



FRAME

FORECASTING AND ASSESSING EUROPE'S
STRATEGIC RAW MATERIALS NEEDS

WP7 Historic Mine Sites revisited

Deposit Fact Sheet

Krobica, Gierczyn

Authors: Stanisław Z. Mikulski and Rafał Małek



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Name of deposit	Krobica, Gierczyn
Author	Stanisław Z. Mikulski and Rafał Matek Polish Geological Institute-National Research Institute (PGI-NRI), 4 Rakowiecka street; 00-975 Warszawa, Poland

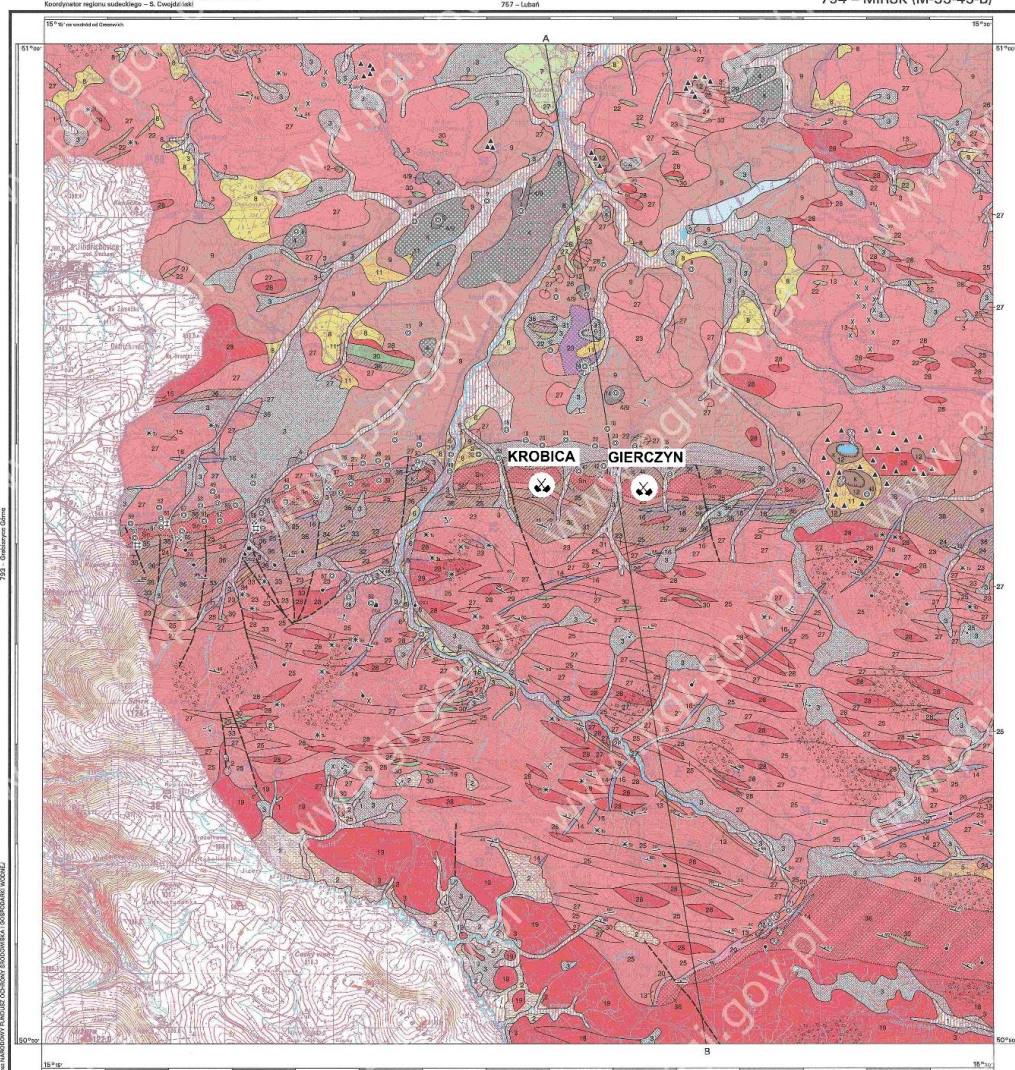
PAŃSTWOWY
INSTYTUT GEOLOGICZNY

SZCZEGÓŁOWA MAPA GEOLOGICZNA POLSKI
1:50 000

Opracował: Z. CYMERMAN¹ - 2007 r.
Ogólny koordynator Szczegółowej mapy geologicznej Polski - S. Lisicki
Koordynator regionalnego oddziału - S. Ciemliński

793 - Luban

794 - MIRSK (M-33-43-B)



(Source: <http://pgi.gov.pl/>)

Location	Country	(nearest) Town	Coordinates	
	Poland	Świeradów-Zdrój	Latitude	Longitude
			50°54'30"N	15°20'00"E



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Main Commodity/ies	Sn
By-products	Zn, Pb, Cu, As,
CRM potential	Co, Bi, In, Nb, Ga, Re, V, La, Ce, PGE

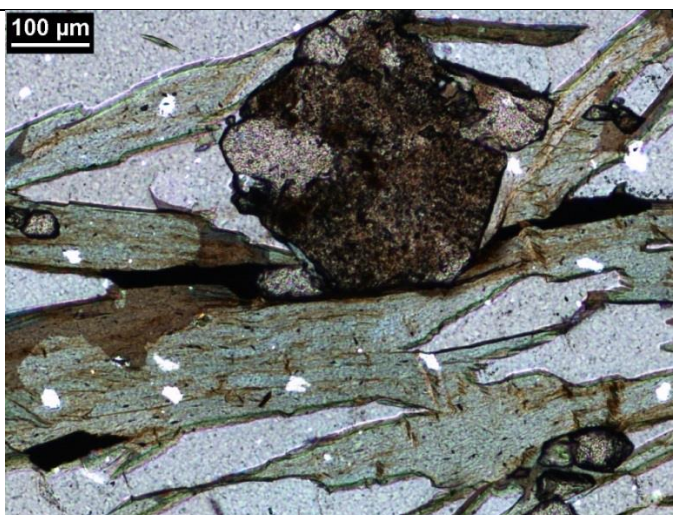
Type of deposit	Stratiform					
Mine Status	closed					
Period of activity	Start	End				
	16th century	probably 1938				
Production	Annual production	Tonnage	type	Cumulative historic production (period)	Tonnage	Type
	before 1790	unknown		1790-1816	~1300 t	ore
	1790–1792	39.55 t	ore			
	1811–1816	1250 t	ore			
	after 1816	unknown				
	Year 5	-	-			

Regional Geology		
Host rock(s)	Age of host rock	
metamorphic, mica schists	Lower Paleozoic (schists)	
Mineralization		
Ore forming minerals	Age of mineralization	Ore grade
cassiterite, pyrrhotite, pyrite, chalcopyrite, arsenopyrite, sphalerite, ilmenite, rutile	pre- and Variscan	from 0.23 to 0.87 % of Sn
Deposit Type	Hydrothermal vein-impregnation type	

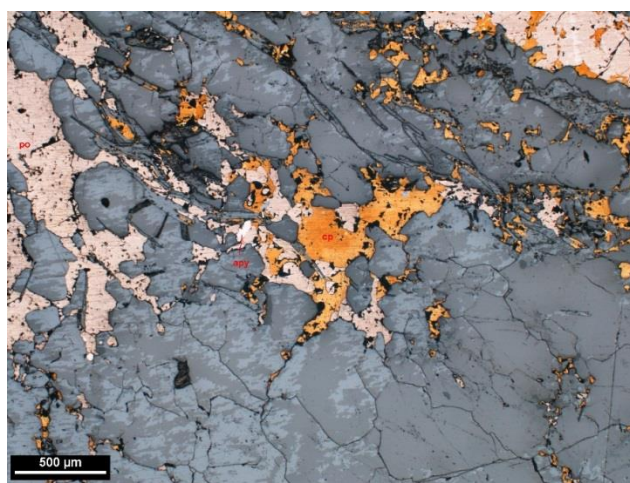


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Cassiterite within chlorite lamina (mica schists) from the Krobica tin deposit.



Sulphides mineralization (po – pyrrhotite, cp – chalcopyrite, apy – arsenopyrite) is overprinted cassiterite mineralization. With sulphides are associated bismuth appearance. The Krobica Sn deposit.

Reserves	Reserves (t ore)	Code	Category/ies
	5 500 000	Polish category	C ₁ / C ₂
Resources	Resources (t metal)	Code	Category/ies
	21 754	Polish category	C ₁ / C ₂



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Access restrictions	yes	no	unknown
	yes		
	Type of restrictions		
	some mines are tourists attractions today, other are closed and unavailable		
Ownership	Type of owner	Name	
	State		

References	Literature
	WISZNIEWSKA J. 1983. Origin of tin mineralization of the Iżera schists in Kamienieckie Range (Sudetes). <i>Archiwum Mineralogiczne</i> , 38 (2): 45-55. COOK N.J., DUDEK K. 1994. Mineral chemistry and metamorphism of garnet chlorite-mica schist associated with cassiterite-sulphide mineralization from the Kamienica Range, Iżera Mountains, SW. Poland. <i>Chemie der Erde</i> , 54: 1–32.

Remarks
Deposits “Krobica” and “Gierczyn” are considered as undeveloped. Historical excavation took place only in a few adits.



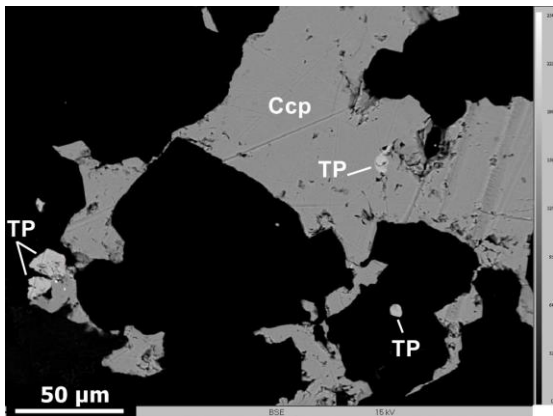
Summary of results from studies during the FRAME project

NEW FIELD WORK	Method	Results
	Mineralogical – geochemical investigation in the historic Saint John and Saint Leopold adits.	Initial X-ray examinations inside historical ore excavations using a field XRF spectrometer. The geochemical studies showed elevated concentrations of a range of elements (Co, Bi, Hf, In, Sc, As, Cu). 13 samples were collected for further investigation. Reference: Małek, R., Mikulski, S.Z., Chmielewski, A., 2019. The geochemical-mineralogical characteristic of cassiterite-sulphide mineralization in the historic Saint John and Saint Leopold shafts in the Stara Kamienica schist belt (Western Sudetes) (in Polish with English summary). <i>Przegląd Geologiczny</i> , 67: 910-920. http://dx.doi.org/10.7306/2019.50

NEW ANALYSIS AND RESEARCH APPLIED	Method	Results
	(1) Portable XRF spectrometer; (2) Geochemical methods: (a) WD-XRF, (b) ICP-MS, and (c) GF-AAS; (3) ore microscopy in reflected and transmitted lights (NIKON ECLIPSE LV100 POL); (4) electron microprobe (EMPA) CAMECA SX-100; (5) electron microscope LEO-1430 (ZEISS) with EDS detector	Ad. (a) The content of trace elements were determined in pressed powder 13 new samples (As, Ba, Bi, Br, Cd, Ce, Co, Cr, Cu, Ga, Hf, La, Mo, Nb, Ni, Pb, Rb, Sn, Sr, Th, U, V, Y, Zn, and Zr) and in fused samples from the Zn-Pb deposits the main compositions (SiO ₂ , TiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , MnO, MgO, CaO, Na ₂ O, K ₂ O, P ₂ O ₅ , SO ₃ , Cl, and F) were determined. Analyses were performed by wavelength dispersive X-ray fluorescence spectrometry (WD-XRF) method using a Philips PW-2400 spectrometer. ad. (b) The content of rare earths (Sc, Y, La, Ce, Pr, Nd, Eu, Sm, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu) and trace elements (Ag, As, Bi, Cd, Co, Cu, Hf, In, Mn, Mo, Ni, Nb, Re, Sb, Se, Sn, Ta, Te, Th, Tl, W, and V) were determined after decomposition with a full mixture of HCl, HNO ₃ , HF, and HClO ₄ acids using a Perkin Elmer ICP-MS Elan DRC II mass spectrometer by means of the inductively coupled plasma mass spectrometry (ICP-MS). ad. (c) Au, Pd, and Pt were measured using a Perkin Elmer model 4100 ZL spectrometer by graphite furnace atomic absorption spectrometry (GF AAS) method).



		Elevated concentrations of critical elements (In, Bi, Ga, Co, Nb, Pt, Pd and Re) as well as associated elements (Cu, Zn and Pb) were revealed in 13 samples collected from historic workings. References: MIKULSKI, S.Z., MAŁEK, R., 2019. Indium and other critical elements enrichment in cassiterite-sulphide Mineralization from the stratiform tin deposits in the West Sudetes (SW Poland). 15th SGA Biennial Meeting, 27-30 August 2019, Glasgow, Scotland, 4: 1818-1821.
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NEW DATA	Method	New Results
	Identification of indium bearing minerals: chalcopyrite, sphalerite and unnamed Zn-In-Cu-Fe mineral phase containing up to 19.4 wt.% of In.	EMPA investigation revealed that chalcopyrite and sphalerite from Krobica and Gierczyn tin deposits are indium carriers. Chalcopyrite contains up to 1580 ppm of In (n=56) while sphalerite up to 1640 ppm of In (n=21). In addition, an unnamed Zn-In-Cu-Fe transition mineral phase (TP) was identified from the perspective Czerniawa Zdrój area (west from the Krobica deposit).  (Transition Phase) in form of separate grains (up to 20 μm in size) and as a intergrowths in chalcopyrite (Ccp). Reference: MAŁEK R., MIKULSKI S.Z., 2021. A rare indium-bearing mineral (Zn-In-Cu-Fe sulphide) from the Stara Kamienica Schist Belt (Sudetes, SW Poland). Geological Quarterly 65, (1): DOI: http://dx.doi.org/10.7306/gq.1572.