



IGSMiE PAN

**MODE OF REPORTING RESOURCES AND
RESERVES IN
POLAND
AND RELATIONSHIP TO UNFC CRIRSCO AND
PRMS
CLASSIFICATIONS**

Marek NIEĆ

Mineral and Energy Economy Research Institute
Polish Academy of Science

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The standardized mode of resources and reserves reporting was introduced in Poland in 1953 yr.

It is based on 57 year experience

of resources/reserves evaluation of deposits of varied size and geological setting:

135 coal and 76 lignite

82 oil and 258 gas

14 Cu , 21 Zn-Pb, 4 Ni ores

12 sulphur

19 rock salt

> 1000 varied industrial rocks

Basic concepts of mineral policy in Poland

- **Deposits of mineral commodities are the part of natural environment.**
- **Reasonable utilization of deposits of mineral commodities is indispensable for sustainable development**
- **Reasonable utilization of mineral resources should be guaranteed and supervised by government**

State supervision on mineral resources utilization is realized through:

- Legal regulations of the mode of presentation resources and reserves data
- Licensing exploitation rights
- Accounting of mineral deposits in land use planning
- Surveillance of reasonable resources exploitation, executed by mining offices

General procedure of resources and reserves evaluation consists of two steps:

I Resources evaluation based on exploration data

Approved by governmental administrative body

II Preparation of “Deposit development plan” (prefeasibility study) with reserve evaluation

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**Exploration results are presented in
“Geological documentation of deposit”
that contain presentation of:**

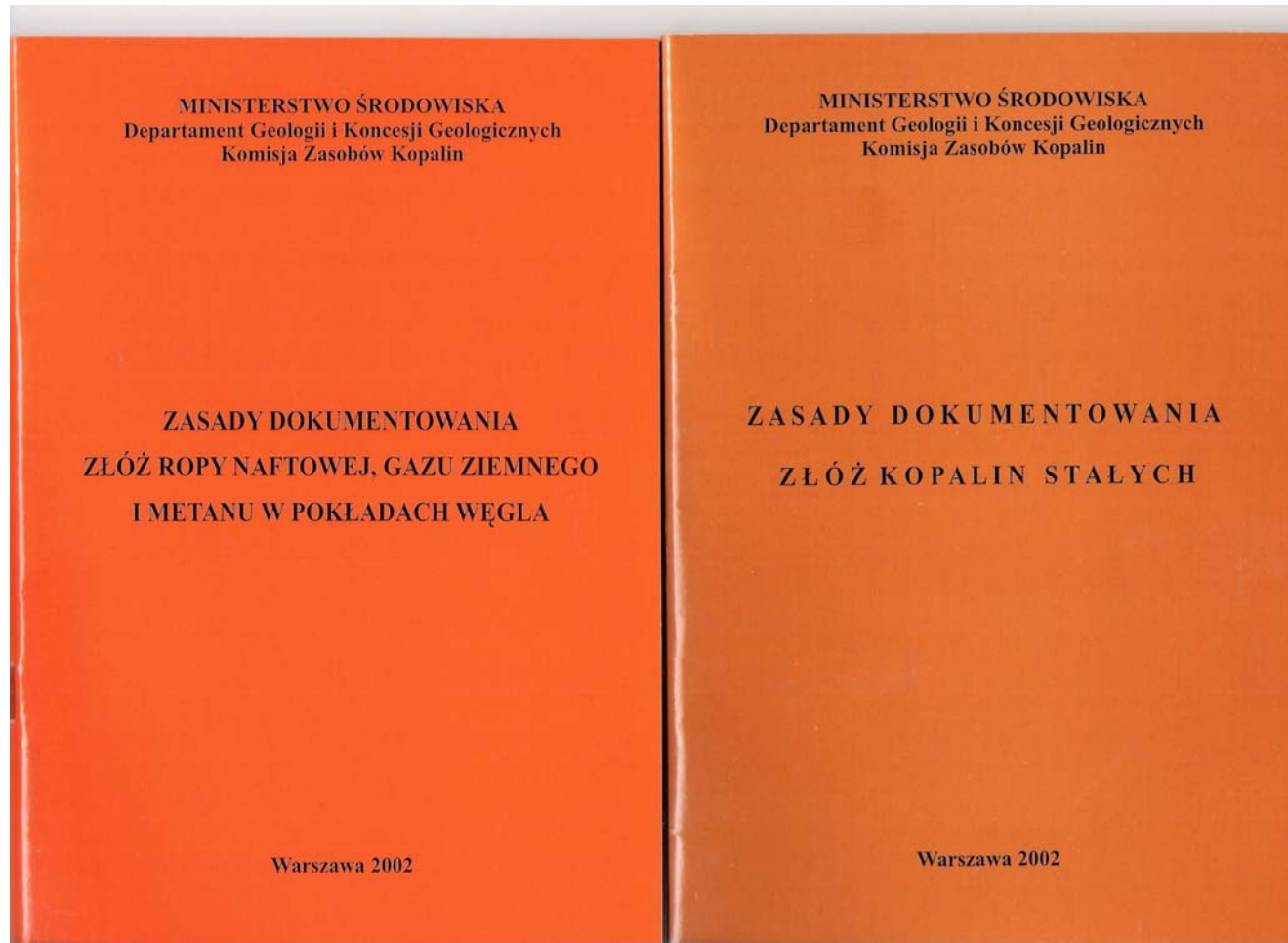
- geological model of deposit,**
- quality of mineral commodity,**
- geological conditions of mining (hydrogeology,
geotechnic etc.),**
- environmental conditions of the area,**
- resources evaluation**

**“Geological documentation” is presented in uniform manner
according to the rules prepared by the Commission of Mineral
Resources, the advisory body the Ministry of Environment.**

Guidelines for resources evaluation

Hydrocarbons

Solid mineral commodities



Evaluation of resources taking into account geological model of deposit is considered the most important as the base for further reserve estimation

The competent persons authorized by governmental approval are the only one allowed to prepare Geological documentation of deposit.

**Resources are evaluated with the use of uniform criteria
for their delineation designed by Ministry of Environment**

	Coal deposit feature	Parameter Value
1	Maximum depth [m]	1000 (>1000 if deeper mining is possible)
2	Minimum coal seam thickness [m]	1 (0,6)
3	Minimum coal calorific value in seam with barren interlayers [MJ/kg]	15
4	Maximum total sulphur content [%]	2 (>2 if desulphurization is planned)

In the „Deposit development plan” probable reserves are presented

They are calculated in 4 steps:

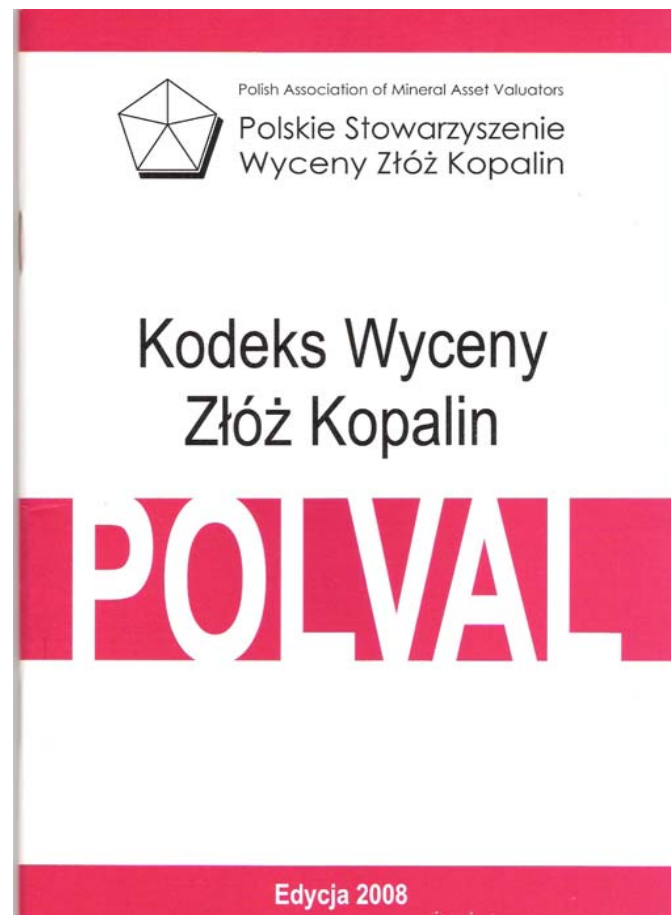
- delineation of resources technically mineable,
- delineation of resources technically mineable –
and economically feasible,
- estimation of resources that could be transformed to
reserves (economic reserve base in place),
- estimation of probable reserves

„Deposit development plan”

Is the obligatory document presented with the application for mining licence

Proved reserves are evaluated only for internal use of mining enterprises and are not officially reported

**ECONOMIC EVALUATION OF RESERVES SHOULD
FOLLOW „POLISH CODE OF EVALUATION OF MINERAL
DEPOSITS”**



**The resources and reserves of operating
mines are yearly recalculated**

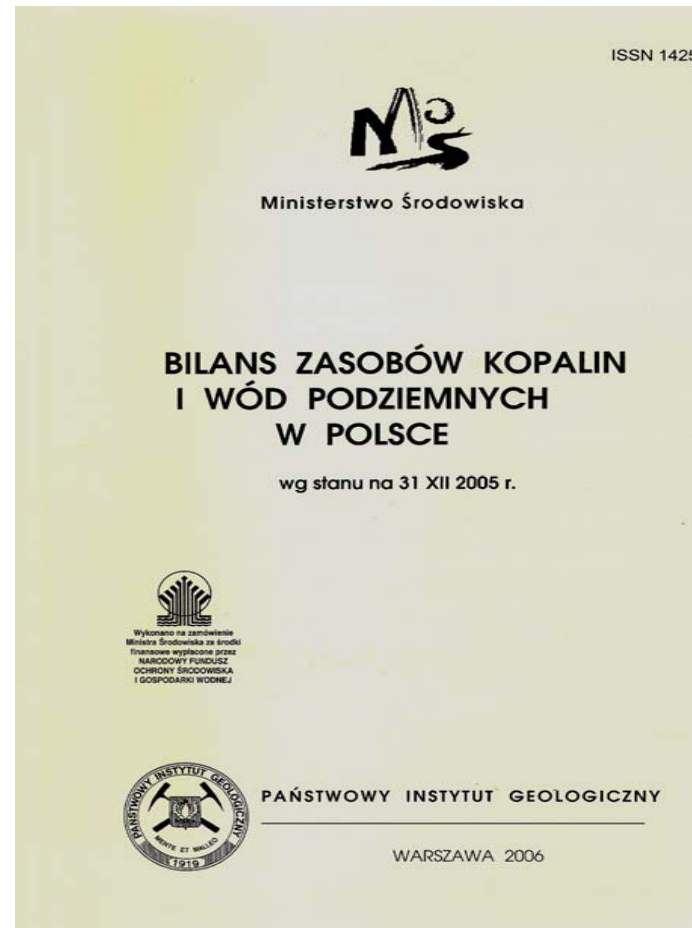
in

„resources inventory report”

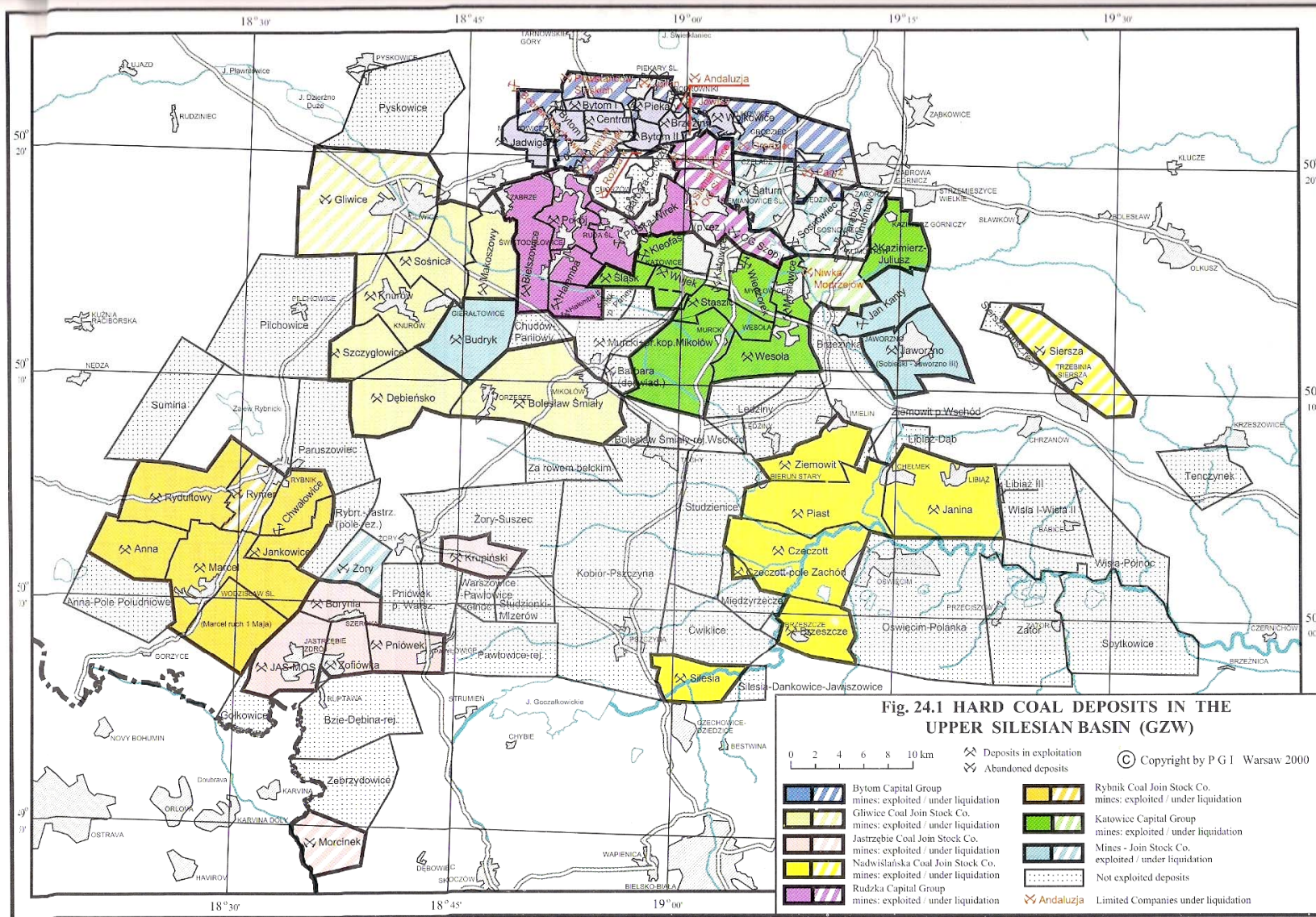
**and presented (obligatory) to geological
survey (Polish Geological Institute).**

**The data on resources, recalculated at the
end of each year, are published in open file
report.**

Mineral Resources Inventory (Balance)

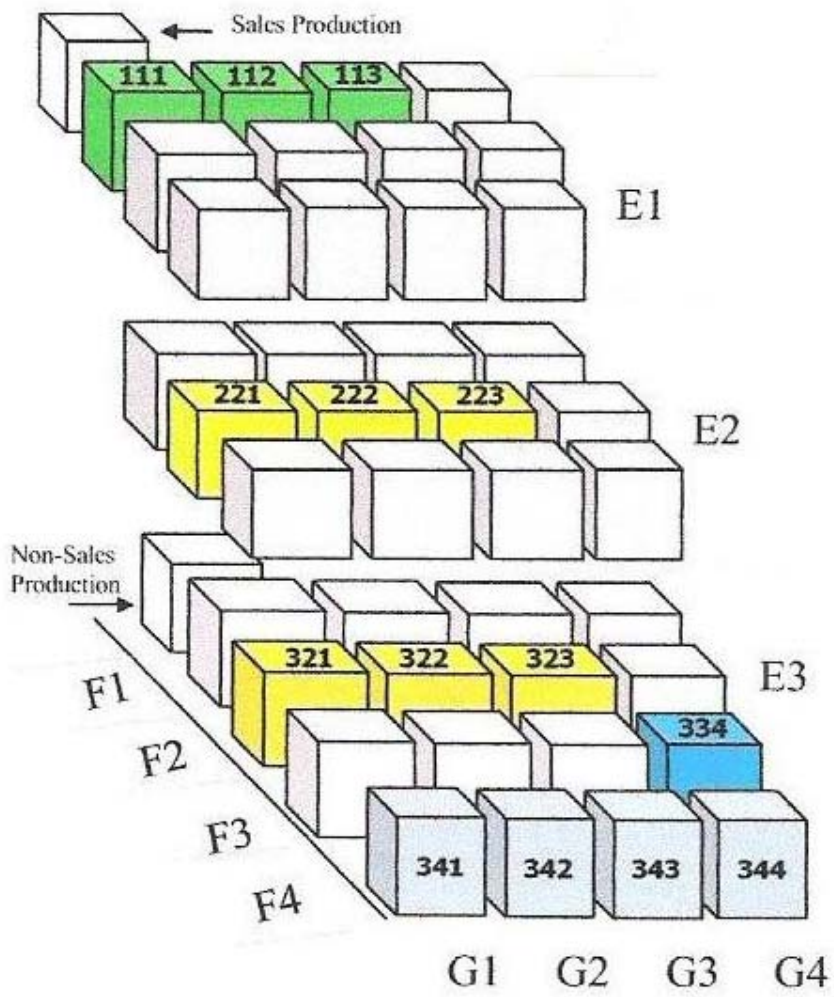


UPPER SILESIA COAL DEPOSITS (mines and explored areas)

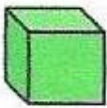
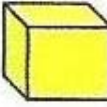
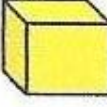
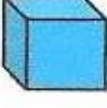
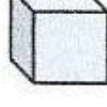
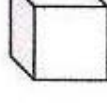


Lp.	Nazwa złoża	Stan zag. złoża	Zasoby geologiczne bilansowe			Zasoby przemysłowe	Wydobycie
			Razem	A+B+C1	C2		
54	Laziska	E	204 927	94 179	110 748	53 524	1 546
55	Makoszowy	E	480 398	235 144	245 254	207 468	2 716
56	Marcel	E	275 396	237 860	37 536	143 448	2 444
57	Marcel-Ruch 1 Maja	Z	tylko pzb.	-	-	-	-
58	Międzyrzecze	P	403 864	-	403 864	-	-
59	Mikołów	R	294 070	172 266	121 804	-	-
60	Morcinek	Z	tylko pzb.	-	-	-	-
61	Moszczenica	Z	tylko pzb.	-	-	-	-
62	Murcki	E	463 428	365 247	98 181	224 781	2 566
63	Mysłowice	E	36 830	36 286	544	31 547	1 617
64	Niwka-Modrzejów	Z	tylko pzb.	-	-	-	-
65	Oświęcim-Polanka	R	2 086 237	5 207	2 081 030	-	-
66	Paruszowiec	R	348 020	160 572	187 448	-	-
67	Paryż	Z	tylko pzb.	-	-	-	-
68	Pawłowice - rej.	R	2 048 850	1 150 143	898 707	-	-
69	Piast	E	931 786	903 284	28 502	291 415	4 176
70	Piekary	E	29 750	29 750	-	12 425	653
71	Pniówek	E	295 411	205 227	90 184	154 619	3 666
72	Pokój	E	135 805	134 774	1 031	67 086	1 485
73	Polska-Wirek	E	81 497	81 059	438	23 599	1 656
74	Porąbka-Klimontów	Z	tylko pzb.	-	-	-	-
75	Powstańców Śląskich	Z	tylko pzb.	-	-	-	-
76	Rozalia	Z	tylko pzb.	-	-	-	-
77	Rozbark	Z	tylko pzb.	-	-	-	-
78	Rybn.-Jastrz.(pole rez.)	R	24 141	3 437	20 704	-	-
79	Rydultowy	E	166 121	71 281	94 840	73 709	1 816
80	Rymer	Z	tylko pzb.	-	-	-	-
81	Saturn	Z	tylko pzb.	-	-	-	-
82	Siemianowice (p. rez.)	R	30 600	8 600	22 000	-	-
83	Siemianowice OG Szop. I	Z	tylko pzb.	-	-	-	-
84	Siemianowice OGSi.I,II	Z	tylko pzb.	-	-	-	-
85	Siersza	Z	tylko pzb.	-	-	-	-
86	Siersza (obsz.rez.)	R	61 240	11 800	49 440	-	-
87	Silesia	E	505 692	326 598	179 094	50 082	660
88	Silesia-Dankowice-Jawisz.	R	198 668	111 169	87 499	-	-
89	Sosnowiec	Z	tylko pzb.	-	-	-	-
90	Sońnica	E	294 192	156 997	137 195	99 485	2 060
91	Spytkowice	P	662 614	-	662 614	-	-
92	Staszic	E	683 348	575 901	107 447	329 240	3 837
93	Studzienice	R	1 282 150	16 883	1 265 267	-	-
94	Szczygłowice	E	630 408	375 826	254 582	328 538	2 744
95	Śląsk	E	158 344	134 904	23 440	63 861	839
96	Śląsk-Pole Panewnickie	E	116 599	111 836	4 763	8 115	136
97	Tenczynek	P	64 543	-	64 543	-	-

**The general rules of classification of
resources and reserves used in Poland are
concordant with the
United Nations Framework Classification
(UNFC)**



Legend

-  Commercial Projects
-  Potentially Commercial Projects
-  Non-Commercial Projects
-  Exploration Projects
-  Additional quantities in place
-  Combinations not frequently used
- 123** Codification (E1;F2;G3)

UNFC

Geologic axis

UNFC

categories used in Poland - (admissible error of estimate)

G 4	E (D ₃), D ₂ (officially not used)
	D (D ₁) (>40 %)
G 3	C ₂ (up to 40 %)
G 2	C ₁ (up to 30 %)
G 1	B (up to 20 %)
	A (up to 10 %)

Stage of prospecting/exploration	UNFC	CRIRSCO	POLAND		
			Resources/reserves categories	admissible error limit for resources/reserves (at 0,9 confidence level)	
Reconnaissance	G4	Exploration results	D		>40%
Prospecting	G3	Inferred	C	C₂	30-40%
General exploration	G2	Indicated/probable		C₁	20-30%
Detailed exploration and exploitation planning	G1	Measured/proved	B		10-20 %
			A		<10%

Economic and feasibility subdivisions used in Poland

Resources in Place	GEOLOGICZNE (RESOURCES)		
	BILANSOWE (resources supposed economic)		Pozabilansowe (subeconomic)
	PRZEMYSŁOWE (ECONOMIC RESERVE BASE)	Nieprzemysłowe (subeconomic)	Pozabilansowe (subeconomic)
	OPERATYWNE (RESERVES)	Straty (losses)	
Diluting material	OPERATYWNE		
EKSPLOATACYJNE (RESERVES)			

Economic axis:

UNFC

polish categories

- | | |
|------------|--|
| E 3 | subeconomic (pozabilansowe, nieprzemysłowe) |
| E 2 | anticipated (supposed) economic - reserve base (bilansowe,
przemysłowe) |
| E 1 | reserves (operatywne) |

Feasibility axis:

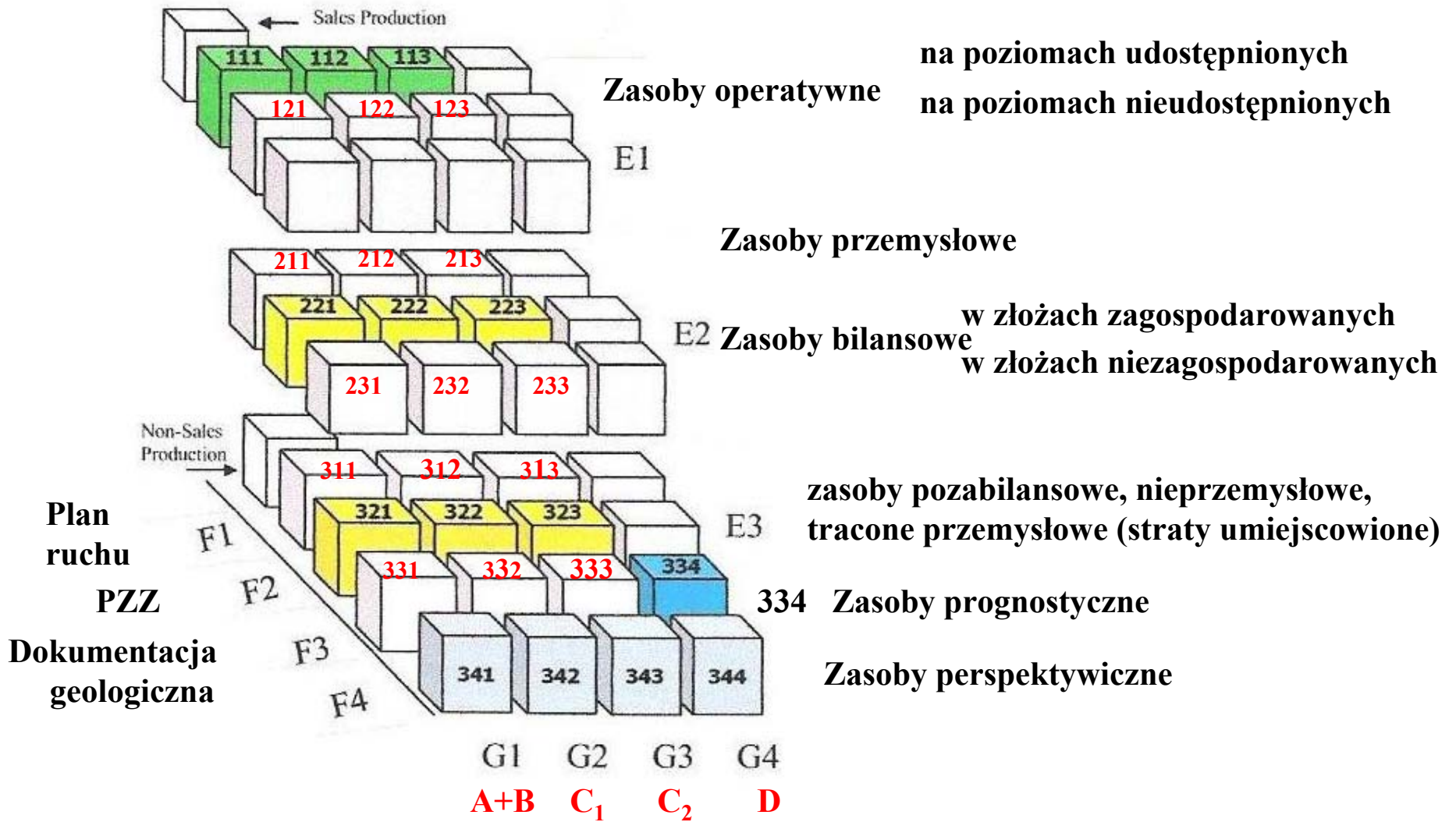
UNFC

polish categories

-

- | | |
|-----|---|
| F 4 | deposits not accessible and subeconomic |
| F 3 | geological reports – deposits not licenced for mining,
considered economic |
| F 2 | geological reports – deposits licenced for mining, |
| F 1 | deposit development plan (PZZ) |

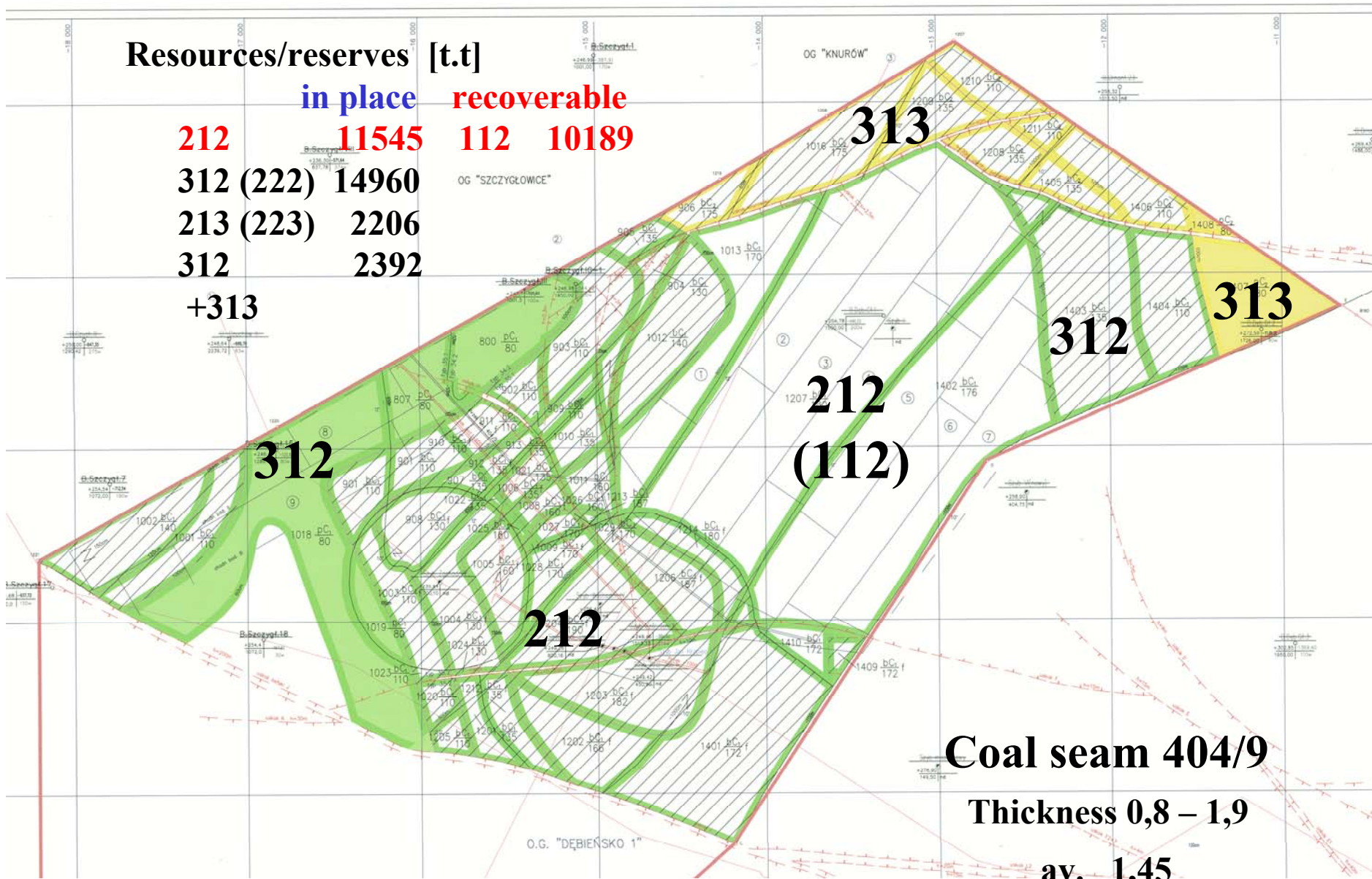
Polish resources/reserves classification and UNFC



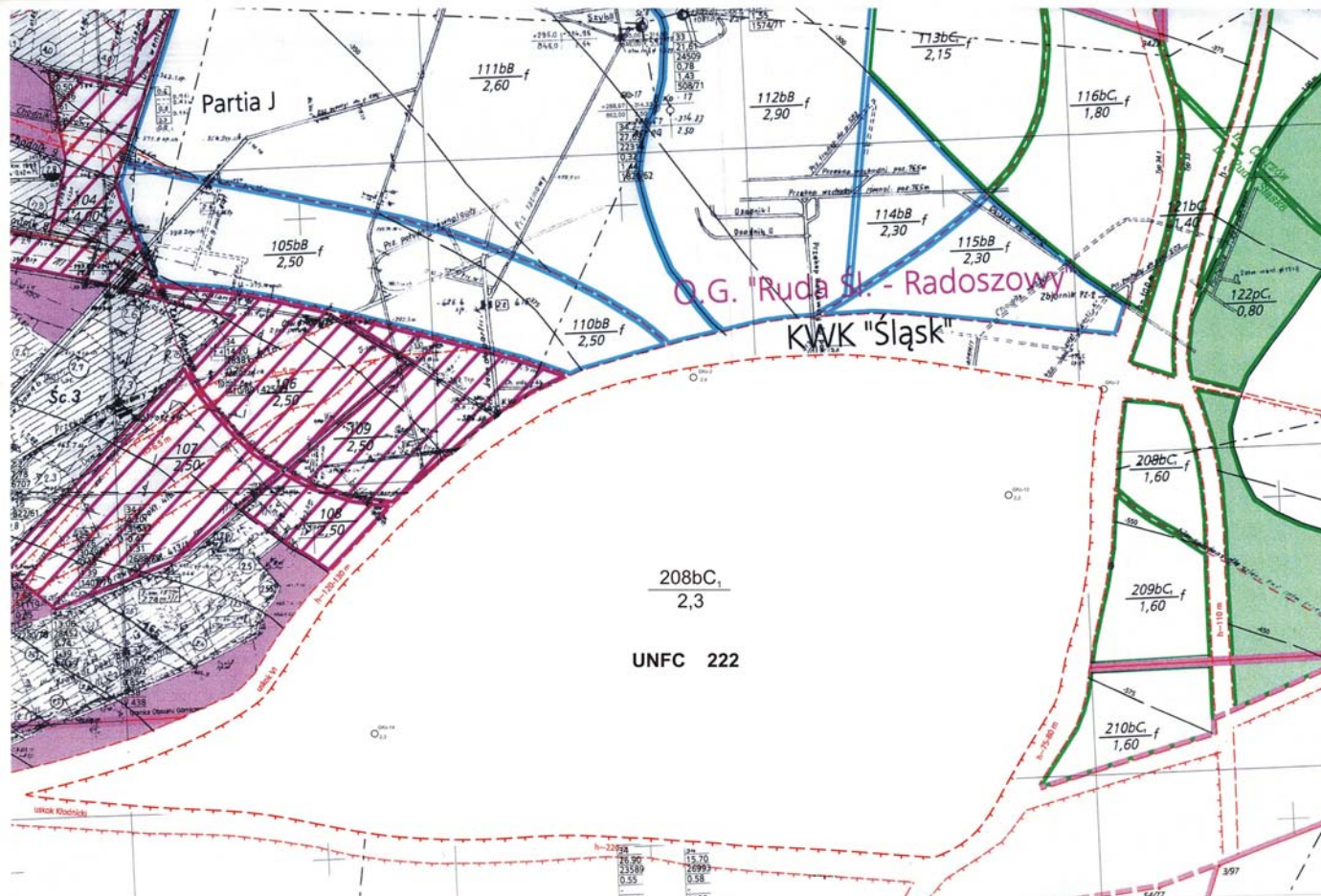
Polish classification		JORC Code CRIRSCO	PRMS (zasoby wydobywalne)	UNFC 2008		
				Geological report		Feasibility study
				Deposits licensed for mining	Deposits not licensed for mining	
prognostic resources D		Prospecting results	Prospective resources Low, Best, High	2 3 4, 3 3 4		
Anticipated economic („balance”) resources	C ₂ C ₁ A+B	Resources Inferred Indicated Measured	Contingent resources Low, Best, High	2 2 3 2 2 2 2 2 1	2 3 3 2 3 2 2 3 1	
Anticipated subeconomic („subbalance”) resources	C ₂ C ₁ A+B			3 2 3 3 2 2 3 2 1	3 3 3 3 3 2 3 3 1	3 1 3 3 1 2 3 1 1
„Not industrial” subeconomic resources	C ₂ C ₁ A+B					3 1 3 3 1 2 3 1 1
„Industrial” economic resources	C ₂ C ₁ A+B					2 1 3 2 1 2 2 1 1
Extractable resources	C ₂ C ₁ A+B					1 1 3 1 1 2 1 1 1
Mineable reserves C ₂ C ₁ A+B		Reserves Probable Proved	Reserves Proved, Probable, Possible			(1 1 3) (1 1 2) (1 1 1)

Resources/reserves [t.t]

	in place	recoverable
212	11545	112 10189
312 (222)	14960	
213 (223)	2206	
312	2392	
+313		



Parcela z udokumentowanymi zasobami bilansowymi w kat.
C₁ (UNFC 222)

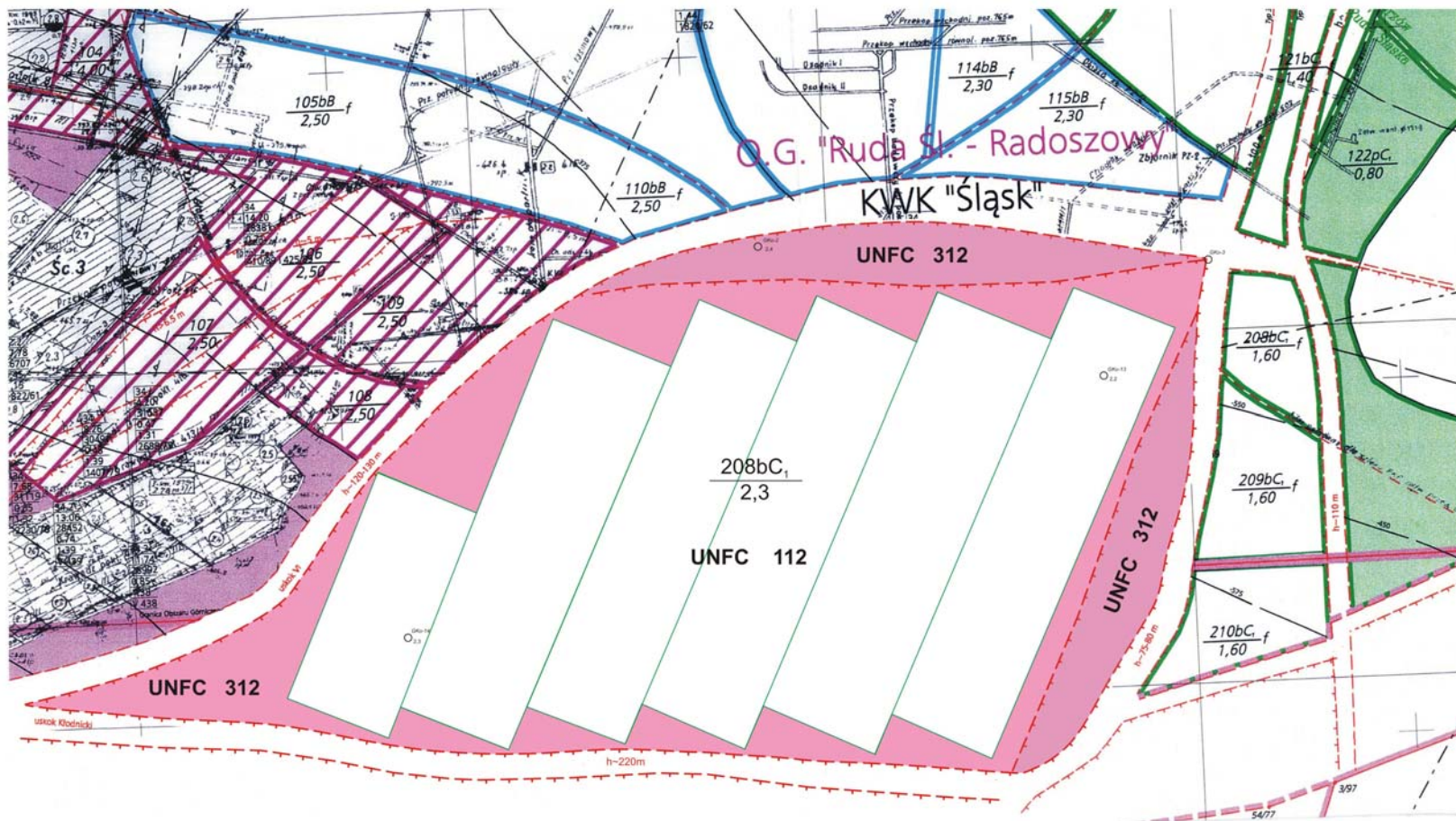


Geological report: Coal resources UNFC 222

Development plan

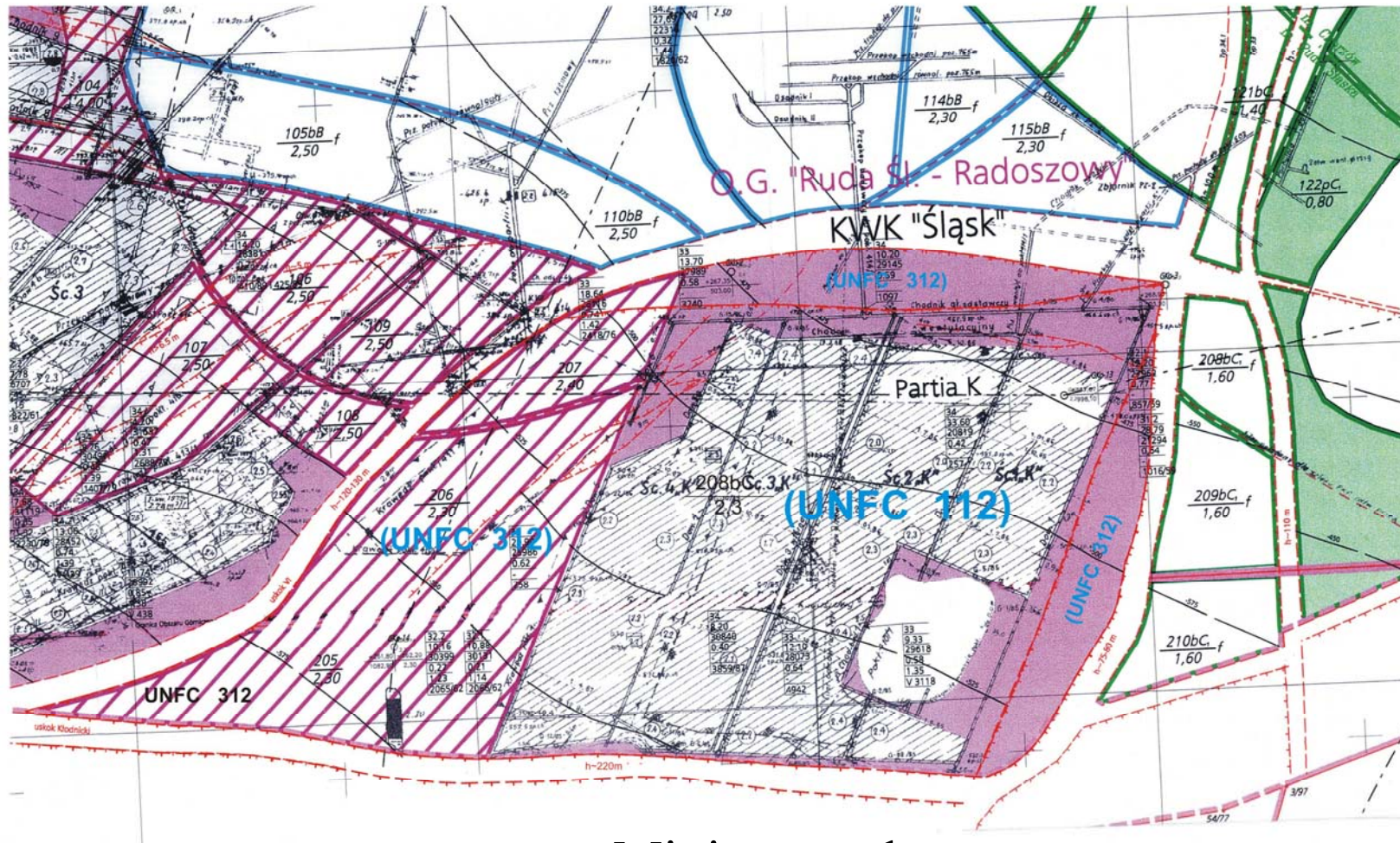
212

Parcela z udokumentowanymi zasobami operatywnymi w kat. C₁
(UNFC **112**) i przewidywanymi stratami (UNFC **312**)



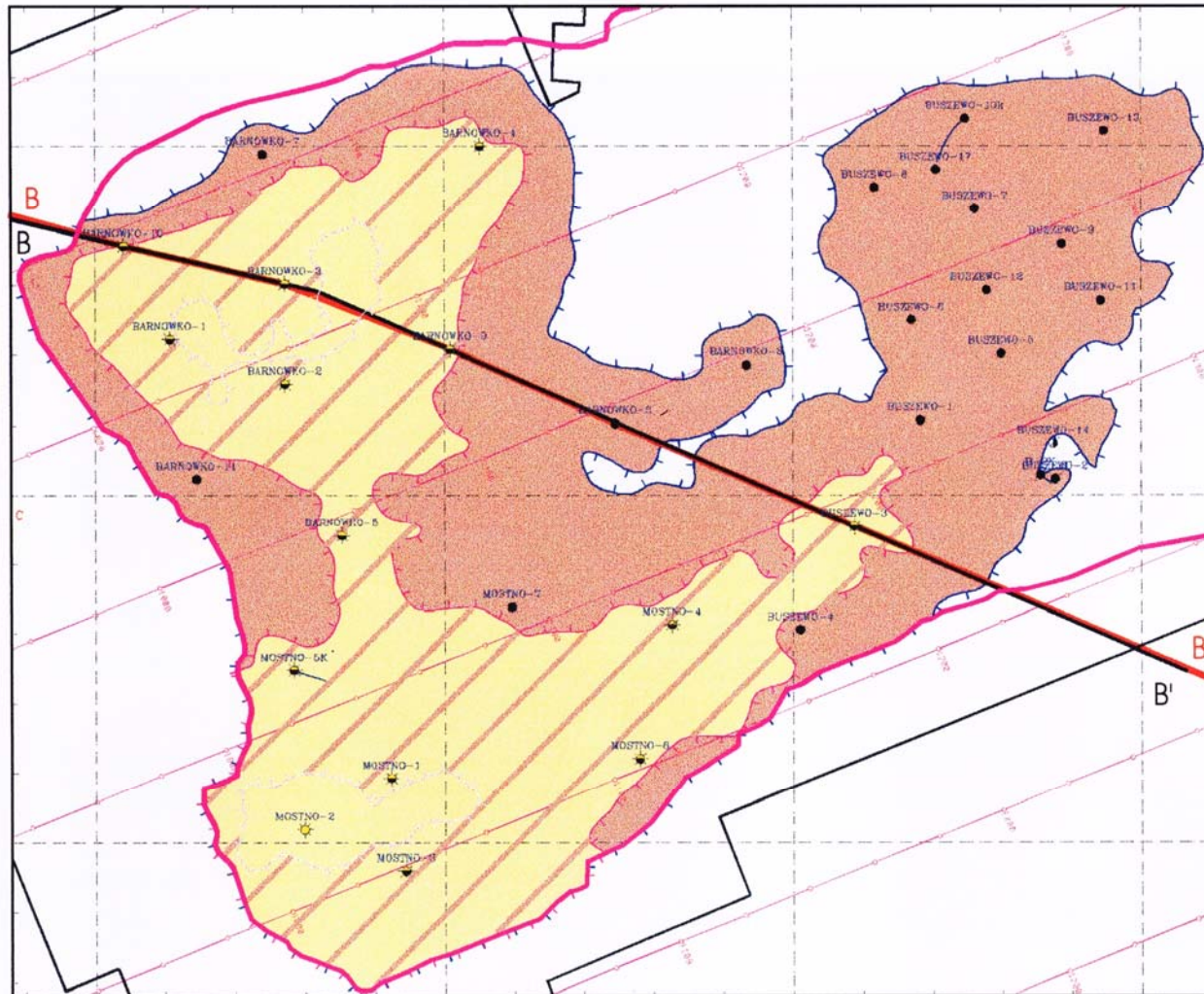
Mining operational plan UNFC **112** and UNFC **312**)

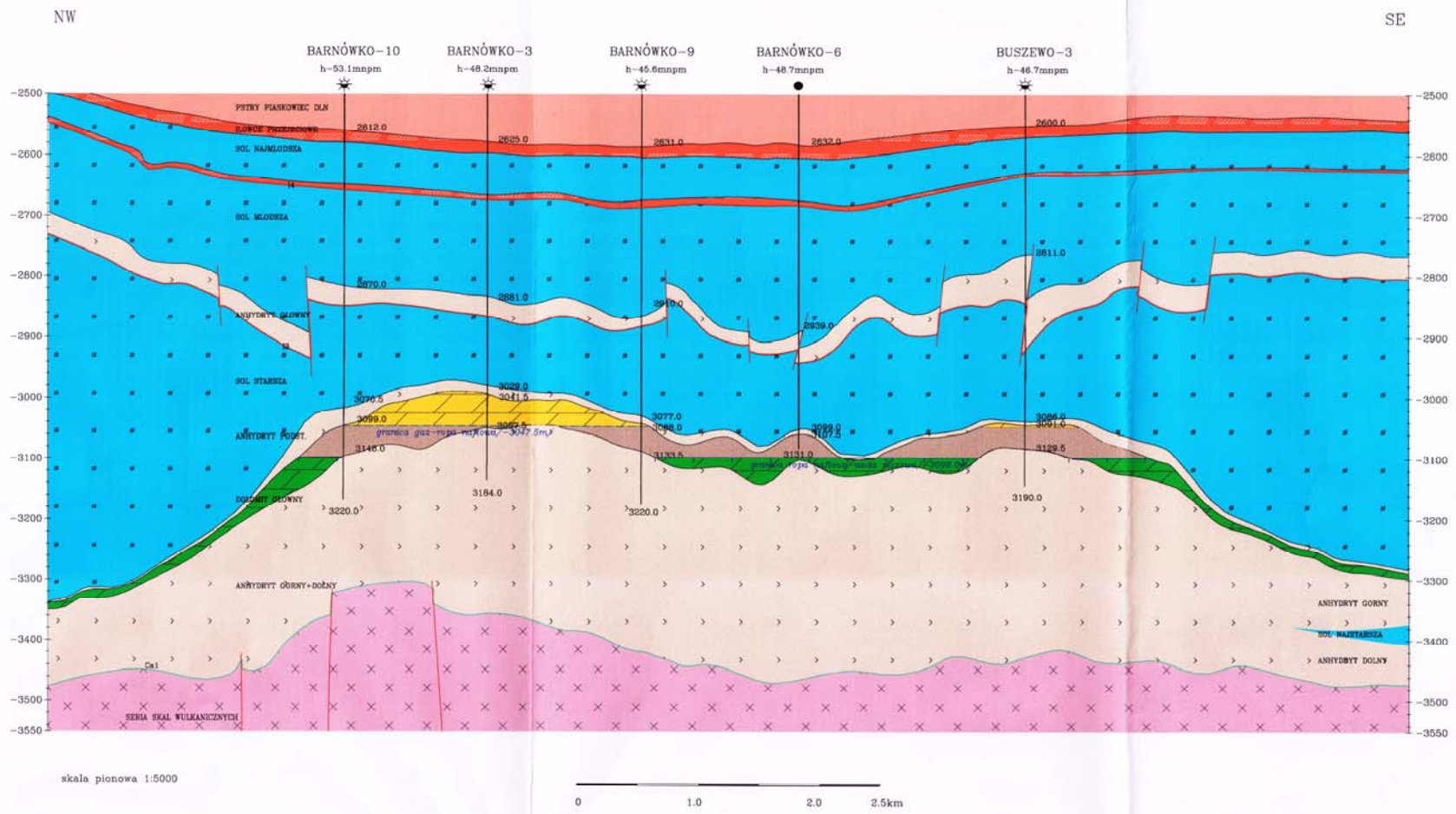
Parcela po zakończeniu eksploatacji



Mining results

Oil deposit in Upper Permian Dolomites





gas
 oil
 Lower Trias (sandstones)
 Upper Permian (claystones)
 Rock salt
 Anhydrite
 Dolomites
 Lower Permian (sandstones)

Recoverable reserves (commercial)

	oil m.t	gas bln Nm ³	sulphur t.t
Proved	9,8	3,53	
probable	10,9	3,82	654
Possible	11,9	4,11	

THANK YOU FOR ATTENTION

