **Identifier:** YUG-00087
Commodities: Mo 100 000 t **Class** B **Status:** Dormant deposit
Company:
Longitude: 22.217 **Latitude:** 42.747 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Porphyry Cu-Mo and Mo deposits: Cu, Mo, (W, U, Re)

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata
 Column, chimney with possibly brecciated ore

Mineralization **Age:** Cenozoic

Ore mineralogy

Molybdenite
 Pyrite
 Hematite
 Chalcopyrite
 Sphalerite
 Galena
 Hübnerite

Host rock mineralogy

Quartz
 K-Feldspar
 Muscovite
 Calcite

Hydrothermal alteration

Silicification
 Sericitization

Host rocks **Age:** Cenozoic

Hostrock formation names

Surdulica granodiorite complex

Host rock lithology

Granodiorite
 Dacite
 Schist/shale

Economy**Exploitation type**

Unworked

Mo **Molybdenum (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	100000 t	Average grade:	0.1 %

Environment

High acid generation potential due to the primary ore composition enriched in sulfides minerals.
 The alteration types increase acid-generating capacity of the rocks.

Comments

Data in Laznicka P. (1985) p 1226 : 20,000 t Mo (0.1%)
 Other data : 181 Mt @ 0.078% Mo : 141,180 t Mo
 The contents of Cu and W in the ore are very low.
 Rhenium is about 185 g/t in the Mo concentrate (Simic M. - 1997)

Geological references

Jankovic S and Petkovic M. - (1980) - The main lead, zinc and copper deposits of Yugoslavia; excursion No. 202 C. - Yugoslavia; outline of Yugoslavian geology; Excursion 201 A-202 C. Grubic A (Ed), Int, Geol. p. 75-94.
 Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
 Jankovic S, Petkovic M, Tomson IN, and Kravcov V. - (1980) - Porphyry copper deposits in the Serbo-Macedonian Province, southeastern Europe. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 96-102.

Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Mankov S and Andreeva L. - (1978) - Tungsten-molybdenum deposits in the Bulgarian-Yugoslavian border region. - Metallization associated with acid magmatism; Volume 3. Geol, Surv. p. 39-42.

Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Simic M. - (1997) - Geological-structural features of the Besna Kobila Zone in SE Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 185-195

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-122

Maglic

General data*Deposit name(s):* **Maglic***Identifier:* **YUG-00071***Commodities:* **Cr** 0 t *Class* **N/A***Status:* Deposit or prospect of unknown status*Company:**Longitude:* 20.544 *Latitude:* 43.603*District:* Raski**Geology***Ore deposit type (geology)*

Unspecified ore deposit type

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Ore mineralogy*

Chromite

Host rocks *Age:***Economy***Exploitation type*

Mining method unknown

Cr **Chrome (Cr₂O₃)***Ore type:* Ore in which the element forms a distinct mineral phase*Past production:* - t*Average grade:* -*Reserve:* - t*Average grade:* -*Resource:* - t*Average grade:* -**Environment**

No specific environmental signature.

Comments**Geological references****Economic references****Other references***Other data bases*

Carte Métallogénique de l'Europe 26-081

Magura

General data

Deposit name(s): **Magura** **Identifier:** YUG-00024
Goles Mg

Commodities: **Mg** 2 500 000 t **Class** C **Status:** Dormant deposit

Company:

Longitude: 21.009 **Latitude:** 42.537 **District:** Kosovo

Geology**Ore deposit type (gitology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Cenozoic**Ore mineralogy**

Magnesite (Giobertite)

Sepiolite

Host rock mineralogy

Opal

Chalcedony

Host rocks**Age:****Hostrock formation names**

Golesh ultramafic mass

Host rock lithology

Basic to ultrabasic rock s.l.

Serpentinite

Economy**Exploitation type**

Underground mining

Mg **Magnesium, magnesite (MgCO₃)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	2500000 t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Trough erosion of exposed mining areas, the ore mineralogy and host rock alteration can generate high suspended solids content in surface water that can produce some impacts associated with surface waters, groundwater and terrestrial ecosystems.

Comments

The ore contains 44-49% MgO, 0.2-1.5% CaO and 0.2-5.0% SiO₂.

Production between 1923-1995 : 2.5 Mt of magnesite.

Hight content of Sepiolite which has not been recovered up to now.

Geological references

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

Ilic M., Bacanac M., and Tosovic R. - (1995) - Glavne geoloske karakteristike i postanak zicnog magnezitskog lezista Goles - The main geological characteristics and the origin of the vein magnesite deposit of Goles. - Transactions of the Faculty of Mining and Geology, b. 34, Belgrad, 1995, pp. 285-292.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-111

Majdanpek

General data

Deposit name(s): Majdanpek	Identifier: YUG-00058
Commodities:	Status: Producing industrial mine
Au 240 t <i>Class</i> B	
Cu 3 750 000 t <i>Class</i> B	
Ag 1 750 t <i>Class</i> C	
Mo 30 000 t <i>Class</i> C	
PbZn 83 000 t <i>Class</i> C	
Fe 0 t <i>Class</i> N/A	
Company: Rudarsko Topioninarski Basen BOR	
Longitude: 21.950 Latitude: 44.376	District: Borski

Geology**Ore deposit type (geology)**

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)

Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape

Discordant envelope of disseminated ore

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Upper/Late Cretaceous**Ore mineralogy**

Chalcopyrite

Bornite

Molybdenite

Telluride

Gold

Pyrite

Magnetite

Tellurite

Hydrothermal alteration

Biotitization

Sericitization

Silicification

Host rocks **Age:** Upper/Late Cretaceous**Hostrock formation names**

Precambrian gneiss

Senonian subvolcanic intrusion of andesite porphyry

Host rock lithology

Quartz diorite

Gneiss (s.l.)

Economy**Exploitation type**

Surface mining

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** 1550000 t **Average grade:** 0.31 %**Reserve:** - t **Average grade:** - %**Resource:** 2200000 t **Average grade:** 0.31 %**Mo Molybdenum (metal)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** - %**Reserve:** 30000 t **Average grade:** 0.005 %**Resource:** - t **Average grade:** - %

Ag	Silver (metal)	<i>Ore type:</i> Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	750 t	<i>Average grade:</i> 1.5 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	1000 t	<i>Average grade:</i> 1.5 g/t
Au	Gold (metal)	<i>Ore type:</i> Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	100 t	<i>Average grade:</i> 0.2 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	140 t	<i>Average grade:</i> 0.2 g/t
PbZn	Lead + Zinc (metal)	<i>Ore type:</i> Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> - %
	<i>Reserve:</i>	- t	<i>Average grade:</i> - %
	<i>Resource:</i>	83000 t	<i>Average grade:</i> 4.6 %
Fe	Iron (metal)	<i>Ore type:</i> Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

Acid Mine Drainage production generating high concentrations of dissolved metals in drainage water. The large alteration halos and mineral assemblages have a significant acid generation capacity.

No accurate information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

In 1978, reserves were estimated at 200 Mt @ 0.83% Cu and 0.005% Mo. Modern open-pit began in 1959 and in 1981, the output was 14 Mt/y of ore and 33.5 Mt of overburden.

Ore output : 36,000 t/day

Chalcopyrite contains native gold, tellurides and selenides.

Molybdenite has a Rhenium content of 2000 g/t.

Data in Laznicka P. (1985) p 974 : 3 Mt Cu (0.6%), 30,000 t Mo, 1,800 t Ag, 190 t Au.

In 1998, current reserves exceed 800 Mt @ 0.4% Cu and 0.3 g/t Au (Herrington and al - 1998).

Majdanpek produces magnetite concentration from flotation tailing, the concentrate is about 62% Fe.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt fur Geowissenschaften und Rohstoffe, Hannover. 386 p.

Antonišević I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Bogdanovic P.O. - (1976) - Metalogenetska rejonizacija istocne Srbije Translated Title: Metallogenic zoning of eastern Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 33-34, p. 111-133.

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- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.
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- Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32
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- Steblez W. - (1998) - Republics of the former Yugoslavia. - Mining Annual Review, 1998, p. 218-221.

Other references

Other data bases

- | | |
|--|--------|
| Carte Métallogénique de l'Europe | 26-058 |
| The Iron Ore Deposits of Europe - 1978 | YU10 |

Mandre

General data**Deposit name(s): Mandre****Identifier: YUG-00216****Commodities: U**

0 t

Class: N/A**Status: Primary occurrence of unknown status****Company:****Longitude: 20.316****Latitude: 44.086****District: Moravicki****Geology****Ore deposit type (geology)**

Uraniferous vein, breccia and stratabound disseminated deposits: U, (Mo, Cu, Se, F, Th, REE, Pb, Zn)

Ore deposit shape

Discordant isolated lode with different vein morphologies: tension-gash, bayonet-shaped ("jog"), en echelon, sigmoidal, saddle reef, etc.

Mineralization Age: Tertiary**Ore mineralogy**

Uraninite

Pyrite

Chalcopyrite

Tetrahedrite

Marcasite

Galena

Martite

Magnetite

Host rock mineralogy

Ankerite

Dolomite

Calcite

Barite

Siderite

Host rocks**Age:****Host rock lithology**

Undifferentiated metamorphic rock

Graphitic shale

Economy**Exploitation type**

Unworked

U Uranium (metal)**Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t**Average grade:** -**Reserve:** - t**Average grade:** -**Resource:** - t**Average grade:** -**Environment**

Acid generation potential due to the sulfides minerals present in the ore.

Expected concentrations of dissolved U, radionuclides and base metals in the drainage waters.

Radon and gamma radiations.

Comments**Geological references**

Klajn D. - (1983) - Uranium hydrothermal mineralization in the Borac-Rudnik Area (Sumadija); possible relation with buried stratiform ore deposits. - Anuarul Institutului de Geologie si Geofizica = Annuaire de l'Institut de Geologie et de Geophysique, 61, p. 199-204.

Economic references

Other references**Markov Kamen****General data**

Deposit name(s): Markov Kamen **Identifier:** YUG-00067
Commodities: Cu 0 t **Class:** N/A **Status:** Old workings
Company:
Longitude: 22.090 **Latitude:** 43.786 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Unspecified ore deposit type

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age:**Ore mineralogy**Pyrite
Chalcocite**Host rocks Age:****Host rock lithology**

Andesite

Economy**Exploitation type**

Mining method unknown

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment**Comments**

Bor District

Geological references

Jankovic S, Terzic M, Aleksic D, Karamata S, Spasov T, Jovanovic M, Milicic M, Miskovic V, Grubic A, and Antonijevic I. - (1980) - Metallogenic features of copper deposits in the volcano- intrusive complexes of the Bor District, Yugoslavia. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 42-49.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-074

Mazic

General data

Deposit name(s): Mazic **Identifier:** YUG-00119
Commodities: PbZn 0 t *Class* N/A **Status:** Deposit or prospect of unknown status
Company: TREPICA Mining and Metallurgical Complex
Longitude: 20.969 **Latitude:** 42.928 **District:** Kosovo

Geology**Ore deposit type (geology)**

Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:****Host rocks** **Age:****Economy****Exploitation type**

Unworked

PbZn **Lead + Zinc (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

No data.

Comments

Trepca ore field

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Meljenica

General data

Deposit name(s): Meljenica **Identifier:** YUG-00120
Commodities: PbZn 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company: TREPICA Mining and Metallurgical Complex
Longitude: 20.923 **Latitude:** 42.948 **District:** Kosovo

Geology**Ore deposit type (geology)**

Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:** Tertiary**Host rocks** **Age:****Economy****Exploitation type**

Unworked

PbZn **Lead + Zinc (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

No data.

Comments

Trepica ore field

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Mokra Gora

General data

Deposit name(s): Mokra Gora **Identifier:** YUG-00194

Commodities: Ni 3 500 000 t **Class** A **Status:** Dormant deposit

Cr 5 800 000 t **Class** B

Fe 10 000 000 t **Class** C

Company:

Longitude: 19.500 **Latitude:** 43.801 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Residually enriched ore deposits: Fe, Mn, Ni-Co, Au, Pt, P, U, corundum, etc.

Fe and Mn sedimentary deposits: Fe, Mn

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Lower/Early Cretaceous**Ore mineralogy**

Fe-Chlorite

Hematite

Goethite

Magnetite

Chromite

Millerite

Pyrite

Host rock mineralogy

Quartz

Clay

Host rocks **Age:** Lower/Early Cretaceous**Hostrock formation names**

Late cretaceous redeposition - Marine sedimentary

Lateritic weathering of ultrabasic rock

Host rock lithology

Oolitic limestone, oncoidal limestone

Coarse-grained detrital rock s.l.

Medium- to fine-grained detrital rock

Economy**Exploitation type**

Unworked

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	10000000 t	Average grade:	21.47 %

Ni Nickel (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	3500000 t	Average grade:	0.705 %

Cr Chrome (Cr2O3)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	5800000 t	Average grade:	1.16

Environment

Possible particulate and colloidal iron compounds in discharge waters.

Potential Acid Rock Drainage production due to the presence of some sulfides (pyrite, millerite).

Comments

The grade of the ore is very variable : 20-40% Fe, on average 26.5% Fe, 1.3-2% Cr, 0.3-1.3% Ni, up to 0.15% Co and 20-40% SiO₂ (Jankovic-1982).

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt fur Geowissenschaften und Rohstoffe, Hannover. 386 p.

Antonijevic I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Boev B. and Jankovic S. - (1996) - Nickel and nikeliferous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. and Jelenkovic R. - (2000) - Metallogeny of the Dinarides - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 281-305

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-069

The Iron Ore Deposits of Europe - 1978 YU11

Morava

General data

Deposit name(s): Morava	Identifier: YUG-00143
Commodities: Coal 0 t Class: N/A	Status: Producing small-scale mine
Company: Rudnik mrkog uglja i lignita JASENOVAC	
Longitude: 21.453 Latitude: 44.075	District: Pomoravski

Geology**Ore deposit type (geology)**

Lignite deposits
Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene

Host rocks **Age:** Miocene

Hostrock formation names

Despotovac Coal Basin

Host rock lithology

Detrital rock s.l.
Bituminous or carbureted rock: clay,
claystone, sand, sandstone,
limestone, dolomite, etc.

Economy**Exploitation type**

Underground mining
Longwall mining

Coal **Coal, lignite (substance)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

Potential acid rock drainage with respect of the sulfides content.
Suspended matter in mine water discharge. Large geomorphic modifications of the landscape (pits, gullies, spoil heaps...)
Landform instability (collapses) created during and after mining operations.

Comments

The mine is active since 1936. In 1981, the current output was 40,000 t/y and an annual output of 100,000 t/y of brown coal and 60,000 t of lignite was expected for 1985.

The lignite contains up to 35% of moisture and its heating value is up to 12,500 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Mramor**General data**

Deposit name(s): Mramor **Identifier:** YUG-00169
Commodities: Mg 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.000 **Latitude:** 44.054 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks
 Supergene ore deposits

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age: Miocene

Ore mineralogy

Magnesite (Gibbertite)

Host rocks Age:

Hostrock formation names

Maljen - Suvobor ultramafic massif

Host rock lithology

Serpentinite
 Dunite
 Harzburgite

Economy**Exploitation type**

Mining method unknown

Mg Magnesium, magnesite (MgCO₃)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage waters by suspended matter.

Comments

Low grade, not economic

Geological references

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.

Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references**

Nevade

General data

Deposit name(s): Nevade **Identifier:** YUG-00159
Commodities: Mg 0 t **Class:** N/A **Status:** Dormant deposit
Company:
Longitude: 20.495 **Latitude:** 44.047 **District:** Moravicki

Geology**Ore deposit type (geology)**

Lacustrine deposits (sebkha, salar, alkaline lake): Li, B, (Na, Mg, Ca, nitrates, sulphates, etc.)
 Unspecified volcano-sedimentary and sedimentary-exhalative deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age: Upper/Late Miocene

Ore mineralogy

Magnesite (Gibbsite)

Host rock mineralogy

Opal
 Dolomite
 Pyrite

Host rocks Age: Upper/Late Miocene

Hostrock formation names

Gornji Milanovac Miocene series

Host rock lithology

Varved lacustrine sediment
 Medium- to fine-grained detrital rock
 Pyroclastic deposits s.l.
 Latite

Economy**Exploitation type**

Unworked

Mg Magnesium, magnesite (MgCO₃)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Moderate acid generation potential due to the presence of pyrite in the gangue mineralogy and potentially buffered by the magnesite content.

Comments

Resources of about 25 Mt of low-grade ore

Geological references

Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.
 Ilich M. - (1976) - Hidrotermalno-sedimentno magnezitsko leziste, Nevade, Gornji Milanovac, SR Srbija Translated Title: Hydrothermal-sedimentary magnesite deposit of Nevade, Gornji Milonovac (western Serbia). - Zbornik Radova Rudarsko Geoloskog Fakulteta, Universitet u Beogradu, 19, p. 307-329.

Economic references**Other references**

Novakovaca

General data

Deposit name(s): Novakovaca **Identifier:** YUG-00230
Commodities: Cu 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company:
Longitude: 19.689 **Latitude:** 44.169 **District:**

Geology**Ore deposit type (geology)**

Volcanogenic massive sulphides (VMS) deposits: Cu, Pb, Zn +/- Au-Ag, (Sn, S, As, Cd, Bi, etc.)

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Jurassic**Ore mineralogy**

Chalcopyrite

Pyrite

Magnetite

Host rocks **Age:** Jurassic**Host rock lithology**

Dolerite, diabase

Economy**Exploitation type**

Mining method unknown

Cu **Copper (metal)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

High Acid generation potential due to the sulfides minerals contained in the ore.
 Expected high dissolved and particulate contents of Cu in drainage waters.

Comments**Geological references**

Putnik S. - (1981) - Metalogenia bakra jurske dijabaz-roznacke formacije - Metallogenesis of copper in jurassic diabase-chert formation - Geoinstitut. Beograd, 1981. Monographs, vol. 6, 117 p., 2 plates.

Economic references**Other references**

Novo Brdo Mn

General data

Deposit name(s): Novo Brdo Mn
Stara Jama

Identifier: YUG-00184

Commodities: Mn 1 421 440 t **Class** C **Status:** Old industrial mine, abandoned deposit
PbZn 58 660 t **Class** C
Ag 59 t **Class** E

Company: TREPCA Mining and Metallurgical Complex

Longitude: 21.428 **Latitude:** 42.620 **District:** Kosovo

Geology**Ore deposit type (geology)**

Atypical or unspecified high- or low-sulphidation ore deposits
Atypical supergene deposits

Ore deposit shape

Concordant to subconcordant envelope of disseminated ore

Mineralization **Age:** Tertiary

Ore mineralogy

Manganese oxide (unspecifie
Manganite
Psilomelane
Pyrolusite (Polianite)
Iron Oxydes(unspecified)
Chalcophanite
Polianite
Coronadite
Smithsonite
Calamine

Host rock mineralogy

Siderite
Rhodochrosite (Dialoqite)
Calcite
Dolomite

Host rocks **Age:**

Economy**Exploitation type**

Unworked

Mn Manganese (metal)

Ore type: Oxide/hydroxide ore within the oxidized zone

Past production:	- t	Average grade:	- %
Reserve:	310940 t	Average grade:	22.21 %
Resource:	1110500 t	Average grade:	22.21 %

PbZn Lead + Zinc (metal)

Ore type: Oxide/hydroxide ore within the oxidized zone

Past production:	- t	Average grade:	- %
Reserve:	58660 t	Average grade:	4.19 %
Resource:	- t	Average grade:	- %

Ag Silver (metal)

Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	- g/t
Reserve:	59 t	Average grade:	42 g/t
Resource:	- t	Average grade:	- g/t

Environment

Possible high dissolved contents of fe, Mn and Zn in drainage waters.

Comments

Indicated reserves : 1.4 Mt @ 22.21% Mn, 13.35% Fe, 1.12% Pb, 3.07% Zn and 42 g/t Ag. Inferred reserves : 5 Mt with similar grades.

Geological references

Barjaktarevic D. - (1995) - The revision of the mineral deposit in the ore field Novo Brdo. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Simic M. - (2000) - Metallogeny of the Draznja-Propastica-Novo Brdo ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Department of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 409-424

Economic references

Other references

Novo Brdo PbZn

General data

Deposit name(s): Novo Brdo PbZn Farbani Potok	Identifier: YUG-00031
Commodities: ClyR 3 000 000 t <i>Class</i> B	Status: Dormant deposit
Pb 257 130 t <i>Class</i> B	
Zn 258 100 t <i>Class</i> B	
Ag 973 t <i>Class</i> C	
Au 7 t <i>Class</i> D	
Company: TREPCA Mining and Metallurgical Complex	
Longitude: 21.420 Latitude: 42.616	District: Kosovo

Geology**Ore deposit type (geology)**

Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Volcanic-hosted industrial rock and mineral deposits: bentonite, diatomite, kaolinite, pumice, opal, chalcedony, zeolite, vermiculite, perlite, etc.

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization **Age:** Tertiary**Ore mineralogy**Sphalerite
Galena
Pyrite
Pyrrhotite
Arsenopyrite
Chalcopyrite
Marcasite
Bourbonite
Grey copper**Host rock mineralogy**Halloysite
Siderite
Psilomelane
Pyrolusite (Polianite)
Chalcophanite
Polianite
Coronadite**Hydrothermal alteration**Advanced argillic alteration
Skarn formation**Host rocks** **Age:** Paleozoic (Primary)**Hostrock formation names**Paleozoic metamorphites
Tertiary andesites**Host rock lithology**Undifferentiated metamorphic rock
Marble, cipolin (crystalline limestone)
Andesite**Economy****Exploitation type**

Underground mining

ClyR **White-firing clays (refractory & ceramic) (subst.)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	3000000 t	Average grade:	-
Resource:	- t	Average grade:	-

Pb **Lead (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	105000 t	Average grade:	2.9 %
Reserve:	118000 t	Average grade:	4.4 %
Resource:	34130 t	Average grade:	0.8 %

Zn	Zinc (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	110000 t	<i>Average grade:</i> 3.2 %
	<i>Reserve:</i>	131000 t	<i>Average grade:</i> 4.9 %
	<i>Resource:</i>	17100 t	<i>Average grade:</i> 0.4 %
Ag	Silver (metal)		
	<i>Ore type:</i>	Ore of indeterminate nature	
	<i>Past production:</i>	360 t	<i>Average grade:</i> 105 g/t
	<i>Reserve:</i>	366 t	<i>Average grade:</i> 137 g/t
	<i>Resource:</i>	247 t	<i>Average grade:</i> 58 g/t
Au	Gold (metal)		
	<i>Ore type:</i>	Ore of indeterminate nature	
	<i>Past production:</i>	- t	<i>Average grade:</i> - g/t
	<i>Reserve:</i>	2.9 t	<i>Average grade:</i> 1.1 g/t
	<i>Resource:</i>	4.3 t	<i>Average grade:</i> 1 g/t

Environment

The ore content in sulfides (Pb, Zn and Fe) generate acid and dissolved metals during oxidation. Acid generation and drainage can affect both surface and groundwater in particular through mine water discharge. The advanced argillic alteration existing at the mine site decreases acid-buffering capacity and also substantially decreases rock and fracture permeability. Near the former processing plant, along the river Kriva, pyritic tailings (0.6-1 Mt) is a source of surface water contamination. The existence of an ore processing plant at Gracanica has generated large tailings disposals (15-18Mt) that can be a source of groundwater and surface water contamination.

Comments

In the Middle Ages, the mining activity was very intense and it made Novo Brdo the biggest town in Balkan Peninsula (40,000 inhabitants).

In 1982, the Novo Brdo mine was currently scheduled for expansion to 450,000 t/y of Pb-Zn ore.

During the exploitation at Farbani Potok, a large body of pure halloysite was discovered, the reserves are estimated at 3.0 Mt of halloysite assaying 39-42% Al₂O₃, 39-43% SiO₂ and less than 1% Fe₂O₃

Farbani Potok : the ore contains 1-5% Pb, 1-8% Zn, about 100 g/t Ag and 3-4 g/t Au

ITT/UNMIK Mission (12/2000) : Past production (1964-1997) : 3,439,000 t @ 2.9% Pb, 3.2% Zn and 105 g/t Ag. Resources of poly metallic ore : 2,674,000 t @ 4.4% Pb, 4.9% Zn, 137 g/t Ag and 1.1 g/t Au. Resources of pyritic ore : 4,266,000 t @ 0.8% Pb, 0.4% Zn, 58 g/t Ag and 1.0 g/t Au.

Geological references

- Barjaktarevic D. - (1995) - Polymetallic mineral phenomenon of Glama silver near by Gnjilane. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.
- Barjaktarevic D. - (1995) - The revision of the mineral deposit in the ore field Novo Brdo. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.
- Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.
- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Maksimovic Z and Nikolic D. - (1978) - The primary kaolin deposits of Yugoslavia. - Schriftenreihe fuer Geologische Wissenschaften, 74, 11, p. 179-196.
- Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492
- Simic M. - (2000) - Metallogeny of the Draznja-Propastica-Novo Brdo ore field in the Vardar Zone - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Department of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 409-424
- Simic V. and Jovic V. - (1997) - Genetic types of kaolin and kaolinite clay deposits in Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 197-201
- Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-117

Novo Okno

General data

Deposit name(s): Novo Okno **Identifier:** YUG-00150
Commodities: Cu 0 t **Class:** N/A **Status:** Deposit of unknown status
Company: Rudarsko Topioninarski Basen BOR
Longitude: 22.106 **Latitude:** 44.086 **District:** Borski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives
 Unspecified volcano-sedimentary and sedimentary-exhalative deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)
 Stratabound envelope of disseminated ore

Mineralization **Age:** Upper/Late Cretaceous

Ore mineralogy

Pyrite
 Chalcopyrite
 Enargite
 Covellite
 Chalcocite
 Bornite

Host rocks **Age:** Upper/Late Cretaceous

Hostrock formation names

Timok andesite complex

Host rock lithology

Andesite

Economy**Exploitation type**

Mining method unknown

Cu **Copper (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

High acid generation potential due to the sulfide content of the primary ore.
 Expected high dissolved content of Cu and Fe in drainage water.

Comments

Bor district. Has been in operation since 1983.

Geological references

Jankovic S, Cvetkovic L, Miskovic V, et al. - (1984) - Mineral paragenesis and elements distribution in the ore body "Novo Okno," Bor. - International Geological Congress, Abstracts - Congrès Géologique Internationale, Résumés, p. 304-304.
 Jankovic S. - (1990) - Types of copper deposits related to volcanic environment in the Bor District, Yugoslavia. - Geol. Rundsch, 79, (2), p. 467-478.
 Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32

Economic references

Other references**Odorivci****General data**

Deposit name(s): Odorivci **Identifier:** YUG-00081
Commodities: Fe 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company:
Longitude: 22.900 **Latitude:** 43.150 **District:** Pirotski

Geology**Ore deposit type (geology)**

Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Lower/Early Jurassic (Lias)**Ore mineralogy**

Hematite

Siderite

Iron Oxydes(unspecified)

Host rocks **Age:** Lower/Early Jurassic (Lias)**Host rock lithology**

Limestone

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)****Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Discharge water can have high suspended solids contents enriched in Fe/Mn.

Comments**Geological references****Economic references****Other references****Other data bases**

Carte Métallogénique de l'Europe 26-101

Osanica

General data

Deposit name(s): Osanica **Identifier:** YUG-00199

Commodities: Au 0 t **Class** N/A **Status:** Deposit of unknown status

Sb 0 t **Class** N/A

W 0 t **Class** N/A

Company:

Longitude: 21.660 **Latitude:** 44.298 **District:** Branicevski

Geology**Ore deposit type (geology)**

Granitic and peri-granitic veins and stockworks (greisen): Sn-W, (Cu, Bi, Sb, base metals)

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age:**Ore mineralogy**

Wolframite
Stibnite
Pyrite
Marcasite
Scheelite
Gold

Host rock mineralogy

Quartz

Host rocks Age:**Host rock lithology**

Granite (s.l.)
Gneiss (s.l.)
Mica schist of sedimentary origin s.l.

Economy**Exploitation type**

Mining method unknown

W Wolfram (WO3)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Au Gold (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Sb Antimony (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals contained in the ore.
Expected high dissolved contents of base metals and W in surface water.

Comments

The ore contains 0.5-1.5% WO₃ and 3-5% Sb, the wolframite contains 400 g/t of Scandium (Jankovic - 1982)

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32

Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references

Other references

Ostrovica Lojane

General data*Deposit name(s):* **Ostrovica Lojane***Identifier:* **YUG-00091***Commodities:* **Cr** **0 t** *Class* **N/A***Status:* Deposit or prospect of unknown status*Company:**Longitude:* 21.500 *Latitude:* 42.368*District:* Kosovo**Geology***Ore deposit type (geology)*

Ophiolite-hosted ore deposits: Cr, (PGE)

Ore deposit shape

Concordant to subconcordant mass, lens or pod of massive to submassive ore

Mineralization *Age:**Ore mineralogy*

Chromite

Host rocks *Age:**Host rock lithology*

Dunite

Peridotite

Economy*Exploitation type*

Unworked

Cr **Chrome (Cr2O3)***Ore type:* Ore in which the element forms a distinct mineral phase*Past production:* - t*Average grade:* -*Reserve:* - t*Average grade:* -*Resource:* - t*Average grade:* -**Environment**

No specific environmental signature according to the data available.

Comments

Grade : 35-42% Cr2O3

Geological references**Economic references****Other references***Other data bases*

Carte Métallogénique de l'Europe 26-133

Pasjaca

General data

Deposit name(s): Pasjaca **Identifier:** YUG-00078
Commodities: Gr 0 t **Class:** N/A **Status:** Old prospect
Company:
Longitude: 21.583 **Latitude:** 43.158 **District:** Topolicki

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to metamorphic rocks: andalusite group, wollastonite, graphite, etc.
 Pegmatites: Sn, Nb-Ta, Li-Be, gemstones, cryolite, mica, etc.

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age:**Ore mineralogy**

Graphite
 Quartz
 Muscovite

Host rocks Age:**Host rock lithology**

Pegmatite
 Gneiss (s.l.)

Economy**Exploitation type**

Unworked

Gr Graphite (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Exposed earthen materials at the surface can be an environmental concern due to the erosion-sedimentation process that can threaten surface water and ecosystem quality.

Comments**Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-097

Pek

General data

Deposit name(s): **Pek** **Identifier:** **YUG-00176**
Volujski Kljuc

Commodities: **Au** 4 t **Class** **D** **Status:** Deposit under development - project

Company:

Longitude: 21.761 **Latitude:** 44.473 **District:** Branicevski

Geology**Ore deposit type (geology)**

Alluvial-eluvial placers: Au, Pt, Sn,Ti, REE, diamond, gemstones, (Zr, etc.)

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Quaternary**Ore mineralogy**

Gold
Magnetite
Ilmenite
Rutile
Titanite
Monazite

Host rocks **Age:** Quaternary**Host rock lithology**

Alluvium s.l.

Economy**Exploitation type**

Unworked

Au **Gold (metal)****Ore type:** Native-element ore

Past production:	2.2 t	Average grade:	- g/m3
Reserve:	- t	Average grade:	- g/m3
Resource:	2 t	Average grade:	0.3 g/m3

Environment

Few data available to determine an environmental signature.

Comments

Placer 5000 m long, 400-600m wide, layer 2-3m thick, 0.3 g/m3 Au : 2 t gold

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Schumacher F. - (1954) - The ore deposits of Jugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references**Other references**

Petkovic

General data

Deposit name(s): Petkovic **Identifier:** YUG-00126

Commodities: Co 0 t **Class** N/A **Status:** Deposit of unknown status
 Cu 0 t **Class** N/A
 Ni 0 t **Class** N/A

Company:

Longitude: 20.659 **Latitude:** 42.422 **District:** Kosovo

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to basic-ultrabasic magmatic rocks
 Fault-related ore deposits in a magmatic context: Cu, As-Co-Cu-Ni-Ag-Bi

Ore deposit shape

Discordant mass or lens of massive to submassive ore
 Discordant envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Chalcopyrite
 Pyrrhotite
 Pentlandite
 Skutterudite
 Breithauptite
 Rammelsbergite
 Cubanite
 Sphalerite
 Valleriite
 Magnetite
 Chromite
 Niccolite
 Chloanthite
 Millerite
 Pyrite
 Bornite
 Chalcocite
 Gold

Host rocks Age:**Hostrock formation names**

Orahovac Peridotite Complex

Host rock lithology

Basic to ultrabasic rock s.l.
 Peridotite
 Pyroxenite
 Amphibolite (s.l.)
 Serpentinite

Economy**Exploitation type**

Unworked

Cu Copper (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Ni	Nickel (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -
Co	Cobalt (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

Acid generation potential due to the sulfidic ore composition.

Potential release of dissolved metals (Fe, Cu, Zn, Ni, Co,...) into the drainage water with possible concentration in stream sediments.

Presence of arsenites and sulfoarsenites that may release As into the environment with particular concentration in the stream sediments.

Comments

Massive ore contains 1-2.5% Cu, 0.2-0.4% Ni, 0.1-0.25% Co, while disseminated ore contains 0.25% Cu, 0.3% Ni and 0.15% Co.

Geological references

Jankovic S and Putnik S. - (1980) - Copper deposits in the Southeastern Europe connected with the ophiolite complexes. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects, Belgrade. p. 117-123.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Other references

Picelj

General data

Deposit name(s): Picelj **Identifier:** YUG-00117

Commodities: Asb 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 20.985 **Latitude:** 42.975 **District:** Kosovo

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age:**Ore mineralogy**

Chrysotile (Clino-, Ortho-, Par

Host rocks Age:**Hostrock formation names**

Kopaonik ultramafite mass

Host rock lithology

Basic to ultrabasic rock s.l.

Serpentine

Peridotite s.l.

Economy**Exploitation type**

Mining method unknown

Asb Asbestos (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Emission of particulate matters in the form of fugitive dust.

The dust mainly composed of fibrous minerals can be inhaled by people and thus may induce illnesses.

Comments

Located in Kopaonik mountains

Geological references

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references**

Piskanja

General data

Deposit name(s): Piskanja **Identifier:** YUG-00137
Pobrdjski Potok

Commodities: Bor 2 600 000 t **Class** C **Status:** Deposit under development - project

Company: Ras-Borati Ltd

Longitude: 20.663 **Latitude:** 43.375 **District:** Raski

Geology**Ore deposit type (geology)**

Lacustrine deposits (sebkha, salar, alkaline lake): Li, B, (Na, Mg, Ca, nitrates, sulphates, etc.)

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene

Ore mineralogy

Colemanite

Host rock mineralogy

Magnesite (Gibbsite)

Dolomite

Host rocks **Age:** Miocene

Hostrock formation names

Jarando Miocene basin

Host rock lithology

Carbonaceous rock: clay, sandstone, etc.

Varved lacustrine sediment

Economy**Exploitation type**

Unworked

Bor **Borates (B2O3)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	2600000 t	Average grade:	37 %

Environment

Potential contamination of drainage waters by Bore compounds.

Comments

Ras-Borati Ltd : joint venture between Serbia's Elektroprivredna and Canada's Erin Ventures Inc.

In 1997, the partners plan to complete 15,000 m drilling programme to prove 7 Mt @ 35-39% B2O3.

The ore include Colemanite and Howlite (2SiO₂, 4CaO, 5B₂O₃, 5H₂O).

Geological references

Dedic L., Mozina A., Radulovic P., Joksimovic D. and Jovovic M. - (1995) - Non metallic sources deposit of the Kopaonik area. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Joksimovic D., Anicic S., Stefanovska D. and Seke L. - (1995) - Potential from mineral sources of neogene basin Jarandol. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Obradovic J, Stamatakis MG, Anicic S, and Economou GS. - (1992) - Borate and borosilicate deposits in the Miocene Jarandol Basin, Serbia, Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 87, (8), p. 2169-2174.

Economic references

Steblez W. - (1998) - Republics of the former Yugoslavia. - Mining Annual Review, 1998, p. 218-221.

Other references**Popina****General data**

Deposit name(s): Popina **Identifier:** YUG-00210
Commodities: Agt 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.947 **Latitude:** 43.603 **District:** Rasinski

Geology**Ore deposit type (geology)**

Atypical supergene deposits

Unspecified ore deposits related to basic-ultrabasic magmatic rocks

Ore deposit shape

Tabular-shaped orebody of secondary origin

Mineralization Age:**Ore mineralogy**Opal
Chalcedony**Host rock mineralogy**

Quartz

Host rocks Age: Neogene (Miocene to Pliocene)**Host rock lithology**

Coarse-grained detrital rock s.s.

Basic to ultrabasic rock s.l.

Economy**Exploitation type**

Unworked

Agt Agata, chalcedony, jasper (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Possible contamination of surface water by suspended matter.

Comments**Geological references**

Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.

Economic references**Other references**

Popovac

General data

Deposit name(s): Popovac **Identifier:** YUG-00223
Commodities: LstC 0 t **Class:** N/A **Status:** Producing industrial mine
Company: Fabrica cementa NOVI POPOVAC
Longitude: 21.509 **Latitude:** 43.923 **District:** Pomoravski

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age:

Host rocks Age: Jurassic

Host rock lithology

Limestone

Marl

Economy**Exploitation type**

Surface mining

LstC Cement limestone (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Dust production and fallout.

Geomorphic modifications in the landscape (quarry).

Comments

Production 1990 : 770 kt

2 deposits : Marl : Tresnja, and limestone : Cokoce

Geological references

Ilich M. - (1991) - Yugoslavian cement. Raw materials and production - Industrial Minerals, november 1991, pp. 59-61

Economic references**Other references**

Postojka Coka

General data

Deposit name(s): Postojka Coka **Identifier:** YUG-00164
Commodities: Qtz 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 21.843 **Latitude:** 44.387 **District:** Borski

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to plutonic rocks: ornamental stones, feldspar, nepheline, etc.

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age:**Ore mineralogy**

Quartz

Host rocks Age:**Hostrock formation names**

Neresnica Pluton

Host rock lithology

Granite (s.l.)

Economy**Exploitation type**

Unworked

Qtz Massive quartz, blocks for ferrosilicon (SiO₂)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature.

Comments**Geological references**

Rubezanin D. - (1978) - Kvarcne stene Postojka coke kod Neresnice Translated Title: The quartz deposits of Postojka Coka, Neresnica. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 35-36, p. 7-18.

Economic references**Other references**

Pozega

General data*Deposit name(s):* **Pozega***Identifier:* **YUG-00068***Commodities:* **Mn** 0 t *Class* **N/A***Status:* Deposit or prospect of unknown status*Company:**Longitude:* 20.038 *Latitude:* 43.846*District:* Zlatiborski**Geology***Ore deposit type (geology)*

Unspecified ore deposit type

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Host rocks* *Age:***Economy***Exploitation type*

Mining method unknown

Mn **Manganese (metal)***Ore type:* Ore of indeterminate nature*Past production:* - t*Average grade:* -*Reserve:* - t*Average grade:* -*Resource:* - t*Average grade:* -**Environment****Comments****Geological references****Economic references****Other references***Other data bases*

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Radejna

General data

Deposit name(s): Radejna Vidlic **Identifier:** YUG-00106

Commodities: Fe 1 050 000 t **Class:** D **Status:** Deposit or prospect of unknown status

Company:

Longitude: 22.833 **Latitude:** 43.032 **District:** Pirotski

Geology**Ore deposit type (geology)**

Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Stratabound bed (single or multi-layered)

Mineralization **Age:** Lower/Early Jurassic (Lias)**Ore mineralogy**

Goethite

Hematite

Iron Oxydes(unspecified)

Host rocks **Age:** Lower/Early Jurassic (Lias)**Host rock lithology**

Sedimentary rock

Economy**Exploitation type**

Unworked

Fe **Iron (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	525000 t	Average grade:	35 %
Resource:	525000 t	Average grade:	35 %

Environment

Drainage water with suspended solids content enriched in Fe/Mn.

Comments

Reserves C1 : 1.5 Mt @ 35% Fe and C2 : 1.5 Mt.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Economic references**Other references****Other data bases**

The Iron Ore Deposits of Europe - 1978 YU26

Radocelo

General data

Deposit name(s): Radocelo **Identifier:** YUG-00109
Perisin Potok

Commodities: Fe 0 t **Class** N/A **Status:** Deposit of unknown status
 Ni 0 t **Class** N/A

Company:

Longitude: 20.442 **Latitude:** 43.469 **District:** Raski

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.
 Fe and Mn sedimentary deposits: Fe, Mn

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Hematite
 Magnetite
 Chromite
 Pyrite

Host rocks **Age:** Mesozoic (Secondary)

Hostrock formation names

Permo-Triassic Studenica series

Host rock lithology

Undifferentiated metamorphic rock
 Serpentinite

Economy**Exploitation type**

Mining method unknown

Fe Iron (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Ni Nickel (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the presence of pyrite. The existence of chromite in a lateritic context may lead to the release of hexavalent chromium (toxic form of Chromium) into the environment .

Comments

The ore contains 40-50% Fe, 1.3 to 2% Cr, up to 0.8% Ni, less than 0.1% S and P and 8-15% SiO₂.

Geological references

Antonijevic I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Maksimovic Z., Panto G., Nagy G. and Popovic R. - (2000) - Metamorphosed Paleozoic serpentinites with metamorphosed weathering crust and reworked Ni-Fe ore in Radocelo Mt., Serbia - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Department of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 313-321

Economic references

Other references

Rajiceva Gora

General data

Deposit name(s):	Rajiceva Gora	Identifier:	YUG-00110
Commodities:	Sb 33 600 t	Class	B
	PbZn 15 000 t	Class	D
	As 0 t	Class	N/A
	Au 0 t	Class	N/A
Company:	Zajaca - Rudarsko - Topioninarski Basen		
Longitude:	20.929	Latitude:	43.156
		District:	Rasinski
		Status:	Deposit of unknown status

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposits of basic to ultrabasic affinity: Hg, Sb, As, (Co, Ni, Au, Ag, Cu, Zn)

Ore deposit shape

Stratabound envelope of disseminated ore

Discordant envelope of disseminated ore

Mineralization Age: Neogene (Miocene to Pliocene)**Ore mineralogy**

Stibnite
Galena
Sphalerite
Realgar
Pyrite
Marcasite
Arsenopyrite
Pyrrhotite
Bravoite
Bourmonite
Boulangerite
Jamesonite
Grey copper
Chalcocopyrite
Millerite
Orpiment
Cinnabar
Gold

Host rock mineralogy

Quartz
Chalcedony
Calcite
Barite

Hydrothermal alteration

Silicification

Host rocks Age:**Hostrock formation names**

Contact Serpentinite - Upper Cretaceous flysh

Host rock lithology

Serpentinite
Volcaniclastic rocks: pyroclastic rocks,
volcaniclastic (volcano-detrital,
volcano-sedimentary) rocks
Latite
Listwaenite

Economy**Exploitation type**

Underground mining

PbZn **Lead + Zinc (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	15000 t	Average grade:	0.5 %
Resource:	- t	Average grade:	- %

Sb	Antimony (metal)	<i>Ore type:</i> Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> - %
	<i>Reserve:</i>	33600 t	<i>Average grade:</i> 1.12 %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %
As	Arsenic (metal)	<i>Ore type:</i> Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -
Au	Gold (metal)	<i>Ore type:</i> Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

High acid generation potential due to the sulfidic composition of the primary ore. The hydrothermal alteration type (silica) tends to decrease acid-buffering capacity of the host-rocks. Moreover, the presence of sulfosalts (sulfoarsenites) and cinnabar tends to release, when oxydized, elements like As and Hg into the environment. Those elements, when accumulated in the natural receptors (like soils or stream sediments) are toxic for human health and ecosystems.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

Data in Laznicka P. (1985) p 999 : 10 Mt ore
Reserves : 3 Mt @ 1.12% Sb, 0.5% PbZn, 0.24% As

Geological references

- Jankovic S, Mozgova NN, and Borodaev YS. - (1977) - The complex antimony-lead/ zinc deposit at Rujevac/ Yugoslavia; its specific geochemical and mineralogical features. - Mineralium Deposita, 12, (3), p. 381-392.
- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
- Jankovic S and Zaric P. - (1980) - Metalogenetske odlike Sb-mineralizacije na jugoistocnom Kopaoniku (Rudno polje Rajiceva Gora) Translated Title: Metallogenic features of the antimony mineralization in the Rajiceva Gora Deposit, southeastern Kopaonik, Yugoslavia. - Zbornik Radova Rudarskog Geoloskog Fakulteta, Univerzitet u Beogradu, 22, p. 43-56.
- Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

- Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.
- Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Ramaca

General data

Deposit name(s): Ramaca **Identifier:** YUG-00207

Commodities: Agt 0 t **Class:** N/A **Status:** Dormant deposit

Company:

Longitude: 20.681 **Latitude:** 44.111 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Atypical supergene deposits

Supergene industrial rock and mineral deposits: clays, kaolin, silica sand, etc.

Ore deposit shape

Tabular-shaped orebody of secondary origin

Mineralization **Age:****Ore mineralogy**

Opal

Chalcedony

Host rocks **Age:****Host rock lithology**

Serpentine

Ultrabasic rock

Economy**Exploitation type**

Unworked

Agt **Agata, chalcedony, jasper (substance)****Ore type:** Ore in which the element forms a distinct mineral phase**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

Possible contamination of surface water by suspended matter.

Comments**Geological references**

Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.

Economic references**Other references**

Rastiste

General data

Deposit name(s): Rastiste **Identifier:** YUG-00193

Commodities: Ti 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 19.363 **Latitude:** 43.935 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Gabbro-norite hosted deposits of disseminated titanomagnetite: Fe, Ti, (V, P)

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:****Ore mineralogy**

Magnetite

Titanomagnetite

Ilmenite

Host rocks **Age:****Host rock lithology**

Gabbro

Serpentine

Peridotite

Economy**Exploitation type**

Unworked

Ti **Titanium, general (TiO₂)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

No specific environmental signature.

Comments**Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Razhana

General data

Deposit name(s): Razhana **Identifier:** YUG-00168
Commodities: Mg 0 t **Class:** N/A **Status:** Old industrial mine, exhausted deposit
Company:
Longitude: 19.944 **Latitude:** 44.081 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks
 Supergene ore deposits

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age: Cenozoic

Ore mineralogy

Magnesite (Gibbsite)

Host rocks Age:

Hostrock formation names

Maljen - Suvobor ultramafic massif

Host rock lithology

Serpentine
 Harzburgite

Economy**Exploitation type**

Mining method unknown

Mg Magnesium, magnesite (MgCO₃)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage waters by suspended matter.

Comments**Geological references**

- Fallick AE, Ilich M, and Russell MJ. - (1991) - A stable isotope study of the magnesite deposits associated with the alpine-type ultramafic rocks of Yugoslavia. - Economic Geology and the Bulletin of the Society of Economic Geologists, 86, (4), p. 847-861.
- Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67
- Petrov VP, Vakanjac B, Joksimovic D, Zekic M, and Lapcevic I. - (1980) - Magnesite deposits of Serbia and their origin. - International Geology Review, 22, (5), p. 497-510.
- Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references**

Rembas

General data

Deposit name(s): Rembas Resavica	Identifier: YUG-00144
Commodities: Coal 0 t Class N/A	Status: Producing small-scale mine
Company: Rudnik mrkog uglja REMBAS - EPS	
Longitude: 21.600 Latitude: 44.016	District: Pomoravski

Geology**Ore deposit type (geology)**

Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene**Host rocks** **Age:** Miocene**Hostrock formation names**

Resava Morava Coal Basin

Host rock lithology

Detrital rock s.l.

Economy**Exploitation type**

Underground mining

Coal **Coal, lignite (substance)****Ore type:** Ore of indeterminate nature

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

Potential acid rock drainage with respect of the sulfides content.
Suspended matter in mine water discharge.
Large geomorphic modifications of the landscape (pits, gullies, spoil heaps...)
Landform instability (collapses) created during and after mining operations.

Comments

In 1981, the coal was mined by operations Senjski Rudnik, Vodna, Resavica and Jasenovac. An output of 736,000 t/y was expected.

The coal heating value ranges from 14,000 to 21,000 kJ, moisture is about 18%, ash 16% and sulphur below 1%.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Reskovica

General data**Deposit name(s):** Reskovica**Identifier:** YUG-00060

Commodities: Cu 0 t *Class* N/A
 PbZn 0 t *Class* N/A

Status: Deposit or prospect of unknown status**Company:****Longitude:** 21.624 **Latitude:** 44.253**District:** Branicevski**Geology****Ore deposit type (geology)**

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age:**Ore mineralogy**

Sphalerite
 Galena
 Chalcopyrite
 Magnetite
 Cosalite
 Molybdenite
 Scheelite

Hydrothermal alteration

Skarn formation

Host rocks Age:**Economy****Exploitation type**

Mining method unknown

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

PbZn Lead + Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

Comments**Geological references**

- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
 Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32
 Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references

Other references

Other data bases

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Rgotina

General data

Deposit name(s): Rgotina **Identifier:** YUG-00148
Commodities: Silc 0 t **Class:** N/A **Status:** Producing industrial mine
Company: Radna Organizacija R. Kvarnog Peska Kvarc-Rgotina
Longitude: 22.262 **Latitude:** 44.007 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age: Miocene

Host rocks Age: Miocene

Host rock lithology

Sand

Economy**Exploitation type**

Surface mining

Silc Silica, silica sand (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of drainage water with suspended matter.
 Potential geomorphic modifications of the landscape.

Comments

2 opencast mines were operative in 1982 : Velika Poljana and Oblaci with a content of SiO₂ between 93-99% after washing. Exploited by open pit since 1905.

During 1972-1976, the annual production varied between 150,000 and 220,000 t for the glass and smelting industries and 100,000 t for the building industry.

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Ridanj

General data

Deposit name(s): Ridanj **Identifier:** YUG-00055
Commodities: Fe 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company:
Longitude: 21.685 **Latitude:** 44.632 **District:** Branicevski

Geology**Ore deposit type (geology)**

Fe (magnetite) skarns: Fe, (Co)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age:**Ore mineralogy**Magnetite
Pyrite
Pyrrhotite
Chalcopyrite**Host rocks Age:****Economy****Exploitation type**

Mining method unknown

Fe Iron (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

The associated sulfide minerals assemblage can produce Acid Mine Drainage, source of potential impacts on surface water, groundwater, soils and stream sediments.

Comments**Geological references**

- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
 Jelenkovic R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32
 Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references**Other references****Other data bases**

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Rogozna

General data

Deposit name(s): Rogozna **Identifier:** YUG-00160
Kasaljska Reka

Commodities: PbZn 0 t **Class** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 20.634 **Latitude:** 43.034 **District:** Raski

Geology**Ore deposit type (geology)**

Atypical or unspecified ore deposits associated with acid and alkaline plutonic rocks
 Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:**

Host rocks **Age:**

Economy**Exploitation type**

Unworked

PbZn **Lead + Zinc (metal)**

Ore type: Ore of indeterminate nature

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

No data available.

Comments

S-SW of Crnac, limit with Kosovo

Geological references

Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

Economic references**Other references**

Rudjinci

General data

Deposit name(s): Rudjinci **Identifier:** YUG-00182

Commodities: Co 7 000 t **Class** C **Status:** Dormant deposit

Ni 161 000 t **Class** C

Company:

Longitude: 20.888 **Latitude:** 43.598 **District:** Raski

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Nontronite
Magnesite (Gibbsite)
Montmorillonite
Pyrite
Bravoite
Millerite
Stibnite
Cinnabar

Host rock mineralogy

Silica

Host rocks Age:**Host rock lithology**

Serpentinite
Peridotite

Economy**Exploitation type**

Unworked

Ni Nickel (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	161000 t	Average grade:	1.15 %

Co Cobalt (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	7000 t	Average grade:	0.05 %

Environment

Acid generation potential due to the presence of pyrite.

Possible contamination of drainage waters by high content of suspended matter, and by dissolved metals such as Ni, Sb and possibly Hg.

Comments

Veluce-Rudjinci Ore Field (Boev and Jankovic - 1996) : Exploration carried out determined possible ore reserves of 14 Mt @ 1.15% Ni and 0.05% Co.

2 orebodies : Orlovac and Ravno Bucje.

Geological references

Boev B. and Jankovic S. - (1996) - Nickel and nikeliferous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Economic references

Other references

Rudna Glava

General data**Deposit name(s): Rudna Glava****Identifier: YUG-00101**

Commodities:	Fe	870 000 t	Class	E
	Au	0 t	Class	N/A
	Cu	0 t	Class	N/A

Status: Old industrial mine, abandoned deposit**Company:****Longitude:** 22.094 **Latitude:** 44.333**District:** Borski**Geology****Ore deposit type (geology)**

Fe (magnetite) skarns: Fe, (Co)

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Mineralization **Age:** Lower/Early Carboniferous
(Dinantian, Tournaisian+Visean,
Lower/Early Namurian)

Ore mineralogyMagnetite
Chalcopyrite
Pyrrhotite
Molybdenite
Scheelite
Smaltite**Host rock mineralogy**Garnet
Pyroxene
Chlorite
Epidote
Quartz**Hydrothermal alteration**

Skarn formation

Host rocks **Age:** Paleozoic (Primary)**Hostrock formation names**

Gornjanski granodiorite

Host rock lithologyMarble, cipolin (crystalline limestone)
Granodiorite
Quartz gabbro
Skarn**Economy****Exploitation type**

Mining method unknown

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	350000 t	Average grade:	- %
Reserve:	520000 t	Average grade:	42 %
Resource:	- t	Average grade:	- %

Au Gold (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid mine drainage potential due to the primary ore composition enriched in sulfides like chalcopyrite and pyrrhotite.

Comments

Old mine (4500 B.C.) for Cu and probably gold

Fe mine from 1935-1963

Ore : 42% Fe, 0.1-0.6% Cu and 0.38-0.94% Cr.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Antonijević I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Janković S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 1:2,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Janković S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jelenković R. and Serafimovski T. - (2000) - The metallogeny of the Carpatho-Balkanides: The Eastern Serbia part. - ABCD-GEODE 2000, Bulgaria, p.32

Economic references

Other references

Other data bases

The Iron Ore Deposits of Europe - 1978 YU14

Rudnik

General data

Deposit name(s):	Rudnik	Identifier:	YUG-00052
Commodities:	Pb 133 000 t	Class	B
	Ag 525 t	Class	C
	Zn 126 000 t	Class	C
	Cu 21 000 t	Class	D
	Bi 0 t	Class	N/A
Company:	DP Rudnik i Flotacija Rudnik		
Longitude:	20.512	Latitude:	44.140
		District:	Sumadijski

Geology**Ore deposit type (geology)**

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age: Cenozoic**Ore mineralogy**Galena
Sphalerite
Chalcopyrite
Cubanite
Valleriite
Breithauptite
Maucherite
Millerite
Pyrrhotite
Pyrite
Linnaeite
Grey copper
Bourmonite**Host rock mineralogy**Barite
Quartz
Calcite**Hydrothermal alteration**Skarn formation
Silicification
Kaolinization**Host rocks** Age: Cretaceous**Hostrock formation names**Cretaceous sediments
late Tertiary dikes and stocks andesites
dacites**Host rock lithology**Limestone
Andesite
Quartz diorite**Economy****Exploitation type**

Sublevel stoping

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	133000 t	Average grade:	1.9 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	126000 t	Average grade:	1.8 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Cu	Copper (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	21000 t	<i>Average grade:</i> 0.3 %
	<i>Reserve:</i>	- t	<i>Average grade:</i> - %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %
Ag	Silver (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem	
	<i>Past production:</i>	525 t	<i>Average grade:</i> 75 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t
Bi	Bismuth (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

The potential acid mine drainage generated is buffered by the gangue mineralogy (carbonates) which are acid-consuming minerals. The host rock assemblage (limestone) which alters to calc-silicates decrease acid-buffering capacity.

The information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals, indicates the existence of 7 Mt of active tailings (still high content in pyrite and pyrrhotite) in Rudnik.

Comments

In 1982, current annual output was about 200,000 t of ore.

Metal content differs from one orebody to another, ranging from 0.36 to 7.36% Pb, 0.32 to 5.68% Zn and 0.15 to 1.19% Cu, also with Ag (25 to 155 g/t), Bi (13 to 698 g/t) and Cd (50 to 272 g/t) in the galena concentrate.

Modern mining started in 1952.

Nov 2001- Visit J.Monthel : 7 Mt of tailings with 25-30% pyrite-pyrrhotite, Annual production : 205,000t of ore containing about 3100 t of Pb, 3100t of Zn and 340t Cu. Grade of the ore during 2001 : 1.9% Pb, 1.8% Zn, 0.3% Cu and 75 g/t Ag. Presence of Au and possibility of Pt/Pd minerals.

Geological references

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Jelenkovic R., Serafimovski T. and Lazarov P. - (1997) - Uranium Mineralization in the Serbo-Macedonian Massif and the Vardar Zone : Types and Distribution Pattern - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 149-157

Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Tosovic R.D. - (2000) - Evolution of the ore process formation in the polymetallic Rudnic deposit (Vardar Zone) - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 463-468

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-052

Rudovci

General data

Deposit name(s): Rudovci **Identifier:** YUG-00149

Commodities: ClyR 0 t **Class** N/A **Status:** Producing industrial mine
 Kln 0 t **Class** N/A

Company: Ro Samot Rudnici Vatrostalnih Glina

Longitude: 20.461 **Latitude:** 44.354 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Pliocene

Ore mineralogy

Kaolin

Illite

Host rocks **Age:** Pliocene

Hostrock formation names

Arandelovac and Kolubara basins

Host rock lithology

Bituminous or carbureted rock: clay, claystone, sand, sandstone, limestone, dolomite, etc.

Economy**Exploitation type**

Surface mining

Underground mining

ClyR **White-firing clays (refractory & ceramic) (subst.)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Kln **Kaolin (substance)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

Potential contamination of drainage water with suspended matter.
 Potential geomorphic modifications of the landscape.

Comments

In 1981, the output was about 230,000 t/y and expected at 320,000 t/y in 1985.
 Pits name : Svabinac, Lazine, Rudovci, Krusik and Vrbica.

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
 Simic V. and Jovic V. - (1997) - Genetic types of kaolin and kaolinite clay deposits in Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 197-201

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Rujevac

General data

Deposit name(s): Rujevac **Identifier:** YUG-00111

Commodities: As 0 t **Class** N/A **Status:** Deposit of unknown status

PbZn 0 t **Class** N/A

Sb 0 t **Class** N/A

Company: Zajaca - Rudarsko - Topioninarski Basen

Longitude: 19.314 **Latitude:** 44.342 **District:** Macvanski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives
 Jasperoid-hosted stratabound low sulphidation epithermal veins: Hg, Sb

Ore deposit shape

Stratabound envelope of disseminated ore
 Concordant to subconcordant stockwork (veinlets network) envelope

Mineralization **Age:** Miocene

Ore mineralogy	Host rock mineralogy	Hydrothermal alteration
Stibnite	Quartz	Silicification
Pyrite	Calcite	
Sphalerite	Chalcedony	
Galena		
Arsenopyrite		
Realgar		
Chalcopyrite		
Boulangerite		
Bournonite		
Zinkenite		
Grey copper		
Orpiment		
Cinnabar		
Gold		

Host rocks **Age:** Jurassic

Hostrock formation names

Jurassic limestone, schists and sandstone
 Dacite dikes

Host rock lithology

Limestone
 Medium- to fine-grained detrital sediment
 Schist/shale
 Dacite

Economy**Exploitation type**

Sublevel stoping

Sb Antimony (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

PbZn Lead + Zinc (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

As Arsenic (metal)*Ore type:* Ore in which the element forms a distinct mineral phase

<i>Past production:</i>	- t	<i>Average grade:</i>	-
<i>Reserve:</i>	- t	<i>Average grade:</i>	-
<i>Resource:</i>	- t	<i>Average grade:</i>	-

Environment

High acid generation potential due to the sulfidic composition of the primary ore.
 The hydrothermal alteration type (silica) tends to decrease acid-buffering capacity of the host-rocks.
 Moreover, the presence of sulfosalts (sulfoarsenites) and cinnabar tends to release, when oxidized, elements like As and Hg into the environment.
 Those elements, when accumulated in the natural receptors (like soils or stream sediments) are toxic for human health and ecosystems.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

Exploitation began in 1981. Overall output was 120,000 t/y in 1981 (RTB Zajaca).
 The ore contains 2-3% Sb, 0.5-2.2% As, 0.2-0.8% Pb and 0.5-0.6% Zn

Geological references

- Jancovic S, Mozgova NN, and Borodaev YS. - (1977) - The complex antimony-lead/ zinc deposit at Rujevac/ Yugoslavia; its specific geochemical and mineralogical features. - Mineralium Deposita, 12, (3), p. 381-392.
- Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Moelo Y, Borodaev YS, and Mozgova NN. - (1983) - Association twinnite-zinkenite-plagionite du gisement complexe a Sb-Pb-Zn de Rujevac (Yougoslavie) Translated Title: The twinnite- zinkenite-plagionite association from the Sb-Pb-Zn deposit, Rujevac, Yugoslavia. - Bulletin de Minéralogie, 106, 5, p. 505-510.

Economic references

- Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.
- Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Rujiste

General data

Deposit name(s): Rujiste **Identifier:** YUG-00039
Commodities: Asb 0 t **Class:** N/A **Status:** Old industrial mine, abandoned deposit
Company:
Longitude: 20.767 **Latitude:** 42.926 **District:** Kosovo

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age:**Ore mineralogy**

Chrysotile (Clino-, Ortho-, Par

Host rocks Age:**Hostrock formation names**

Kozarevo-Gradevci Serpentine Mass

Host rock lithology

Basic to ultrabasic rock s.l.

Economy**Exploitation type**

Mining method unknown

Asb Asbestos (substance)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Fibrous minerals in the form of fugitive dust pose a risk to human health through air contamination (airborne transportation).
Mining wastes expose asbestos to erosion by natural agents (wind and water).
The weak, widely exposed, highly fractured rocks are geologic factors that influence environmental effects.

Comments**Geological references**

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.
Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references**Other references**

Ruplje

General data**Deposit name(s):** Ruplje**Identifier:** YUG-00201

Commodities: Ag 0 t *Class* N/A
 Au 0 t *Class* N/A
 Cu 0 t *Class* N/A
 PbZn 0 t *Class* N/A

Status: Old industrial mine, exhausted deposit**Company:****Longitude:** 22.227**Latitude:** 42.849**District:** Jablanicki**Geology****Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age: Tertiary**Ore mineralogy**

Pyrite
 Sphalerite
 Galena
 Chalcopyrite
 Arsenopyrite
 Marcasite
 Tetrahedrite

Host rocks Age: Tertiary**Hostrock formation names**

Ruplje dacite stock

Host rock lithology

Dacite

Economy**Exploitation type**

Underground mining

PbZn Lead + Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Au Gold (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Ag Silver (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential acid drainage production due to the sulfides minerals present in the ore.
Expected high dissolved contents of base metals and arsenic in drainage waters with possible concentrations in stream sediments.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

The more important concentrations have been discovered at Crveni Breg and Novo Selo.

Samples from the Crveni Breg dump : 4.44-13.14% Pb, 7.91-20.44% Zn, 0.14-0.17% Cu, 0.19-1.18% As, 4-28 g/t Bi, 0.23-2.17 g/t Au and 550-783 g/t Ag (Simic - 1997).

Geological references

Simic M. - (1997) - Geological-structural features of the Besna Kobilja Zone in SE Serbia - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 185-195

Economic references**Other references**

Rusanda

General data

Deposit name(s): Rusanda **Identifier:** YUG-00232
Commodities: Petr 0 m3 **Class:** N/A **Status:** Producing deposit
Company:
Longitude: 20.239 **Latitude:** 45.538 **District:**

Geology**Ore deposit type (geology)**

Oil deposits: oil, (S)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:****Host rocks** **Age:****Economy****Exploitation type**

Mining method unknown

Petr **Petroleum (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- m3	Average grade:	-
Reserve:	- m3	Average grade:	-
Resource:	- m3	Average grade:	-

Environment

Potential contamination of surface waters, soils and sediments by hydrocarbons and oil products.

Comments**Geological references****Economic references****Other references**

Sar

General data

Deposit name(s): Sar **Identifier:** YUG-00225
Commodities: LstC 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 21.276 **Latitude:** 42.140 **District:** Kosovo

Geology**Ore deposit type (geology)**

Sedimentary-related industrial rocks and minerals: Clays, limestones, dolomite, calcite, siliceous sand, quartzite, etc.

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization Age:

Host rocks Age: Upper/Late Cretaceous

Host rock lithology

Limestone

Marl

Economy**Exploitation type**

Surface mining

LstC Cement limestone (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Dust production and fallout.
 Geomorphic modifications in the landscape (quarry).

Comments

Content of CaCO₃ : 73.8%
 Production 1990 : 284 kt

Geological references

Ilich M. - (1991) - Yugoslavian cement. Raw materials and production - Industrial Minerals, november 1991, pp. 59-61

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Sastavci

General data

Deposit name(s): Sastavci **Identifier:** YUG-00214
Commodities: PbZn 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.703 **Latitude:** 43.312 **District:** Raski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age: Cenozoic**Host rocks** Age:**Host rock lithology**

Quartz diorite
 Dacite
 Andesite
 Pyroclastic rocks s.l.

Economy**Exploitation type**

Mining method unknown

PbZn Lead + Zinc (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No data available.

Comments**Geological references**

Radulovic B and Grabeljskec V. - (1978) - Geoloski prikaz novopronadenih lezista olova i cinka Sastavci i Kizevak potok na Kopaoniku Translated Title: Report on exploration of new lead-zinc deposits at Sastavci and Kizevak, Kopaonik region. - Radovi Instituta za Geolosko Rudarska Istrazivanja i Ispitivanja Nuklearnih i Drugih Mineralnih Sirovina, 18, (12), p. 93-104.

Radulovic B. - (1992) - Leziste cinka i olova karadak Translated Title: The Karadek zinc and lead deposit. - Radovi Geoinstitut, 27, p. 169-180.

Radulovic B. and Savic R. - (1995) - Deposits and the potential of base and precious metals in the ore field Raska. - Geology and Metallogeny of the Kopaonik Mt. Symposium, June 1995.

Economic references**Other references**

Sijarinska Banja

General data**Deposit name(s):** Sijarinska Banja**Identifier:** YUG-00203**Commodities:** Au 0 t **Class** N/A**Status:** Deposit or prospect of unknown status**Company:****Longitude:** 21.623 **Latitude:** 42.776**District:** Jablanicki**Geology****Ore deposit type (geology)**

Fault and shear-zone controlled low sulphidation epithermal veins: Au, Ag, (Mn)

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)

Ore deposit shapeField of discordant lodes (n*km², n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Tertiary**Ore mineralogy**Pyrite
Chalcopyrite
Arsenopyrite
Galena
Sphalerite
Bismuthinite
Stibnite
Gold**Host rock mineralogy**

Quartz

Host rocks **Age:****Host rock lithology**Amphibolite (s.l.)
Gneiss (s.l.)
Andesite**Economy****Exploitation type**

Unworked

Au **Gold (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

High acid generation potential due to the sulfides minerals contained in the ore.

Expected high dissolved contents of base metals, Sb, Bi and As in drainage waters with possible concentrations of some of those elements in stream sediments.

Comments

Rekalije and Guri Gat occurrences

Geological references

Popovic R. - (2000) - Distribution of base and precious metals in the Lece volcano-intrusive massif (Vardar Zone) - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Department of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 443-452

Economic references

Other references

Sip

General data

Deposit name(s): Sip **Identifier:** YUG-00089
Orahovac

Commodities: Cr 40 000 t **Class** E **Status:** Old small-scale mine, exhausted deposit

Company:

Longitude: 20.652 **Latitude:** 42.463 **District:** Kosovo

Geology

Ore deposit type (geology)
 Ophiolite-hosted ore deposits: Cr, (PGE)

Ore deposit shape
 Concordant to subconcordant mass, lens or pod of massive to submassive ore

Mineralization Age:

Ore mineralogy
 Chromite

Host rocks Age:

Host rock lithology
 Dunite
 Peridotite

Economy

Exploitation type
 Mining method unknown

Cr Chrome (Cr2O3)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	40000 t	Average grade:	48 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

No specific environmental signature.

Comments

30-50 kt ore extracted between 1929-1945 - 48% Cr2O3

Geological references

Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.

Economic references**Other references**

Other data bases
 Carte Métallogénique de l'Europe 26-127

Soko

General data

Deposit name(s): Soko **Identifier:** YUG-00145
Sokobanja

Commodities: Coal 0 t **Class** N/A **Status:** Producing small-scale mine

Company: Rudnik mrkog uglja SOKO - EPS

Longitude: 22.040 **Latitude:** 43.626 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Lignite deposits
 Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene

Host rocks **Age:** Miocene

Hostrock formation names

Sokobanja Coal Basin

Host rock lithology

Bituminous or carbureted rock: clay,
 claystone, sand, sandstone,
 limestone, dolomite, etc.
 Detrital rock s.l.

Economy**Exploitation type**

Underground mining

Coal **Coal, lignite (substance)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential acid rock drainage with respect of the sulfides content.
 Suspended matter in mine water discharge.
 Large geomorphic modifications of the landscape (pits, gullies, spoil heaps...)
 Landform instability (collapses) created during and after mining operations.

Comments

Output expected : 260,000 t/y in 1985.

Coal heating value is 15,700 kJ, moisture is up to 22%, ash content about 18%.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Stancha

General data

Deposit name(s): Stancha **Identifier:** YUG-00133
Commodities: Cu 5 000 t **Class:** E **Status:** Deposit or prospect of unknown status
Company:
Longitude: 20.430 **Latitude:** 43.722 **District:**

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to basic-ultrabasic magmatic rocks
 Volcanogenic massive and disseminated Cu-Au sulphide deposits: Cu, Au, (Zn, Co, Mo, Bi)

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata
 Discordant envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Pyrite
 Chalcopyrite
 Magnetite
 Ilvaite
 Pyrrhotite

Hydrothermal alteration

Silicification
 Chloritization

Host rocks **Age:** Jurassic

Host rock lithology

Dolerite, diabase
 Peridotite

Economy**Exploitation type**

Mining method unknown

Cu Copper (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	5000 t	Average grade:	0.5 %

Environment

High acid generation potential due to the sulfide content of the primary ore body.
 This Acid Rock Drainage can be enhanced by the various mineral assemblages forming the hydrothermal alteration halo.

Comments

Resources : 1 Mt @ 0.5% Cu

Geological references

Jankovic S and Putnik S. - (1980) - Copper deposits in the Southeastern Europe connected with the ophiolite complexes. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects, Belgrade. p. 117-123.
 Putnik S. - (1981) - Metalogenia bakra jurske dijabaz-roznacke formacije - Metallogenesis of copper in jurassic diabase-chert formation - Geoinstitut. Beograd, 1981. Monographs, vol. 6, 117 p., 2 plates.

Economic references**Other references**

Stara Planina

General data

Deposit name(s): Stara Planina	Identifier: YUG-00080
Commodities: Fe 0 t Class N/A	Status: Deposit or prospect of unknown status
Company:	
Longitude: 22.683 Latitude: 43.217	District: Pirotski

Geology**Ore deposit type (geology)**

Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization **Age:** Lower/Early Jurassic (Lias)**Ore mineralogy**

Hematite

Siderite

Iron Oxydes(unspecified)

Host rocks **Age:** Lower/Early Jurassic (Lias)**Host rock lithology**

Limestone

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)****Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential contamination of surface water by suspended matter.

Comments**Geological references**

Antonijevic I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-099

Stari Glog

General data

Deposit name(s): Stari Glog **Identifier:** YUG-00093

Commodities: Mo 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 21.906 **Latitude:** 42.553 **District:** Pcinjski

Geology**Ore deposit type (geology)**

Granitic and peri-granitic veins and stockworks (greisen): Sn-W, (Cu, Bi, Sb, base metals)

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age:**Ore mineralogy**

Molybdenite

Host rock mineralogy

Quartz

Host rocks Age:**Host rock lithology**

Granite (s.l.)

Economy**Exploitation type**

Mining method unknown

Mo Molybdenum (metal)**Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

No specific environmental signature.

Comments**Geological references**

Schumacher F. - (1954) - The ore deposits of Yugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-135

Stari Trg

General data

Deposit name(s): Stari Trg
Trepca

Commodities:

Pb	2 281 000 t	Class	A	Status: Dormant deposit
Ag	3 064 t	Class	B	
Bi	4 115 t	Class	B	
Zn	1 483 000 t	Class	B	
Cd	1 655 t	Class	C	

Company: TREPCA Mining and Metallurgical Complex

Longitude: 20.917 **Latitude:** 42.938 **District:** Kosovo

Geology**Ore deposit type (geology)**

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Ore deposit shapeDiscordant mass or lens of massive to submassive ore
Breccia-pipe, funnel, chimney, column, brecciated dyke**Mineralization** **Age:** Miocene**Ore mineralogy**Galena
Sphalerite
Pyrrhotite
Pyrite
Chalcopyrite
Arsenopyrite
Stibnite
Jamesonite
Boulangerite
Magnetite
Scheelite
Cubanite
Bismuth**Host rock mineralogy**Rhodochrosite (Dialoqite)
Dolomite
Calcite
Garnet
Epidote
Actinolite
Diopside
Wollastonite
Quartz
Siderite**Hydrothermal alteration**Sericitization
Silicification
Pyritization
Carbonatization
Skarn formation**Host rocks** **Age:** Paleozoic (Primary)**Hostrock formation names**

Ordovician to Silurian marble

Host rock lithologySericitic schist, sericite schist of sedimentary origin
Marble, cipolin (crystalline limestone)
Dacite
Undifferentiated volcanic breccia**Economy****Exploitation type**

Underground mining

Pb **Lead (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	2066000 t	Average grade:	6 %
Reserve:	215000 t	Average grade:	3.9 %
Resource:	- t	Average grade:	- %

Zn	Zinc (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	1371000 t	<i>Average grade:</i> 4 %
	<i>Reserve:</i>	112000 t	<i>Average grade:</i> 2 %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %
Cd	Cadmium (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	1655 t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -
Ag	Silver (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	2569 t	<i>Average grade:</i> 75 g/t
	<i>Reserve:</i>	495 t	<i>Average grade:</i> 90 g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t
Bi	Bismuth (metal)		
	<i>Ore type:</i>	Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)	
	<i>Past production:</i>	4115 t	<i>Average grade:</i> 102 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

The potential acid mine drainage generated is buffered by the gangue mineralogy (carbonates) which are acid-consuming minerals.

The host rock assemblage (marble and cipolin) which alters to calc-silicates decrease acid-buffering capacity.

Presence of As which is highly mobile in medium to high pH environment and which can accumulate in stream sediments.

The information related to tailings disposals which are potential sources of contaminants in the form of particulates and dissolved metals, indicate that large amounts of such materials (~30 Mt) exist in the Prvi Tunel area.

Comments

In 1982 : reserves of at least 50 Mt of ore @ 5-7% Pb and 4% Zn. Mineralization extends below 1,300 m.

Mined since the Middle Ages, Trepca is currently worked by cut-and-fill techniques.

In 1982, the output was 600,000 t of ore

Data in Laznicka P. (1985) p 1248 : 3 Mt Pb (6%), 2 Mt Zn (4%) and 5,000 t Ag (100 g/t)

Data in "geology of canadian mineral deposit types (1995), from Forgan (1950) : 12.5 Mt @ 3.8% Zn, 8.6% Pb, 0.2% Cu, 140 g/t Ag

Production 1930-1950 : 10,047,540t @ 8.2% Pb (825,000 t Pb), 5.6% Zn (566,000 t Zn) and 102 g/t Ag (1,022 t Ag). Bi was produced in about the same amount as Ag (Schumacher F. 1954).

Mission ITT-UNMIK (12/2000) : Past production (1931-1998) : 34,350,000 t @ 6.0% Pb, 4.0% Zn, 75 g/t Ag. Resources : 5,500,000 t @ 3.9% Pb, 2.0% Zn and 90 g/t Ag.

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Forgan C. B. - (1950) - Yugoslavia. Ore deposit at the Stantrg lead-zinc mine - International Geological Congress. Report of the eighteenth session Great Britain 1948. Part VII. Symposium and proceedings of section F. The geology, paragenesis, and reserves of the ores of lead and zinc, pp. 290-307

Jankovic S and Petkovic M. - (1980) - The main lead, zinc and copper deposits of Yugoslavia; excursion No. 202 C. - Yugoslavia; outline of Yugoslavian geology; Excursion 201 A-202 C. Grubic A (Ed), Int, Geol. p. 75-94.

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

- Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.
- Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
- Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.
- Mari D. and J. - (1979) - La mine de « Stari-Trg » (Trepca, Yougoslavie) et ses richesses minéralogiques. - Minéraux et Fossiles, dec. 1979, n° 59-60, pp. 19-28.
- Schumacher F. - (1954) - The ore deposits of Jugoslavia and the development of its mining industry - Economic Geology, Vol 49, n°5, pp. 451-492
- Strucl I. - (1981) - Die schichtgebundenen Blei-Zink-Lagerstaetten Jugoslawiens Translated Title: The stratiform lead-zinc deposits of Yugoslavia. - Mitteilungen der Oesterreichischen Geologischen Gesellschaft, 74-75, p. 307-322.

Economic references

- Anonymous. - (1982) - Jugoslavija za Rudarstvo. - 11th World Mining Congress, Beograd. 172 p.
- Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.
- Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.
- Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.
- Steblez W. - (1998) - Republics of the former Yugoslavia. - Mining Annual Review, 1998, p. 218-221.

Other references

Other data bases

- Carte Métallogénique de l'Europe 26-105

Stavalj

General data

Deposit name(s): Stavalj Sjenica	Identifier: YUG-00146
Commodities: Coal 0 t Class N/A	Status: Producing small-scale mine
Company: Rudnik lignita STAVALJ - EPS	
Longitude: 19.991 Latitude: 43.278	District: Zlatiborski

Geology**Ore deposit type (geology)**

Lignite deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene**Host rocks** **Age:** Miocene**Hostrock formation names**

Sjenica Coal Basin

Host rock lithology

Undifferentiated sediment

Economy**Exploitation type**

Surface mining

Underground mining

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment

Potential acid rock drainage with respect of the sulfides content.

Suspended matter in mine water discharge.

Large geomorphic modifications of the landscape (pits, gullies, spoil heaps...).

Landform instability (collapses) created during and after mining operations.

Comments

Annual output ranged up to 50,000 t/y in 1981.

Heating value 14,600 kJ, moisture 30.9%, ash 9.74% sulphur 0.94%.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Economic references

Anonymous - (1998) - Electric Power Industry of Serbia - 1998 - EPS, Beograd 1998, 152 p.

Anonymous - (1999) - Electric Power Industry of Serbia - 1999 - EPS, Public Relations Center, Beograd, 56 p.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Stimlje

General data

Deposit name(s): Stimlje **Identifier:** YUG-00102
Commodities: Fe 400 000 t **Class** E **Status:** Deposit of unknown status
Company:
Longitude: 21.050 **Latitude:** 42.467 **District:** Kosovo

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.
 Fe and Mn sedimentary deposits: Fe, Mn

Ore deposit shape

Cap, blanket, crust
 Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization **Age:** Upper/Late Cretaceous

Ore mineralogy

Chamosite
 Hematite
 Magnetite
 Goethite
 Chromite

Host rocks **Age:** Upper/Late Cretaceous

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	400000 t	Average grade:	36 %

Environment

Potential particulate and colloidal iron compounds in drainage water.

Comments

The ore contains 28-44% Fe, 1.3-2.3% Cr and 0.01% Co

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Economic references**Other references****Other data bases**

The Iron Ore Deposits of Europe - 1978 YU18

Stolice

General data

Deposit name(s): Stolice **Identifier:** YUG-00158
Commodities: Sb 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 19.302 **Latitude:** 44.401 **District:** Macvanski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives
 Vein and disseminated Sb deposits: Sb, Hg, As, (Au, Tl)
 Jasperoid-hosted stratabound low sulphidation epithermal veins: Hg, Sb

Ore deposit shape

Stratabound envelope of disseminated ore
 Field of discordant lodes (n*km², n*ha)

Mineralization Age:**Ore mineralogy**

Stibnite
 Pyrite
 Chalcopyrite
 Galena

Host rock mineralogy

Quartz

Hydrothermal alteration

Silicification

Host rocks

Age: Upper/Late Carboniferous
 (Stephanian-Westphalian, Upper/Late
 Namurian, Silesian, Pennsylvanian)

Host rock lithology

Limestone
 Undifferentiated metamorphic rock
 Dacite
 Andesite

Economy**Exploitation type**

Mining method unknown

Sb Antimony (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals contained in the ore.
 Expected dissolved content of Cu and Sb in drainage waters.

Comments**Geological references**

Durickovic A. - (1982) - Metalogenija rudnog polja Brasina-Zajaca-Stolice-Dobri Potok Translated Title: Metallogeny of the Brasina mining field, Zajaca, Stolice, Dobri Potok. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 40, p. 17-53.
 Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.
 Mudrinic C. - (1975) - Primarni oreoli rasejavanja rudnih metala u antimonskom lezistu Stolice (Zapadna Srbija) Translated Title: Primary dispersion aureoles of the Stolica antimony deposit; western Serbia. - Zbornik Radova Rudarskog Geoloskog Fakulteta, Universitet u Beogradu, 18, p. 57-66.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Stragari

General data

Deposit name(s): Stragari **Identifier:** YUG-00053
Commodities: Asb 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.674 **Latitude:** 44.163 **District:** Sumadijski

Geology**Ore deposit type (gitology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Discordant envelope of disseminated ore

Mineralization **Age:** Cenozoic**Ore mineralogy**

Chrysotile (Clino-, Ortho-, Par

Host rocks **Age:****Hostrock formation names**

Contact serpentinite mass - Cretaceous limestone

Host rock lithologyBasic to ultrabasic rock s.l.
Serpentinite
Limestone**Economy****Exploitation type**

Surface mining

Asb **Asbestos (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	15 %
Resource:	- t	Average grade:	%

Environment

Fibrous minerals in the form of fugitive dust pose a risk to human health through air contamination (airborne transportation).
Mining wastes expose asbestos to erosion by natural agents (wind and water).

Comments**Geological references**

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Vakanjac B. - (1982) - Geology of deposits of non-metallic minerals and mineral construction materials. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 95-111.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references**Other data bases**

Carte Métallogénique de l'Europe 26-053

Suplja Stena

General data**Deposit name(s):** Suplja Stena**Identifier:** YUG-00047**Commodities:** Hg 309 t **Class** D**Status:** Old industrial mine, abandoned deposit**Company:****Longitude:** 20.544 **Latitude:** 44.632**District:** Beograd**Geology****Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Mercury deposits hosted by sediments injected by basic diatremes (Almaden): Hg, (As, Sb)

Ore deposit shape

Discordant envelope of disseminated ore

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Miocene**Ore mineralogy**Cinnabar
Pyrite
Marcasite
Sphalerite
Chalcopyrite**Host rock mineralogy**Quartz
Barite**Hydrothermal alteration**

Silicification

Host rocks **Age:** Jurassic**Host rock lithology**Basic to ultrabasic rock s.l.
Serpentinite
Undifferentiated sediment**Economy****Exploitation type**

Underground mining

Hg **Mercury (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	80 t	Average grade:	1.46 %
Reserve:	229 t	Average grade:	0.6 %
Resource:	- t	Average grade:	- %

Environment

The primary ore mineralogy, mainly composed of sulfides generates Acid Mine Drainage and associated dissolved metals that can affect the quality of drainage water, soils and stream sediments.

The alteration of cinabar leads to the release of Mercury that can be bioaccumulated in the ecosystems and the foodchain.

Comments

The ore contains 0.2-1.0% Hg (Jankovic - 1982).

Between 1885-1891, 7,796 t @ 1.46% Hg have been extracted.

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe

26-047

Suva Ruda

General data

Deposit name(s): Suva Ruda **Identifier:** YUG-00103

Commodities: Fe 1 000 000 t **Class** D **Status:** Deposit of unknown status
 Cu 0 t **Class** N/A

Company: Rudnik Magnetita Suva Ruda - Raska

Longitude: 20.735 **Latitude:** 43.304 **District:** Raski

Geology**Ore deposit type (geology)**

Fe (magnetite) skarns: Fe, (Co)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization Age: Cenozoic**Ore mineralogy**Magnetite
Chalcopyrite
Martite
Pyrite
Marcasite
Valentinite
Bismuthinite**Host rock mineralogy**

Garnet

Hydrothermal alteration

Skarn formation

Host rocks Age: Paleozoic (Primary)**Hostrock formation names**Paleozoic schists
Kopaonik granodioritic complex**Host rock lithology**Exoskarn
Amphibolite (s.l.)
Marble, cipolin (crystalline limestone)
Calcic hornfels, tactite**Economy****Exploitation type**Surface mining
Underground mining**Fe Iron (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	1000000 t	Average grade:	42 %
Resource:	- t	Average grade:	- %

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	0.96 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

Acid mine drainage potential due to the primary ore composition enriched in sulfides like chalcopyrite, pyrite, marcasite.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

CommentsMining was initiated in 1972 with an output of 250,000 t/y and a content of 26.78% Fe₃O₄ and 0.96% Cu

Geological references

- Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.
- Antonijević I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.
- Janković S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 1:2,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.
- Janković S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

- Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.
- Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

The Iron Ore Deposits of Europe - 1978 YU19

Suvo Rudiste

General data

Deposit name(s):	Suvo Rudiste	Identifier:	YUG-00104
Commodities:	Fe 200 000 t <i>Class</i> E	Status:	Old industrial mine, exhausted deposit
	Cu 0 t <i>Class</i> N/A		
	Mn 0 t <i>Class</i> N/A		
Company:	Rudnik Magnetita Suva Ruda - Raska		
Longitude:	20.790	Latitude:	43.291
		District:	Rasinski

Geology**Ore deposit type (geology)**

Fe (magnetite) skarns: Fe, (Co)

Ore deposit shape

Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization **Age:** Cenozoic**Ore mineralogy**Magnetite
Chalcopyrite
Martite
Pyrite
Marcasite
Valentinite
Bismuthinite
Hematite**Host rock mineralogy**

Garnet

Hydrothermal alteration

Skarn formation

Host rocks **Age:** Paleozoic (Primary)**Hostrock formation names**Kopaonik granodioritic complex
Paleozoic schists**Host rock lithology**Exoskarn
Marble, cipolin (crystalline limestone)
Amphibolite (s.l.)
Calcic hornfels, tactite**Economy****Exploitation type**

Surface mining

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	200000 t	Average grade:	38 %
Resource:	- t	Average grade:	- %

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	0.7 %
Resource:	- t	Average grade:	- %

Mn Manganese (metal)**Ore type:** Ore of indeterminate nature

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	0.4 %
Resource:	- t	Average grade:	- %

Environment

Acid mine drainage potential due to the primary ore composition enriched in sulfides like chalcopyrite, pyrite, marcasite etc.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

The ore contained 36-40% Fe, 0.7% Cu and 0.2% Mn. In 1982, annual output was 300,000 t/y ore.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Antonijević I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Janković S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 1:2,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Janković S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

The Iron Ore Deposits of Europe - 1978 YU20

Takovo

General data

Deposit name(s): Takovo **Identifier:** YUG-00115

Commodities: Sb 0 t **Class:** N/A **Status:** Group of mineral occurrences

Company:

Longitude: 20.397 **Latitude:** 44.056 **District:** Moravicki

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives
Sediment-hosted ore deposits related to shallow intrusions: Au, Ag, Hg, Sb, As

Ore deposit shape

Discordant envelope of disseminated ore
Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Neogene (Miocene to Pliocene)

Ore mineralogy

Stibnite
Cinnabar
Pyrite
Marcasite

Host rock mineralogy

Quartz
Chalcedony
Opal

Hydrothermal alteration

Silicification

Host rocks **Age:** Triassic

Hostrock formation names

Triassic silicified limestone
Subvolcanic dacite intrusions

Host rock lithology

Dacite
Limestone

Economy**Exploitation type**

Unworked

Sb **Antimony (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

High acid generation potential due to the sulfidic composition of the primary ore.
The hydrothermal alteration type (silica) tends to decrease acid-buffering capacity of the host-rocks. Moreover, the presence of cinnabar tends to release, when oxidized, Hg into the environment.
This element, when accumulated in the natural receptors (like soils or stream sediments) is toxic for human health and ecosystems.

Comments**Geological references**

Jankovic S and Petkovic M. - (1982) - Metallogenic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.
Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Other references

Tanda

General data

Deposit name(s): Tanda **Identifier:** YUG-00198
Commodities: W 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 22.157 **Latitude:** 44.233 **District:** Borski

Geology**Ore deposit type (geology)**

Granitic and peri-granitic veins and stockworks (greisen): Sn-W, (Cu, Bi, Sb, base metals)

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization Age:**Ore mineralogy**Scheelite
Chalcopyrite
Molybdenite
Sphalerite
Galena
Pyrite
Stibnite
Gold**Host rock mineralogy**

Feldspar

Host rocks Age:**Hostrock formation names**

Granite of Tanda

Host rock lithology

Granite (s.l.)

Economy**Exploitation type**

Mining method unknown

W Wolfram (WO₃)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals contained in the ore.
 Expected high dissolved contents of base metals and W in surface water.

CommentsThe ore contains up to 0.9% WO₃ (Jankovic - 1982)**Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Teocin

General data

Deposit name(s): Teocin **Identifier:** YUG-00209
Commodities: Qtz 71 550 t **Class** D **Status:** Deposit of unknown status
Company:
Longitude: 20.279 **Latitude:** 44.088 **District:** Moravicki

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization **Age:****Ore mineralogy**

Quartz

Host rocks **Age:** Triassic**Host rock lithology**

Dolomite, dolostone

Economy**Exploitation type**

Mining method unknown

Qtz **Massive quartz, blocks for ferrosilicon (SiO₂)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	71550 t	Average grade:	-

Environment

Possible contamination of surface water by suspended matter.

Comments

Possibility for piezoelectric or/and optical use

Geological references

Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.

Economic references**Other references**

Tisovik

General data

Deposit name(s): Tisovik **Identifier:** YUG-00114
Commodities: Pb 0 t **Class:** N/A **Status:** Old small-scale mine, exhausted deposit
Company:
Longitude: 19.563 **Latitude:** 44.264 **District:** Kolubarski

Geology**Ore deposit type (geology)**

Carbonate-hosted base metals deposits: Pb-Zn-Ag, Ba, F
 Unspecified volcano-sedimentary and sedimentary-exhalative deposits

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:** Middle Triassic (Muschelkalk)

Ore mineralogy

Cerussite
 Mimetite
 Pyrite

Host rocks **Age:** Middle Triassic (Muschelkalk)

Hostrock formation names

Middle Triassic carbonate facies

Host rock lithology

Carbonate rock s.l.

Economy**Exploitation type**

Mining method unknown

Pb **Lead (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid mine drainage potential due to the pyritic composition of the primary ore. The carbonates (like cerussite) existing either in the gangue or in the host rocks may increase the acid-buffering capacity of the rocks.

Comments**Geological references**

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Popovic R. - (1991) - Pojava sulfidne mineralizacije u Dolovima (dolina reke Ljubovide, zapadna Srbija) Translated Title: Occurrence of sulfide mineralization in Dolovi, the Ljubovida River valley, western Serbia. - Glasnik Prirodnjackog Muzeja u Beogradu, Serija A: Mineralogija, Geologija, Paleontologija, 46, p. 143-149.

Economic references**Other references**

Tolishnitsa

General data**Deposit name(s):** Tolishnitsa**Identifier:** YUG-00132

Commodities: Cu 15 000 t **Class** D
 Au 0 t **Class** N/A

Status: Deposit or prospect of unknown status**Company:****Longitude:** 20.460**Latitude:** 43.612**District:****Geology****Ore deposit type (geology)**

Unspecified ore deposits related to basic-ultrabasic magmatic rocks

Volcanogenic massive and disseminated Cu-Au sulphide deposits: Cu, Au, (Zn, Co, Mo, Bi)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization Age:**Ore mineralogy**

Pyrite
 Chalcopyrite
 Magnetite
 Cubanite
 Covellite
 Chalcocite
 Iron Oxydes(unspecified)

Host rock mineralogy

Quartz
 Chalcedony
 Carbonates

Hydrothermal alteration

Silicification
 Chloritization

Host rocks**Age:****Economy****Exploitation type**

Mining method unknown

Cu Copper (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	-	t	Average grade:	-	%
Reserve:	-	t	Average grade:	-	%
Resource:	15000	t	Average grade:	0.6	%

Au Gold (metal)**Ore type:** Ore of indeterminate nature

Past production:	-	t	Average grade:	-	
Reserve:	-	t	Average grade:	-	
Resource:	-	t	Average grade:	-	

Environment

High acid generation potential due to the sulfide content of the primary ore body.

This Acid Rock Drainage can be enhanced by the various mineral assemblages forming the hydrothermal alteration halo.

Comments

Resources : 2.5 Mt @ 0.6% Cu

Geological references

Jankovic S and Putnik S. - (1980) - Copper deposits in the Southeastern Europe connected with the ophiolite complexes. - European Copper Deposits. Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects, Belgrade. p. 117-123.

Putnik S. - (1981) - Metalogenia bakra jurske dijabaz-roznacke formacije - Metallogenesis of copper in jurassic diabase-chert formation - Geoinstitut. Beograd, 1981. Monographs, vol. 6, 117 p., 2 plates.

Economic references

Other references

Topola

General data

Deposit name(s): Topola **Identifier:** YUG-00105
Commodities: Fe 130 000 t **Class:** E **Status:** Deposit of unknown status
Company:
Longitude: 20.683 **Latitude:** 44.253 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.
 Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Cap, blanket, crust
 Subconcordant or stratabound mass or lens of massive to submassive ore

Mineralization **Age:** Lower/Early Cretaceous

Ore mineralogy

Chamosite
 Goethite

Host rocks **Age:** Lower/Early Cretaceous

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	130000 t	Average grade:	31 %
Resource:	- t	Average grade:	- %

Environment

Drainage water with suspended solids content enriched in Fe/Mn.

Comments

The ore contains 31% Fe, 20% SiO₂, 19% Al₂O₃, 1% Ni and 2.74% Cr.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.
 Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references****Other data bases**

The Iron Ore Deposits of Europe - 1978 YU22

Trbusnica

General data

Deposit name(s): Trbusnica **Identifier:** YUG-00163
Commodities: Sb 0 t **Class:** N/A **Status:** Group of mineral occurrences
Company:
Longitude: 20.363 **Latitude:** 44.352 **District:** City of Beograd

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**Stibnite
Sphalerite
Galena
Pyrite
Jamesonite**Host rock mineralogy**Quartz
Chalcedony
Calcite**Host rocks** **Age:** Upper/Late Cretaceous**Hostrock formation names**

Upper Cretaceous flysh

Host rock lithologyLimestone
Flysch and fine- to medium-grained
volcaniclastic (volcano-sedimentary)
turbidite**Economy****Exploitation type**

Unworked

Sb **Antimony (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides content of the primary ore.

Comments**Geological references**

Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.

Stajevic B and Mudrinic C. - (1978) - Pojave antimona kod Trbusnice (Severna Sumadija) Translated Title: Antimony occurrences at Trbusnica near Lazarevac, northern Sumadija. - Zbornik Radova Rudarsko Geoloskog Fakulteta, Universitet u Beogradu, 21, p. 35-42.

Economic references**Other references**

Trijeska

General data

Deposit name(s): Trijeska **Identifier:** YUG-00217
Commodities: U 0 t **Class:** N/A **Status:** Primary occurrence of unknown status
Company:
Longitude: 20.522 **Latitude:** 44.011 **District:** Moravicki

Geology**Ore deposit type (geology)**

Uraniferous vein, breccia and stratabound disseminated deposits: U, (Mo, Cu, Se, F, Th, REE, Pb, Zn)

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age: Tertiary**Ore mineralogy**

Apatite
 Pyrite
 Chalcopyrite
 Iron Oxides(unspecified)

Host rock mineralogy

Opal
 Illite

Hydrothermal alteration

Kaolinization

Host rocks Age: Tertiary**Hostrock formation names**

Borac calderas and Trijeska neck

Host rock lithology

Pyroclastic rocks s.l.
 Andesite

Economy**Exploitation type**

Unworked

U Uranium (metal)

Ore type: Ores in which the element is adsorbed onto clays, organic compounds, oxyhydroxides, etc.

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides minerals present in the ore.
 Expected concentrations of dissolved U, radionuclides and base metals in the drainage waters.
 Radon and gamma radiations.

Comments**Geological references**

Klajn D. - (1983) - Uranium hydrothermal mineralization in the Borac-Rudnik Area (Sumadija); possible relation with buried stratiform ore deposits. - Anuarul Institutului de Geologie si Geofizica = Annuaire de l'Institut de Geologie et de Geophysique, 61, p. 199-204.

Economic references**Other references**

Trnava

General data

Deposit name(s): Trnava **Identifier:** YUG-00074
Commodities: Mg 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 20.586 **Latitude:** 43.124 **District:** Raski

Geology**Ore deposit type (geology)**

Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization Age:**Ore mineralogy**

Magnesite (Gibbsite)

Host rocks Age:**Economy****Exploitation type**

Mining method unknown

Mg Magnesium, magnesite (MgCO₃)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment**Comments**

Other Trnava : 20.5123/43.2889, near Raska

Geological references

Vakanjac B and Ilich M. - (1980) - Non-metallics in the ultramafites of the ophiolite complex of Yugoslavia. - Ophiolites; International ophiolite symposium. Nicosia, Cyprus. April 1-8, 1979. p. 722-726.

Economic references**Other references****Other data bases**

Carte Métallogénique de l'Europe 26-091

Trstenik

General data

Deposit name(s):	Trstenik	Identifier:	YUG-00030
Commodities:	Ni 30 000 t	Class	C
	Fe 1 200 000 t	Class	D
	Cr 105 000 t	Class	E
	Co 0 t	Class	N/A
Company:		Status:	Deposit of unknown status
Longitude:	20.848	Latitude:	42.667
		District:	Kosovo

Geology**Ore deposit type (geology)**

Residually enriched ore deposits: Fe, Mn, Ni-Co, Au, Pt, P, U, corundum, etc.
Oolitic iron ore deposits (Clinton, Minette): Fe

Ore deposit shape

Stratabound envelope of disseminated ore
Cap, blanket, crust

Mineralization **Age:** Upper/Late Cretaceous

Ore mineralogy

Goethite
Magnetite
Chromite
Hematite
Siderite
Fe-Chlorite
Millerite

Host rock mineralogy

Calcite
Quartz
Serpentine
Kaolinite

Host rocks **Age:** Upper/Late Cretaceous

Hostrock formation names

Paleozoic serpentinite
Upper Cretaceous rocks (Senonian)

Host rock lithology

Conglomerate
Sandstone
Reef limestone (bioherm, biostome)
Oolitic limestone, oncoidal limestone

Economy**Exploitation type**

Unworked

Fe Iron (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	1200000 t	Average grade:	40 %
Resource:	- t	Average grade:	- %

Cr Chrome (Cr2O3)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	105000 t	Average grade:	3.5 %
Resource:	- t	Average grade:	- %

Ni Nickel (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	30000 t	Average grade:	1 %
Resource:	- t	Average grade:	- %

Co Cobalt (metal)*Ore type:* Ore of indeterminate nature

<i>Past production:</i>	- t	<i>Average grade:</i>	- %
<i>Reserve:</i>	- t	<i>Average grade:</i>	0.1 %
<i>Resource:</i>	- t	<i>Average grade:</i>	- %

Environment

Particulate and colloidal iron compounds can contaminate discharge water.

Comments

Investigated in 1952 by adits and drilling.

Individual bodies not over 0.5 Mt of ore with 34.39% Fe (max 41.5%), 1.39% Cr, 0.98% Ni and 0.1% Co.

Data in Laznicka P. (1985) p 212 : 1.2 Mt Fe (40%), 105,000 t Cr (3.5%) and 30,000 t Ni (1%)

Drenica ore field : Trstenik, Vrbovec and Gradina deposits (Boev and Jankovic - 1996).

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Boev B. and Jankovic S. - (1996) - Nickel and nikeliforous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references***Other data bases*

The Iron Ore Deposits of Europe - 1978 YU24

Tulare

General data**Deposit name(s):** Tulare**Identifier:** YUG-00136

Commodities: Au 0 t *Class* N/A
 Cu 0 t *Class* N/A
 PbZn 0 t *Class* N/A

Status: Deposit or prospect of unknown status**Company:****Longitude:** 21.443**Latitude:** 42.795**District:** Jablanicki**Geology****Ore deposit type (geology)**

Low-sulphidation (adularia - sericite) epithermal deposits: Au, Ag, Pb, Zn, Cu, Sb, (Hg, As, Mn, Tl)

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)

Ore deposit shapeField of discordant lodes (n*km², n*ha)

Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**

Pyrite
 Galena
 Sphalerite
 Chalcopyrite
 Tetrahedrite
 Enargite
 Bornite
 Antimonite
 Pyrrhotite
 Gold
 Electrum

Host rock mineralogy

Quartz
 Alunite

Hydrothermal alteration

Argillic alteration
 Silicification

Host rocks **Age:** Neogene (Miocene to Pliocene)**Hostrock formation names**

Tulare Caldera
 Lece Volcanogenic complex

Host rock lithology

Pyroclastic rocks s.l.
 Andesite

Economy**Exploitation type**

Unworked

Au Gold (metal)**Ore type:** Ore of indeterminate nature**Past production:** - t**Average grade:** -**Reserve:** - t**Average grade:** -**Resource:** - t**Average grade:** -**Cu Copper (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t**Average grade:** -**Reserve:** - t**Average grade:** -**Resource:** - t**Average grade:** -

PbZn Lead + Zinc (metal)*Ore type:* Ore of indeterminate nature

<i>Past production:</i>	- t	<i>Average grade:</i>	-
<i>Reserve:</i>	- t	<i>Average grade:</i>	-
<i>Resource:</i>	- t	<i>Average grade:</i>	-

Environment

High acid generation potential due to the sulfidic composition of the primary ore.
 The widespread hydrothermal alteration types (silica, advanced argillic) tends to increase acid-generating capacity of the rocks.
 Potential release of Cu and others metals (Zn, Pb, Sb..) into the drainage waters.

Comments**Geological references**

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babeş Bolyai, Geologia. 40, (1), p. 85-102.

Pesut D. - (1976) - Geology, tectonics and metallogeny of Lece Massif. - Rasprave Zavoda za Geoloska i Geofizicka Istrazivanja, 14, 59 p.

Popovic R. - (2000) - Distribution of base and precious metals in the Lece volcano-intrusive massif (Vardar Zone) - Proceedings of the International Symposium "Geology and Metallogeny of the Dinarides and the Vardar Zone". The Academy of Sciences and Arts of the Republic of Srpska. The Departement of Natural, Mathematical and Technical Sciences, Vol. 1, pp. 443-452

Economic references**Other references**

Usce

General data

Deposit name(s): Usce **Identifier:** YUG-00140

Commodities: Coal 0 t **Class** N/A **Status:** Deposit of unknown status

Company: Rudnik kamenog uglja IBARSKI RUDNICI - EPS

Longitude: 20.604 **Latitude:** 43.473 **District:** Raski

Geology**Ore deposit type (geology)**

Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Miocene**Host rocks** **Age:** Miocene**Hostrock formation names**

Ibar Tertiary coal basin

Host rock lithology

Coal (anthracite, graphite)

Detrital rock s.l.

Economy**Exploitation type**

Underground mining

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Potential acid rock drainage with respect of the sulfides content.

Suspended matter in mine water discharge.

Landform instability (collapses) created during and after mining operations.

Comments

Coal mined in the Ibar basin is considerably metamorphosed by contact-thermal changes of andesite effusions.

The average sulphur content is 5 to 6% and the heating value is about 26,000 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Tsvetichanin R. - (1976) - Petrography of coals in Yugoslav deposits of various ages. - Lithology and Mineral Resources, 11, (1), p. 120-126.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Other references

Valja Saka

General data

Deposit name(s): Valja Saka **Identifier:** YUG-00059
Commodities: PbZn 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status
Company: Rudarsko Topioninarski Basen BOR
Longitude: 21.909 **Latitude:** 44.224 **District:** Branicevski

Geology

Ore deposit type (geology)
Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)
Ore deposit shape
Atypical, unspecified or ill-defined form
Mineralization **Age:**
Host rocks **Age:**

Economy

Exploitation type
Mining method unknown
PbZn Lead + Zinc (metal)
Ore type: Ore of indeterminate nature

Past production:	-	t	Average grade:	-
Reserve:	-	t	Average grade:	-
Resource:	-	t	Average grade:	-

Environment**Comments****Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.
Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Economic references**Other references**

Other data bases
Carte Métallogénique de l'Europe 26-059

Velebit

General data*Deposit name(s):* **Velebit***Identifier:* **YUG-00231***Commodities:* **Petr** 0 m3 *Class* **N/A***Status:* Producing deposit*Company:**Longitude:* 19.942*Latitude:* 45.977*District:***Geology***Ore deposit type (geology)*

Oil deposits: oil, (S)

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization *Age:**Host rocks* *Age:***Economy***Exploitation type*

Mining method unknown

Petr **Petroleum (substance)***Ore type:* Ore in which the element forms a distinct mineral phase*Past production:* - m3*Average grade:* -*Reserve:* - m3*Average grade:* -*Resource:* - m3*Average grade:* -**Environment**

Potential contamination of surface waters, soils and sediments by hydrocarbons and oil products.

Comments**Geological references****Economic references****Other references**

Veliki Krivelj

General data

Deposit name(s): Veliki Krivelj **Identifier:** YUG-00076

Commodities: **Au** 50 t **Class** B **Status:** Producing industrial mine
Cu 2 385 000 t **Class** B
Mo 120 000 t **Class** B
Ag 280 t **Class** D

Company: Rudarsko Topioncarski Basen BOR

Longitude: 22.097 **Latitude:** 44.131 **District:** Borski

Geology**Ore deposit type (geology)**

Porphyry Cu-Au deposits: Cu, Au, (Ag, Bi, Te)
 Secondary Cu sulphide (cementation) deposits: Cu

Ore deposit shape

Discordant envelope of disseminated ore
 Stockwork (or network) of stringers or veinlets (thickness < 50 cm), discordant on the strata

Mineralization **Age:** Upper/Late Cretaceous

Ore mineralogy

Chalcopyrite
 Molybdenite
 Pyrite
 Magnetite
 Scheelite
 Fluorite

Hydrothermal alteration

Biotitization
 Sericitization
 Argillic alteration
 Silicification

Host rocks **Age:** Upper/Late Cretaceous

Hostrock formation names

Timok andesite complex

Host rock lithology

Andesite
 Quartz diorite
 Diorite

Economy**Exploitation type**

Surface mining

Cu Copper (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	510000 t	Average grade:	0.34 %
Reserve:	- t	Average grade:	- %
Resource:	1875000 t	Average grade:	0.34 %

Mo Molybdenum (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	Average grade:	-
Reserve:	120000 t	Average grade:	-
Resource:	- t	Average grade:	-

Ag Silver (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	60 t	Average grade:	0.4 g/t
Reserve:	- t	Average grade:	- g/t
Resource:	220 t	Average grade:	0.4 g/t

Au	Gold (metal)		
	<i>Ore type:</i>	Ore of indeterminate nature	
	<i>Past production:</i>	10 t	<i>Average grade:</i> 0.07 g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	40 t	<i>Average grade:</i> 0.07 g/t

Environment

Extreme Acid Mine Drainage production due to the sulfides assemblages and the large alteration halos. This AMD is enhanced by the types of hydrothermal alteration (argillic, sericitic..) that greatly increase acid-generating capacity.

Produced mine waters or drainage waters tend to have a high base metal content.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

In 1982, the production design rate was 8 Mt/y, containing more than 30,000 t of Cu and 60,000 t/y of magnetite, 200 t/y of Mo, precious and rare metals (Au,Ag,Pt,Pd,Se and Re).

Data in Laznicka P. (1985) p 975 : 3.2 Mt Cu (0.4%), 120,000 t Mo, 240 t Ag and 64 t Au. About 50% supergene enrichment.

Geological references

Bogdanovic PO. - (1976) - Metalogenetska rejonizacija istocne Srbije Translated Title: Metallogenic zoning of eastern Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 33-34, p. 111-133.

Herrington R.J., Jankovic S. and Kozelj D. - (1998) - The Bor and Majdanpek copper-gold deposits in the context of the Bor Metallogenic Zone (Serbia, Yugoslavia) - MDSG 98 Programme at St Andrews Scotland 13th-15th December 1998, 10 p.

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S and Jelenkovic R. - (1995) - Gold mineralization in Yugoslavia; metallogenic environments and associations of minerals. - Studia Universitatis Babeş Bolyai, Geologia. 40, (1), p. 85-102.

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S, Herrington RJ, Kozelj D, and Porter TMe. - (1998) - The Bor and Majdanpek copper-gold deposits in the context of the Bor metallogenic zone (Serbia, Yugoslavia) In: Porphyry and hydrothermal copper & gold deposits; a global perspective; conference proceedings. - Porphyry and hydrothermal copper & gold deposits; a global perspective. Perth, West.Aust., Australia. Nov. 30-Dec. 1, 1998.

Jankovic S, Terzic M, Aleksic D, Karamata S, Spasov T, Jovanovic M, Milicic M, Miskovic V, Grubic A, and Antonijevic I. - (1980) - Metallogenic features of copper deposits in the volcano- intrusive complexes of the Bor District, Yugoslavia. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 42-49.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Karamata S., Knezevic V., Pecskay Z. and Djordjevic M. - (1997) - Magmatism and metallogeny of the Ridanj-Krepoljin belt (eastern Serbia) and their correlation with northern and eastern analogues - Mineralium Deposita, 32, pp. 452-458

Marjanovic D and Hovanec G. - (1979) - Promene rude lezista "Veliki Krivelj" u zavisnosti od lokalnih meteoroloskih faktora i autogenih procesa u rudnoj masi; rastovaranje grozda iz ruda Translated Title: Alterations of the Veliki Krivelj ore deposit as a result of meteorological factors and a - Rudarski Glasnik, 1, p. 39-45.

Sillitoe RH. - (1980) - The carpathian-Balkan porphyry copper belt. A cordilleran perspective. - European Copper Deposits.

Jankovic S and Sillitoe RH (Eds), UNESCO - IGCP Projects N° 169 and 63, Belgrade. p. 26-35.

Economic references

Anonymous. - (1979) - Yugoslavia's metal with a future. - Metal Bulletin Monthly, December 1979, p. 30-36.

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Graham G. - (1982) - Bor starts up new mine. - Metal Bulletin, 6729, p. 13. 1982.

Lewis A. - (1983) - Yugoslavia's "RTB Bor" copper combine; Europe's largest copper producer eliminates concentrate imports as the new Veliki Krivelj complex reaches capacity. - E&M J, 184, (10), p. 70-74.

Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Steblez W. - (1998) - Republics of the former Yugoslavia. - Mining Annual Review, 1998, p. 218-221.

Other references

Veliki Majdan

General data

Deposit name(s): Veliki Majdan **Identifier:** YUG-00045

Commodities: Ag 0 t **Class** N/A **Status:** Producing industrial mine
 Cd 0 t **Class** N/A
 Cu 0 t **Class** N/A
 PbZn 0 t **Class** N/A

Company: Hemijska Industrija Zorka Sabac, Veliki Majdan

Longitude: 19.340 **Latitude:** 44.306 **District:** Macvanski

Geology**Ore deposit type (geology)**

Pb-Zn-Ag skarns and stratiform mantos: Pb, Zn, Ag, (Au)

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)

Ore deposit shape

Discordant mass (cylinder, sheet, cone, etc.) with filling commonly brecciated

Mineralization **Age:** Cenozoic**Ore mineralogy**

Magnetite
 Sphalerite
 Valleriite
 Pyrrhotite
 Chalcopyrite
 Galena
 Arsenopyrite
 Grey copper
 Jamesonite
 Bournonite
 Miargyrite
 Pyrargyrite
 Stibnite
 Safflorite

Host rock mineralogy

Quartz
 Calcite
 Barite
 Siderite

Hydrothermal alteration

Skarn formation

Host rocks **Age:** Triassic**Hostrock formation names**

Contact zone of the Boranja granodiorite
 Triassic limestone

Host rock lithology

Undifferentiated metamorphic rock
 Limestone
 Andesite
 Dacite

Economy**Exploitation type**

Underground mining

PbZn Lead + Zinc (metal)**Ore type:** Ore of indeterminate nature

Past production:	-	t	Average grade:	5.9	%
Reserve:	-	t	Average grade:	-	%
Resource:	-	t	Average grade:	-	%

Cu Copper (metal)**Ore type:** Ore of indeterminate nature

Past production:	-	t	Average grade:	0.4	%
Reserve:	-	t	Average grade:	-	%
Resource:	-	t	Average grade:	-	%

Ag	Silver (metal)		
	<i>Ore type:</i>	ore of indeterminate nature	
	<i>Past production:</i>	- t	<i>Average grade:</i> - g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> - g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t
Cd	Cadmium (metal)		
	<i>Ore type:</i>	ore of indeterminate nature	
	<i>Past production:</i>	- t	<i>Average grade:</i> -
	<i>Reserve:</i>	- t	<i>Average grade:</i> -
	<i>Resource:</i>	- t	<i>Average grade:</i> -

Environment

The primary mineralization is mainly composed of sulfides whose oxidation generates acid, ferric iron and dissolved metals (Pb, Zn, Cu...) that can affect drainage water, soils and stream sediments.

The potential acid mine drainage generated is buffered by the gangue mineralogy (carbonates) which are acid-consuming minerals. The host rock assemblage (marble and cipolin) which alters to calc-silicates decrease acid-buffering capacity.

Presence of As released by the oxidation of arsenopyrite and Grey copper. As which is highly mobile in medium to high pH environment, can be accumulated in stream sediments.

No information related to mine waste deposits as well as to tailings which are potential sources of contaminants in the form of particulates and dissolved metals.

Comments

Podrinje Zone, around the Boranja granodiorite intrusion

In 1982, current output was 60,000 t @ 3.5% Pb, 2.4% Zn, 0.4% Cu, 25% Pyrite, 160 g/t Ag and 200 g/t Cd.

In 1990, the grade was about 5% Pb, 4% Zn, 190 g/t Ag.

Geological references

Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.

Jankovic S. - (1967) - Metallogenetske epohe i rudonosna podruca jugoslavije. - Beograd, 1967.

Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Strucl I. - (1981) - Die schichtgebundenen Blei-Zink-Lagerstaetten Jugoslawiens Translated Title: The stratiform lead-zinc deposits of Yugoslavia. - Mitteilungen der Oesterreichischen Geologischen Gesellschaft, 74-75, p. 307-322.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-043

Veluce

General data

Deposit name(s):	Veluce	Identifier:	YUG-00095
Commodities:	Co 2 400 t	Class	C
	Ni 36 900 t	Class	C
	Pltd 0 t	Class	N/A
Company:		Status:	Dormant deposit
Longitude:	21.084	Latitude:	43.544
		District:	Rasinski

Geology**Ore deposit type (geology)**

Laterite-related ore deposits: Fe, Mn, Ni-Co, Au, Pt, corundum, P, REE, Nb, etc.

Modern placers, deposits associated with tillites, etc.: Au, Pt, Sn,Ti, REE, diamond, gemstones, (Zr, etc.)

Ore deposit shape

Concordant to subconcordant envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Nontronite
Magnesite (Giobertite)

Host rock mineralogy

Silica

Host rocks Age:**Host rock lithology**

Ultrabasic rock
Peridotite
Serpentinite

Economy**Exploitation type**

Mining method unknown

Ni Nickel (metal)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	36900 t	Average grade:	1.23 %

Co Cobalt (metal)

Ore type: Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	- %
Reserve:	- t	Average grade:	- %
Resource:	2400 t	Average grade:	0.08 %

Pltd Platinoids, group (metal)

Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

The main potential environmental problems are related to :

- the clay minerals assemblage existing in a lateritic context. Trough erosion of exposed mining areas, those assemblages generate high suspended solids content in surface water that can produce many impacts associated with surface waters, groundwater and terrestrial ecosystems;
- The dissolved metals (Ni, Co and Fe, Mn) that migrate from old mining operations to local ground and surface water.

Comments

Veluce-Rudjinci Ore Field (Boev and Jankovic - 1996) : Exploration carried out determined possible ore reserves of 3 Mt @ 1.23% Ni and 0.08% Co.
Occurrences of placer minerals of Pt (Jankovic - 1982).

Geological references

Boev B. and Jankovic S. - (1996) - Nickel and nikeliferoous iron deposits of the Vardar Zone (SE Europe) with particular reference to the Rzanovo-Studena Voda ore-bearing series - University "St. Kiril and Metodij" - Skopje. Faculty of Mining and Geology - Stip. Geological Department. Special Issue n° 3, 273 p.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-163

Veta

General data

Deposit name(s): Veta **Identifier:** YUG-00197
Commodities: Gr 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 22.173 **Latitude:** 43.201 **District:** Pirotski

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to metamorphic rocks: andalusite group, wollastonite, graphite, etc.

Ore deposit shape

Concordant to subconcordant envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Graphite

Host rocks Age: Carboniferous

Host rock lithology

Schist (s.l.), phyllite

Economy**Exploitation type**

Unworked

Gr Graphite (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Possible contamination of surface water by suspended matter.

Comments

The graphite content ranges from 9 to 18% C. Preliminary flotation tests have proved that products with 45-50% C can be obtained from the ore. The graphite lenses are up to 40 m long and 1-4m thick.

Geological references

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Vidovacki Krs

General data

Deposit name(s): Vidovacki Krs **Identifier:** YUG-00218

Commodities: Feld 0 t **Class** N/A **Status:** Deposit of unknown status
 Mica 0 t **Class** N/A
 Qtz 0 t **Class** N/A

Company:

Longitude: 21.543 **Latitude:** 43.167 **District:** Toplicki

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to plutonic rocks: ornamental stones, feldspar, nepheline, etc.
 Pegmatites: Sn, Nb-Ta, Li-Be, gemstones, cryolite, mica, etc.

Ore deposit shape

Mineralized dyke (orebody: magmatic rock)

Mineralization Age:**Ore mineralogy**

Feldspar
 Quartz
 Muscovite
 Biotite

Host rocks Age:**Host rock lithology**

Pegmatite

Economy**Exploitation type**

Surface mining

Feld Feldspar, nepheline (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	Average grade:	-
Reserve:	-	Average grade:	-
Resource:	-	Average grade:	-

Qtz Massive quartz, blocks for ferrosilicon (SiO₂)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	Average grade:	-
Reserve:	-	Average grade:	-
Resource:	-	Average grade:	-

Mica Mica, sheet (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	-	Average grade:	-
Reserve:	-	Average grade:	-
Resource:	-	Average grade:	-

Environment

Possible contamination of surface water by suspended matter.

Comments

Exploitation of feldspar from Prokuplje pegmatitic province was initiated in 1956. During the 80st the flotation process annually yields 50,000 t of feldspar concentrate, 36,000 t of quartz concentrate and 14,000 t of mica concentrate.

The deposit of Vidovacki Krs contains about 60% of feldspar, 30% of quartz, 5% muscovite and 5% biotite.

Geological references

Anonymous. - (1982) - Jugoslavija za Rudarstvo. - 11th World Mining Congress, Beograd. 172 p.

Economic references

Other references

Vlajna

General data

Deposit name(s): Vlajna **Identifier:** YUG-00219
Commodities: Feld 0 t **Class:** N/A **Status:** Deposit of unknown status
Company:
Longitude: 21.887 **Latitude:** 42.795 **District:** Jablanicki

Geology**Ore deposit type (geology)**

Industrial rocks and minerals related to plutonic rocks: ornamental stones, feldspar, nepheline, etc.

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:****Host rocks** **Age:****Economy****Exploitation type**

Mining method unknown

Feld **Feldspar, nepheline (substance)****Ore type:** Ore of indeterminate nature**Past production:** - t **Average grade:** -**Reserve:** - t **Average grade:** -**Resource:** - t **Average grade:** -**Environment**

No data available.

Comments

Kukavica Mountains, South of Leskovac, feldspar deposit indicated on the SFR Yugoslavia geological map - 1:500,000 - 1970.

Geological references**Economic references****Other references**

Vranovac

General data

Deposit name(s): Vranovac **Identifier:** YUG-00174

Commodities: Ag 0 t **Class** N/A **Status:** Deposit of unknown status
 Au 0 t **Class** N/A
 Bi 0 t **Class** N/A
 Fe 0 t **Class** N/A

Company:

Longitude: 19.252 **Latitude:** 44.329 **District:** Macvanski

Geology**Ore deposit type (geology)**

Fe (magnetite) skarns: Fe, (Co)

Ore deposit shape

Discordant mass or lens of massive to submassive ore

Mineralization **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**Magnetite
Pyrrhotite
Arsenopyrite
Chalcopyrite
Scheelite
Pyrite
Sphalerite
Galena
Bismuth
Bismuthinite
Tetradymite
Tellurobismuthite**Host rock mineralogy**Garnet
Diopside
Hedenbergite
Epidote
Ilvaite**Hydrothermal alteration**

Skarn formation

Host rocks **Age:** Upper/Late Carboniferous
(Stephanian-Westphalian, Upper/Late
Namurian, Silesian, Pennsylvanian)**Hostrock formation names**Permo Carboniferous marble and schist
Neogene Boranja granodiorite**Host rock lithology**Marble, cipolin (crystalline limestone)
Schist/shale
Granodiorite
Skarn**Economy****Exploitation type**

Unworked

Fe Iron (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Au Gold (metal)**Ore type:** Ore in which the native element forms inclusions (sulphides, etc.)

Past production:	- t	Average grade:	- g/t
Reserve:	- t	Average grade:	0.84 g/t
Resource:	- t	Average grade:	- g/t

Ag	Silver (metal)		
	<i>Ore type:</i>	Ore in which the native element forms inclusions (sulphides, etc.)	
	<i>Past production:</i>	- t	<i>Average grade:</i> - g/t
	<i>Reserve:</i>	- t	<i>Average grade:</i> 640 g/t
	<i>Resource:</i>	- t	<i>Average grade:</i> - g/t
Bi	Bismuth (metal)		
	<i>Ore type:</i>	Ore in which the element forms a distinct mineral phase	
	<i>Past production:</i>	- t	<i>Average grade:</i> - %
	<i>Reserve:</i>	- t	<i>Average grade:</i> 1.88 %
	<i>Resource:</i>	- t	<i>Average grade:</i> - %

Environment

High acid generation potential due to the sulfides minerals contained in the primary ore.

The Acid Rock Drainage produced may be partly buffered by the limestone and the skarn formation of the host lithology, but in general calc-silicate skarn minerals show low neutralizing reactivity with acid waters.

Expected dissolved contents of Cu, Zn and Pb as well as As in the drainage waters with possible concentrations of those metals in the stream sediments.

Comments

The ore contains 0.84 g/t Au, 640 g/t Ag, 1.88% Bi

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Economic references

Other references

Vrelo

General data

Deposit name(s): Vrelo **Identifier:** YUG-00229
Commodities: Asb 15 000 000 t **Class** A **Status:** Industrial project under development
Company: Drvna industrija KOPAONIK - Kursumlija
Longitude: 21.250 **Latitude:** 43.057 **District:**

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to basic-ultrabasic magmatic rocks
 Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:**

Host rocks **Age:**

Host rock lithology

Basalt

Economy**Exploitation type**

Surface mining

Asb Asbestos (substance)

Ore type: Ore of indeterminate nature

Past production:	- t	Average grade:	-
Reserve:	15000000 t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Dust emission and fallout of fibrous minerals can pose a risk to human health.

Comments

Project of mine and plant in order to produce basalt fiber with annual production capacity of 2,700 t of basalt continuous fibers.

Geological references**Economic references**

Simic R., Jakovljevic S., Gilic N. and Dukic R. - (2001) - Feasibility study on building a plant for continuous basalt fibres production in Kursumlija. - Drvna industrija Kopaonik - Kursumlija. Rudarsko geoloski fakultet - Beograd, 38 p..
 Steblez W. - (1998) - Republics of the former Yugoslavia. - Mining Annual Review, 1998, p. 218-221.

Other references

Vrska Cuka

General data

Deposit name(s): Vrska Cuka **Identifier:** YUG-00147
Commodities: Coal 0 t **Class:** N/A **Status:** Producing small-scale mine
Company: Rudnik antracita VRSKA CUKA - EPS
Longitude: 22.336 **Latitude:** 43.824 **District:** Zajecarski

Geology**Ore deposit type (geology)**

Coal deposits

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Lower/Early Jurassic (Lias)**Host rocks** **Age:** Lower/Early Jurassic (Lias)**Host rock lithology**

Coal (anthracite, graphite)

Medium- to fine-grained detrital rock

Economy**Exploitation type**

Mining method unknown

Coal **Coal, lignite (substance)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Too few data for an environmental signature.

Comments

Production is limited by complex mining-geological conditions. 3 coal seams are of interest.

Vrska Cuka bituminous coal contains on average 2 to 3% of moisture, 14% of ash, 1% sulphur and its heating value is about 27,000 kJ/kg.

Geological references

Cveticanin R. - (1982) - Review of Yugoslav coal basins. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 46-67.

Tsvetichanin R. - (1976) - Petrography of coals in Yugoslav deposits of various ages. - Lithology and Mineral Resources, 11, (1), p. 120-126.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Davidovic S, Perisic M, and Bizjak A. - (1987) - Geostatistic processing of deposit Vrska Cuka; application of the specific methodology in coal deposit estimation in all stages of operation life of the mine. - The Mining Pribam in the Science and Technology 1987; Mathematical methods in geology. p. 7-7.

Other references

Vuckovica

General data

Deposit name(s): Vuckovica **Identifier:** YUG-00208
Commodities: Agt 0 t **Class:** N/A **Status:** Dormant deposit
Company:
Longitude: 20.794 **Latitude:** 43.948 **District:** Sumadijski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to basic-ultrabasic magmatic rocks
 Asbestos, talc or magnesite deposits hosted by basic and ultrabasic rocks

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age:**Ore mineralogy**

Opal
 Chalcedony
 Agate

Host rock mineralogy

Magnesite (Gibbsite)
 Dolomite
 Silica

Host rocks Age:**Host rock lithology**

Ultrabasic rock
 Serpentinite

Economy**Exploitation type**

Unworked

Agt Agata, chalcedony, jasper (substance)

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Possible contamination of surface water by suspended matter.

Comments**Geological references**

Ilic M. - (1998) - Gem raw materials and their occurrence in Serbia - Juvelirske mineralne sirovine i njihova nalazista u Srbiji - Beograd, Univerzitet, Rudarsko-geoloski fakultet, 140 p.

Economic references**Other references**

Zajaca

General data

Deposit name(s): Zajaca **Identifier:** YUG-00044

Commodities: Sb 90 000 t **Class** A **Status:** Old industrial mine, abandoned deposit

Company: Zajaca - Rudarsko - Topionicarski Basen

Longitude: 19.248 **Latitude:** 44.464 **District:** Macvanski

Geology**Ore deposit type (geology)**

Vein and disseminated Sb deposits: Sb, Hg, As, (Au, Tl)
 Jasperoid-hosted stratabound low sulphidation epithermal veins: Hg, Sb

Ore deposit shape

Stratabound envelope of disseminated ore
 Field of discordant lodes (n*km², n*ha)

Mineralization **Age:** Cenozoic

Ore mineralogy

Stibnite
 Pyrite
 Chalcopyrite
 Galena

Host rock mineralogy

Quartz

Hydrothermal alteration

Silicification

Host rocks **Age:** Upper/Late Carboniferous
 (Stephanian-Westphalian, Upper/Late
 Namurian, Silesian, Pennsylvanian)

Hostrock formation names

Late Carboniferous limestone
 Paleozoic schists

Host rock lithology

Undifferentiated metamorphic rock
 Limestone

Economy**Exploitation type**

Sublevel stoping

Sb **Antimony (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	90000 t	Average grade:	2.5 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

Generation of Acid Mine Drainage due to the content of iron sulfides and others sulfides.
 Potential production of dissolved metals like Sb in surface water.

Comments

Podrinje Zone, around the Boranja granodiorite intrusion
 The area produced about 90,000 t of Sb since 1890, with the deposits of Brasina, Rujevac, etc. Exploitation stopped in 1990.

Geological references

- Durickovic A. - (1982) - Metalogenija rudnog polja Brasina-Zajaca-Stolice-Dobri Potok Translated Title: Metallogeny of the Brasina mining field, Zajaca, Stolice, Dobri Potok. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 40, p. 17-53.
- Jankovic S and Petkovic M. - (1980) - The main lead, zinc and copper deposits of Yugoslavia; excursion No. 202 C. - Yugoslavia; outline of Yugoslavian geology; Excursion 201 A-202 C. Grubic A (Ed), Int, Geol. p. 75-94.
- Jankovic S and Petkovic M. - (1982) - Metallogenetic Epochs and Provinces of Yugoslavia. - Mining of Yugoslavia. 11th World Mining Congress, Beograd. p. 24-45.
- Jankovic S. - (1967) - Metalogenetske epohe i rudonosna podrucja jugoslavije. - Beograd, 1967.
- Jankovic S. - (1979) - Antimony deposits in south-eastern Europe. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 37, p. 25-48.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Salatic D. - (1999) - Mineral potential and its valorisation in yugoslavia - "VIII Balkan Mineral Processing Conference", 13-18 september 1999, Beograd, 9 p.

Other references

Other data bases

Carte Métallogénique de l'Europe 26-042

Zaovine

General data

Deposit name(s): Zaovine **Identifier:** YUG-00192

Commodities: Ti 0 t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company:

Longitude: 19.406 **Latitude:** 43.871 **District:** Zlatiborski

Geology**Ore deposit type (geology)**

Gabbro-norite hosted deposits of disseminated titanomagnetite: Fe, Ti, (V, P)

Ore deposit shape

Stratabound envelope of disseminated ore

Mineralization Age:**Ore mineralogy**

Magnetite
Titanomagnetite
Ilmenite

Host rocks Age:**Hostrock formation names**

Tara Mountain Gabbro

Host rock lithology

Gabbro
Dolerite, diabase

Economy**Exploitation type**

Unworked

Ti Titanium, general (TiO₂)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

No specific environmental signature.

Comments**Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Zavlaka

General data**Deposit name(s):** Zavlaka**Identifier:** YUG-00191**Commodities:** PbZn 0 t **Class:** N/A**Status:** Deposit or prospect of unknown status**Company:****Longitude:** 19.500**Latitude:** 44.464**District:** Macvanski**Geology****Ore deposit type (geology)**

Carbonate-hosted base metals deposits: Pb-Zn-Ag, Ba, F

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:** Triassic**Host rocks** **Age:** Triassic**Host rock lithology**

Limestone

Economy**Exploitation type**

Unworked

PbZn **Lead + Zinc (metal)****Ore type:** Ore of indeterminate nature**Past production:** - t**Average grade:** -**Reserve:** - t**Average grade:** -**Resource:** - t**Average grade:** -**Environment**

No data available.

Comments**Geological references**

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references**Other references**

Zelj

General data

Deposit name(s): Zeljin **Identifier:** YUG-00177

Commodities: Fe 0 t **Class:** N/A **Status:** Group of mineral occurrences

Company:

Longitude: 20.793 **Latitude:** 43.429 **District:** Rasinski

Geology**Ore deposit type (geology)**

Unspecified syn- to late orogenic ore deposits
 Unspecified ore deposits related to volcanic systems and shallow intrusives

Ore deposit shape

Discordant lode or vein (thickness > 50 cm), in clusters or isolated

Mineralization **Age:** Neogene (Miocene to Pliocene)

Ore mineralogy

Hematite
 Pyrite

Host rock mineralogy

Quartz

Host rocks **Age:**

Host rock lithology

Serpentinite
 Granite (s.l.)

Economy**Exploitation type**

Mining method unknown

Fe **Iron (metal)**

Ore type: Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Few data available to determine an environmental signature.

Comments

Grade : 50% Fe, 20-25% SiO₂ and 0.5% S.

Geological references

Jankovic S. - (1977) - The iron ore deposits in Yugoslavia. - The iron ore deposits of Europe and adjacent areas; explanatory notes to the International map of the iron ore deposits of Europe, 12,500,000; Volume I, Text and figures. Zitzmann A (Ed), Bundesanst, Geowiss. p. 411-418.

Economic references**Other references**

Zijaca

General data

Deposit name(s): Zijaca **Identifier:** YUG-00121

Commodities: PbZn t **Class:** N/A **Status:** Deposit or prospect of unknown status

Company: TREPCA Mining and Metallurgical Complex

Longitude: 20.914 **Latitude:** 42.964 **District:** Kosovo

Geology**Ore deposit type (geology)**

Replacement deposits (skarns, mantos): Au, Cu, Pb, Zn, Ag, W, Mo, Sn, Fe

Ore deposit shape

Atypical, unspecified or ill-defined form

Mineralization **Age:****Host rocks** **Age:****Economy****Exploitation type**

Unworked

PbZn **Lead + Zinc (metal)****Environment**

No data.

Comments

Trepca ore field

Geological references

Jankovic S. - (1978) - Izotopni sastav olova u pojedinim tertsijarnim olovo-tsinkovim rudishtima Srpsko-makedonske metalogenetske provintsije Translated Title: The isotopic composition of lead in some Tertiary lead-zinc deposits within the Serbo-Macedonian metallogenic province - Geoloski Anali Balkanskoga Poluostrva, 42, p. 507-525.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Economic references

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references

Zimovnik

General data

Deposit name(s): Zimovnik **Identifier:** YUG-00166
Commodities: PbZn 0 t **Class:** N/A **Status:** Group of mineral occurrences
Company:
Longitude: 20.744 **Latitude:** 43.257 **District:** Raski

Geology**Ore deposit type (geology)**

Unspecified ore deposits related to volcanic systems and shallow intrusives

Unspecified ore deposits related to basic-ultrabasic magmatic rocks

Ore deposit shapeField of discordant lodes (n*km², n*ha)**Mineralization** **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy**

Arsenopyrite
 Pyrrhotite
 Pyrite
 Galena
 Sphalerite
 Tetrahedrite
 Loellingite
 Boulangerite
 Silver
 Jamesonite
 Pentlandite
 Breithauptite
 Smaltite
 Chloanthite

Hydrothermal alteration

Silicification
 Sericitization
 Chloritization

Host rocks **Age:****Host rock lithology**

Serpentinite
 Dacite
 Andesite

Economy**Exploitation type**

Unworked

PbZn Lead + Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Acid generation potential due to the sulfides and sulfosalts content and enhanced by the hydrothermal alteration type.
 Potential release of As into the environment with possible concentration in the stream sediments.
 Expected dissolved contents of Ni, Co, Fe, Cu, Sb in drainage waters.

Comments**Geological references**

Novovic T. - (1977) - Geolosko-strukturne karakteristike i mineraloski sastav Pb-Zn lezista u Zimovniku (Kopaonik) Translated Title:

Geological- structural characteristics and mineral composition of lead-zinc deposits at Zimovnik, Kopaonik. - Glasnik Prirodnjackog Muzeja u Beogradu, Serija A: Mineralogija, Geologija, Paleontologija, 32, p. 15-20.

Radulovic B. and Savic R. - (1995) - Deposits and the potential of base and precious metals in the ore field Raska. - Geology and Metallogeny of the Kopaonik Mt. Symposium, june 1995.

Economic references

Other references

Zitni Potok

General data

Deposit name(s): Zitni Potok **Identifier:** YUG-00082

Commodities: Fe 100 000 t **Class** E **Status:** Deposit of unknown status

Company:

Longitude: 21.594 **Latitude:** 43.090 **District:** Topolicki

Geology**Ore deposit type (geology)**

Banded iron formations (BIF "Superior Fe"): Fe

Ore deposit shape

Stratiform bed: single or multi-layered (syn-depositional with host rock)

Mineralization **Age:** Precambrian**Ore mineralogy**

Magnetite
 Chalcopyrite
 Pyrrhotite
 Ilmenite
 Hematite
 Rutile

Host rocks **Age:** Precambrian**Hostrock formation names**

Quartz magnetite rocks

Host rock lithology

Ferriferous quartzite, Banded Iron
 Formation (BIF), itabirite
 Chlorite schist of igneous origin
 Gneiss (s.l.)

Economy**Exploitation type**

Unworked

Fe **Iron (metal)****Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- %
Reserve:	100000 t	Average grade:	50 %
Resource:	- t	Average grade:	- %

Environment

The presence of chalcopyrite and pyrrhotite when oxidized may generate Acid Mine Drainage and readily soluble salts. Particulate and colloidal iron compounds in surface water may be notable.

Comments

The ore contains 53-60% Fe, 0.1-0.2% Mn, 0.2% S and 4-7% SiO₂.
 The reserve is estimated as a few million tons.

Geological references

Anonymous. - (1978) - The Iron Ore Deposits of Europe and adjacent Areas. - Explanatory Notes to the International Map of the Iron Ore Deposits of Europe, 1:2,500,000. Zitzmann A. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover. 386 p.

Antonijević I. - (1983) - Lezista gvozda Srbije Translated Title: The iron ore deposits of Serbia. - Vesnik, Zavod za Geoloska i Geofizicka Istrazivanja, Serija A: Geologija, 41, p. 5-40.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S., Serafimovski T., Jelenkovic R. and Cifliganec V. - (1997) - Metallogeny of the Vardar Zone and Serbo-Macedonian Mass - Proceedings of the Symposium "Magmatism, metamorphism and metallogeny of the Vardar Zone and Serbo-Macedonian Massif". Plate tectonics aspects of Alpine Metallogeny in the Carpatho-Balkan Region. Faculty of Mining and Geology Stip, pp. 29-67

Economic references

Other references

Other data bases

Carte Métallogénique de l'Europe 26-106
The Iron Ore Deposits of Europe - 1978 YU30

Zlace

General data

Deposit name(s): Zlace
Zlot

Commodities: Ag 0 t Class N/A Status: Old industrial mine, abandoned deposit
Au 0 t Class N/A

Company: Rudarsko Topioninarski Basen BOR

Longitude: 22.022 **Latitude:** 44.066 **District:** Borski

Identifier: YUG-00125

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)

Ore deposit shape

Field of discordant lodes (n*km2, n*ha)

Mineralization Age: Upper/Late Cretaceous**Ore mineralogy**Gold
Pyrite
Sphalerite
Galena
Marcasite
Grey copper
Chalcopyrite
Bornite**Host rock mineralogy**Quartz
Calcite
Barite**Host rocks** Age: Upper/Late Cretaceous**Hostrock formation names**

Upper Cretaceous andesites

Host rock lithology

Andesite

Economy**Exploitation type**

Underground mining

Au Gold (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	- t	Average grade:	- g/t
Reserve:	- t	Average grade:	- g/t
Resource:	- t	Average grade:	- g/t

Ag Silver (metal)**Ore type:** Ore in which the element does not form a distinct mineral phase (i.e. camouflaged or refractory elem)

Past production:	- t	Average grade:	-
Reserve:	- t	Average grade:	-
Resource:	- t	Average grade:	-

Environment

Production of Acid Rock Drainage due to the sulfidic composition of the primary ore.

Presence of calcite (an acid consuming mineral) in the gangue that can partly buffer the acidity produced.

Existence of CN or Hg associated with the gold mineral processing ?

Comments

In exploitation up to 1939 by Beshina Gold Ld. Grade ore is variable, 2 to 23 g/t Au, 20 to 250 g/t Ag, about 1% Pb, 1.5% Zn and locally up to 1% Sb.

State of the resource in 1930 : 41,000t @ 8.9 g/t Au and 65 g/t Ag

Geological references

Jancovic S, Milovanovic D, Jelenkovic R, and Hrkovic K. - (1992) - Gold Deposits and Occurrences in Serbia: Types, Metallogenic Units and Outlook. - Chair of Economic geology, Faculty of Mining and Geology, University of Belgrade, Belgrade. 285 p.

Jankovic S, Terzic M, Aleksic D, Karamata S, Spasov T, Jovanovic M, Milicic M, Miskovic V, Grubic A, and Antonijevic I. - (1980) - Metallogenic features of copper deposits in the volcano- intrusive complexes of the Bor District, Yugoslavia. - Special Publication of the Society for Geology Applied to Mineral Deposits, 1, p. 42-49.

Economic references

Other references

Zuta Prlina

General data

Deposit name(s): Zuta Prlina **Identifier:** YUG-00113
Jekalce

Commodities: **Pb** 19 000 t **Class** C **Status:** Deposit of unknown status
Zn 18 000 t **Class** D

Company: TREPCA Mining and Metallurgical Complex

Longitude: 20.889 **Latitude:** 43.151 **District:** Kosovo

Geology**Ore deposit type (geology)**

Low-sulphidation epi- to mesothermal polymetallic-Ag veins: Pb, Zn, Ag, Mn, Cu, (As, Sb)

Ore deposit shapeField of discordant lodes (n*km², n*ha)**Mineralization** **Age:** Neogene (Miocene to Pliocene)**Ore mineralogy****Host rock mineralogy**

Pyrite	Quartz
Sphalerite	Calcite
Galena	
Chalcopyrite	
Pyrrhotite	
Arsenopyrite	
Grey copper	
Argentite	
Boulangerite	
Gold	
Proustite	

Host rocks **Age:****Hostrock formation names**

Serpentinite - Quartzlatite contact

Host rock lithologySerpentinite
Latite**Economy****Exploitation type**

Underground mining

Pb Lead (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	19000 t	Average grade:	2.5 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Zn Zinc (metal)**Ore type:** Ore in which the element forms a distinct mineral phase

Past production:	18000 t	Average grade:	2.5 %
Reserve:	- t	Average grade:	- %
Resource:	- t	Average grade:	- %

Environment

High acid generation potential due to the sulfidic composition of the primary ore (highly reactive sulfides). The presence of calcite (an acid-consuming mineral) within the gangue tends to increase the acid-buffering capacity of the rocks. Release of dissolved base metals (Pb, Zn,..) into the environment as well as As (presence of sulfoarsenites) that can accumulate in the stream sediments.

The ore processing plant located in Lepocavic has generated large amounts of tailings (8 Mt).

Comments

The mine has been in operation since 1971. In 1981, current output was 60,000 t/y of ore averaging 2% Pb and 5% Zn. This output should be increase by 20,000 t in 1983.

ITT/UNMIK Mission (12/2000) : Past production (1972-1982) : 734,000 t @ 2.5% Pb and 2.5 % Zn.

Geological references

Barral J.P. - (2001) - Réhabilitation du combinat de Trepca au Kosovo - Revue de la Société de l'Industrie Minérale, IM Environnement, N°12, Avril 2001, pp. 6-10.

Jankovic S. - (1982) - Yugoslavia. - Southeast Europe. Dunning FW, Mykura W, and Slater D (Eds), Mineral, Soc. p. 143-202.

Jankovic S. - (1984) - Major metallogenic units and ore deposits in Yugoslavia. - Earth Science (Paris) = Sciences de la Terre (Paris), 17, p. 385-394.

Novovic T. - (1979) - Marusic Pb-Zn pojava na Kopaoniku Translated Title: Marusic Pb- Zn occurrence at Kopaonik. - Glasnik Prirodnjackog Muzeja u Beogradu, Serija A: Mineralogija, Geologija, Paleontologija, 34, p. 59-64.

Economic references

Anonymous. - (1982) - Rudnici Jugoslavije. - 11th World Mining Congress, Beograd.

Chadwick JR. - (1982) - Yugoslavia; mining industry with considerable potential. - World Mining, 35, 11, p. 52-55.

Other references