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INSTITUTIONAL ENVIRONMENTAL PROTECTION AND EXPLOITATION OF ROCK DEPOSITS WITH OPEN CAST METHOD

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Abstract: This article presents an analysis of the legal requirements related to environmental protection and the management of a deposit, paying special attention to the impact of the management of the deposit from the time of discovery, documentation and making the deposits available for exploitation until reclamation and use of deposit after dismantling of the mining plant on the institutional forms of environmental protection such as: forms of protection of landscape and nature, forms of protection of groundwater, forms of protection of soil and the forms of forest protection. Accepted forms of division of environmental protection results from assessment of documented and undeveloped deposits of rock materials in task 7: *Protection of rock deposits - criteria of their rational management, conditions and opportunities of implementation of the project Strategies and technological scenarios for development and utilisation of rock deposit*, using the method of assessment of Nieć and Radwanek-Bąk (Nieć & Radwanek-Bąk, 2011). It also presents statistics showing the number of analysed forms of environmental protection applied in Poland. It was noted that every year the process of extending of legal protection to new areas has been observed. This process causes increased safety requirements for the planned mining activities in these areas. It is also emphasised that the management of the deposit should be implemented in a reasonable manner, compatible with the spatial policy pursued at all levels of administration. The mineral exploitation should to be economically justified and undertaken with measures, which reduce the negative impact of the different cycles of the life of the deposit on the elements of the environment, which are located directly on the planned or performed mining activities and in its vicinity. It also shows that mining activities can be performed in areas of institutional protection, after meeting the requirements imposed by the regulations and after obtaining the decision on environmental conditions of the planned mining activities.

Keywords: environmental protection, management of mineral deposit, mining activities

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INTRODUCTION

Poland has a great biodiversity as a result of active measures intended for the protection of the environment. One of the aspects of state spatial policy is the increase of protected areas and forests and the establishment of the Polish ecological system, which is included in the European system NATURA 2000. There are many forms of environmental protection as well as many areas with special protection status in the territory of Poland (Fig. 1) (Ptak & Kasztelewicz, 2011; Figlarska-Warchoł & Matlak, 2012). According to the data presented in Table 1 the increase of the protected area has caused about 32% of the country to be covered by different forms of nature conservation. It is also noteworthy that about 30% of the country is covered by forests, which are only partially within the protected areas. It is impossible not to mention the Natura 2000 areas, which according to (Kasztelewicz & Ptak, 2011) currently cover about 20% of the land area of Poland and only partially overlap with forests and other forms of legal protection.

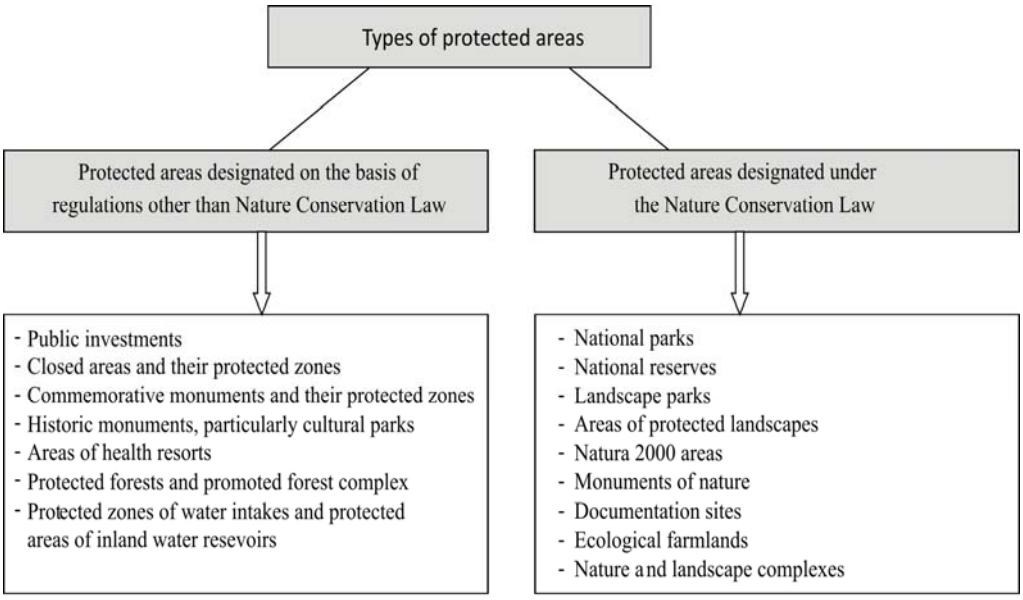

Fig. 1. Forms of land protection (Kasztelewicz & Ptak, 2011)

The currently observed process of legal protection of the increasing areas and conditions for the protection of soil and water cause an increase in the required conditions for mining activities and the associated higher direct and indirect costs of such protection. An additional problem is the depletion of resources in the non-conflict areas, resulting in drawing attention to the resources in protected areas (Kaźmierczak, 2003). This is a serious problem because, for example, in Lower

Silesia, which is the most valuable area of Poland regarding rock resources, in 2011 over 22% of the exploited deposits were located in legally protected areas (Kaźmierczak & Kaźmierczak, 2012). Additionally, there are many conditions concerning the protection of soil, water and forests. Environmental aspects play an important role in the management of rock materials. Mining activity is legally obliged to comply with the principles of environmental protection at every stage of its activity in the life cycle of the project. So it seems important to be aware of the environmental requirements concerning the life cycle of the deposit, from its documentation until the liquidation of the post-mining plant, including the assessment of the effects of this protection. Therefore, the legal conditions of the protection of nature, waters, forests and soils were analysed, focusing on the impact on the management of deposit from its documentation to the liquidation of the mine plant, which means rehabilitation and development of the area after mining ceases.

Table 1. Increase of the area covered by various forms of nature conservation in Poland in 1990-2010 (based on "Kasztelewicz & Ptak, 2011; Kacprzyk et al, 2006)

Forms of nature conservation	Area (in thousands ha)			
	1990	1995	2003	2010
Protected areas:	6073	8146	10 173	10 102
National Parks	166	270	315	315
Nature Reserves	117	121	161	174
Landscape Parks	1215	1931	2489	2514
Areas of protected landscape	4575	5783	7081	6969.0
Other forms	–	41	128	130.9
Protected areas as % of the country:	19,4	26,1	32,5	32,5

ENVIRONMENT PROTECTION IN MINING ACTIVITIES

According to Art. 6 item 1 of the Nature Conservation Act of 16 April 2004 (Dz.U. 2004.92.880) institutional forms of nature and landscape protection are: national parks, nature reserves, landscape parks, protected landscape areas, Natura 2000 areas, monuments of nature, documentation sites, ecological farmlands, nature and landscape complexes and the protection of plant, animal and fungal species. At present, the Polish system of protected areas consists of 23 National Parks, 120 landscape parks, 418 areas of protected landscape, 1441 nature reserves, 164 documentation sites, 6798 ecological farmlands, 214, nature and landscape complexes and 35 320 monuments of nature. These areas cover approximately one third of the country (Bochenek, 2011). In addition, a significant form of protection is the network of Natura 2000, which already

consists of approximately 1500 sites. Also water as an integral part of the environment is protected in the form of maintenance and improvement of water quality. Therefore, in the 1986-1989 the system of Main Groundwater Reservoirs was established. Water in these reservoirs is characterised by the most favourable conditions for their use. Soils and forests are subject to legal protection in accord with the Act of 3 February 1995 *on The protection of farmland and forest* (Dz.U. 1995.16.78).

ACCESS TO DEPOSIT

The Act, which regulates all components of the environment and determines general principles and basic definitions, is the Act of 27 April 2001 *on Environment Protection* (Dz.U.2001.62.627). It defines the protection of mineral deposits, which is based on rational management of resources and the comprehensive utilisation of minerals, including accompanying minerals (Dz.U. 2001.62.627, Art. 125). This Act also stipulates that the exploitation of a mineral deposit should be conducted in a commercially reasonable manner, using measures that reduce damage to the environment and ensuring the rational exploitation and mineral use (Dz.U. 2001.62.627, Art. 126 sec.1). In addition, the entity, which begins exploitation of mineral deposit or carries out this exploitation is required to undertake the necessary measures to protect the resources of the deposit, and to protect the soil and surface and ground water, gradually rehabilitate the post–exploitation areas and restore the proper state of other natural elements (Dz.U.2001.62.627, Art. 126 sec. 2). This Act refers to specific provisions, such as: *Geological and Mining Law, The Protection of Nature, The protection of agricultural and forest, Water Law, etc,* designating for them a general legal framework by determining general principles of the protection of the environment compatible with European Union legislation.

LOCATION OF DEPOSITS IN LEGALLY PROTECTED AREAS

The main aspect of the effect of the impact of the environmental protection on the management of mineral deposits is the location of the documented deposits within the boundaries of protected areas. Such a location can cause blocking of part of the resources and even the inability of their exploitation. Indeed, under the *Nature Conservation Law*, any mining activities are prohibited in reserves and national parks, (Dz.U.2004.92.880, Art. 15 sec. 8). However, there is the possibility of exploitation of deposits if the Minister responsible for the environment, by the way of administrative decision, would make exceptions to the prohibitions in the National Park. Such activities, however, may not result in an adverse impact on wildlife in the park. Similarly, the General Director for Environmental Protection may permit some exceptions to the prohibitions in the wildlife reserve. The voivodeship regional councils may (but need not) introduce a total ban on the exploitation of minerals in the

resolutions establishing landscape parks and areas of protected landscape. However, implementation of projects that may significantly affect the environment in these areas, including exploitation of mineral resources may be possible, if the completed procedure of environmental impact assessment demonstrates no adverse impact on wildlife in the landscape parks or significant negative impact on the environment (Dz.U.2004.92.880, Art. 17 and 24).

The situation is similar in the case of resolutions of local municipality councils that establish such forms of nature protection as: nature and landscape complex, ecological farmlands, documentation sites and monuments of nature. However, it is almost certain that the decision-making body would qualify the projects concerning the exploitation of proven deposits, located in the protected areas for environmental impact assessment (Badera, 2010). Exemption from this requirement concerns only aggregate deposits of up to 2 hectares and annual production to 20 thousand m³. On the other hand, in the case of deposits located in Natura 2000 area, the *Nature Conservation Act* does not ban the exploitation of minerals. However any project, even located outside this area, may be prohibited if it is proved to have negative impact on the objectives of conservation. This depends on the results of the environmental impact assessment.

PROCEDURE OF ENVIRONMENTAL IMPACT ASSESSMENT

The implementation of planned projects, which may always or may possibly have a significant impact on the environment, requires an environmental impact assessment (Kasztelewicz & Ptak, 2009). Types of projects classified as projects, which may affect the environment significantly are defined in the Ordinance of 9 November 2010 *on Projects, which may affect the environment significantly* (Dz.U. 2010.213.1397). According to this ordinance projects which may always affect the environment significantly are for example, exploitation of minerals from the deposit with open cast method on a mining area not less than 25 ha and installations for processing minerals in quantities of not less than 100 000 m^3 per year. The projects, which may always affect the environment significantly are exploitation of minerals from the deposit with open cast method on a mining area not less than 25 ha but larger than 2 ha or with exploitation of more than 20 00 m^3. But in any proposed project that may have a significant impact on the environment, such an obligation is to be determined, by order by the authority competent to take a decision on the environmental conditions. Environmental impact assessment of the project on the environment is also required when a project could have a significant effects on Natura 2000 areas and is not directly connected with the protection of this area or does not arise from the protection and in the case when the authority competent to grant the decision on environmental conditions of the project, prior to that decision states, that the project may have a significant impact on a Natura 2000 area (Dz.U.2008.199.1227, Art. 59 and art. 63).

The result of the environmental impact assessment is the decision concerning environmental conditions that determine the environmental conditions of the project.

SPATIAL PLANNING IN THE MANAGEMENT OF DEPOSIT

Another aspect of environment protection against its misuse is the balance in nature and rational management of natural resources in the spatial policy at the national, voivodeship and local municipal level. Since the exploitation of rock deposits is carried out in relatively small areas up to several tens of hectares, so under the Act of 27 March 2003 *on Spatial Planning and Development* (Dz.U.2003.80.717) determination of the purpose of the land, distribution of public investments and identification of development and the conditions of this development are specified in local urban spatial development plan. In case of the lack of a local spatial development plan, the determination of the development and the building conditions shall have the form of decision about the building and development conditions. However, before drawing up a local urban spatial development plan, local municipality is obliged to prepare the *Study of conditions and directions of spatial management plan*, which is not a local legal act, but the study findings are binding for local municipal authorities in the preparation of local plans. The provisions of the aforesaid Act show that the *Study* and the *local urban spatial development plan* should take into consideration conditions related to the occurrence of documented mineral deposits and mining areas, designated under separate legislation (i.e. *The Geological and Mining Law,* Dz.U.2011.163.981); areas for which the local municipality intends to draw up a *local urban spatial development plan*; programs for rational use of the areas, including the areas of mineral exploitation and rational management of farmland and the conditions resulting from the need to prevent soil mass movements and their consequences. In addition, spatial local municipal plan must ensure the balance of nature and rational management of natural resources, determined on the basis of eco-physiographic studies and characteristics of the natural elements and their interrelationships.

According to the *provisions of planning and spatial management*, mineral deposits should be included in the Study and local spatial development plan of the local municipality. However, such area with mineral deposit may be included in the planning documents only when it is documented and the deposit may be considered as a documented deposit at the time of approval of the geological documentation of the deposit. Such approval is a decision by a competent geological administration authority. In case of rock material the geological administration authorities are marshal of the voivodeship (with the help of voivodeship geologist) and district chief executives (with the help of district authority geologists). After approval of the geological documentation, the competent geological administration authority is obliged, in accord with Art. 94 of the Act of June 9, 2011, the *Geological and Mining Law* (Dz.U. 2011.163.981), to send the copy of the decision on the geological

documentation to the executive bodies of local government units, for the territories to which the geological documentation applies (Dz.U. 2011.163.981, Art. 94).

Art. 95 of the *Geological and Mining Law* (Dz.U. 2011.163.981), as in previously mentioned acts, provides that the proven reserves of mineral deposits for their protection are included in *Study of conditions and directions of spatial management plan of local municipality, local spatial development plan* and *spatial development plan of voivodeship*. In addition, within two years from the date of approval of the geological documentation, the area of documented mineral deposits is compulsorily introduced into the *Study*. After this date, the voivode introduces a documented area of materials for the study of conditions and directions of spatial development and issues a replacement order concerning this issue. A Study conducted in this mode produces legal consequences such as the *Study of conditions and directions of spatial development of the municipality.*

Provisions and data in *local urban spatial development plan* of municipality are also the conditions for granting a concession to develop the deposit, i.e. the exploitation of minerals. Issuing the concession requires the consent of the competent chief executive of the municipality, mayor, or city president (Dz.U. 2011.163.981, Art. 16.5). Such consultation is based on the *local urban spatial development plan* of the municipality, or in the absence of such plan, this consultation is based on the *Study*. The legislature provides for the possibility of refusal of such concession by the relevant authority, for example if the intended activity would prevent the use of real estate in accord with the purposes specified respectively by the *local urban spatial development plan* or in a case of the absence of *local urban spatial development plan w*ould prevent the use of the real estate as defined in the *Study of conditions and directions of spatial management of the municipality*, or in separate regulations (Dz.U. 2011.163.981, Art. 23.2). Of course, in the absence of relevant provisions in the *Study* or in the *local urban spatial development plan* relevant to the documented deposit, the process of change may be initiated in the provisions of the plan, but change of *Study* or *local spatial development plan of municipality* is carried out in the same manner in which they are adopted (Dz.U.2003.80.717, Art 27). Furthermore, according to Art. 104 sec. 1 of the *Geological and Mining Act* (Dz.U. 2011.163.981), the mining areas shall be considered in the *Study* and *local spatial development plan of municipality*. If the exploitation is expected to have significant effects on the environment, for mining area or a part thereof a *local spatial development plan* may be prepared, which should include environmental protection activities related to determination of facilities or areas for which the protective pillar measure is determined, within the boundaries of which the operations of the mining plant may be prohibited or may be allowed only in a manner ensuring protection of these facilities or areas (Dz.U. 2011.163.981, Art. 104, sec. 5 item 1). The expected environmental effects of the activities specified in the concession shall be defined in the eco-physiographic study prepared for the needs of the study of conditions and directions of spatial management plan of the

municipality and on the basis of the deposit management plan (Dz.U.2011.163.981, Art. 104, sec. 3).

THE CONCESSION FOR THE EXPLOITATION OF DEPOSIT

Exploitation of minerals from deposits in accordance with the provisions of the Act of June 9, 2011, the *Geological and Mining Law* (Dz.U.2011.163.981) may be commenced only after the granting of a concession. To the application referred to in sec.1, the deposit development plan shall be attached, specifying the requirements for the rational management of minerals deposit, in particular through a comprehensive and rational use of the main mineral, accompanying minerals and exploitation technology ensuring reduction of the adverse environmental impacts.), and the decision on environmental conditions of the project. This obligation does not apply to exploitation of minerals on a surface of less than 2 hectares or production to 100 000 m^3 per year. In the application for the concession, the expected manner of operation of the mining plant shall be determined, with respect to the requirements of the plan defining the scope of the operation of the mining plant and foreseen mining plant closure method.

The application for granting the concession for exploitation of minerals from deposits should include the following requirements related to environmental protection: the areas covered by specific forms of protection, including nature conservation; the manner of counteracting the negative influence of the intended activity on the environment; information on the designation of real estate, within which the intended activity is to be performed, in particular those provided by local urban spatial development plan or separate provisions. Concessions for exploitation of minerals from deposits shall be granted for a period no shorter than 3 years and not longer than 50 years. The concession shall specify the type and manner of performance of the intended activity, the space, within the boundaries of which the intended activity is to be performed, the validity period of the concession, and the commencement date of activities specified by the concession. The concession may stipulate other requirements on the performance of activities that it covers, in particular general safety and environmental protection. Granting the concession may be subject to establishing collateral to secure the claims that may arise as a result of conducting the activities.

The collateral may in particular take the form of civil insurance of the entrepreneur or bank guarantees. The form of the collateral shall be resolved by the concession authority acting by way of a resolution (Dz.U. 2011.163.981, Art. 28). If the entrepreneur violates the requirements of the Act, in particular concerning environmental protection and the rational development of the deposit, or fails to comply with conditions specified in the concession, including not undertaking the foreseen activity or permanent cessation thereof, the concession authority shall

summon it to cease the infringements. (Dz.U.2011.163.981, Art. 37 sec. 1). The legislator also anticipated the situation regarding the revocation of a concession or a statement of its expiration or invalidation for whatever reason. In this case, the hitherto entrepreneur is not exempt from discharging the obligations concerning environmental protection and those related to the closing down of the mining plant (Dz.U.2011.163.981, Art. 39 sec. 1).

It is also worth mentioning that exploitation of minerals from subterranean deposits from beneath inland waters and on the areas exposed to direct or potential flood hazard shall require consultations with the authority competent for water maintenance of the water resources and the opinion of the authority competent for granting *Water Law* permit (Dz.U.2001.115.1229, Art 23 sec. 2). Exploitation of minerals from deposits shall require consent of the head of the municipality (town mayor or city president) competent for the place of the intended activity with the purpose or manner of the use of real estate in accord with the provisions of the local urban spatial development plan (Dz.U.2011.163.981, Art 23). This issue is described in item 2.1.3. of this publication.

EXCLUSION OF LAND FROM AGRICULTURAL OR FORESTRY PRODUCTION

Recognition of the boundaries of a mineral deposit in the *Study* and *local spatial development plans* of municipality is not tantamount to the designation of land for mining activities. Only the change of land use and the manner of development, in the *local spatial development plans* are the basis for the exclusion of land from current use and enables mining activities (Dz.U.2003.80.717, Art. 14; Dz.U.1995.16.78, Art. 7 and 11). Art. 111 sec. 1 b (Dz.U.1995.16.78) shows that the application on excluding from agricultural production land classes IV, IVa, IV, V and VI, made from organic soils is binding for the authority permitting the exclusion of land from production, and the decision has a declaratory form. Exemptions shall be made in *local spatial development plans* by decision. Change of use of agricultural land, which is agricultural of land classes I-III, for which the area designated for such a purpose is of more than 0,5 ha, requires the consent of the minister responsible for rural development and designation of forest areas owned by the State for non-forest purposes requires the consent of the minister responsible for environment or person authorised by him, and the opinion and consent of the voivodeship marshal, expressed at the request of the executive officer or mayor of municipality/mayor/president of the city and also opinion of the Chamber of Agriculture. The mayor of the municipality/mayor/president of the city attaches to the application for the forest land owned by the State, the opinion of the Director of the Regional Directorate of State Forests and to the application for the land in national parks - the opinion of the Director of the park. In case of approval of the Minister and designation of agricultural and forest land for non-agricultural and non-forest purpose an entry must be maiden

the local spatial development plans at the request of the chief executive / mayor / president. Such application shall contain such variant solutions for land reclamation and development of land during and after the industrial activity, including the costs and losses incurred by agriculture and forestry industry – if land for mining related purposes investments has an area of over 10 hectares.

Exclusion from production of any agricultural land of mineral and organic origin, belonging to classes I, II, III, IIIa, IIIb, and agricultural classes IV, IVA, IVB, V and VI, of organic soils and also land referred to in art. 2 sec. 1 item 2–10 (Dz.U. 1995.16.78) intended for non-agricultural purpose and forest may follow issuing the decision approving this exclusion, which includes the obligations relating to the exclusion and issued after the effective exclusion of land from production (Dz.U. 1995.16.78, Art. 11 item 3). Application for exemption from agricultural production land of classes IV, IVA, IVB, V and VI, of organic soils is binding, and the decision is a declaration.

A person granted permission for the exclusion of land from production, is obliged to pay the amount due and the annual fees from the date of actual exclusion of land from agricultural production, and in relation to forest land is obliged to pay additional one-off compensation in the event of premature felling. The sum of one-off compensation for premature felling of the stand is the difference between the expected value of the stand at mature felling, set in the forest management plan, and the value at the time of felling. In younger stands, where one cannot have assortments of wood, it is the value of the compensation costs for the establishment and maintenance of stands. The minister responsible for the environment shall define, by regulation, the detailed rules for determining the one-off compensation for the premature felling of stand, taking into account the value of forests, density of stand at the age of actual felling, the stand area and the current selling price of 1 m³ of wood.

An owner, who, within 2 years renounces in whole or in part from the right to the exclusion of land from agricultural production, receives return of the payment, which he paid, according to the area of land not excluded from production (Dz.U.1995.16.78, Art. 12 item 2). Charges for exemption from production of 1 ha of agricultural land referred to in Art. 2 sec. 1 item 1, 3 and 5 (Dz.U.1995.16.78) are shown in Table 2.

Charges for exemption from production of one hectare of forest without stand are shown in Table 3. Charges and annual fees for the exclusion of forest from production in the protected forest are higher by 50% from fees and charges referred to in Table 2 (Dz.U.1995.16.78, Art. 12 sec.12).

The charges shall be paid within 60 days from the date on which the decision becomes final (Dz.U.1995.16.78, Art, 12 item 3), and an annual fee for given year shall be paid on or before June 30 of that year, regarding the amount for agricultural land determined on the basis of art. 12 item 7 (Dz.U. 1995.16.78, Art. 12 sec. 14 item 1), and in respect of forest land it shall be taken as the basis the price of 1 m³ of wood,

used during imposing of forest tax in a given year (Dz.U. 1995.16.78, Art. 12 sec. 14 item 2).

Table 2. Charges for exemption from the production of 1 ha of agricultural land (Dz.U.1995.16.78, Art. 12 item 7)

Arable land and orchards, under buildings and facilities in farms and under tree-covered and bush-covered areas, including the areas under anti-wind belts and anti-erosion devices		Permanent meadows and pastures, under buildings and facilities in farms and under tree-covered and bush-covered areas, including the areas under anti-wind belts and anti-erosion devices	
Class	Charge PLN	Class	Charge PLN
Agricultural land of mineral and organic origin			
I	437175	Ł and Ps I	437175
II	378885	Ł and Ps II	361398
IIIa	320595	Ł and Ps III	291450
IIIb	262305		
Agricultural land of organic origin			
IVa	204015	Ł and Ps IV	174870
IVb	145725	Ł V	145725
V	116580	Ps V	116580
VI	87435	Ł and Ps VI	87435

Table 3. Charges for exemption from the production of one hectare of forest (Dz.U.1995.16.78, Art. 12 item 117)

Item	Type of forest site	Equivalent of the price for 1 m^3 of wood by Central Statistical Office
1	Forests: fresh, damp, riparian and mountain, alder ash forest and mountain ash forest	2000
2	Mixed forests: fresh, damp, swampy, upland, mountain and alder forest	1500
3	Mixed ancient forest: fresh, damp, swampy, upland and mountain	1150
4	Mixed ancient forest: fresh, damp, mountain	600
5	Ancient forests: dry and swampy	250

THE USE OF WATER

The Act of 18 July 2001 *Water Law* (Dz.U. 2001.115.1229) regulates water management in accord with the principle of sustainable development. The provisions of this Act in relation to mining activities are used for mine drainage, releasing sewage into water or soil and extraction of stone, gravel, sand and other materials from surface

water (Dz.U.2001.115.1229, Art. 31). Sewage includes water from the dewatering of mines (Dz.U.2001.115.1229, Art. 9 par. 14 letter e).

Use of water consists of common, ordinary or special use. Extraction of stone, gravel, sand from water of the sea, internal waters and internal waters of the Gulf of Gdansk and the waters of the territorial sea and mountain streams under the art. 37 is a special use beyond the common or ordinary use (Dz.U. 2001.115.1229, Art. 34 sec.3 item 1, 3), which may be implemented after obtaining the consent of the water owner, in places designated by the municipality council by resolution (Dz.U. 2001.115.1229, Art. 34 sec. 4). As for an area with special flood hazard, it is prohibited to locate new undertakings, which could have significant effects on the environment (Dz.U. 2001.115.1229, Art. 40 sec. 1 item 3). The regional director of the Water Management Board, by decision, may waive the above prohibition, determining the conditions necessary for the protection of water quality, if this decision would not cause a threat to the quality of water in case of flooding (Dz.U.2001.115.1229, Art. 40 sec. 3). However, in the areas of direct protection of groundwater and surface water intakes, it is completely prohibited to use land for purposes other than the exploitation of water (Dz.U. 2001.115.1229, Art. 53 sec. 1). In areas of indirect protection of groundwater and surface water intakes, it may be prohibited or restricted to conduct of construction works and other activities that reduce the usefulness of water from these intakes or the performance of intakes, including the extraction of stone, gravel, sand and other materials (Dz.U. 2001.115.1229, Art. 54, sec. 2 and 6) and in the areas of preservation of inland water reservoirs it can be prohibited to locate investments which can have significant effects on the environment (Dz.U. 2001.115.1229, Art. 59, sec. 2).

In the case of a special use of water, extraction of stone, gravel, sand and other materials and their storage – in areas with special flood hazard and in case of discharge of sewage into water or soil, it is required to obtain a water permit. However, the Act provides for an exception to this rule in cases where drainage of facilities or building excavations creates a depression that does not extend beyond the boundaries of the site of the area, which is owned by the plant (Dz.U.2001.62.627, Art. 124). Water permit is issued by decision for a limited duration. And so in the case of a particular use of water, this period cannot exceed 20 years and in case of discharging of sewage into water or soil, this period cannot exceed 10 years (Dz.U.2001.62.627, Art. 127).

EXPLOITATION OF THE DEPOSIT

The operation of the mining plant is conducted on the basis of a mining plant operation plan. The plan of the mining plant operation shall be prepared by the entrepreneur and this plan specifies: the organisational structure of the mine (by indicating in particular the positions of management and operation supervision), specific activities necessary to ensure: performing the activities covered by the

concession, public safety, fire safety, the safety of persons residing in the mining plant, rational management of mineral deposit, protection of the environment, protection of buildings and prevention of damage and repair (Dz.U.2012.0.372, Art. 108 sec. 1 and 2). Specific requirements for the content of the mining plant operations plan and plan for mining plant closure (closure of a designated part thereof), differentiating them according to the nature and methods of activity and taking into account the specific activities carried out within the boundaries of the Polish marine areas are defined in the Regulation of the Minister of Environment of 16 February 2012 on mining plant operational plans (Dz.U.2012.0.372).

However, an entrepreneur who has been granted a concession for exploitation of minerals, except for areas of less than two hectares, or with extraction of up to 100 000 m³ per year, is obliged to have geological survey documentation, update and supplement it during progress of works. The geological survey documentation includes: survey documentation, calculations documentation, mapping documentation presenting the current geological and mining situation of mining plant and also the condition of space within the boundaries of the mining area. (Dz.U.2011.163.1397, Art. 116, sec. 1), which are set out in detail in the Regulation of the minister responsible for environment on 22 December 2011 on geological-survey documentation (Dz.U. 2011.291.1713). In addition, the competent mining supervision authority may, by decision, require the preparation of additional documents included in the survey geological documentation if during the mining operations would be taken activities necessary to: prevent natural hazards, inspection of the rational management of mineral deposits resources during the process of its exploitation, prevent damage to the environment as a result of mining operations, land reclamation and land use after cessation of mining activities (Dz.U.2011.291.1713, Art 116 item 6 points 2, 4, 5, 7).

LIQUIDATION OF MINE PLANT- RECLAMATION OF POST- MINING AREAS

The final stage of management of deposit is the stage when the deposit has been exhausted. The mining entrepreneur is legally obliged to close the mine plant, reclaim and manage the land after the exploitation of the deposit. The area must be reclaimed and ready for development so it can be used for the purposes determined in the *local spatial development plans* of the municipality in accord with art. 4 of the *Planning and Spatial Management Law* (Dz.U.2003.80.627). Here the situation is complicated because it is important to determine the function, this area is to serve in the future. These functions should be included in the *Study*, and *local spatial development plans* of municipality.

Definition of such functions is often very difficult because the time of exploitation of minerals sometimes even spans decades and during this time social, economic and political conditions and circumstances can change. In addition, the basic problem is to

determine the appropriate time when the entrepreneur is to ask for the decision determining the direction of rehabilitation. The law does not specify this time precisely, resulting in postponing this duty until the completion of exploitation of the deposit.

Analysing the *Geological and Mining Law* (Dz.U.2011.163.981) in the case of mining plant closure, in whole or in part, the entrepreneur is obliged to secure or eliminate the excavation and mining equipment, installations and facilities of a mining plant, secure the unused part of a mineral deposit, secure the adjacent mineral deposits, take the necessary measures to protect the excavation of adjacent mining plants, take necessary measures for environmental protection and land reclamation after mining activities. (Dz.U.2011.163.981, Art. 129 item 1). The mine closure is carried out under the provisions of the mining plant operations plan (Dz.U.2011.163.981, Art 129 item 3), and the rehabilitation of land after mining activities shall be carried out under the Act of 3 February 1995 *on the protection of agricultural and forestry lands* (Dz.U.2004.121). The Act in section 5 regulates the issues of restoration and development of land. And so, according to its provisions the reclamation and development of land is planned, designed and implemented at all stages of industrial activity, for example in relation to the management of deposit (Dz.U.2004.121, Art 20 item 3). Land reclamation is carried out when these areas become, fully, partially or for a specified period redundant for industrial activity and this reclamation ends no later than five years from the discontinuation of the activities (Dz.U.2004.121, Art 20 item 4).

The authority, competent to issue decisions on rehabilitation and management of the land is the district chief executive, who in respect of land affected by mining activity, after obtaining the opinion of the Director of the relevant Regional Mining Authority, and in respect to the proposed forest land reclamation, after obtaining the opinion of the Director of the Regional Directorate of State Forests or the director of the National Parks and the chief executive of municipality/mayor/city president (Dz.U.2004.121, Art. 22 item 2).

Decisions on land reclamation and development specify the following issues: the degree of reduction or loss of value of land, established on the basis of expert opinions, the person obliged to reclaim land, direction and time period for the reclamation and recognition of completion of restoration. In addition, those persons obliged to recultivate the land are required to notify the district chief executive on or before February 28 of each year of the changes to the land in the previous year (Dz.U.2004.121, Art 22). This Act also provides for restrictions in relation to the non-execution of provisions relating to land reclamation. Monitoring of the performance of reclamation obligation includes checking at least once a year the conformity of documentation for reclamation of the land with activities carried out, especially the technical requirements and deadlines, with particular emphasis on the obligation to complete reclamation within five years after cessation of industrial activities

(Dz.U.2004.121, Art. 27). In the event of default on the obligation concerning the land reclamation, shall be determined, by decision, an annual payment of the equivalent of the annual fee for the proportion in which there has been a reduction of the land value by the entity responsible for the rehabilitation. This payment shall be transferred to a separate bank account of the management of the voivodship office or of the Forest Fund. The values shown in the Tables 2 and 3 are used to determine the amount of the annual fee for downgrading of the land. In case of failure to complete the reclamation of damaged areas during the five years following the end of the industrial activities, a penalty is imposed in the form of an annual fee increased by 200% from the date on which the restoration should be completed (Dz.U.2004.121, Art. 28). Of course, these fees may not be included in the operating expenses of persons who must pay these charges. Also if the charges relate to organisational units, the heads of these units shall be fined the sum of their remuneration for the last 3 months (Dz.U.2004.121, Art. 29).

MINING DAMAGES

Another issue concerning the protection of the environment within the management of the deposit is the concept of mining damages. *Geological and Mining Law* (Dz.U.2011.163.981) determines that the liability for damages shall be borne by the entrepreneur leading mining plant operations and the restoration to the previous condition may be through delivering land, buildings, equipment, premises, water or other goods of the same type.

Redressing damage to agricultural land or a forest or land damaged as a result of a mining plant activity, occurs in a manner determined by the provisions on the protection of these lands. The obligation of restoration to the previous condition rests on the entity responsible for the damage. An aggrieved party, with the consent of the entity responsible for the damage, may perform the obligation in return for a suitable sum of money (Dz.U.2011.163.981, Art. 146 and 147).

SUMMARY

This article examines the legal considerations relating to the impact of management of deposits on individual elements of the environment such as: protected areas, underground water, soil and forests. Management of mineral deposits has been analysed from the stage of identifying and making the deposit available, through the steps of obtaining the concession for its exploitation, exploitation and liquidation, which means rehabilitation and development of land after the time when mining plant is ceased. Mining activities carried out in different stages should be carried out while ensuring efficient extraction and development of mineral deposits (including

accompanying minerals) and in an economically reasonable manner with measures, which reduce the negative impact on the environment.

The paper also shows that, despite the prohibition of excavation of mineral deposits located in protected areas, mining activities are possible in these areas. However, it requires the demonstration of absence of adverse effects of the operation on the various elements of the environment, using the procedure of environmental impact assessment, resulting in the decision on environmental conditions, setting out in detail the environmental aspects of the implementation of the proposed project.

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REFERENCES

BADERA J., 2010. *Social-environmental determinants of the development of mineral aggregate deposits in Poland*, Mining Science. Previously Scientific Papers of the Institute of Mining of the Wroclaw University of Technology, Mining and Geology, Vol. 130, Wroclaw (in Polish).

Dz.U. 1991.101.444 the Act of 28 September 1991 on forest (in Polish).

Dz.U. 1995.16.78 the Act of 3 February 1995 on the protection of farmland and forest (in Polish).

Dz.U. 2001.62.627 the Act of 27 April 2001 on Environment Protection (in Polish).

Dz.U. 2001.115.1229 the Act of 18 July 2001 Water Law (in Polish).

Dz.U. 2003.80.717 the Act of 27 March 2003 on Spatial Planning and Development (in Polish).

Dz.U. 2004.92.880 the Act of 16 April 2004 of the Nature Conservation (in Polish).

Dz.U. 2008.199.1227 the Act of 3 October 2008 on Granting access to information about the environment and its protection, public participation in environment protection and environmental impact assessment (in Polish).

Dz.U. 2010.213.1397 the Regulation of 9 November 2010 on Projects, which may affect the environment significantly (in Polish).

Dz.U. 2011.163.981 the Act of 9 June 2011 on the Geological and Mining Law (in Polish).

Dz.U. 2011.291.1713 the Regulation of 22 December 2011 on geological-survey documentation (in Polish).

Dz.U. 2012.0.372 the Regulation of 16 February 2012 on mining plant operational plans (in Polish).

BOCHENEK D., ed., 2011. *Environmental protection 2011. Statistical information and elaborations*. Central Statistical Office, Regional and Environmental Surveys Division, Warszawa (in Polish).

FIGLARSKA-WARCHOŁ B., MATLAK E., 2012. *Environmental constraints for mining of rock raw materials between Cieszyn and Skoczów in the last century*, Mineral Resources Management, Vol 28/2 (in Polish).

KACPRZYK K, KARACZUN Z. M., RZESZOT U., 2006. *Strategic Environmental Assessment of the draft national development strategy 2007-2015*, The study was commissioned by the Ministry of Regional Development, Warszawa (in Polish).

KASZTELEWICZ Z., PTAK M., 2009. *The procedure of environmental impact assessment in opencast mining in the light of new law regulations with particular focus on the specific character of Nature 200 areas*, Mineral Resources Management, Vol. 25/3, Krakow.

KASZTELEWICZ Z., PTAK M., 2011. *Formal and legal exploitation of natural aggregates in protected areas, Conference materials, Exploitation of natural aggregates in protected areas*, AGH University of Science and Technology, Krakow (in Polish).

KAŹMIERCZAK U., 2003. *Rock mining in Wroclaw and surrounding area*, Opencast mining, Vol. 6, Wroclaw (in Polish).

KAŹMIERCZAK U., KAŹMIERCZAK W., 2012. *Assessment Lower Silesian rock mining in the years 2003-2011*, Mining Science (Previously Scientific Papers of the Institute of Mining of the Wroclaw University of Technology, Mining and Geology) Vol. 134/41, Wroclaw (in Polish).

NIEĆ M., RADWANEK-BĄK B., 2011. *Ranking value of industrial rocks deposits*, Opencast mining, Vol. 6, Wroclaw (in Polish).