MINERAL RESOURCES/RESERVES IN THE LEGISLATION OF THE REPUBLIC OF SERBIA

5th Session,
Expert Group on Resource Classification
29 April - 2 May 2014
Geneva
GEOGRAPHICAL POSITION OF THE REPUBLIC OF SERBIA
**GEOTECNIC POSITION**

- **MILLENNIUM TRADITION OF MINING**
  (Cu, Au, Ag, Pb, Zn etc.)
- **2000 MINERAL/ORE OCCURRENCIES AND ORE DEPOSITS**
- **APPEALING TO FOREIGN INVESTORS SINCE THE MEDIEVAL PERIOD**
- **DEVELOPED GEOLOGICAL AND MINING PRACTICE IN THE TIMES OF MODERN/MARKET CONDITIONS**


According to BRGM (Franc.), 2001.
EXPLORATION AREAS AND EXPLOITATION FIELDS
www.mprrpp.gov.rs
LEGAL FRAMEWORK – the management method

- The first rules related to mining in Serbia date back to 1412 (the time of Despot Stefan Lazarević).

- Mining Law Book for the Kingdom of Serbia, passed in 1866.

- Nowadays, the management is defined by the following acts:
  - The Law on Public Administration (2011)
  - The Law on the Ministries (2012/2013)
  - The Law on Health and Safety at Work (2005)
  - The Law on Environmental Protection (2005)
  - The Law on Cultural Property and Heritage (2011)
  - The Law on Administrative Fees (2011/2013)
LEGAL FRAMEWORK – THE WAY TO USE IT

The Law, Rule Books (>20), Regulations and Technical Instructions:

- The Law on Mining and Geological Exploration (2011),
- The Rulebook on Classification and Categorization of Solid Mineral Raw Material Resources and on their Record Keeping (1979),
- The Rulebook on Classification and Categorization of the Oil, Condensates and Natural Gases Resources and their Record Keeping (1987),
- The Rulebook on Classification and Categorization of the Groundwater and their Record Keeping (1979),
- The Regulation on the Content of Geological Exploration Projects and on the Content of their Studies (1996),
- The Regulation on Fees Payment (Geological and Mining) (2012)
APPLIED GEOLOGICAL EXPLORATIONS – in three steps:

- THE SURVEYS WERE DIVIDED INTO (THE LAW, 2011):
  - BASIC – Financed from the budget
    Performed by the Geological Institute of Serbia based on the Program
  - APPLIED – Market conditions

- THE INVESTORS PERFORM APPLIED SURVEYS ACCORDING TO THIS APPROVAL:
  - The first step - Obtain the approval / *Exploratory right*
  - The second step – Geological exploration performance,
  - The third step - Reserves estimates and *certification of resources*
    *(The Resolution / Certificate on quantity, quality and purpose of resources)*
    - GEOLOGICAL EXPLORATION PROJECT AND THE APPROVAL FOR IT
    - ANNUAL AND FINAL REPORTS; THE STUDY ON RESERVES AND RESOURCES,
  - THE MINISTRY
  - THE FOLLOW UP AND THE SUPERVISORY INSPECTION.
APPLIED GEOLOGICAL EXPLORATIONS - COMPLIANCE OF THE PROCEDURES

SERBIAN LEGISLATION

GEOLOGICAL EXPLORATIONS ARE PERFORMED ON THE BASIS OF THE PROJECT / PROGRAM OF THE EXPLORATION ITSELF
ACCORDING TO THE LEGAL PROCEDURES AND REPORTING STANDARDS RUN BY EXPERTS - COMPETENT PERSONS

(REPORTING STANDARDS (JORC Code, Ni 43-101, PERC,...)

(IDENTICAL) METHODS AND TECHNIQUE OF EXPLORATION ARE APPLIED, IN REFERENCE LABORATORIES

On the EXPLORATION AREA
(of the compatible structural - geological - metallogenic characteristics) are obtained

in situ
IDENTICAL AMOUNTS

"MINERAL RESOURCES" (since 2011) (former term - Geological reserves)

Mineral Resources

Geological exploration: 8-10+ years

GEOLOGICAL EXPLORATION $3+2+2$ years $= 7$ years
THE FIRST STEP - OBTAIN THE APPROVAL FOR THE EXPLORATION EXPLORATORY RIGHT

THE INVESTOR

CADASTRE ACCESS REQUEST (WebGIS)

REQUEST FOR THE GEOLOGICAL EXPLORATION APPROVAL FOR CERTAIN EXPLORATORY AREA

THE MINISTRY... GEOLOGY AND MINING DEPARTMENT

PROVINCIAL ENERGY AND MINERAL RESOURCES DEPARTMENT

LOCAL GOVERNMENT

THE PROJECT OF GEOLOGICAL EXPLORATION

(Annual/Perennial)
Performed in accordance with obtained approvals from the Institute for Environmental and Cultural Heritage Protection

THE APPROVAL -EXPLORATORY RIGHT-(DURATION: 3+2+2 YEARS = 7+)
THE INVESTOR - THE CONTRACTOR

EXPLORATORY FIELD

THE STUDY ON RESERVES AND RESOURCES

GEOLOGICAL EXPLORATION APPLICATION, PAYMENT OF ADMINISTRATIVE FEES, GEOLOGICAL EXPLORATION PERFORMANCE

ANNUAL AND FINAL REPORTS

THE MINISTRY... GEOLOGY AND MINING DEPARTMENT

PROVINCIAL ENERGY AND MINERAL RESOURCES DEPARTMENT

LOCAL GOVERNMENT

CONFIRMATION AND CERTIFICATION OF RESOURCES COMMITTEE/WORKING GROUP

THE SECOND STEP - APPROVED GEOLOGICAL EXPLORATIONS PERFORMANCE
THE THIRD STEP - THE ESTIMATE AND CERTIFICATION OF MINERAL RESERVES/RESOURCES

THE STUDY ON RESOURCES AND RESERVES
(Conversion Mineral resources to reserves ≈ Pre-Feasibility study)

(COMPETENT PERSONS’ REPORTS (BSc Eng of Geology and Mining)

THE CONFIRMATION OF RESERVES AND RESOURCES IS THE PRECONDITION FOR ISSUING MINING DOCUMENTATION AND EXPLOITATION ITSELF

THE MINISTRY...
GEOLOGY AND MINING DEPARTMENT

PROVINCIAL ENERGY AND MINERAL RESOURCES DEPARTMENT

LOCAL GOVERNMENT

CONFIRMATION AND CERTIFICATION OF RESOURCES COMMITTEE/WORKING GROUP

THE CONFIRMATION OF RESERVES AND RESOURCES IS THE PRECONDITION FOR ISSUING MINING DOCUMENTATION AND EXPLOITATION ITSELF

THE INVESTOR

GEOLOGICAL EXPLORATIONS RESULTS

MINERAL RESOURCES
INFERRRED
INDICATED
MEASURED

RESERVES
PROBABLE
PROVED
<table>
<thead>
<tr>
<th>Proposed new Regulation on Solid Mineral Raw Material (2012)</th>
<th>The results of basic geological explorations</th>
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<tbody>
<tr>
<td></td>
<td>Mineral resources</td>
</tr>
<tr>
<td></td>
<td>Inferred</td>
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<tr>
<td>Valid Regulation on Solid Mineral Raw Material (1979)</td>
<td>Reserves (old term)</td>
</tr>
<tr>
<td></td>
<td>Potential D₂ and D₁ category</td>
</tr>
<tr>
<td></td>
<td>Identified off-balance and balance geological <em>(in situ)</em></td>
</tr>
<tr>
<td></td>
<td>C₁ category</td>
</tr>
<tr>
<td>UNFC (2009)</td>
<td>Mineral resources</td>
</tr>
<tr>
<td></td>
<td>334</td>
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</tbody>
</table>
Proved reserves (Low -2011)
Balanced A+B (Rule book-1979)

Probable reserves (Low -2011)
Balanced C1 (Rule book -1979)

In situ
Out-balanced +Balanced reserves B+A (Rule book 1979)

In situ
Out-balanced +Balanced reserves C1 (Rule book 1979)

In situ
Potential reserves C2 (Rule book 1979)

- Commercial projects
- Potentially commercial projects
- Non-commercial projects
- Exploration projects
- Additional quantities in place
- Other combinations
- Extracted quantities

Final report
Annual Report...

Measured A+B (A
Indicated C1 B+C1
Inferred C 2
D1+D2)

Licence for Geology exploration
Licence for Geology exploration
The main mining project
Elaborat of mineral resources and ore reserve study (techno-economic evaluation, pre-feasibility study)
OIL, CONDENSATES AND NATURAL GASES RESERVES/RESOURCES

TOTAL (GEOLOGICAL) RESOURCES

Identified (discovered) resources
CATEGORIES

A (Proved)
B (Explored)
C₁ (Insufficiently Explored)

Potential (undiscovered) resources
CATEGORIES

C₂ (Perspective)
D₁ (Forecasting)
D₂ (Assumed)

CLASSES
Based on technical and economic possibilities of exploitation

Balance
A and B (for deposit development and production preparation); C₁ (for projects’ exploratory works and as a basis for the trial production)

Off-balance

Could not be acquired in the deposits of balanced ones
In deposits with no cost-effective production
In an exhaustive or abandoned deposits

The Rule Book on Classification and Categorization..., 1987
The new Rule Book is being created...
GROUNDWATER DEPOSITS
DRINKING, MINERAL, THERMAL WATERS AND WATER VAPOR

RESOURCES

CATEGORIES
Data based on the exploitation, experimental exploitation or exploratory-exploitation pumping

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C1</th>
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<tbody>
<tr>
<td></td>
<td>(investigated and defined parameters ...)</td>
<td>(investigated and defined parameters ...)</td>
<td>(Partially investigated and defined parameters)</td>
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CATEGORIES
Data based on the basic hydrogeological / geothermal

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<tr>
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<th>C2</th>
<th>D1</th>
<th>D2</th>
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<tbody>
<tr>
<td></td>
<td>(Approximately investigated and defined parameters)</td>
<td>(Assumed / forecasting)</td>
<td>(estimated / forecasting)</td>
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CLASS
Economic evaluation of cost-effectiveness based on technical and economic parameters of profitability

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<tr>
<td></td>
<td>Balance</td>
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The Rule Book on Classification and Categorization,..., 1987. (Table prepared by Vukas, March 2014)
EXPLOITATION OF THE RESOURCES - in three steps

- THE INVESTOR
  - ELABORATES THE INVESTMENT - TECHNICAL DOCUMENTATION, OBTAINS THE APPROVALS OF THE COMPETENT AUTHORITIES: ENVIRONMENTAL, WATER SUPPLY, URBAN PLANNING ETC.

- REQUEST FOR EXPLOITATION OF RESERVES
  - The first step - Obtain the approval for mining / mining field,
  - The second step - Obtain the approval for the mining works,
  - The third step - Occupancy Permit

- THE MINISTRY
  - PERFORMS CONTROL MEASURES AND INSPECTION SUPERVISION
THE FIRST STEP - OBTAINING EXPLOITATION PERMIT

EXPLOATATION (MINING) FIELD

THE REQUEST SHALL INCLUDE:
SOLUTION / CERTIFICATE ON RESOURCES AND RESERVES,
FEASIBILITY STUDY,
STUDY ON ASSESSMENT OF THE ENVIRONMENTAL IMPACT,
WATER MANAGEMENT, URBANISTIC AND OTHER APPROVALS

THE MINISTRY...
GEOLOGY AND MINING DEPARTMENT

PROVINCIAL
ENERGY AND
MINERAL RESOURCES DEPARTMENT

LOCAL GOVERNMENT

THE DECISION ABOUT THE EXPLOITATION IN THE EXPLOITATION FIELD
( THE DURATION OF ABOUT 25 YRS.)
THE SECOND STEP - THE PERMIT FOR THE MINING WORKS

THE REQUEST SHALL INCLUDE:
- THE MAIN MINING EXPLOITATION PROJECT,
- THE CERTIFICATE ON RESOURCES AND RESERVES,
- THE PROOF OF LAND OWNERSHIP,
- THE PERMIT GIVEN BY THE ENVIRONMENTAL AND WATER SUPPLY AUTHORITIES, AND THE LAND RECULTIVATION PROJECT

THE MINISTRY...
- GEOLOGY AND MINING DEPARTMENT
- PROVINCIAL ENERGY AND MINERAL RESOURCES DEPARTMENT
- LOCAL GOVERNMENT

THE DECISION APPROVES THE EXECUTION OF MINING OPERATIONS

THE APPLICATION OF THE MINING OPERATIONS COMMENCEMENT

TO COMPETENT AUTHORITY AND MINING INSPECTION

THE EXPLOITATION (MINING) FIELD
THE THIRD STEP - UTILITY PERMIT

THE REQUEST FOR THE USE OF MINING FACILITY

TECHNICAL CHECK

MINING FACILITY

THE MINISTRY...
GEOLOGY AND MINING DEPARTMENT

PROVINCIAL ENERGY AND MINERAL RESOURCES DEPARTMENT

LOCAL GOVERNMENT

THE EXPLOITATION OF THE RESERVES

THE RECULTIVATION

CLOSING OF THE MINING FACILITY

UTILITY PERMIT FOR THE MINING FACILITY

RESTORATION AND RECLAMATION
LIFE CYCLE OF THE MINERAL RESOURCE

THE REGULATION OF THE REPUBLIC OF SERBIA

Mineral Resources Education Program of BC-Jun 2011
www.bcminerals.ca/s/MinDevCycle.asp, Vancouver, Canada

Available Land Resources

Mineral Resources Development Cycle

GEOLOGICAL EXPLORATIONS 3 +2 +2 = 7 years.

ENVIRONMENTAL ASSESSMENT AND PERMIT 1 - 3 years.

APPROVALS AND BUILDING THE FACILITIES 1-5 years.

MINERAL RESOURCES LIFE CYCLE

CLOSING OF THE MINING FACILITY 1-3 YEARS.

MONITORING 5 YRS AND MORE. REPAIR AND RECULTIVATION - 1 YEAR.

AVAILABILITY OF THE LAND, SELECTED EXPLORATION AREA, THE APPROVAL > 1 YEAR.

Exploitation WORKS 10-30 years

Reclamation

~ 50 YEARS

Reclamation 1-4 years Monitoring 5 years → ∞

Construction 1-3 years

Operation 10-30 years

Closure 1-2 years

Environmental Assessment & Approval Ongoing stakeholder consultations

Exploration 8-10+ years
CURRENT APPLIED GEOLOGICAL EXPLORATION AND EXPLOITATION OF RESERVES

**THE SUBJECT OF EXPLORATION AND THE EXPLOITATION ARE:**

- metals (Cu, Au, Ag, Pb, Zn, B, Li,..) oil and gas, coal, oil shale
- (energy resources), industrial minerals, geothermal energy, water...

**PRESENT COMPANIES:**

- RIO TINTO, FREEPORT, EUROMAX, DANDE PRECIOUS METALS,
- AMECO, RESERVOIR MINERALS, BETEC, GASPROMNJERT, HOLCIM,
- TITAN, LA FARGE, RTB BOR, RUDNIK, FARMAKOM MB, VELIKI
- MAJDAN, OMYA ETC.,

**WHERE ARE THE WORKS CARRIED OUT:**

- IN DOZENS OF EXPLORATORY AND MINING FIELDS.
THE EFFECTS GEOLOGICAL EXPLORATION AND EXPLOITATION
SINCE 2000

FOR THE FIRST TIME AFTER 75 YEARS THE PROCEDURE FOR AWARDING THE CONCESSIONS WAS CARRIED OUT FOR GEOLOGICAL EXPLORATION / MINING,

- IN GEOLOGICAL EXPLORATION OF METAL IT IS INVESTED ABOUT 50 MILLION U.S. DOLLARS PER YEAR,

- VERY SIGNIFICANT PREVIOUSLY UNKNOWN DEPOSITS, CONSIDERED TO BE ECONOMIC POTENTIALS, WERE FOUND AS FOLLOWS:
  - Of Lithium (new mineral – Yadarite (jadarit)), in sediments of Yadar basin (Jadar, Loznica, Western Serbia) Rio Tinto /Rio Sava exploration,
  - Of gold (scattered mineralization) in sediments (Žagubica, Eastern Serbia), Dundee Precious metals/ Ava Res, Dundee Precious metals/ Ava Resources
  - Of copper and gold in the field of Timok - magmatic complex (Bor, Eastern Serbia) / Free Port

- THE MINING SECTOR CURRENT SHARE IS APPROXIMATELY 1,5 - 1,7% (optimistic estimate is that by 2030, it will be 5%).
GREETINGS FROM BELGRADE

THANK YOU SO MUCH FOR YOUR ATTENTION!

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