Explanatory note on Chapter 4.6 - Potential impact, Air

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Detailed Contents:

1. **Review of impact of the change in the relevant legal framework on the Project and/or EIA Report**

Section 4.6 Biodiversity was drawn up based on a legal framework developed on three main aspects: international conventions ratified by Romania which represent the legal framework of ground rule value, "pure" national legislation and Community legislation. Several characteristics of this legal system are significant.

First, the international conventions complex forms an inertial system (conventions are subject to a slow legislative evolution). Therefore, the most important conventions in the field:

- Convention on the Conservation of European Wildlife and Natural Habitats, adopted at Bern on 19 September 1979 (ratified by Law No. 13/1993),
- Convention on Biological Diversity, signed at Rio de Janeiro on June 1992 (ratified by Law No. 58/1994),
- Convention on Conservation of Migratory Species of Wild Animals, adopted at Bonn on 23 June 1979 (ratified by Law No. 13/1998),

to mention just a few of them, have not been amended since their preparation and submission of EIA Report until now. Therefore, there are no relevant developments in this area.

Second, it should be noted that the Community regulatory acts governing the biodiversity have decisively determined the development of national legislation. Anticipating this evolution, the EIA Report drawn up and submitted in May 2006 took into consideration not only the legal acts applicable at the respective date (practically, exclusive of the national legislation, inclusive of international conventions ratified by Romania), but also the European Union legislation (e.g. Directive 79/409/EEC on the conservation of wild birds, Directive 92/43/ECC on the conservation of natural habitats, flora and fauna). Therefore, the studies and tests conducted in view of preparing the Chapter Biodiversity in the EIA Report took into consideration at the time all these European regulations.

Finally, for the sake of rigour, we will further summarize the main changes in the national legislation occurred between the date of drawing up and submission of the EIA Report and current date.

(a) Thus, the Law on the Forest Code no. 26/1996 was abrogated by Law No. 46/2008 on the Forest Code of Romania (as amended) („**New Forest Code**"). In addition, the New Forest Code also abrogated the Governmental Ordinance no. 96/1998 on forestry regime and administration on the national forest fund. The new legislative act brings a series of amendments as follows:

- the concept of "forests" is clearly regulated, the obligation of administration as well as provision of forestry services is introduced for all forests regardless of their ownership, through private or state owned Forest Districts. The purpose of this amendment is to encourage a more efficient administration of forests, through Forest Districts; previously the administration of privately owned forestry stock was conducted directly by its owners.
- a rule is defined whereby establishment of protected natural areas of national interest which include also forests shall be done under the law and with the prior approval of the central authority responsible for the forestry sector. The Rosia Montana mining project will not affect any type of protected natural area of national interest and this new rule has no impact in this context.
- certain specific rules regarding removal of some lands from the national forest stock are reiterated and clarified, including rules for the development of ore exploration / mining projects (by imposing physical compensation with land and setting minimum value and area thresholds). The Project will require removal of lands from the national forest stock (255 ha in 4 phases, years 0, 7, 14 and 16 respectively), and in view of achieving this goal all procedures regulated by the new Forest Code, as well as other related legal regulations will be observed.
- new rules for the sustainable development of the national forestry stock are set out: national reforestation programme, system for establishing and updating the national forestry stock. All these measures are the responsibility of the competent public authorities, without any direct impact on the EIA Report content or the studies and tests conducted.

(b) Also, the Emergency Governmental Ordinance No. 236/2006 on the regime of the protected natural areas, preservation of natural habitats, of flora and wildlife (in force on the date of EIA Report preparation and submission) was abrogated by the Governmental Ordinance No. 57/2007 on the regime of the protected natural areas, preservation of natural habitats, of flora and wildlife (as amended). The legal act transposes Directives 92/43/CEE and 79/409/CEE, as amended.

We underline some of the most important changes in this regulatory field:

- new categories of protected natural areas are introduced (of Community interest or "Natura 2000" sites and of county or local interest);
- the documentation required in view of establishing the regime of protected natural area of national interest has been modified by requesting the cadastral documentation outlining the categories of use; the obligation to comply with the management plans and protected natural area rules by the protected natural area administrators and natural persons owning or administrating goods in the vicinity of protected natural areas is defined;
- the measure of granting compensations to owners or license holders of lands privately owned or leased within the protected natural areas is stipulated; the measure of forbidding pollution generation activities or activities that may deteriorate or disturb habitats or species is introduced for the protected natural areas of Community interest; hence any plan or project which may significantly affect the area is subjected to an adequate assessment of the potential effects on the protected natural area of Community interest, integral part of the environmental assessment or environmental impact assessment;
- the annexes containing the lists of animal and plant species of Community / national interest requiring strict protection.

As the successive studies and monitoring campaigns conducted for the purposes of Chapter 4.6 - Biodiversity of the EIA Report took into account not only the national legislation in force at the respective date, but also the Community legislation, the amendments imposed by GEO No. 57/2007 have no impact on the nature and procedures used for study / testing and on the conclusions of EIA Report.

- Law No. 347/2004 - Law of Mountain - was successively amended, the most important changes being effected by GEO No. 21/2008. We specify some of the most important changes: rating of mountain areas as disadvantaged area; including the provision of efficient management as specific objective of the mountain policy, of the ecological network of protected natural areas by protection and conservation of protected natural areas, wild flora and fauna and sustainable use of available natural resources within the limits of their natural biological regeneration potential; abrogation of provisions related to the mountain soil protection and obligation of natural and legal persons owning or using under any title agricultural and forestry lands to apply measures to prevent and combat soil degradation (Art. 13 of the original regulation).

(c) Law No. 103/1996 of hunting stock and protection of game was abrogated by Law No. 407/2006 of hunting and protection of hunting stock. Among the most important changes we mention: changing of the establishment rules of hunting stocks and way of granting their right of management; establishment of the obligation to prepare a management plan for each hunting stock; the management plans are prepared for a period of 10 years by the specialized personnel of the manager; in case of hunting stocks overlapping the protected natural areas, the hunting management plans will be correlated with the management plans of the protected natural areas; some lists of species of hunting interest are stipulated as compared to the previous law.

In summary, pursuant to the verification of the entire legal framework took into consideration upon the preparation of Chapter 4.6 Biodiversity of the EIA Report, it can be concluded that the changes occurred since the preparation of submission of the EIA Report until the present time do not require its amendment or reconducting of the studies / tests conducted for the purposes if the EIA Report. The entire documentation developed for the biodiversity chapter took into consideration the provisions of the Community regulations regarding biodiversity. GEO 57/2007 transposed the provisions of the EU Directives mentioned above.

2.   **Updates of Chapter 4.6 - "Biodiversity" - Biodiversity Baseline Report**
2.1.   **Overview of Vegetation**

The studies on biodiversity commenced in 1999, when Stantec Canada prepared the Baseline Report for the Feasibility Study (1999-2001). These studies continued with the preparation of the baseline report for the Environmental Impact Assessment Report (2003) and a revision thereof (2005). In 2006 a new revision of the documentation was carried out in view of preparing the EIA Report, in accordance with the legal provisions in force at the respective date and based on the regulatory table of content. The entire set of studies started with the investigation of the vegetation, documenting the presence of a significant anthropogenic impact which led to a profound distortion of vegetation associations and severe impoverishment of floristic diversity.

The monitoring conducted between 2007-2010 confirmed that within the forestry formations, largely dominant are the secondary forests dominated by a reduced number of tree species (9 species), together with numerous invasive allochthonous species (acacia - *Robinia pseudaccacia*, ailanthus - *Ailanthus altissima*, black pine - *Pinus nigra* and *Scots pine- Pinus silvestris*) Many of the stands have a reduced productivity (production class III and IV) with occurrence of large areas (approximately 5% of the total area under review) of non-productive forestry areas (with no forestry vegetation). It is obvious the invasion of hornbeam (predominance of hornbeam *Carpinus*

betulus) and occupation of forestry areas by pioneer species with low conservation value, such as birch (*Betula pendula*).

Between 2007 and 2010 a mapping of major formations of vegetation and determination of vegetation succession status in correlation with the habitat types described at national level was conducted for the entire area, also establishing the correspondence with the Natura 2000 habitat types as per their definition system (Interpretation Manual of European Union habitats).

It should be noted in this respect that the vegetation facies occur generally in a transition phase, in few places being strongly affected by anthropogenic impacts. Following the monitoring campaigns conducted between 2007-2010, a rudelization generalized for meadows and hayfields was noticed, due to the abandoning of some agricultural practices; extended underbrush occur over significant areas (*Rosa sp., Crataegus sp., Prunus sp.*).

2.2. Information on local flora and fauna

Upon the presentation of EIA Report in May 2006, the inventory of plant species revealed the presence of 403 species. In 2007, following the completion of 25 sample perimeters and over 30 transects of vegetation, 38 additional species were identified, the total number of species reaching 411.

Regarding habitats, transition phases associated with a number of 3 forestry habitats were identified, as follows: 9130 - beech forests of Asperulo-Fagetum type, 9110 – beech forests of Luzulo-Fagetum type and 91V0- Dacic beech forest (Symphyto-Fagion); as well as 11 meadow habitats (40A0, 6510, 6520, R3119, R3120, R3121, R3801, R3802, R8701, R8703, R8704).

The representation of vegetation formation distribution was carried out in GIS format. The area is missing the major conservation species (see Annex *NE_Cap 4.6_02*).

Invertebrates

The inventory of species conducted until 2007 revealed the presence of 106 Lepidoptera species and was confirmed during the subsequent monitoring campaigns. During the 2007-2010 campaigns, the presence of 32 coleoptera species was revealed (out of the 82 considered as potentially present). The area is missing the major conservation species (see Annex *NE_Cap 4.6_02*).

2.3. Aquatic flora and fauna and biotic indices for water quality

2.3.1. Background

The sample collection started in 2000 and were conducted by experts within the Ecological Department of the Faculty of Biology, Bucharest University. The data was checked by specialists within the Ovidius University of Constanta. In 2007 (months of June, July and September) the monitoring programme for aquatic biodiversity from lotic and lentic systems within the Project site commenced, using as model the protocols for sample collection, analysis and reporting used by the National Administration Romanian Waters for an easier integration in the national aquatic biodiversity monitoring system.

2.3.2. Methods

Period 2000-2001

Both qualitative and quantitative sampling approaches were used. Three quantitative replicate samples and one qualitative sample were collected at each station. The objective of the qualitative sample is to make site comparisons to determine the presence or absence of benthic invertebrates having varying degrees of tolerance to pollution and to obtain information on the richness of taxa, at family level. Quantitative methods essentially provide an estimation of the abundance of the various components of the invertebrate community per unit area. There samples were sorted and interpreted in the laboratory. Several lake and pond sampling stations were also established at locations accessible from shore. At each sampling station the following physico-chemical parameters were recorded: substrate type, current velocity, depth, water temperature, alkalinity, pH, hardness, and dissolved oxygen.

Year 2007

Two campaign for investigation of lotic systems were carried out in April and June and a campaign for investigation of aquatic biodiversity in lentic systems. For lakes, the analysis reports contain:
- general data on: collection date and time, water level in the lake, collection profile and depth, pH, water temperature, air temperature, transparency, conductivity, phytoplankton (Nr/dm^3), zooplankton (Nr/dm^3), biomass (mg/l) for phyto and zooplankton, plankton componence - groups and dominant species for phyto and zooplankton, trophicity level;

- specific data for each level (depth): taxons (species or type in rare cases), MU, density and biomass for each identified taxon

For lakes, the analysis reports contain:
- general data on: name of watercourse, name of sample collection station, location in STEREO 70, collection date, collected sample (plankton, , macrozoobentos, microfitobentos), collection area, filtered volume, volume subject to counting
- collection depth, water depth, width of water surface, subsoil type, bank description, physical/chemical indicators (for air and water), water aspect, pH, oxygen, dissolved, conductivity, hydromorphological parameters, meteorological conditions, comments
- specific data for plankton and benthic: systematic groups, taxons, saprob area, saprobity, Nodmp, Frcv. Rel, H, Sxh.

The collection stations were located on the rivers and lakes to be directly impacted by the Project and on control rivers and lakes within the protection area.

2.3.3. **Results**

2000-2001 Phase
Aquatic insects collected in rivers and lakes were identified, analysed to the family level (47 families).
The following were described in a table: identified aquatic families and identification place, number of benthic invertebrate families, community indices for sampling points within the river system, community indices for sampling points within standing water systems.

Step 2007:
By applying the analysis protocols, analysis reports resulted where an attempt was made to complete the existing information on aquatic biodiversity. The analysis was generally made to the species level and where not possible the organisms were identified to the type level or more rarely to family level. Therefore, a number of 82 taxons of phytoplankton, 73 of zooplankton, 58 of macrozoobentos and 9 of microphytobentos were identifed in the rivers. Regarding the analysis reports, they showed the presence of 2 taxons belonging to Chrysophyta, 34 of Cyanophyta, 49 diatomea, 43 clorophyta, 27 taxons of Euglenophyta, 7 of Dinophyta, 7 of Rhizopoda, 12 Ciliata, 26 Rotatoria, 2 Gastrotricha, 2 Cladocera and 4 species of Copepode.

In conclusion, the data collected using the Romanian Water method, in the period following the submission of the EIA Report lead to the same conclusions as those presented in the EIA Report of 2006.

The new data prove that the Rosia stream is biologically devastated, downstream of the confluence with tributaries contaminated by acidic waters from stockpiles and adits. In the Rosia Montana village the water is polluted with domestic fecaloid water from households, the water having parameters normal for a mountain river just upstream of the locality up to Taul Mare. The Corna river water is contaminated in the village with domestic fecaloid compounds and upstream also with mining contaminants, however in a much lower concentration. The Vartop river water, taken as reference, shows parameters normal for a mountain river located at this altitude.

2.4. **Vertebrate Fauna**
2.4.1. **Fish**
In the rivers and streams with the Project direct impact zone, no fish was identified, because these waters are heavily polluted. Some fish species were identified in lakes; this is explained by the artificial fish introduction, particularly for fishing activities. This is also confirmed by the presence of invasive allochthonous species *Pseudorasbora parva* present in all laked and which was introduced accidentally together with the alevins of other species.
Being species artificially introduced and exploited, they were not subject to quantitative investigations, the qualitative investigations being conducted during the monitoring programme of amphibians which use the lakes for reproduction. In addition, data from fishermen and AJVPS Câmpeni Subsidiary were also used.
In conclusion, data collected during the 2006-2010 monitoring campaigns is similar to the data presented in the EIA Report and the new collected data brings no elements to determine the updating/completion of the analysis presented in the EIA Report.

2.4.2. Amphibians
2.4.2.1. Investigation background
The first data on the amphibians occurring in the area to be impacted by the future Project site was obtained in the autumn of 1999 and spring of 2000.

Detailed research on amphibians were conducted in 2003 during the vertebrate species research programme, part of the biodiversity research programme conducted by STANTEC Canada. The monitoring plan of the key vertebrate species was conducted in 2007 and the monitoring plan of amphibians was implemented for one season. Data on the presence of amphibians was collected and by identification of amphibians confined in the archeological survey trenches. Following identification of a large number of captive amphibians, the trenches were provided with special slopes to allow frogs and tritons to escape these traps. Qualitative data on the presence of amphibians on the proposed Project site were further collected throughout 1999-2010 during the biodiversity monitoring campaigns. On this occasion, receptor habitats were identified for the relocation of amphibians from the lakes to be drained.

2.4.2.2. Methodology
Qualitative data was collected during all year periods when amphibians are active.

All potential reproduction sites of amphibians located on the proposed Project site were visited during the amphibian reproduction period. Some quantitative data was collected in 2007 and 2010. Unfortunately, the lack of numerical data at local, regional or national level makes it impossible to estimate the impact magnitude at these levels. Locally, the populations of amphibians located on the proposed Project site, particularly those in the lakes to be drained will be strongly impacted.

2.4.2.3. Results
During 1999-2010, 8 species of amphibians were identified of which 7 are on the proposed Project site, while one of the species was noticed only in the Ardealului flood plain near the locality of Carpinis. In 2010 a new investigation of the amphibians presence in the reproduction locations was conducted by applying the monitoring protocol in the above-mentioned plan.

No significant differences between data collected prior to 2006 and data collected during 2007-2010 which would change the conclusions presented in the EIA Report were identified.

2.4.3. Reptiles
2.4.3.1. Investigation background
The first data on the site reptiles were obtained in the autumn of 1999 and spring of 2000.

Detailed research on reptiles were conducted in 2003 during the vertebrate species research programme, part of the biodiversity research programme conducted by STANTEC Canada. Qualitative data on the presence of reptiles on the proposed Project site were further collected throughout 1999-2010 during site visits. The very small number of identified species, with the exception of *Lacerta agilis,* was the reason for not including reptiles in the monitoring plan of key vertebrate species.

2.4.3.2. Methodology
The study of reptiles was conducted by direct identification on transect during investigations for other vertebrate species. Transects covered all types of habitats on the site.

2.4.3.3. Results
During field visits, particularly during 2003, 4 species of reptiles were identified of which 3 on the further Project site. Subsequent investigations during 2007-2010 confirmed only the presence of these 3 species.

No significant differences between data collected prior to 2006 and data collected during 2007-2010 which would change the conclusions presented in the EIA Report were identified.

2.4.4. Birds
2.4.4.1. Investigation background
First data on the birds present of the proposed Project site dates back to the autumn of 1999 and spring of 2000 when an initial list of bird species in the Project impact area and adjacent areas was prepared . The first systematic studies date back to 2003 as part of the STANTEC research programme. A total of 10 transects were used which covered all types of habitats in the Project impact area, as well as Vartop Valley. In 2010, a new assessment was conducted to obtain and/or verify the quantitative data.

2.4.4.2. Methodology

Breeding bird and wildlife surveys were undertaken in early June, July and August of 2003. Bird surveys were carried out using the transect method. Each transect contained at least one habitat type. A total of 10 transects was conducted. The ten transects are described as follows:

1. Mixed forest dominated by fir (Abies alba) mixed with few deciduous trees and shrubs, such as sycamore maple (Acer pseudoplatanus), European mountain-ash (Sorbus aucuparia), hazel (Corylus avellana), birch (Betula pendula), honeysuckle (Lonicera nigra), rose (Rosa canina) and hawthorn (Crataegus monogyna). At the forest boundary, a small lake of approximately 0.25 ha is present. The transect encompasses both the margin and interior of the forest.
2. Pasture with small tree clumps (maximum 0.25 ha), of mainly black alder (Alnus glutinosa), aspen (Populus tremula), European elderberry (Sambucus nigra) and goat willow (Salix caprea). In some places the saturated soil favoured wetland vegetation. Mixed forest edge on the Ghergheleu hill base.
3. Corna Valley: pasture with small coniferous and deciduous tree patches of maximum 1 ha, alternating with field crops. Beech forest (Fagus silvatica)
4. From Roşia Montană to Taul Mare: orchards alternating with deciduous woodlots.
5. Jig-Vaidoaia Pasture to Tarina – Roşia : overgrazed pastures and clumped shrubs of hawthorn (Crataegus monogyna), rose (Rosa canina), Rubus sp. and black thorn (Prunus spinosa).
6. rock outcrops and clumped shrubs of hawthorn (Crataegus monogyna), rose (Rosa canina), Rubus sp. and black thorn (Prunus spinosa).
7. Orlea area: pastures and tree rows, natural regenerated forest with young birch (Betula pendula) and heath (Calluna vulgaris) and shrubs patches of the species mentioned above.
8. Taul Tapului – Roşia Montană area: ungrazed secondary meadows, small forest patches; small lake with small bur-reed (Typha sp.) patches.
9. Vârtop Valley: interface between spruce and deciduous forests and pasture areas.
10. Localities: backyards, gardens, and several empty houses.

All birds observed within an approximately 100 metre wide strip on both sides of a transect line were recorded. Transects were censused between 7 and 12 a.m. and again between 6 and 9 p.m., at slow uniform speed. Birds were identified acoustically (by songs or calls) or visually (through binoculars), using the Svensson field guide (Mullarney, Svensson et al., 1999). For each observed individual, additional information concerning the breeding status (i.e. territorial behaviour and song, juvenile presence) was recorded. In order to obtain quantitative data (relative density by area unit, nesting areas for predator species etc.) the following methods were used in 2010: for birds of prey - remote observations from fixed points, for Passeriforma species and woodpeckers the transect fixed points method was used. Density was calculated with the following formula:

$D = n(n/n_2)*n/m\pi r^2$;

where n is the total number of observed birds, , n_2 is the number of birds outside de 30m radius, m is the number of observation points and r is the circle radius (30m). The short transects for density calculations were located only in the direct Project impact area.

2.4.4.3. **Results**

A total number of 83 bird species was observed on the site during 2003-2007. During 2007-2010 all previously observed species with the exception of *Otus scops* were confirmed. There is the possibility that the specimens heard in May 2003 were in migration, knowing that the male of this species sing during migration. Twelve more bird species were observed in this period, some nesting on the proposed Project site while others were observed only during migration or in winter time. The list of species observed on the site was integrated in a table completed with:

- their appertaining to the annexes of national and European legal acts
- numerical data
- population in Romania
- population in Europe

This list is presented in Annex *NE_Cap 4.6_ 02*.

No significant differences between data collected prior to 2006 and data collected during 2007-2010 which would change the conclusions presented in the EIA Report were identified. Identification of new species on a certain site increases with the amount of time spent for the investigation of the respective site. Some of the observed species are accidental species occurred during spring and winter migrations. None of these newly recorded species depend exclusively of areas and/or specific habitats on the proposed Project site, therefore the Project impact on these species is punctual or even null for the accidental species.

2.4.5.   Mammals
2.4.5.1. Background
The first data on the presence of mammals within the Project impact area were obtained in the autumn of 1999 and spring of 2000. At the time, qualitative data were obtained as a result of first field visits. Systematic data was collected in 2003 during the STANTEC research programme. Qualitative and quantitative data regarding mammal species of hunting interest were taken from the reports on the hunting stock affected by the Project located at the AJVPS Câmpeni Subsidiary. Qualitative data was collected between 2007 and 2010 during field visits conducted mainly for the application of monitoring protocols implemented in 2007 and for quantitative research of bird species.

2.4.5.2. Methodology
Mammal inventory was conducted as the same time with bird inventory. Direct and indirect observations were used, such as excrements, food remains with specific impressions or trails. For small mammals traps were used to capture the animals alive. The overnight captures were recorded then the animals were set free. In addition, records of mammal presence were provided by the Campeni Hunting Department.
Chiropters were inventoried by specialists through direct observations, by inspecting the rest locations (crevices, holes in cliffs, tunnels) as well as by overnight research, using the transect method, of various habitats in the area by means of ultrasound detectors.

2.4.5.3. **Results**
A total of 31 mammal species were observed during 1999-2007. In the winter of 2007-2008 an intensive programme for searching of mammal tracks particularly for carnivorous species and otter whose presence could not be confirmed.

Data obtained from field visits conducted during 2007-2010 could not confirm the presence of mammals other than those listed in the EIA Report.

3.   Updates on Chapter 4.6 - "Biodiversity"
Detailed data on the environmental factor biodiversity can be found in the technical documentation, in the form of lists (inventories) of species and habitats. The followings were identified: 441 plat species; 188 terrestrial invertebrate species, 8 amphibian species, 4 reptile species, 83 bird species (to which subsequent research added 12 more species, some accidental, others present but unnoticed until 2006), 31 mammal species.

3.1.   General Considerations
In order to meet the measures assumed in Plan H - Biodiversity Management Plan attached to the EIA Report, direct monitoring measures were conducted in 2007. In this respect, 25 sampling areas were identified (3 degraded areas, 1 cliff area, 12 meadows and 1 area of antrophic-urban environment, one new forestry plantation, 7 forestry areas). Distinct observations over 10 sampling areas within waste rock dump areas were added to the above sampling areas, looking at highlighting the natural vegetation succession, revegetation rate etc. Therefore, with respect to environmental component, the assessment of the state of the factors is inconceivable in the absence of an objective monitoring system. Particular attention was given to the identification of habitats and species pointed out by various actions related to the amendment of initial reports and documents. During the monitoring programme the presence of elements of conservation interest could not be confirmed.

Work methods
For the purpose of completing the monitoring methods presented in the EIA Report (Chapter 4.6 - Biodiversity: pages 11-16), a set of dedicated measures was detailed which aimed to define and detail aspects related to habitats, flora and vegetation, invertebrate species respectively, based on a system of methods as well as on standard working protocols presented in Annex *NE_Cap 4.6_01.*
A monitoring plan of key vertebrate species as well as aquatic biodiversity was developed in 2007 which was audited by independent experts from Germany – Wisutech, AMEC Earth & Environmental and URS- UK. Monitoring protocols for nesting birds, large size mammals, aquatic biodiversity, amphibians were implemented after 2006 producing the results mentioned above. Currently, a standardization process of monitoring protocols for terrestrial invertebrates, flora and habitats is undertaken with those already audited in order to develop a consistent biodiversity monitoring plan.

3.2. Baseline conditions

The continuation of the monitoring programme of habitats, flora and invertebrate species resulted in the updating of the list of species of conservation interest, including in terms of changes in the legal provisions (publication of GEO 57/2007). The results are summarized in the table in Annex *NE_Cap 4.6_02*, thus being certified the occurrence of 5 invertebrate species, 2 species of plants under the protection status respectively. Given hat no unique key habitats were identified for the preservation of valuable species invertebrates for eco-economic, scientific, or other reasons, we consider that protective measures are not justified on any area of the Project site in view of invertebrate species cinservation.

3.3. Assessment of Impacts on Biodiversity

Even though the Project impact area is outside Natura 2000 network (see the map attached to the Project versus SCI/SPA Natura 2000 sites), in order to conduct a baseline assessment of activities with anthropogenic impact on the environmental factors within the perimeter under review, the system proposed in this respect was followed, recognising the quantifiable value and possibility to create a superposable system, comparable with natural and/or seminatural perimeters etc.

The magnitude of the anthropogenic impact in the pre-project phase (before Project implementation) or the so-called analysis of actual condition of the perimeter under review was assessed following the coded system of activities with anthropogenic impact in view of assessing the condition of environmental factors at the level of Natura 2000 sites. The results of implementation of some of the monitoring protocols are presented in Section 2.4 of this document.

Methodology for assessing the impact on biodiversity

While in Romania there are no clear criteria to estimate the magnitude and value of the impact on biodiversity for areas outside protected natural areas which together can provide an idea on the significance of the impact to be generated by a plan or programme, methods to estimate the impact on the biodiversity of a potentially affected area can still be designed. In the absence of comparable quantitative data, the impact on biodiversity can be expressed qualitatively as follows: neutral, insignificant, moderate, high or very high and, depending of the conservation value of habitats, species or proposed Project site location, of the percentage of the area occupied by the species occurring here, strict dependence of the impacted habitat etc. The impact can be geographically localized (e.g. punctual, local, regional, national etc.) and can be describes as generated on short, medium and long term.

Thus, in case of the Project, the impact on biodiversity was describes following the potential impact of the Project on protected natural areas containing important biodiversity elements (such botanical, forestry, fauna reserves). It should be noted that upon the EIA Report submission date there were no designated protected natural areas of Community interest. Nevertheless, the proposals given by the team of experts were taken into consideration.

The conclusion of this analysis was that the impact of the Project on the protected natural areas designated for the protection of habitats and wild fauna and flora is inexistent. Piatra Corbului is located within the conservation area while Piatra Despicată is in fact a natural monument represented by a rock without biodiversity elements of Community interest.

After designation of Natura 2000 sites an analysis regarding the potential adverse impact on these sites was conducted. As shown in the Project site location map in relation to Natura 2000 sites and pollutant dispersion models, considering the worst case scenario, it can be seen that they will not be impacted by the Project.

In case of species for which there are available quantitative data at national or European level, such as for birds, a percentage estimation of the number of nesting pairs which may be affected by the Project was conducted. The worst case scenario was considered, namely that they will disappear off the site area and those more sensitive also off the adjacent areas at the same time. The impact was considered high at local level and insignificant at regional, national or European level. It is noted that, as percentage, the population of each species that might disappear is insignificant compared to the population at national level. While the assumption of total disappearance of these species from the area was considered, this assumption is not supported by the surveys carried out in the early 2000 when the State owned mining company was operational without employing any impact mitigation methods and when most of the bird species presented in the EIA Report were observed on the proposed Project site or in the immediate vicinity, many even in the active mining area.

Other species for which local quantitative data are available are the species of hunting interest. Here a comparison between the maximum specimen number observed on site and number of specimens estimated in the hunting stocks wherein the Project site is included. Also, the area of these stocks which may be lost as a result of Project implementation was percentage estimated. The worst case scenario was imagined, whereby all hunting stock areas suffered no impact to date due to mining operations. However, the impact at the level of populations estimated within hunting stocks is insignificant.

For invertebrate species whose population is not known at national level, other criteria was used for the estimation of the impact scale such as the impacted area of habitats on which these animals depend on, their abundance in the Project area and habitats nearby the Project site.

The amphibians and reptiles have no known population at regional, national etc. level. The only quantitative data, very vague, are given in the work Red Book of Invertebrates from Romania (Botnariuc et al 2005). These can hardly be used for the evaluation of habitats as the estimates are in the order of thousands, tens of thousands, hundreds of thousands etc.

For amphibian species an assessment of the reproduction habitat areas lost in case of Project implementation was conducted. It was noticed that, in the absence of measures to restore the wet lands and relocate the populations from the 3 lakes to be drained, as well as from the combined area of temporary on site ponds, they will be destroyed. Also the impact mitigation measures were not taken into consideration, particularly the restoration prior to the Project start-up of potentially affected wet areas, nor the improvement of conditions in some existing wet but silted areas, nor the planned relocation actions. Under these circumstances, the impact is considered significant at the level of the Project surface area, but insignificant at regional or national level. The impact scale decreases significantly after the implementation of impact mitigation measures.

In case of reptiles, their rarity within the site area was considered, thus in case of total loss of their populations, the impact will be limited to a punctual impact.

For other mammal species (other that those of hunting interest), species whose populations are not known at national level such as rodents, insectivores etc. the impact was assessed based on their abundance and frequency on the site, conservation value of these species, their role in the support of other species with higher conservation value, their exclusive dependence on the habitats within the impact area. It was noted that there are common species, largely spread at regional and national level which populate in large numbers the habitats outside the Project site, therefore the impact was considered moderate or high at punctual or local level and insignificant at regional, national etc. level. The worst case scenario was also considered for these species, of the total and simultaneous destruction of all areas within the Project footprint and inexistence of impact mitigation measures.

Cumulated Impact

In the proposed Project area no other projects which may create a cumulated impact are proposed for implementation, except for traditional meadow exploitation activities (grazing, mowing). With respect to gold and silver mining projects, the only project which may have a cumulated impact on the Mures river watershed and its associated biodiversity is the Certej gold and silver and polymetallic ore mining project. The modelings presented in the Annex confirms that the impact, even considering the worst case scenario, can not be cumulated with the Certej impact, as the water pollution plume and dust emissions will not reach the area potentially impacted by the other project. At the same time, the above-mentioned modelings show that there is no impact generated by polluted water discharges or suspended particulate emissions which may affect Natura 2000 sites located nearby the Project site, as the closest Natura 2000 site is Trascau at 7.8 km from the site.

Residual Impact

The residual impact concept occurs in the legislation only in Order No. 863/2003 of the Minister of Environment, and Forests for the approval of the Methodological Guidelines for adequate assessment of potential impacts of plans or projects on protected natural areas of Community interest. The project does not generate impacts on any of the protected natural areas of Community interest.

However, we briefly present the residual impact remaining after the implementation of the Project impact mitigation measures. By applying specific mitigation measures, the residual impact is reduced to the modification of some habitats on the proposed Project site and corresponding decrease of the populations of species dependent on this type of habitats. With respect to habitats, flora species and invertebrate species, the compensatory measures are likely to contribute to the removal of any residual impact. An argumentation in this respect starts with the assumed objectives whereby the removal of important areas with no significance for these species (nonproductive areas, degraded areas, skeleton soils, eroded perimeters) and their replacement with habitats of high significance for these species is proposed.

With respect to vertebrate species, there will be no residual impact. The loss of reproduction habitats represented by the 3 lakes (Cartus, Corna and Taul Tapului) will be compensated by the restoration of some silted ponds located nearby the Project footprint and in the long term the amphibians will be able to colonize also the newly created lakes.

The impact on Rosia and Abrudel rivers will be positive, the Rosia river being currently in a state of "biological devastation". Following the implementation of the measures regarding the collection and treatment of ARD water generated by the waste rock dump run-off and underground workings, the water will maintain the conditions for natural repopulation with related lotic species.

3.4. General measures and recommendations for biodiversity impact mitigation

The measures and recommendations regarding mitigation of biodiversity impact included general considerations and also a complex set of dedicated measures designed for local particularities. All measures were described in the EIA Report. Some of these measures were detailed in the period 2006-2010 due to the involvement of experts with international experience regarding the management of environmental factors in case of mining projects.

3.5. Management of Biodiversity

Plan H - Biodiversity Management Plan attached to the EIA Report provides coherent and concrete measures for biodiversity impact mitigation. Undertaking the impact associated to the mining project represents one of the principles underlying the responsible mining concept. Moreover, the proposed mining project also takes on the responsibility of historical pollution, including upon the biodiversity environmental factor. The materialization of these concepts is represented by the proposal to develop a compensatory functional ecological network which will comprise over 1000 ha of newly developed forests (representing approximately 4 times more than the impacted forest areas), as well as a management aiming to increase the biodiversity indices in the forest areas and adjacent meadows.

4. Updated on Chapter 4.6 - "Biodiversity" - Biodiversity Management Plan

4.1. Objectives of Biodiversity Management

RMGC's Biodiversity Management Plan involves an integration of programs within the project area with the priority areas of the National Strategy and Action Plan for the Biological Diversity Conservation and Sustainable Use of its Components in Romania. The Management Plan started from the elements identified within the baseline studies in order to meet the general environmental objectives (increased habitat connectivity, provision of compact revegetated areas, ecological niche is a function of the species, it cannot be created as a niche in the wall etc.) with relevance to the environmental factor biodiversity. The measures to be implemented within the Biodiversity Management Plan will be detailed in parallel with the Project development, particularly following the analysis of the results of the Biodiversity Monitoring Plan implementation, and will be correlated and scaled at punctual level in the form of dynamic response.

The Biodiversity Management Plan includes milestones correlated with the main phases of the Project development (years: 0, 7, 10, 16, 19), accompanied by several detail elements taken into account (road, culvert, ecological corridor structure etc.), to overlap structures (technological) taken into account or pre-existent. The Biodiversity Management Plan should also contain a very short description of the general situation and measures leading to the conservation of species and habitats on the site and immediate Project vicinity.

The reason for using specialist literature data, mainly specialist literature published abroad, is due to the unique character of this project in Romania and the fact that for the mining projects implemented in Romania, no such plans have been so far developed and implemented. For this reason, we had to use data on methods implemented in other similar projects from abroad and/or those methods described in the good practice guides for biodiversity conservation in mining areas such as those published pursuant to the cooperation with IUCN (International Union for Conservation of Nature) and ICMM (International Council on Mining and Metals).

RMGC's Biodiversity Management Plan involves an integration of programs within the project area with the priority areas of the National Strategy and Action Plan for the Biological Diversity Conservation and Sustainable Use of its Components in Romania.

4.2. Evaluation of the Biodiversity Management Plan

The evaluation of the Biodiversity Management Plan undertook the information and consultation phase from 2006 as integral part of the environmental impact assessment procedure in parallel with the EIA Report. The comments recorded during these public information and consultation phases or during the CAT meetings from 2007 showed the necessity to undertake an extended monitoring programme, comparable and long term, able to respond to a wide range of aspects. During 2006-2007, the biodiversity section, including the Biodiversity Management Plan undertook an independent auditing and detailing conducted by the auditors: Wisutec (Germany), Amec (UK) and URS (UK). The audit was finalized with a series of recommendations to be implemented during the Project construction and operation phases.

In this respect, it was decided to supplement the Biodiversity Management Plan with actions to be implemented in the following Project phases and able to provide solutions to relevant issues not considered in the initial documents. Therefore, during 2007-2010, a mixed team consisting of Project employees and independent biodiversity experts identified several issues to be solved prior to commencement of the construction phase:

- completion of operational procedures for invertebrate species, plants (flora and vegetation) and habitats for the preparation of a comprehensive manual similar to the manual prepared for vertebrate species;
- identification of a monitoring system with longitudinal transects (up to 200m) which crosses at least 2 major habitat types;
- integration of 50-55 monitoring plots (5 x 5 m; 25m²) covering the industrial area, EFCN as well as 5 neighboring sites;
- initiation of pilot projects (monitoring and small ecological reconstruction activities) nearby the Project site, in the management areas of waste generated by the historical mining operations;
- creation of a long term action programme for monitoring of key species with clearly defined periods, defined objectives and deadlines, reporting and system for recording in the central database (ALWIS/GIS) which will ensure implementation of the most objective statistical tools.
- detailed monitoring plans/procedures for various invertebrate species.

Starting from the construction phase, a mixed team consisting of Project employees and independent experts, people with relevant experience in the biology field (5-10 zoologists with special references for all considered groups of species , 3-5 botanists with experience in mushrooms, seed plants, moss and lichens, 3-5 ecologists with special experience in habitat mapping, 3-5 landscapists with special experience in GIS data management will ensure the implementation of the Biodiversity Management Plan objectives and standard operational procedures.

The key species monitoring plan will form integral part of the Biodiversity Management Plan. The implementation of this plan will provide real time information on the potential impact of the Project on the on site population/species as well as on the efficiency of the impact mitigation measures so that these measures can be adapted to the impact time and scale.