

2. Legislative Conditions for Geological Deposit Exploration in Slovakia

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Abstract: The article deals with legislative conditions of the deposit geological exploration in Slovakia. It provides classification of minerals and their division into reserved (natural wealth of SR) and non-reserved (part of the land). It gives description of the stages of the exclusive deposits exploration as well as deposits of the non-reserved ones and of the procedure at acquiring professional competence in carrying out the geological works and geological authorisation. A process for determining the exploration area for reserved minerals is analysed, along with duties and rights of the holder of the exploration area and the whole process from developing the project of geological works through the solution of conflicts of interests and access to the third party property to permit mining activity, which mainly concerns the special prospecting mining works. The final part of the paper is devoted to the issue of the final report with the estimation of reserves and the conditions for assessing and approving such reports by the competent authorities of the state administration and the entire process is completed by issuance of the certification of the exclusive deposit.

Key words: Deposit geological survey, exclusive deposits, deposits of non-reserved minerals, project of geological works, calculation of mineral reserves, certificate of exclusive deposit

2.1. Introduction

The basic legislation governing the conditions of design, implementation and evaluation of geological works in the Slovak Republic, is the Law no. 569/2007 Coll. on Geological Works (Geological Act), as amended by further legislation. The deposit geological survey is under this regulation a survey, which mainly explores mineral deposits, verifies their reserves and processes geological documents for their exploitation and protection. In addition, under this kind of geological works geological conditions are verified for the establishment and operation of underground gas and liquids reservoirs in natural rock structures and access to the caves, stability of underground spaces is ensured. Security and liquidation of old mine works and the establishment and operation of natural rock structures and underground spaces for the purposes of permanent storage of carbon dioxide in the geological environment are also solved under Geological Act.

The Law no. 44/1988 Coll. on the Protection and Utilisation of Mineral Resources (Mining Act), as amended, outlines the obligations of the organization in the geological exploration of exclusive deposits. It defines the conditions of utilization of the exclusive deposit reserves as a

basis for the calculation of reserves and classifies reserves of the exclusive deposit.

The details on both legislations related to the deposit geological survey are laid down by the Regulation of the Ministry of Environment of the Slovak Republic no. 51/2008 Coll., Implementing the Geological Act, as amended, and the Ministry of Environment of the Slovak Republic no. 33/2015 Coll., Implementing certain provisions of Law no. 44/1988 Coll. on the Protection and Use of Mineral Resources (Mining Act), as amended.

2.2. Definition of basic terms in deposit geological exploration

2.2.1. Exclusive deposits and deposits of non-reserved minerals

Exclusive deposits are deposits of reserved minerals, which are radioactive minerals, coal, oil, combustible natural gas, bituminous rocks suitable for energy use, minerals, from which there can be industrially produced metals or phosphorus, sulphur, fluorine and its compounds, rare earth elements and elements with the semiconductors properties, further magnesite, rock salt, potassium, boron, bromine and iodine salt, graphite, barite, asbestos, mica, talc, diatomaceous earth, glass and foundry sand, mineral dyes, bentonite, technically useful crystals of minerals, precious stones, halloysite, clay, ceramic and fire-proof clays and claystones, gypsum, anhydrite, feldspar, perlite, zeolite, travertine, also granite, granodiorite, diorite, gabbro, diabase, serpentine, dolomite and calcite (if they are mined in blocks and they are polishable), and the silica, quartzite, limestone, dolomite, marl, basalt, trachyte and phonolite (provided they are appropriate for chemical or melting processing), mineralized water, of which reserved minerals and technically useful natural gases may be obtained industrially. The exclusive deposits represent the mineral wealth of the Slovak Republic.

A natural wealth comprises rock structures and underground spaces, incurred as a result of extraction of oil and flammable natural gas or salt if they are suitable for storage of gases or liquids, and natural rock structures suitable for utilization of geothermal energy.

Non-reserved minerals are minerals and other natural accumulations and backfill in underground mines, dumps, or tailings ponds containing them. These are in particular

the deposits of building stone, gravel and sand and brick materials. Since 2002 the non-reserved mineral deposits, of which in 1991 decided the relevant central government authorities that they are suitable for the needs and development of the national economy, or their mining areas were not determined until 2001, have been considered as the exclusive deposits, but only within the determined limits of the mining area. Non-reserved minerals are part of the land.

2.2.2. Stages of the deposit geological exploration of exclusive deposits

In the scope of the deposit geological exploration of exclusive deposits geological conditions and tectonic structure are explored, along with distribution of various minerals by quality, mining-technical conditions that may affect the mining of detected and proven reserves of minerals forming deposits. The issues of possibility of disposal of dumps, heaps and tailing ponds are studied along with expected impact on the environment, the hydrogeological conditions and occurrence and accumulation of groundwater that can affect the deposits mining.

The deposit geological exploration of exclusive deposits is divided into search, detailed and extractive deposit geological survey.

In the scope of the search deposit geological survey an exclusive deposit is verified, its approximate extent is determined, within its parts reserves of category Z-2 are calculated and verified, in the rest parts the reserves of the category Z-3 are verified and calculated or estimates of resource prognosis. The rock structures or underground spaces are identified and verified, their sealing potential and their suitability for storage of gases and liquids.

In the scope of the detailed deposit geological survey reserves of the deposit are verified in the amount and quality of their designed use; they are calculated as reserves of the category Z-1, other reserves of the deposit are calculated as the category Z-2. The range of rock structures or underground space is verified along with the calculation of the volume and the tightness of surroundings, the hydrogeological conditions are determined and the conditions for the establishment and operation of underground reservoirs of gas and liquids.

In the scope of the extractive deposit geological exploration of the exclusive deposit the knowledge on the position of the reserves is specified and their quality and types of pollutants in the raw materials that are needed to regulate the mining of the deposit and Z-1 category reserves are calculated.

The knowledge about geological and mining-technical conditions for the conversion of oil, combustible gas, exploitable gas and salt for the underground storage of gases or liquids, are specified.

2.2.3. Deposit geological exploration of non-reserved minerals

The deposit geological exploration of the deposits of non-reserved minerals has the similar legislative frame as it is in the case of the exclusive deposits. However, only

the stage of search exploration is carried out and at a deposit the reserves are verified and calculated, their approximate range, quality and types of resources.

2.3. Chronology of the deposit geological exploration

2.3.1. Award of professional competence for execution of geological works

Professional competence is an essential condition for the implementation of geological works, which in the case of geological exploration must possess a natural person who is an entrepreneur, agent or representative of a legal entity as a contractor of geological works. The professional competence must possess also the principal investigator of the geological task, which manages, coordinates and resolves a geological project.

The professional competence is verified by the Ministry of Environment of the Slovak Republic by an exam upon written request by the applicant or his employer; the request shall contain name, title, date and place of birth, permanent address of the applicant and the definition of geological works, subject to an award of professional qualifications.

The application shall include copies of university education of second or third degree in geology and a copy of the certificate on state, doctoral or PhD examination in the subject, which is identical to deposit geological survey.

The application shall be accompanied by a reference of geological tasks which were addressed by the applicant, including the list of the final reports and other written materials from the archives of the State Geological Institute of Dionýz Štúr, which should document at least five years' experience in the deposit geological survey.

A foreign natural person or a representative of a foreign legal entity shall attach to a written request for verification of professional competence a copy of the foreign geological authorisation issued in another state or non-certified or certified translation of such authorisation.

A Certificate of professional competence is not required from the natural person who is resident in a Member State of the European Union and who in Slovakia will temporarily or occasionally carry out geological work of up to six months a year, and will address a maximum of three geological projects, if he proves that he is authorized to carry out geological work under the legislation of a Member State of the European Union.

The application for verification of professional competence shall be accompanied by an electronic stamp with a face value of 33 Euros.

Professional competence is proved by issuing the Certificate of professional competence and is verified every five years.

2.3.2. Award of geological authorisation

The deposit geological survey may carry out an individual who is an entrepreneur and a legal person authorized to carry out geological works. The geological authorisation is issued by the Ministry of Environment of the Slovak Republic on the request for geological authorisation issuance.

The request of the natural person or his representative (if any) for geological authorisation shall contain personal information (name, date of birth and residence), proof of integrity, business name, geological work, to which he has applied geological authorisation, identification number (if it is assigned) and number of the professional competences licences (including principal investigator of the geological task). The integrity means that the individual or his representative should not be condemned for a threat to or damage the environment, which is unjustified waste management, unauthorized discharges of polluting substances, violation of water and air protection, unauthorized manufacture and disposal of ozone depleting substances, violation of plant protection and animals, trees and shrubs, spread of contagious diseases of animals and plants, organisms escape and poaching. The application shall be accompanied by a statement of convictions of a natural person or a representative not older than six months, the original contract between the agent and the applicant for geological authorisation (in case the representative is also a natural person) a certified copy of identification number, provided it has been allocated.

Request of the legal person for geological authorisation contains similar data; change compared with the application of a natural person is in a trade name and registered office, personal data of the member of the statutory body or its representative and the original certificate of Companies Register (or certified copy) not older than three months or contract of company establishment or a certified copy. The application must also be accompanied by the original contract between the agent and the applicant (if a representative is not also a statutory body) and officially verified copy of the identification number of the organization.

In the case of foreign natural or legal person analogous requirements and conditions for issuing geological authorisation are applied. A foreign natural person indicates in the application of geological authorisation also address of the site and the foreign legal person shall sign an undertaking or branch, address, place of business or branch personal data and the head of the company or its branch. A request for issuance geological authorisation shall be submitted in the state language and the application shall be accompanied by non-certified translations of documents into the state language.

The request for issuance geological authorisation shall be accompanied by an electronic stamp with a face value of 50 Euros.

Geological authorisation is issued for an indefinite period.

Without authorisation, the deposit geological survey can be carried out by the contractor of geological works in the mining of exclusive deposits.

2.3.3. Preparation of preliminary documentation and geological intention

The geological task in the scope of the deposit geological survey shall be elaborated by the contractor of the project of geological task that may be preceded by development of preparatory documentation as a general solution or as a preliminary study.

In the general solution geological plan is defined in a wider context, demonstrating the practicality, feasibility and rationality of the geological plan, it provides an overview of the work and an estimate of costs and presents information on the conception and design of long-term forecasts and plans for geological works.

The preparatory study assesses or specifies prognostic resources of minerals and considers the expected economic benefits, claims and justifies the optimum location, analyses the different methodological and technical procedures to address the geological task and evaluates the economic benefits of envisaged solutions including documents for their economic justification.

Geological intention of a geological task includes the name, date of issue, type of geological works, geological exploration stage, the name of the client and the contractor of geological works, signature of the statutory body of the customer and contractor of geological works, the contractor's representative of geological works (if appointed) and principal investigator of the geological task. Way of a geological task solving in geological intention includes limits of investigated territory, the name and code number of regions, districts, municipalities and cadastral territories, objective of a geological task, procedure of a solution and its justification and specification, the number and range of the projected works.

Preparatory documentation and geological intention is approved by the customer of geological works.

2.3.4. Determining the exploration area

The deposit geological survey of reserved minerals and natural rock structures and underground spaces on the establishment and operation of underground reservoirs of gas and liquid is among the selected geological works that can be performed only in the exploratory area, which determines the Ministry of Environment of the Slovak Republic on the ordering of geological works.

A proposal to determine the exploration area contains the name or business name and address of the customer of geological works and original extract from the Companies Register, or an officially certified copy. The proposal also includes the name of the exploration area, the name and code of the cadastral territories, municipalities, districts and regions in which the exploration area is located, as well as the relative proportions of municipalities according to the size of the exploration area in the individual cadastral areas. The proposal briefly states the purpose of geological task, designation of the geological works, geological exploration stage and the expected use of the different types of geological works, geological project budget and the date of the geological task completion.

The proposal shall contain definition of exploration area in the exploration area map, coordinates of apex points on the surface of the Uniform trigonometric cadastral network area and exploration area in km² rounded to two decimal places, attested by the chief mining meter or authorized surveyor and cartographer.

The extent of the exploration area can be up to 250 km². The exploration area proposed for the deposit geological

prospecting of reserved minerals may involve only one exclusive deposit with a designated protected deposit area for the same types of minerals and cannot include exclusive deposit with a designated mining area.

The exploration area proposed for deposit geological exploration of natural rock structures and underground spaces for the purposes of the establishment and operation of underground reservoirs of gas and liquid cannot include a protected area for the same purpose.

The exploration areas for the same purpose cannot overlap even partially and for different purposes cannot be fully or partially overlapping provided, this would essentially make it difficult or impossible to carry out geological works or use their results in the case of the survey of developmentally and spatially related deposits of reserved minerals or natural rock structures and underground spaces.

To the application for the determination of exploration area a customer of geological works shall attach geological intention, details of the contractor of geological works (name, location, number and date of issue of the geological authorisation), information on other exploration areas, protected areas, protected deposit areas and mining areas, which cut exploration area or border with it immediately. The application shall also contain a statement of the Department of environmental protection of district office and the opinion of the State Geological Institute of Dionýz Štúr not older than three months.

The application for the determination of exploration area of radioactive minerals shall contain opinions of municipalities falling within the exploration area, and of a self-governing region. They give their statements to the geological intention in terms of objectives and priorities of the programmes of economic and social development of municipalities and counties or binding part of spatial planning documentation.

The deposit geological exploration of oil and combustible gas can be carried out only in areas designated by the Ministry of Environment of the Slovak Republic and which are posted on its website. Upon receipt of the proposal to determine the exploration area to carry out the deposit geological exploration for oil and flammable natural gas the Ministry of Environment of the Slovak Republic shall issue a notice in the Official Journal of the European Union, indicating the time limit within which competing proposal may be submitted, the territory which is the subject of a the proposed duration of determination of exploration area. The proposal must include documents proving financial capacity and technical competence of a customer of geological works. In the case of several proposals for the determination of exploration area for the implementation of deposit geological exploration for oil and flammable natural gas the Ministry of Environment of the Slovak Republic shall make a decision with regard to the technical and financial capacity of the customer, the proposed method of implementation of geological work and the way to obtain the most complete information and better protection of the interests protected by special regulations. The exploration area can be determined also to a group of customers, which jointly fund geological works in a determined area.

The request for a decision on determination of exploration area shall contain electronic stamp with a face value of 35 Euros and on the issue of the decision to change the exploration area requires an electronic stamp with a face value of 30 Euros..

Exploration area is not determined for the deposit geological prospecting of reserved minerals or non-reserved minerals in the mining area and the deposit geological exploration of non-reserved minerals.

2.3.5. Rights of the holder of exploration area

The holder of the exploration area for deposit geological prospecting of reserved minerals is entitled to get determination on the mining area within one year after the review and approval of the final report. In his exploration area the holder has the right to perform selected geological works as stated in the decision on determination on the exploration area alone, if he has a geological authorisation, or he may order them from another person with geological authorisation. In the determined exploration area, the holder may carry out other than selected geological works as stated in geological authorisation. Another person may carry out geological works only with the consent of the holder of the exploration area while respecting conditions and obligations, if it is in accordance with his geological authorisation.

The holder of the exploration area may make a proposal to extend the period of validity of exploration area, but he must allocate at least 70% of the budget of the geological task to carry out selected geological works.

The holder of the exploration area is authorised, upon the approval of the Ministry of Environment of the Slovak Republic to conclude an agreement to transfer exploration area to another person with the condition of allocation at least 10% of the budget of the geological task, in the case of deposit geological exploration for oil and flammable natural gas after spending at least 5% of the budget of the geological task.

The application for approval of legal transfer of exploration area and undertake the necessary changes in the records of exploration areas shall be accompanied by an electronic stamp with a face value of 20 Euros.

2.3.6. Obligations of the holder of the exploration area

The holder of the exploration area shall submit to the Ministry of Environment of the Slovak Republic approved project of geological task with the resolved conflicts of interests protected by special regulations drawn up in accordance with the present geological intention within three months from the entry into force of the law-decision on determining the exploration area. Each change to the project of geological works shall be submitted within 30 days of its approval.

The holder of the exploration area submits to the Ministry of Environment of the Slovak Republic annual report on exploration activities with the results, and evidence of funds allocated for geological exploration within six weeks after the end of the calendar year.

By the end of the second year after the entry into force of the decision extending validity period of the exploration

area the holder of the exploration area is obliged to spend on geological works additional 30% of the budget of the geological task.

Payment for exploratory area is, for every year and every km² during the first four years, 100 Euros, over the next four years, 200 Euros, over the next two years, 350 Euros and over the next years, 700 Euros. The holder of the exploration area is required to remit the payment to the Ministry of Environment of the Slovak Republic within three months after the start of each calendar year.

2.3.7. Elaboration of the project of geological works

The project of geological works reflects the objective of the geological task, proposes and justifies the selected types of geological works and specifies the logical methodological and technical approach of their professional and safe implementation. It shall be approved by the customer after the prior written consent of contractor of geological works or his representative, if any.

The title page contains the project name of the geological task, date of issue, type of geological works, geological exploration stage and the name of the customer and contractor of geological works. The project shall be signed by the statutory body of the customer and contractor of geological works, the contractor's representative (if appointed) and principal investigator. Approval of the project is characterized by the name and surname, signature of the statutory body of the customer, the approval date and stamp of the customer.

The geological part of the project shall contain topographical definition of the investigated territory or object in the appropriate scale, the name and code number of region, district, municipality and cadastral zone. The objective of the geological task should indicate range of issues that need to be addressed with regard to the future, especially economic exploitation of the results of the deposit geological exploration, indicating the expected quantity and quality of entries into deposit reserves divided into the categories (for reserved minerals). When defining the basic facts there must be mentioned geological factors conditioning the solution of geological task, present geological and deposit exploration degree, including data on prognostic resources of minerals and reserves levels by categories, including conditions for reserves utilization. The project set out the relationship of geological works to the creation and protection of the environment.

The main part of the project of geological works is a solution procedure and its justification, specifications, number and extent of the projected kinds of works with their time continuity and qualitative conditions for carrying out geological works. Geological part of the project shall contain graphical attachments that show way of the solution of geological task, documents on dealing with conflicts of interest and a list of references and other sources.

The technical part of the project provides the information how the geological task will be ensured and identifies technological procedures of designed works, conditions for their implementation, technical means, it justifies the place and method of storage of the mineral resource, de-

termines the storage location of the samples, drilling fluid used, the method of handling waste produced in carrying out geological works. The disposal and remediation works are addressed, along with the admissions to the property, measures to safeguard the interests protected by special regulations for preventing damage in carrying out geological works and to ensure the safety of occupational health and safety in operation. Fire prevention measures and social and hygienic facilities shall be documented, too.

The project shall indicate the budget of geological task, which shall include a quantification of the projected costs of geological works by each type of work. The types of works comprise the geological activities (archive excerption, monitoring, control and coordination of work, geological documentation, evaluation of geological data and final processing), technical work, geophysical, geochemical, technological, laboratory, field surveying, special sampling and surveying work and activities. Geological project budget includes the costs of project development, safe-guarding, maintenance and disposal of geological works and geological objects or budgetary provision for costs not possible to predict in the project.

The geological task shall start only after approval of the project of geological works by the customer of geological task. If during the geological project solution a circumstance occurs, asking for a necessity to choose a different methodological or technical approach for the solution, or to perform a greater range of geological works beyond the approved project, the contractor of geological works is obliged to propose an amendment of the project of geological task. Contractor shall also propose amendments to the project in the case, when in the course of the solution it is shown that the objectives of the geological project cannot be achieved for reasons differing from the assumptions set out in the approved project of geological task.

The contractor shall submit an amendment to the geological works if it is possible to carry out geological works without changing the project, but on a different scale of each kind of work without changing the budget of geological works.

The amendment to the project of geological task and amendment to the geological works shall be approved the customer of geological works.

2.3.8. Addressing conflicts of interest

In the project documentation of geological task, it is necessary to define measures to ensure the interests protected by specific regulations. For this purpose it is necessary to seek the statements of interested bodies and organizations, and the project of the geological task should take into account potential conflicts of interest.

The nature protection authority, which is the department of environmental protection in district office at the county, shall give a statement to the project of geological task, to its amendments and to the geological intention from the perspective of ensuring the protection of flora, wildlife and their communities, natural habitats and ecosystems and geological and geomorphological formations.

In the sector of protection of agricultural land and forestry expresses its statement land and forest department of district office at the county.

The competent road authority shall determine the conditions for conducting geological works in protection zones of highways and roads of higher classes (50 to 100 meters from the axis of the adjacent driving belt) as well as lower-class roads and local roads (15 to 25 meters from the axis of the road).

The Railways of the Slovak Republic, state enterprise, Bratislava and railway company Cargo, a.s., Bratislava express their opinions to the project, when the geological works will interfere with the railroad protective zone (60 m from the track) and the prior approval of railway facilities keeper, the relevant regional directorate, is required.

Respective branch of the Slovak Water Management Enterprise, Banská Štiavnica makes its statement to the project of geological works from the viewpoint of the development of water management, technical and operational concerns of the administrator of watercourses and in terms of the requirements of protection against pollution.

The expression of the relevant distribution company is required when the technical works will be implemented in the protected zone of external overhead electrical power of very high, high and low voltage lines and below these lines.

Relevant water supply company shall provide its statements on the existence of utilities networks under the management and operation maintenance of these facilities.

The existence of underground telecommunications facilities shall be formulated by the individual operators of these facilities and the statements to the existence of telecommunication lines and radio equipment as well as general conditions for the protection of networks shall provide telecom operators.

The existence of gas facilities and conditions for carrying out activities within their safety and security zones is expressed by the relevant distribution company Slovak Gas Industry, a.s., Bratislava.

The Memorials Office expresses its statements to the geological work in the field of protection of monuments, archaeological finds and archaeological sites.

If the geological works are performed in a military district, the Ministry of Defence of the Slovak Republic gives conditions of their realization and an opinion for their implementation.

2.3.9. Admission to the foreign property

Geological legislation does not define admission to foreign property as a conflict of interest, and this fact is crucial not only for geological survey, but especially during the subsequent use of research results and permitting mining activities.

According to the Geological Act for the purpose of carrying out geological works in the public interest, the contractor is entitled to execute geological and related works entering on foreign property, in the necessary time and for appropriate compensation with minimum interference with the rights of the owner of the property, including the minimization of potential damages.

However, the question is what is the public interest in carrying out geological works, as clear and unambiguous definition of public interest is not included in any piece of legislation, including the Geological and Mining Laws. This fact is crucial already at the stage of deposit prospecting, as it blocks the very implementation of opening, preparation and extraction of exclusive deposits.

The contractor shall notify in writing the owner of the property about the method of implementation and duration of geological works at least 15 days in advance. If a property owner disagrees with the scope, method and duration of geological works, based on a proposal from the contractor of geological works the Ministry of Environment of the Slovak Republic shall decide within six months. If this deadline is insufficient for objective reasons, it may be extended for a further six months.

For use of the land belongs to the owner adequate compensation from the contractor of geological works. If the amount thereof is not agreed by the parties, the court shall decide about it.

The rights and obligations of the property owner have also agricultural cooperatives, trustees of state or municipality property, tenant, Slovak Land Fund, land cooperatives with legal personality, legal or natural person who manages forest land and trustee of higher territorial unit property.

2.3.10. Reporting of geological works

The contractor of geological works declares an implementation of the deposit geological exploration to the State Geological Institute of Dionýz Štúr not later than by the date of commencement of geological task (except survey carried out within the designated mining area). The notification shall state the name and address of the contractor and the customer of geological works, the name and number of the geological task, type of geological works and exploration stage, the name and code of the cadastral area and a district, objectives of the geological task, definition, specification and scope of geological works, definition of the territory on the map document on an appropriate scale and the expected date of commencement and completion of geological works. There shall be also declared a change in the extent of area in which geological works are carried out, change in the objective of geological task or range of geological works, or that the announced geological work will not be carried out at all. The electronic announcement shall be done on the website of the State Geological Institute of Dionýz Štúr.

2.3.11. Mining works permission

The deposit geological exploration of the exclusive deposit belongs to mining operations. Authorisation by the competent District Mining Office is required if the survey will be carried by vertical mining works deeper than 40 m, horizontal or inclined mining works longer than 100 m, or even shorter workings when additional workings with a total length of more than 100 m are to be driven.

In this case, the application for authorisation of mining activity shall contain the name and address of the organ-

ization, type of mining activity, name and identification number of cadastral area, the name and code of the district, scheduled beginning and completion or interruption of mining activities, the names and addresses of the parties for the authorisation of mining activities (physical and legal persons whose rights and interests protected by law can be influenced, the public concerned and the community, within the territorial jurisdiction of which mining activities shall be carried out). The application shall include documentation of search and exploration of the exclusive deposit by mining works.

2.3.12. Reporting mining activities and activities conducted by mining methods

An organization is obliged to report to the competent District Mining Office about the deposit geological exploration of the exclusive deposit and exploration for non-reserved minerals (which are activities performed by mining method). The reporting obligation shall apply to the realization of wells in the workings and underground wells, laboratory work, monitoring, control and coordination of geological works, geological mapping, compilation of geological maps, conducting geological documentation and special geological works, elaboration of projects of geological works, studies, final reports, calculations of reserves, opinions and research.

The announcement shall contain the name and address of the organization, type, purpose and intended scope of activity, the name of the district, municipality and cadastre, the date of planned start and completion, the nature and type of technical equipment, measures to ensure the safety and health protection, method of remediation of effects of activities and map showing the location and type of activity.

The establishment of boreholes from the surface with a designed depth of more than 500 m, digging pits and shafts and galleries development shall be announced separately.

Commencement, interruption for more than 30 days and discontinued operations are reported eight days in advance.

2.3.13. Procedure in geological exploration of exclusive deposits

In identifying and comprehensive evaluation of all useful minerals of the exclusive deposit and their commercial components, in order to evaluate the possibility of the deployment of individual minerals, the contractor shall provide a sampling work followed by samples testing and provision of special analyzes and tests, including laboratory and modelling research of treatability. It should be reviewed also the possibility of using the examined mineral/s by economic efficiency, which is usually expressed by a factor of economic efficiency and which expresses the ratio of the value of raw materials and production (direct, indirect, capital, investment, reclamation and other) costs recalculated to 1 t/1,000 m³ of extracted material.

The contractor shall verify the facies and lithological conditions of the exclusive deposit in order to create the conditions for the design of construction of mines and

quarries, of opening, preparation and mining of the exclusive deposit according to the principles of mining technology and to ensure the efficient utilization of reserves of the exclusive deposit. The projected geological works by the degree of exploration of the exclusive deposit should check its size, shape, storage and tectonic conditions, physical and mechanical, engineering geological, hydro-geological and other characteristics of the deposit and its surroundings and should solve issue of water-logging of exclusive deposit and disposal of mining water. Last but not least the geological survey should design the optimal method of preparation, development and extraction of exclusive deposits, although this proposal incorporates a plan of opening, preparation and extraction by an organization which possesses a designated mining area.

Geological survey should be carried out so as to avoid impossibility or prevent any use of the exclusive deposit or its part and unjustified loss of its reserves. This means that the geological work should bind minimum geological reserves. They should also examine the negative factors that may affect future mining, for example, the possibility of water in-breaks, auto-ignition in case of coal and gas deposits, or slope deformations at the surface exploited deposits and propose measures to prevent the interconnection of aquifers. Surface structures and equipment should be not situated in places where they block the future use of reserves of the exclusive deposit.

Last but not least, the deposit geological survey assesses the possible effects of the exclusive deposits on other deposits, on the individual components of the environment and other public interests. It examines the possibility of influencing the mined rock structures in particular with sources of natural healing resources and natural mineral waters and defines the conditions to minimize the impact of mining on the environment. At the stage of geological exploration in the final report of the geological task, there are proposed options for disposal of extractive waste so that it does not block future use of deposits and the impact of the muck use on objects and interests protected by special regulations is assessed, for example in relation to the territorial nature protection, the protection and utilization of agricultural land or the already mentioned groundwater resources. Equally important are the provisions regarding the evaluation of the exclusive deposit in relation to land-use planning documentation and cooperation with land-use planning when procuring or updating of land-use planning documentation. The binding nature of spatial planning at the regional level could solve many conflicts of interests between producers' organizations and municipalities in the use of the results of deposit geological exploration.

Finally, the measures shall be implemented to secure the geological works and geological objects at the interruption of geological works, so that in the future the deposit geologic exploration and subsequent use by other holders of exploration area or mining area, may continue to be carried out.

2.3.14. Final report elaboration with the estimation of reserves of the exclusive deposit or its part

After completion of the geological task, the contractor is obliged to evaluate geological works in his final report

and submit it to the customer of geological works. If the deposit geological survey sought and verified mineral deposits, it must include comprehensive qualitative assessment of the mineral in terms of its potential use and calculation of mineral reserves and accompanying minerals or part thereof. Results of the geological project can be evaluated in interim final reports.

The final report with the calculation of reserves of the exclusive deposit in addition to basic data (name and number of the geological task, type of geological works and stage of the survey, the customer and the contractor of geological works, principal investigator and the investigators and the submission date) contains in the text the topographical definition of territory, objective of geological task and information about the project and its changes. When characterizing the natural conditions the geomorphological, geological, hydrogeological, hydrological and climatic characteristics of the deposit, or areas protected by special regulations, shall be stated. In to date geological exploration the details of the works carried out and their results in relation to addressing the issue shall be discussed. The description of the geological project shall include the method, procedure and temporal link among all realized geological works and activities including waste and extracted materials handling, security measures or liquidation of geological works carried out and measures to eliminate or minimize the impact of technical works on the environment. The spatial characteristics of deposit shall describe comprehensively the deposit and its extent, including the accompanying minerals. The qualitative and technological characteristics shall define the kind of reserved mineral, its technological types, properties of commercial and harmful ingredients, variability in the quality characteristics of deposit, treatment and refining practices, and comprehensive assessment of the mineral in terms of its use in practice. Description of hydrogeological characteristics includes the impact of tectonics on hydrogeological conditions of the deposit, the chemical composition of water, envisaged inflows of water into the deposit during mining and its hydrogeological classification.

The main chapter of the reserves calculation provides calculation methodology and its justification, the basic parameters of the calculation process, principles of the division into blocks, the inclusion of reserves into categories and the basic parameters calculation in tabular form and the overall results of reserves estimation. When tested a non-reserved mineral, its calculation or qualified estimate are indicated, or even an educated guess of prognostic resources. It suggests the optimal utilization of the deposit, its protection and assesses the relationship to the expected mining interests protected by special regulations and relationship to the land-use planning documentation. The text part of the final report concludes comment to economic benefits of the solution of the geological task, data on the geological documentation storage, conclusions and recommendations, and a list of references and other sources.

Part of graphical attachments is situational map of the wider surroundings of deposit, orthophoto of its environs, geological map and basic reconnaissance and mining

maps. Graphic annexes include also map of blocks of reserves with their projections on the surface and protection zones and security pillars, vertical and horizontal sections, map of prognostic resources and accompanying minerals (provided their professional estimate was elaborated), targeted and thematic maps, geological documentation of geological works, or other geological documentation and photodocumentation.

Part of the text attachments is the decision on determination of exploration area or a specific exploration area (provided the geological task was financed from the state budget).

Terms of exploitable reserves are the basis for the inclusion of calculated balance between reserves or non-balanced reserves, which are also annexed to the final report with the estimation of reserves of the exclusive deposit, which details the geological, mining-technical and economic indicators. Among the geological indicators we rank, for instance, the minimum amount of balance reserves, or the maximum available quantity of oil, combustible gas, technically usable natural gas from one borehole, minimum/exploitable thickness of the deposit, the maximum thickness of technically unsuitable horizons, the minimum and maximum average content of useful and harmful components (even in the outskirts sample and in the border geological work), the maximum depth of deposit in the deep mining, the maximum stripping ratio, requirements for the raw material properties, the collector characteristics of the productive horizon and requirements resulting from the relevant Slovak technical standards. Geological indicators of conditions of utilization are determined with regard to the type of mineral or the nature of the exclusive deposit. The same goes for mining-technical indicators (mechanical stability of deposit, optimal mining method, treatment and refinement, exploitation ratio, recovery and pollution, measures against unforeseen circumstances, waste mining water and mining waste and the impact of mining activities on the environment) and economic indicators (the price of the mineral resource, operating and investment costs). It should be pointed out that the organization/contractor often defined the conditions of utilization of reserves in conflict with the law. Terms of exploitable reserves are in fact the basis for the classification of reserves between the balanced and the non-balanced reserves and not for the inclusion of reserves in the relevant category, and the inclusion of reserves in free or bound reserves.

The text attachments should contain tables referring to analyses and tests including the verification tests, thickness calculations, density and quantity of reserves in each block, total reserves estimation, geodetical surveying activities (targeting different geological works) or other reports (e.g. geophysical, geochemical, mineralogical, petrological, technological).

Application for approval of reserves includes the name of the deposit, reserved mineral, accompanying materials, exploration area, protected deposit area, mining area, cadastral area, district and region, the geological characteristics, hydrogeological conditions and description of deposits, the use of minerals and accompanying minerals

by economic and bound categories, reserves quality, the amount of surface overburden earmarking the amount of agricultural land, or stripping conditions and other parameters listed in terms of utilization of reserves.

If prognostic resources were estimated, the final report shall be accompanied by an inventory sheet containing the name and identification of prognostic area, the name of the mineral and the accompanying minerals, division of prognostic resources (P1 or P2), the estimated amount and geological and hydrogeological characteristics. The index passport deposit is also attached, containing summary information on the deposit and protocols on security and maintenance or disposal of geological works.

2.3.15. Final report elaboration with the estimation of reserves of non-reserved mineral

The content of the final report with the estimation of reserves of non-reserved mineral has a similar structure as in the case of the final report with the estimation of reserves of the exclusive deposit. However, the text part shall contain in simplified form the description of the deposit and its position, as well as hydrogeological characteristics and processing methods and results of the calculation of reserves. The economic benefits of the geological task are not stated. The graphical attachments shall not contain the map of prognostic resources, targeted and thematic maps, geological documentation; sufficient is vertical or horizontal geological cross-section. For purposes of reserves calculating it is not necessary to determine the conditions of utilization of reserves, because reserves of non-reserved mineral are not broken down by categories Z-1, Z-2 and Z-3, neither under the terms of the usability of the balanced and non-balanced reserves nor by accessibility of the free and bound reserves.

2.3.16. Appraisal and approval of the final report with the calculation of mineral reserves

The final report with the calculation of mineral reserves shall be appraised and approved by the Ministry of Environment of the Slovak Republic regardless of the source of funding within six months after its submission; customer shall submit it for approval to the Ministry of Environment of the Slovak Republic within one month after its receipt from the contractor of geological works in written, graphic and digital forms together with the expert's opinion elaborated by an authorised person on the deposit geological survey.

For the purpose of issuing the decision on approval of the final report with the estimation of reserves of the exclusive deposit the customer of geological works attaches an electronic stamp with a face value of 35 Euros.

2.3.17. Issue of the exclusive deposit certificate

The Certificate of the exclusive deposit is issued by the Ministry of Environment of the Slovak Republic after appraisal and approval of the final report with the calculation of reserves of the exclusive deposit, based on a propos-

al for its issuance by the customer of geological works, which includes the name of the exclusive deposit, reserved mineral and accompanying minerals, the name and code of the cadastral area, municipalities, districts and regions, the coordinates of the apex-points of the peripheral blocks of reserves, depth limitation of deposit, division of reserves blocks by categories, economic appreciation and bound reserves proportion, characteristic of reserves, geological and hydrogeological characteristics and estimated effects of exclusive deposit mining on objects and interests protected by special regulations.

The application shall be accompanied by a decision on the approval of the final report and map showing the above data.

For the purpose of issue of the exclusive deposit the customer of geological works attaches an electronic stamp with a face value of 20 Euros.

2.3.18 The rules for submitting final reports with the calculation of reserves of mineral deposits

The final report with the calculation of reserves of mineral deposits shall be transferred to the Ministry of Environment of the Slovak Republic for approval using technology that ensures its durability and reproducibility in addition to the written and graphical forms also in the digital format. The client may specify the conditions under which the final report with calculation of reserves of the deposit shall be disclosed and information provided. Decommissioning of material geological documentation shall be carried out upon the agreement of the client of geological works after proper written and graphical documentation of technical works.

2.3.19 Balance of the raw mineral reserves

Ministry of Environment of the Slovak Republic keeps a balance of reserved and non-reserved minerals. The Balance is issued annually by January 1, and it lists the exclusive deposits arranged by types of exclusive deposits, kind of reserved minerals or non-reserved minerals of exclusive deposits, territorial division and status of utilization of reserved deposits, list of exclusive deposits written off the balance sheet stating the reasons for the exclusion. In addition the Balance provides information on the status of the protection of exclusive deposits with the identification of the protected deposit area and mining area, the name of the holder of the exploration area, an organization that has a designated mining area, or organization that registers or provides the protection of the exclusive deposit, overview of reserves broken down by degree of exploration, utilization of reserves and the conditions of their exploitability, selected chemical, technological or energy properties of reserved minerals. It keeps in an appropriate form records of reserves of non-reserved minerals.

2.4. Conclusions

In accordance with the principle of sustainable development of mineral resource base it will be useful in future to support the deposit geological exploration of mineral resources with particular emphasis on deficient minerals

important for ensuring economic needs of the Slovak Republic and in the wider context for the needs of the European Union (e.g. critical raw materials).

Verification of economically important deposits in Slovakia in recent periods points to the merits of further research and exploration activities focused mainly on effective use of deposit potential in the geological conditions of the Western Carpathians.

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References

- Act no. 569/2007 Coll. on Geological Works (Geological Act) as amended by further legislation
- Act no. 44/1988 Coll. on Protection and Exploitation of Raw Mineral Wealth (Mining Act)
- Regulation of the Ministry of Environment of the Slovak Republic no. 51/2008 Coll., which regulates some provisions of the Act no. 569/2007 Coll. on Geological Works (Geological Act) as amended by further legislation
- Regulation of the Ministry of Environment of the Slovak Republic no. 33/2015 Coll., which regulates some provisions of the Act no. 44/1988 Coll. on Protection and Exploitation of Raw Mineral Wealth (Mining Act) as amended by further legislation